EFFECTIVENESS OF TREATMENT FOR CANNABIS USE DISORDER IN NEW ZEALAND

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ABSTRACT

This study, believed to be the first cannabis treatment outcome study in New Zealand, used a naturalistic design to examine the relationships among client characteristics and correlates of cannabis use problems, treatment variables, outcome measures, and client satisfaction. Participants were 63 persons seeking treatment for cannabis use problems recruited from four geographically diverse outpatient settings. All participants completed baseline assessment and began treatment as typically delivered at New Zealand drug treatment services. A high rate of attrition characterized the study from very early on and continued through follow-up. Eighteen participants completed posttreatment assessment. Outcome measures for those who completed treatment revealed a significant reduction in both cannabis use and psychological distress, accompanied by a significant increase in self-efficacy. A significant correlation between attending more sessions and better outcomes on days of cannabis use and self-efficacy was also noted. However, at treatment termination two-thirds (12) were still using cannabis on at least 3 days per week, with half (9) using daily/near daily. Hypotheses regarding the relationship between theoretically important client variables and treatment dropout were tested. No predictors of dropout were established. Attrition peaked at 86% at the final assessment point with 8 (only) responses to the 3-month follow-up survey. While clients were generally satisfied with treatment services received, some suggestions for improvement to the cannabis treatment programmes were made. Retention- and therapeutic-enhancement strategies are discussed in terms of making treatment services more responsive to identified client needs to improve outcomes. Recommendations for clinical and research attention include the development of individualized treatment packages tailored to meet the presenting needs and deficits of cannabis clients, and ongoing routine evaluation of these programmes.

For my children

Virginia and Shane

with love

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SUBSTANCE USE DISORDERS AND THEIR TREATMENT IN NEW ZEALAND

Cannabis use dates from antiquity. Today, cannabis is the most popular illegal drug in the world, estimated to be used by 2.4 percent of the global population, and its 'abuse' far more widespread than that of all other illegal drugs combined (United Nations Office of Public Information, 1998). In New Zealand cannabis use ranks only behind alcohol and tobacco (Field & Casswell, 1999b).

Despite the earlier consensus that cannabis was *not* a drug of dependence (Hall, Solowij & Lemon, 1994), since the late 1980s a dramatic development has occurred in the escalation of presentations for treatment for primary cannabis use problems at drug treatment services, both overseas and in New Zealand. Paradoxically, in spite of its long and unique history, little is known about how best to treat cannabis dependence/abuse problems.

Views on the nature of all forms of drug dependence have been heavily influenced by the literature on alcohol dependence. The concept of a drug dependence syndrome was first articulated in the alcohol dependence syndrome (Edwards & Gross, 1976) and subsequently generalized to all psychoactive drugs. The ongoing debate concerning the effectiveness of treatment for addictive behaviours has also been led by researchers in the alcohol treatment field. Not surprisingly, therefore, most interventions used for cannabis problems to date have been adaptations of alcohol interventions. The major question that inevitably arises is the acceptability, appropriateness, and effectiveness of these approaches for the primary cannabis clientele of drug treatment services. Ironically, as the new millennium begins the historical dearth of treatment studies for cannabis use problems persists.

As a first New Zealand attempt to find urgently-needed answers to these and other closely-related treatment issues, one of the major aims of the current study was to

evaluate the appropriateness and effectiveness of the treatment programmes currently available to the cannabis clientele of local drug treatment services. The remainder of this chapter aims to set cannabis in the context of substance use and substance use disorders in New Zealand to provide a general background for the current research. Firstly, a brief outline of the concept of substance dependence/abuse and prevalence of both substance use and substance use disorders in New Zealand is provided. This is followed by a review of cannabis use - patterns in New Zealand, harmful effects, high-risk groups, and related social problems. To clarify the state of the art in the drug treatment paradigm an overview of current treatment approaches and recent developments follows. As a prelude to the current cannabis treatment outcome study the chapter concludes with a discussion of the many problems and dilemmas that have plagued treatment outcome research in the addictions field.

SUBSTANCE USE DISORDER

The current version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) codifies operational definitions that differentiate two subtypes of Psychoactive Substance Use Disorders, *Substance Dependence* and *Substance Abuse* (see Appendix 1 for specific DSM-IV diagnostic criteria). While the tabulated diagnostic principles apply across the various drug classes, drug-specific variations are outlined in DSM-IV.

As the diagnostic criteria indicate, Substance Dependence is currently conceptualised as a psycho-biological-social syndrome, the 'drug dependence syndrome' (Edwards, Arif & Hodgson, 1981) featuring a cluster of cognitive, behavioural and physiological symptoms related to a central phenomenon, "that the individual continues use of the substance despite significant substance-related problems" (APA, 1994,p 176). Addiction specialists currently define addiction/dependency as a complex and progressive pathological behaviour pattern characterised fundamentally by:

a)   loss of control over drug use

b)   escalating drug craving and drug-seeking behaviour

c)   a subjective compulsion to use despite adverse sequelae, and a strong tendency to reinstatement of the behaviour pattern following periods of withdrawal/abstinence

(Marlatt & Gordon, 1985; Peele, 1985).

The essential feature of Substance Abuse is recurrent substance use (without evidence of tolerance, withdrawal, or compulsive use) resulting in recurrent and significant adverse consequences (APA, 1994). Thus, Substance Abuse is currently understood as any use of drugs that causes physical, psychological, economic, legal or social harm to the individual user or to others affected by the drug user's behaviour (see Rinaldi, Steindier, Wilford & Goodwin, 1988).

The reader is referred to Appendix 1 for DSM-IV diagnostic criteria, some important assumptions associated with the drug dependence syndrome, and clarification of terminology with regard to the concept categories of 'use', 'misuse' and 'abuse'.

Prevalence of Substance Use and Substance Use Disorders in New Zealand

Data presently available on alcohol and drugs in New Zealand suggest a clear hierarchy of incidence of use. While legal drugs, alcohol and tobacco are the ones most commonly used in New Zealand today, a large minority of the population is using illicit drugs, most often cannabis.

There have been three major general population surveys of drug use in New Zealand over the past decade (Black & Casswell, 1993; Bushnell, Carter & Howden-Chapman, 1994; Field & Casswell, 1999a, 1999b). The most recent national survey of a general population sample from across New Zealand (Field & Casswell, 1999b) confirmed the general findings from the 1990 survey (Black & Casswell, 1993). In

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the past 12 months alcohol was the most commonly used drug (86%) followed by tobacco (36%) and cannabis (20%). Considerably lower frequency of use was found for other drugs such as hallucinogens (LSD, mushrooms, ecstacy) and stimulants (9%). Use of opiates (1%) and tranquilliser/solvents (1%) was even lower.

As reported elsewhere in the world, multiple drug use was the 'norm' in the New Zealand sample. However, unlike the situation in the USA or Britain (where multiple drug use implies combinations of cocaine, heroin, crack, LSD and alcohol, etc.) multiple drug use in New Zealand was most likely to involve alcohol, cannabis and tobacco (Field & Casswell, 1999b).

The National Advisory Committee on Core Health and Disability Support (1994) reported that alcohol and drug problems were the second most common mental health problem (after depression) in New Zealand, and affect 9.1 percent (or one in ten) of the population. Not all of these people have moderate to severe dependency, and less than one-third would seek help for their problem. However, there is a serious lack of quality research data on the prevalence of substance use disorders among the New Zealand population (Sellman, Hannifin, Deering & Borren, 1996). The Health Funding Authority reported that well over 30,000 people accessed local drug and alcohol services in the 1997/1998 year (Fox, 1998). Given the notorious problems involved in obtaining reliable prevalence estimates of substance use and substance use disorders (Johnston & Hannifin, 1987; Sellman et al., 1996), these statistics might well represent a 'tip of the iceberg' phenomenon.

The only source of community-based prevalence data with a large-scale probability sample of the general adult population is the Christchurch Psychiatric Epidemiology Study (CPES) in 1986 (Wells, Bushnell, Joyce, Oakley-Browne & Hornblow, 1989). It was found that nearly one person in five (18.9%) met DSM -defined criteria for an alcohol disorder, while only about 6 percent had a lifetime drug use disorder. There was a remarkable consistency with available American and Australian data (Anthony, Warner & Kessler, 1994; National Drug Strategy, 1996) in the proportion of the drug use disorders accounted for by cannabis dependence.

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Most of the drug use disorders in this sample (5%) related to cannabis dependence, with the lifetime prevalence of all other drug use disorders each below 1 per cent (Wells et al., 1989). Other similar findings were that alcohol and drug use disorder (cannabis) were very likely to co-occur. Further, men were more likely than women to have alcohol and drug disorder(s) comorbid with other mental health disorders (Bushnell et al., 1994).

Cannabis Use In New Zealand: Epidemiology and Adverse Consequences

Prevalence

Despite prohibition on its use, population-based studies have consistently revealed that cannabis is the most widely used illegal substance globally (Johnson, 1991). The United Nations Office of Public Information (1998) reports that:

> Annual prevalence of cannabis use is estimated
> at 2.4 per cent of the global population, or about
> 145 million people. Its abuse is far more widespread
> than the abuse of cocaine (0.23 per cent), heroin (0.14
> per cent) or ATS (amphetamine-type stimulants, 0.5 per
> cent) combined (p.43).

In 1998, an estimated 13.6 million Americans overall (6.2 percent of the U.S. population age 12 and older) were current users of illicit drugs. About 60 percent of all illicit drug users reported using marijuana only, and another 21 percent reported marijuana use and some other illicit drug use (National Household Survey on Drug Abuse, 1998). In Australia, estimates of the number of persons who have ever tried cannabis are typically in the order of one third (Makkai & McAllister, 1993) to one half (National Drug Strategy, 1996). While most of those who try cannabis never

repeat the experience, approximately 10 per cent continue to engage in regular recreational use for some years (Reilly, Didcott, Swift & Hall, 1998).

As in other comparable English-speaking countries such as Australia (Donnelly & Hall, 1994), Canada (Adlaf, Ivis & Smart, 1994) and the United States (Adams & Martin, 1996), cannabis is the most commonly used recreational drug in New Zealand after alcohol and tobacco (Ministry of Health, 1995, 1996, 1998). Utilizing identical methodology and general population samples aged between 15 and 45 years, a series of surveys were conducted to provide national and regional data about drug use in New Zealand (Black & Casswell, 1993; Field & Casswell, 1999a, 1999b). The surveys investigated both legal and illegal dug use, focusing particularly on marijuana, the most popular form of cannabis in New Zealand.

A 1990 survey (Black & Casswell, 1993) from two North Island regions (a metropolitan and a provincial region) found that while 43 per cent had tried marijuana, 18 per cent had used it in the last year, but only 13 per cent were current users. An even smaller proportion (2.4 per cent) were defined as heavy users (more than 10 times in the last 30 days). Data were strongly related to gender and age: while frequent use was most common (81 per cent) among those under thirty years of age and declined steeply thereafter, frequent users were more likely to be men (81 per cent). When asked at what age they had first tried marijuana, 40 per cent of lifetime users had done so by 16 years of age (Black & Casswell, 1993).

Using a sample from the same age group within the same population, a follow-up comparison survey was conducted in 1998 to investigate any changes in drug use since the initial survey in 1990 (Field & Casswell, 1999a). The percentage of people who had ever tried marijuana increased from 43 per cent in 1990 to 52 per cent in 1998. Use of marijuana in the last year increased from 18 per cent to 21 per cent, and current users (metropolitan region only) increased from 13 per cent to 17 per cent. These substantial increases in marijuana use were reported more among women than men.

Heavier marijuana use also showed a trend towards an increase between the two surveys (2.4 per cent versus 3.2 per cent). As in the 1990 survey, frequent heavier

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users were more likely to be younger men. Finally, more people in the 1998 survey (52 per cent) than the 1990 survey (40 per cent) reported that they had tried marijuana by age 16 (Field & Casswell, 1999a).

A 1998 national survey of drug use in a sample drawn from three broad regions across New Zealand (the northern North Island, the southern North Island, and the South Island) has yielded a more comprehensive and representative profile of current cannabis use in the general population (Field & Casswell, 1999b). This survey found that 50 per cent of New Zealanders aged 15-45 years had tried marijuana (56 per cent men and 44 per cent women). As in the comparison surveys, however, most of those who had tried marijuana no longer used it (69 per cent), and the majority of users did not use it on a regular basis. Only 24 per cent of lifetime users had used marijuana more than twice in the last 12 months.

While 20 per cent of the total sample had used marijuana in the last year, 15 per cent described themselves as current users (20 per cent men and 10 per cent women). Consistent with the comparison surveys, a very small proportion (3 per cent) were defined as frequent users, and only 1 per cent of these were daily users. Also in accordance with the comparison surveys, three-quarters of heavier users were men, and 62 per cent were aged under 30. Frequent, heavy use was most common in the 18-24 year age group (11 per cent of all men aged 18-19, and 8 per cent of men aged 20-24). The percentages for women were considerably lower at this level of use.

Patterns Of Use

Field and Casswell (1999b) compared the pattern of reported illegal drug usage in New Zealand with that of Australia, Britain, Canada and the United States, and found that rates of last year use of marijuana in New Zealand were similar to those of Australia and the United States, but higher than in Britain. In broad terms, reported use of all drugs in the last 12 months in New Zealand was most comparable with that of Australia. People in both countries were more likely to have tried all

three of alcohol, tobacco and marijuana than any drug alone or combination of any other substances.

The specific pattern of cannabis consumption in New Zealand also appears similar to that reported in Australia (Donnelly & Hall, 1994; National Drug Strategy, 1996) in which a large number of young people try ("experiment with") cannabis, but the majority do not appear to use it regularly, and only a relatively small proportion are defined as frequent users (Black & Casswell, 1993; Field & Casswell, 1999b).

Self-Reported Harmful Effects

Despite its widespread use, some users do experience problems related to cannabis consumption. Respondents to the drug surveys were asked to identify which of several aspects of their life had been harmed by their cannabis (and alcohol) use. Life areas most frequently identified as harmed by both marijuana and alcohol use were energy and vitality, financial position, health, and outlook on life. There was an increase from the 1990 to the 1998 comparison survey in the proportion of respondents reporting harmful effects on their energy and vitality from both drugs (Field & Casswell, 1999a). Frequency of marijuana use, however, was the most significant predictor of problems across all three surveys. That is, frequent marijuana users (who were more likely to be men and who were also heavier alcohol users) reported higher levels of harmful effects related to both drugs on their energy and vitality, financial position and health.

In addition to responding to a pre-determined set of life areas, the national survey also asked people to voluntarily identify *any* problems they had had because of using marijuana. Loss of memory (10 per cent), loss of motivation or energy (9 per cent), general physical health (6 per cent), and feelings of paranoia (4 per cent) were the problems most often spontaneously reported. Men were more likely to also report trouble with the law as a problem (4 per cent). Again, however, more frequent users (6 per cent of total sample) reported higher levels of problems than lifetime and last year users. In this survey, frequent users identified problems of

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memory loss (22 per cent), loss of motivation/energy (11 per cent), trouble with the law (7 per cent), relationship problems (6 per cent), problems with parents (6 per cent) and general physical health (6 per cent) (Field & Casswell, 1999b).

Finally, respondents were asked their perceptions of the health risks associated with smoking marijuana at both an individual level and as a community problem. Consistent with popular benign perceptions of the harm potential of the drug, a higher perception of the risks associated with smoking cigarettes than smoking marijuana was reported. As a community concern, cannabis was ranked as the fifth most harmful drug after other illegal drugs, solvent abuse, alcohol, and tobacco use (Field & Casswell, 1999b).

Several studies involving nontreatment samples of self-identified cannabis users in the United States provide further indicators of the nature and incidence of problems associated with cannabis use (e.g. Haas & Hendin, 1987; Hendin, Haas, Singer, Ellner & Ulman, 1987; Rainone, Deren, Kleinman & Wish, 1987; Roffman & Barnhart, 1987). At least half of the respondents in each study sample reported adverse physical, psychological, social and occupational consequences directly related to their cannabis use. These included impairment of memory, concentration, motivation, and problems with their self-esteem, health, interpersonal/family relationships, finances, school/ job performance, and difficulties controlling cannabis use.

A more recent Australian study of 268 cannabis users with a median history of 19 years regular use (Reilly et al., 1998) found that the most commonly reported negative effects were feelings of anxiety, paranoia or depression (21 per cent), and tiredness, lack of motivation and low energy (21 per cent). One quarter of the sample (26 per cent) had been charged with cannabis possession.

High Risk Groups

High risk groups for health implications from cannabis use include adolescents,
Maori, women of childbearing age, and persons with pre-existing diseases (MOH,
1996, 1998).

Adolescence

A recent White Paper from the United States reported that in 1996 (the latest
numbers available) more adolescents aged 19 and younger entered treatment for
cannabis abuse and dependence than for any other drug including alcohol. In fact,
nearly as many teens and children were admitted to treatment for cannabis as were
admitted for abuse and dependence on all other substances combined. Of the nearly
181,784 teens and children who entered treatment in 1996, nearly half (48.2%) were
admitted for dependence or abuse of marijuana alone. More than half of this group
were between the ages of 15 and 17 (The National Center on Addiction and
Substance Abuse, 1999).

Several New Zealand studies indicate a significant upturn in cannabis use within
adolescent populations in recent years, similar to that reported in the United States,
Australia and Canada (Black & Casswell, 1993; Feehan, McGee, Raja & Williams,
1994; Field & Casswell, 1999a, 1999b; Fergusson, Lynskey & Horwood, 1996;
McGee & Feehan, 1993; Poulton, Brooke, Moffitt, Stanton & Silva,1997). The
most recent in a series of longitudinal studies of a birth cohort found that by age 21
years nearly 10 per cent met DSM-defined criteria for cannabis dependence
(Poulton et al., 1997). In short, cannabis appears to be an integral part of New
Zealand youth culture in the late 1990s.

A considerable body of research data has consistently demonstrated a correlation
between heavy adolescent cannabis use and impaired educational and occupational
performance, school dropout and unemployment, arrested psychological maturation,

disrupted interpersonal and family relationships, low self-esteem and achievement motivation, increased risk of other illegal drug use and drug-related crime, and adverse effects on mental health, especially depression (e.g. Feehan et al., 1994; Fergusson & Horwood, 1997; Fergusson et al., 1996; Kandel & Davies, 1992; Kandel, Davies, Karus & Yamaguchi,1986; Pandina, Labouvie , Johnson & White, 1988; Yamaguchi & Kandel, 1984). Accordingly, evidence of ever younger initiation into cannabis use in New Zealand as elsewhere gives cause for concern as a potential source of future societal morbidity (Fergusson & Horwood, 1997; Makowharemahihi, 1993; Ngata, 1993).

A more immediate and serious concern in our society is the elevated incidence of youth suicide in New Zealand. The Canterbury Suicide Project (Beautrais, 1998) examined the characteristics and risk factors in young people aged under 25 years who had made serious non-fatal suicide attempts. It was found that young people with a substance abuse disorder have a risk of serious suicidal behaviour of nearly 4 times higher than the risk of those without substance use disorders. Almost 40 per cent of those making serious suicidal attempts met criteria for substance abuse at the time of their suicide attempt. Importantly, while 31 per cent of these met criteria for alcohol dependence, 12 per cent (one in eight) met criteria for cannabis dependence or abuse. When odds ratio (OR) statistics were calculated it was estimated that those with cannabis abuse or dependence had odds of serious suicide attempts of over 10 times higher than those without such a disorder. Subsequent analyses (Beautrais, Joyce & Mulder, 1999) reduced this OR to 2.0 after adjustment for sociodemographic, family, concurrent disorder and other confounding factors and factors. However, these authors concluded that cannabis abuse/dependence may make an independent contribution to risk of suicide attempts, both directly and indirectly, through the possible effects of cannabis abuse on risks of other mental disorders (Beautrais et al., 1999). The implications of these findings are both self-evident and of major concern.

Maori

Existing research and anecdotal evidence suggests widespread use of cannabis among some groups of Maori. In some communities generations of Maori use cannabis (Drugs Advisory Committee et al., 1995; Ngata, 1993). Lux, King, Lux & Makowharemahihi, 1993) report Department of Justice statistics that show that a greater proportion of Maori are convicted for cannabis offences than other ethnic groups. Several sources (Abel & Casswell, 1993; Drugs Advisory Committee et al., 1995; Mataira, 1993; Ngata, 1993; Te Runanga o Te Rarawa, 1995; Walker, Cocklin, Blunden, Davis, Kearns & Scott, 1998) note the use of cannabis by children raised in communities characterized by a "cannabis environment" (Ngata, 1993, p.3).

This prevalence has considerable impact over a range of social dimensions. Ngata (1993) notes a reported relationship between admissions to psychiatric units for psychoses in young Maori men and cannabis use, and the disproportionate number of Maori seeking help at drug treatment agencies for cannabis use problems. Lux et al. (1993) argue that excessive use of cannabis by Maori may exacerbate the *already serious* risks for respiratory and mental illness, educational failure and unemployment, criminal lifestyles/imprisonment, and social/cultural alienation among the cannabis-using Maori population.

Women Of Childbearing Age

Teratogenic studies show that cannabinoids cross the placenta as readily as alcohol and other drugs (Hollister, 1986). Evidence indicates that cannabis use during pregnancy may cause impaired fetal development and associated low birth weight, and increased risk of birth or childhood abnormalities (Fried, 1989; Hall et al., 1994; Hollister, 1988; Zuckerman, Frank, Hingson, Amaro, Levenson, Kayne, Parker et al., 1989). The recent discovery of a markedly higher density of cannabinoid receptors in the fetal and neonatal brain raises issues for further investigation (Glass, Dragunow & Faull, 1997).

People With Pre-Existing Diseases

Persons with certain pre-existing diseases (such as cardiovascular and circulatory diseases, respiratory diseases, schizophrenia, and alcohol or other drug dependence) are at risk of precipitating or exacerbating the symptoms of their disease by cannabis use (Hall et al., 1994).

The cannabis "black market": a "prohibition dope and dole economy"

Under the New Zealand Misuse of Drugs Act (1975) it is illegal to cultivate, supply, possess or use cannabis. Enforcement measures include the detection and apprehension of suppliers and users, and crop eradication. However, it is widely acknowledged that New Zealand is self-sufficient in cannabis production, and that there is a thriving cannabis black market economy in certain rural areas with favourable climatic conditions, including Northland, Coromandel, the East Coast, and various other remote areas (Abel & Casswell, 1993; Mataira, 1993; National Drugs Intelligence Bureau, 1997;Yska, 1990).

A recent study of cannabis trade in Northland found it to be a significant component of the regional economy, and the main source of subsistence for some people in a region characterized by persistent structural unemployment (Walker et al.,1998). These findings are consistent with those of Te Runanga o Te Rarawa (1995) which reported an "epidemic" of cannabis abuse among Northland Maori. The widespread use of cannabis is attributed to its function as an escape/avoidance coping mechanism which "eases the social pain" from the underlying issues of spiralling unemployment and poverty, inadequate housing, low educational achievement, cultural dislocation and low self-esteem (Te Runanga o Te Rarawa, 1995; Lux et al., 1993; Walker et al., 1998). For many dispossessed and disenfranchised Maori, cannabis symbolizes an expression of resistance and cultural identity. However, these reports suggest that among the many detrimental social and environmental effects of cannabis production and consumption in the region are the threat to

survival of Maori culture and community cohesion, individual and whanau dysfunction, and the crime and violence associated with the clandestine cannabis-related activity.

Cannabis-Related Crime

One consequence of this widespread contravention of the law is that cannabis offences comprise the vast majority of all drug offences in New Zealand (Abel & Casswell, 1993). A recent Ministry of Justice study (Spier, 1997) reported that convictions for offences involving cannabis made up 91 per cent of all convictions for drug offences in 1996. While the number of convictions for possession and use of cannabis (excluding those not sentenced or fined) showed an overall downward trend of −25 per cent in the 1987-1996 decade, convictions for cultivation or possession for supply showed an overall upward trend of +37 per cent (Spier, 1997). Meaningful interpretation of these statistics, however, is confounded by the unknown rates of undetected offences and the increased leniency shown to cannabis offenders (e.g. pre-trial diversion scheme) during this period (Abel & Casswell, 1993).

What **can** be said with certainty is that whether cannabis-related crime is committed either to support a drug habit or in order to subsist, the personal, familial, and public costs of cannabis supply reduction/law enforcement measures in New Zealand are enormous, and inestimable (see Abel & Casswell, 1993; 1998; for review). These outcomes and other issues are explored in the ongoing cannabis decriminalization/legalization public debate, the parameters of which are beyond the scope of the present focus.

TREATMENT FOR SUBSTANCE USE DISORDERS

Given the magnitude of the estimates of the prevalence and the personal and social costs of cannabis and other substance use disorders, the provision of appropriate and effective treatment services to persons suffering from these disorders is of extreme importance. A standardised definition of treatment in the substance abuse field is:

> any person-to-person intervention which is designed to identify and minimize hazardous, harmful or dysfunctional drinking/drug taking behaviour (National Campaign Against Drug Abuse, 1992).

The term 'treatment', however, requires careful specification as it is an inclusive construct that incorporates a wide and heterogeneous range of therapeutic interventions. Treatment for individuals with substance use disorders generally includes an assessment phase, the treatment of intoxication/withdrawal when necessary, and the development of an overall treatment strategy. Two general treatment strategies are used: drug-free and substitute (e.g., methadone in opioid addiction). Pharmacologic treatments also include selective use of medication to assist in detoxification and to treat comorbid medical and psychiatric conditions (e.g. anxiolytics and anti-depressants). Psychosocial treatments include cognitive - behavioural therapies, psychodynamic/interpersonal and supportive-expressive therapies, group and family therapies and participation in self-help groups (American Psychiatric Association, 1995). As Miller (1992) has noted, virtually every major psychological and psychiatric treatment strategy has been attempted with substance abusers. A comprehensive treatment programme involves a combination of components of pharmacological (if indicated and available) and psychosocial treatments tailored to individual needs (APA, 1995; Geller, 1997).

Treatment Objectives and Goals

The facilitation of positive behavioural change is the central stated aim or objective of a substance abuse treatment programme (De Leon, Inciardi & Martin, 1995; Maisto & Connors, 1988). At the level of therapeutic dyad the therapist attempts to mobilize the client's own innate resources in order to initiate or facilitate the change process. The primary mission of substance abuse treatment is to restore the user to a healthier and more functional, productive lifestyle. It assists the drug user to see his/her problems from a different perspective; by motivating and enabling, it enhances self-reliance, and empowers the individual to make choices and work constructively for change; it confers self-esteem, and gives hope (World Health Organization, 1993). Behavioural outcomes, such as drug use cessation, gainful employment and a prosocial lifestyle are the distal goals of drug abuse treatment (Teeson, 1998).

Historically, the simplistic treatment goal for substance use disorders has been total abstinence from all psychoactive drug use (APA, 1995; Anglin & Hser, 1992). However, the *harm reduction* approach to substance use disorders and their treatment has become ascendant in the alcohol and drug treatment field in recent years (Jonas, 1997; Sellman et al., 1996; Wardlaw, 1992) and is the perspective articulated in the National Drug Policy in New Zealand (Ministry of Health, 1998).

Lenton and Single (1998) define a policy, programme or intervention as being one of *harm reduction* only if three criteria are met: (1) the primary goal is the reduction of drug related harm rather than drug use, *per se* (2) where abstinence-orientated strategies are included, strategies are also included to reduce the harm for those who continue to use drugs, and (3) strategies are included which aim to demonstrate that, on the balance of probabilities, it is likely to result in a net reduction in drug-related harm (p. 25).

Traditionally disparate models of behaviour change used by drug treatment services, however, have important implications for treatment focus, level of intervention, content, and hence, treatment goals and outcome evaluation. For example, viewing

drug addiction as a lifelong incurable disease, treatment in the (Alcoholics Anonymous) disease model involves restructuring the individual's characterological defect through the 12-Step programme and lifestyle change, with permanent AA (Marijuana Anonymous, Narcotics Anonymous) affiliation. The only legitimate goal of 12-Step treatment is lifelong abstinence and the sine qua non of outcome is (categorical) drinking/drug behaviour.

In direct contrast to the disease perspective, the Behavioural/Social Learning Model conceptualises drug addiction as a set of learned habitual dysfunctional behaviours that are aligned along a continuum of severity and determined by the complex interaction of biological, psychological, social and environmental factors over time. From this perspective, addiction is not a unitary phenomenon, but inflicts multifarious damage to a person's life and wellbeing. Hence, treatment must be multivariate in approach, skills based, and tailored to the individual's specific needs. Similarly, treatment goals are negotiated and tailored to the individual's drug use profile. Flexibility is applied in drug use goals, using an incremental approach to abstinence (such as the intermediate goals of "moderated" or "controlled" use) as this model views total and lifelong abstinence as a disincentive for treatment involvement for those at lower levels of dependency (Rotgers, 1996). Accordingly, multiple, continuous measures of client functioning across multiple life domains and environments are seen as vital for treatment outcome evaluation (Maisto & Connors, 1988).

Thus, with the ascension of the multivariate *harm reduction* approach global goals of treatment outcome now include:

(1)   reduction in the use and harmful effects of substances or achievement of abstinence
(2)   reduction in the frequency and severity of relapse, and
(3)   improvement in psychosocial adjustment (physical, psychological, family and social functioning (APA, 1995).

Many writers state that additional goals pertain to the treatment for illicit drug problems. These include social rehabilitation, including improvement in

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relationships, employment, residential stability, financial status, cessation or reduction in criminal activity (Anglin & Hser 1992;Heather & Tebbutt, 1989) and reduction of high-risk behaviours (such as sexual or 'using' behaviours) among injecting populations (Heather & Tebbutt, 1989; Sellman et al., 1996).

The Substance Abuse Treatment Paradigm: Recent Developments

As in other Western countries, the biomedical disease model of alcohol and drug abuse predominated in New Zealand until the late 1960s. Persons with drinking or non-opiate problems were typically referred to 12-Step-based inpatient programmes characterized by a relatively predictable highly-structured 'standard formula': detoxification, a spiritual (AA) philosophy and milieu, group psychotherapy, educational films and lectures and relatively unspecified general alcoholism counselling, often of a confrontational nature. Persons with opiate use problems were often referred to relatively longer inpatient programmes run by ex-addicts according to the Therapeutic Community model. Others were referred to Methadone Maintenance programmes. Substance disorder treatment was conducted largely according to these three models with little difference across programmes espousing similar philosophies and little attempt to tailor treatment to specific client needs (Johnston & Hannifin, 1987; Miller, Brown, Simpson, Handmaker, Bien, Luckie, Montgomery et al, 1995; Miller & Hester, 1986a, 1986b).

During the 1970's, the orthodoxy of this model came under increasing challenge internationally (Stewart & Casswell, 1992). Since this critical period several major developments have catalyzed a reassessment of the fundamental philosophies, techniques, and delivery of substance abuse services in New Zealand, as elsewhere (National Advisory Committee, 1994; Sellman et al, 1996; Stewart & Casswell, 1992). Among these driving forces of change were the global shift towards more outpatient and community-based services (Johnston & Hannifin, 1987) and the

progressive use of briefer interventions and greater accountability for outcomes (Stewart & Casswell, 1992).

These initiatives were accompanied by the rapid emergence of a wide variety of innovative, often empirically-driven approaches (Miller & Hester, 1986a; Prochaska, Di Clemente & Norcross, 1992) from across the entire spectrum of theoretical paradigms (i.e., Psychodynamic, Learning, Cognitive, Systems, Humanistic). Some of these approaches have been integrated into traditional treatments (see Mattick & Jarvis, 1993; Miller & Hester, 1986a; Miller et al, 1995, for comprehensive reviews). Concomitant advances in neurobiology have led to an increasingly promising investigation of effective pharmacotherapeutic approaches to treatment for alcohol, opiate and cocaine dependence (Gardner, 1997; Geller, 1997; Sellman et al, 1996). As yet, however, no parallel pharmacotherapies have been developed to assist those seeking assistance with cannabis use problems (Adams & Martin, 1996; Tennant, 1986).

In addition to these timely advances, treatment researchers have begun to gather empirical data suggesting that behavioural approaches *are* effective for particular client subtypes, thus providing scientific evidence that "matching" clients to treatments may be possible (see Glaser, 1980; Institute of Medicine, 1990; McLellan, Woody, Luborsky, O'Brien & Druley, 1983; Miller & Hester, 1986a, 1986b). This is a notion with the manifest potential to revolutionize the entire substance abuse treatment field. A generic 'matching hypothesis' (Glaser, 1980) assumes that prescribing specific treatments based on individual characteristics and needs would improve treatment outcomes compared to simply offering the same treatment to all individuals with a similar diagnosis. It thus posits that the therapeutic impact will be increased among clients who are appropriately matched to treatment relative to clients not so matched (Institute of Medicine, 1990; McLellan et al., 1983; Miller & Hester, 1986a, 1986b).

There is now a growing literature on how to match individuals to optimal treatment strategies. The largest clinical trial ever conducted, Project MATCH, was designed to test a series of a priori hypotheses on how client-treatment interactions relate to outcome in alcoholism treatment (Project MATCH Research Group, 1997, 1998).

Contrary to predictions, it was found that there was little overall difference in outcomes by type of treatment, with the three different treatments tested being more or less equally successful with all clients. Beyond the testing of specific matching hypotheses, several findings of theoretical and clinical interest were also reported:

(1)   among outpatients higher initial motivation for change was a strong predictor of better treatment outcomes

(2)   clients who continued longer in treatment showed better outcomes. The more sessions a client attended the better the outcomes

(3)   process measures supported the importance of self-efficacy and processes of change in predicting substance use throughout the follow-up period (Project MATCH Research Group, 1998).

Finally, while the field of substance abuse treatment continues to diversify into an ever expanding armamentum of competing methods and technologies, in the field of psychotherapy and behaviour change generally there has been a contrasting movement towards integration of traditionally disparate approaches to behaviour change following Goldfried's (1980, 1982) call for 'rapprochement' across parochial and doctrinaire lines. Broad Spectrum and Multimodal Therapy approaches and models such as Prochaska and Di Clemente's (1984, 1986; Prochaska et al, 1992) transtheoretical Stages of Change have been proposed and conceptualised as ways of understanding the process of behaviour change and development of treatment packages that are tailored to individual client needs. By providing a synthesis for the diversity of treatment methods currently available for addictive behaviours, the Stages of Change approach exemplifies the prevailing *'zeitgeist'* in helping to integrate a therapy field that "has fragmented into an overwhelming number of alternative and competing treatments" (Prochaska & Di Clemente, 1986, p4).

The Stages Model has been widely endorsed and integrated in New Zealand drug treatment agencies, and currently services are largely delivered with reference to the principles of this model. Working within a 'holistic' paradigm and from an eclectic approach, therapists are progressively integrating techniques from a variety of diverse theoretical orientations to help clients cope with the multiple problems with

which they present for treatment (Johnston & Hannifin, 1987, Stewart & Casswell, 1992).

The Stages of Change Model

Prochaska and Di Clemente (1983, 1984, 1986; Prochaska et al., 1992) propose a sequence of stages that are common to both self-change and therapy-assisted change. Vaillant's (1983) natural history approach to addictive disorders provided the supportive conditions for this perspective to emerge in the substance abuse treatment field. Prochaska & Di Clemente (1984) stimulated the movement by giving theoretical substance and empirical sustenance to the concept of discrete developmental stages of addiction. This concept has had a profound heuristic effect in understanding natural recovery, understanding and guiding the course of treatment and treatment evaluation (Maisto & Connors, 1988; Heather & Tebbutt, 1989).

Featuring a three-dimensional model that integrates six sequential temporal stages (Precontemplation, Contemplation, Preparation, Action, Maintenance and Relapse) with ten processes (representing cognitive, affective, behavioural and environmental activities) at five hierarchical levels of functioning (intrapersonal and environmental) the transtheoretical approach views comprehensive, interdisciplinary, multifaceted and holistic treatment as the differential application of the processes of change at the six stages of change according to the problem level being addressed. Prochaska and his colleagues (1992) conceptualise change as a spiral pattern which exemplifies the dynamic and cyclical, relapsing nature of both addictions and the nonlinear process of general behaviour change. Central features of the model are:

(1)   Motivation/readiness for change occupies a pivotal position in the model, and is viewed as a dynamic and cyclical, recursive series of stages and associated processes through which an individual progresses and regresses (Prochaska & Di Clemente, 1983, 1984, 1986; Prochaska et al., 1992). An individual's stage

of readiness for change must be continually assessed and interventions tailored to match (Miller& Rollnick, 1991; Prochaska et al., 1992). The source of an individual's motivation must originate in appropriate, individualized treatment goals that the client generates to fit with his/her stage of change (Miller, 1985, 1989; Prochaska et al., 1992).

(2) The essence of the model is that different types of interventions (processes) are required for people at different stages in the change process. The transtheoretical model guides eclectic matching and sequencing of intervention strategies to match key client characteristics (Prochaska et al., 1992).

(3) The model has clear implications for a 'client-treatment matching' strategy and for treatment *mis*matching (Di Clemente, Carbonari & Velasquez, 1992). The model is a multivariate, holistic, developmental approach addressing the many different problems at all levels of the individual's internal/external environment at different times in the individual's treatment career (Prochaska et al., 1992).

Importantly, the model has pan-substance application, thus has potential relevance for cannabis as for all other substances. Empirical support for the stages of change construct in drug addictions treatment has come from research investigating smoking cessation (Prochaska & Di Clemente, 1983) and outpatient alcoholism treatment outcome (Di Clemente & Hughes, 1990; Isenhart, 1997).

The widely-used Stages of Change model, however, is not without its critics. While agreeing that the model has intuitive appeal and heuristic value, Sutton (1996) rejects both the spiral representation of the change process and the invariant logical sequence of the stages of change, claiming that there is no strong evidence that using particular processes in particular stages promotes movement to subsequent stages. Sutton (1996) concludes that rather than describing how people *do* change, Prochaska & Di Clemente's model prescribes how people *should* change, and is thus a model of *ideal* change (see Sutton, 1996, for critical discussion).

From a similar perspective, Davidson (1992) cautions that "addictions scientists are not immune to the vagaries of fashion "(p. 821) and should accordingly, "develop a critical wariness of rickety bandwagons" (p. 822). Finally, Isenhart (1997) points out that while the term "stages of change" implies that a client's motivation level can be categorised exclusively into one specific stage, research has demonstrated that on scales that assess the stages of change individuals can receive high or moderate scores on more than one scale. Consequently, motivation is best conceptualised as "readiness for change": consisting of combinations of varying levels of dimensions (referred to as Precontemplation, Contemplation, Preparation, Action and Maintenance).

State of the Art: Treatment Approaches in the 1990s.

The substance abuse treatment field in the late 1990's in New Zealand, as elsewhere, is characterised by a vast array of diverse and competing treatment models developed within the major theoretical systems (psychodynamic, behavioural, cognitive-behavioural, social learning, client-centred, systems, existential, 12-Step (AA) facilitation). Each model is associated with various techniques (see Mattick & Jarvis, 1993; Miller et al, 1995; Miller & Hester, 1986a, for excellent reviews of interventions available in Australia and the USA, respectively). Within the continuum of care interventions may be delivered in different settings (detoxification/inpatient, residential, outpatient, day patient), be of a different duration and intensity (brief or minimal vs intensive intervention) and in different modalities or format (individual vs peer group, milieu group, marital and family group). (APA, 1995; Mattick & Jarvis, 1993; Heather & Tebbutt, 1989). In addition, there is an ever-expanding array of self-help support groups (e.g. Alcoholics Anonymous, Marijuana Anonymous, Narcotics Anonymous, Cocaine Anonymous, Gamblers Anonymous, Rational Recovery, Women for Sobriety) that either complement treatment services or provide an alternative (Johnston & Hannifin, 1987; McCrady & Delaney, 1995).

Accompanying this exponential growth in treatment alternatives has been the progressive development of more rigorous scientific strategies to test the effectiveness of differential approaches for heterogeneous client subtypes. It is in the context of providing the most appropriate and effective treatment possible with the most cost-effective and cost-efficient use of scarce resources in the 'cost containment' and 'accountability' economic environment of the late 1990's that treatment outcome research plays a critical role.

Evidence of causal efficacy or effectiveness is the touchstone of treatment credibility and quality care, and is essential for guiding clinical decisions, improving programme design, and developing sound policies. The ever-shrinking health dollar will inevitably exert more pressure on drug treatment services to be able to clearly demonstrate their consumer outcomes for the rational allocation of health care resources (Longabaugh, 1991; Teeson, 1998).

Treatment outcome evaluation for addictive behaviours, however, is fraught with methodological issues. A brief review of some of the major difficulties facing researchers in this field will serve to set the background context for the considerable limitations and issues that confronted this researcher (JB) when planning, making important methodological decisions, and conducting the cannabis treatment outcome research to be reported here.

Common Problems in Evaluation of Treatment for Substance Use Disorders

'Efficacy' and 'Effectiveness'

Effectiveness/efficacy of treatment concerns whether individuals who utilise treatment are better off than if they had no treatment (Holder, Longabaugh, Miller & Rubonis, 1991). 'Efficacy' and 'effectiveness' studies often utilize essentially different research strategies. An efficacy study typically contrasts some kind of

therapy to one (or more) comparison group(s) under rigorously controlled experimental conditions and a sophisticated technology. Emphasis is on demonstrating the relative potency of the interventions (main effects) for all study subjects. Inclusion/exclusion criteria are established to reduce variability and promote homogeneity of the study population. This research paradigm has become the "gold standard" for programme evaluation (Cook & Campbell, 1979; Graham, 1994; Seligman, 1995).

In contrast to these artificially controlled conditions 'effectiveness' studies often utilise correlational (predictor) methods in quasi-experimental or naturalistic designs to attempt to evaluate a treatment regimen *as it is actually done* in the field setting (see De Leon et al., 1995, and Seligman, 1995, for critiques of 'gold standard' designs in drug treatment research). Researchers have begun to document the problems and dilemmas of randomized designs for community-based interventions (e.g. Ashery & McAuliffe, 1992; Inciardi, Tims & Fletcher, 1993; Mohr, 1995; Moos & Finney, 1988). Cowen (1978) has described the many special hazards that inevitably arise in designing and conducting evaluation research in the community, the realities of which militate against ideal "antiseptic" programme evaluation studies. The many limitations include problems of access to community systems, recruitment, data bias and control, all of which impact on external validity/generalisation to other settings, times and subjects.

Although there is a long history of conducting research on outcome of treatment for the addictive behaviours, the scientific evaluation of treatment for alcohol and drug problems is still in its infancy. Despite a rapidly-expanding research literature and methodological advances much of the empirical work is of poor quality (Breslin, Sobell, Sobell & Sobell, 1997; Maisto & Connors, 1988; Moncreiff & Drummond, 1998; Sobell, Sobell, Brochu, Roy & Stevens, 1987) in a field with a "seemingly disordered research methodology" (Steketee & Chambless, 1992, p398). Moreover, evaluation of substance abuse treatment is an area subject to ideological, professional and commercial interests which further complicate the execution and interpretation of studies (Moncreiff & Druumond, 1998). As a consequence, the current degree of uncertainty about findings is considerable (Heather & Tebbutt, 1989).

Debate on appropriate standards of evidence for treatment efficacy is a prominent issue among researchers in the substance abuse treatment field today. Miller and Sanchez-Craig (1996) observed that without sufficient scientific rigor, virtually any programme could be misleadingly evaluated as effective (Type I error). Conversely, Moos (1997) was concerned that the application of scientific rigor may deceptively mask the effectiveness of bona fide treatment methods (Type II error). As Miller (1997) observed, the addiction field seems to be at a formative point in deciding what standards will govern practice.

A variety of limitations and problems have continued to plague treatment outcome studies over the years (Breslin et al., 1997; Sobell et al, 1987). Comprehensive reviews of weaknesses and limitations and various checklists/guidelines for quality treatment outcome research are found in Adams (1987); Allison & Hubbard (1985); Breslin et al. (1997); Finney & Moos (1989); Frawley (1991); Graham (1994); Heather & Tebbutt, (1989); Holder et al (1991); Hubbard (1997); Longabaugh (1991); Maisto & Connors (1988); Miller & Hester (1986b); Moncher & Prinz (1991); Moncrieff & Drummond (1998); Moos & Finney (1988); Sobell et al (1987); Steketee & Chambless (1992). The many trenchant problems include political, legal, ethical, logistical, economic, conceptual, theoretical, design, methodological and statistical issues. A brief review of some of the more prominent issues relevant to the current study will demonstrate.

Design and Control Problems

Criticisms of the failure to use the true experimental paradigm with 'adequate' control/comparison groups fail to acknowledge the political, economic and practical realities of research in a community setting, and how to provide control without violating important ethical principles and a client's right to treatment. Randomized clinical studies are complex, time-consuming and expensive. Further, various methodological issues limit the generalisability of the findings (Ashery & McAuliffe, 1992; Rog, 1994). De Leon et al (1995) make the point that assignment

to a 'no treatment' or 'wait list' control group is de facto withholding treatment and warn of the client's potential to relapse in the interim, violating the ethical mandate of 'no harm' to the subject. Similarly, both assigning a client against his/her will or choice to a particular treatment, and the invasion of personal privacy in long-term follow-up raises ethical concerns and difficulties.

De Leon and colleagues (1995) also emphasise the precarious nature of the relationship between all descriptive variables used and treatment outcome (typically accounting for less than 20 per cent variance in outcome) in a field where the spontaneous recovery rate is considerable and the means of evaluating recovery controversial. Potentially infinite unmeasured and/or uncontrolled personal, environmental, post - and extra - treatment variables impact and interact with treatment outcome. Within any particular individual substance use disorders manifest an extremely variable, idiosyncratic and inconsistent course, and thus the effects of treatment on recovery are hard to disentangle from the individual's ecological life context (Moos, Finney & Cronkite, 1990; Vaillant, 1983). Conceptual models and empiric findings stress the key role of post-treatment experiences in long-term recovery which can either reinforce or nullify the impact of treatment (Moos et al., 1990). Hence, all these uncontrolled and unmeasured contextual events and processes are 'noise' in the system. As Cronbach (1982) observes, "the quest for an effect 'free and clear' of other effects is unrealistic" (p32).

Nonetheless, using no form of control group involves the problem of confounding variables such as statistical regression, maturation, and history (Cook & Campbell, 1979). Without random assignment to treatment alternatives the effects of client characteristics are confounded with treatment effects, introducing self-selection bias (Campbell & Stanley, 1963; Cook & Campbell, 1979). Typical confounds in substance abuse research include, for example, age (both at onset of drug use and at treatment admission), gender, ethnicity and polydrug use.

Maisto and Connors (1988) criticize the bulk of outcome studies because of their failure to collect good baseline (control) information. Well-designed follow-up assessments have no point of comparison if the baseline information is retrospective

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and anecdotal. These researchers urge that outcome research be pre-planned a priori studies, and that good data collection be built in as routine at admission to any treatment programme.

The Problems of Sample Size, Selection and Mortality

Too few subjects and lack of statistical power to detect all but the most powerful effects is a major problem for most research conducted in the context of a single outcome study (Rossi, 1993; Steketee & Chambless, 1992). Recruitment problems are particularly acute for community-based drug abuse treatment studies and samples are typically small (Ashery & McAuliffe, 1992; Cowen, 1978). However, procedures adopted to enhance recruitment can pose methodological problems in terms of sampling bias (e.g., volunteers vs those declining to participate, or clinical referrals vs media-recruited subjects). In addition, restrictive inclusion/exclusion criteria commonly used in efficacy studies limit the ability to test for potentially important predictors (Babor, 1988; Steketee & Chambless, 1992).

One of the most serious limitations in *all* treatment outcome research is **sample attrition** (APA, 1995; Heather & Tebbutt, 1989; Maisto & Connors, 1988; Stark, 1992). Loss of client contact or data either during treatment or the follow-up period creates a positive bias in treatment outcome research, while excessive attrition has the power to impair the methodological quality of any longitudinal study for which statistical techniques cannot fully compensate. How the researcher handles this loss can significantly affect the reported results (Maisto & Connors, 1988). For example, attrition commonly impacts the internal validity of a study when there is differential attrition among treatment groups (Cook & Campbell, 1979). It can also limit study generalisability if certain subgroups (e.g., severe substance abusers; males, etc.) are more likely to be lost to attrition (Bootsmiller, Ribisl, Mowbray, Davidson, Walton & Herman, 1998). The general assumption is that dropouts and clients not located at follow-up are faring worse than treatment remainers and those contacted (Desmond, Maddix, Johnson, & Confer, 1995). However, a high proportion of 'successful' outcomes in a residual sample may be a function of

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selecting out treatment remainers independent of programme efficacy. In fact, the nonresponse error introduced by excessive attrition is great enough that studies with high follow-up completion rates would have found different results if only easy-to-locate participants were included in the analyses (Bootsmiller et al., 1998). Despite this potential to effectively invalidate study findings, failure to report sample attrition remains a ubiquitous and serious problem in treatment outcome reports (Sobell et al, 1987).

The Problem of Self-Report Data Bias

Reliability and validity of clients' self-reports in substance abuse treatment has long been a major issue (Brown, Kranzler & Del Boca, 1992; Grant, Arciniega, Tonigan, Miller & Myers, 1997; Maisto & Connors, 1988). Illicit drug users clearly face strong disincentives to divulge drug use information (Sellman et al., 1996). Various data collection strategies have been devised to counteract this tendency (see Babor & Del Boca, 1992; Babor, Stephens & Marlatt, 1987). However, self-reports must be validated by triangulation, using objective techniques such as biochemical tests (blood, urine) and/or corroborating data collected from collaterals (Lennox & Dennis, 1994). Inevitably, these techniques pose their own methodological problems for the researcher!

Conceptual and Theoretical Problems

Critics (e.g., Heather & Tebbutt, 1989; Steketee & Chambless, 1992) observe a singular lack of relationship to any theory or body of research in many treatment outcome studies. The theoretical rationale for behaviour change underlying the treatment approach should be comprehensively described and the research measures demonstrate a clear and logical link to an organizing a priori conceptual framework (Chen, 1990). Thus, the concepts presumed to be indexed by the dependent (outcome) variables should be explicitly indicated. A variety of idiosyncratic outcomes still appear to pervade the literature (Sobell, et al, 1987). Although the

addictive disorders field has long been cognizant of the impact of substance use on multiple aspects of the user's life, the assessment of a variety of outcomes is not yet systematic. Implicit in the notion of *harm reduction* or *harm minimization* is the idea that it is not just the use of substances that should be attended to, but also the consequences of their use, especially the ability of the consumer to function in the community. Measurement of outcome should therefore be multidimensional, covering symptoms, risk factors, and disability or functioning (Teeson, 1998). Outcome measurements reported in the literature, however, are often incomplete, inconsistent or narrowly focused (e.g., drug use only).

The Problems of Treatment Specification, Integrity and Fidelity

One of the most critical requirements in substance abuse treatment outcome research is the clear conceptualisation and operationalisation of the 'treatment condition' variable and adequate training of treatment agents in delivery of the treatment protocol (Moncher & Prinz, 1991; Heather & Tebbutt, 1989; Maisto & Connors, 1988). The vast majority of studies of addictive behaviours, however, have been "black box" studies with little or no specification of what actually happened (Ball & Ross, 1991; De Leon et al., 1995; Moos & Finney, 1988). Treatment variables generally (including the therapeutic alliance) have received little attention in substance abuse treatment outcome research (De Leon et al, 1995; Hubbard, 1997; McLellan, Alterman, Cacciola, Metzger & O'Brien, 1992; Sobell et al, 1987; Steketee & Chambless, 1992). As yet, no widely-accepted standardised measures exist to measure these critical variables (De Leon et al, 1995; Moos & Finney, 1988; Hubbard, 1997; Longabaugh, 1991; Moos et al, 1990; McLellan et al, 1992). Treatment as currently rendered is a complex, multifaceted process delivered in a variety of contexts and environments to clients undergoing changes at different rates (Finney, 1995; Prochaska & Di Clemente. 1986). Given that the majority of studies of treatment outcome have found that information on the process (the active and non-specific mechanisms or mediators of change) and engagement/retention in treatment are the most important predictors of outcome, this presents a considerable challenge for treatment outcome researchers (Ball & Ross, 1991; De Leon et al,

1995; Hubbard, 1997; Simpson, 1979, 1981; Simpson, Joe, Rowan-Szal & Greener, 1995; Stark, 1992).

The researcher in the community-based setting is also faced with the problem of treatment integrity and fidelity, i.e. the implementation of the specified treatment as intended (Moncher & Prinz, 1991). Any violation of treatment integrity or fidelity has significant implications for internal, external and construct validity and statistical power of treatment outcome research. The difficulties of maintaining a uniform psychosocial intervention by different counsellors (especially in multiple sites) produce inevitable (and often subtle) variations in the treatment variable. Having to rely on counsellors to document the delivery of (unsupervised) treatment components is an ever-present threat to the study's reliability and validity. Collectively or singly, these factors all impact negatively on the replicability and hence the generalisability of a particular study from a particular site (Cowen, 1978; Hubbard, 1997).

Problems of Criteria, Measurement, and Defining "Success"

Longabaugh (1991) asserts that the choice of instruments for measuring outcomes in drug treatment research involves a "very difficult set of decisions" (p. 193). Universally accepted, continuous and sensitive standardised outcome measures simply do not exist (Teeson, 1998). Although the list of known prognostic factors is large and growing, their relative significance is not yet understood (Holder et al, 1991). Clearly, until both of these conditions are met, the question of treatment effectiveness cannot be answered (Longabaugh, 1991).

A controversial and somewhat confused aspect of treatment outcome research into drug programmes has been criteria for "successful" treatment. Miller (1989) observes that the criteria for treatment success are widely variable, and depend upon the different goals each stakeholder has for treatment outcome (the client, the therapist, the justice system, etc.). Treatment goals also vary considerably between programmes, and make inter-study comparisons very difficult. There is no standard

for measuring/reporting rates of "success". Furthermore, there is no commonly accepted standard of effect. There is, for example, no uniform agreement on what constitutes 'abstinence' or 'reduction in use', how to measure these effects, and over what time period (Holder et al, 1991). In short, there is "no gold standard" (Miller, 1989, p. 87). Along a continuum of different degrees of success outcomes are as complex and widely diverse as are substance use aetiologies and idiosyncratic courses (Einstein, 1981). The researcher must select and specify the multiple, multidimensional behavioural outcomes that will constitute evidence of treatment effectiveness and, in so far as is possible, the empirically-validated standardised measurement techniques with which to measure them (Teeson, 1998). If not available, the researcher is faced with the prospect of designing a (non-validated) instrument specifically for his/her study. Given that the criteria for a good measure are that it must be applicable and acceptable, practical and brief, reliable, valid, and sensitive to change (Graham, 1994; Teeson, 1998), this is no small challenge!

It is in this context that the client's perspective of treatment effectiveness **(Client Satisfaction)** occupies a pivotal position as an intervening variable between service provision and ultimate outcome thus serves as both a dependent and independent variable (Greenfield & Attkisson, 1989; Lebow, 1982a). As an independent variable client satisfaction contributes to the behaviour of the client and is a good measure of treatment quality (and "success"). Importantly, systematic collection of client satisfaction data counteracts the provider/researcher bias of much evaluation research (Larsen, Attkisson, Hargreaves & Nguyen 1979; Lebow, 1982b, 1982c, 1983). Obtaining reasonable client satisfaction has been found to be a necessary (but not sufficient) condition for treatment success and researchers in today's politicoeconomic environment are increasingly compelled to use or devise measures to collect satisfaction data (Deane, 1993; Lebow, 1982a, 1982b). This measurement area, however, is also fraught with methodological and practical problems (Larsen et al, 1979; Lebow, 1982a). It is not surprising, therefore, that few studies in the substance abuse treatment outcome literature report client satisfaction data.

Further outcome measurement problems derive from the mandatory post-treatment follow-up to assess the durability of the therapeutic gains. A frequent criticism of

many outcome studies has been the use of inadequate or no follow-up periods (Maisto & Connors, 1988; Nathan & Lansky, 1978; Sobell et al, 1987). Longitudinal research has the critical advantage of monitoring client fluctuations and changes over time, but longitudinal designs can be expensive, time-consuming and problematic, factors which may contribute to their infrequent use (Longabaugh, 1991). For example, sample mortality is one common artifact inherent in longitudinal research. This includes clients dropping out, being lost due to tracking difficulties over time, withdrawing and declining to continue participation (Desmond et al., 1995; Johnston & Hannifin, 1987; Longabaugh, 1991; Maisto & Connors, 1988).

Importantly, efficacy frequently has a time dimension. Treatment programmes may differ in their capacity to produce a delayed impact, i.e. "sleeper effects" (De Leon et al., 1995). However, researchers do not agree on what *is* the appropriate interval for following clients after treatment. It is argued that short follow-up intervals (3 or 6 months) are not adequate for determining durable behavioural change and, given the complexity of relapse phenomena, 1 - 2 years is seen as a minimum (Longabaugh, 1991; Maisto & Connors, 1988; Marlatt & Gordon, 1985; Nathan & Lansky, 1978; Sobell et al, 1987).

Decisions about the format of follow-up present yet further measurement problems. There is a consensus that treatment outcome results need to achieve at least a 70 per cent follow-up rate (Desmond et al., 1995; Grant et al, 1997). Postal return rates are typically low, effectively exacerbating the attrition problem at this point in the research process (Maisto & Connors, 1988). This poses a further dilemma for the researcher with no practical alternative to the postal survey mode of follow-up data collection.

The Problem of Appropriate Statistical Analyses and Interpretation

Critics of drug treatment outcome research cite the ubiquitous use of inappropriate statistical tests to analyse data as a major flaw in many studies (De Leon et al, 1995;

Mohr, 1995; Sobell et al, 1987; Steketee & Chambless, 1992). For the complex, multivariate, multidimensional data analyses typical of substance abuse treatment outcome research, powerful and sophisticated 'state of the art' parametric inferential statistical techniques (such as multiple regression, path analysis, logistic regression and discriminant functional analyses) are needed to calculate the estimated strength of the effect of a particular treatment. Regression techniques are also needed to identify treatment relevant client attributes in process (explanatory) research (De Leon et al, 1995; Finney, 1995; Maisto & Connors, 1988; Mohr, 1995). Use of tightly controlled research designs with sophisticated and sensitive analytic approaches to behavioural and psychological measurements will help to determine the underlying relationships between client characteristics and predispositions, treatment interventions and services, and external environmental events that impact the client's recovery from drug abuse. This dilemma arises for the researcher faced with the typical experience of inadequate recruitment (power) and inability to implement a randomized, controlled design in the context of community-based, applied settings.

Finally, Steketee and Chambless (1992) consider that, "among the thorniest of problems" (p. 396) in substance abuse treatment outcome research is how to interpret the findings from these analytic methods. When is a statistically significant predictor variable important enough to warrant a change in treatment approach for a particular subgroup of clients? How poor must a client's prognosis be before that client is steered away from a treatment method (hopefully toward an alternative one)? What are the ethical responsibilities?

Statistical significance does not guarantee psychological/clinical significance. Statistical significance tests provide no information on the variability of response to treatment within a sample, yet information regarding within-treatment variability of outcome is of utmost importance to clinicians (Jacobsen & Traux, 1991). Once the effect of a treatment has been demonstrated an estimate of the proportion of the variance it accounts for becomes the important concern (De Leon et al., 1995).

As yet, however, research data on the complex interactions among personal and social factors are currently insufficiently advanced to recommend particular

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approaches with any certainty of an individual's response to therapy (Heather & Tebbutt 1989; Miller et al, 1995; Steketee & Chambless, 1992). The current lack of empirically-verified client-treatment matching information extends to treatment approaches for alcohol and drug abuse treatment generally, and cannabis treatment in particular.

Evaluation of Treatment for Drug Use Problems

In direct contrast to that of alcohol use disorder, theory and treatment outcome is a "neglected" area of illicit drug research (Allison & Hubbard, 1985; Gottheil, Thornton & Weinstein, 1997; Heather & Tebbutt, 1989; Hollister, 1990; Hubbard, 1997). No systematic, large-scale controlled/randomised trials comparing the effectiveness of the major modalities or the relative benefits of particular components in typical programmes in community settings have yet been conducted (Anglin & Hser, 1992; Hubbard, 1997). Although firm conclusions are circumscribed by the paucity of controlled studies, the empirical evidence currently available suggests that:

(1) Across the major treatment modalities treatment *is* an effective and cost-effective strategy (Hubbard, 1997; Institute of Medicine, 1990; McLellan, Woody, Luborsky, & O'Brien, 1982).

(2) No specific type of individual psychotherapy, however, has consistently been shown to be superior as treatment for all illicit drug abusers.

(3) Time spent in treatment was among the most important predictors of long-term successful treatment outcome across all modalities (Hubbard, 1997; Simpson, 1993). Longer duration of treatment is consistently associated with continued improvements in functioning. Unlike alcoholism treatment, treatments lasting less than 90 days appear to be of limited benefit for the illicit drug-abusing population, *regardless* of treatment setting and modality (Simpson, 1981, 1993).

(4)   Dropout, however, is the rule across all modalities, and the pattern of dropout
        is predictable. Most clients leave early in the treatment course when
        withdrawal phenomena are most intense. This pattern is particularly evident
        in outpatient settings (Anglin & Hser, 1992; Simpson, 1981; Stark &
        Campbell, 1988).

(5)   The likelihood of retention in treatment is difficult to predict from client
        characteristics. No comprehensive profile has emerged that predicts length of
        stay in treatment (Craig, 1984; Simpson, 1979). In general, individuals who
        are black, unmarried, unemployed, polydrug abusers, present with greater
        psychological disturbance (particularly depression) and who have more
        criminal involvement before treatment appear more likely to drop out of
        treatment and hence have the poorest outcomes (Anglin & Hser, 1992;
        Simpson & Joe, 1993; Stark, 1992). Improving retention is thus the key to
        improving treatment outcome in the illicit drug area.

A comprehensive extended review of the effectiveness of drug abuse treatment is
beyond the scope of the present focus. For excellent reviews the reader is directed
to Allison and Hubbard (1985), Anglin and Hser (1992), Crits-Christoph and
Siqueland (1996), Heather and Tebbutt (1989), Hubbard (1997), Kleber (1989),
McLellan, Woody, Metzger, McKay, Durell, Alterman, and O'Brien (1996),
Prendergast, Podus and McCormack (1998) and Simpson (1993).

However, and again in contrast to the alcohol area, there has been very little focus
on client-treatment matching in the illicit drug research area (Ball, 1994; Hubbard,
1997; McLellan et al., 1996). In fact, there is still widespread disagreement among
both practitioners and research investigators about the specific types of treatment
which are effective for various drug abuse clients (see Ball, 1994). Consequently,
little guidance is offered regarding the effectiveness of *particular* interventions
within a *particular* programme or context for a *specific* subgroup of clients. There is
a large research gap with regard to controlled efficacy studies on each type of

substance dependence and abuse, most notably cannabis. A major review of existing controlled research on efficacy/effectiveness of psychosocial treatment for various drug use disorders (Crits-Christoph & Siqueland, 1996) found that, despite the large number of regular cannabis users compared with users of other illicit drugs, only one clinical trial evaluating manual-guided treatment for cannabis dependence had been published (i.e., Stephens, Roffman & Simpson, 1993, 1994). However, this (and more recent) studies are limited by their analogue status and do not readily generalize to either the New Zealand drug treatment context or the typically heterogeneous characteristics of the local primary cannabis clientele.

In short, research on efficacy or effectiveness of treatment for cannabis use problems is currently at an embryonic stage of development. The state of the art in the cannabis treatment area presents a paradox: in spite of its long and unique history, little is known about how best to teat cannabis dependence/abuse problems. There is a dearth of empirically-verified knowledge available to guide clinical approaches. Accordingly, virtually nothing is known about the attractiveness, appropriateness, or the effectiveness of current treatment interventions adapted from the alcoholism treatment area, and typically offered those presenting for assistance with cannabis use problems at community-based drug treatment services in New Zealand.

CANNABIS USE PROBLEMS AND CONTEMPORARY TREATMENT APPROACHES

Until the 1980's, a common belief about cannabis was that its relatively low dependence potential and/or mild physiological withdrawal symptoms preclude the likelihood that chronic users will either need or seek treatment (Roffman, Stephens, Simpson & Whitaker, 1988; Stephens & Roffman, 1993; Swift et al., 1997). From the late 1980's, however, two related developments have exposed the fallacy of this assumption: (1) a substantial growth in demand for services at drug treatment agencies internationally by people seeking professional assistance with their primary cannabis use problems, and (2) a programme of scientific inquiry into the health and psychological effects of cannabis use which has demonstrated that this earlier benign outlook is, in fact, unwarranted (Hall et al., 1989; Smith, Schmelling & Knowles, 1988). Although a controversial area of inquiry, it currently appears that prolonged, regular use of cannabis is associated with several potentially harmful health outcomes, including a high risk of developing cannabis dependence (Drugs Advisory Committee et al., 1995; Hall et al., 1989; MOH, 1996).

Thus far, treatment responses to primary cannabis treatment seekers reflect the lack of uncertainty among treatment providers as to how best to assist those with cannabis use problems. While there have been several isolated reports of specialized interventions for cannabis in the drug treatment literature, the few controlled studies documented have evaluated approaches derived from the alcoholism treatment area. Neither the suitability nor the efficacy of these interventions for cannabis clients of New Zealand drug treatment services has yet been investigated.

To provide the context for this first New Zealand-based cannabis treatment outcome study to address these issues, the remainder of this chapter critically examines the contemporary literature regarding the specific problems associated with prolonged,

regular cannabis use and the various treatment approaches that have hitherto been applied. Initial sections discuss the special characteristics of the drug Cannabis, and the evidence for both acute and chronic effects that may arise from its use. Various indicators of the prevalence of cannabis use problems, and growth in demand for treatment for these problems, are then discussed. This is followed by an inclusive examination of cannabis interventions applied to date. As the literature in this treatment area is sparse, all studies located during the protracted literature search that preceded the current study are included. The main focus, however, will be on the few existing controlled treatment outcome studies. The review concludes with a summary and critique of existing cannabis treatment outcome literature, and a brief section outlining the state of the art in approaches to cannabis use problems in New Zealand. The specific research questions and hypotheses that were generated and examined in this thesis are presented in the chapter to follow.

CANNABIS THE DRUG

Cannabis is the generic term for a variety of drug preparations derived from the Indian hemp plant Cannabis sativa, a dioecious annual which grows with relative ease in the temperate New Zealand climate (Abel & Casswell, 1993; MOH, 1996). While the generic term is used throughout this paper, there are a number of terms applied to the substance. The more familiar products include marijuana (or "dope", "weed", "grass", "pot", "mull"), hashish and hash oil. Forms of cannabis grown hydroponically are known as "hydro", and a recent popular hybrid form is known as "skunk".

The pharmacology of cannabis is unique, complex, and uncertain. Not a single drug, cannabis consists of over 400 identified chemicals of which 60 are biologically active cannabinoids (Vereby, Gold & Mule, 1986). The primary psychoactive constituent is a single cannabinoid named delta-9-tetrahydrocannabinol (THC) (APA, 1994; Johnson, 1991). THC is to cannabis as nicotine is to tobacco: the amount of THC available to the consumer is dependent upon the plant quality, cultivation techniques, and the means of drug preparation and administration. The concentration of THC content in marijuana typically ranges

from 2-3 per cent (low-grade leaf) to approximately 10 per cent (premium sinsemilla buds or "heads") while concentrations in resin preparations (hashish and hash oil) range up to 20 and 60 per cent respectively (Rosenthal, 1994). The concentration of New Zealand hash oil can vary between 5 and 50 per cent (Drugs Advisory Committee et al., 1995)

New Zealand is required by international conventions to control cannabis, and under the Misuse of Drugs Act 1975 and its amendments the cultivation, manufacture, distribution, possession and use of cannabis are illegal in New Zealand (Abel & Casswell, 1998). Within the Act illegal drugs are divided into three categories (classes A, B and C) according to their supposed harm potential. While hashish and hash oil are classified as Class B marijuana is classified as Class C.

Ingestion, Distribution, Elimination, and Detection

Cannabis preparations can be smoked in "joints" or "reefers" or by using a bong water-pipe, eaten with foodstuffs, drunk as an extract, inhaled or more rarely, injected intraveneously (Johnson, 1991). Different methods of ingestion give rise to differing pharmacokinetics (Hall et al., 1994). Smoking is the most efficient route of administration as up to 50 per cent of the preparation is absorbed and metabolized and the full effects manifest within minutes (Hollister, 1986). Blood levels of THC then decline rapidly to about 5-10 per cent of the initial level within the first hour after inhalation. THC and its metabolites are highly lipophilic and therefore rapidly distributed via the bloodstream to the adipose tissue of the lungs, brain, liver, adrenals, ovaries and testes, where it remains with a plasma half-life decay rate of between 19-57 hours (Ali & Christie, 1994).

Excretion of THC is less efficient than for certain other drugs such as alcohol and cocaine. The complete elimination from the body of a single dose of THC might take more than thirty days (Hunt & Jones, 1980) as water soluble metabolites are excreted slowly (Johnson, 1991). Repeated administration results in accumulation of THC and its metabolites in the body. While the biologic significance of this

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accumulation is not yet known (Hall et al., 1994), it has been suggested that the regular cannabis smoker may be undergoing continual intoxication effects (Nelson, 1993; Roffman & George, 1988). Alternatively, some investigators hypothesize that because THC is stored in fat and later metabolized, a delayed withdrawal syndrome may be experienced (e.g. Tennant, 1986). Unlike various other recreational drugs (alcohol, cocaine, opiates) however, the acute toxicity of cannabis is very low, and there are no confirmed cases of human deaths from cannabis poisoning in the world medical literature (Compton, Dewey & Martin, 1990; Hall et al., 1994; Hollister, 1986; Nelson, 1993; Rosenthal, 1994).

While body levels of THC depend on the dose and the smoking history (faster elimination for experienced users) they are also subject to substantial individual variability which makes it very difficult to determine from blood levels of THC how recently cannabis has been smoked. Because of similarly erratic distribution and elimination kinetics, urine levels of THC cannot be used to reliably predict the recency of intake (Negrete, 1988). Typically, cannabinoids excreted in urine can easily be detected 2-3 days following smoking of a single joint (Adams & Martin, 1996). Furthermore, there is no clear dose-response relationship between blood/urine levels of THC and degree of either impairment or subjective intoxication (Adams & Martin, 1996; Hall et al., 1994; Roffman & George, 1988).

The Cannabis Controversy: the "Cannabis Menace"

Cannabis has had a long history of medical and therapeutic use in Eastern, and later Western, medicine for its antinociceptive properties (Adams & Martin, 1996; Castle & Ames, 1996; Grinspoon & Bakalar, 1997). Twentieth century therapeutic usage of synthetic cannabinoid analogues outside of New Zealand has included the treatment of epilepsy, asthma, pain, glaucoma, anorexia associated with AIDS, and most effectively, nausea induced by cancer chemotherapy (Caswell, 1991; Hall et al., 1994; Hollister, 1986; Pertwee, 1999; Segal, 1986). It currently appears that the most promising therapeutic potential of cannabiniods is as an adjuvant analgesic (Gowing, Ali, Christie & White, 1998; Hall et al., 1994; Smith, 1995).

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Many commentators, however, believe that no other pyschoactive substance arouses greater controversy than cannabis (e.g., Adams & Martin, 1996; Grinspoon & Bakalar, 1997; Negrete, 1988). Polarised and emotive public debates shrouded in tenacious myths, misinformation and fears about the "exotic weed" have a long but fragmented history (Hannifin, 1990; Newbold, 1992; and see Negrete, 1988, for historical review). Cannabis has been praised as a totally harmless "soft" drug and a "normal" part of adolescence. Alternatively, it has been reviled as a "deceptively dangerous drug" that will inevitably lead to more severe hard drug abuse and long-term pathopsychophysiological manifestations (American Medical Association, 1981; Nahas & Latour, 1992). Interpretation of the "scientific facts" that have emerged from toxicology studies often appears to change with the changing ideological climate in value-driven inquiry (Hollister, 1986; Nelson, 1993). Nelson (1993) has provided an in-depth critical review of selected research literature that demonstrates this vexatious phenomenon.

Hall (1997) asserts that any balanced appraisal of the health and psychological effects of cannabis is improved by clearly distinguishing health issues from debate about the legal status of cannabis. Utilizing improved research methodology, a renaissance of international scientific inquiry in recent years has demonstrated that the earlier benign outlook is unwarranted (Hall et al., 1994; Smith et al., 1988).

HEALTH AND PSYCHOLOGICAL EFFECTS

As with all other drugs the psychoactive and other effects of cannabis are dose-dependent and extremely variable (Estroff & Gold, 1986; Ghodse, 1986; Hollister, 1986; Nelson, 1993; Weil, 1975; Zinberg, 1984). Individual vulnerability is determined by such factors as the THC content or strength of the drug; the quantity taken; the method of ingestion; the mental state of the user (attitudes and expectations); the setting or context; the individual's history of drug use; whether other psychoactive drugs are also used; and individual physiology (Drugs Advisory Committee et al., 1995, p.4). Furthermore, research evidence suggests that psychological outcomes may be a function of interactions between personality

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dispositions and cannabis use (Musty, 1988; Swift, Hall & Copeland, 1997). Data from a recent study also suggest a heritable "genetic vulnerability" to subjective effects of cannabis (Lyons, Toomey, Meyer, Green, Eisan, Goldberg, True & Tsuang, 1997). Weil (1975) argued that cannabis should be understood to be an "active placebo" which facilitates already existent covert behaviours and pathologies. This may well offer a plausible explanation for the great variation in psychological responses individuals make to similar batches of cannabis in similar research situations.

Acute Psychological Effects

Cannabinoids produce a variety of acute psychological and behavioural effects in humans which have been reviewed extensively by Dewey (1986), Hall et al. (1994) and Hollister (1986). In small doses cannabis has a sedative effect like alcohol through its depressant action on the CNS. It also has analgesic and stimulant properties.

Perceptual and psychic changes induced by cannabis intoxication are biphasic: the desired initial period of euphoria or "high" is followed by drowsiness, lethargy and/or depressive symptoms (Hollister, 1986; Thomas, 1993). Cardinal short-term effects include being "stoned", disinhibited and talkative, with perceptual distortion. Increased appetite, pulse rate, and tachycardia or orthostatic hypotension are also prominent (Dewey, 1986; Hollister, 1986; Jaffe, 1985; Negrete, 1988).

Marked deterioration in cognitive functioning, concentration, memory, orientation and psychomotor performance is the major potential health hazard (driving or operating machinery) from acute cannabis use, particularly when augmented with alcohol as the effects on performance appear to be additive (Adams & Martin, 1996; Hall et al., 1994). It currently appears that THC impairs acquisition and working memory but not retrieval of previously learned facts (Chait & Pierri, 1992; Heishman, Heustis, Henningfield & Cone, 1990; Roffman & George, 1988; Schwartz, 1993). Subtle speech difficulties reported in cannabis users have been

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attributed to this interference in working memory (Weil & Zinberg, 1969). Data indicate that cannabis can impair complex human performance up to 24 hours after ingestion (Heishman et al., 1990).

Cannabis may also be classified as a hallucinogen. Researchers and reviewers currently agree that a brief organic (cf. functional) toxic psychosis can follow the ingestion of high doses of cannabis. Typical symptoms of this acute hypomanic state (acute anxiety, thought fragmentation, hallucinations) generally disappear within hours with the loss of intoxication (Chaudry, Moss, Bashir & Suliman, 1991; Ghodse, 1986; Hollister, 1988; Negrete, 1988; Thomas, 1993; Thornicroft, 1990; Tunving, 1985; 1987). Though transient and self-limiting in previously asymptomatic individuals, this organic psychosis may recur on repeated exposure to the drug (Jones, 1984; Pope, Gruber & Yurgelun-Todd, 1995; Thomas, 1993). Accordingly, continuing reference to a distinct gnosologic entity "cannabis psychosis" (and hence the putative psycho-toxicity of cannabis) has been rejected by many (e.g. Dewey, 1986; Grinspoon & Bakalar, 1997; Hollister, 1988; Nelson, 1993; Thomas, 1991; 1993; Thornicroft, 1990).

In sum, harmful health outcomes appear more likely with chronic use (Drugs Advisory Committee et al., 1995).

The Consequences of Chronic Cannabis Use

The chronic residual effects of cannabinoids are currently a matter of considerable controversy (see Hall et al., 1994; Nelson, 1993; Scallet, 1991, for review). Several factors complicate the interpretation of cannabis-induced impairment in humans. Confounds include individual drug histories; co-use of other drugs and difficulties in quantifying doses of cannabis and other drugs; development of tolerance; individual variability in vulnerability; possible individual nutritional differences; pre-morbid factors and level of cognitive or psychological impairment preceding cannabis use (a large proportion of cannabis research to date has involved treatment populations

or psychiatric referrals from which only post hoc attributions can be made); ethical difficulties and technological limitations; and the intrinsic difficulties in conducting a systematic evaluation in the general population (Adams & Martin, 1996; Chait & Pierri,1992; Deahl, 1991; Hall et al., 1994; Hollister, 1986; 1988; Nelson, 1993; Patrick, Straumanis, Struve, Nixon, Fitz-Gerald, Manns & Soucair, 1995). Furthermore, to study residual effects in chronic cannabis users would require assurance that they had not used any cannabis whatsoever for several months prior to examination (Nelson, 1993; Pope et al., 1995).

Despite these seemingly intractable difficulties, however, the evidence currently available suggests that the chronic regular use of cannabis is associated with increased risk of:

(1) development of a cannabis dependence syndrome characterized by loss of control over cannabis use

(2) exacerbation of psychological symptoms

(3) subtle forms of cognitive impairment which may/may not reverse after prolonged abstinence

(4) several adverse physiological effects.

A brief review of key research findings will clarify the current status of knowledge in this area and provide an appropriate theoretical and empirical background context for the research that follows.

The Cannabis Dependence Syndrome

The DSM-IV (APA, 1994) defines Cannabis Dependence :

> Individuals with Cannabis Dependence have compulsive use...
> (and) may use very potent cannabis throughout the day over a

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period of months or years...(and) may also persist in their use despite knowledge of physical problems... or psychological problems (p.216).

No specific criteria are set by DSM-IV for Cannabis Dependence or Cannabis Abuse in addition to those already set for general substance dependence and abuse applicable across all substances (see Appendix 1).

It is now widely agreed that a cannabis dependence syndrome probably occurs in chronic, heavy users of cannabis (Compton et al., 1990; Gold, 1991; Hall et al., 1994; Stephens & Roffman, 1993; Swift et al., 1997; Tennant, 1986). Chronic heavy use of cannabis has been associated with both physical and psychological dependence as indicated by drug craving, compulsive use and tolerance. Controversy remains, however, as to whether a clinically significant withdrawal syndrome follows the cessation of the drug or if withdrawal contributes significantly to the persistent use of cannabis (APA, 1994; Budney, Novy & Hughes, 1999; Duffy & Milin, 1996; Relman, 1982; Stephens & Roffman, 1993). Reflecting this uncertainty the DSM-IV does not include a diagnostic category for cannabis withdrawal. As Budney and his colleagues (1999) argue, this is unfortunate as the exclusion of cannabis withdrawal from the DSM contributes to the perception that cannabis use has minimal risk for harm or development of dependence. Likewise, it also suggests that the development of behavioural or pharmacological treatments specifically for cannabis dependence is not necessary (Budney et al., 1999).

Case reports, clinical observations, laboratory research and epidemiological studies indicate both the development of tolerance and a withdrawal syndrome on the abrupt cessation of cannabis use (Budney et al., 1999; Budney, Radonovich, Higgins & Wong, 1998; Cohen, 1986; Cottler, Shuckit, Helzer, Crowley, Woody, Nathan, & Hughes, 1995; Duffy & Milin, 1996; Smith et al., 1988; Tennant, 1986; Weisbeck, Schuckit, Kalmijn, Tipp, Bucholz & Smith, 1996). The withdrawal syndrome is usually described as mild and nonspecific with the relative symptomatology not as severe as that of alcohol, opioids or cocaine (Compton et al., 1990; Negrete, 1988; Tennant, 1986) and unlikely to require specialist treatment or medical assistance.

Albeit, recent clinical observations of adolescent cannabis-only heavy users suggest that withdrawal symptoms may be "neither mild nor inconsequential" (Duffy & Milin, 1996, p.1620). In this study it was the severe physiological withdrawal symptoms over fourteen days (marked diaphoresis, insomnia, gastrointestinal upset and nausea, vomiting, shakiness, night sweats, chills, and irritable mood) and not psychological drug craving which led to the reinstitution of cannabis use in cannabis-only adolescent users despite motivation to stop use.

A recent study of individuals seeking outpatient treatment for cannabis dependence (Budney et al., 1999) reported that the number and severity of the perceived withdrawal symptoms described by the sample suggests that these abstinence effects may contribute to cannabis dependence problems *and* may negatively influence attempts to quit cannabis use. In this study the dose of cannabis (times used per day) was linearly related to withdrawal severity, suggesting that a relatively severe withdrawal syndrome can occur. Thus, unlike the alcohol withdrawal syndrome, the cannabis withdrawal syndrome is not life-threatening, but may be sufficiently aversive to be a major obstacle to cannabis dependants achieving stable abstinence in the short term (Budney et al., 1999; Duffy & Milin, 1996).

In sum, chronic daily/near daily use of cannabis has a "high risk of producing dependence" (Hall et al., 1994, p.20). It currently appears, however, that risk of dependence may be unequally distributed across the population of users. Adolescents appear to be particularly vulnerable, even at low levels of cannabis use. (Anthony et al., 1994; Chen, Kandel & Davies, 1997; Kandel, Chen, Warner & Kessler, 1997). Similarly, Swift and her colleagues (1997) reported a more rapid development of cannabis dependence problems in women, despite their shorter history of use.

Psychopathology

Psychosis

Although there is scant support for the existence of a cannabis-induced functional psychosis, there is strongly suggestive evidence for the exotic potentiation of chronic cannabis use on a latent psychosis in vulnerable individuals (see Allebeck, 1993; Castle & Ames, 1996; Hall, 1998; Hall et al., 1994; Nelson, 1993; Thomas, 1991; Thornicroft, 1990, for review). Cannabis may also alter the course and expression of a schizophrenic illness as affected individuals continue to try to control delusional states by self-medicating (Adams & Martin, 1996; Linzen, Dingemans & Lenior, 1994; Mueser, 1999; Negrete, 1989; Thornicroft, 1990). Alternatively, cannabis use might serve to neutralize the effect of the neuroleptic medication (Castle & Ames, 1996). In sum, the psychotomimetic involvement of cannabis in the aetiology (in at least some cases) of schizophrenia remains problematic and unresolved (Castle & Ames, 1996; Copolov, Bradbury, Dong, Dean & Lim, 1999; Negrete, 1989; Nelson, 1993). Hall and his colleague (Hall, 1998; Hall & Degenhardt, 1999) provide the most recent comprehensive reviews of studies on this contentious issue.

Affective Disorders

The relationship of cannabis to affective disorders remains elusive (Zablocki, Aidala, Hansell & White, 1991). Transient mood disturbance is a cardinal cannabis effect, and depressive symptoms may follow euphoria (Hollister, 1986; 1988; Thornicroft, 1993). While ethnographic studies suggest that some individuals do use cannabis as self-medication for pre-existing psychological distress (e.g. Haas & Hendin, 1987; Rainone et al., 1987) major studies have produced inconsistent findings. The high correlation of cannabis use with every other major drug of abuse has been a serious confounding factor in studies attempting to disaggregate the effects of cannabis, hence any attribution to cannabis per se may be spurious.

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Affective disorders specifically attributed to cannabis are usually characterized as mild and transient. However, clinical reports have suggested that cannabis use may precipitate relapse in patients with pre-existing disorder (Thomas, 1993). Studies of treatment populations reveal that cannabis users do evince psychological distress at intake. Ginzburg, Craddock, Hubbard & Glass (1984) found between 40-50 per cent of clients had depressive symptoms at admission which reduced to about six per cent after 90 days. Lundqvist (1995b) reported that chronic cannabis users scored lower on depression-related measures on treatment admission than did all the other comparison groups in the study. After six weeks in treatment scores were similar to those in the non-using control group. Importantly, those in the group who had terminated cannabis use for more than forty days scored higher than than those abstinent for less than seventeen days. Lundqvist suggests the possibility that differential improvement among quitters may be due to progressive elimination of THC in the system, and that cannabis users might consume cannabis to medicate depression. Accordingly, research on clients entering treatment would be useful to test the 'self-medication hypothesis'.

A case study monitoring changes in levels of anxiety and depression during withdrawal from cannabis reported a similar drop from significant to non-significant levels of both disorders over the four-week post-cessation period (Solowij, Grenyer, Chesher & Lewis, 1995). Various other researchers also suggest that the protracted withdrawal process (the 'protracted abstinence syndrome') may explain affective and other symptoms observed in cannabis treatment (e.g. Miller, Gold & Pottash, 1989).

The "amotivational syndrome"

The term "amotivational syndrome" was coined by Smith (1968) to describe a group of subtle yet reliable behavioural sequelae to regular cannabis use. The symptoms include apathy, lethargy, passivity, loss of goals and effectiveness, inability to concentrate and follow routines, flattening of affect and depression (Gold, 1991; Roffman & George, 1988; Weller, 1985).

There is conflicting evidence on whether cannabis use can lead to an "amotivational state" (Thornicroft, 1990). The signs and symptoms are essentially the same as those found with chronic intoxication with any sedative drug (Thomas, 1993). Thus far, empirical attempts to verify its existence have failed (Castle & Ames, 1996; Musty & Kaback, 1995; Nelson, 1993). In many cases, moreover, this anergic condition is apparently reversed after months of abstinence. Hence the symptoms could be understood as a facilitated endogenous depressive disorder brought to the fore by chronic cannabis use in a minority of predisposed individuals (Creason & Goldman, 1981; Nelson, 1993; Weller, 1985). Musty & Kaback (1995) found that chronic heavy users of cannabis scored lower on motivation measures only when they showed symptoms of depression concurrent with cannabis use, suggesting an interaction between depression and motivation independent of cannabis use. These researchers concluded that amotivational symptoms in heavy users in treatment are due to depression, and that depression is a necessary condition for amotivational behaviour in chronic heavy cannabis users. Again, research on clients entering treatment would elucidate the relationships among chronic, heavy cannabis use, depression, and motivation.

Finally, researchers and clinicians (Roffman & George, 1988; Roffman et al., 1988; Stephens et al., 1993; Zweben & O'Connell, 1988) have observed that notwithstanding the general lack of definitive research evidence for the "amotivational syndrome", it is important to note that clients who voluntarily seek treatment for cannabis problems typically complain of amotivational effects such as mild boredom, lack of zest, or a low-level depression. Individuals frequently perceive that their activity level and vigor generally correlate negatively with their cannabis consumption. A commonly reported problem in nontreatment study samples of regular cannabis users was reduced energy and/or motivation (Haas & Hendin, 1987; Hendin et al., 1987; Rainone et al., 1987; Reilly et al., 1998; Roffman & Barnhart, 1987). Similarly, loss of energy and vitality and a negative outlook on life were among the most commonly reported adverse effects from cannabis use in the drug use surveys of New Zealand general population samples over the past decade (Black & Casswell, 1993; Field & Casswell, 1999a, 1999b).

Violence and Aggression

Certain substances (alcohol, amphetamines, cocaine, PCP, LSD) are regularly associated with aggressive behaviour (Miller, Gold & Mahler, 1991; Miller & Potter-Efrom, 1989; McCormick & Smith, 1995). The recent finding of a strong relationship between levels of cannabis use and violent behaviour in a longitudinal study of a New Zealand birth cohort gives cause for concern (Poulton et al., 1997). Unambiguous conclusions, however, are compromised by polydrug use in research samples, and the controversial cause/effect linkages in these associations. For example, childhood aggression often precedes adolescent drug use. It is equally possible that elevated rates of violent behaviour associated with cannabis use are concomitants of procurement and/or supply of this drug (Abel & Casswell, 1993; Poulton et al., 1997).

Nonetheless, there is a pervasive belief among the general public that cannabis makes otherwise docile individuals violent, a belief that is not validated by research. Regular cannabis use did not appear to make a significant independent contribution to aggression in studies of adolescents abusing multiple substances (Kleinman, Wish, Deren, Rainone & Morehouse, 1988; Tinkleberg, 1974). Experimental studies have found that violent behaviour is actually decreased rather than increased by cannabis intoxication (Hollister, 1986; Nelson, 1993). Reviews have come to the consensus that cannabis does not precipitate violence in the vast majority of users (Abel, 1977; Hollister, 1986). In fact, studies have found that some cannabis users self-medicate to cope with aggression or fear of potential aggression. For this subgroup of users in treatment the "emotional anaesthetic" properties of cannabis function as an ongoing obstacle to the resolution of personal conflicts and/or social issues that underlie drug use problems (Flintoft, 1994; Grenyer, Luborsky & Solowij, 1995).

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Cognitive Impairment

Unlike the abundant evidence of pathophysiology associated with chronic heavy alcohol consumption, a major unresolved question is whether long-term cannabis use produces irreversible effects (Cohen, 1986; Scallet, 1991; Schwartz, 1993). CAT scans have failed to support earlier claims of cannabis-related cortical atrophy and ventricular dilation (Hollister, 1988; Nelson, 1993; Wert & Raulin, 1985). Because it acts as a specific receptor (Glass et al., 1997; Pertwee, 1997) chronic cannabis use is unlikely to cause gross structural damage. There is a possibility, however, that prolonged heavy cannabis use may affect this receptor in ways that affect brain function (Hall & Solowij, 1997). Ex-users, for example, do score better on performance tests than current users. However, their performance does not reach the level of proficiency demonstrated by drug-free controls, even after prolonged abstinence (Solowij, 1995). Evidence for a persisting selective impairment of cognitive functioning following a period of sustained abstinence has emerged from longitudinal naturalistic studies (Fletcher, Page, Francis, Copeland, Naus, Davis, Morris et al., 1996; Page, Fletcher & True, 1988), controlled community studies (Schwartz, Gruenewald, Klitznerm & Fedio, 1989), laboratory studies (Solowij, Michie & Fox, 1991; Solowij, 1993; 1995) and case studies (Solowij et al., 1995).

More recent and methodologically rigorous research using electrophysiological methods has been reviewed (see Deahl, 1991; Pope et al., 1995; Solowij, 1996a, 1996b). It was concluded that chronic cannabis use produces complex and subtle impairments specific to higher ("executive") cognitive functions such as the organization and integration of complex information involving attention and memory processes. A duration effect suggests that this impairment is progressive with increasing years of use (Solowij, 1996a, 1996b). Nevertheless, there are large individual differences in susceptibility to cognitive impairment, the nature of which remains uncertain. Hall et al (1994) caution that even though subtle, these impairments may affect everyday functioning, particularly in adolescents with marginal educational aptitude, and among adults in occupations requiring high levels of cognitive capacity.

It has been hypothesized that long-term cannabis use impairs the frontal lobe, an area of the brain which functions in the temporal organization of behaviour (Adams & Martin, 1996; Solowij, Grenyer, Peters & Chesher, 1997). This accords with clinical observations in cannabis treatment subpopulations (e.g. Lundqvist, 1995a) who exhibit cognitive differences resembling a 'prefrontal syndrome'. Characteristics include deficits in classifying, synthesizing and comprehending information, and in psychospatial and mental representation skills. It is claimed that these changes in cognitive processes lead to a mental and behavioural profile that appears unique to cannabis use (Lundqvist, 1995a). This hypothesized pattern of impairment is supported by the fact that cannabinoid receptors are more dense in the forebrain than in the hindbrain (Glass et al., 1997; Herkenham, Lynn, Little, Johnson, Melvin, De Costa, & Rice, 1990). Though the user is able to begin to control his or her cognitive functioning after fourteen days abstinence from cannabis, it takes up to six weeks of therapy before normal cognitive functioning resumes (Lundqvist, 1995a, 1995b); Tunving, Lundqvist & Ericsson, 1988).

Finally, quantitative autoradiographic receptor studies that have localized very high levels of cannabiniod receptors in the human hippocampus and subiculum suggest the anatomical basis of the amnesic effects of cannabis (Glass et al., 1997). In addition, recent morphological studies of the long-term effects of THC have shown a decrease in neuronal density and an increase in glial cell reactivity in the hippocampus, hypothesized to cause observed ageing-like degenerative changes in hippocampal neurons (Smith, 1995). Given the critical contribution of the hippocampus to memory processes, Pope et al (1995) assert that "the case is not closed on the issue of lasting CNS toxicity" (p. 32).

Adverse Health Effects

The most probable adverse physiological effects of long-term regular cannabis use appear to be respiratory diseases associated with smoking such as chronic bronchitis and asthma (Tashkin, 1993; Van Hoozen & Cross, 1997). However, the possible concurrent risks to health include pre-cancerous changes in the oral and oesophageal

tract (Van Hoozen & Cross, 1997); impaired fetal and early childhood development among offspring of cannabis-using pregnant women (Fried, 1989; Hollister, 1986; Zuckerman et al., 1989); modulation of immune system function (Adams & Martin, 1996; Hollister, 1986; Klein, Friedman & Specter, 1998); and interference with the male and female reproductive systems (Hall et al., 1994; Hollister, 1986).

The entire spectrum of effects on health produced by cannabis use are beyond the scope of the present paper. For excellent reviews the reader is directed to Adams & Martin (1996), Hall and his colleagues (1994), Kalant, Corrigal, Hall and Smart (1999), and Scallet (1991).

The Natural History of Cannabis Use

Unlike alcohol (Vaillant, 1983) heroin (Kandel & Logan, 1984; Robins, Davis & Goodwin, 1974; Thorley, 1981; Vaillant, 1970) and cocaine (Siegal, 1984), the long-term course of cannabis dependence/abuse has not yet been fully documented. Because of the relative recency of widespread cannabis use in western societies, the properties of the drug that promote and maintain its use are still poorly understood (Reilly et al., 1998). More is known about the characteristics that predict who will initiate cannabis use than those that predict a continuation of its use (Donnelly & Hall, 1994; Duffy & Milin, 1996).

In a wide-ranging span of studies the initiation of/motivation for cannabis use has been associated with such diverse psychosocial correlates as: the desire to get "stoned" or to gain the euphorigenic, relaxing effects (Musty, 1988; Reilly et al, 1998; Swift et al., 1997; Weil, 1975); impulsivity, excitement, and experimentation, and/or to alter perceptions and deepen self-understanding, or creativity (Haas & Hendin, 1987; Reilly et al., 1998; Swift et al., 1997); peer and sibling use, and susceptibility to social pressure (Jessor & Jessor, 1977); having favourable attitudes to drug use, and values and behaviours reflective of a drug subculture (Jessor & Jessor, 1977); stressful life events and environmentally-induced stress (Kandel, 1988; Kandel et al., 1986); self-medication to relieve negative mood states such as

pre-existing anxiety, depression, and low self-esteem (Haas & Hendin, 1987; Musty, 1988; Rainone et al., 1987); anger control for feelings of hostility and aggression and a lack of self-control, or as an escape/aid in problem solving (Swift et al., 1997); personal and social developmental deficits (Pandina et al.,1988); adaptive difficulties in personal relationships and lack of stability in adult role performance (Haas & Hendin, 1987; Kandel,1975; Kandel et al., 1986); poor academic performance, precocious sexual activity, and antisocial behaviour (Jessor & Jessor, 1977) and the ready availability of cannabis (Swift et al., 1997).

In their longitudinal research Kandel and colleagues (Kandel & Davies, 1992; Kandel & Logan, 1984; Kandel et al., 1986) found that variables which predict the onset of cannabis use also predicted the continuation of its use. The strongest predictor of continued involvement was the extent of prior involvement in drug use. Those who had initiated use at a younger age, were heavier users, had used other illicit drugs, and who used for psychological (as opposed to social) reasons, were more likely to continue their use.

A major public concern about cannabis has long been that its use in adolescence increases the risk of developing cannabis dependence and the likelihood of using other more dangerous drugs such as cocaine and heroin. Robins (1984), however, has demonstrated that the concept of "gateway drugs" is flawed if applied independent of the age of the host at introductory drug use. That is, use of cannabis is a good predictor of more serious drug use only if cannabis use begins early, similar to early alcohol use predicting later cannabis use. This notion was supported in a study (Rainone et al., 1987) in which heavy cannabis users who had engaged in multiple lifetime drug use had begun cannabis use at a very young age (less than 14 years).

The role of cannabis as a "gateway drug" in the sequence of illegal drug use, however, remains controversial. While most of the research into the "developmental pathway" model of drug involvement has been carried out in the United States, recent Australian studies have suggested that alcohol and tobacco may be more important "gateway" drugs for the use of more serious illegal drugs than is cannabis (Donnelly & Hall, 1994). As yet New Zealand has no comparable

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data. However, given the observed similarities in drug use with that of Australia (e.g. Field & Casswell, 1999b), it seems reasonable to expect a corresponding pattern in New Zealand. Again, it is important to bear in mind that the overwhelming majority of cannabis users do not use harder drugs, such as cocaine and heroin.

Much of the literature on cannabis fails to support the concept of the "pure" cannabis user (Rainone et al., 1987; Reilly et al., 1998; Sellman, 1993; Swift et al., 1997; Tennant, 1986). The recent national survey on drug use in New Zealand (Field & Casswell, 1999b) found that only 0.3 per cent of a general population sample had tried marijuana only. Multiple drug use is the "norm" in the 1990s. However, unlike the situation in the United States where multiple drug use generally implies combinations of other illicit substances (cocaine, heroin, cannabis, crack, LSD), research has found that polydrug use in New Zealand (and Australia) was more likely to involve alcohol, tobacco and cannabis than other drugs (Black & Casswell, 1993; Field & Casswell, 1999b; Reilly et al., 1998; Sellman, 1993; Swift et al., 1997). As many as 59 per cent of the respondents in the Field and Casswell national survey who had used cannabis in the last year always, mostly, or sometimes used it with alcohol. Seventy-five percent had combined cannabis and alcohol on a regular basis in the Swift et al. study of long-term cannabis users. Indeed, for over half of the drinkers in the latter study, excessive alcohol use was an independent predictor of severity of DSM-III-R Cannabis Dependence (Swift et al., 1997). Of note, respondents in this study reported experiencing dramatic adverse effects from the combination of cannabis and alcohol.

As with other substances (alcohol, opioids) the long-term course of cannabis dependence is variable. Currently it appears that cannabis use is typically discontinued in the late 20's (Kandel & Davies, 1992; Kandel & Logan, 1984; Kandel et al., 1986). It is also believed that there is probably a high rate of remission of cannabis dependence without formal treatment (Hall et al., 1994; Rees, Copeland, Swift, Roffman & Stephens, 1998; Swift et al., 1997). As yet, however, there are no New Zealand data on either the natural history of cannabis dependence or the long-term outcome from treatment.

PREVALENCE OF CANNABIS DEPENDENCE/ABUSE PROBLEMS

Despite the continuing popularity of cannabis there has not been a systematic programme of research on the cannabis dependence syndrome comparable to that conducted on the alcohol and opiate dependence syndromes. Consequently, interpretable epidemiological data are lacking (Chen et al., 1997; MOH, 1996, 1998; Stephens & Roffman, 1993; Swift et al., 1997). Efforts to determine consumption patterns/problems of cannabis users are inevitably plagued with many of the same definitional and data base problems found in the drug dependence field in general, and "hidden" populations in particular, including illegality, stigma, measurement and estimation issues (Sellman et al., 1996). In addition, the lack of a specific cannabis measuring instrument is a major issue for research into cannabis dependence/abuse (Cottler, 1993; Rounsaville, Bryant, Babor, Kranzler & Kadden, 1993; Swift et al., 1997). Nonetheless, some indication of the extent of cannabis dependence problems has been developed from several sources. Applying various measures of dependence a diverse body of research studies and other indices collectively indicate that cannabis dependence is a significant phenomenon, and "likely to be a larger problem than previously thought" (Hall et al., 1994, p. 13).

Population Survey Data

Using identical methodology and DSM-III criteria epidemiologic data from the United States (Robins & Regier, 1991) and New Zealand (Wells et al., 1989, 1992) produced similar population prevalence estimates. While cannabis was the most commonly used illegal drug in both countries, cannabis dependence/abuse was also the most common form of lifetime dependence on an illegal substance (4.4 per cent and 4.7 per cent respectively). Remarkably similar estimates of lifetime cannabis dependence (4 per cent) were produced by the United States National Comorbidity Survey (Anthony et al., 1994). The recent Australian National Survey of Mental Health and Well-being (Australian Bureau of Statistics, 1996) used both DSM-IV and ICD-10 criteria to define disorder in the general population over the previous 12

months, and found that cannabis accounted for more drug use disorders than any other illegal drug (1.7 per cent of a total of 2.2 per cent drug use disorders). Kandel and her colleagues (1997) reported on a DSM-IV measure of cannabis dependence in a nationally representative United States sample of those aged at least 12 years who had used cannabis in the last year. It was found that 8.2 per cent of last year users were dependent on cannabis (compared to 5 per cent for alcohol, 12 per cent for cocaine, and 28 per cent for nicotine). Finally, a Canadian study (Adlaf et al., 1994) found that while 1.2 per cent of the general population met ICD-10 criteria for cannabis dependence, among those who had ever used cannabis in their lifetime 13.3 per cent were classified as cannabis dependent.

Studies of Self-identified Long-term Users

Epidemiologic data show that the proportion of regular users who display symptoms of cannabis dependence is approximately 60 per cent (Robins & Regier, 1991). Research on large samples of long-term cannabis users in Australia has examined the patterns of cannabis dependence in a rural and a metropolitan area. Over half (57 per cent) of the rural sample who had been using cannabis on average for 19 years met DSM-III-R criteria for cannabis dependence (Didcott, Reilly, Swift & Hall, 1997). Only 1 in 4 of this sample believed that their cannabis use was a problem. However, the lifetime prevalence of cannabis dependence among the Sydney sample with an average history of 11 years use was comparatively much higher, with 92 per cent meeting DSM-III-R criteria, and 40 per cent of these diagnosed as severely dependent (Swift et al., 1997). Level of dependence was correlated with cannabis consumption level; over half of this sample used cannabis daily and three-quarters used the drug on four days per week. These prevalence figures confirm earlier estimates of a "substantial" risk of dependence among regular cannabis users (Swift et al., 1997).

As yet there are no comparable New Zealand data that precisely identify the proportion of regular cannabis users who would meet diagnostic criteria for cannabis dependence. The 1986 Christchurch Psychiatric Epidemiology Survey

(Wells et al., 1989, 1992) was conducted well over a decade ago, and while such population survey data are potentially conservative or even serious underestimations (Sellman et al., 1996), trends in cannabis use problems may have changed considerably over that time period. In fact, a substantial rise in the demand for cannabis treatment services within this time frame suggests an upward trend both in cannabis consumption and cannabis use problems.

Demand for Cannabis Treatment

Other indicators of the prevalence of cannabis dependence/abuse among regular users come from clinical observations (Estroff & Gold, 1986; Miller & Gold, 1989; Roffman & George, 1988; Smith et al., 1988; Tennant, 1986; Zweben & O'Connell, 1988) and drug treatment admissions for cannabis problems.

Clinical Populations

Until recently, cannabis dependence/abuse had not been a significant clinical concern (Tennant, 1986). More than a decade ago, however, Tennant (1986) prognosed that the need for clinical treatment of cannabis dependence "will escalate" (p. 236). This speculation was founded on two emerging trends in the United States: (1) the perceived manifold increase in potency of marijuana since the 1960's, and (2) routine urine screening in the workplace, criminal justice system, and clinical settings, which was increasingly identifying persons dependent on cannabis. Indeed, from the 1980's evidence began to emerge of an increase in the number of persons seeking help with cannabis as their major drug problem.

In the United States both Jones (1984) and Roffman and George (1988) noted a fifty per cent increase in three years in clients of drug treatment services seeking treatment for a primary cannabis problem. A more recent indicator of cannabis-related problems in the United States suggests that cannabis was the primary drug of

abuse for between 11 and 26 per cent of clients presenting for treatment at community treatment agencies from 1994 -1996. In general, United States treatment presentations are male, polydrug (particularly alcohol) users, and mostly over age 20 years (United States Office of National Drug Control Policy, 1996).

Similar reports have come from Sweden (Engstrom, Allebeck, Rodwall & Rydberg, 1985; Tunving et al., 1988) where approximately one-third of clients at outpatient clinics requested help in controlling their hashish use. In the Netherlands a rapid rise in treatment-seeking for hashish use problems was first noted in the 1980's, a trend that continued well into the 1990's (Kerssemakers, 1996). However, while 3.5 per cent (or 24,000) of the estimated 675,000 hashish smokers in the Netherlands presented for help with their use problems in the 1996/1996 year, it is believed that these presentations represented only "the tip of the iceberg" (Kerssemakers, 1996, p.4).

In both Australia and New Zealand establishing the numbers of clients presenting to treatment agencies with cannabis problems has been made difficult by inconsistencies in intake coding procedures and lack of cannabis-specific databases (Flintoft, 1994; Johnston & Hannifin, 1987; MOH, 1996; Swift et al., 1997). Didcott, Flaherty and Muir (1988) reported that cannabis was the primary drug problem identified by 25 per cent of clients treated in twelve residential treatment services in Australia in 1985/1986, second only to opioid drugs (73 per cent). Furthermore, over half of all clients acknowledged their cannabis use as a problem. A 1992 National Census of Clients of Australian Treatment Services Agencies (Chen, Mattick & Baillie, 1993) reported that cannabis use was recorded as the main drug problem for 6 per cent of all clients, representing an increase on the figure of 4.1 per cent seeking help in 1991. Even more notable, however, the 1995 census found that there had been a 60 per cent increase in clients seeking help for cannabis problems compared with the 1992 survey (Torres, Mattick, Chen & Baillie, 1995). Indeed, a community-based treatment programme for cannabis clients in Melbourne reported that "demand always exceeds supply" (Wood, 1997/1998, p.8).

Data collected by the New Zealand Health Information Service (NZHIS, MOH, 1996) indicated an increase in gazetted admissions to inpatient treatment for

cannabis dependence in the period 1987 to 1993. Reflecting patterns of use found in the general population (Black & Casswell, 1993), these admissions were higher among men in the younger age groups, with highest admissions for males aged 20 to 24 years. Admissions dropped steadily from about 29 years of age (MOH, 1996). Data on outpatient treatment for cannabis problems, however, are more difficult to obtain. In 1989, the last year that national statistics were collated by the Alcohol Advisory Council, 13 per cent of those receiving community-based services reported cannabis use problems (MOH, 1996).

However, most clients in the 1990's are polydrug users, with alcohol or cannabis as the most frequent secondary drug problem, and accurate statistics would require recording these use profiles. Two surveys of New Zealand treatment clinicians provide an indication of the incidence of clients presenting to New Zealand treatment services for help with cannabis use problems. Respondents to Flintoft's (1994) survey reported that 32 per cent of all clients presented specifically for primary cannabis problems, with a further 44 per cent having a secondary cannabis problem. Only 24 per cent of all admissions had no cannabis problems.

A more recent telephone survey of a random sample of 217 New Zealand alcohol and drug clinicians (outpatient and residential) yielded a randomly selected sample of 291 clients seen within the previous two weeks around New Zealand (Adamson, Sellman,Collier, Huriwai, Deering, Todd & Robertson, 1998). Data revealed that the largest group of clients were seen for alcohol problems (45 per cent) followed by cannabis (27 per cent) and opioids (17 per cent). Consistent with other research several significant factors differentiated primary cannabis clients from those with alcohol/other drug use problems:

(1) on average cannabis clients were younger (25 years) than the remainder of the sample (33 years).

(2) Maori were more likely to present with cannabis problems (40.7 per cent) than the remainder (21.9 per cent).

(3) Men were more likely to be recorded as cannabis users (36.8 per cent) than women (12.8 per cent). (Adamson et al., 1998).

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These national data provide a valuable and much-needed information baseline on the prevalence and characteristics of client presentations for cannabis problems at New Zealand drug treatment services. Although there is likely to be regional variability, data from both surveys appear commensurate with the most recent statistics reported by the Auckland Regional Alcohol and Drug Services (RADS) which confirm that cannabis **is** a significant issue for clients presenting to community treatment services in New Zealand.

At the RADS units cannabis problems are defined as using daily/more than daily, or a score of 3 or more on the Severity of Dependence Scale questions on cannabis (Gossop, Darke, Griffiths, Hando, Powis, Hall & Strang, 1995). Thirty-seven percent of all RADS clients presenting with an alcohol or drug problem in the last 5 months (n = 583, April – August 1999) had a cannabis problem (Auckland Regional Alcohol & Drug Services Clinical Information & Research Unit [CIRU], 1999). While the majority (81%) of this cannabis client group were New Zealand Europeans, 14% were Maori, and 5% Pacific Islanders.

Data available seem comparable with the statistics previously reported from the National Telephone Survey (Adamson et al., 1998). For example, 59 percent of all RADS cannabis clients were under 30 years of age; Maori (51%) were more likelyoresent with cannabis problems than New Zealand Europeans (36%) and Pacific Islanders (28%); 40% of all male clients and 31% of all female clients had a cannabis problem (CIRU, 1999).

In short, over the last decade there has clearly been a substantial growth in demand for services at drug treatment agencies both overseas and in New Zealand by people seeking professional assistance for cannabis use problems.

Media-Recruited Treatment Seekers

During this same period there has also been a strong response to media advertisements attempting to attract cannabis users concerned about their cannabis use and interested in professional assistance with their use problems. For example,

from as early as 1985 a series of community-wide marijuana-specific research advertisements recruited large cohorts of volunteer respondents seeking help with their cannabis use problems in the United States (Roffman & Barnhart, 1987; Stephens et al., 1993, 1994). In excess of 1200 applications were received in the relatively brief advertising periods. Of interest, furthermore, although these treatment seekers averaged more than 10 years of daily cannabis use and more than six serious past attempts to quit, very few reported previous participation in drug abuse treatment programmes (Roffman & Barnhart, 1987; Stephens et al., 1993).

In Australia a recent National Drug and Alcohol Research Centre (NDARC) study recruited 240 volunteer participants via media advertisements for a controlled trial of cannabis-specific treatment (Rees et al., 1998). A concomitant NDARC study examining the reversal of electrophysiological charges in the brain of cannabis smokers upon abstinence (Grenyer, Solowij & Peters, 1996) generated an enormous response to advertisements. Participants in this study also expressed interest in the psychodynamic intervention offered to assist them achieve abstinence.

Finally, in a third Australian study 200 respondents were recruited primarily from media advertisements for the Swift and colleagues (1997) study of long-term regular cannabis users. When their beliefs about desirable interventions for problematic cannabis use were addressed, the vast majority (94 per cent) believed that a variety of treatment services should be provided to those who require them. The most common suggestion was for counselling (34 per cent). Other suggestions included support/self-help groups (13 per cent) and Marijuana Anonymous (7 per cent), provision of alternative activities (7 per cent), cannabis substitute therapies (6 per cent), detoxification or residential services (5 per cent), health farms or "new life" programmes (4 per cent), and a phone line for advice and support (3 per cent). A further 15 per cent believed services should be provided, but did not know what would be appropriate (Swift et al., 1997).

Barriers to Help-seeking for Cannabis Use Problems

Demand for services, however, is influenced by a diverse range of factors including cost, availability, access, attractiveness (and so on) to potential consumers (see Cunningham, Sobell, Sobell, Agrawal & Toneatto, 1993; Sellman et al., 1996). Despite the manifest demand for treatment services, several factors appear to account for the apparent disinclination of many people with cannabis use problems to enroll in community drug treatment programmes (Stephens & Roffman, 1993).

Firstly, the decline of social acceptance of illegal drug use (and particularly cannabis) in recent years renders the illegal status of cannabis as a major disincentive to help-seeking and open discussion. Indeed, fear of what would happen on contacting the service (23 percent) and fear of law/police (14 percent) were among the service-related reasons cited by marijuana users in the recent New Zealand drug use survey who said they had wanted help, but not got the help they needed (Field & Casswell, 1999b). Secondly, the tenacious street mythology of cannabis as a harmless drug free of dependence liability renders many potential cannabis clients unlikely to perceive themselves as needing assistance (Roffman & George, 1988). Sensationalized controversies of the cannabis decriminalization/legalization debate articulated through the mass media have been an obstacle to the layperson's accurate understanding of the facts (Abel & Casswell, 1993; Hannifin, 1990; Newbold, 1992; Roffman & George, 1988). This notion was clearly borne out in the national survey in which Field and Casswell found that although more than a quarter (27 percent) of last year cannabis users were not happy with their consumption level, 82 percent of this group said they needed "no help at all" (p. 38).

Other barriers include the perceived inappropriateness of the treatment models used by treatment services, and the lack of choice of treatment options and outcome goals (Copeland, 1997; Roffman & George, 1988). More than half of Copeland's female sample did not wish to become abstinent, but to continue using cannabis and/or alcohol on a social basis. Further concerns among this sample included the confrontational nature of traditional approaches and the lack of gender-sensitive

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(women-only) services. Arguably, however, a major barrier to treatment seeking for cannabis use problems may be that chronic cannabis users may be unaware that treatment services are available to assist them with their problems (Rees et al., 1998; Roffman & George, 1988). The reason most commonly given by New Zealand marijuana users (33 percent) for not receiving the help they needed was not knowing where to go (Field & Casswell, 1999b).

In summary, although imperfect these various indicators of the potential volume of individuals who either desire **or** would benefit from professional assistance with overcoming their cannabis dependence and associated problems are "clearly a phenomenon to be taken seriously" (Zweben & O'Connell, 1988, p. 26). Despite this expanding demand, there is a paucity of research literature on the treatment of cannabis-related problems (Heather & Tebbutt, 1989; Rees et al., 1998; Roffman & George, 1988; Smith et al., 1988; Solowij et al., 1995; Stephens et al., 1993, 1994; Swift et al., 1997). Today, treatment responses to cannabis-related problems remain seriously under-researched.

EFFECTIVENESS OF TREATMENT FOR CANNABIS DEPENDENCE

Despite the escalating demand internationally among cannabis users for services to assist them in stopping or modifying their cannabis use there is little agreement among treatment services providers as to whether cannabis users do require assistance, what type of intervention might be appropriate, or even in what circumstances or context treatment is appropriate (Heather & Tebbutt, 1989; Swift et al., 1997).

Treatment Approaches

Thus far approaches to intervention for cannabis dependence have been eclectic and range from those based on smoking cessation (Jones, 1984; Smith et al., 1988); on a disease conceptualisation incorporating the 12-Step approach (Miller et al., 1989);

or approaches adapted from practices in the alcoholism treatment area (e.g. Miller & Gold, 1989; Zweben & O'Connell, 1988; Tennant, 1986). Various self-help groups such as 12-Step fellowship movements including Alcoholics Anonymous (AA) Narcotics Anonymous (NA) and Marijuana Anonymous (MA), or those founded on the principles of Rational Recovery (RR; Trimpey, 1992; Wright, 1994), have provided an alternative approach or served as adjuncts to formal treatment. Controlled evaluations of these approaches, however, are rare and present several methodological problems (McCrady & Delaney, 1995).

Although overseas researchers have recently begun to document the development of various specialized interventions for cannabis use problems, such reports are sparse and not yet part of an ongoing and systematic, empirically-based programme of treatment development and evaluation. Among the few reported is an established Melbourne 8-week group counselling programme with a harm minimization philosophy in which clients choose their own goal targets. This programme includes cognitive-behavioural therapy, motivational interviewing, and psychodynamic therapeutic techniques (Wood, 1997/1998). Weekly 2-hour sessions proceed with one hour of individual sharing of experiences (the "process") to address issues underlying cannabis use and to build trust. The second hour incorporates cognitive-behavioural techniques based on the Prochaska and Di Clemente Stages of Change Model (the "content"), including cannabis education, relapse prevention techniques, and redefining goals. A novel feature of this group approach is the "buddy" system, incorporated to address cannabis users' lack of socialisation and alienation from non-smokers. Paired group members are responsible for supporting each other between the weekly sessions. Combined with other social events such as shared pre-session dinners, picnics, and other group outings, the social aspects of this innovative approach are believed to be the key issue in clients' success. Programme providers claim that 75 per cent of clients achieve and sustain their individual goals, and that the relapse rate is as low as 35 per cent at the 6-month follow-up (Wood, 1997/1998).

An educational, awareness-raising minimal intervention, "Self-Control Training" for younger (15-25) cannabis smokers in the Netherlands has reported positive results

for the project, with 82 per cent of the participants endorsing the utility of the programme (Dupont & Niewijk, 1996).

Of particular interest is a Swedish programme developed specifically to accommodate and restore the cognitive dysfunction typically induced by chronic, regular cannabis use ("A Way Out Of The Fog"; Lundqvist, 1993, 1995a, 1995b; Tunving et al., 1988). Featuring a three-step structure (a medical, psychological, and psychosocial focus) this specialized intervention is essentially an educational/supportive approach in which the therapist educates the client about his/her cannabis-induced cognitive dysfunction, coaches the client in the restoration/acquisition of cognitive skills and a more adaptive reality, and supports the client in the process of a new identity development. Tunving and his colleagues claim that 75 per cent of treatment completers become abstinent as a direct result of the programme. Furthermore, a study showed that post-treatment scores of chronic cannabis users on scales measuring cognitive coherence were in the range of the "normal" control group after six weeks of treatment (Lundqvist, 1995b). As yet, however, there has been no long-term controlled outcome/relapse research reported to establish conclusively the efficacy of this promising approach.

Controlled Treatment Outcome Research Studies

There have been only five controlled studies investigating the efficacy of interventions for cannabis, and all were conducted in the United States and Australia with volunteer adult samples.

The first United States study published was a small (n=22) clinical trial of a four-week, abstinence-oriented behavioural programme utilizing THC-free marijuana, aversion therapy, and self-management group counselling to develop and reinforce drug free coping behaviour (Smith et al., 1988). At the six- and twelve-month follow-up, cannabis smoking represented an 89 per cent and 78 per cent reduction from pretreatment baseline levels. A concurrent finding was that changes between pre- and posttreatment scores on the Shipley Institute of Living Scale were

significant for both IQ and conceptual quotient. The researchers concluded that as these abstinence rates matched or exceeded those reported in studies using similar treatment procedures for nicotine dependent smokers, this protocol offers promise as an effective cannabis smoking cessation programme (Smith et al., 1988).

Questions remain, however, as to the extent that the small sample, their volunteer status and relatively advantaged sociological characteristics, reliance on self-report as the only outcome measure, and failure to assess other important life areas limits the generalization of these results beyond this particular population of cannabis smokers. Furthermore, no evaluation was attempted of the relative contributions of the various treatment components to treatment outcomes.

The most extensive series of controlled outcome studies of cannabis-specific outpatient treatment in the United States have been conducted by Stephens, Roffman and their colleagues in the context of a first empirical attempt to determine if cannabis dependent individuals could be recruited and effectively treated (Roffman et al., 1988; Roffman, Klepsch, Wertz, Simpson & Stephens, 1993; Stephens et al., 1993, 1994; Stephens, Curtin, Simpson & Roffman, 1994; Stephens, Roffman, Cleaveland, Curtin & Wertz, 1994; Stephens, Wertz & Roffman, 1993, 1995). Subjects were those who met eligibility criteria from a large pool of applicants recruited via media advertisements. Exclusion criteria included concurrent abuse of any drug other than cannabis, ongoing participation in any other treatment programme, and severe comorbid psychopathology.

The first of these abstinence-oriented studies compared the effectiveness of two alternative group counselling approaches: a relapse prevention oriented cognitive-behavioural model (RP) and a more traditional nonbehavioural approach emphasizing social support and group discussion (SSP) (Stephens et al., 1994). Subjects were 161 men and 51 women (n=212) with a mean age of 31.9 years. Ninety-five per cent of the sample were White, and 85 per cent were employed. The typical subject had smoked cannabis for 15 years and reported using cannabis on 81 of the past 90 days. Indices of the severity of cannabis abuse (89 per cent) and general psychopatholgy were in the clinical range for a majority of the sample.

The RP condition was a highly-structured, psychoeducational coping skills-training intervention modelled closely on techniques described by Marlatt and Gordon (1985), and nested within a stage conceptualisation of the change process (Prochaska & Di Clemente, 1983,1986). The comparison SSP treatment used a facilitative group support process model of therapeutic change, and was based on the content of contemporary substance abuse treatment programmes. Subjects were randomly assigned to treatments conducted in cohort groups which met for ten 2-hour sessions. Subjects in both groups were expected to cease cannabis use by the fourth session. Assessments were conducted at pretreatment and treatment termination, and at multiple posttreatment follow-ups. After the tenth session clients' perceptions of the helpfulness of their treatments were assessed.

Stephens and his colleagues (1994) hypothesized that subjects assigned to the RP treatment would achieve and maintain superior outcomes compared to those assigned to the SSP treatment. Contrary to expectations, however, the researchers found no differences in outcomes between the two treatment conditions on measures of days of marijuana use, related problems, or abstinence rates. While significant reductions in cannabis use and mean number of cannabis-related problems were reported at all follow-up intervals compared with pretreatment, the relapse curve was steep in the first several months posttreatment, and only 20 per cent were abstinent at the one-year assessment.

This relapse pattern and overall outcomes are comparable to those reported in treatment outcome studies in the alcohol and tobacco-dependent populations (Mattick & Jarvis, 1993; Quality Assurance Project, 1992). .

Several additional outcome findings were of interest. While women were less likely than men to maintain abstinence, they were also more likely to report non-problematic use than men who continued to use. This gender effect is consistent with findings from other intervention studies for substance dependence (e.g. Sanchez-Craig, Leigh, Spivak & Lei, 1989). A general lack of effect on other substance use was also reported. Generally, neither an increase in other substance use predicted by the "symptom-substitution hypothesis" nor generalization of treatment effects manifest in reduced use of other drugs was recorded, suggesting a

rather benign impact of these approaches to cannabis treatment on other drug use. Posttreatment increases in problems associated with alcohol did not appear to relate to reduced cannabis use (Roffman et al., 1988; Stephens et al., 1994).

Finally, just over two-thirds (69 per cent) of the sample completed treatment and all the posttreatment follow-up assessments, a retention rate which compares favourably with that of other drug treatment outcome studies (see Stark, 1992, for review). Consistent with many studies, outcomes for completers were superior to outcomes for dropouts. A noteworthy differential attrition rate was observed. The "early" dropouts (11 per cent) who attended up to three sessions only, tended to be younger, less socially and economically stable, and more likely to report psychological distress than "late" dropouts (20 per cent) or treatment completers (Roffman et al., 1993). These findings are also consistent with other studies of attrition from drug treatment programmes (Anglin & Hser, 1992; McLellan et al., 1983). Accordingly, the researchers opined that short-term outpatient therapy has "considerable" potential for retaining the marijuana-dependent client in treatment. However, while late dropouts and completers were similar on a number of measures (e.g. age, income, home ownership, ability to pay bills, psychological distress levels, self-efficacy), the lower rates of abstinence in the late dropouts resembled the treatment outcomes of early dropouts (Roffman et al., 1993).

The researchers concluded that in the absence of clear treatment differences and a no-treatment control group, it was not possible to attribute outcomes to treatments with any certainty. Nonetheless, given the substantial reductions from pretreatment levels in both cannabis use and psychosocial problems in this sample together with high client ratings of treatment efficacy and helpfulness, the study had demonstrated both the appeal and efficacy of abstinence-oriented group counselling approaches to the treatment of cannabis use (Stephens et al., 1994). Given that 75 per cent of the sample had aspired to abstinence before treatment began, however, it had also demonstrated the resistance of that behaviour to change, suggesting that cannabis dependence "is a formidable problem requiring treatment and, perhaps, multiple attempts to quit" (Stephens & Roffman, 1993, p.216).

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Several possible interpretations of the equivalent outcomes between treatment conditions in this study led to the development of a second randomized controlled trial by this research team. Consistent with a growing literature on brief interventions with other addictive behaviours (Bien, Miller & Tonigan, 1993; Drummond, 1997; Heather, 1995; Hubbard, 1997), Stephens and his team (1994) reasoned that minimal intervention with individuals voluntarily seeking to quit cannabis use may be superior to no treatment, and equally as effective as longer, more extensive treatment. Alternatively, the acquisition of coping skills in the RP treatment may be considerably enhanced by a longer training period and the involvement of others in the clients' support network in the treatment process.

Accordingly, this time incorporating a no-treatment control condition to test these hypotheses, 291 people were assigned to either a wait-list condition; a brief, two session individual intervention (IAI) based on motivational interviewing principles (Miller & Rollnick, 1991; Rollnick & Miller, 1995); or a more extensive, 14-session relapse prevention group intervention based on a cognitive-behavioural approach supplemented by partner and self-help group support (RPSG). Subject variables were similar to those in the preceding study.

As in the first study, the researchers reported no significant differences between either treatment group at the follow-up assessments on any outcome indicator. Both active treatments produced significant reductions in cannabis use and related problems relative to pre-treatment. Moreover, the control group also showed a tendency to reduce their cannabis use over the waiting period. There were no significant differences in outcome by gender.

As Stephens and colleagues (1994) concluded, the finding of equivalent efficacy of the active treatments in this study has important implications for cannabis treatment in that: (1) brief interventions may be more cost-effective than more intensive, extended group counselling interventions, (2) the brief intervention was the preferred treatment chosen by the majority of the control group following the waiting period, so clearly is attractive to cannabis users, and (3) there were no differences in the percentage of subjects "very satisfied" (77 per cent) with their treatment assignment at the one month follow-up .

These groundbreaking studies of treatment for cannabis use problems from the research team in the United States have clearly shown that the cognitive-behavioural approach offers a promising, empirically verifiable approach which warrants further investigation incorporating modifications appropriate to the local context of programme development and evaluation. An Australian research team has recently embarked on this research venture.

In collaboration with the authors of the American trials a replication study was conducted recently in Australia at the National Drug and Alcohol Research Centre (NDARC) incorporating modifications appropriate to the Australian context in order to ascertain whether efficacious, attractive and cost-effective services may be provided to local cannabis users (Rees et al., 1998). Modifications included an individual mode of treatment delivery, a briefer version of the brief intervention, and refinement of the extended intervention to be more comparable with the briefer version. Each session was of approximately one hour duration. Subjects (n=240) were recruited via media advertisements. Exclusion criteria included abuse/dependence on alcohol and nicotine using DSM-IV criteria, and use of any other drugs in the previous six months on more than a weekly basis.

Subjects were assessed and randomly assigned to either (a) a six-session, brief cognitive-behavioural intervention package incorporating a motivational interview during the assessment phase and a standard relapse prevention intervention (see Rees, Copeland & Swift, 1998); (b) a one-session version of the more intensive intervention with a NDARC self-help booklet, and (c) placement on a 24 week wait-list control group.

As yet, preliminary data only have been reported, and reveal that subject characteristics (sociodemographic and cannabis use variables) were comparable to samples in the American studies. Ninety-seven per cent met DSM-IV criteria for cannabis dependence in the past year. Among the substantial cannabis-related problems reported were criminal convictions (18 per cent), respiratory complaints (50 per cent), depression and paranoia (26 per cent), motivational decline (24 per cent) and memory problems (21 per cent). The researchers predicted that subjects

receiving the more intensive, six-session interventions would have a superior treatment outcome than those receiving the less intensive intervention, who in turn would have superior functioning than those in the wait-list control. Treatment outcome was assessed at the 24-week and 36-week posttreatment follow-up, and included repeat baseline measures of dependence, cannabis use, cannabis-related problems, and client satisfaction with treatment.

At the time of writing, limited outcome data only are available. Data reported include significant reductions in urinary THC levels, cannabis-related problems, and levels of depression (as measured on the Beck Depression Inventory). These preliminary results led Rees and colleagues (1998) to tentatively conclude that CBT is a suitable clinical intervention for cannabis dependence, and one which may also be effective.

In sum, although the development of a range of empirically-verified treatment alternatives for cannabis dependence is only at a very early stage it currently appears that whether delivered in an individualized or group format, cognitive-behavioural therapy tailored specifically to meet the specific needs of cannabis dependent clients in different contexts and settings may be an appropriate, efficacious and cost-effective intervention for cannabis use problems. This reflects the current status of the approach in the alcoholism treatment area where the majority of approaches with demonstrated efficacy and cost-effectiveness fall within the broad rubric of cognitive-behavioural approaches (Holder et al., 1991; Miller & Hester, 1986a; Miller et al., 1995).

It is thought that a learning based conceptualisation of excessive cannabis use and treatment may be more appropriate than the disease (12-Step) model, especially given the unique sociocultural history of cannabis use and its relatively mild dependence liability (which suggests that physiological factors play a minimal role in maintaining cannabis use). The learning based model is also compatible with the prevailing harm reduction philosophical paradigm with its associated flexibility in accommodating individual client treatment needs and goals. Hence, the equally successful application of the cognitive-behavioural approach to the treatment of cannabis dependence as to treatment of other drugs (alcohol, nicotine) represents an

important addition to the growing range of viable treatments for drug dependence (Rees et al., 1998).

Nonetheless, a recent study suggests that brief cognitive-behavioural interventions for cannabis dependence may not be the optimal approach to treatment for all client subgroups seeking assistance with their cannabis use problems. An NDARC controlled study which compared a brief intervention and a psychotherapy programme for 100 cannabis dependent individuals was the first study of individual psychotherapy for cannabis dependence (Grenyer et al., 1996). Volunteer subjects were 83 men and 17 women of moderate SES status and a mean age of 32 years. All subjects had used cannabis for more than five years, all were using daily/near daily, and all met DSM-IV criteria for cannabis dependence. All subjects reported significant levels of psychological distress (depression, anxiety).

Subjects were assessed and randomly assigned to either (1) a single, two-hour session including assessment, a motivational interview, discussion of quitting strategies, and provision of the NDARC self-help booklet, or (2) the Psychotherapy condition, a 16-session programme using traditional supportive-expressive dynamic psychotherapy techniques. Both therapies were in an individualized format. At the four-month assessment (i.e. the end of psychotherapy and four months after the brief intervention) 75 per cent of the psychotherapy clients were abstinent compared to only 10 per cent of the brief intervention clients. At the 12-month follow-up, however, a converging trend was emerging: the psychotherapy group's abstinence level had dropped to 40 per cent while the brief intervention level had risen to 20 per cent.

Better results on measures of psychological symptoms and functioning were also produced by the psychotherapy clients, particularly a large reduction in depression. At the 12-month follow-up psychotherapy clients were almost asymptomatic for depression, and either asymptomatic or had only mild to moderate problems in psychological functioning, while the brief intervention clients continued to have mild to moderate depression and psychological functioning problems. Grenyer and his colleagues (1996) concluded that the psychotherapy treatment was significantly more effective than the brief intervention for this population. Furthermore,

psychotherapy clients reported being more satisfied with their treatment than were brief intervention clients.

Importantly, although brief intervention was found to be a cost-effective alternative, it had little impact on mental health (Grenyer et al., 1997). These findings accord with those of McLellan and his research team (McLellan et al., 1982; McLellan, Luborsky, Woody, O'Brien & Druley, 1983; McLellan et al., 1983) who found that depression was a significant prognostic indicator in treatment outcome for opiate-dependent clients. Similarly, Project MATCH concluded that psychiatric severity (and especially depression) should be considered when assigning clients to treatment for alcoholism (Project MATCH Research Group, 1997).

A Critique: Limitations of Previous Cannabis Treatment Research

Although the efficacy of the Grenyer and colleagues (1996, 1997) psychotherapy study has not been unequivocally established, it raises several important issues germane to the client-treatment matching hypothesis and the associated myths of client homogeneity and treatment uniformity discussed in chapter one. Despite the seemingly compelling health economic arguments emerging from brief intervention research in the contemporary "cost containment" environment, Drummond (1997) asserts that the efficacy of brief intervention as a mass intervention approach has been exaggerated by selective reviewing of favourable studies. Consequently, brief intervention research evidence "should be interpreted with caution" (p. 375).

Both Drummond (1997) and Heather (1995) highlight the important distinction between "treatment-seeking" populations and those studied in various research settings. The majority of brief intervention research has been conducted with a different (and less problematic) subject group compared with cases in the target population symptomatic of more severe chronic and complex psychopathology. Many subjects, moreover, do not improve in spite of brief intervention. In a field

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where there is a significant level of spontaneous remission of controls and nontreatment populations and a current lack of long-term follow-up data, questions have to be raised about the generalizability of research findings. Studies have found that outcome differences between controls and intervention conditions are not always maintained during longer follow-up (Bien et al., 1993; Heather, 1995).

Furthermore, reductions in self-reported substance use do not necessarily translate into health or psychosocial gains (Maisto & Connors, 1988; Teeson, 1998). At the very minimum, efficacious interventions need to demonstrate an appreciable effect on the natural history of the target condition. There is clearly a need to take account of the differences between specific, clinically-meaningful client subgroups being compared in different studies, and how they differ in terms of chronicity and severity of cannabis problems in the long term. In short, in terms of the matching hypothesis a more appropriate question to answer is: what type of intervention, incorporating what kind of components, delivered by whom, in what treatment setting, to which excessive cannabis user, is effective?

These criticisms, together with several of the limitations in previous drug treatment outcome research discussed in chapter one, are relevant to the cannabis treatment studies reviewed earlier. Most prominently, the analogue status of these randomized controlled trials imposes constraints on their generalizability along several major parameters. Specifically, these include:

(a) limitations on external/ecological validity. Both the American and Australian university research settings of the interventions, the context of which also includes the specially-trained therapists, treatment modality and process, resources utilized, and other operational aspects of the abstinence-oriented research protocol, such as the (atypical) standardized and lengthy assessment batteries and procedures, are not adequately representative of the infinite diversity of geographic contexts, settings, therapists, philosophies, approaches, programmes, resources, protocols and procedures that characterize existing community-based drug treatment programmes. As Seligman (1995) opines, deciding whether one treatment, under highly controlled (and "artificial") conditions, works better than

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another treatment or a control group "is a different question from deciding what works in the field" (p. 966).

(b) limitations on population validity. These derive from several characteristics of the samples. First, the self-selection bias in the media-recruited volunteer samples suggests elevated levels of motivation to change, widely acknowledged as a (if not the) critical client variable in treatment outcome (Miller, 1985; Rollnick & Miller, 1995), and a major source of bias if left unaddressed. Clients of drug treatment services typically present with varying levels of motivation for change/compliance with treatment. For example, court-mandated or otherwise-coerced and/or ambivalent clients are common presentations for treatment at community-based agencies.

Second, failure to attract other than predominantly White, male, well-adjusted subject groups in their early 30's imposes considerable restrictions on generalizing findings beyond the samples in these studies.
Age, gender, and ethnicity are typical confounds in substance abuse research.

Third, the largely functional psychosocial profiles of the samples studied reflect an employed, socially and financially stable population, without overt evidence of debilitating psychopathology or major life disruptions. While indicators of social stability (SES, employment, social support, criminal involvement) have been consistently associated with outcomes across a variety of treatment programmes (Stark, 1992), elevated levels of psychopathology (particularly depression) have been associated with poorer outcomes (McLellan et al., 1982, 1983; Mirin, Weiss, Griffin & Michael, 1991; Stark, 1992).

In addition, the explicit exclusion of cannabis users with comorbid substance dependencies effectively excluded those who were potentially more severely disturbed polydrug users (i.e. problem severity). Poorer

outcomes have consistently been associated with polydrug use (Anglin & Hser, 1992; Stark, 1992).

However, polydrug use/abuse is the "norm" in the 1990's, and to exclude multiple drug users from cannabis study samples is both unrealistic and counterproductive in the quest to empirically develop/verify the most appropriate and effective treatments for cannabis use problems. Furthermore, stringent exclusion criteria limit the discriminative ability of a study's ability to potentiate a "matching" strategy (Babor, 1988).

In short, the relatively homogeneous samples from the population of chronic heavy cannabis users in these studies is neither representative of substance abusers generally, nor cannabis users in particular. Research has repeatedly shown that like other treatment populations, drug abusers are a heterogeneous population (Anglin & Hser, 1992; Hubbard, 1997; McLellan et al., 1983; Stark, 1992).

(c) lack of long-term data to evaluate durability of treatment gains. As yet, extended follow-up data from the studies reviewed have not been published. As in all drug treatment research, moreover, posttreatment attrition rates were high (approximately one-third) and results suggested that the more favourable outcomes were more representative for a subsample of better-adjusted subjects reporting fewer cannabis-related problems (Stephens et al., 1994)

In sum, the generalizability of the reviewed studies to other clinically-meaningful subgroiups of the target population of cannabis users presenting for assistance with problematic cannabis use across diverse geographic contexts, settings, and at different temporal periods, has not yet been demonstrated.

New Zealand Approaches To Cannabis Treatment

Despite escalating admissions for cannabis use problems to New Zealand alcohol and drug treatment services, no New Zealand empirical literature on treatment outcome has yet been documented. Further, although clinician manuals have been developed and published in Australia for both the psychotherapy and cognitive-behavioural approaches to cannabis dependence discussed in the studies reviewed earlier (Grenyer et al., 1995; Rees et al., 1998), there is a singular lack of New Zealand prescriptive literature on treatments considered appropriate for these problems in the local context.

However, anecdotal information and the scant literature that is available indicates that, as in the United States and Australia, the generic counselling approach to substance abuse problems incorporating interventions and techniques developed primarily in the alcoholism treatment area is the main (if not the only) treatment approach offered in New Zealand. Indeed, the recent national survey of current treatment practices in New Zealand alcohol and drug treatment services (Collier, Sellman, Adamson, Huriwai, Deering, Todd & Robertson, 1998) found that the most common psychotherapeutic model used by clinicians for substance abuse treatment was Rogerian/Supportive Counselling, followed by Cognitive-Behavioural therapy, Motivational Interviewing and Eclectic therapy. Flintoft's earlier (1994) survey of New Zealand alcohol and drug clinicians had found that the preferred methods for treating cannabis-dependent clients were, in order of decreased frequency of endorsement: Education, Assessment, Relapse Prevention, Motivational Interviewing, 12-Step Support Group (MA, NA), Social Skills Training, Peer Support Groups, Psychotherapy, Self-Control Training, and Community Reinforcement. Other perceived "useful" treatment modalities specifically reported in this survey included individual counselling, cognitive-behavioural interventions, systems/family therapy, Tikanga Maori, and detoxification.

In direct contrast to the extensive documented efficacy information of these treatment modalities in the alcoholism treatment area (see Howden-Chapman & Huygens, 1988; Holder et al., 1991; Miller & Hester, 1986a; Miller et al., 1995),

little is known about the suitability or the efficacy of these treatment methods for cannabis clients in New Zealand. Flintoft (1994) found that while treatment providers in New Zealand agencies reported using a variety of "preferred" approaches, no agency kept statistical records of success rates. A few respondents merely estimated their cannabis treatment successes, and many treatment providers responded qualitatively, for example, "not successful", "patchy", "very average", "very successful", and so on (p. 13). Though important and necessary, clinical judgments and impressions about treatment effectiveness have repeatedly been shown to be unreliable (see Cohen & Cohen, 1984; Gordis, 1987). Global judgments are equally fallible in that they derive from the clinician's recent experience of clients who they (wrongly) believe to be representative of all clients (Cohen & Cohen, 1984;Teeson, 1998).

In short, there is a serious lack of empirically-verified knowledge about the suitability and effectiveness of treatment services as they are currently delivered to clients presenting to New Zealand drug treatment agencies with primary cannabis use problems. Researchers (Flintoft, 1994; Rees et al., 1998; Stephens et al., 1994; Swift et al., 1997) emphasize the need to evaluate treatments that vary in format and content for this expanding client population of existing treatment services. The present study is an attempt to begin to address this identified need.`

THE PRESENT STUDY

RESEARCH ORIGINS

New Zealand has a cannabis dependence/abuse problem of some magnitude (MOH, 1996, 1998). People with cannabis use problems are a rapidly expanding client group at New Zealand drug treatment services (e.g., CIRU, 1999). Several at-risk groups have been identified (MOH, 1995,1996, 1998). Despite research trends emerging elsewhere, however, there is no New Zealand literature documenting the evaluation of treatment programmes delivered to people with cannabis use problems. In fact, studies have only recently begun to examine the characteristics of primary cannabis clients presenting for treatment at our local drug treatment services (e.g. Adamson et al., 1998). Hence, little – if anything – is known about (1) their particular (perhaps unique) characteristics and needs, and (2) the appropriateness and effectiveness of services that are delivered to the cannabis clientele within the current treatment paradigm. The limited overseas cannabis treatment research data that have been documented (and reviewed in chapter two) are not representative of either the local treatment context or the typically heterogeneous characteristics of clients presenting to New Zealand treatment services for assistance with their cannabis use problems.

The widespread use of cannabis in New Zealand (Field & Casswell, 1999a, 1999b) has important public health implications for heavy, chronic users of the drug. These arise from both the risk of dependence from such use, and the increased risk of adverse health consequences (Hall et al., 1994). It is therefore important that appropriate professional help is available to help address such problems.

Indeed, from the public health perspective, the provision of appropriate and effective help for those wishing to abstain from, or control, their cannabis use is a central component of the *harm reduction/harm minimization* philosophy integral to

the National Drug Policy (MOH, 1998). Specifically, reduction of the use and consequences of cannabis use in the general population and especially in high risk groups, and the provision of accessible, appropriate, and effective treatment options for people with cannabis problems are national priorities articulated within the strategic framework of the National Drug Policy for New Zealand (1998-2003). Arguably, significant improvement in treatment of even selected segments of the population of chronic heavy cannabis users is of considerable public health significance given the reported number of presentations for assistance among high risk groups (youth, Maori, polydrug users, women of childbearing years, dual diagnosis clients) (e.g. Adamson et al., 1998; CIRU, 1999; MOH, 1996, 1998; Ngata, 1993).

Accordingly, given the widespread cultivation and consumption of cannabis in New Zealand, its relatively unique history and status in our culture, the nature and scale of manifest problems directly associated with its use, and the reported escalation of admissions at drug treatment services for assistance with these problems, the dearth of empirical investigation in this critical area of inquiry seems paradoxical, and redress decidedly overdue. Highlighting this significant information gap, researchers and authorities specifically recommend priority research attention to the evaluation and/or amendment of existing treatment programmes for cannabis clients to ensure effective service delivery for this client group (e.g., Hall, 1995; Hall et al., 1994; MOH, 1996, 1998; Rees et al., 1998; Stephens et al., 1993, 1994; Swift et al., 1997). Thus, in the absence of any previous research the present study represents an important first step in redressing the empirical neglect of the understudied cannabis client group in the New Zealand addictions treatment literature.

The origins of the research to be reported here lie in an explicitly articulated need for cannabis treatment outcome information during the researcher's initial consultation with treatment providers at the Nelson Alcohol and Drug Services to ascertain their research concerns in May, 1996. Treatment staff reported a total lack of feedback information about the appeal, suitability, and effectiveness of the treatment services currently delivered to the cannabis clientele. Concern was expressed about the perceived excessive rates of attrition among this client

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population relative to other drug treatment groups. Little, if anything, was known about either their specific needs, or the outcome of treatment services that had been delivered to cannabis clients who had dropped out of treatment. Thus, it was thought that a study addressing these important issues would provide the much-needed information required for an informed reappraisal of the cannabis treatment programmes to ascertain any changes or modifications that might be necessary. During the course of the 6-month consultation process the desired outcome information was formulated into a coherent set of research questions in three interrelated outcome areas: (1) the number of presentations and characteristics of primary cannabis clients (2) the appropriateness and effectiveness of the cannabis treatment programmes typically delivered to cannabis clients, and client satisfaction with treatment services (3) client factors that predict dropout from treatment. These questions were:

1   What are the personal characteristics of clients presenting with primary cannabis problems?

    1.1   What is the ethnic mix, the gender ratio, the age range of this clientele?

    1.2   What are the correlates of cannabis dependence/abuse problems among this client group?

2   Who has referred cannabis clients for treatment?

3   What client characteristics differentiate treatment completers from dropouts?

    3.1   Do demographic factors differentiate remainers from dropouts?

    3.2   Do levels of cannabis/other drug use affect treatment retention?

    3.3   Does readiness to change predict retention in treatment?

    3.4   Are elevated levels of psychological distress associated with attrition?

    3.5   To what extent is social stability associated with dropout?

4   Are treatment programmes offered cannabis clients appropriate and effective?

4.1 Does treatment work? Are treatment goals met?

4.2 How do the treatment programmes impact on clients' life functioning?

4.3 Are clients satisfied with the programmes?

4.4 With which aspects of treatment are clients dissatisfied?

4.5 Which treatment components do clients find most helpful?

4.6 What suggestions do clients make for possible improvement to the programmes or services?

During the systematic development of the research protocol negotiations resulted in the participation of the Taranaki Alcohol and Drug Services in the study from August, 1997. The research subsequently became a multisite study with its extension to an Auckland arm in the incorporation of the RADS units from Auckland Central and Auckland West in August, 1998.

As the aim of the research was to investigate the outcome of treatment as it is typically delivered to cannabis clients of our community-based outpatient drug treatment services the evaluation design selected for the study was a naturalistic experiment (Rog, 1994) incorporating pre-posttest methodology augmented by a 3-month follow-up survey. The logic underlying this decision follows.

RATIONALE FOR STUDY DESIGN

Research design is concerned with anticipating and eliminating or minimizing important threats to valid inference within the constraints of available resources and time (Campbell & Stanley, 1963; Cook & Campbell, 1979). Many investigators consider that an efficacy study is the "gold standard" for measuring whether a treatment works (e.g., Cook & Campbell, 1979; McLelland & Judd, 1993; Moncrieff & Drummond, 1998). The many problems of randomized controlled designs for outpatient psychosocial interventions for drug addiction have, however, been well documented (see e.g. Ashery & McAuliffe, 1992; Boyle, 1990; Campbell, 1984; Cowen, 1978; Inciardi et al., 1993; Nathan & Lansky, 1978; Teeson, 1998). Indeed, a number of researchers have argued that control group designs created by

either matched group or random sampling in drug abuse treatment research are conceptually irrelevant, methodolgically impossible to assemble, create serious political and legal dilemmas, and are ethically questionnable (e.g. Ball & Ross, 1991; De Leon et al., 1995; Moos & Finney, 1988). Several points directly applicable to the present study are emphasized:

(1) Client differences make assembling matched treatment and control groups untenable. Even careful matching or statistical correction techniques cannot adequately control for unmeasured differences between participants and comparison or control groups (Ball & Ross, 1991; Cowen, 1978; Grossman & Tierney, 1993; Mohr, 1995).

(2) Truly random designs are potentially disruptive and extremely difficult (if not impossible) to implement in a field setting. Accumulating wait-lists and assembling and tracking large comparison groups is often beyond the (neophyte) researcher's expertise and resources, and unrealistic (Barlow, Hayes & Nelson, 1984; Nathan & Lansky, 1978). Furthermore, the size of the target population may be too small to divide randomly (Boyle, 1990; Maisto & Connors, 1988; Rog, 1994).

(3) Given client vulnerability to relapse, withholding treatment from a control group cannot be ethically justified. Systematic exclusion criteria, assignment to a no-treatment or a more versus less treatment condition is de facto withholding service (De Leon et al., 1995; Nathan & Lansky, 1978). Trialling treatment of unestablished efficacy or assigning a client against his or her will or choice to a particular service is also unethical (Ashery & McAuliffe, 1992; Seligman, 1995; Teeson, 1998).

(4) Client samples based on random designs are different from those selected from traditional recruitment strategies, and randomization may actually change a programme creating an artificial treatment initiative of no relevance to applied settings (De Leon et al., 1995).

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(5) Efficacy study methodology demands strict administration of manualized "fixed" treatments and standardized, lengthy instrumentation and procedures, regardless of individual client characteristics and needs (Barlow et al, 1984; Seligman, 1995). In the *"real world"* of drug abuse treatment the self-correcting trajectory of nonrandom clinical treatment decisions in which modalities and techniques are modified with the client's progress highlights the inherent contradiction between clinical and random assignment (Seligman, 1995). Accordingly, conclusions made about treatment in the context of controlled research may not apply to treatment conducted with clinically selected clients.

(6) The random model is not generally appropriate for the evaluation of established, ongoing treatment programmes (Boyle, 1990), and

(7) ultimately, in the real world of community drug treatment programmes there may, in fact, be no alternative treatment regimen to compare.

(8) Furthermore, attempting to create comparison groups by dichotomizing or trichotomizing on various continuous variables results in loss of statistical power (Cohen, 1988, 1992).

It can be argued, therefore, that the practical, conceptual, programmatic, analytical and ethical strains on the application of the traditional control group paradigm to evaluate effectiveness of treatment in field settings are prohibitive. Moreover, while Cronbach (1982) posits that one-treatment designs **are** viable, and reach conclusions that are instructive (p.104), Basham (1986) makes the timely reminder that an experiment does not require a control group in order to be scientific. An outcome study will often have fewer threats to its internal validity by not attempting to use a control group design (p. 92).

In contrast to the rigorous control and methodology of the efficacy study, effectiveness studies often utilize correlational (predictor) methods in quasiexperimental or naturalistic designs to evaluate a drug treatment regimen *as it is actually done in the field setting* (De Leon et al., 1995; Rog, 1994; Seligman, 1995). Such a predictor perspective can use client history or baseline as the no-

treatment comparative condition and make use of a multivariate analytical model to help account for the many other influences on outcome while concurrently examining the important interactions between variables (Babor, 1988; De Leon et al., 1995; Mohr, 1995).

The compelling logic and methodological strength of the community approach is its *ecological realism:* it samples and assesses the effectiveness of psychosocial treatment **as** it is actually delivered **by** the therapists in the field **to** the population that actually seeks it (Cowen, 1978; Seligman, 1995). Compared to the stringently filtered samples (exclusion criteria) of efficacy studies, effectiveness study samples reflect the real-life heterogeneous characteristics of clients who actually seek treatment for their (often) multiple parallel and interacting drug-related problems at community treatment programmes. An effectiveness study mirrors what actually happens in the field and informs about treatment effectiveness under actual situational and progress-contingent treatment duration constraints (Seligman, 1995). Compared to the manualized fixed treatment of efficacy studies, an effectiveness study self-corrects when a technique or modality fails as therapists assign clients to appropriate treatment at the appropriate juncture. Analogue studies or randomized controlled trials have little utility if they cannot be transported to the field (Nathan & Lansky, 1978).

However, Cowen (1978) describes how the community setting provides a "diabolically complex" (p. 803) and often hostile environment in which to conduct research. Various background contextual factors give rise to major problems for the researcher including those of adequate recruitment and treatment implementation, selection of outcome criteria and appropriate measures, multiple potential sources of data bias, typically high rates of attrition, and inadequate or serious misuse of control. All of these problems threaten generalizability to other settings, times and subjects. Although some of these problems can be reduced through judicious planning others, beyond the researcher's control, cannot. In short, community settings are "noisy laboratories" that intrinsically militate against sound programme evaluation (Campbell, 1984; Cowen, 1978; Nathan & Lansky, 1978).

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Facing these daunting challenges with limited expertise, resources and time the fledgling researcher (JB) was unavoidably subject to the special dilemmas associated with community-based research as well as some of the general limitations discussed in chapter one. In particular, the inability to utilize a randomized controlled design opened the study to various threats to internal and external validity (see Campbell & Stanley, 1963; Cook & Campbell, 1979, for a review of potential sources of classic artifact and bias). In addition, time constraints limited the posttreatment follow-up to a 3-month window. It is widely acknowledged in the field that a 2-year follow-up period is the minimum necessary to provide a suitably comprehensive view of the power of treatment to effect lasting change, given the complexity of relapse phenomena and the treatment x environment interaction (Anglin & Hser, 1992; Maisto & Connors, 1988; Nathan & Lansky, 1978). Alternatively, however, as Babor and Del Boca (1992) caution, self-reports are subject to the vagaries of human memory, and when relative precision in drug use recall is required a time window of only a few months is optimal (p.14).

Mohr (1995) asserts "It is extremely important to note that ... the before-after design ... can at times be quite adequate"(p. 73). Systematically addressing these anticipated confounds and biases both during the planning stage and monitoring them as the study progressed ensured that this research was as methodologically sound as was possible in the field setting (Cowen, 1978; McLelland & Judd, 1993; Nathan & Lansky, 1978). By following the recommendations for quality research of various reviewers and commentators (e.g. Breslin et al., 1997; Cowen, 1978; Heather & Tebbutt, 1989; Maisto & Connors, 1988; Moncrieff & Drummond, 1998; Ogbourne, 1984; Simpson, 1993; Steketee & Chambless, 1992; Teeson, 1998), this study had several strengths. In brief, these include:

(a) a representative design on all pertinent dimensions (population and ecological validity) and non-stringent exclusion criteria

(b) an *a priori* design incorporating a prospective and longitudinal, preplanned evaluation for investigating hypotheses about conceptually and theoretically important predictors from the drug treatment literature.

(c) collection of comprehensive client baseline data and the use of multidimensional treatment outcome measures tapping a wide range of relevant client behaviour.

(d) multiple data collection techniques from various perspectives and use of corroborating data sources for validation of client self-report.

(e) where available, the use of sensitive, standardized psychometrically validated measures which were brief, meaningful, easy to administer and at the appropriate level of abstraction for the target group's requirements (critical in this study given the likely cognitive and memory deficits within this clientele).

(f) the use of operationally identical instruments and procedures at both pre- and posttreatment assessment points to maximize comparability of data across different time periods, detection of a treatment effect, and to reduce error variability.

(g) the use of an external evaluator (JB) and several important internal controls to help compensate for the inability to implement a randomized controlled design and the geographic dispersal of the collaborating treatment agencies.

(h) the implementation of a vigorous, sustained effort to maximize the response rate (and minimize attrition/non-response bias) at all data collection phases of the research using the various strategies recommended in the drug treatment literature.

(i) the optimal use of quantitative, continuous data to maximize power for statistical analysis.

(j) the careful selection of predictors and limiting the number of (potentially infinite) hypotheses to be tested, and

(k) appropriate statistical analyses with corrections necessary to minimize the likelihood of Type I error.

In addition, this study incorporates three models of evaluation from the evaluation paradigm: the *efficacy* (outcome) model; elements of the *process* model; and the *consumer evaluation* (client satisfaction) model (Lebow, 1982b). In the present context it is argued that systematically incorporating treatment content/delivery information will demystify and reduce the "black box" client/treatment outcome paradigm that pervades much of the addictions treatment outcome literature (Ball & Ross, 1991; De Leon et al., 1995; Mattson & Donovan, 1994; Miller, 1993; McLellan, Alternman, Metzger, Grissom, Woody, Luborsky & O'Brien, 1994; Steketee & Chambless, 1992). Without treatment delivery information treatment outcome evaluations risk assessing non-events or activities very different from those actually prescribed. This has been termed the "Type III error" in evaluation (Scheirer, 1994). Clearly, by utilizing such a complementary, integrated evaluative approach this study achieves a comprehensive assessment of treatment programmes and, if indicated, maximizes the potential for modification/improvement to services for cannabis clients.

DEFINITION OF KEY CONCEPTS

At this point it is important to clarify the key concepts and variables in this study (Breslin et al., 1997; Chen, 1990; Finney, 1995). These include *treatment* (theoretical underpinnings, process, and constituent components), *effectiveness/efficacy* of treatment, *attrition,* and *client satisfaction*.

Treatment: Theoretical Model and Components

Consistent with treatment practices most commonly reported in a recent national telephone survey of alcohol and drug treatment clinicians in New Zealand (Collier et al, 1998), current approaches to treatment for primary cannabis clients at the four treatment sites in this study were essentially eclectic, incorporating Rogerian/supportive counselling, cognitive-behavioural therapy, motivational interviewing and relapse prevention components. These interventions are driven by well-researched social learning theories of behavioural change with reference to the transtheoretical Stages of Change framework (Prochaska & Di Clemente, 1983, 1984, 1986; Prochaska et al, 1992) for conceptualising behavioural change processes and treatment outcomes (see chapter one for brief specification of the stage model).

According to theories of drug abuse treatment behavioural outcomes are a result of progressive and subtle changes such as those conceptualised by Prochaska et al (1992) involving cognitive initiation and readiness phases that occur prior to overt behavioural actions. This process is gradual and operates through the proximal goals summarized as client change (progress) in emotional wellbeing, cognitive functioning, and social support resources (Simpson et al, 1995). From the perspective of the stage model individuals modifying addictive behaviour move through a series of stages from contemplation to maintenance before successfully dealing with their addiction (Prochaska et al, 1992). In brief, these stages are:

Precontemplation : There is a lack of awareness or denial that a problem exists.

Contemplation : there is acknowledgment that a problem exists but ambivalence as to whether change should be attempted.

Action : Problems are being actively addressed, either themselves or with the help of therapists.

Maintenance : The required changes have been put into effect and efforts to maintain them made.

Relapse : Behaviour patterns which had been overcome resume (Prochaska et al., 1992).

In the first attempts at overcoming addiction relapse is seen as being a likely, but hopefully temporary, outcome which prompts a movement back through the initial stages of Precontemplation or Contemplation (Rollnick, Heather, Gold & Hall, 1992). The movement back through the stages is thought to be quicker with each successive attempt at change, ideally culminating in a permanent exit from the cycle.

Programme delivery is highly individualized as each client has a different addiction history and experiences different treatment needs. Counsellors deliver the various treatment components in an integrated intervention sequence tailored to individual client's stage of readiness and addressing client-specific needs. To help facilitate the change process counselling strategies and techniques are fluid and cyclical as therapy focuses on the varied cognitive-behavioural processes that underlie the modification (or nonmodification) of addictive behaviour patterns through the four central stages of change.

According to Prochaska and his colleagues (1992) each stage represents a period of time as well as a set of tasks (processes) needed for movement to the next stage. Although the time an individual spends in each stage may vary, the tasks to be accomplished are assumed to be invariant. For example, becoming more aware of the consequences of cannabis use (consciousness-raising / education, assessment, feedback), feeling confident and in control of one's life (self-liberation / motivational interviewing, goal setting), developing a helping relationship with someone who cares (therapeutic alliance, social support, self-help and peer groups) and stimulus control (relapse prevention, social skills training, stress management, problem-solving skills training). The various theory-based components of cannabis treatment programmes represent the specific interventions prescribed to facilitate the

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processes of change, and are intended to stimulate the individual's own innate resources to initiate the change process.

Both Finney & Moos (1986) and Scheirer (1994) emphasise the importance of (1) a detailed components specification as the foundation of monitoring and assessing programme delivery and (2) measurable, agreed-upon components, especially in a multisite study such as the present research. Accordingly, constituent components of treatment programmes studied in this research were a result of the researcher's protracted consultation with counsellors at the treatment agencies for agreement on components and specifications. Each component in the cannabis treatment programme is separate and distinguishable from other components and each component has an explicit link to an underlying theoretical rationale (Chen, 1990; Finney, 1995) Definition and specification of these constituent cannabis treatment programme components follows.

Assessment

Assessment refers to the structured and comprehensive, multidimensional pretreatment evaluation of clients with the aim of establishing a diagnosis and developing an individualized treatment plan with optimal goals and strategies (Miller et al, 1995; Miller & Hester, 1986). Important dimensions commonly covered in a broad-based assessment include drug/alcohol use, dependence syndrome, biomedical effects, psychological and social functioning, criminal history, neuropsychological problems, treatment history, family history and other psychological problems (Anglin & Hser, 1992; Hubbard, 1997; McLellan et al, 1983). Importantly, assessment is ongoing over multiple sessions and reevaluation is essential as client progresses in treatment and treatment needs change.

Feedback

Feedback is the use of results from individual assessment interviews and /or laboratory tests (urine or blood samples) to provide clients with a thorough summary of the findings. Feedback involves presenting the information in a neutral or consultative, objective manner, clarifying complex information, and checking repeatedly for understanding and agreement. Giving personal feedback to the client is an important strategic opportunity to encourage client involvement in his or her own recovery (Miller, 1995; Miller & Rollnick, 1991).

Education

Educational approaches to drug abuse problems are based on the assumption that such problems evolve from deficient knowledge, misinformation, or lack of accurate information about the health effects and dependency potential of various psychoactive substances (Miller et al, 1995). Counsellors thus employ educational strategies to provide clients with factual, objective (unbiased) and up-to-date knowledge about the health and psychological effects of cannabis. Once well-informed, cannabis clients will presumably be less likely to use cannabis in a hazardous or harmful way and to suffer pathological sequelae.

Motivational Interviewing

Motivational Interviewing is defined as " a directive client-centred counselling style for eliciting behaviour change by helping clients to explore and resolve ambivalence" (Rollnick & Miller, 1995, p. 326). Motivational interviewing intends to move the client from precontemplation or contemplation to determination and action. The counselling style is generally a quiet and eliciting one; resistance and "denial" are not seen as client traits but as feedback regarding counsellor behaviour. Therapist skills of empathic listening, reflecting, acceptance and affirmation are a

key element in this approach (Miller, 1983; Miller & Rollnick, 1991; Rollnick & Miller, 1995). The goal is to create a salient dissonance between the person's current behaviour and important personal goals. Emphasis is on the client's expression of his/her own concerns about cannabis use, to state that he or she has a problem, and to state that he or she is willing to change. Motivational interviewing relies heavily on the FRAMES Model of brief intervention, which is an acronym for Feedback of personal risk or impairment; Emphasis on personal responsibility; clear Advice to change; Menu of alternative change options; therapist Empathy, and facilitation of Self-efficacy or optimism (Miller & Rollnick, 1991).

Relapse Prevention

Relapse Prevention is defined as a cognitive-behavioural self-management approach that combines behavioural skills training procedures with cognitive techniques to help individuals maintain their desired behavioural change (Annis & Davis, 1989; Marlatt & Gordon, 1985). Integrating principles from social-cognitive theory (Bandura, 1986) health psychology and psychoeducational therapeutic approaches, relapse prevention focuses on enhancing the individual's self-efficacy to anticipate, identify, and cope with specific high-risk situations while generally working towards broader lifestyle balance. From this perspective relapse is viewed as a mistake which presents an opportune learning experience in a transitional process. Specific intervention strategies may include identification of a hierarchy of risk situations, self-monitoring and behavioural assessment, planning and skill training for coping responses, identifying clients' strengths and resources, efficacy-enhancing imagery, relapse rehearsal, relaxation training and stress management, cognitive restructuring and self-control strategies (Dimeff & Marlatt, 1995).

Social Skills Training

Social skills training is based on a social cognitive learning theoretical perspective that the drug-abusing client lacks adequate skills to cope with environmental demands involving social, interpersonal, or marital relationships. Social skills training utilizes skill training interventions designed to ease interactions with important people in the client's environment. Communications skills training is a major element in this component and specific training strategies for cannabis clients include: joint refusal skills, giving criticism and positive feedback, receiving constructive criticism about cannabis use, listening skills, conversation skills, developing non-smoking supports, conflict resolution skills, expressing feelings (such as anger), assertiveness training, role-playing and nonverbal communication (Marlatt & Gordon, 1985; Monti, Abrams, Kadden & Cooney, 1989; Platt & Hermalin, 1989).

Problem Solving Skills

Problem-solving skills training aims to teach clients new and more appropriate strategies for coping with his or her environment without resorting to cannabis use. Training may involve a widely-used four-step cyclical formula for solving problems: (1) defining the problem (2) generating alternatives and considering the consequences (3) deciding on and implementing a solution, and (4) evaluating the outcome. Problem-solving training plays an important role in teaching a client to become independent. Homework assignments provide practice on current problems and counsellors may give feedback and reinforcement as indicated at subsequent sessions (Marlatt & Gordon, 1985).

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Goal Setting

Goal setting involves the process of negotiation by which the counsellor and cannabis clients clarify and agree on mutually acceptable, individualized goals for clients' future cannabis use (Miller, 1995). Depending on the individual's drug use profile and prognosis, change objectives are flexible in the harm reduction perspective and use an incremental approach to abstinence. Individual change goals may range, for example, from total abstinence to moderated consumption, through to controlled use. An underlying assumption is that the motivation for change can be enhanced by encouraging client participation in all decision-making activities pertaining to cannabis consumption.

Referral

Referral to peer group support therapy (such as 12-Step groups e.g. A.A., M.A., or N.A.) or other appropriate service (e.g. psychiatric, medical, or inpatient drug treatment programme, marital or family therapy, anger management, women's groups, sexual abuse counselling) may be indicated as a result of pretreatment assessment or issues arising during treatment. Counsellors may also refer clients to other adjunctive social services such as employment or income support services.

Other

Space was left in the "other" box to allow for other components that counsellors may use from their own personal skills repertoire.

Urine Testing

Urine testing refers to the on-site collection of a urine sample from cannabis study participants for laboratory analysis.

Effectiveness/efficacy of Treatment

Programme '*effectiveness*' or '*efficacy*' refers to the extent to which programmes meet the objectives of their operation (De Leon et al., 1995; James, Duignan, Casswell & Crosbie, 1992; Miller, Westerberg & Waldron, 1995). The universal central objective of any substance abuse treatment programme is positive client change (De Leon et al., 1995).

An evaluation of a programme outcome examines the actual impact (postive *or* negative) of services on those who received them (Longabaugh, 1991; Miller et al., 1995). Teeson (1998) defines 'outcome' as "an *effect* on the health of an individual, or group or population, which is attributable to an intervention or series of interventions" (p. 2). Implicit in this definition is that outcome is a measure of change. For outcome measured on a group or population the overall effect should be improvement (Teeson, 1998). However, Teeson includes a caveat: in substance abuse treatment: it is important to acknowledge that no change can be a legitimate outcome of treatment for some individuals with severe drug use and symptoms.

From the currently ascendant multivariate (biopsychosocial) model the outcome of treatment is a dynamic result of interrelated performance in several life domains (Maisto & Connors, 1988; Sobell et al., 1987). In the evaluation of drug treatment outcome this translates in practice to the systematic empirical assessment of during-treatment positive change in client functioning in multiple theoretically important behavioural domains (Anglin & Hser, 1992; Graham, 1994; Hubbard, 1997; Lennox & Dennis, 1994; Maisto & Connors, 1988; Sobell et al., 1987; Teeson, 1998). Implicit in the notion of *harm reduction/minimization* is the idea that it is not only

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drug use that should be attended to but also the ability of the consumer to function in the community. A good outcome commonly means a reduction in drug and/or alcohol use, disability, risk factors, and the social consequences of drug use (Teeson, 1998).

The objectives and goals of the cannabis treatment programmes in the current study were those generally considered the most important outcomes in the drug abuse treatment literature:

1   cessation or decreased use of cannabis and other drugs

2   improved psychological functioning, general health, and wellbeing

3   social rehabilitation, including improvement in relationships, employment, residential stability, financial status, cessation or reduction in criminal activity.

These treatment goals were operationalized in the pre-post assessment battery of outcome measures tapping the relevant domains. Measures included: demographics, source of referral, cannabis and other drug use, psychological functioning (anxiety and depression, motivation to change, self-efficacy), cannabis-related problems (employment, relationship, cognitive, health) social and economic stability, general health, and treatment variables. The extent of improvement on these measures reflected in clients' pre-post change scores was used as the index of effectiveness of the cannabis treatment programmes. In accordance with the *harm reduction* philosophy clients' personal treatment goals were also included as a valid supplementary measure of treatment effectiveness.

In addition to these behavioural outcomes, the other indicator of treatment effectiveness used in this study was **client satisfaction**.

Client Satisfaction

Given the consistently demonstrated fallibility of clinical impressions and global judgments (Cohen & Cohen, 1984; Gordis, 1987; Miller et al., 1995; Teeson, 1998) it is vital that the client's unique perspective is integrated into any evaluation of treatment services. As argued in chapter one, not including the client's perspective results in an incomplete assessment of programme performance, biased towards the providers' perspective and with the potential for unacceptable, inappropriate, inadequate, and poor quality services. From the *consumer perspective*, in fact, measures of outcome based on objective criteria are invalid, since individual differences and preferences are not taken into account. Thus self-report, and not clinical assessment, is considered the *only* valid way in which to measure outcomes (De Jong, 1997).

Clearly, how the client feels about treatment affects the treatment process itself. As an independent variable client satisfaction contributes to the behaviour of the client, and is a good measure of treatment quality and "success". Empirical evidence (and common sense!) suggests that satisfied clients demonstrate the greatest therapeutic gain (Lebow, 1982a, 1982b). As a pivotal determinant of services utilization client satisfaction is both an independent mediator of treatment effectiveness *and* an ultimate goal of treatment in itself.

In short, the importance of including client perceptions and satisfaction indices in a treatment outcome study cannot be overstated. Minimal client satisfaction has been found to be a necessary (but not sufficient) condition for treatment success and researchers in today's politicoeconomic environment are increasingly compelled to use or devise measures to collect satisfaction data (Deane, 1993; Lebow, 1982a, 1982b). The incorporation of the consumer evaluation (client satisfaction) model (Lebow, 1982b) into the design of the current study was thus an explicit strategy to achieve a comprehensive, multi-perspective (and hence more valid) evaluation of the cannabis treatment programmes.

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Client satisfaction has been defined, operationalized, and assessed in several different ways. Lebow (1982b) differentiated a narrow definition in which client satisfaction "assesses the extent to which treatment fulfills the wants, wishes and desires of clients for treatment" (p. 244). Self-report survey methods have been the most widely used means of gathering such client information, tapping both **global satisfaction** (satisfaction with the service as a whole), and/or **dimensions of satisfaction/specific satisfaction**, which refers to the different components of treatment, therapist characteristics, treatment milieu, and so on. A broader definition includes more indirect, unobtrusive measures of client satisfaction such as measures of client outcome, services utilization, engagement/attrition patterns, treatment compliance, and the nature of treatment termination. The assumption is that participation reflects approval.

The correlation between utilization/outcome variables and self-reported satisfaction is imperfect, however, (Attkisson & Zwick, 1982; Deane, 1993; Lebow, 1983, 1987) and the use of utilization measures has been relegated to an adjunctive status accordingly. Clearly, the combination of both direct and indirect indices yields the most comprehensive approach, and this is the method adopted in the present study.

Attrition

Attrition refers to "the loss of contact with a client and thus the loss of data pertaining to his/her functioning" (Maisto & Connors, 1988, p. 448). The problem of attrition from all drug treatment programmes generally, and from outpatient settings in particular, was previously noted in chapter one. Most investigators have found an attrition rate of over 50 percent within the first month rising to 60 per cent within the first three months. Though there are exceptions, there is now considerable evidence that longer drug treatment duration and treatment completion are associated with better outcomes (Anglin & Hser, 1992; Craig, 1984,1985; Hser, Polinsky, Maglione & Anglin, 1999; McKay, Alterman, McLellan & Snider, 1994; Maisto & Connors, 1988; Simpson, 1979, 1981, 1993; Simpson & Joe, 1995; Steer, 1983; and see Stark, 1992, for review). As many studies have shown, treatments of

less than 90 days duration appear to be of limited benefit regardless of treatment settings, approaches, and modality involved. Beyond this juncture, treatment outcome improves in direct relationship to the length of time spent in treatment (Anglin & Hser, 1992; Simpson, 1979, 1981).

Simpson (1979, 1981) found, moreover, that across all drug treatment modalities, *only* length of treatment was associated with both intermediate and long-term improvement. Those who quit or were expelled fared poorly. Thus treatment completion in outpatient (and other) drug treatment programmes has added to the prediction of outcome beyond the variance accounted for by the length of time in treatment. In short, time in drug abuse treatment is a major predictor of follow-up outcomes. Hence, because of the consistently reported high initial dropout rates very few drug abusing clients receive the potential benefits from treatment and are vulnerable to relapse and its attendant sequelae (Anglin & Hser, 1992; Hubbard, 1997).

Improving retention is the key to improving treatment outcome (Bootsmiller et al., 1998; Craig, 1985; Simpson, 1979, 1981, 1993; Stark, 1992; Steer, 1983). Accordingly, retention in treatment is viewed as a critical proximal goal in its own right. Specific efforts should be directed towards motivating clients to remain in treatment (APA, 1995; Craig, 1985; Steer, 1983; Stark & Campbell, 1988). Clearly, however, preventing client withdrawal prior to the intended cessation of the treatment process presents a "considerable challenge" to treatment providers in the field (Stark, 1992).

Reducing attrition is an important objective for numerous reasons. Not only is length of time retained strongly related to outcome for drug abusers, but dropouts constitute a major threat to the efficacy and cost-efficiency of drug treatment programmes (Simpson, 1993). High dropout rates are likely to affect both staff and cliente morale, prevent earlier admission of others on the waiting-list, and may erode the programme's standing with funding authorities and referral sources (Roffman et al., 1993).

Although several client characteristics appear to be negative prognostic factors (e.g., polydrug use, unemployment, criminal history, greater psychological disturbance), a reliable "dropout" profile has not yet been yielded in the drug abuse research literature (Stark, 1992). Given the paucity of specific research attention to cannabis treatment, little empirical knowledge exists that might suggest a typology of attrition from cannabis treatment (Roffman et al., 1993; Simpson, 1993; Stark & Campbell, 1988).

Criteria for operationally defining treatment *engagement/attrition* have not been uniform in the published literature (see Stark, 1992). Classification of dropouts in different studies has varied according to treatment philosophy, theoretical assumptions, empirical evidence and clinical judgments. In addition, past research has generally included overall treatment tenure as the principal indicator of treatment "dose" (Simpson et al., 1995). A more precise measure represented by session attendance is used in the present study for defining level of therapeutic engagement. This study largely follows the classification strategy applied in a study of attrition from an outpatient drug treatment centre which included cannabis clients, and distinguished immediate dropouts from longer-term remainers (Stark & Campbell, 1988).

In a field setting in the naturalistic environment "dropout" is clearly measured by the actual number of clients "splitting" a treatment programme. Thus, in the context of the present research "dropout" status refers to the failure of clients to complete the treatment programme and graduate in an agreed-upon, planned exit session. Dropouts are those clients who terminated unilaterally, and who would have benefited from continued treatment. Treatment "completers" are defined as those clients who exited the treatment programme in a planned termination session and completed the postreatment assessment battery. An appropriate termination was thus one mutually agreed upon by counsellor and client.

POTENTIAL BENEFITS OF THIS RESEARCH

Many benefits from this research should accrue to all stakeholder groups: the cannabis clientele themselves, treatment providers and programme developers, and to wider society as a whole. It is expected that the study will provide empirically-verified information about the appropriateness and effectiveness of existing treatment programmes and/or the various constituent components delivered to cannabis clients. Such evaluative feedback documents programme accomplishments and shortcomings, providing management with much-needed guidelines for changes or modifications to existing programmes by identifying potential areas of change. Providing the information treatment providers explicitly requested should help inform the reorientation of the programme to concentrate resources on those specific services and components that are associated with better outcomes.

This study should generate insights into key cannabis client variables associated with attrition from treatment, and the pattern of attrition. A better understanding of attrition phenomena is urgently needed to assist the pretreatment screening of clients who fit a 'high risk of attrition' profile and the derivation of timely programmatic or organizational modifications to enhance treatment longevity (Roffman et al., 1993; Stark, 1992).

In addition to measured behavioural outcomes, client satisfaction data feedback may illuminate areas of dissatisfaction where changes or improvement to programmes are needed and/or to which resources or additional treatment services should be channelled. Clients' opinions may be consonant or dissonant with programme objectives, so service providers can consider the appropriateness of their programme philosophy, assumptions, goals and services to ensure that the programme available *is* consistent with the unique needs of individual cannabis clients being served. This function of satisfaction data is particularly relevant in the present groundbreaking study of treatment for cannabis use problems in New Zealand, and satisfies the increasing demand for accountability to the consumer in the contemporary movement towards consumer-oriented mental health services (Deane, 1993).

Active participation in the research process has a direct impact on the clients themselves, manifest in the empowering effect on an historically marginalised group having a "voice" in the development and provision of quality services that are acceptable, appropriate, adequate and effective to meet their individual wants and needs. Incorporating the *consumer evaluation* model into the design has the potential to enable cannabis clients to help initiate change by debunking any potentially fallible paternalistic beliefs and assumptions about what clients "need" and what "works". Rollnick (1997) captures the essence succinctly:

> Is it not one of the saddest reflections of the dangers of
> expert-led treatment that clients are so seldom asked what
> they think of treatment methods? In fact, why are they
> not used in the development of methods themselves? (p.
> 2).

Empirical evidence of treatment effectiveness is the touchstone of treatment credibility and quality of care (Graham, 1994; Miller et al., 1995). From a *public health* perspective, in New Zealand, as elsewhere, the ever-shrinking health dollar will inevitably exert more pressure on drug treatment services to clearly demonstrate clinical and funding accountability for the rational allocation of scarce health resources (Deane, 1993; Longabaugh, 1991; Teeson, 1998). In an increasingly competitive market treatment providers want to know how effective their programme is in relation to other providers.

Finally, disseminated summaries of the research findings may help bridge the persisting gulf between the findings of scientific literature and everyday practice (Heather & Tebbutt, 1989; Miller et al., 1995). Given the call for "improved communication" between researchers and drug treatment providers (Heather & Tebbutt, 1989; Mattson & Donovan, 1994; Woody, McLellan, Alterman & O'Brien, 1991) this study will clearly be a timely, valuable contribution to the drug treatment field in general, and to a growing body of knowledge in a recently-established programme of inquiry in the cannabis treatment area, in particular.

OBJECTIVES AND HYPOTHESES

This study had three main objectives. The first was to provide data on the personal characteristics of primary cannabis clients of New Zealand outpatient drug treatment services, and to examine the correlates of problematic cannabis use among this clientele.

The second objective concerned the scientific evaluation of treatment effectiveness for this group, and the identification of client variables that predict engagement in/attrition from treatment. It is in association with this objective that the research hypotheses are presented.

The third objective was to provide client satisfaction feedback on specific questions developed about treatment services delivered to cannabis clients. These questions had largely provided the impetus for the study. However, the relatively short history of client satisfaction research in general and among outpatient samples in particular (Deane, 1993), the limited literature data base (Lebow, 1982b, 1983), and the absence of guidelines on how to analyse data, preclude the adequate formulation of hypotheses at this point in this area of inquiry. Accordingly, the methods chosen aimed at answering the questions that helped spawn the present research.

Objective 1   To examine the personal characteristics of primary cannabis clients and the correlates of cannabis use among this group.

Objective 2   Scientific evaluation of treatment effectiveness and identification of client characteristics that may account for retention or dropout from treatment

In searching for the correlates of dropout, nine specific hypotheses were generated. These were as follows:

1   Pretreatment psychosocial functioning will be negatively related to client dropout.

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2   Pretreatment cannabis consumption will be positively related to client dropout.

3   Clients with higher levels of cannabis consumption and cannabis-related problems, and lower levels of social and economic stability at treatment entry will have higher rates of dropout .

4   Pretreatment depression will be positively related to client dropout.

5   Pretreatment anxiety will be positively related to client dropout.

6   Pretreatment readiness for change/motivation will be negatively related to client dropout.

7   Pretreatment cannabis-related problems will be positively related to client dropout.

8   Pretreatment cannabis-related cognitive problems will be positively related to client dropout.

9   Pretreatment self-efficacy will be negatively related to client dropout.

Objective 3   To provide client satisfaction data feedback about treatment services provided and clients' suggestions for improvements to treatment programmes.

The specific questions that had provided the original impetus for the study were:

Are treatment programmes offered cannabis clients acceptable, appropriate, and effective ? (i.e.):

1   Are clients satisfied with the programmes?
    (Did clients *like* the programmes?)

2   With which aspects of treatment were clients dissatisfied?

(What did clients *dis*like about the programmes?)

3   Were any pretreatment client characteristics associated with satisfaction?

   i   demographics

   ii   level of cannabis use

   iii overall psychosocial adjustment

4   What components of the programmes determine global satisfaction?

5   Which treatment components did clients rate most helpful?

METHODOLOGY

STUDY DESIGN

The overall approach of the research to be reported here is correlational. The evaluation design subsumes the optimal combination of a *within – subjects* strategy supplemented by a secondary *between-subjects* analysis (Barlow et al., 1984; Cook & Campbell, 1979). Implementing both analyses maximized the information yielded by this study and combined their various strengths and advantages.

In the context of a naturalistic experiment (Rog, 1994) the *within – subjects* comparison used a one-group pretest-posttest method (Cook & Campbell, 1979) to determine the extent of measurable changes/aggregate improvement that occurred in the psychosocial functioning of treated cannabis clients whose multivariate baseline data served as the no-treatment comparative condition (De Leon et al, 1995; Mohr, 1995). In the evaluation research paradigm this strategy is also referred to as the 'reflexive control design' (Rossi & Freeman, 1989). Such designs utilize naturally occurring bases of comparison and commonly use statistical adjustment procedures to approximate the control brought about by random assignment (Cook & Campbell, 1979; Rog, 1994).

Volunteer participants in this study were first assessed at treatment admission on a range of theoretically important outcome variables (cannabis and other drug use and related psychosocial functioning). Urinalysis was incorporated to provide biochemical verification of self-reported cannabis use. Treatment then proceeded in the individual counsellor-client modalilty that typifies services delivery to cannabis clients at the participating drug treatment services. A record of treatment sessions attended, specific components delivered, and general client progress was documented for each client. The baseline assessment battery was readministered at the exit treatment sessions of treatment remainers followed by a brief measure of

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client satisfaction. Pre-post change scores on all the outcome measures were calculated and served as the primary indicator of the effectiveness of the cannabis treatment programmes. The client satisfaction measure provided a secondary indicator of treatment effectiveness/helpfulness. A follow-up postal survey three months after individual exit sessions (remainers and dropouts) attempted to assess the generalization of treatment effects over time for treatment completers, posttreatment functioning of dropouts, and to provide further, more specific, satisfaction data.

A secondary *between –subjects* analytic strategy investigated the occurrence of any client–treatment interactions. Specifically, analyses were conducted to ascertain: (1) the relationship between treatment implementation variables (number of sessions, components, treatment duration) and client outcomes, and (2) the relationship between treatment components received and client satisfaction with treatment. A post hoc analysis was conducted to determine which (if any) client characteristics (moderators) were predictors of the high dropout in this study.

RESEARCH SETTINGS

This multisite study was conducted at four geographically diverse alcohol and drug treatment agencies in New Zealand. These community-based outpatient services are located in Nelson in the South Island, in Taranaki, and in both the central and western units of Auckland Regional Alcohol and Drug Services (RADS) in the North Island.

As well as geographic diversity, the regions served by the respective drug treatment services reflect cultural and socioeconomic heterogeneity. The more densely populated northern areas have disproportionate representations of Maori, Pacific Island and other ethnic populations, with corresponding (elevated) rates of unemployment and poverty. As noted in chapter two, the adjacent Northland region is recognized as a major producer of cannabis on a national basis and rates of offences for cannabis cultivation and use are higher than in the rest of New Zealand (National Drugs Intelligence Bureau, 1997). A significant proportion of this

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cannabis production is destined for consumption in the Auckland metropolitan area (Walker et al., 1998). However, the temperate latitudes and remote west coastal (largely conservation) terrain of both the Taranaki and Nelson/Golden Bay regions has also rendered these areas popular sites for cannabis cultivation, consumption and associated offences.

Consistent with these phenomena, the four drug treatment services participating in this study report a steady increase in presentations for assistance with cannabis use problems in recent years. Lack of comparative drug-specific databases precludes precise estimates being made, but all the agencies reported that presentations for primary cannabis problems comprised an ever-increasing proportion of total presentations. RADS, for example, reported that in the relevant period a quarter of total client presentations at RADS units reported an average consumption of at least once per day, the threshhold level at which cannabis use problems are defined. Furthermore, this trend was even more prevalent among younger treatment-seeking clients: two-thirds of clients aged under 20, and nearly half of those under 30 (CIRU, 1999). Anecdotal and subjective reports from both the Taranaki and Nelson agencies expressed a similar concern with ever-younger presentations for cannabis problems among treatment seekers.

Given the gravity of these observed trends highlighting the need for treatment research efforts focused on cannabis, the incorporation of the four treatment sites into this study was an explicit design strategy with a twofold aim: (1) to capitalize on the recruitment potential to assemble an adequate and representative sample from among the target population, and (2) to maximize the ecological/external validity (settings, therapists, programmes) and population validity (client heterogeneity) of study findings.

Despite geographic diversity, the participating drug treatment agencies are similar along several important parameters. All units are centrally located and accessible Crown Health Enterprise outpatient facilities that provide a comprehensive range of services and programmes free of charge to all drug-involved individuals and family members. Services include assessment and drug counselling, referral to other appropriate services (e.g. to residential programmes or other support groups such as

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AA, NA or MA), a range of specialized support groups (e.g. the Nelson acupuncture detoxification group), education services to schools, workplaces or community groups, and education and support for young people. Programmes include Methadone Maintenance and Detoxification (inpatient or supervised Home Detoxification). Referrals come from a wide variety of sources such as general practitioners, hospitals, psychiatrists, psychologists and other mental health workers, social workers, schools, lawyers and government departments. Some clients are court-mandated. A large number of clients, however, refer themselves.

In addition to services and programmes, the drug treatment services share similar mission statements, philosophies and objectives. Espousing the *harm minimization* perspective currently ascendant in national policy for the drug treatment field, the treatment agencies are committed to health promotion and reducing the harm to individuals, families and the community associated with substance use. This recovery-oriented perspective recognizes the heterogeneity of the nature and severity of substance use disorders, and takes a flexible, incremental approach to abstinence.

All participating agencies employ a multidisciplinary team of health professionals including medical officers, psychologists, social workers, counsellors, and administration staff who come from a variety of personal backgrounds and experiences. Staff are ethnically representative and range in age from the early 20's to the late 50's. Some of these staff are in long-term stable recovery from their own substance use problems.

All counsellors have professional training and qualifications in alcohol and drug problems. Although most work from a predominantly cognitive-behavioural theoretical orientation, counsellor approaches are essentially flexible, eclectic and pragmatic, in accordance with the Stages of Change framework, and tailored to individual drug use profiles and client needs.

Importantly, all agencies participating in this study conduct an intake screening interview procedure from which clients are matched with an appropriate counsellor.

Where possible, clients are accorded their personal choice of counsellor with regard to ethnicity, gender, age, and other characteristics.

PARTICIPANTS

Sixty-three (n = 63) participants were recruited from the pool of clients presenting for assistance with a primary cannabis use problem at the Nelson, Taranaki, Auckland Central and Auckland West drug treatment services. Forty-eight of these participants were recruited at the Nelson agency, while 8 were recruited at the Taranaki, and 7 at the Auckland sites, respectively. Recruitment extended over a 20-month period commencing in September, 1997 at the Nelson and Taranaki agencies, and over a 9-month period from September 1998 at the Auckland sites.

Every effort was made to keep recruitment procedures as standardized as possible. All consecutive cannabis clients meeting eligibility criteria at the intake screening interview were asked to participate in the study. The use of non-stringent inclusion/exclusion criteria was aimed at maximizing sample heterogeneity to reflect the typically diverse characteristics of clients of community drug services, thus enhancing population validity. The only explicit criterion for inclusion in the study was that participants acknowledged, and actively sought assistance for, their cannabis use problem at the point of admission to treatment. Clients perceived to have a significant cannabis component in their drug use repertoire but who neither acknowledged nor sought assistance for this using problem at treatment admission were not included.

Clients were also excluded from participation if they evidenced psychiatric or neuropsychological impairment that indicated a need for more immediate and stabilizing therapy. These impairments render clients unable to make valid responses to research questionnaires and compromise the counselling process.

Although precise statistics are not uniformly available as a result of inconsistent compilation of drug-specific databases, information on eligibility and aborted participation was collected. Of the 136 cannabis presentations to the Nelson agency

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during the research period, approximately 30 were not invited to participate as they were in crisis and needed immediate, intensive therapy. A further 58 invitees declined. These were mainly New Zealand European males in the 25-35 age group who were using daily. Reasons given for their refusal to participate included paranoia about research participation in view of the legality issue, their involuntary referral source (justice system), and that they simply "could not be bothered". All who were asked to participate at both Auckland sites agreed to participate. However, after giving a pretreatment urine sample 3 immediately aborted from participation in the study. Two of these were New Zealand European males in their mid-thirties and both were using daily. The third aborted starter was a New Zealand European female aged 30, also a daily user. Information on total cannabis presentations at the Taranaki site was not available. However, of those eligible and invited, 12 declined to participate for reasons similar to those given for the Nelson sample. One New Zealand European male aged 38 years who was using daily aborted participation after providing the mandatory pretreatment urine sample.

MEASURES

The variables investigated in the present analyses of treatment outcome and predictors of dropout status were: *demographics, voluntariness/source of referral, cannabis and other drug use, readiness to change/motivation, self-efficacy, psychological distress (anxiety and depression), problems created by cannabis, social and economic stability, general health, treatment variables, and satisfaction with treatment (global and specific satisfaction, and therapeutic alliance).*

Where available, data on these variables were collected using published instruments with empirically-verified psychometric properties. Three additional instruments were developed *de novo* to meet the specific data collection requirements of this study. These were the pretreatment baseline and exit session counsellor-administered questionnaires (see Appendices II and III) and the 3-month Cannabis Treatment Programme Follow-Up and Client Satisfaction Survey (see Appendix IV).

The decision to develop these measures of important constructs in this study resulted from the researcher's failure to find published measures of appropriate content, specificity, length, and costs in terms of time and resources. As both Longabaugh (1991) and Teeson (1998) observe, there is no universally- accepted, standardized instrument for measuring client outcomes. More narrowly, there is no existing cannabis-specific measure (Swift et al, 1997). The measure currently considered the "gold standard" for measuring drug treatment outcomes, the Addiction Severity Index (ASI, McLellan, Luborsky, Woody & O'Brien, 1980) involves mandatory fully-trained interviewer administration and interviewer ratings (hence raises interrater reliability issues), omits several construct areas relevant to functioning, and requires too much investment in terms of time and costs to be used as a research instrument for monitoring outcomes (Longabaugh, 1991). The operational aspects of outcome measures such as ease of administration cost, interviewer training time and staff resources, and restrictions on applicability are critical practical considerations whenever outcome research is planned for a (multisite) field study (Cowen, 1978). Accordingly, in this study these measures were designed to be brief, minimally-intrusive, easy to implement in the context of routine assessment practices at the treatment sites, and to require minimal interviewer training. Most of the information collected, moreover, was that typically documented in intake assessment procedures and widely-used in addictions treatment outcome research (e.g. Anglin & Hser, 1992; Hser et al., 1999; McLellan et al, 1992; Stephens et al, 1994).

Considerable attention was given to the construction of these questionnaires to ensure that these measures satisfied the criteria for good questionnaire construction suggested by various researchers (e.g. Anderson, 1990; Babbie, 1992; Oppenheim, 1992). Accordingly, the measures are in a short, multiscale format and contain a balance of Likert-type rated responses, categorical choices (yes-no), continuous values, open-ended questions and spaces for free comments or suggestions. Each construct has a conceptual and theoretical underpinning and is of clear relevance to the present analyses. All questions are without bias and phrased in the appropriate language abstraction for the target clientele. With regard to the 3-month follow-up survey in particular, care was taken to construct items in nonjudgmental phraseology

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and to survey areas of outcome typically considered in many recent drug treatment outcome studies that might credibly be voluntarily reported by clients themselves.

A description of the full range of measures follows.

Demograhics

Demographic variables used were age, gender (1= male; 2= female), and ethnicity (1= European, 2= Maori, 3= Pacific Island; 4= other).

Source of Referral/Voluntariness

Referral categories were used as indicators of participants' voluntary participation in treatment, and included : 1=self, 2=partner/family, 3=friends, 4= general practitioner, 5=school, 6= Probation, 7= lawyer, 8= court-mandated, and 9=other.

Cannabis Use

Age of first use, age of first daily use/near daily use, and total years of use were assessed to describe the **chronicity** of cannabis use. A **frequency** index (DAYS90) of cannabis consumption in the 90 days prior to treatment was calculated by multiplying the average number of days per week on which cannabis was smoked by 13 (weeks). A **quantity-frequency (Q-F)** measure of cannabis consumption during this period (USES90) was then calculated by multiplying DAYS90 by the number of episodes of use on a typical day.

Similar measures of cannabis consumption were calculated at treatment termination and at the three-month posttreatment follow-up to provide comparable indices of frequency and quantity/frequency of use across assessments. Both indices served as primary dependent variables in the analyses.

Biochemical Measures/Urinalysis

Valid assessments of drug consumption are critical for interpreting treatment outcome data. As discussed in chapter one, reliability and validity of clients' self-reports in drug abuse treatment is a longstanding issue (Brown et al., 1992; Grant et al., 1997; Maisto & Connors, 1988). Given the illegal status of cannabis, users face strong disincentives to divulge drug use information. Studies suggest, however, that drug abusers' self-reports of substance use and related consequences are reliable and valid when respondents provide the information in a clinical research context with assurance of confidentiality, when they are not intoxicated, and when aware that their reports will be checked against other sources (see Babor & Del Boca, 1992; Maisto & Connors, 1988).

Results from a study specifically designed to assess the validity of self-reported cannabis use yielded evidence that strongly supported the validity of self-reported cannabis use among polydrug users (Martin, Wilkinson & Kapur, 1988). In fact, in this research context it appeared that either over-reporting was occurring, or the self-report measure was more sensitive than the urine screening method. Although the limitations to generalisability of these findings to field studies is acknowledged, self-reports of drug use must be verified by triangulating techniques and urinalysis offers an objective biochemical test for providing convergent validity information.

In this study urine samples were collected on-site at the baseline assessment and pre-exit treatment sessions, and participants were screened with an enzyme multiplied immunoassay technique analysis to verify the presence or absence of cannabinoid metabolites and the cannabiniods/creatinine ratio. The Nelson and Taranaki specimens were assayed at the Canterbury Health Laboratories, and Auckland samples at Auckland Healthcare Laboratory Services

The Syva Emit ll 5B3 THC Assay provides only a preliminary semiquantitative analytical test result, however, and for more rigorous analyses confirmatory techniques such as gas chromatography/ mass spectrometry are used. Regrettably,

these sophisticated tests are expensive, and beyond the financial resources of the present study.

Alcohol and Other Drug Use

Lifetime and concurrent dependency problems, and previous treatment experiences for the use of any drug other than cannabis were assessed to provide indicators of participants' drug use history and current polydrug dependency profile.

At all assessment points the average number of days per week participants reported using alcohol and other drugs in the last 90 days (13 weeks) provided indices of average weekly use of alcohol, tobacco, heroin/opiates, cocaine, amphetamines, hallucinogens, inhalants and solvents, benzodiazepines, painkillers and other specified drugs. These measures were taken to determine whether treatment or changes in cannabis use were associated with changes in other substance use.

Problems Created by Cannabis

Cannabis-related problems at the pre- and posttreatment assessments were measured by asking participants to rate on a 5-point scale ranging from 1 ("never") to 5 ("always") the extent to which cannabis created problems in their personal relationship, employment, general health, and cognitive functioning. The score was compiled by totalling the four items yielding a maximum score of 20, with higher scores indicative of a greater number of reported problems. A composite index PROBX was then created from the mean of the maximum score, with a range of 1-5.

Social and Economic Stability

Social and economic stability was assessed using indicators of social and economic status, personal relationships, employment, residential information, and legal/criminal involvement.

Participants first reported their current occupation and their partner's occupation, both of which were coded in numerical categories derived from the Elley-Irving Socio-Economic Index 1981 Census Revision (Elley & Irving, 1985). Occupational level categories ranged from 1 (higher professional occupation groups) to 6 (unskilled/manual labour). Four additional categories were adapted from the Ministry of Education (1990) derivation of Elley-Irving codes to meet the needs of this study. These included: 7 (student), 8 (homemaker/caregiver), 9 (unemployed), and 10 ("don't know"). Participants then reported on 8 other factors: their main and secondary source of income; ability to pay their bills; type of residence (own home, rented home or apartment or parents' home, or other); the number of homes lived in during the last two years and time in present home (or whether shifted home since treatment began); whether or not they were married or in a relationship; the duration of that relationship; and if their partner used cannabis regularly, as further measures of social and economic status.

Employment measures included the number of jobs held in the last 12 months (or since treatment began), and the longest time any of these jobs lasted. Finally, participants reported information concerning their legal/criminal involvement including lifetime imprisonment or conviction for any offence (yes-no), convictions in the last 12 months (or since treatment began) (yes-no), and whether or not they were currently awaiting a court hearing or trial (yes-no).

All items were scored and summed to create a 17-item summary scale, SESTAB. To prevent any one variable from dominating all the others in the composite, variables were rescaled to have a range of 1 to 5. Hence the mean of the maximum scores was 5. Scores at the higher end of the range reflected social and economic stability, while lower scores were indicative of relative instability or "life chaos".

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General Health

Participants reported the number of times they had sought treatment for any medical or psychological problems in the last 12 months (or since treatment began) on a 5-point scale ranging from 1 (=not at all) to 5 (= ten times or more). Scores on this item provided a single index of general health.

Self-Efficacy

Self-efficacy for achieving personal goals for future cannabis use was assessed at all assessment points. Participants first reported their personal goal for cannabis use on a 5-point scale ranging from " abstinence"(5) " to reduce consumption " (4) "to control consumption "(3) "to continue as before "(2) to "don't know"(1). Participants then rated the degree to which they felt confident in their ability to achieve this personal goal on a 1("no confidence at all") to 5 ("very confident") scale to provide a single index of self-efficacy.

Readiness to Change (Motivation)

Motivation is the key to behavioural change, and before motivational skills can be usefully employed it is important for therapists to have an idea of the level of motivation, or stage of readiness, of particular clients. In this study motivation to change was measured using an adapted form of the Readiness to Change Questionnaire (RCQ, Rollnick et al., 1992; see Appendix V).

The RCQ is a short, 12-item self-completed questionnaire originally designed for use in brief, opportunistic interventions in busy medical settings among problem drinkers as an easy and efficient measure of their stage of readiness to change their

drinking behaviour. The RCQ comprises three subscales (four items per scale) each of which corresponds to one of the stages of change (Precontemplation, Contemplation, Action) as conceptualised by Prochaska & Di Clemente, 1983, 1984, 1986). Subjects respond according to a Likert-type five-point rating scale scored as follows: strongly disagree (-2) disagree (-1) unsure (0) agree (+1) strongly agree (+2). The range of each subscale was therefore –8 to +8 and measured the extent to which the subject endorsed that stage of change. To calculate the score for each scale item scores were simply added and the highest scale score represented the subject's stage of change destination (P C or A). If one of the four items on a subscale was missing the respondent's score for that subscale was pro-rated. If two or more items from a particular subscale were missing then that subscale was regarded as missing and the score not calculated.

A study of the reliability and validity of the RCQ was undertaken by its authors (Rollnick et al, 1992) on a subject subsample derived mainly from hospital wards and general medical practices in Cardiff and Sydney. This showed the instrument to have good psychometric properties, with satisfactory internal consistency, test-retest reliability and concurrent validity. Rollnick et al reported the Cronbach alpha coefficient representing the four-item scales was: precontemplation 0.73; contemplation 0.80; and action 0.85, while the test-retest correlations were: precontemplation 0.82; contemplation 0.86; and action 0.78.

Two diverse analyses of validity were conducted and the strength of the associations reported constituted good evidence of concurrent validity of the CSQ. In addition, more recent research has yielded strong evidence for the predictive validity of the RCQ (Heather, Rollnick & Bell, 1993). The allocated stage of change in a sample of 174 excessive drinkers provided statistically significant relationships at the .005 level with drinking outcomes. Moreover, multiple regression analysis showed that stage of change was a strong predictor of changes in drinking at a six-month follow-up even when other predictors were taken into account which, as the authors observed, " increases confidence that the predictive validity of the questionnaire is not a transitory phenomenon" (p1676).

Since this initial study was done research (Prochaska et al., 1992) has supported the importance of assessing a fifth stage of change, Preparation, which does not have its own specific items. Rather, clients are assigned to the Preparation stage if their score for the Contemplation items is higher than their scores for the other two subscales, and they must also score positively for the Action subscale. In their psychometric analysis of the RCQ its authors used the "Simple Method" of stage allocation. Subsequently, Rollnick et al (1992) have advocated the use of a "Refined Method" of stage allocation when time permits, and this is the method used in the present research.

Although the samples in these studies consisted almost entirely of male excessive drinkers not actively seeking help for their drinking problems, the authors intended from the outset that the RCQ's usefulness would extend beyond the study for which it was designed (Rollnick et al, 1992). Indeed, because of its brevity, ease of administration and scoring, its specific diagnostic role in stage of change allocation and treatment assignment, and its prominent links with innovative developments in addictions treatment and research, the RCQ's potential for use within addictions treatment agencies both overseas and New Zealand was quickly recognized (Coynash, 1997). However, after repeated complaints concerning the intelligibilty (hence reliability) of certain items for clients of New Zealand drug treatment services, the RCQ was adapted for use in the New Zealand context and tested for reliability and psychometric validity (Coynash, 1997). Dissatisfaction with the instrument centred primarily around items with the potential to generate double negatives and hence confuse respondents it was suggested that this grammatical situation was particularly troublesome for Maori and Pacific Island clients whose own languages were devoid of double negatives.

Subjects for the study were clients actively seeking help for their alcohol problems at New Zealand treatment services and included Maori and Pacific Island clients. The final version of the RCQ comprised items 1,4,9,10 and 12 in their modified form, and the remaining items in their original form. Results showed impressive improvements in reliability and concurrent validity of the revised RCQ over its original counterpart (Coynash, 1997). While statistically significant improvements were reported for the Precontemplation subscale as a whole as well as modified

items from that subscale, an overall mean improvement for item-to-subscale correlation of 0.05 was achieved. Three-factor analysis with Varimax rotation also revealed a much improved factor structure providing evidence of good construct validity for the revised RCQ (Coynash, 1997). Accordingly, the researcher recommended that the revised RCQ be used in the context of New Zealand drug treatment services (Coynash, 1997) and is the version used in the present study.

The RCQ was a particularly appropriate measure of motivation/readiness to change in this study for the reasons outlined above. Given the cognitive deficits likely to be found among the cannabis clientele, a brief and simply worded measure was essential. By necessity the wording of the RCQ was adapted for use with cannabis clients by substituting the word "cannabis" for "alcohol" in each item. The title of the instrument was also modified to reflect this departure from the original RCQ for the specific purposes of this study, and entitled the "Cannabis RTC Questionnaire". This strategy had a dual purpose in that it also represented an important internal control implemented to keep clients as "blind" to the nature of the questionnaire as was possible in order to minimize potential threats to validity of their responses, such as demand characteristics, testing effect, and various response biases.

Reliability analyses were conducted on this study's data to examine the effect of these changes on the instrument's psychometric properties. The Cronbach alpha for the various stages was: Action .80; Contemplation .76; Precontemplation .67. As a result it was considered acceptable to retain the format of the questionnaire originally designed for alcohol populations.

Observing correct protocol, the researcher wrote to the RCQ's main author to obtain his written permission to use the adapted format in this study (see Appendix VI for the favourable response). Given that motivation/readiness to change is a key predictor in this study, the RCQ's manifest face validity, its reported reliability (test-retest and internal consistency), construct and criterion-related (concurrent and predictive) validity (Coynash, 1997; Heather et al, 1993; Rollnick et al, 1992) rendered this measure a desirable candidate for use in this study.

Psychological Distress (Anxiety and Depression)

In this study anxiety and depression were measured using the Hospital Anxiety and Depression (HAD) Scale (Zigmond & Snaith, 1983; see Appendix VII). As a concept "depression" carries no precise meaning, and debate continues about its clinical application. The range of symptoms varies widely with severity of depression and overlap with anxiety is considerable (Barlow, 1988; Snaith & Taylor, 1985). There are numerous depression and anxiety rating scales, and researchers receive little guidance in the selection of an appropriate instrument for a particular study. The majority of existing measures are clinician-administered, complex and lengthy. A study comparing depression scales, moreover, found that some assessment scales with five or eight items performed better than others with twelve or more items (Kearns, Cruickshank, McGuigan, Riley, Shaw & Snaith, 1982). Given the widespread prevalence of affective disorders among presentations for treatment across a wide variety of clinical settings, Zigmond & Snaith (1983) saw the need for a brief, standardized, self-assessment screening test for clinically-significant anxiety and depression among new referrals in outpatient services.

In the development of the HAD Scale Zigmond & Snaith (1983) specifically aimed to maximize the distinction between the concepts of anxiety and depression and selected items based solely on the psychic symptoms of depression and anxiety neurosis that had been well-validated in published instruments and research. Symptoms relating to severe mental disorder (such as suicidal preoccupation or phobic limitations) were excluded (Zigmond & Snaith, 1983).

The HAD Scale is a 14-item self-assessment measure incorporating a 7-item depression subscale and a 7-item anxiety subscale. The even numbers refer to depression and the odd numbers to anxiety. Respondents rate each item on a four-point scale ranging from "most of the time" to "sometimes" to "not often" to "not at all" (see Appendix VI for the full range of responses). Corresponding scores range from zero to three points on each item and were designed to indicate the severity of disorder on each subscale. Thus a score 0-7 indicates probable absence of depression and anxiety, a score of 8-10 indicates possible or "borderline" depression

or anxiety, while a score of 11-21 indicates probably clinically significant depression or anxiety.

To minimize the potential for response bias in the HAD Scale the authors alternated the order of responses indicating maximum severity, adopted a four-point scale to prevent the respondent opting for the middle grade to all items, and removed the scoring device originally positioned in the margin of the instrument (Zigmond & Snaith, 1983). A scoring guide is provided to facilitate rapid and accurate scoring.

The HAD Scale was tested on a sample of 100 adult patients aged 16-65 years in general medical outpatient clinics (Zigmond & Snaith, 1983). The authors found the scale very acceptable to these respondents who had no difficulty understanding and completing it. Zigmond & Snaith also reported the results of various statistical analyses demonstrating several important psychometric qualities of the HAD Scale.

Firstly, Spearman correlations calculated to examine the internal consistency of the two subscales ranged from 0.76 to 0.41 at the .01 significance level for the anxiety subscale, with correlations of -.60 to -.30 for the depression subscale, all significant beyond the .02 level. A split-half test of reliability of subscale scores used to allocate subjects into categories found the HAD Scale had minimal levels (average 1%) of false negatives and false positives. To determine whether scores on the two subscales could justifiably be used as indications of the severity of depression and anxiety Spearman correlations of the subscale scores and independent psychiatric interview ratings were calculated. The results were: for depression, $r = 0.70$, and for anxiety, $r = 0.74$, both significant at the .001 level (Zigmond & Snaith, 1983).

Finally, the ratings of a subsample were correlated with psychiatric interview ratings to determine whether the subscales did reliably distinguish between depression and anxiety. The repeated finding that self-report measures of anxiety and depression correlate highly has cast doubt on the discriminant validity of these measures as assessment devices of distinct affective domains (Barlow, 1988; Cone & Foster, 1996). The results provided some support for the ability of the subscales to discriminate between different aspects of mood disorder, yielding $r = .79$ at the .01

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level of significance for the depression subscale, and $r = .54$ at the .05 significance level for the anxiety subscale.

Zigmond & Snaith concluded that the HAD Scale is a widely used, reliable and valid measure for screening for (construct validity), and differentiating between clinically significant anxiety and depression (discriminant validity) in clients of outpatient clinics. The HAD Scale has also shown to be a valid measure of the severity of both mood disorders, and sensitive to change at subsequent time intervals (Zigmond & Snaith, 1983). These psychometric characteristics render the HAD Scale appropriate and useful in the present treatment outcome research context.

The limitations to generalisability of both the sample and setting in the study discussed above must be acknowledged. The authors foresaw no reason as to why the use of the HAD Scale would be invalid in other populations attending other outpatient clinics. In fact, a subsequent study comparing the concurrent validity of various scales as measures of the separate concepts of anxiety and depression (Snaith & Taylor, 1985) examined these phenomena in a psychiatric outpatient of new referrals suffering from anxiety and depression neurosis. Pearson product-moment inter-correlation values of the HAD Scale with other measures widely-used among this population were .81 for depression and .69 for anxiety, providing further support for the HAD Scale's concurrent and discriminant validity and its generalisability to other populations, times and settings.

With these important psychometric properties and as a brief, comprehensible and easy to score measure readily available at no cost to the researcher, the HAD Scale offered an appropriate measure of anxiety and depression in cannabis clients presenting for treatment. Given the prominent predictive role of depression and anxiety in this study, it was also important that the HAD Scale had demonstrated sensitivity to change, and had yielded indices of both mood disorders at an acceptable level of precision.

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Summary Index

An overall index of outcome (SUMMARY) was created as a single composite outcome measure of all the major outcome criteria in this study. SUMMARY was the mean of its constituent components: DAYS90, USES90, PROBLEMS INDEX, SOCIAL AND ECONOMIC STABILITY, ANXIETY, DEPRESSION, SELF-EFFICACY, and READINESS TO CHANGE. All these indexes had been scaled and normalised to prevent any one variable dominating the others (range 1 – 5) and hence SUMMARY reflects a weighted linear combination of these eight specific outcome criteria. Accordingly, SUMMARY also had a range of 1-5, with higher scores indicative of heavier cannabis use, more problems and poorer overall adjustment.

Treatment Variables

Treatment implementation variables measured in this study were *treatment participation* (number of sessions attended or treatment "dose"), *treatment components* delivered, and *treatment duration.* These variables were recorded on the Treatment Components Record Form, an individualized log-type record of each client's participation in treatment, designed specifically for this research following data collection strategies for measuring programme delivery suggested by Scheirer (1994). Treatment session data recorded by counsellors after each treatment session included the session number, the date, and the specific treatment components delivered. Treatment sessions were numbered consecutively to yield a total number of sessions attended before treatment termination (or dropout). Counsellors were also encouraged to include relevant comments about their observations during treatment and clients' progress, and space was provided for this purpose (see Appendix VIII).

Satisfaction with Treatment

Given the acknowledged potential for high rates of attrition in this study the Satisfaction with Cannabis Treatment Programme Questionnaire (SCTPQ) was used at the exit session to ensure that at least some posttreatment measure of client satisfaction was obtained (see Appendix IX). The measure was then incorporated into the 3-month treatment follow-up as a further check on satisfaction at a later point in time.

The three-item measure of **global satisfaction** is a psychometrically sound shortened version of the Client Satisfaction Questionnaire-8 (CSQ-8, Attkisson & Zwick, 1982) which, in turn , is extracted from the Client Satisfaction Questionnaire-31 (CSQ-31, Larsen et al., 1979). The SCTPQ features three Likert-type items with four response choices in which "1" indicates maximum satisfaction and "4" indicates maximum dissatisfaction for items one and two. Scoring is reversed for item three. Thus, the index SATISFACTION was the mean of the three items, and had a range of 1 - 4.

Item four is an open question inviting client comments about, or suggestions for improvement to, the cannabis treatment programme (see Appendix IX for all items). Both Larsen et al (1979) and Lebow (1982) proposed that supplementary items be added to the instrument to meet specific needs and these items should not alter the psychometric properties of the scale. Item four on the SCTPQ represents such an addition.

The CSQ-8 has been empirically verified as a reliable and valid measure of client satisfaction (Attkisson & Zwick, 1982; Lebow, 1982, 1983(a), 1983(b); Pascoe, Attkisson & Roberts, 1983). After extracting the CSQ-8 from the CSQ-31 Attkisson & Zwick reported a Cronbach alpha coeffcient of .93, this high degree of internal consistency indicating that the scale provides a homogeneous estimate of general satisfaction with services. Factor analyses showing only one factor for the scale confirmed the internal consistency of items (Nguyen, Attkisson & Stegner, 1983).

Deane (1993) found a similarly high alpha coefficient of .92 in a New Zealand study at two outpatient mental health clinics.

Hypothesizing that client satisfaction should be associated with service utilisation Attkisson & Zwick (1982) found the CSQ-8 to be a valid measure of **global satisfaction.** Clients dropping out of treatment within the first month were less satisfied than treatment remainers (r= .37 at the .01 significance level) as were clients who missed a greater percentage of their scheduled appointments. Significant relationships were also found between client satisfaction and client self-ratings of improvement. Similarly, Deane (1993) reported evidence for the validity of the CSQ-8 in New Zealand with a positive relationship between client scores on the CSQ-8 and three diverse ratings of symptom change, all of which were found to be independent of halo effects.

Lebow (1982) cautions that the point in time chosen to measure satisfaction may affect the evaluation, and evaluating treatment at termination or at a follow-up point has the important strength of including a consideration of the complete treatment programme. However, terminated clients become difficult to locate, especially the "typically transient recipients of mental health services" (Lebow, 1982, p. 352). Clearly, assessing satisfaction at multiple points in time is desirable as an assessment of its reliability can be examined. However, when only one assessment is possible (or likely) termination appears the best single point in time to collect satisfaction data (Lebow, 1982).

With its reported psychometric properties and as a brief, simply worded instrument the shorter scale of the CSQ-8 provided an acceptable and timely posttreatment measure of treatment completers' satisfaction with services in this study. The scale was adapted for a New Zealand sample by substituting the English spelling "programme" for the American "program" and the title altered to reflect its specific application in the present research.

Finally, following the recommendations of various researchers (eg. Babor & Del Boca, 1992; Babor et al, 1987; Caddy, 1980; Maisto & Connors, 1988; Ogbourne, 1984), several important strategies were employed in an effort to enhance the

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reliability and validity of clients' responses to the SCTPQ. Specifically, clients were: (1) assured that their identity and responses were confidential and would not be seen by their counsellor or anybody else associated with their treatment; (2) fully informed and aware of the importance of the honesty of their responses for the purposes of programme evaluation; (3) thanked for their help in providing satisfaction information, and (4) provided with a coded but otherwise blank envelope in which to seal the completed questionnaire.

Posttreatment Follow-Up

At the 3-month posttreatment assessment point the postal Cannabis Treatment Programme Follow-Up and Client Satisfaction Survey surveyed changes in the outcome areas assessed at the pre- and posttreatment interviews (see Appendix IV). In addition, client ratings of the helpfulness of the cannabis treatment programme in dealing with their cannabis use and the various problem areas in their lives provided indices of both their **global** and **specific satisfaction** with treatment services. Finally, a brief measure of the **therapeutic alliance** was included to allow a preliminary examination of the role of this relatively unexplored variable in outcome and satisfaction

Global satisfaction

Global satisfaction was measured by the incorporation of the four-item general satisfaction scale (Satisfaction With Cannabis Treatment Programme Questionnaire) administered at the exit session (and discussed earlier in this section). This reassessment was intended to provide a check on the temporal durability /generalisability of both treatment benefits and general satisfaction with services received.

Specific Satisfaction

Participants were also asked to rate (1) the extent to which the specific constituent components of treatment helped them in dealing with their cannabis use, and (2) the extent to which treatment helped them deal with the specific problem areas in their lives (relationship, employment, finances, legal system, general health and cognitive functioning). Each item was rated using a 5-point Likert scale which included "it made things worse (-2) "it made things a bit worse" –1) "it made no difference" (0) "it helped a bit" (+1)" and it helped a lot" (+2).

Therapeutic Alliance

Given the critical role of perceived therapist care in client satisfaction with treatment, a brief measure of participants' impressions and experiences of the therapeutic alliance was incorporated in the survey to provide a basis for correlation with other satisfaction and outcome measures.

Research reviews have indicated that the development of the therapeutic or "helping" alliance early in treatment is correlated with subsequent outcome at a level ranging from .2 to .5 (Alexander & Luborsky, 1984). Reviews have also consistently indicated that perceived therapist care is a strong correlate of client satisfaction with treatment, accounting for approximately 50 per cent of the variance of client satisfaction ratings (Luborsky, McLellan, Woody, O'Brien, & Auerbach, 1985; Miller, 1985; Silove, Parker, & Manicavasagar, 1990).

Although it is now widely acknowledged that the therapist's ability to form a warm, supportive alliance is possibly the most crucial determinant of his/her effectiveness, therapists' performance in determining outcomes of treatment is a relatively unexplored area in addictions research (Luborsky et al, 1985; Miller, 1985, 1994). Consequently, there is a paucity of existing measures focusing specifically on clients' perceptions of the quality of the therapeutic relationship.

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From principal-components analyses Silove et al (1990) derived several dimensions of therapist behaviours found to be important predictors of outcome across all forms of therapy. These were Care-Concern, Understanding, Directive-Control, and Critical-Confronting. In this study these empirically-verified dimensions were measured on a four-item scale (one item per dimension). Respondents were asked to rate their counsellor on each item using a 5-point Likert scale (always, most of the time, sometimes, hardly at all, not at all). Scale scores were then computed by simple summation of constituent item scores paying due regard to the negative loadings of appropriate items.

Change Scores

The degree of measurable improvement that occurred during treatment on all the outcome criteria used in this research was used as the primary measure of effectiveness of the cannabis treatment programmes studied. Change scores were computed by subtracting the mean pretest score on each outcome scale and the mean composite indexes from the mean posttest score. All of the indexes (PROBX, SESTAB, NRCHANGE, SUMMARY) and the individual variables used as indexes (General Health, Self-Efficacy) were normalised to a range of 1 - 5, thus change scores could range from + 4 (maximum increase) to − 4 (maximum decrease). Similar change scores were also possible on a range of individual variables such as personal goal for cannabis use, financial difficulties, partner problems, number of jobs held, job problems, criminal convictions, currently awaiting a court trial and cognitive problems.

Change scores on both the Anxiety and Depression scales theoretically extended to +20 and − 20 (range 1 − 21). Change scores for quantifying indexes such as DAYS90 and USES90 were based on calculations of mean number of days used and mean number of times used in past 3 months (90 days). DAYS90 could theoretically range from 0 − 90, while USES90 had no finite maximum/range. Change in duration of relationship (in months) was calculated in a similar way. Change scores on the remaining variables (yes/no) could range from +1 to − 1. These included

concurrent drug problems, shifted home since treatment began, currently in a relationship, partner uses cannabis regularly, belief that cannabis has created health problems, additional counselling since treatment began.

PROCEDURES

Pilot Study

Pilot studies provide important a priori information for clarifying and validating a study's rationale, design, and procedures (Anderson, 1990; Cone & Foster, 1993). To ensure the viability of the planned data collection procedures a pilot study was conducted using the pretreatment assessment instruments and the follow-up survey. The purpose of these pretests was fourfold: (1) to ensure that the instructions, the wording, and the formatting of questions was appropriate to, and easily understood by, the target clientele (2) to test the time involved in questionnaire administration (3) to alllow counsellors to familiarise themselves with the assessment protocol, and (4) to solicit counsellor feedback on content areas covered, identify any possible omissions or ambiguities, and invite their suggestions for refinement and improvement to the instruments(Anderson,1990; Babbie, 1992; De Vaus, 1991; Oppenheim, 1992).

Five pilot tests were conducted between the Nelson and Taranaki sites using the counsellor-administered pretreatment questionnaire. While counsellor feedback resulted in some minor cosmetic modifications to the instrument, the time involved in questionnaire completion (about 20 minutes) was considered satisfactory. Two pilot tests were conducted using the client self-administered Cannabis RTC Questionnaire, the HAD Scale, and the Client Follow-Up and Satisfaction Survey. Volunteer participants were cannabis clients already in treatment and hence not included in the present research. Respondents were told that any feedback regarding the process/experience was welcome (Anderson, 1990; De Vaus, 1991, Oppenheim, 1992). No difficulties with these instruments were reported.

The questionnaires were not specifically piloted at the two Auckland sites as the research was well advanced at the time of their incorporation into the study. During the researcher's training sessions with counsellors and supervisors at these agencies, however, counsellors did not anticipate any problems arising for the cannabis clientele in completing the brief questionnaires. Likewise counsellors reported no foreseeable difficulties with their role in filling out the assessment questionnaires and treatment record forms.

Recruitment

Participants were recruited over a 20-month period commencing in September 1997 at the Nelson and Taranaki sites and from August 1998 at the Auckland sites. All consecutive admissions seeking assistance with primary cannabis use problems were screened to evaluate inclusion/exclusion criteria, and eligible clients were invited to participate in the study.

Following client/counsellor assignment, counsellors explained the research purpose and procedures fully to eligible clients and answered any questions clients raised. Counsellors also outlined the research obligations clients incurred by agreeing to participate and gave prospective participants the researcher's information sheet to take away and consider carefully before making this commitment (see Appendix Xa and Xb). This information sheet summarized the study aims and procedures, clients' right to withdraw at any time, stressed that participation was entirely voluntary and that non participation would not affect clients' care in any way whatsoever. The collection of group as opposed to individual data was emphasised as was assurance of clients' anonymity on any research forms or subsequent reports. Careful attention had been given to ensuring that the format and level of abstraction was appropriate for cannabis clients with cognitive impairments during the compilation of this written information.

Adequate time was allowed for clients to decide about participation without feeling coerced. Clients volunteering to participate were required to sign the separate

consent form routinely used by the respective treatment services (see Appendix XI). These consent forms were retained by the individual treatment agencies. Participants were allocated a code number by their counsellor which from this point on was the only form of identification used on all research documents and reports. The master sheet connecting code numbers to client names was kept confidential at the treatment services. Participants were required to provide a telephone number and a contact address to which the three-month follow-up survey could be sent. A second locator person and contact address was also requested as an explicit strategy to facilitate follow-up tracking and thus help minimize attrition (see Bale, Arnoldussen & Quittner, 1984; Craig, 1984; Goldstein, Abbott, Paige, Sobell & Soto, 1977; Ogbourne, 1984; Stark, 1992; Stark, Campbell & Brinkerhoff, 1990).

Pretreatment Assessment

Client baseline assessment was made within the context of the routine assessment practices followed at the drug treatment services, and assessment procedures kept as standardized as possible. Participants first completed self-report measures of (1) readiness to change/ motivation and (2) depression and anxiety. Care was taken to keep the administration order of these measures constant. Clients were also kept "blind" to the constructs underlying both instruments in order to counteract potential response biases and other artifact (e.g. pretesting, demand characteristics).

Measures of client demographics, voluntariness (source of referral), cannabis and other drug use, drug addiction and treatment history, personal treatment goals and self-efficacy, problems created by cannabis use, social and economic stability, and general health were then completed by the counsellor during the counsellor-administered pretreatment assessment interview. Counsellor administration of these questionnaires was an important strategy to maximize the accuracy of data collected (and hence minimize non-response, self-report or other respondent bias) by eliminating inappropriate "N/As", "don't' knows", and total omissions on items (Oppenheim, 1992; Babbie, 1992). It was also anticipated that cannabis clients could have marginal reading skills, drug-induced concentration difficulties, may be

distracted or confused, or may lack motivation to complete the questionnaires. Within the therapeutic dyad, counsellors were able to probe appropriately for sensitive information, and were also able to refer to their files to complement and verify data (Babbie, 1992; Oppenheim, 1992).

Finally, participants were required to provide an on-site urine sample for laboratory analysis to verify self-reported cannabis use. As an objective, biochemical measure the incorporation of urinalysis in this study was an important triangulating source of convergent validity information and thus encouraged honesty (accuracy) in self-reports of cannabis use (Babor & Del Boca, 1992; Maisto & Connors, 1988).

Treatment

Following baseline assessment treatment programmes for study participants proceeded as normally delivered to cannabis clients and in the individualized counselling format that typifies service delivery at the drug treatment agencies. These treatment modalities generally operate on a one-session-a-week basis with individual variation as indicated by client needs. Similarly, treatment duration is dependent upon clients' individual treatment goals and needs, the rate of progress through the stages of change, and the timing and nature of termination status (mutually planned exit or dropout).

Exit Session

At the penultimate treatment session treatment remainers provided a pre-exit urine sample for analysis and feedback of results at the planned exit session. At the terminal treatment session treatment completers were reassessed using the core battery of intake measures and procedures, with the addition of a brief self-report measure of satisfaction with treatment. In order to preserve client confidentiality, and because of the sensitive nature of the information elicited, a coded but otherwise

blank envelope was provided in which clients placed the completed satisfaction with treatment questionnaire. This procedure was an attempt to encourage frank and honest responses to the questionnaire items. At this juncture counsellors reminded participants of their consent given to receive the three-month follow-up postal survey, and thus their research obligations to return the completed questionnaire promptly.

Posttreatment Follow-Up

Three months after each individual exit session a follow-up questionnaire was posted to all intake clients (treatment completers and dropouts) to survey their posttreatment cannabis and other drug use, psychosocial functioning, their perceptions about the therapeutic alliance and the extent to which treatment helped them deal with the problem areas in their lives. Clients' general and specific satisfaction with the various treatment services received, and their suggestions for improvement to the cannabis treatment programmes were also solicited. A covering letter reminded clients of the confidentiality of both their identity and responses which would not be seen by anyone whatsoever from the treatment services. Clients were urged to respond to all items as honestly as possible, whether their opinions were positive or negative. A stamped envelope addressed to "The Researcher" was included for return of the survey. Upon their receipt these were to be forwarded, unopened, to the researcher.

Several systematic strategies were implemented to enhance both treatment retention and response rates to the postal survey, as suggested in the addictions literature (see Bale et al, 1984; Craig, 1985; Goldstein et al, 1997; Miller, 1985; Stark, 1992; Stark et al, 1990). At the outset, as outlined earlier, in the context of the informed consent process clients were thoroughly educated about the study aims and procedures to ensure that they understood and agreed to what was expected of them. A follow-up personal telephone call, or a letter and personalized appointment card, was mailed to clients who had missed scheduled sessions. A second mailing of the follow-up survey was made to participants if a response had not been received within two to

three weeks of posting, and it was known that clients remained at the given address. Otherwise this second mailing was sent to the second locator person's address. Counsellors also made telephone contact with clients who had promised to return the questionnaire but were slow in doing so.

Administration Checklists

In order to help facilitate the overall administration of the research procedures the researcher compiled several checklist-type forms which counsellors and supervisors/coordinators could readily consult for guidance or to monitor individual client status in the research process. These included the Counsellor Guide/Checklist, the Coordinator Guide/Administration Checklist, and the Client Information/Checklist (see Appendices XII, XIII, and II, respectively). Both the counsellor and the coordinator guides outlined in detail the specific procedures to be followed at each step in the research process, and provided a concise reference for the required assessment forms and instruments. These guides represented a strategy to help control for any implementation variations, and to help monitor the consistency and integrity of the interventions across the research sites.

The Client Information/Checklist was incorporated into a cover sheet format in conjunction with demographic and intake information and designed to remain in participants' files until the completion of data collection. Counsellors and coordinators could see at a glance just where the client was in the research process. Space was allocated, for example, for entering the date of the exit session so that the checklist provided a basis for ensuring that the follow-up survey was posted to clients three months after these individual terminal sessions.

DATA ANALYSIS

Univariate analyses and bivariate analyses were conducted using SPSS for Windows. Descriptive analyses are presented for all major variables. In the

univariate analyses frequencies and percentages are reported for categorical variables, and means and medians for normally distributed and skewed continuous variables, respectively. Using the Explore procedure, normality tests on the scale variables were conducted applying both the Shapiro Wilks (whole sample, n=63) and the Kolmogorov-Smirnov with Lilliefors correction for significance for small samples (treatment completers, n=18).

Bivariate analyses included both parametric and nonparametric tests. Crosstabs were used for categorical variables, while Pearson product moment correlations are presented for continuous variables. T-tests for both independent and paired samples were used for comparison of two scale variables. Nonparametric tests included the Spearman Rank-Order correlation coefficient where data for one variable was ordinal, the Wilcoxon Matched-Pairs for pre-post comparisons, while the Mann Whitney U test compared two independent samples (ordered variables). The 'Exact significance' option was selected for both these latter tests. The rationale for all tests used in this study is presented in Appendix XIV.

ETHICAL AND LEGAL ISSUES

This study was designed in accordance with the ethical guidelines of the New Zealand Psychological Society (1986) and the Massey University Code of Ethical Conduct (1994). As a multisite study the protocol was reviewed and approved by the Massey University Human Ethics Committee (Appendix XV), the Nelson-Marlborough Ethics Committee (Appendix XVI), the Taranaki Ethics Committee (Appendix XVII), and the Auckland Ethics Committee (Appendix XVIII). While subject to the whole spectrum of ethical and legal issues normally considered in research with human subjects, the present study involved some particular issues demanding special consideration. These include informed consent, confidentiality and anonymity, cultural sensitivity and minimizing harm to participants, and publication and public statements.

Informed Consent

As outlined in the procedure, the initial approach to clients for recruitment purposes was made by their counsellor in the context of the standardised routine intake assessment interview during which all eligible admissions for primary cannabis use problems at each drug treatment site were invited to participate in the study. Counsellors explained the research purpose and procedures fully, invited and answered any questions clients raised, and provided clients with the researcher's written information sheet to take away and consider. In language and format appropriate to the target clientele the information sheet summarized the study aims and procedures, provided researcher information and supervisor contact details, informed clients that participation was entirely voluntary, outlined clients' right to withdraw at any time without affecting their care and their right to receive a summary of the results, and gave assurance of participants' total anonymity on any research forms or subsequent written reports (see Appendix Xa and Xb). Clients were asked to direct any further questions to their counsellor who would, in turn, obtain the required information from the researcher or supervisor.

Clients of alcohol and drug treatment services in New Zealand are protected by the national Code of Health and Disability Consumer Rights 1994 and all sites participating in this study have an established complaints procedure in place. In addition, Auckland clients were provided with the Health Advocates Trust local phone number (Appendix Xb).

Ample time was allowed clients to decide whether or not to participate and in all cases data collection did not begin before participants had given their informed consent in writing. Clients agreeing to participate were required to sign a separate consent form in the format routinely used by the respective treatment agencies. (see Appendices XI).

Confidentiality and Anonymity

All clients of alcohol and drug treatment services in New Zealand are protected under the Privacy Act 1993 and the Health Information Privacy Code 1994.

Given the legality issue, the sensitive nature of this study, and cannabis-related characteristics of the target client group, the mutual anonymity of the researcher and participants was considered obligatory. At no point during the research process did the researcher interface with participants and was known to clients only as "the researcher." This was critical both for personal safety reasons and for any realistic prospect of data collection.

As promised clients in the information sheet, a coding system was utilized for all data collection purposes, including urine testing. Counsellors at each site assigned participants a code number which was then transferred to a master sheet containing client names. This master sheet was the only tangible connection between code numbers and client names and was kept secure in a locked filing cabinet at the various agencies. From this point all research forms were identified only by a code number and no identification of individual participants was made (or is possible) in any written report on this study. When obtaining raw data at the treatment sites the researcher was legally bound by the agency's ethical code of practice and confidentiality, and at no time had direct access to client records. This also required that agency staff sent out the 3-month posttreatment postal survey to keep participants' addresses confidential.

The other face of the confidentiality/anonymity issue in this study was that essential for participants' voluntary evaluative responses to client satisfaction measures which included questions about counsellor attitudes and behaviour. In view of the sensitive nature of the questions and in order to encourage frank and honest responses it was necessary to guarantee client anonymity. To this end a coded but otherwise blank envelope was provided in which clients placed the completed satisfaction questionnaire during the exit session assessment procedure. A stamped envelope addressed to "The Researcher" was included in the 3-month follow-up

survey mailing for the return of completed questionnaires to the treatment site. These were forwarded, unopened, to the researcher upon their receipt.

Cultural Sensitivity and Minimizing Harm to Participants

Researchers are ethically mandated to conduct culturally sensitive research (NZPsS, 1986). During the planning of this study the researcher did raise the issue of urinalysis in the context of culturally-appropriate or culturally-safe practices for Maori and Pacific Island clients (i.e. involving bodily fluids) and was informed that urine testing is a routine procedure in drug treatment centres which had not historically presented any problems among these client groups. Urine sampling is also a standard component in most drug treatment outcome research and is an important objective tool used to corroborate the reliability and validity of self-reported drug use (Maisto & Connors, 1988; Sobell et al, 1987). The researcher is not aware of any reported instances of physical, psychological or other harm to cultural groups or values in the extensive research literature involving this procedure.

However, the researcher was alerted to the possibility of a cultural issue when several younger Maori cannabis clients *appeared* to decline participation in the study on the grounds of the compulsory urine testing. After consulting with her supervisor the researcher issued a memo to all counsellors outlining the specific conditions under which the urine testing component could be waived on the basis of culturally sensitive research procedures (see Appendix XIX). As it eventuated, there were no further instances of refusal for possible cultural reasons.

Ambivalence toward the procedure, however, did subsequently arise from counsellors of the Auckland sites just prior to their incorporation into the study. Mindful of both the ethical mandate to protect *all* research participants from discomfort and the universal right to privacy (NZPsS, 1986) the researcher

negotiated an acceptable compromise with management and issued a memo to all Auckland counsellors accordingly (see Appendix XX).

Publication and Public Statements

Section 8 of the Code of Ethics states that "psychologists are accurate and objective in reporting data or information and do so in a manner that encourages responsible discussion"(NZPsS, 1986, p8). This ethic has direct relevance to the current research where some counsellors clearly saw the programme evaluation as personal evaluation, and therefore threatening. Cowen (1978) describes this dilemma as one of many that arise in field-based research. The researcher addressed this potential artifact (therapist-sourced data bias) by reassuring counsellors that aggregate client outcomes, rather than therapist variables and/or inter-agency comparisons, were the focus of this study. This situation also called for a diplomatic approach in discussing treatment process and reporting back findings in a manner which constructively highlighted the shortcomings of the programmes in retaining clients in treatment, and inter-agency differences in treatment outcomes.

RESULTS

Prior to analysis, all data listings were examined using the screening guidelines outlined in Tabachnick and Fidell (1989). The Explore procedure from the SPSS programme was used to check for accuracy of data entry, missing data, out-of-range values and outliers, and for testing the fit between distribution of relevant key variables and the assumptions of univariate and bivariate analyses to follow.

As the rate of missing data was low and scattered in a random pattern, it was decided not to delete cases or make other adjustments. When the Kologmogorov-Smirnov test with Lilliefors correction was applied to USES90 it was shown to be positively skewed and significantly non-normal. When this variable was transformed by taking the square root, the Kologmogorov-Smirnov test showed it had been normalised. The transformed USES90 variable (U2) was a key outcome variable in all the analyses that followed.

The presentation of results is organized into three sections that largely correspond with the main objectives of this study. These include descriptive analyses of the characteristics of primary cannabis clients and the correlates of cannabis use among this group; quantitative analyses of treatment outcomes and effectiveness, and the identification of predictors of dropout from treatment; and discussion of participants' subjective responses to the follow-up surveys.

CLIENT CHARACTERISTICS AND CORRELATES OF CANNABIS USE PROBLEMS

Sociodemographic Characteristics

The sociodemographic characteristics of the sample are presented in Table 1. Participants were 45 male (71%) and 18 female primary cannabis clients with a mean age of 25 years (SD = 8.57; range = 40). A marked clustering was evident in age distribution. While more than a third of the males (38%) and a third of the females (33%) were under 20 years, most of the males (80%) and the majority of the females (61%) were in the 30 years and under age categories. Only 25% of the sample were older than 30 years. There were no significant age differences by gender at treatment entry (mean of 24.31 for men versus 26.56 for women, (t, 61df = 1.82, p .352).

Two-thirds of the sample (62%) either referred themselves (52%) or were referred by their partner/family (10%). Smaller numbers came from the criminal justice system (6%) lawyers (6%) general practitioners (2%) schools (2%), and 22% were from a variety of other sources, such as mental health professionals, hospitals, youth and social workers.

Over three-quarters (76%) were recruited at the Nelson drug treatment services, 13% from Taranaki, and 11% from the RADS units in Auckland. This recruitment ratio largely reflects the differential timeframe of the treatment sites' participation in the study over the 20-month period.

The majority of the sample were of European origin (78%); twenty-one percent identified themselves as Maori, and one (1%) as a Pacific Islander. Interestingly, three-quarters (77%) of the Maori participants were recruited at the Nelson treatment agency, and the remainder (23%) at the Taranaki site.

Table 1. Sociodemographic Characteristics (n=63)

Variable	Total	Men	Women
Gender	63	45	18
%	100	71	29
Age (in years) (%)			
0 – 20	23 (37)	17 (38)	6 (33)
21 – 30	24 (38)	19 (44)	5 (28)
31 – 53	16 (25)	9 (20)	7 (39)
Mean	24.95	24.31	26.56
SD	8.57	7.51	10.89
Range	(13 – 53)	(14 – 47)	(13 – 53)
Ethnicity (%)			
European	49 (78)	40 (89)	9 (50)
Maori	13 (21)	5 (11)	8 (44)
Pacific Islander	1 (1)	0	1 (6)
Employment status/main source of income (%)			
Full-time employment	13 (21)	11	2
Part-time/casual	5 (8)	4	1
employment	31 (49)	22	9
Govt. benefits	11 (17)	5	6
Other	3 (5)	3	0
None			
Currently in relationship (%)	24 (38)	14	10
Residential situation (%)			
own home	3 (5)	2	1
rented accommodation	31 (49)	20	11
parents' home	25 (40)	20	5
other	3 (5)	2	1
homeless	1 (1)	1	0
Lifetime criminal conviction (%)	21 (58)	18	3
drug-related	15 (42)	11	4
other (violence, burglary, EBA etc.)			

Note: SD= standard deviation

Social and Economic Stability

The vast majority of both the sample and their partners' occupational status (87% and 82% respectively) were classified between level 4 - 6 on the Elley-Irving SES index (1981) and the additional levels (7-9) created for use in this study. Of this group, 30% were classified between SES level 4 - 6; 25% were students (level 7); 11% were homemakers/caregivers (level 8) and 21% were unemployed (level 9).

Less than a third of the sample (29%) were currently in full-time, part-time, or casual employment. Recent employment history, moreover, indicated a volatile pattern. While almost a third (29%) of the sample reported having had 3 or more jobs in the previous 12 months, 39% of this group reported having 5 or more jobs. The modal duration of these jobs was 1 -3 months.

These employment trends were reflected in reported income sources. Half of the sample (49%) were currently receiving government benefits (unemployment, sickness, or domestic purposes) while the main source of income for a further 17% was other family, spouse, and parents. Five percent reported having no source of income at all. Not unexpectedly therefore, over two-thirds (67%) reported experiencing difficulties paying their bills at least sometimes (23% always; 15% often; 29% sometimes).

Living arrangements were similarly variable. Only three (5%) of the sample currently lived in their own home. Eighty-nine percent lived either in rental accommodation (49%) or parents' home (40%). Five per cent lived with other family or group, and one participant claimed to be homeless. Further, while over half the sample (52%) had lived in their current home for less than six months, 70% had lived in the same home for no more than 12 months. On average, participants had moved home 3.6 times in the last 2 years (mode=4 times; range = 19).

As can be seen in Table 1, 38 percent of the sample were currently in a relationship. The Pearson chi square statistic was calculated to test gender differences in relationship status.

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Although not significant, women were more likely to report being in a relationship than were men (56% versus 31%; χ^2 [1, N=63] = 3.26, p = .07). These relationships, however, were generally of relatively short duration. Almost all those (84%) currently in a relationship had been so for no longer than 5 years, and 40% of these for no longer than 12 months. A substantial proportion (44%) of those with partners reported that their partner also used cannabis regularly.

A pattern of pretreatment criminal involvement was also evident in this sample. The majority (57%) had one or more lifetime criminal convictions, most of which (56%) were within the past 12 months. Fifty-eight percent of these were cannabis-related (cannabis possession, cultivation, supply) and 42% were non-drug offences (e.g. violence, assault, burglary, theft; drink-driving, driving while disqualified). In addition, almost a third of the sample (29%) were currently awaiting a court hearing or trial. Again, the alleged offences were predominantly drug-related (44%), with the remainder spread fairly evenly among the given non-drug categories. There were no gender differences in lifetime criminal convictions (t, 34df = -.52, p.609).

Finally, a Student's t- test was conducted to test for gender differences in scores on SESTAB, the composite created for use as a summary index of all the social and economic variables. There were no gender differences in overall social and economic stability (mean of 2.87 for men and 2.90 for women; t, 61df, = - .21, p= .832).

Cannabis Use

Patterns of Past Use

Patterns of historical and pretreatment use of cannabis are presented in Table 2. Student's t tests of means were conducted to compare men and women on both these patterns. Following the reasoning of Rothman (1986) all test results, whether significant or

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non-significant, are reported in Table 3. As the t-tests by gender involved only one comparison for each variable no Bonferroni adjustments were made.

The typical age of initiation to cannabis use was 13.9 years (median=14) for men and 15.2 (median=13) for women. One male respondent reported first using cannabis at age 7. Of note, while a third of the sample had tried cannabis by age 12, almost the entire sample (84%) had first used the drug by age 16. Regular cannabis use (defined as at least weekly use) had commenced at a median of 16 years for men and 14.5 for women, and the typical respondent had been using regularly for 8.6 years (range = <1 - 29). As Table 3 shows, there were no significant gender differences in historical cannabis use either by t- or Mann-Whitney U-tests.

Table 2. Patterns of Pretreatment Cannabis Use (n=63)

Variable	Total	Men	Women
Age of first use (yrs)			
mean	14.2	13.9	15.2
median	14.0	14.0	13.0
range	7 – 33	7 – 19	11 – 33
Age of regular use (weekly +) (yrs)			
mean	16.4	16.1	16.9
median	16.0	16.0	14.5
range	10 – 33	10 – 24	11 – 33
Number of years regular use			
mean	8.6	8.2	9.6
median	8.0	7.0	8.5
range	0 – 29	0 – 29	1 – 26
Average frequency of use, past 90 days (%) (n=62)			
daily/near daily	46(73)	34	12
4 – 5 times/wk	7 (11)	4	3
2 – 3 times/wk	7 (11)	5	2
once/wk or <	3 (5)	2	1
Times used per typical day, past 90 days mean			
median	4.3	4.7	3.2
range	4.0	4.0	3.0
	1 – 15	1 – 15	1 – 10

Table 3. Pretreatment Cannabis Use: t Tests by Gender

| | Men | | Women | | | | |
Variable	M	SD	M	SD	t	df	p
Age first use	13.87	2.34	15.17	6.05	-.87	61	.387
Age began regular use	16.11	3.14	16.94	6.14	-.55	61	.590
No. years regular use	8.20	7.00	9.61	7.84	-.70	61	.487
Days of use past 90 days	73.57	22.05	70.30	25.19	.51	61	.611
Times used past 90 days	17.60	7.34	13.43	5.28	2.19	61	.033*
Age at treatment entry	24.31	7.51	26.56	10.89	-.94	61	.352

Note: Times used past 90 days = U2 (square root USES90).

* = two-tailed p <.05

Patterns of Current Cannabis Use

As can be seen in Table 2, three-quarters of the sample (73%) were typically using cannabis daily/near daily at treatment entry. A further 11% used on at least 4 days a week, and another 11% used on at least two days per week. Only 3 respondents (5%) were using on one day a week or less. In the past 90 days, the mean number of days on which cannabis was used was 73. No gender differences were found in either the t-test or the Mann-Whitney U test in days of cannabis use.

When the quantity-frequency measure was reported, however, a different use pattern was observed (see Table 2). Almost all participants (87%) reported using cannabis more than once on a typical day of use, and over half the sample (51%) used it four or more times per day. However, on the days they used cannabis men were using significantly more times

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than women (mean of 4.7 times per day for men and 3.2 for women; t, 61df = 2.29, p =. 033). As Table 3 shows, this was the only gender difference in pretreatment cannabis use. All other comparisons by gender failed to differ significantly.

Cannabis Use Goals and Self-efficacy

Clients were asked about their personal goals for future cannabis use. Virtually all the sample (98%) reported wanting to at least change their use (51% chose "abstinence"; 20%" to reduce consumption"; 27% "to control consumption"). Only one respondent wanted "to continue as before" and two "didn't know". When then asked how confident they felt in achieving their personal goals, the vast majority (80%) felt at least some confidence (26% felt "very confident" and 54% felt "somewhat confident"). The remaining 20 percent were either "not sure" (9%) or had "not much confidence"(11%). Of interest, no clients endorsed the "no confidence at all" category.

Other Drug Use

Of the 63 participants only four (6%) individuals reported *currently* using cannabis only. These "pure" cannabis users were two male and two female European New Zealanders between the ages 22- 47. When asked if they had had lifetime dependence problems with any drug apart from cannabis, three reported having had such problems; one with alcohol, another with amphetamines and the other with benzodiazepines.

In this sample polydrug use was the norm. Almost the entire sample (85%) were concurrently using alcohol and 77 percent were using tobacco. Almost three-quarters (69%) of tobacco users were using it on a daily/near daily basis, while over a third of those using alcohol (35%) were doing so on 2 or more days per week. .

Reported use of other drugs was far less frequent, and where reported was typically on less than one day a week. The only exceptions were one respondent reporting use of heroin near daily, two respondents using benzodiazepines on 3 days per week, and three respondents using painkillers on 4 or more days per week.

When asked if they were experiencing any problems with drugs other than cannabis over a third (35%) reported having a concurrent drug problem. Of this group nearly half (48%) reported a problem with alcohol, and 28% a problem with tobacco. Only small proportions reported problems with benzodiazepines (8%) hallucinogens (4%) amphetamines (4%) solvents/inhalants (4%) and ecstacy (4%).

A similar pattern emerged for lifetime dependence problems. Just under half the sample (45%) claimed to have experienced a lifetime dependence problem apart from cannabis. Again, this drug was most commonly alcohol (52%) followed by tobacco (13%), then benzodiazepines (13%) opioids (10%) caffeine (6%) amphetamines (3%) and solvents (3%). However, when asked if they had had treatment for these drug problems only a minority (13%, i.e. 8 clients) reported having received treatment, mainly for alcohol problems (7).

Cannabis-Related Problems

When respondents were asked about problems that they believed were *directly* attributable to their cannabis use the most frequently reported adverse consequences were cognitive/thinking impairments. Almost all the sample (84%) believed that cannabis had caused problems with their thinking processes (23% "always"; 33%" often"; 28% "sometimes"). Relatively few clients believed that cannabis had "rarely" (13%) caused problems with their thinking processes, and only 2 clients (3%) claimed cannabis had "never" caused any cognitive problems.

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The particular impairments most often endorsed included memory loss (90% of all cases) concentration (66%) problem solving (34%) and motivation (12%). Other less frequently reported cognitive effects of cannabis were bizarre thought patterns (8%), reduced confidence/self-esteem (6%), and anxiety (2%). Two clients (4%) reported cannabis-induced difficulty with long-term memory recall.

Other cannabis-induced problem categories commonly identified were general health (i.e. medical and psychological problems; 71%), relationship (61%), and employment (46%). Almost a third (28%) of the sample reported seeking treatment for health problems three times or more in the past year. (Of this group 13% of cases reported 10 or more appointments with health professionals during this period). Interestingly, negative psychological (as opposed to physical) effects accounted for the large proportion (63%) of general health problems attributed to cannabis use. These represented feelings of anxiety and paranoia (33%) depression (33%) psychiatric disorder (18%) interpersonal conflict (6%) and social alienation (9%). However, a sizeable minority (18%) reported adverse physiological effects such as respiratory/bronchial problems, and 12% reported various other physical effects.

Psychological factors also accounted for a large proportion of reported cannabis-related relationship problems (including communication difficulties 39%; mood and motivation 20%). The financial costs of using (20%) and the illegal status (13%) of cannabis, however, were also reported as causing relationship problems.

A similar pattern was evident in the cannabis-related employment problems voluntarily identified. Of these, 24 % were attributed to poor performance, accidents or mistakes at work; 19% to attitude/job motivation; 16% to concentration/learning skills deficits; 16% to absenteeism; and 11% to being "stoned" on the job. Two clients (8%) reported being actually dismissed from their job for cannabis-related reasons. A further 5% reported that cannabis use negatively impacted on their confidence/self-esteem in the work environment.

A Student's t-test compared the scores of men and women on the composite problems index (PROBX). There were no significant gender differences in self-reports of cannabis-induced problems (mean of 3.40 for men and 3.23 for women; t, 60df= .62, p = .59).

Psychological Distress

Current psychological distress in this study was assessed by the HAD Scale (Zigmond & Snaith, 1983) which presents information on anxiety and depression subscales. Each scale has a possible score of 21 with higher scores indicative of elevated symptom severity. The mean score on the 7-item depression subscale was 6.58 (range=13), just under the diagnostic threshhold of 7. Sixty percent of the sample scored at or below this threshhold, indicative of no depression in the majority of cases. A further 25% scored between 8-10 indicating possible or "borderline" depression, while the scores of the remaining 15% were at a level indicative of probably significant depression. There were no gender differences in levels of depression.

Of interest, scores on the HAD anxiety subscale produced a comparatively inverted profile. The mean score on this subscale was 10.66 (range=17). While a minority (15%) of the sample scored at or below the cutpoint indicating the absence of anxiety, over a quarter (27%) scored at a level indicative of possible or "borderline" anxiety, and the majority (58%) at levels that indicated the presence of probably significant anxiety. Women scored significantly higher on the anxiety subscale than men (mean of 12.56 for women versus 10.02 for men; t, 60df = -2.45, p = .017).

Motivation/Readiness to Change

Responses to the adapted RCQ (Rollnick et al., 1992) were used to designate participants' current stage in the Stages of Change Model (Prochaska & Di Clemente, 1986; Prochaska et al., 1992). The list of statements in the RCQ form subscales that approximate the theoretical stages in the model.

The refined method of scoring responses yielded four stages, and sample designations were as follows:

Action	(44%)
Preparation	(36%)
Contemplation	(7%)
Precontemplation	(13%)

These results indicate a sample profile of relatively highly motivated cannabis treatment seekers. Designations suggest that the majority (80%) both acknowledged their cannabis use to be a problem, and had made a decision to either stop using or to reduce consumption. While those in the Preparation stage were currently preparing to put this decision into effect, those in the Action stage claimed to be actively doing something to address their use problem.

A comparatively small group (7%) were classified as being in the Contemplation stage, (theoretically) characterized by an acknowledgment that a problem does exist, but ambivalence as to whether change should be attempted. The remaining 13% were designated as "Precontemplators". From the stages perspective, Precontemplators typically lack awareness, or deny, that a problem exists.

The Pearson chi square statistic was calculated to examine the amount of agreement between participants' designated stage of change and stated personal treatment goals.

Although not significant at the .05 level, the p value suggested some agreement between the two measures $(X 2, (9, N=60) = 16.61, p = .06)$.

The same statistic was then used to examine the relationship between gender and ethnicity and readiness for change. There were no significant differences in readiness for change/motivation by gender $(X 2 (3, N =62) = 1.78, p = .62)$ or ethnicity $(X 2 (6, N =62) = 6.77, p =. 34)$.

Summary Index

Client scores (n=63) on the composite created as a summary index of all variables used in this study (possible range 1-5) were: Mean = 2.69; SD = .50; Range = 2.38; Minimum = 1.57; Maximum = 3.96.

Correlates of Cannabis Use

Pearson product moment correlation coefficients were calculated to examine the demographic and psychosocial correlates of cannabis use at treatment entry (see Table 4). As a variable of particular interest in this study, the coefficient for cognitive problems was calculated twice; firstly as a constituent item of the Cannabis-related Problems Index, and then again as an individual variable (see Table 4).

Table 4. Correlates of Cannabis Use: Pearson Correlation Coefficients (n=63)

Variable	YRREGUSE	USES90	Age	Gender	Ethnicity
YRREGUSE		.02	.87***	.09	.02
USES90	.02		-.02	-.27*	-.27*
Depression	.24	.36**	.27*	-.02	-.16
Anxiety	.26*	.12	.25*	.30*	.14
General Health	-.00	-.07	-.07	.05	-.16
Cannabis-related problems	.19	.35*	.06	-.08	-.23
Social and economic stability	-.13	-.20	-.02	.03	.02
Readiness for change	.21	.04	.24	.03	-.15
Cognitive problems	-.26*	-.33*	-.11	-.03	.21

Note: YRREGUSE = Chronicity measure: number of years regular cannabis use

   USES90(U2) = Quantity/frequency measure: number of times used in past 90 days

*= two-tailed p .05 ; ** = two-tailed p < .01; *** = p < .001

As this table shows, of the demographic variables associations were generally weakest between gender and ethnicity and the chronicity/years of regular use variable. As expected, however, age yielded the strongest correlation with chronicity of use (p= <. 0005).

The negative correlation between ethnicity and the quantity-frequency (Q-F) measure indicated that Europeans had used significantly more cannabis than non-Europeans (Maori) in the 90 days prior to treatment (p =. 04). A weak negative correlation between age and the Q-F measure suggested that in this pretreatment interval younger clients reported using more cannabis than older clients. In addition the moderate negative correlation between gender and the Q-F measure indicated that men had used significantly more cannabis than women (p =. 033). This is consistent with the t-test previously reported.

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A generally stronger pattern of association was evident between the cannabis use variables and measures of psychological distress, cannabis-related problems, and cognitive problems (when examined separately).

As can be seen in Table 4, although not related with the measure of general health used in this study, both cannabis use variables were correlated with the HAD Scale measure of depression. The moderate (but nonsignificant) positive correlation between chronicity of use and depression indicated that those with a longer history of use generally reported higher levels of depression (p =. 06). The stronger positive association between the Q-F measure and depression, moreover, suggested that heavier users had scores indicative of significantly elevated levels of depression at treatment entry (p = .004). While depression was generally unrelated to either gender or ethnicity, the moderate positive correlation between depression and age indicated that older clients in this sample scored significantly higher on the depression scale than their younger counterparts (p = .032).

Partial correlation coefficients were computed to further examine the associations among these variables. When controlling for years of regular use, there was no significant relation between age and depression. Alternatively, when holding depression constant, the partial correlation between age and chronicity of use was highly significant (p=<.0005). Controlling for age, partial correlations between depression, Q-F of cannabis use, and gender show that while depression and gender are not significantly correlated, depression and Q-F of cannabis use are (p = .002). Higher levels of cannabis use in the 90- day pretreatment period were associated with significantly higher levels of depression.

When anxiety was examined a different pattern of association emerged. As can be observed, the Q-F measure of cannabis use was only weakly related to anxiety. In contrast, the moderate positive correlation between chronicity of use and anxiety indicated significantly higher anxiety scores among longer-term users (p = .045).

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As was depression, anxiety was moderately related to age, the positive correlation indicating that older clients had significantly higher anxiety scores (p =. 046). In contrast to depression, however, anxiety was associated with gender, the stronger positive correlation indicative of women scoring significantly higher than men on the anxiety scale (p =. 017). This was consistent with the t statistic previously reported. When controlling for gender, however, the partial correlation between anxiety and Q-F of cannabis use was significant (p = .046). Higher levels of cannabis use just prior to treatment were associated with significantly higher levels of anxiety.

Cannabis-related problems were only relatively weakly associated with chronicity of use but more strongly associated with the Q-F measure. Thus, heavier users at treatment entry reported significantly more cannabis-related problems (p =. 006). In general, these problems were either unrelated or very weakly related to the demographic variables.

When examined in isolation, however, a markedly stronger association was manifest between cognitive problems and both of the cannabis use variables. A moderate to strong negative correlation between chronicity of use and cognitive problems indicated that those with a longer history of use reported significantly more problems than shorter-term users (p =.04). In addition, the even stronger negative correlation between Q-F of recent past use and these problems indicated that heavier users reported experiencing significantly more problems with their thinking processes (p. 01). Although cognitive problems were generally unrelated to age and gender, a moderate correlation with ethnicity was evident, indicating that non-Europeans (Maori) generally reported more cannabis-related cognitive problems (p =. 10).

Measures of social and economic stability were generally weak and differentially related to the cannabis use variables. A weak negative correlation with chronicity of use suggested that those who had used for longer generally evidenced higher levels of social and occupational dysfunction. However, the stronger negative (but nonsignificant) correlation with the Q-F measure indicated that evidence of social and occupational dysfunction was more uniformly present among those who were heavier users at treatment entry (p=. 11).

Finally, readiness for change was correlated with some of the variables more than others. While a weak positive correlation with the Q-F measure was evident, a stronger positive correlation with chronicity of use suggested that those who had used for longer were more highly motivated/ready to change their cannabis use ($p = .09$). Readiness for change was unrelated to both gender and ethnicity, but although nonsignificant, the moderate positive association with age was indicative of older clients being generally more ready to do something about their cannabis use problems ($p =. 07$).

THE EFFECTIVENESS OF TREATMENT PROGRAMMES: BEHAVIOURAL OUTCOMES AND SATISFACTION WITH TREATMENT

At the cut-off point for data collection five participants were still engaged in treatment and therefore excluded from any further analyses, leaving a sample of 58. Of these, 40 had dropped out of treatment after varying levels of therapeutic engagement. The remainder of this sample (n=18) had completed treatment (mean of 5.4 sessions ranging between 3 - 14 sessions) and had provided posttreatment assessment data in a pre-planned exit session. Thus the results of outcome analyses to follow in this section apply only to this subsample of 18 treatment graduates.

Treatment Components

During the treatment period a total of 283 (mean of 13.72) treatment components were delivered to the 18 treatment completers. In descending order of frequency the mean number of the various components received by each client was:

Motivational Interview	3.28
Goal Setting	3.28

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Educational	2.06
Relapse Prevention	1.94
Urine Testing/Feedback	1.21
Assessment	1.17
Problem Solving	1.11
Other *	.83
Social Skills Training	.56
Referral to other group or service	.28

* Other includes acupuncture, natural therapies, exercise programmes, homework assignments, planning lifestyle change, stress management, Rational Emotive Therapy, cannabis and alcohol use diary, nutrition planning.

Within-Treatment Change

Wilcoxon Matched-Pairs Signed-Ranks Tests were most appropriate for pre-post analyses in this small sample, and some supplementary t-tests were conducted. Pre- and post- test means and mean changes occurring during treatment on the outcome measures from the counsellor-administered questionnaire are presented with the Z statistic and significance levels in Table 5. The same information with regard to the self-report scales and the composite outcome indexes is presented in Table 6.

Table 5. Mean Changes During Treatment (n=18 unless specified)

Variable	Pretest	Posttest	Mean change	Z
Days used cannabis per week	7.56	5.67	1.89	-2.15 *
Times used per day	4.59	3.59	1.00	-1.86 *
Days used tobacco per week	5.56	5.50	.06	.00
Days used alcohol per week	2.65	2.59	.06	-.05
Other drug use (n=12)	1.92	1.92	.00	.00
Other drug problems	1.56	1.78	-.22	-1.63
Goal for cannabis use	1.73	1.73	.00	.00
Confidence to achieve goal for cannabis use	2.06	1.29	.76	-2.65 **
Financial problems	2.61	2.94	-.33	-1.05
Times shifted home	43.17	1.61	41.56	-3.30 ***
In relationship	1.50	1.56	-.06	-.58
Duration of relationship	34.38	45.00	-10.63	-2.37 *
Cannabis-related partner problems	3.60	3.80	-.20	-1.00
Partner uses cannabis regularly (n=9)	1.56	1.44	.11	-1.00
Cannabis-related job problems (n=9)	4.11	5.00	-.89	-1.84
Times sought medical or psychological treatment	2.66	2.33	.33	-.72
Cannabis-related health problems	1.33	1.77	- .44	-2.00
Cannabis-related cognitive problems	2.35	2.89	- .53	-1.46

* = Monte Carlo 1-tailed p .05,   ** = Monte Carlo1-tailed p .01, *** = Monte Carlo
   I-tailed p. < .001

Table 6. Mean Changes On Outcome Indexes (n=18)

Index	Pretest	Posttest	Mean Change	Z
Cannabis Use				
Days used past 90 days	77.88	52.00	25.88	-2.23 **
Times used past 90 days	334.97	236.17	98.80	-2.22 **
Anxiety	11.28	8.50	2.78	-2.65 ***
Depression	6.94	4.72	2.22	-2.11 *
General Health	2.66	2.33	.33	- .72
Cannabis-related problems	3.13	2.81	.32	-1.27
Social and Economic Stability	3.02	2.94	.08	-1.07
Readiness to Change	3.28	3.28	.00	- .14
Self-efficacy	2.06	1.29	.76	-2.65 ***
Summary Index	2.65	2.12	.53	-2.68 ***

Note: Summary Index = Composite summary mean of overall change

* = Monte Carlo 1-tailed p < .05   ** = Monte Carlo 1-tailed p .01   *** = Monte
Carlo 1-tailed p < .01

Overall, results of analyses on the various outcome criteria indicated generally positive
change on most measures used in this study over the treatment period. Of particular
interest was a significant reduction on all indicators of cannabis consumption and on both
subscales of the psychological distress measure. In addition, a significant increase on the
measure of self-efficacy was indicated.

Cannabis and Other Drug Use

Table 6 shows that a significant overall reduction in cannabis use occurred during treatment. This represented a substantial drop in both the frequency/number of days on which cannabis was used (Wilcoxon z = -2.23, p = .01) and the times used (Wilcoxon z =-2.22, p = .01) during the treatment period. As can be observed in Table 5, this reflects a mean drop in use on both the days per week on which cannabis was used (5.67 vs. 7.56) and the mean number of times used on a typical day (3.59 vs. 4.59). Of note, only 2 individuals (11%) among treatment completers reported "no use" at all during the past 90 days. (An examination of the corresponding laboratory reports verified these claims).

Closer scrutiny of individual level data reveals that compared to pretreatment consumption levels, 50 per cent of the sample reported using cannabis on fewer of the 90 days immediately prior to posttreatment assessment. However, the remaining 50 percent were using on either the *same* or *more* days per week than at pretest. Similarly, while 72 percent reported fewer use episodes on a typical day of use, 28 percent reported using the *same* or *more* times per day. Of these, 40 per cent were using more than 2 times per day.

Overall, 5 clients (28%) were using more cannabis posttreatment and 13 (72%) were using less than at intake assessment. Notably, two-thirds (12) were still using cannabis at levels considered harmful (3 or more days per week) at treatment termination. Half (9), moreover, were still using daily/near daily.

Student's *t*-tests were conducted to compare the cannabis use outcomes of men and women. There were no significant gender differences in posttreatment change on either the days of cannabis use or the times used in the past 90 days.

There was no measurable mean change in personal goals for future cannabis use. All but one participant (95%) intended to at least change their cannabis use. However, as Tables 5 and 6 show, participants did report a significant increase from pretreatment levels of the

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confidence they felt in achieving their individual goals (Wilcoxon $z = -2.65$, $p = .01$; t, 16df $= 3.25$, $p = .01$). This posttreatment increase in self-efficacy indicates that at the exit assessment all treatment completers (100%) felt either "somewhat confident" (33%) or "very confident" (67%) in their ability to reach their personal goals for future cannabis use.

As Table 5 indicates, little change was reported in use of drugs other than cannabis. Minor reductions only were reported in days of alcohol use, while tobacco consumption remained at pretreatment levels.

Because of the relatively low prevalence of other drugs at both assessment points (opiates, cocaine, amphetamines, hallucinogens, inhalants/solvents, benzodiazepines and painkillers) these categories were collapsed and subsequently analysed and reported as "other drug use" (see Table 5). As can be observed, there was no mean change from pretreatment levels in reported use of these "other drug" categories.

Of interest, however, participants at the posttest assessment reported a mean (though not significant) reduction from pretreatment levels of problems with drugs other than cannabis (Wilcoxon $z = -1.63$, $p = .11$). Of the 4 participants reporting concurrent drug problems at treatment termination, alcohol was the problem drug for 2 clients, tobacco for another, and methadone for the other. This latter category represented a pre-existing dependency problem.

Validity of self-reports of cannabis use

Self-reports of cannabis use were obtained from 59 (94%) of the pretreatment sample and from 16 (89%) of the 18 treatment completers. Spearman correlation coefficients were calculated to assess the correspondence between self-reports and the biochemical verifiers. As discussed in chapter four, these laboratory tests are screening procedures only, and because of the wide variation in individual physiology provide only a preliminary indication of recent cannabis use from levels of urinary cannabinoids. Correlations were

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generally stronger at the posttest than the pretest. While the pretest correspondence between the reported quantity used in the past 90 days was relatively weakly correlated with the biochemical test (Υ_s= .19, p = .15) reported frequency of use showed a closer agreement that was significant at the .01 level (Υ_s= .34, p = .01). By comparison, posttest self-reports on both measures of cannabis use corresponded closely with the laboratory tests (quantity of use, Υ_s = .76, p = .001; frequency of use, Υ_s =.70, p = .003). These data provide strong support for the validity of self-reports of cannabis use. In particular, the parity evident in the posttest reports suggests the absence of under-reporting or other bias.

Other Improved Outcomes

Psychological Distress

A statistically significant reduction on mean pretreatment scores on both the anxiety and depression subscales of the HAD Scale was reported. As Table 6 shows there was a significant reduction in anxiety from pretreatment levels at the <.01 level (Wilcoxon z = - 2.65, p = .004) representing a mean drop of 2.78 on the Anxiety scale (possible score 0 - 21). A concomitant pre-post reduction occurred in mean levels of depression, significant at the < .05 level (Wilcoxon z = - 2.11, p = .02; t, 17df, = 2.54, p = .02). This reflects a mean drop of 2.22 on the Depression scale (possible score 0 - 21).

Posttreatment assessment scores indicated that five (28%) treatment completers were probably significantly depressed and a similar proportion (28%) probably experiencing significant anxiety. Although not directly comparable with pretreatment scores of the whole sample (n=63), these data suggest a better overall outcome for those suffering from significant levels of pretreatment anxiety.

As previously noted, however, mean change scores mask important individual-level information. Inspection of the raw change data clarified that while the majority of clients

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reported within-treatment amelioration of symptom severity of both anxiety and depression, not all clients did so. Indeed, while a sizeable minority (17%) reported higher levels, and a further 17 per cent no change in depression, 22 percent reported increased anxiety at the end-of-treatment assessment.

Because of the special interest in the relationship between cannabis use and psychological distress, the relationships between changes in cannabis use and both pre- and posttreatment psychological distress, and between change in psychological distress and changes in cannabis use were examined.

Among the treatment completers were 2 clients who were outliers in terms of both sessions attendance and duration (10 and 14 sessions over a period of one year compared to other clients with 3 - 8 sessions over a modal period of 2-4 months) whose data skewed both the sessions and psychological distress variables. Inspection of their data revealed that these 2 clients were also different to the remainder of the sample in other important ways. Pending court cases was the motivation for both clients. One of these clients was also withdrawing from benzodiazepines. Treatment for both was interrupted by a 4-month prison sentence, after which they resumed treatment in a sporadic pattern. Treatment terminated for one of these clients by reincarceration following increased cannabis use. The other was also convicted again, and continued smoking at heavy levels. Accordingly, it was considered appropriate to eliminate their data on analyses involving treatment participation and psychological distress. When their data were omitted from this analysis, Spearman correlation coefficients showed a highly significant association between changes in cannabis use and depression ($p = .006$) and anxiety ($p = .001$)

General Health

Interestingly, a concurrent (but nonsignificant) reduction occurred in the mean number of times clients sought help for any medical or psychological problems during the treatment period (see Table 5 and 6). During the treatment period 6 clients (33%) had not sought any

form of treatment at all, while a further 33% had done so less than 3 times. However, the remaining 6 clients (33%) had sought treatment more than 3 times, with 3 clients doing so on 10 or more occasions. In addition 7 clients (39%) reported seeking other concurrent counselling or therapy during their cannabis treatment programme. Treatment specified was for programmes such as AA, STOP (smoking cessation programme), Anger Management, Relationship Counselling, and Community Mental Health Clinic for depression.

Cannabis-related Problems

Although not reaching significance level, Table 6 indicates a small postreatment mean reduction in reporting of problems directly attributed to cannabis use, reflecting reductions in personal relationships, employment, general health and cognitive/thinking problems over the treatment period (Wilcoxon $z = -1.27$, $p = .11$; t, 17df $= 1.20$, $p = .25$). This represents a mean change of .32 on the 4-item Problems Index. Mean changes on the individual constituent items are shown in Table 5. Of interest, reductions in job problems (Wilcoxon $z = -1.84$, $p = .06$), and to a lesser degree cognitive problems (Wilcoxon $z = -1.46$, $p = .09$), appear to account for a greater proportion of the mean change than the other items in the index.

Social and Economic Stability

Table 6 indicates a minor mean increase of .08 at the exit assessment on the index of social and economic stability (Wilcoxon $z = -1.07$, $p = .16$; t, 17df $= 1.19$, $p = .25$). This represents small mean positive changes in personal relationships, employment, financial difficulties, residential stability, and criminal/legal involvement. Mean changes on individual variables in this index and their significance can be observed in Table 5. As this Table shows, a highly significant increase in residential stability and a significant increase in duration of clients' personal relationships appear to account for most of the mean improvement on this index. This was not surprising and appears consistent with this

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subsample of clients remaining 'put' during treatment. However, both variables are not directly comparable with their paired value in the analyses, and thus have a tendency to inflate the apparent overall change profile. The reader is cautioned to keep this in mind when inspecting Tables 5 and 6.

A small reduction in mean partner status was apparent at the exit assessment (see Table 5) indicative of relationship terminations during treatment. Four clients reported a criminal conviction since the pretreatment assessment, with one being cannabis-related. At treatment termination four clients were still awaiting trial for a cannabis-related offence.

Readiness to Change/ Motivation

Spearman correlation coefficients were computed to assess the predictive validity of the RCQ for this sample of cannabis clients. There was no significant correlation between change in cannabis use and motivation at either pre or posttest assessment.

As Table 6 shows, there was no mean change in motivational status over the treatment period (Wilcoxon $z = -.14$, $p = .45$). At the posttreatment assessment stages of change designations were:

Action	=12 (67%)
Preparation	= 2 (11%)
Contemplation	= 1 (5%)
Precontemplation	= 3 (17%)

This overall profile of designations appears similar to that of the larger pretreatment sample (n=63). However, mean change scores mask important within-subjects change information. Indeed, an examination of changes in Stages of Change designations for the 18 treatment completers over the treatment period revealed an interesting pattern of movement between the stages. Of the 17 clients who completed the Cannabis RTC Questionnaire at both

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assessment points, 6 clients whose pretreatment scores indicated Action stage designations remained consistent at the exit assessment. Scores of the remaining 11 participants indicated a mixed pattern of movement thus:

Positive changes (n=6)

Preparation to Action	= 4
Contemplation to Action	= 1
Precontemplation to Action	= 1

Negative changes (n=5)

Action to Precontemplation	= 1
Action to Contemplation	= 2
Preparation to Contemplation	= 2

As expected, the above configuration reveals important individual-level information that is lost in group summary data which yields a "net" result. Inspection of this (self-reported) during-treatment movement between the various (theoretical) stages of change appears consistent with the model's conceptualisation of change as a cyclical, recursive pattern.

Overall Change: the Summary Index

Pre-post scores of the 18 treatment completers on all the measures used in this study as indicators of outcome were then compared using the SUMMARY index compiled for use as a single index of overall outcome. As Table 6 shows, this pre-post comparison revealed a mean change of .53 (SD= .69) on the outcome composite (Wilcoxon z = - 2.68, p = .003) representing significant mean overall improvement during treatment. Spearman correlation coefficients revealed that there were no significant differences in overall change by age (p = .42) gender (p = .16) or ethnicity (p = .27). Scores of the vast majority (83%) indicated

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overall improvement during treatment. However, 3 clients (17%) had higher posttreatment than pretreatment scores on the composite summary measure indicative of more problems at end-of-treatment.

In sum, all the indicators used in this study to measure cannabis use, cannabis-related problems and psychosocial adjustment yielded a summary score indicative of positive during-treatment change that was significant at the <.01 level for the subsample of 18 clients who completed treatment.

Client Change and Level of Therapeutic Engagement

Spearman correlation coefficients were calculated to determine the association between mean client change on the major outcome indexes and participation in treatment (see Table 7). This tests whether treatment effects occurred at a constant rate, and thus resulted from treatment rather than some other source. Data from the 2 clients (previously discussed) representing outliers skewing the sessions variable was appropriately deleted from this analysis.

Table 7. Association Between Client Change and Number of Treatment Sessions (n=16)

Variable	Sessions
Change in Cannabis Use	
Days of use in past 90 days	.57 *
Times used in past 90 days	.16
Change in Psychological Distress	
Anxiety	.03
Depression	- .00
Change in General Health	-.51 *
Change in cannabis-related problems	.01
Change in Social and Economic Stability	.04
Change in Motivation/ Readiness to Change	.12
Change in Self-efficacy	.43 *
Summary of overall change	.14

* = 1–tailed p = .05

As this table shows, while attending more sessions was strongly associated with a change in frequency/days used significant at the <.05 level (p = .02), there was only a weak positive correlation between sessions attended and the number of times used in the past 90 days.

There was a strong significant association of general health with treatment participation (p=.02), but this association was in the negative direction. That is, clients who attended more sessions reported less reduction in their treatment-seeking for general health problems.

Of the four variables describing changes in psychological wellbeing, only self-efficacy showed a modest to strong significant positive association with sessions attendance (p = .05). By way of contrast, anxiety and depression, and readiness for change/motivation showed no change/improvement related to quantity or "dose" of treatment.

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Similarly, there was no correlation between change in cannabis-related problems or social and economic stability and sessions attended. Finally, as Table 7 shows, there was no significant association between overall change and participation in treatment

Treatment Participation and Predictors of Dropout

Over the treatment period the sample of cannabis clients (n=58) attended a total of 213 sessions (mean = 3.67; SD = 2.65; range = 13). As time in treatment progressed, however, an escalating rate of attrition from the study occurred. Of the sample, 40 clients had dropped out after varying levels of session attendance (mean = 2.9; SD = 1,96; range = 7). When measured in number of sessions attended treatment graduates had significantly higher rates of treatment participation than dropouts (mean of 5.4 for completers and 2.9 for dropouts; t, 56df = -3.66, p= .01; z = -3.57, p = <.001).

A marked distribution was evident in the attrition profile. While twenty-eight percent (11) of the dropouts attended one session only ("immediate" dropouts), a further 25 percent (10) had dropped out after the second session. Three-quarters (75%) had dropped out after 3 sessions, and the vast majority (90%) had done so after attending 5 sessions. The remaining dropouts attended 6 (one client), 7 (one client), and 8 (two clients) sessions.

It transpired that examining number of sessions as a measure of therapeutic engagement was not appropriate in this study as several participants who dropped out attended more sessions than some treatment completers. As this research was conducted in a naturalistic setting and aimed specifically at examining what actually happens in the 'real world' context of outpatient cannabis treatment programmes, it was inappropriate to predetermine or manipulate what constituted an 'appropriate' number of treatment sessions before treatment termination. As it varied in number across completers and dropouts, therefore, treatment participation (measured by number of sessions) was a confounding variable.

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Accordingly, Student's *t*-tests were undertaken to test hypotheses 1 – 9 (see page 108). Means and standard deviations for those who completed treatment and those who dropped out on variables hypothesized to be related to dropout are presented in Table 8.

Table 8. Pretreatment Client Characteristics as Predictors of Dropout (n=58)

Variable	Groups	N	Mean	SD	t	df	Sig.
Social and economic	1	18	3.00	.32	1.53	56	.13
stability	2	40	2.82	.44			
Cannabis-related problems	1	18	3.13	1.23	-1.76	55	.08
	2	39	3.59	0.81			
No. times used cannabis	1	18	336.19	209.36	.56	56	.58
past 90 days	2	40	296.08	272.62			
Days used cannabis past 90	1	18	78.00	18.92	1.18	56	.58
days	2	40	69.88	26.16			
Depression	1	18	6.94	4.05	.07	55	.95
	2	39	6.87	3.46			
Anxiety	1	18	11.28	3.69	.12	55	.90
	2	39	11.15	3.45			
Readiness for change	1	18	10.44	7.05	-.84	55`	.41
	2	39	12.15	7.24			
Cognitive problems	1	17	2.35	1.11	.07	54	.95
	2	39	2.33	1.01			
Self-efficacy	1	17	2.06	.97	-.15	55	.88
	2	40	2.10	.93			

Group 1 = Treatment Completers

Group 2 = Dropouts

As this table shows, there were *no* significant differences between treatment completers and dropouts on measures used in this study of pretreatment cannabis consumption,

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cannabis-related problems, depression, anxiety, social and economic stability, readiness to change, cognitive/thinking problems, and self-efficacy. *Post hoc* comparisons were conducted to clarify any differences on these variables between 'early' dropouts (attending 1-2 sessions) and "later" dropouts (attending 3 or more sessions). No significant differences were found between these dropout groups.

Given these unexpected findings, supplementary tests were used to explore other possible differences between the treatment completers/dropout groups. There were no significant differences between treatment graduates and dropouts by age ($p = .28$), gender ($p = .12$) or ethnicity ($p = 1.00$).

Differences were found, however, in both the number and types of components delivered to clients in these groups during the sessions attended. Treatment completers received significantly more treatment components during treatment sessions than did treatment dropouts (mean of 6.56 for treatment completers and 5.03 for dropouts; t, $56df = - 2.60$, $p = .01$; Mann-Whitney U, $p = .01$).

Furthermore, treatment completers received significantly more Education (mean of 2.06 vs. 1.13; t, $56df = -2.66$, $p = 01$), Urine Testing/Feedback (mean of 1.22 vs. .58, $p = .002$), Problem Solving Skills (mean of 1.11 vs. .28; t, $56df$, $p = -2.39$, $p = .03$), and Goal Setting (mean of 3.28 vs. 1.40; t, $56df$, $p = .003$) components than did dropouts. Though not reaching statistical significance, treatment completers also received more Motivational Interviewing components ($p = .08$). There were no significant differences in the number of Assessment, Relapse Prevention, Referral, Social Skills Training, or Other treatment components delivered to treatment completers or dropouts.

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Satisfaction with Treatment

Satisfaction with treatment provided the other test of treatment effectiveness and was used to supplement behavioural change scores. Indicators of quality rather than quantity can be found in the client's evaluation of his/her treatment experience.

Mean client satisfaction with treatment on the 3-item index (Satisfaction With Cannabis Treatment Programme Questionnaire) was 1.46 (SD .56; range 1.67). When asked to what extent treatment had met their needs clients' responses indicated that treatment had met "almost all my needs" (67%) "most of my needs" (22%) or "only a few of my needs" (11%). Indications of general satisfaction with treatment services were that almost all were "very satisfied" (55%) or "mostly satisfied" (39%). Only one client (6%) was "mildly dissatisfied". This level of satisfaction was reflected in responses when asked if they would return to the programme if seeking help again. Ninety-four percent said they would return (61% "definitely" and 33% "yes, I think so") while only one client (6%) did not think he or she would come back to the cannabis programme.

Given the dearth of satisfaction data in the cannabis treatment area, Spearman correlation coefficients were computed to examine the association between client pretreatment characteristics and **global** satisfaction with treatment (see Table 9). This same statistic was then used to investigate the association between treatment components received and satisfaction. At this juncture this was used as an approximation of **specific** satisfaction (see Table 10).

Table 9. Association between Client Characteristics and Satisfaction (n=18)

Variable	Satisfaction
Age	-.10
Gender	-.66 **
Ethnicity	-.29
Years of regular use	.00
Days used past 90 days	.45
Times used past 90 days	.75 ***
Cannabis-related problems	.43
Cognitive problems	-.52 *
Social and Economic Stability	-.66 **
Anxiety	.29
Depression	.49 *
General Health	-.04
Readiness to Change/Motivation	-.15
Self-efficacy	.35
Summary Index	.71 **

Note: Summary Index = the overall composite summary index of all outcome
       criteria.

* = 2-tailed p = .05   ** = 2-tailed p = <.01   ***= 2-tailed p = <.001

Global Satisfaction

Table 9 reveals some associations of clinical interest. Chronicity/years of regular cannabis use was not related to satisfaction with treatment. However, frequency of use was moderately (though nonsignificant) positively associated with satisfaction (p=.06), while quantity/times used in the last 90 days pretreatment showed a highly significant association with satisfaction (p=.000). Those using more often, and especially heavier users, reported greater satisfaction with treatment services.

Of the demographic variables, gender had a strong significant association with satisfaction, with men being more satisfied with treatment (p=.003). Although not significant, the moderate relationship between ethnicity and satisfaction indicated that European New Zealanders were generally more satisfied than non-Europeans (Maori). There was no significant association between age and satisfaction. Of the psychological variables, social and economic stability was significantly associated with satisfaction (p=.003), indicating that those less stable at treatment entry reported more satisfaction. Similarly, those with more cognitive problems tended to be more satisfied with treatment (p=.03). Though failing to reach statistical significance, those with more cannabis-related problems were also more satisfied with treatment (p=.08). There was no significant association for general health and readiness to change.

Of the remaining psychological variables, only depression showed a significant association with satisfaction (p=.04), indicating that those who were more depressed at treatment admission reported being more satisfied with treatment. Although not significant the association between anxiety and satisfaction was consistent with those with higher pretreatment levels of anxiety being generally more satisfied. Clients with a greater sense of self-efficacy at treatment intake also tended to be more satisfied with services received. Finally, the highly significant association between the summary index and satisfaction (p=.001) indicates that those with lower overall levels of psychosocial adjustment at treatment entry were significantly more satisfied with the treatment services they received.

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Specific Satisfaction

As Table 10 shows, the only treatment component to reach significance level was Motivational Interviewing (p = .01). The strength of the association was noteworthy. Clients receiving more motivational interviews during treatment reported being more significantly more satisfied with services. There was a comparatively weaker positive association between satisfaction and Assessment, Education, Relapse Prevention, and Goal Setting, and these correlations failed to reach statistical significance.

The only other component significantly associated with satisfaction was Problem Solving Skills Training, but this association was in the negative direction. Clients who received more Problem Solving Skills therapy reported being significantly less satisfied with services (p = .03). The remaining nonsignificant associations were also in the negative direction, with varying strengths of association. That is, there was a moderate negative correlation between satisfaction and Social Skills Training, and only a weak negative association between satisfaction and both Referral and Urine Testing/Feedback components. There was no association between satisfaction and "Other" components.

Table 10. Association Between Treatment Components and Satisfaction (n=18)

Components	Satisfaction
Assessment	.22
Education	.22
Motivational Interviewing	.58 *
Relapse Prevention	.17
Social Skills Training	-.38
Urine Testing/Feedback	-.16
Problem Solving Skills	-.50 *
Referral	-.18
Goal Setting	.32
"Other"	-.04

Note: "Other" includes acupuncture, natural therapies, exercise programmes, homework assignments, planning strategies for lifestyle change, stress management, Family Therapy, Rational Emotive Therapy, Drug Use Diary, nutrition planning.

* = two-tailed $p = < .05$

The direction and strength of the two significant correlations justified a closer scrutiny of these associations among our treatment sample. As regression techniques were not appropriate with our small dataset, scatter plots were produced for this purpose (see Figure 1 and Figure 2)
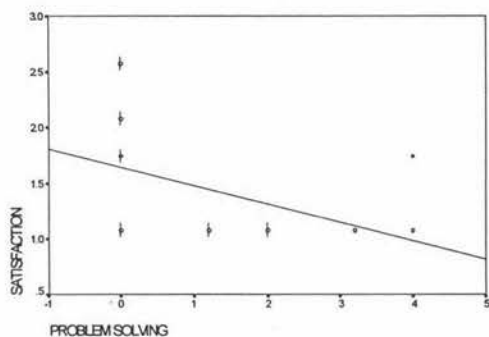
Figure 1. Satisfaction by Problem Solving Skills Training
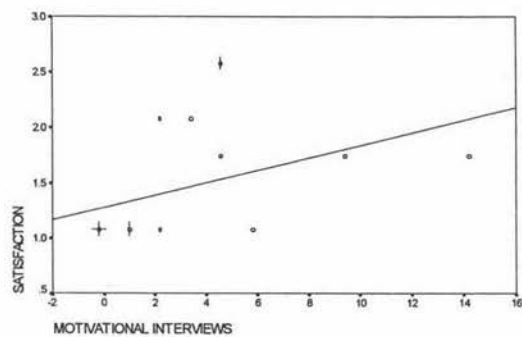
Figure 2. Satisfaction by Motivational Interviewing

As Figure 1 shows, when cases receiving no Problem Solving Sills Training components are removed from the correlation, the slope of the remaining data shows little association remains ($Y_s = .15$ (N=9), p = .35). However, when a similar procedure is applied to the Motivational Interviewing with Satisfaction correlation (Figure 2) the overall relationship remains more 'normal' (i.e. a linear positive relation, and not a Type I error). Receiving more Motivational Interviewing components was associated with greater reported satisfaction with treatment.

FOLLOW-UP SURVEY

Despite the vigorous and sustained attrition-prevention strategies implemented in an effort to maximize the return rate of the 3-month posttreatment postal survey, the response (n=8) was abysmal and disappointing, effectively exacerbating the already substantial attrition at

this juncture. The researcher's typical experience was, for example, "Return to Sender - not at this address" or "Gone - no forwarding address". Of interest, three of the returned surveys were from 'early' dropouts. Higher return rates may have made a comparison between treatment completers and dropouts viable. However, inadequate (and non-validated) data in this study rendered statistical analyses infeasible. In addition, responses were sometimes inconsistent, hence unreliable and not interpretable. Nonetheless, a brief discussion of this small subgroup's subjective impressions of the treatment experience is warranted.

Posttreatment evaluation of the cannabis treatment programme by respondents is shown in Table 11. As this table shows, clients were generally satisfied with treatment services received and indicated that they would return to the programme if seeking help again. However, as Table 11 also shows, treatment did not meet *all* of the clients' needs.

Clients' impressions of the **therapeutic alliance** were also generally very positive. Clients indicated that their counsellor was empathic and caring "always" or "most of the time". Alternatively, when asked if counsellors were judgmental, confrontational or controlling, the modal response was "not at all". Only one client thought his/her counsellor had been "sometimes" disapproving or judgmental.

Most clients reported that treatment had been helpful at least "a bit" in dealing with the problem areas of their lives. Of particular interest, treatment appeared to have been most helpful in the areas of clients' relationships, general health/wellbeing, and their cognitive/thinking abilities. However, three clients (38%) indicated that treatment had "made no difference" in these problem areas. One client indicated that the programme had "made things much worse" with regard to his/her involvement with the legal system. When asked to what extent the various components had helped them deal with their cannabis use, all of the components were endorsed to varying degrees of perceived helpfulness. Components that appeared to be particularly helpful ("helped a lot") were Assessment, Education, Motivational Interviewing, Relapse Prevention, and Goal Setting.

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Nonetheless, when asked if they had achieved their personal treatment goals for cannabis use, over half (5) of the clients endorsed the negative ("no"). Consistent with this response, over half (5) reported daily cannabis use in the 90-day posttreatment interval. Furthermore, on the days they used these clients reported using cannabis between 2 and 40 times. Nonetheless, all but one client endorsed "abstinence" as their goal for future cannabis use, and all of these felt either "very confident" or "somewhat confident" about their ability to achieve their personal goals. One client who was using daily intended "to continue as before"

Four clients (50%) reported having attended other treatment programmes since the cannabis programme, such as smoking cessation programmes, AA and NA.

The magnitude of the drug's addictive potential might well be captured in a client's voluntary comment: "I have been attending both AA and NA since treatment as I have really had enough but I still can't stay stopped...I still need more help"

Table 11. Evaluation of the Cannabis Treatment Programme (n=8)

Satisfaction Variable	N
Overall satisfaction with treatment	
Very satisfied	4
Mostly satisfied	2
Mildly dissatisfied	2
Extent to which treatment met client needs	
All client needs	1
Most of client needs	4
Only a few client needs	3
Client would return to programme	
Yes	7
No	1

Suggestions for Improvement to Programmes

At both the exit session and the follow-up survey assessment more than one-third of respondents (38%) made no suggestions at all in response to the open question inviting comments and/or suggestions for improvement to the cannabis treatment programme. Several clients made confirmatory comments such as "the programme worked well for me", and "stay the same". Others, however, did offer suggestions that indicated the potential for at least an examination of the assumptions underlying the treatment for cannabis use problems, and the approaches upon which services are based.

Three clients made comments that suggested more cannabis-specific education was indicated. These were comments such as "some factual videos on different drugs, their effects on people and their families, etc", and, "more understanding of cannabis derivatives i.e. concentrated THC and cannabis oil are different…you are treating all cannabis as the same when it is frightening different" (sic), and "insufficient information on pure cannibol oil extraction and extended use of". Another suggested the need for a telephone help-line for crisis support when craving for use was strong. A further suggestion, "introduction of THC in tablet form for withdrawal from extended cannabis use" reflects the desire/perceived need for a cannabis-specific medical withdrawal regimen.

Other suggestions indicated more intensive treatment/support would be helpful, such as "more contact/more supervision" and "weekly appointments instead of fortnightly". Two clients made seemingly dichotomous comments related to the therapeutic approach. While one respondent suggested that programmes "be a little tougher, as in most cases we need tough love", another suggested approaches be " a less combative or confrontational attacking method towards non-alcohol users…it's a surprising and off-putting technique." A suggestion for " a printed invitation on how to return " appeared to indicate the respondent's felt need/ambivalence about re-entry to the programme.

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Finally, one client's suggestion for ' improvement' to the cannabis treatment programme was perhaps more a poignant indicator of the motivation for use: "Legalise cannabis…it is a stress reliever" (sic).

DISCUSSION

Over the 20-month period of its duration this study ultimately succeeded in recruiting a sample of 63 from among the understudied population of primary cannabis clients as they presented for treatment at New Zealand outpatient drug treatment services. To the best of the writer's knowledge, it appears to be the first treatment outcome study in this country focusing specifically on the primary cannabis clientele of outpatient drug treatment services. Given the historical lack of a systematic national treatment database for the primary cannabis client population, data from this study should make a valuable initial contribution to this identified need for information (e.g., MOH, 1995, 1996, 1998) in the drug treatment field.

The general profile of cannabis users presenting for treatment at local treatment services is one of relatively young clients with a history of long-term regular use, accompanied by substantial morbidity/treatment needs in several important life areas. These interrelated domains include psychological distress, cognitive deficits, poor social and occupational functioning, and a history of criminal involvement.

CLIENT CHARACTERISTICS AND CORRELATES OF CANNABIS USE PROBLEMS

Sociodemographic Characteristics

The demographic profile of individuals in the study appears generally consistent with that developed of cannabis clients of drug treatment services in the 1998 National Telephone Survey (Adamson et al., 1998). As in the national survey, the average age of cannabis clients in this sample was 25 years and comprised a ratio of men to women of approximately 3:1. Also consistent with the survey, Maori were

overrepresented in this sample of cannabis clients compared to the general New Zealand population (21% vs. 14.5%). By contrast, Pacific Islanders were underrepresented (1% vs. 5.5%; 1996 Census of the New Zealand Population, Statistics New Zealand, 1997). Given these general similarities, it could be argued that this study succeeded in its aim to recruit a reasonably representative sample from among the population of primary cannabis clients of our local drug treatment services.

While clearly not directly comparable, data also accord with those from the recently-published National Survey of drug use in the New Zealand general population (Field & Casswell, 1999b) which reported higher prevalence of both lifetime and current cannabis use in younger age groups (and particularly 18-24) for both men and women. Of note, the comparison survey found that the quantity of cannabis females were using had increased significantly since the 1990 survey (Field & Casswell 1999a). Given that studies have found a more rapid development (or "telescoping") of dependence problems in women than men (e.g., Hasin et al., 1988; Hser et al., 1987; Swift et al., 1997), these data suggest that the current gender ratio of presentations for cannabis dependence problems may show a converging trend in future years. This is clearly an issue of considerable societal concern.

However, compared to other cannabis treatment study samples (e.g., Grenyer et al., 1996, 1997; Rees et al., 1998; Stephens et al., 1993, 1994), participants in this study were considerably younger. While ages ranged from as young as 13 up to 53 years, 75 percent of our sample were 30 years or younger. This phenomenon may reflect the widely-lamented decreasing age of initiation into cannabis use and cannabis dependence, and the parallel escalation in ever-younger presentations for treatment at our drug treatment services (e.g. Fergusson & Horwood, 1997; Poulton et al., 1997; MOH, 1996, 1998). Studies have suggested that adolescents are particularly vulnerable to the development of cannabis dependence problems, even at relatively lower levels of use (e.g., Anthony et al., 1994; Chen et al., 1997; Kandel et al., 1997).

Albeit, the voluntary nature of the recruitment procedures in this study precludes any valid inferences being drawn. For example, the possibility of a self-selection

bias in this sample cannot be discounted, as both younger clients and Maori might have felt less able to decline to participate in the study.

Cannabis Use

The measures implemented to assess cannabis consumption in this study yielded a typical profile of chronic, heavy use among this sample. The typical participant had initiated cannabis use at age 13.9 years, had begun using regularly by 16 years, and had used regularly for 8.6 years (ranging up to 29 years). The absence of gender differences in historical use accords with trends reported in several New Zealand longitudinal studies (e.g., Fergusson et al., 1996; McGee & Feehan, 1993; Poulton et al., 1997) and cross-sectional general population surveys (Field & Casswell, 1999a, 1999b).

Pretreatment patterns of cannabis use in this sample were very similar to those reported in treatment samples discussed earlier (e.g., Roffman et al., 1988; Stepehens et al., 1993). On average, participants had used cannabis on 73 of the 90 days immediately preceding treatment entry, with the vast majority (83%) using on a daily/near daily basis. Furthermore, while almost all the sample (86%) used cannabis more than once on a typical day of use, two-thirds used it 3 or more times per day. The only gender difference that did emerge was the number of times cannabis was used on a typical day of use. This was an expected finding as general population surveys, non-treatment and treatment samples consistently show that men, and especially younger men, are (currently) heavier users of cannabis than women.

Compared to other treatment samples (Stephens et al., 1993, 1994) our sample had initiated cannabis use at an earlier age (mean of 13.9 vs. 16.11 years) and had begun regular use when considerably younger (16 vs. 20 years). The age of initiation was also lower than that in the national survey where most had first tried cannabis between the ages of 15-18 years (Field & Caswell, 1999b). However, as these authors report, regular use in the general population was confined to a very small proportion (3%) with only 1 percent being daily users. Clearly, our sample over-represents that small minority of cannabis users who both initiate cannabis use at an

early age and continue to use regularly, with some individuals using for up to several decades (see e.g., Reilly et al, 1998; Swift et al., 1997).

Cannabis use is typically discontinued in the late 20s (Kandel & Davies, 1992). Albeit, the average age, consumption levels, and long-term profiles of use among our sample invites speculation as to just how many will continue their current use patterns with the potential for a variety of adverse (and potentially serious) psychosocial sequelae, despite their (almost) universal pretreatment aspirations to at least change their cannabis use.

Other Drug Use

As is the 'norm' among clients of drug treatment services in the 1990s. polydrug use was common. To ensure representativeness of primary cannabis treatment seekers the principal criterion for inclusion in this study was that participants both acknowledged and were actively seeking assistance for cannabis use problems. As expected, however, the majority were regular alcohol (85%) and tobacco (77%) consumers in combination with cannabis. This finding is consistent with most studies of both treatment and non-treatment populations. Given the reported level of consumption of these drugs it is not surprising that over a third were experiencing a concurrent drug problem (mainly alcohol 48%, and tobacco 28%). In contrast, reported use of other drugs was relatively low, a phenomenon also reflected in general population studies in New Zealand (e.g. Field & Casswell, 1999b; Wells et al., 1989, 1992).

Almost half (45%) had a history of drug problems other than cannabis. Again, alcohol (52%), tobacco and benzodiazepines (both 13%) were the most frequently reported problem drugs. However, as in both treatment and nontreatment cannabis samples (Stephens et al., 1993, 1994; Swift et al., 1997) only a relatively small number in this study (8 clients i.e., 13%) had previously sought help with these dependency problems, mainly alcohol treatment.

Data from this study, therefore, are generally consistent with much of the literature on cannabis use, which fails to support the concept of the "pure" cannabis user (e.g., Rainone et al., 1987; Reilly et al., 1998; Swift et al., 1997; Tennant, 1986). Even among the general population of New Zealand, for example, only 0.3 percent had tried only cannabis (Field & Casswell, 1999b). Four participants (6%) in this sample were currently using cannabis alone. Three of this small group of cannabis-only users did, however, report a lifetime dependence problem with a drug other than cannabis. The two female and two male European/Pakeha "pure" cannabis users had a mean age of 31 years and an average of 14 years regular use (range 5-27 years).

Psychosocial Adjustment and Correlates of Cannabis Use

Psychological Distress

As in the majority of drug treatment study samples generally (APA, 1995) and cannabis treatment samples in particular (Grenyer et al., 1996; Stephens et al., 1993, 1994) concurrent psychological distress was substantial in our sample at treatment entry. As measured by the HAD Scale, 40 percent reported possible or probably significant depression, and virtually the entire sample (85%) were possibly or probably experiencing significant anxiety. Women reported significantly higher levels of anxiety than men, but there were no gender differences in depression.

This is of both theoretical and clinical interest since the Pearson correlation indicated that heavier users in the immediate pre-treatment period (men in this sample) evinced significantly higher levels of depression at treatment entry . However, when partial correlations were computed controlling for age, both gender and quantity-frequency of cannabis use, and depression and quantity-frequency of cannabis use were significantly correlated. This effect was even greater when both age and gender were held constant. Clearly, clients consuming more cannabis in the 90 days just prior to treatment admission were significantly more depressed than those using less.

The reverse pattern of association with the cannabis use variables apparent with regard to anxiety was also of interest. In contrast to depression, the quantity of cannabis consumed in the recent past was only weakly associated with anxiety, while chronicity of use was associated with elevated levels of anxiety. Like depression, however, anxiety was significantly related to age, and this relationship was also true for gender. Therefore women, and especially older women, reported significantly higher levels of anxiety than did men. No cause-effect could be drawn from these patterns, however, as the Pearson associations are strictly bivariate correlations only. As gender was correlated to both anxiety and quantity-frequency of cannabis use, a possible confounding effect was thought likely. Indeed, a partial correlation controlling for gender suggested that, as with depression, the quantity of cannabis consumed in the 90-day period immediately before treatment was significantly correlated with anxiety. Thus, clients reporting more cannabis use at treatment admission also reported higher levels of anxiety.

Given the current debate in the field on the relationship between chronic heavy cannabis use and affective disorders (especially depression) and the lack of treatment outcome research addressing this important issue, this prospective study provided at least the potential to examine the effects of treatment on both affective disorders.

Classified as a depressant, for example, cannabis is hypothesized to be causally related to the depressive symptoms often observed in clients (even adolescent clients) at treatment admission (e.g. Budney et al., 1999; Ginzburg et al., 1984). Alternatively, much of the literature reports that with its "emotional anaesthetic" properties, cannabis is commonly used to self-medicate for *pre-existing* depression and anxiety (e.g. Estroff & Gold, 1986; Musty, 1988). Furthermore, using cannabis to enhance positive emotional states appears to be more commonly reported than in studies of other substances (see Stephens, Curtin et al., 1994). Thus, this study at least provided the context in which a preliminary examination of the much-debated 'self-medication' hypothesis might be viable, a research priority identified by both clinicians and researchers (e.g. Budney et al., 1999; Estroff & Gold, 1986; Lundqvist, 1995b; Musty & Kaback, 1995).

Cannabis-Related Problems

The almost universal reporting of cannabis-induced thinking/cognitive problems (84%) among our treatment sample was in stark contrast to the rates reported (10%) among heavy cannabis users in the general population survey (see Field & Casswell, 1999b). However, the significant correlation of self-reported cognitive problems with both chronicity and quantity of cannabis consumption was expected and is consistent with the ever-expanding research literature on effects of prolonged, heavy cannabis use on cognitive functioning both short-term, and (more controversially) on long-term memory (e.g., Solowij, 1996a, 1996b). Of interest, two individuals in this sample did report long-term memory recall deficits that they attributed to their cannabis use. Albeit as yet a controversial issue, this finding may have implications for the recent proposition that a duration (residual deficit) effect may be discerned in the cognitive processing of some chronic, heavy users as distinct from the short-term memory deficits which are generally believed to be reversible following sustained abstinence. (Solowij, 1996a, 1996b).

The particular impairments most often endorsed (short-term memory loss, concentration, problem solving) are those commonly referred to as 'executive functions' and consistent with what Lundqvist and his colleagues call the unique "cannabis pattern" created by prolonged cannabis intoxication (Lundqvist, 1995a, 1995b; Tunving et al., 1988). The "cannabis pattern" (these clinicians argue) peaks after two years regular use. If the user continues cannabis consumption, the chronic dysfunction becomes permanent.

In his considerable clinical experience with successfully treating long-term cannabis users, Lundqvist claims that normal cognitive functioning may be restored after six weeks of abstinence-oriented treatment. Clearly, however, this unique constellation of effects of chronic heavy cannabis use on the user's perception, comprehension, memory, and ability to communicate may seriously jeopardise his/her ability to profitably engage in, and comply with, treatment (Johnston & Hannifin, 1987; Lundqvist, 1995b; Tunving et al., 1988).

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Hence, the high rates of reported cognitive deficits in this sample provided the context in which to examine both within-treatment issues and posttreatment outcomes, both of special interest in this study. Importantly, the correlation with ethnicity indicating Maori generally reported more cognitive problems is of considerable concern, given reports of the greater extent of cannabis problems among segments of the Maori population (e.g., Lux et al., 1993; MOH, 1996, 1998; Ngata, 1993; Te Runanga o Te Rarawa, 1995).

Relatively high rates of reporting other self-perceived cannabis-induced problem categories (general health 71%, personal relationship 61%, and employment 46%) were also consistent with dysfunction in the life problem areas typically addressed in most drug treatment outcome research (e.g., Allison & Hubbard, 1985; Anglin & Hser, 1992; Hubbard, 1997; McLellan et al., 1992, 1993, 1994; Nathan & Lansky, 1978). The weak Pearson correlation between the cannabis use variables and general health is of interest, especially as the range of responses was unrestricted in this sample and participants did, in fact, report considerable cannabis-induced general health problems. Part of the explanation could be in the wording of the question, which asked clients to report the number of times they sought help for general health problems in the last year. The financial difficulties commonly reported (and inevitably, the legality issue) are likely to be major barriers for cannabis users to actively seek treatment for their health problems.

It is interesting to note the differential correlation of the cannabis use variables to problems reported. Not surprisingly, clients using more cannabis at treatment entry were more likely to report problems in these life areas. Although the correlation between chronicity of use and reported problems was considerably weaker, this is consistent with the higher use levels reported by younger clients in our sample (and age thus being confounded in this correlation).

Also noteworthy was the reporting of predominantly negative psychological (as opposed to physiological) factors attributed to cannabis use in the general health measure. In this instance anxiety and paranoia (33%) and depression (33%) were subjective, voluntary responses to open questions, clearly underscoring the

hypothesized association of the affective disorders with cannabis use. These reported rates were substantially higher than in the general population survey in which only 4 percent of heavy cannabis users reported feelings of paranoia (Field & Casswell, 1999b). Likewise, in the Swift et al. (1997) study of 200 long-term, heavy cannabis users only 10 per cent of the sample believed cannabis had caused anxiety and paranoia, 13 per cent believed it caused mental problems, and as few as 9 per cent believed it had caused memory deficits. Speculatively, given that the mean age and age range of the present sample was lower than in the Australian sample, it is possible that the known detrimental effects on adolescent cognition and development (e.g. see Fergusson & Horwood, 1997; Hall et al., 1994; MOH, 1996; Pandina et al., 1988) are already manifest among our younger sample. This has clear implications for the urgency of primary prevention efforts targeting New Zealand children before 'experimentation' with cannabis begins, a phenomenon with potential for both individual and societal morbidity.

Social and Economic Stability

The indicators used to measure social and economic stability of this sample yielded an overall profile of substantial social and economic dysfunction, characterized by a lower socioeconomic status, residential instability, high rates of relationship, unemployment and financial problems, and a criminal history. Female participants were equally as socially unstable as were males.

When compared with the 1996 Census of the New Zealand population (Statistics New Zealand, 1997) this sample had three times the rate of unemployment (22% vs. 7%), and twice as many were receiving government benefits (49% vs. 25%). Compared to the general population there was an enormous difference in home ownership (5% sample vs. 67% general population) and twice as many lived in rental accomodation (49% vs. 24%). Furthermore, a prominent pattern of a highly mobile, transient lifestyle was exemplified in the times they moved home (up to 20 times in the last two years), a phenomenon widely-documented in the drug treatment literature (e.g., Bale et al., 1984; Nathan & Lansky, 1978; Ogbourne, 1984).

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As with self-reported problems, the Pearson correlations suggested that the level of cannabis use at treatment entry was more strongly related to social and economic stability than the number of years regular use. The present correlations do not imply causality, however, and it is interesting to speculate whether an alternative explanation was that those among this sample with a history of social instability were using more cannabis at treatment admission.

Given the historical focus on male (and the neglect of female) samples in drug treatment studies (Copeland, 1997; Copeland & Hall, 1992; Wechsberg, Craddock & Hubbard, 1998), the finding that female cannabis clients had similar criminal histories to their male counterparts is of considerable interest, and consistent with mass media reports of increasing female crime. Furthermore, while the majority (58%) of convictions reported in this sample were for cannabis-related activities, a substantial proportion (42%) were for crimes such as violence, assault, burglary and theft. Given the recent finding of a strong relationship between levels of cannabis use and violent behaviour (Poulton et al., 1997), it is interesting to contemplate whether these crime categories were related to the cannabis-using lifestyle (procurement and/or supply), a consequence of prolonged, heavy use, or antecedent factors such as a pre-existing history of offending. Whatever the association, rates of female crime in this sample are of grave societal concern, and especially given the recent increase in female cannabis consumption levels reported in the general population comparison survey (Field & Casswell, 1999a).

Readiness for Change/Motivation and Self-efficacy

The elevated level of readiness for change/motivation in this sample (80% indicating they were at least preparing to change their cannabis use) was generally consistent with their personal treatment goals in which clients expressed a desire to at least change their use (98%). These responses, in turn, appeared compatible with the predominant pattern of self- or significant other- referral. That the majority (80%) also expressed at least some confidence in achieving their personal goals for cannabis use merits note, as self-efficacy judgments have been shown to be a significant predictor of future drug use in various drug studies, including cannabis

(Annis & Davis, 1989; Marlatt & Gordon, 1985; Prochaska et al., 1992; Stephens, Wertz & Roffman, 1993).

Although the Pearson correlations revealed a weak correlation between readiness for change and the amount of cannabis consumed in the 90-day pretreatment period, and a relatively stronger significant relationship with chronicity of use, the significant relationship between readiness for change and age suggests that (yet again) age may be a confounding factor. Older cannabis clients who haven't yet "matured out" of their cannabis use (Kandel & Davies, 1992) may be more ready to accept professional assistance than younger clients.

The fundamental importance of both readiness to change and confidence in one's ability/self-efficacy to do so cannot be overstated (Bandura, 1986; Prochaska & Di Clemente, 1986; Prochaska et al., 1992). Treatment is hypothesized to raise self-efficacy which, in turn, catalyses behavioural change (Annis & Davis, 1989; Rollnick & Heather, 1982; Stephens, Wertz & Roffman, 1993, 1995). All too often, however, the reality is that expressed attitudes bear little correspondence with overt behaviour, for a variety of complex reasons. In his review of the motivation literature, Miller (1985) has shown that stated willingness or intention to participate in substance abuse treatment is empirically unrelated to actual participation. Hence, the relatively high levels of reported motivation/readiness to change and confidence/self-efficacy judgments in relation to future cannabis use goals in our sample provided the timely basis for an analysis of the contribution of these critical (theoretical) variables in treatment outcomes for New Zealand outpatient cannabis clients.

TREATMENT OUTCOMES AND PREDICTORS OF DROPOUT

Although anticipated to a lesser degree, right from its inception this study was plagued with an unremitting trend towards lagging recruitment and excessive attrition. Despite all efforts exerted to obviate the problem, these early trends did not mitigate throughout the study's duration, straining the potential to achieve the stated objectives effectively.

Attrition is widely acknowledged as one of the most serious problems facing researchers investigating treatment outcomes in the addictive behaviours, and particularly problematic for researchers in community-based outpatient settings (see Ashery & McAuliffe, 1992; Cowen, 1978). Most investigators have found over 50 percent attrition within the first month of treatment rising to 60 per cent within the first three months (see Stark, 1992, for review). By a comparable timeframe, however, this study had lost contact with 36 percent of the whole sample after only two sessions, and with two-thirds (75 percent of the 40 dropouts and 44 percent of the 18 treatment completers) after only three sessions. The vast majority (90%) of those dropping out had done so after attending five sessions. An abysmal return rate of 14 percent (8 responses only) for the 3-month postal follow-up exacerbated the attrition problem at this final assessment point. These rates of attrition exceed those generally reported in the drug treatment outcome literature, including studies with primary cannabis clients (e.g. Roffman et al., 1993; Stark & Campbell, 1988; Stark, 1992).

Attrition aside, results from this initial study of treatment programmes for primary cannabis clients of New Zealand drug treatment services provide some clear evidence of effectiveness in terms of both meaningful positive client change toward treatment goals and satisfaction with treatment services. For the subsample of 18 cannabis clients who completed treatment the treatment programmes studied demonstrated achievement of a number (though not all) of their objectives of facilitating and enabling client change in several critical, interrelated outcome areas. These objectives were:

1   cessation or decreased use of cannabis and other drugs

2   reduction in psychological distress, and improvement in general health and wellbeing

3   social rehabilitation, including improvement in relationships, employment, residential stability, financial status, cessation or reduction in criminal activity.

Overall change scores on the composite used as a summary index of all indicators of cannabis use and psychosocial adjustment in this study indicated significant during-treatment improvement for treatment completers. All but three achieved an overall outcome score indicating positive during-treatment change. Three clients, however, were worse at end-of-treatment assessment. Nonetheless, this result indicates that a desirable degree of overall improvement in global functioning had occurred. Interestingly, of the subsample of 18 treatment completers more clients (15) improved in terms of scores on the overall measure of outcome than reduced their cannabis intake (11) suggesting that for the majority rehabilitation had occurred despite continued (or increased) cannabis use.

Significant reductions in cannabis use and psychological distress, and a significant increase in self-efficacy were the most noteworthy outcomes evident in this study. Although minor or small measurable improvement occurred in other important outcome domains, these changes failed to reach statistical significance. As already demonstrated, however, positive client change was *not* uniform across the various outcome criteria. For some treatment graduates change scores on the individual variables measured such as cannabis use and related problems, and psychological distress were sometimes in the negative direction.

Cannabis and Other Drug Use

Despite the significant reduction in overall cannabis consumption at the posttreatment assessment, two-thirds (12) of this treated sample were still using at levels classified as heavy and potentially harmful (more than 3 days per week). Most of these (i.e., 9 clients) were still using daily/near daily. Five (28%) of this group were using *more* cannabis than they were at treatment entry. Nonetheless, although only two of the treatment completers claimed total abstinence, an overall significant drop in both the frequency/days used and times used/quantity of cannabis use during the treatment period was achieved. Interestingly, as in other treatment samples (Stephens et al., 1993, 1994) men and women did not differ significantly in overall during-treatment change of cannabis use.

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Of note, as in other studies (e.g., Martin et al., 1988; Stephens et al., 1994) the validity of self-reported cannabis use was corroborated by the laboratory assay reports. Where discrepancy was noted (five laboratory reports reported a "None Detected" result) it seems that either over-reporting was occurring or the self-report measure was more sensitive than the urine screening method. The sustained emphasis placed on anonymity and confidentiality of information in this study may have increased the accuracy of responses (see Babor & Del Boca, 1992; Maisto & Connors, 1988; Ogbourne, 1984). Arguably, such close correspondence adds confidence to interpretation of other self-report data (Maisto, McKay & Connors, 1990).

Although significant change was not reported in use of other drugs other than cannabis, the overall trend was towards a reduction both in consumption levels and concurrent problems with these substances. While it is acknowledged that these self-reports cannot be validated and were clearly open to under-reporting bias, the general trends observed contrast with those in the American study in which a significant increase in posttreatment alcohol use occurred among a sample of cannabis-only users (Stephens et al., 1994). Accordingly, at least for the small subset of treated cannabis users in this study the 'symptom-substitution' hypothesis was not confirmed.

Anxiety and Depression

Concomitant improvement in other outcome areas indicative of psychosocial adjustment was encouraging. Of special interest was the significant reduction from pretreatment levels of psychological distress. Given the ongoing debate in the cannabis field, the finding of a significant association between change in cannabis use and change in both anxiety and depression is of both clinical and theoretical importance. While there were a few exceptions, pre-post reductions in anxiety (61%) and depression (67%) were consistent with reported (and verified) reductions

in cannabis use among this sample. However, a minority reported *in*creased levels of anxiety (22%) and depression (17%) despite reductions in cannabis use.

Thus, given the general limitations of the present design, whether these findings reflect a "protracted abstinence syndrome" (Miller et al., 1989; Mirin et al., 1991) following cessation/reduction of prolonged, heavy cannabis use or support the "self-medication hypothesis" (Estroff & Gold, 1986; Lundqvist, 1995b; Musty, 1988) was not directly answerable by the data, and clearly a priority for future research attention. Clarifying these issues would necessitate a controlled, longitudinal (preferrably time-series) design and strictly supervised abstinence-oriented compliance criteria.

In view of the prognostic significance of psychological distress in substance abuse treatment outcomes, however, what *is* of immediate clinical concern was the persisting prevalence of depressive and anxiety symptoms among clients whose distress levels remained either unchanged or even increased. As the most frequently occurring comorbid psychiatric illness among substance abusers, depression has consistently been found to complicate the onset, clinical course, treatment compliance and prognosis for clients with drug use disorders (APA, 1995; McLellan et al., 1994; Solowij et al., 1995; Woody, McLellan & Luborsky, 1984), and repeatedly correlated with dropout (see Musty, 1988; Stark, 1992; Steer, 1983).

Grenyer and his associates (1995) assert that brief cognitive-behavioural interventions may not be the optimal treatment for *all* client subgroups seeking assistance with their cannabis use problems. This Australian research team (Grenyer et al., 1996, 1997; Solowij, 1995) found that intensive supportive-expressive (SE) psychotherapy over extended treatment (a 16-session intensive group approach, and an 8-session individual SE psychotherapy intervention) achieved a substantial end-of-treatment reduction in depression and anxiety to below pretreatment clinically-significant levels. These outcomes, furthermore, were maintained at follow-ups that extended past 12 months.

From a 'matching' perspective, these phenomena highlight the need for systematic, careful evaluation of clients at admission for diagnostic accuracy, and targeting any

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manifest depression and/or anxiety for appropriate and timely therapeutic intervention(s). As Solowij (1995) states, it is also important to carefully monitor symptoms over the course of cannabis withdrawal.

Self-efficacy

The finding of a significant increase from pretreatment levels in the confidence clients in the New Zealand sample felt in achieving their personal treatment goals for cannabis use also merits note. Although treatment goals remained unchanged (all but one nominated the "abstinence" 56%, or "controlled consumption" 39%, categories), the measurable gain in self-efficacy over the treatment period is of particular import given that both pre- and post- treatment self-efficacy was a strong predictor of outcomes in the American cannabis treatment samples, accounting for unique variance in postreatment cannabis use (Stephens, Wertz & Roffman, 1993, 1995). In the present study the entire sample of treatment completers (100%) expressed at least some confidence in their ability to achieve their treatment goals at posttreatment assessment.

Self-efficacy is hypothesized to be the critical mediator through which behaviour change occurs (Bandura, 1977, 1984, 1986), playing a central role in theories of motivation and related movement through the stages of change (Prochaska & Di Clemente, 1986; Prochaska et al., 1992). Thus, although most clients clearly did not achieve their during-treatment goals, the finding of a significantly greater sense of self-efficacy at treatment termination could possibly augur well for more distal outcomes.

Questions inevitably arise, however, as to the adequacy and utility of the one-item index of self-efficacy used in this study. With regard to substance cessation or reduction, self-efficacy has been most often operationalized as a judgment about one's ability to avoid or reduce substance use in a number of specified ("high risk") situations that tempt use. Using this procedure in their study, and contrary to Bandura's (1986) notion of self-efficacy as a mediator of behaviour change,

Stephens and colleagues (1993) observed that cannabis users do *not* automatically and realistically take into account other influences on their ability to avoid cannabis use.

Research is clearly needed to understand the conditions under which clients give valid assessments of their ability to avoid cannabis use. This is likely to be related to both sample characteristics (including motivation) and assessment techniques used. There is a clear need for pretreatment assessment procedures and measures that address the multiple sources of this critical construct in a realistic manner to enhance the validity of cannabis users' efficacy judgments.

Readiness to Change/Motivation

By way of contrast to the universal increase in reported self-efficacy, there was no significant difference in pre- and posttreatment readiness to change. Indeed, client designations according to the stages of change framework seem to exemplify the (theoretical) dynamic and spiralling, recursive nature of readiness for change/motivational status during the change process (Prockaska & Di Clemente, 1986; Prochaska et al., 1992). At posttreatment assessment approximately one-third remained in their pretreatment 'Action' designation. A further one-third had graduated to an advanced stage, while the remaining one-third had *regressed* to a lesser stage of readiness for change/motivation. This was perhaps most poignantly depicted in the movement of one individual from a pretreatment Action designation to that of a posttreatment "Precontemplator".

On the one hand, these findings appear to evoke Sutton's (1996) criticism of the stages of change model as idealistic, and not an accurate description of how people do, in fact, change. At least one-third of this sample did not show a stable forward progressive movement through the (theoretical) stages. Sutton rejects both the invariant temporal sequence and the spiral representation of change that the model depicts. On the other hand, the possibility of client-treatment *mis*matches in this study cannot be ruled out. Di Clemente and his colleagues (1992) outline many

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ways that a 'mismatch' can occur (e.g., rushing the Precontemplator or Contemplator, mismanaging Contemplation, ignoring Preparation, stalling the ready for Action, and so on).

The finding that the RCQ (Rollnick et al., 1992) had no predictive validity for this sample of cannabis treatment clients (in contrast to alcohol treatment populations [see Coynash, 1997]) is a finding of both clinical and theoretical importance. Motivation/readiness for change is widely-acknowledged as a prerequisite and a *sine qua non* for treatment success, and compliance with treatment a strong predictor of successful outcomes (APA, 1995; Miller, 1985; Miller & Rollnick, 1991). In the illegal drug treatment area, De Leon and Jainchill (1986) have suggested that motivation for drug abuse treatment is multidimensional, and found in their research that clients' personal assessments of intrinsic pressure (motivation), readiness for treatment, and perceived suitability of the treatment programme were predictive of both short-term and long- term dropout.

Similarly, in their large-scale study at outpatient drug treatment agencies, Simpson and Joe (1993) found that clients' personal assessments on three motivational scales (Drug Use Problems, Desire for Help, and Treatment Readiness) incorporated into a brief, self-rating instrument predicted who would drop out of treatment within 60 days. An important finding in that study, moreover, was that more modest (and hence more realistic) goals for quitting drug use had better holding power in treatment. Clients aiming for immediate "abstinence" and feeling "confident" in their goals were more likely to drop out of treatment. It seems reasonable to conjecture that this latter finding could provide at least part of the explanation for the excessive dropout rates among our sample.

In sum, it is clear that more work needs to be done on both the complex stages of change (presumably involved from recovery from addiction) and associated self-efficacy/expectations for quitting, specifically in relation to cannabis. Meanwhile, the self-reported highly-motivated profile of this sample at treatment admission, viewed in conjunction with the excessive rate of attrition in this study, serves to reinforce the need for continued efforts focused on evaluating and maximizing motivation levels and self-efficacy at intake, and goal setting early in

the treatment process (see e.g. Miller, 1985; Miller & Rollnick, 1991; Roffman et al., 1993; Stephens, Wertz & Roffman, 1995).

Cannabis-related Problems

Lack of significant change on the composite indicator of problems directly attributed to cannabis use, and particularly in reported cannabis-related thinking/cognitive problems, is also of considerable clinical concern. Although half (50%) of the 18 treatment completers reported some reduction in cognitive/thinking problems, levels of impairment remained substantial (67% reporting "always" or "often" or "sometimes" experiencing cannabis-related cognitive deficits) at end-of-treatment assessment. Three clients reported *more* thinking problems.

In his clinical experience Lundqvist (1995b) has observed that it takes at least 14 days of abstinence before the chronic cannabis user is able to control cognitive functioning, and up to six weeks abstinence before normal cognitive functioning resumes. Valuable lessons can be learned from the alcohol treatment area. It has been hypothesized that to the extent that higher cognitive functions are impaired in alcohol abuse, these cognitive deficits may hamper an individual's motivation for, compliance with, and ability for engagement/retention in a treatment programme (APA, 1995; Finney & Moos, 1986; Sanchez-Craig & Walker, 1982; Smith & McCrady, 1991; Wilkinson & Sanchez-Craig, 1981).

It is argued that these critical issues can readily be generalized to treatment for cannabis problems. The cannabis detoxification period is very protracted and the state of chronic intoxication affects cognitive processes in such a way that cannabis abusers are often incapable of learning new concepts, self-reflecting, or thinking clearly (see Johnston & Hannifin, 1987; Lundqvist, 1995a, 1995b; Tunving et al., 1988). These deficits can adversely affect aspects of treatment that have a strong cognitive component, and these are the approaches that were predominantly used in the New Zealand cannabis treatment programmes studied. In fact, most psychosocial interventions involve cognitively-mediated learning processes.

Information processing skills affect how and to what extent clients organize and process the information that is presented to them during treatment and the degree to which they are able to retain information and apply it after treatment. These characteristics thus play an important role in determining the level at which a particular therapeutic approach is implemented across individual clients. In terms of the client/treatment 'matching hypothesis' a *mis*match between client cognitive capabilities or styles and treatment delivery implies inadequate implementation of the various components utilized (see Finney & Moos, 1986; Prochaska & Di Clemente, 1986). This was clearly possible - and even likely - in the present study.

Cognitively-impaired individuals are hypothesized to do less well in cognitive-behavioural/didactic approaches, and research has shown that client information processing abilities need to be matched to both the content and the way treatment is delivered (see e.g., Finney & Moos, 1986; Goldman, 1983, 1987; Sanchez-Craig & Walker, 1982). This suggests that various strategies could profitably be implemented in the cannabis treatment programmes to accommodate the cognitive deficits likely to be (and were) observed in the cannabis clientele at treatment entry. In their Swedish clinics, Lundqvist and his associates have developed special 3-phase programmes for cognitively-impaired cannabis users which they claim are highly successful (see Lundqvist, 1995a, 1995b; Tunving et al., 1988, and reviewed in chapter two).

Alternatively, a longer period of treatment may provide cognitively-impaired cannabis clients the opportunity for the 'overlearning' necessary to compensate for information processing deficits and the assimilation of the therapeutic programme (see Finney & Moos, 1986). Simpson, Chatham and Joe (1993) describe the incorporation of cognitive "mapping" into the counselling process to improve the fundamental step of information input and cognitive integration and to counteract the conceptual difficulties addicts have in means-end thinking involving step-by-step problem solving. As a "thinking" tool mapping has been shown to improve information storage and retrieval, which in turn facilitates cognitive integration of knowledge with resulting behavioural implications (Simpson et al., 1993).

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Whichever approach is taken, the pretreatment profile of almost universal cognitive deficits (84%) in our treatment sample points to the importance of instituting both systematic and effective retention-enhancing strategies from the point of first contact. In conjunction, the development of appropriate, effective interventions to assist in the long-term assimilation and retention of the therapeutic content among this clientele is imperative. These innovations will inevitably need to be carefully monitored and evaluated.

Social and Economic Stability

No significant pre-posttreatment change on the composite measure of social and economic stability was evident. In view of the brief time interval between pre- and posttest assessment points (a maximum of 3 treatment sessions in several cases) and continued cannabis consumption, this was hardly surprizing. Given the pretreatment sample profile of relationship, residential, employment, financial, and legal/criminal problems, expectations of significant improvement in these problem areas in the timeframe would be unrealistic. The prognostic implications of these problems can be seen in the context of other research. Stephens and his colleagues (1993) found that pretreatment severity of cannabis-related problems (social, financial, legal) accounted for the prediction of posttreatment social and economic problems. Similarly, in their study with a sample of other drug abusers (alcohol, opiates, cocaine), McLellan and his team (1994) found that social adjustment at follow-up was negatively predicted by more severe housing, financial, employment, criminal, family and psychological problems at treatment admission.

Traditionally environmental/social support factors such as "social stability" (marital, occupational, financial and residential status) have been a major factor predictive of treatment retention and outcome (Anglin & Hser, 1992; Miller & Hester, 1986b; Simpson & Joe, 1993; Stark, 1992). Thus, from the contemporary *harm minimization* perspective, focusing exclusively on cannabis use/abuse with no regard for the considerable drug-related problems in these critical domains is likely

to be counterproductive with cannabis clients. Evidence indicates that if left untreated, these other life problems leave clients at high risk for relapse to drug use.

McLellan and his colleagues (1994) found that routine, comprehensive assessment in all these life areas functionally related to drug use and targeting identified client needs with problem-specific ancillary services was predictive of better psychosocial outcomes. Results from the most recent 'matching' study in the drug treatment field demonstrate these issues with clarity. In a unique approach to a client/treatment matching strategy, Hser and his colleagues (1999) considered clients' expressed desires for specific services when measuring need for services and selecting an appropriate treatment programme. In an outpatient study which included primary cannabis users these researchers hypothesized that client outcome would improve as a result of receiving the services that matched their expressed needs. Results showed that clients receiving the desired services (vocational, housing, childcare, transportation, legal) were retained in treatment significantly longer and achieved significantly better outcomes than those whose expressed desires for needed services were not met.

It is argued that the systematic incorporation of an advocacy approach to meet clients' immediate primary needs as a 'matching' strategy in the cannabis treatment programmes is likely to achieve not only a better retention rate, but also significant improvement in overall longer-term outcomes. Persons with substance use disorders are generally disenfranchised, and lack reinforcement and support in the community. Thus, taking this advocacy/referral or 'broad spectrum' approach is also likely to have a desirable, empowering effect on the cannabis clientele.

Treatment Participation

Given the few significant positive changes in cannabis use and psychosocial adjustment it was informative to examine client change in the context of treatment participation. Retention in treatment has consistently been one of the most reliable predictors in drug treatment outcome research, and session attendance was presumed to be a major part of treatment engagement and intensity on which retention effects depend. Clients attending more treatment sessions/receiving more

treatment services had the best outcomes during and at the end of treatment in the vast majority of studies in drug treatment outcome research, including cannabis populations (see Anglin & Hser, 1992; Ball & Ross, 1991; McLellan et al., 1992, 1994; Roffman et al., 1993; Simpson, 1979; Simpson et al., 1995; Stark & Campbell, 1988; Steer, 1983).

Consistent with these findings, in the present study 'more' treatment *was* associated with better outcomes in frequency of posttreatment cannabis use and clients' sense of self-efficacy about their ability to change their cannabis using behaviour. Clients attending more sessions reported significantly greater reductions in the frequency/days on which they had used cannabis during the treatment period. While a parallel significant association between treatment participation and reduction in use episodes (or 'dose') on days of use was not evident, the trend nonetheless was towards a small overall reduction, and this was verified by laboratory reports.

This reduction in cannabis use was accompanied by a significant increase in clients' confidence to achieve their personal goals for future cannabis use. The more sessions clients attended the greater their sense of self-efficacy which, as noted earlier, was a significant predictor of post-treatment cannabis use in previous cannabis studies (Stephens, Wertz & Roffman, 1993, 1995). Although the modesty of scale of the present study is acknowledged, it is suggested that these promising findings are both an endorsement of the benefits of a longer treatment, and a clear rationale for efforts invested in retention-enhancing strategies. .

The significant negative correlation between sessions attendance and change in general health/treatment-seeking was unanticipated. However, when viewed in conjunction with the overall level of continued cannabis use and persisting anxiety and depression, inspecting individual level data clarified this (seemingly) ambiguous finding. The majority of reasons specified for treatment-seeking for health problems during the cannabis programmes were for depression and anxiety, withdrawal symptoms, and respiratory problems. These results serve to reiterate the position taken in an earlier section, suggesting that anxiety and depression *is* a prevalent and particularly troublesome problem for cannabis users attempting to reduce or quit their cannabis consumption, and should be targeted for specific, adjunctive therapy.

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Although session attendance showed no significant association with change/improvement in anxiety and depression, cannabis-related problems, social and economic stability, readiness for change/motivation, and overall improvement, these relatively 'weak' positive correlations must be put in context. Many researchers (e.g. Ashery & McAuliffe, 1992; Cowen, 1978; McClelland & Judd, 1993; Steketee & Chambless, 1992) stress that by their very nature outpatient interventions in field settings are less intense than inpatient (or controlled trials) and one can therefore expect smaller short-term differences. More 'noise' means reliable effects are harder to detect, and it is unrealistic to expect that one or more hours per week will account for a large proportion of outcome variance (and especially over as few as 3 sessions).

Furthermore, as Bell and his colleagues (1995) emphasize, treatment does not occur in a linear, cumulative progression. De Leon and his associates (1995) found that 'efficacy' frequently has a time dimension, and the impact of treatment programmes may have a delayed, "sleeper" effect. Small outpatient effects are common in all fields but are, therefore, clinically important. And, as Teeson (1998) reminds us, 'no change' can be a legitimate outcome of treatment for some (severely symptomatic) individuals for whom maintenance of a given level of functioning and thus avoiding deterioration is a clinically important positive outcome.

Thus on the one hand, given that the pretreatment profile of the cannabis clients in this sample was one of considerable morbidity in several important life domains, the weak to modest associations between sessions attended and positive change in these problem areas appears quite promising, in view of the brief treatment interval being assessed. On the other hand, however, these same weak to modest associations between client change and treatment participation clearly identify several important areas in which problem-specific strategies might profitably be implemented to enhance treatment longevity, and ultimately facilitate positive long-term client outcomes.

Albeit, unlike outcomes in the alcohol area (e.g., Howden-Chapman & Huygens, 1988; Miller & Hester, 1986a; Miller et al., 1995) research has also consistently

shown that regardless of treatment setting or modality, treatment lasting **less** than 90 days (irrespective of whether a client drops out) is of limited benefit to drug abusers. Studies have suggested, moreover, that the relationship between treatment tenure beyond 90 days and positive outcomes is linear (i.e. more treatment the better) and there may therefore be no uniquely defined time interval of 'optimal' time spent in treatment (see Anglin & Hser, 1992; Simpson, 1979). Time in treatment should therefore be carefully tailored to match individual client needs.

Given these consistent findings, the level of participation of treatment graduates in this study was not a good prognostic sign for durability of treatment gains. Although treatment completers attended more sessions overall than dropouts (average of 5.4 compared with 2.9 for dropouts), just under half of the treated sample (44%) exited treatment after attending only 3 sessions, which was less than the number of treatment sessions attended by several of the dropouts. When viewed in conjunction with continued cannabis use at harmful levels and unmet treatment goals, residual levels of psychological distress, cannabis-related cognitive and other problems, and social dysfunction manifest among treatment completers at postreatment assessment, this serves to highlight the urgency for strategies implemented to facilitate therapeutic engagement to enhance treatment longevity (and by extension better outcomes) among the cannabis clientele.

Predictors of Dropout

The (unanticipated) confounding effect of sessions attended could have contributed to the failure of results to support the hypotheses tested in this study. Within the non-manipulated context of the community-based cannabis treatment programmes, data from this study failed to differentiate treatment completers from dropouts on all of the hypothesized predictors of dropout. That is, there were no significant differences between treatment dropouts and treatment completers with regard to pretreatment cannabis use, cannabis-related problems, depression, anxiety, cognitive/thinking problems, social and economic stability, readiness to change, and self-efficacy, as measured in this study.

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The only other study examining predictors of attrition from cannabis-*specific* treatment (Roffman et al., 1993) was conducted in a highly-controlled, manipulated research context with media-recruited (hence motivated!), relatively well-adjusted subjects. These researchers found that, consistent with much of the substance abuse literature, early dropouts were younger, less socially and economically stable, had higher levels of psychological distress, and were less confident in their ability to achieve abstinence than either late dropouts or treatment completers. Unfortunately, the present study was unable to verify (or disconfirm) the profile of dropouts generated in the American study to contribute to the developing cannabis treatment literature. Interestingly, that study utilized a classification scheme in which 'early dropout' was operationalized as the failure to attend treatment after the fourth session. 'Later dropouts' were those receiving at least 70 percent of the ten-session treatment package. According to these criteria, then, 10 (56%) of the 18 treatment 'completers' in the New Zealand outpatient sample would be viewed as 'early dropouts.'

The exploratory *post hoc* analyses that were conducted in an effort to 'compensate' for lack of substantive findings also failed to yield any demographic information that differentiated dropouts from treatment graduates. Dropouts and treatment remainers did not differ with regard to age, gender or ethnicity. As Stark's (1992) review has shown, a vast body of studies examining demographic correlates of substance abuse treatment dropout has thus far failed to yield a reliable profile of the 'dropout'.

Treatment variables were then examined, and the only differences that emerged were variation in the number and types of components delivered to dropouts and treatment completers in the sessions that were attended. These findings were not readily interpretable within the study's design, however, and suggest an important area for future research attention. Nonetheless, the confounding effect of sessions attendance was but one of the possible explanations for failure to differentiate dropouts from treatment completers, and the various other limitations in this study will be discussed in a section addressing these issues.

Given the number and variety of predictors tested, the lack of any hypothesized differences between dropouts and remainers and between 'early' and 'later' dropouts in this study was a striking finding in itself. Even so, it was not an isolated finding. In a study that included a sizeable subsample of primary cannabis users, Stark and Campbell (1988) found no differences between dropouts and treatment remainers compared on any drug use or personality variables examined (including depression and anxiety). Indeed, as many researchers comment (e.g. Craig, 1985; Stark, 1992; Stark & Campbell, 1988) it seems that continuation in treatment is problematic for most substance abusers, irrespective of their demographic status, drug of choice, background, and personal characteristics. In his extensive review of drug treatment studies, for example, McLellan (1983) found that the best combination of a wide variety of pretreatment client variables predicted only 25 to 45 percent of the variance in retention/dropout.

In short, as De Leon and Jainchill (1986) have succinctly observed, the fact that retention is difficult to predict from client characteristics suggests that drug abusers seeking treatment are more similar than different. This has led several researchers (e.g. Craig, 1985; Noel, McCrady, Stout & Fisher-Nelson, 1987) to suggest that researchers ought to investigate modality-specific factors within specific treatment settings that may ultimately have utility only for *that* modality, in *that* particular setting, and with *that* specific type of clientele.

FOLLOW-UP AND SATISFACTION WITH CANNABIS TREATMENT PROGRAMMES

As the other indicator of treatment 'effectiveness' in this study the uniformly high level of reported satisfaction with services (94%) among clients completing the treatment programmes was an important outcome in itself. An unexpected finding was the pattern of association between general satisfaction reported and client characteristics. Reviews of the scant satisfaction literature (see Lebow, 1983) have shown that while demographic characteristics are not good predictors of satisfaction with mental health services, drug abusers and clients with poorer prognoses have generally reported being less satisfied with services.

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In direct contrast to prior studies, cannabis clients among this sample reporting greater satisfaction with services at the end-of-treatment assessment were those evincing heavier cannabis use and poorer overall psychosocial adjustment at treatment entry. Specifically, clients using more cannabis, men, and those manifesting higher levels of cannabis-related problems and more depression, and lower levels of social and economic stability reported being significantly more satisfied with services.

In the present context it is not unreasonable to suggest that this unexpected outcome reflects the underlying need (and expressed desire) of the cannabis clientele for helping, supportive relationships and social contact. Lebow's (1983) review, however, revealed that client satisfaction surveys often result in high satisfaction ratings. The only published New Zealand study that has used the CSQ (Larsen et al, 1979) in outpatient clinic samples found that 90 percent of clients were satisfied with services (see Deane, 1993). While clearly these favourable endorsements can be taken as evidence of the high quality of treatment services provided, the uniformly high degree of satisfaction at end-of-treatment assessment in the present study must be viewed in context. A universal positive response (although welcome to treatment providers!) has many negative sequelae.

Given that those who indicated they were "very" or "mostly satisfied" with services (94%) and that "all" or "most of my needs have been met" (89%) often continued to both use cannabis at pretreatment (or minimally reduced) levels and report substantial psychosocial problems, these high satisfaction ratings appear somewhat ambiguous, and even problematic. Despite all the strategies used to achieve and to guarantee clients confidentiality and anonymity (see chapter four), the possibility of various response biases arising from demand characteristics of the rating situation is always present. As Lebow (1983) cautions, having the client answer the survey at the treatment facility inevitably inflates reactivity. Deane (1993) found that clients who completed the questionnaires at the treatment facility reported significantly higher rates of satisfaction than clients who completed the questionnaire at home.

Consumers of mental health services often respond in accordance with how they perceive their ratings will affect their future requests for services and the possible repercussions for the practitioner. Although encouraged to state their "dislikes" about the programmes, no such comment was elicited from our sample. It is possible, therefore, that these responses represented 'grateful testimonials' from a socially dysfunctional, disempowered (and censured) population with no alternative to the publicly-funded treatment services (see Nguyen et al., 1983). Other factors which Lebow (1983) suggests distort a realistic consideration of treatment are transference, poor reality testing, and cognitive functioning. Arguably, these biases might have been present in this study context.

The face validity of the present data is thus called into question, especially when juxtaposed with the other indirect measures of satisfaction used in this study such as the dropout rate, sessions attendance, and the nature of treatment termination. The most conspicuous positive bias at the end-of-treatment assessment point was the sampling bias inherent in the selecting out of treatment completers who were likely to be more motivated and report greater satisfaction with services (see Bootsmiller et al., 1998; Lebow, 1983; Maisto & Connors, 1988). Another important artifact was the concurrent involvement in other treatment programmes reported by 7 (39%) treatment completers. These programmes included AA, smoking cessation programmes, relationship counselling, outpatient depression counselling, and anger management group therapy. Thus, satisfaction reported was also confounded with the effects of these extra-treatment programmes (Cowen, 1978).

Although it cannot be assumed that treatment dropout *is* evidence of dissatisfaction (and may result from quite unrelated reasons) satisfaction research has generally shown that dissatisfied clients are the ones most likely to drop out in the first month, to miss a greater number of scheduled appointments, and when they do attend, to fail to comply with treatment (see Larsen et al., 1979; Zastowny, Roughman & Cafferata, 1989).

Consistent with these research findings, the only study addressing these issues in the cannabis treatment area (Roffman et al., 1993) found that both 'early' and 'later' dropouts were less satisfied with treatment services and less likely to perceive

treatment as being helpful. Furthermore, treatment outcomes of 'later' dropouts resembled those of 'early' dropouts in that both dropout groups were more likely to be using cannabis than the treatment completers.

Lebow (1983) cautions that the timing of assessment influences the responses elicited. This study aimed to examine both the temporal generalisability of *global* satisfaction and the *specific* dimensions of client satisfaction with the cannabis treatment programmes at the 3-month follow-up postal survey. As Paton-Simpson (1997) observed, while there are numerous *ex cathedra* statements about the 'minimum' follow-up interval, there is no consensus in the literature on an appropriate delay. The decision to survey all cannabis treatment 'starters' at each client's 3-month treatment anniversary represented a pragmatic balance between the exigencies of (researcher) time, the infinite post- and extra-treatment factors that make it difficult to attribute outcomes to the programmes after lengthy intervals, the vulnerability to relapse within this critical early period, and the anticipated memory deficits among the cannabis clientele. This latter problem made the chances of their responding not only more remote, but also of dubious reliability from contamination by recall bias. In addition, of course, was the tracking challenge!

Although rigorous implementation of multiple retention and tracking strategies was incorporated into the design in an effort to maximize the return rate and minimize a nonresponse bias (see chapter four), the final return rate (8 only, 14%) was abysmal. In fact, this response rate was markedly lower than either the average for postal surveys in the satisfaction literature (40%; Lebow, 1983) or RADS posttreatment surveys (30-50%; Paton-Simpson, 1997), seriously inflating the attrition rate to 86 percent at this final assessment point.

A vast body of literature attests to the frustrating and (seemingly) intractable difficulties encountered in tracking substance abusers for follow-up (see e.g., Bale et al., 1984; Bootsmiller et al., 1998; Craig, 1979; Desmond et al., 1995; Goldstein et al., 1977; Ogbourne, 1984; Stark, 1992). Indeed, the researcher's collection of "Return to sender" unopened envelopes was testimony to the well-documented "highly transient nature of the existence of many drug abusers" (Lebow, 1983; Nathan & Lansky, 1978, p. 720) who often lead nomadic, clandestine lives.

Counsellor anecdotal reports told of countless "broken promises" made by particpants to meet their agreed-upon research commitments to return the survey, in spite of many 'reminder' telephone contacts. Counsellors also advised that some cannabis clients had been imprisoned meanwhile and, sadly, at least one had died. The characteristic 'response', however, was a total absence of any acknowledgment whatsoever. This nonresponse bias seriously compromised the study's ability to achieve one of its primary objectives to generate meaningful feedback on the suitability and helpfulness of the treatment programmes for the cannabis clientele, and their constructive suggestions for perceived improvement(s). Lebow (1983) opines that such nonresponse to follow-up surveys is a clear indicator of *dis*satisfaction, as satisfied clients are much more likely to return their questionnaires. From this position then, responses from three of the 'early' dropouts were of particular interest.

Generally, satisfaction responses were in the direction Lebow (1983) predicted. Dropouts who did respond to the follow-up survey reported being less satisfied than treatment completers with the services they had received. What was also of concern, however, was the considerably higher reported level of cannabis use among treatment completers than among dropouts.

All treatment completers reported being "very" (4) or "mostly" (1) satisfied with treatment, and that "all" (3) or "most" (1) of their needs had been met. The exception was the one client "mostly" satisfied who had had "only a few" of his or her needs met. However, while two treatment completers reported sustained abstinence from cannabis at the 3-month follow-up, the three others were still using daily (from 3-40 times a day), and one reported using more than at the exit assessment. Not surprisingly, these three clients said they had not met their treatment goals, but would come back to the programme if the need arose.

Of interest, one of the dropouts reported treatment had met "most" of his or her needs and that he or she was "mostly" satisfied with treatment. This client, moreover, reported being abstinent since treatment and having met his or her treatment goals. However, the remaining two dropouts reported being mildly

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dissatisfied with treatment, that few of their needs had been met, and that they had failed to reach their treatment goals. One of these dropouts was using daily, and indicated he/she would not return to the programme. The other reported using cannabis 2 days per week, and indicated he or she would return to treatment if necessary.

In spite of these patterns of unremitting heavy cannabis use among some respondents, all but this latter dropout continued to endorse "abstinence" as their goal for future cannabis use and reported confidence in achieving this goal. These reports raise considerable concern given that at treatment termination these clients had reported being confident they could achieve abstinence, and yet were continuing to use at these heavy levels. Clearly, as Roffman and his associates (1993) found in their sample of cannabis users, individual users do not realistically assess all the internal and external influences on their ability to avoid cannabis use. The potency of these factors is illustrated in clients' non-achievement of their abstinence goals despite having attended further programmes (such as AA, NA) in the postreatment interval. A respondent's comment, "I have really had enough, but I still can't stay stopped" seems to convey the reality. This reinforces the argument raised earlier for accurate assessment and therapeutic attention to the critical self-efficacy variable both early in and throughout the treatment interval.

The Pearson correlates that were computed as an approximation (only) of *specific* satisfaction at treatment termination showed that the only treatment component positively (and strongly) associated with client satisfaction to reach significance level was Motivational Interviewing. Receiving more motivational interviews during (more) sessions attended was associated with greater satisfaction with treatment, reinforcing the (theorized) central place of this component in all drug treatment programmes (Miller, 1985; Miller & Rollnick, 1991; Prochaska et al., 1992).

To a large extent, however, the differential level at which the various components were perceived as being helpful among this smaller sample subset of survey respondents reflected the differences in the actual number and variety of components delivered during the sessions attended, hence interpretation is quite

limited. Nonetheless, some components were endorsed more often than others and these included Assessment, Education, Motivational Interviewing, Relapse Prevention and Goal Setting. That is, despite continued cannabis use cannabis clients found these components helped them deal with the problem areas in their lives, particularly their personal relationship, general health and their thinking difficulties. Clearly, these aspects need further examination in prospective, longitudinal research with a comparison or control group design to determine the most suitable and helpful combination of components that constitute an effective package or menu of alternatives for the cannabis treatment programmes.

The universally positive perceptions of the *therapeutic alliance* were of special interest, for as Miller and Rollnick (1991) observe, "motivation to change does not simply reside in the skin of the client but involves an interpersonal context" (p. 35). Many studies have shown that the therapist is not simply the transmitter of a standard therapeutic agent but an important independent agent of change with the ability to magnify or reduce the effects of therapy (Miller, 1985). Indeed, client-therapist 'matching' effects have been greatly underestimated and underinvestigated in the drug treatment area (Anglin & Hser, 1992). It merits note, therefore, that the small group of clients who did respond to the survey endorsed their experience of a quality supportive therapeutic relationship (that inevitably was reflected in the high satisfaction ratings).

In sum, in spite of the high satisfaction ratings by treatment completers, the positive response bias that accompanied the escalating attrition rate at each assessment point prohibited valid inferences being drawn. In addition, evidence of dissatisfaction with services among the few dropouts who did respond to the follow-up survey raises questions about the satisfaction of the 86 percent (including 13 treatment completers and 37 dropouts) who did not respond. However, although Lebow (1983) opines that such non-response is a clear indicator of dissatisfaction, the known historical mobility and other information about the sample, together with the researcher's own experience of returned, unopened envelopes, suggests other reasons may also have contributed to the exceptionally low return rate. It is clear that client reasons for dropout should be a research priority so that areas of

dissatisfaction are identified and retention efforts appropriately targeted to satisfying any unmet client needs.

At the same time, in view of clients' reaffirmed goals of "abstinence" and "confidence to achieve" their goals, the continued heavy cannabis use reported by the majority of respondents in this sample subset appears to support Roffman and George's (1988) assertion that (as with all forms of chemical dependence) cannabis dependence "is a formidable problem requiring treatment and, perhaps, multiple attempts to quit" (p. 216).

STUDY LIMITATIONS

Despite all the various efforts exerted to circumvent problems arising from the inability to implement a randomized controlled design (see chapter three for discussion) this study presents several limitations. These issues are:

Design and Sample Limitations

The ecological realism/external validity valued in the naturalistic design comes at the expense of easy interpretation. The complexity and "noise" of real world settings limits the power to detect only the strongest effect and a "pure" treatment effect is unrealizable (Cronbach, 1982; McLelland & Judd, 1993). This limits the inferences that can be drawn. The study was open to various confounds such as regression to the mean (drug treatment clients typically present in crisis), normal human maturation (clients may "mature out" or their cannabis use problems might spontaneously remit), and history of the (potentially infinite) events external to the treatment environment (Cook & Campbell, 1979). One obvious historical artifact is the cannabis "season" and the fluctuating supply of the drug. The brief timeframe of continuous, successive individual client treatments over the 20 months of study duration, however, suggests these confounds were minimized.

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Although the multisite study was a strategy to maximize sample (and therapist, setting, programme) representativeness, the voluntary nature of participation potentially introduced a recruitment bias, a self-selection, and selection-treatment interaction bias. Results, therefore, may pertain to those clients more highly motivated to change than the wider population of primary cannabis clients. Data were systematically gathered on 'decliners' and non-starters, however (see chapter four), and counsellors' views suggest that the characteristics of the treatment sample were similar to those who either declined to participate, or those who agreed to do so and then aborted before providing data.

Slow recruitment, a small sample, an excessive dropout profile, and the brief treatment interval of most clients (some as few as 3 sessions) compromised the study's statistical power to detect many significant effects (see Rossi, 1993). Further, in the 'real world' of drug abuse treatment variables are distributed nonnormally, adding to the difficulties. These issues were addressed statistically by variable transformation, case deletion where appropriate, the use of nonparametric tests that are insensitive to normality and appropriate for small samples, and selecting the "exact P value " option.

The steep attrition curve that characterized this study impeded the adequate evaluation of the treatment programmes studied as valid outcome evaluation necessitates studying all who were exposed to the full "dose" of the intervention(s). Escalating attrition rates precluded assessment of the impact of treatment on dropouts lost to follow-up at each subsequent assessment point, thus compromising generalisability as premature terminations were systematically undersampled in all outcome analyses. Nathan and Lansky (1978) consider that treatment dropouts should be included in all analyses and classified as "failures". However, despite the assumption that those who drop out are likely to be faring less well than those who are contacted/complete treatment, Stark (1992) cautions that it *cannot* be assumed that dropouts have poorer outcomes than treatment remainers. In fact, in Paton-Simpson's (1997) experience non-response to postal surveys is often the result of treatment *success*; successful clients often want to forget the whole (drug) episode of their life which includes the treatment services.

Every effort was made to both retain participants in treatment and maintain contact after treatment termination (discussed in chapter four). However, the abysmal return rate of the follow-up surveys seems to epitomise the characteristic response to such efforts, and appears to reflect the "transient existence" of substance abusers (Nathan & Lansky, 1978). In view of this problem any forthcoming criticism/perceived limitation of an "inadequate" follow-up interval seems (somewhat) misplaced. Indeed, assessment at the 3-month treatment anniversary is generally recommended because of the high relapse rate during this period. Any longer, and it becomes more difficult to attribute outcomes to the programmes. The reality is that memory deficits of cannabis clients make the reliability of comments they might make questionable. Given the response rate, the researcher is *not* convinced that a 6-month (or even longer) follow-up would have been more fruitful!

Data Validity

Data biases are omnipresent in all research involving illegal substances. Guarantees of anonymity and confidentiality were emphasized in this study (Babor & Del Boca, 1992; Ogbourne, 1984). Biochemical verifiers were used to validate self-reported cannabis use and confidence in other self-report data was increased by the close agreement observed in these tests. Moreover, counsellors administered the questionnaires and were able to refer to client files for data confirmation. An important strategy was selecting and constructing questionnaires with a simple format and at the appropriate level of abstraction for this clientele.

Counsellors, however, also represent a potential source of data bias by careless, inaccurate, or inconsistent completion of forms (Cowen, 1978). Thus, while the researcher continually monitored counsellor records and queried ambiguous or incomplete data, random error in form completion is unavoidable in any research.

Procedures and Treatment Fidelity

As a multisite study this research incorporated several diverse geographical settings, counsellors, clients, programmes and philosophies. Adequate supervision to monitor consistency in programme/component implementation was impossible (Cook & Campbell, 1979). Each client situation was unique, moreover, as counsellors tailored treatment to individual needs. Although a strength of the naturalistic design, as Scheirer (1994) comments, this opens the study to the "Type III error" in evaluation, represented by variations in programme delivery across sites. Nonetheless, the potential for this problem was anticipated and addressed by careful negotiation and specification of agreed-upon components and procedures to maximize the standardization of the treatment process. The incorporation of the log-type Treatment Components Record Form for each client was a strategy used to monitor both implementation of services and client participation in treatment.

Measurement Limitations

Measurement limitations included possible inadequate operationalization of the variables of interest, using published instruments not specifically validated for cannabis clients, and possible response biases in client self-report data, endemic in drug treatment research. No universally-accepted standardized outcome measures exist in the drug treatment field (Teeson, 1998). More importantly, no cannabis-specific outcome measures exist at all (Swift et al., 1997). The researcher was constrained by the necessity to use *very* brief measures at a simple level of abstraction as cognitive deficits were anticipated in the cannabis clientele.

Reliability tests conducted on the data showed the Readiness for Change Questionnaire was acceptable for use among this sample, but as it eventuated, the measure had no predictive validity. Other widely-used instruments validated for measuring psychological distress in substance abusing populations, such as the Beck Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) or the

SCL-90-R (Derogatis, 1983) were considered too lengthy and complex for use in this study context with the cannabis clientele. It could also reasonably be argued that the one-item measures of self-efficacy and general health were an inadequate index of clients' status in those areas. A testing effect, moreover, cannot be ruled out, in view of the brief treatment interval of several clients (Cook & Campbell, 1979).

However, time involved was a major consideration in the agencies agreeing to participate in the study, and every effort was made to achieve a pragmatic balance between an assessment battery that was standardised (where possible), acceptable, brief, meaningful, adequate, and sensitive to change, while also as non-intrusive on the treatment process as possible.

RECOMMENDATIONS AND CONCLUSIONS

In contrast to the alcohol treatment area, the length of time clients spend in treatment for drug use disorder has been the major variable predictive of long-term successful outcomes, a finding replicated across therapeutic settings and approaches (Ball & Ross, 1991; De Leon et al., 1995; Gerstein & Harwood, 1990; Hubbard, 1997; McLellan et al., 1993; Simpson, 1979, 1981, 1993; Simpson & Joe, 1993; Stark, 1992). As previously noted, moreover, across all drug treatment modalities *only* length of treatment was associated with both intermediate and long-term improvement (Simpson, 1979, 1981). In short, although clearly there are exceptions, longer duration of drug disorder treatment (and treatment completion) are consistently associated with better outcomes (Anglin & Hser, 1992; Craig, 1984, 1985; Hser et al., 1999; McLellan et al., 1994; Maisto & Connors, 1988; Simpson, 1979, 1981; Steer, 1983; and see Stark, 1992, for review). However, because of the high initial attrition rates, very few drug disordered clients receive the potential benefits from treatment, and are vulnerable to relapse and its attendant sequelae (Anglin & Hser, 1992; Hubbard, 1997). Improving retention/treatment longevity is thus a key to improving treatment outcomes (Bootsmiller et al., 1998; Craig, 1985; Maisto & Connors, 1988; Simpson, 1979, 1981; Simpson et al., 1995; Stark, 1992; Steer, 1983).

Consistent with these principles and research findings, a major tenet of this thesis is that improved engagement/retention in, and completion of, cannabis treatment is likely to result in better outcomes for cannabis clients. It is acknowledged that preventing client withdrawal prior to the intended cessation of treatment presents a considerable challenge to treatment providers (see e.g., Stark, 1992). Moreover, in addition to retention-related factors common to all substances several characteristics of cannabis may account for the particularly high attrition rates observed among cannabis clients. A second major tenet of this thesis, however, is that consumer-oriented, eclectic and flexible services geared primarily towards meeting clients'

individual treatment needs are likely to enhance both the rate of attracting *and* retaining cannabis clients in treatment. In short, it can be argued that attractive and appropriate treatment services responsive to clients' presenting needs will enhance: (a) motivation (b) compliance (c) engagement (d) satisfaction (e) retention, and thus (f) ultimate outcome.

The final part of this thesis draws on both process information and observations from the current study and literature from the drug treatment field to offer cannabis treatment providers some suggestions with regard to promising retention- and therapeutic-enhancement strategies. The immediate aim is to synthesize this material appropriately in order to make constructive and potentially viable suggestions for improving both treatment retention and outcomes for cannabis clients. Albeit modestly, the ultimate aim is to contribute to the advancement of the cannabis treatment field. Firstly, the various barriers to retention in cannabis treatment are explored. Suggested strategies for retention- and therapeutic-enhancement then follow. This is followed by recommendations for clinical and research attention arising from this study. The chapter ends with the general conclusions drawn from this first cannabis treatment outcome study to be conducted in New Zealand.

BARRIERS TO RETENTION IN CANNABIS TREATMENT

It is patently obvious that a programme can only exert its effects when clients are therapeutically engaged, and retention is viewed as an important goal of all drug treatment programmes. Although Stark (1992) cautions that it cannot be assumed that dropouts have poorer outcomes than treatment completers, research with substance-abusing clients consistently depicts a "powerful association between dropping out and negative outcomes" (p. 96).

Dropout, however, can occur suddenly and impulsively, and empirical evidence for such spontaneous aborting from treatment has been found (see Stark, 1992). Counsellors' subjective perceptions of cannabis clients who 'split' from the

outpatient cannabis treatment programmes in this study seem consistent with this phenomenon. Counsellors reported dropouts as being generally "hard to engage", "unpredictable", and "paranoic" individuals who often "break promises" and fail to attend scheduled appointments despite motivation-building strategies used and multiple attempts to keep continuous, follow-up contact.

So what **are** the factors likely to be associated with spontaneous abortion or otherwise premature termination from the outpatient cannabis treatment programmes ? Several factors are believed to pose significant barriers to therapeutic engagement/retention and a successful treatment outcome once the chronic cannabis user is admitted for treatment. Counsellor comments on the log-type records kept of treatment process during the sessions attended by those who did drop out suggest some areas that *may* have contributed to attrition from the specific programmes studied in this research. Retention-related variables include pharmacological, psychological, social and environmental, and treatment factors.

Pharmacological Barriers

As a drug, cannabis has several unique pharmacokinetic properties that affect treatment and recovery. These include the protracted detoxification/withdrawal process for which there is currently no specific medical withdrawal regimen, a factor clinicians have frequently observed to have undermined cannabis clients' retention in treatment, especially in the first month when withdrawal phenomena are most intense (e.g. Roffman et al., 1988; Tennant, 1986; Zweben & O'Connell, 1988). Indeed, despite widespread belief that cannabis withdrawal is a relatively "mild" phenomenon, there is evidence that withdrawal symptoms may be neither mild nor inconsequential and, therefore, have clinical relevance (e.g. Budney et al., 1999; Duffy & Milin, 1996). Counsellors in the present study often recorded notes such as "in withdrawals", "experiencing quite severe symptoms of excessive use", and "withdrawal symptom management" as a major focus of early sessions, and following (documented) "relapse" episodes.

Zweben and O'Connell (1988) state that easing the stresses and discomforts of the withdrawal period increases the likelihood of the client remaining in treatment and provides a way to build the therapeutic alliance. In her survey of cannabis treatment issues among New Zealand treatment providers Fintoft (1994) notes the importance of planning the detoxification process, managing the symptoms, establishing support systems and providing structure and distraction. Accurate education for the client about withdrawal symptoms to encourage realistic expectations and acceptance was emphasized. Another important factor was the assembling of the client's support system, and clinicians' suggestions included family/whanau support, support groups, peer support, and the 'buddy' system.

A concomitant barrier is the unique constellation of effects on the chronic user's perception, cognition, and motivational processes, frequently observed to seriously jeopardise his/her ability to profitably engage in, and comply with, treatment (see Johnston & Hannifin, 1987; Lundqvist, 1995b; Tunving et al., 1988). Studies have consistently shown that drug use just prior to, and during treatment is a poor prognostic sign for retention (Anglin & Hser, 1992; McLellan et al., 1983; Stark, 1992). Flintoft (1994) notes that the client being "stoned", comprehension and communication difficulties, paranoia problems, and missed appointments because of memory deficits, are likely. These factors are consistent with such counsellor notations as the ubiquitous "FTKA" (Failed to keep appointment), "hard to engage", "reality check required" "X arrived stoned - short session", "first session cut short", "hefty dose of paranoia", "early signs of cannabis psychosis" and "no further contact" recorded in this study. (Cognitive/rationality problems were also observed in some of the respondents' own comments on the questionnaires). These observations reinforce the previous argument that early assessment of the cannabis client's cognitive functioning and learning style, and specific strategies implemented to accommodate/match treatment content and delivery to the individual's information processing level should routinely be implemented to enhance treatment longevity and ensure the assimilation of the therapeutic content.

Psychological Barriers

The various lifestyle changes critical to cessation of cannabis use present major challenges to the chronic user. Clients who use cannabis to self-medicate for negative or intolerable mood states (anxiety, depression, anger or potential for aggression) or as an escape/avoidance 'coping' mechanism for personal and social problems or unresolved underlying issues, face difficult lifestyle changes. As clinicians (e.g. Flintoft, 1994; Grenyer et al., 1995) have observed, this can be overwhelming once the "emotional anaesthesia" of cannabis is no longer an option.

In effect, cannabis provides a pharmacological buffer/shield from the discomforts of the real world. Clients' inability to conceive of life without this refuge from life's hassles introduces a poor self-efficacy effect into treatment, which as Roffman and his colleagues (1993) found, was a formidable treatment obstacle to overcome among their cannabis sample. Counsellor notes accord with these phenomena. Comments such as "client aware cannabis helps to anaesthetise pain from earlier abuse", "explored strategies for managing anger", "explored traumatic events in client's life", "noting some anger/stress issues emerging", "client is acknowledging cannabis makes depression worse", "discussed feelings surfacing when client withdraws", "smoking again - family stress and grief", "paranoid thoughts and depression exacerbated by THC", "client in crisis", "hefty dose of guilt", and "unresolved grief issues" seem to verify these notions. These phenomena serve to reiterate the position argued earlier, that careful accurate assessment at treatment entry for readiness to begin abstinence, self-efficacy, and comorbid psychological distress should be systematic, and retention-enhancing efforts routinely implemented to provide any needed additional time and specific support/therapy required.

Socioenvironmental Barriers

The clients' social environment and contacts are also critical variables in maintaining cannabis use. In Flintoft's (1994) survey of clinicians the most reported

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barrier to cannabis change was peer pressure, which extended from friends to family/whanau, to social acceptability. Counsellor records such as " now working, and anxious about those who working with pressing him to smoke" "working on peer pressure trigger issues", "when under pressure gives in", "not a starter (abstinence) because of social setting" "motivated to stop but needs lots of support", "trying to avoid smokers", and "relapsed - to own surprise" seem to capture the issues.

New Zealand studies (Abel & Casswell, 1993; MOH, 1996: Walker et al., 1998) have documented the widespread social acceptance or tolerance of cannabis in New Zealand, and the reality of a distinct 'cannabis subculture'. The chronic users's self-image may be so strongly centred within this 'cannabis subculture' group that the threatened loss of group identification entailed in stopping use is a major barrier to cannabis change (Flintoft, 1994; Roffman & George, 1988). The ambivalence underlying this prospect is captured in a counsellor's note, "Busted !! ...Wanting to get away from the scene...but ambivalent about giving up or not." A pro-drug and anti-social support system mitigates against clients' sustained commitment to treatment.

The dilemma of this (perceived) loss of association is often compounded by potential poverty. As Flintoft (1994) reports, many of the more seriously cannabis involved clients of New Zealand alcohol and drug treatment services are dealers whose income derives from the black market cannabis economy. Concomitants of such a lifestyle include deficits in important life areas of life functioning such as social, educational, occupational or job skills. A generally consistent finding in substance abuse treatment studies (including cannabis) has been the correlation between indicators of SES and social stability and retention/dropout (Anglin & Hser, 1992; Simpson & Joe, 1993; Stephens et al., 1993; Stark, 1992). The low SES, substantial unemployment, financial, interpersonal and criminal problems of this sample at treatment admission were thus negative prognostic factors for both retention and/or a successful outcome. It is vital that these factors functionally related to cannabis/drug use are addressed for any realistic hope of treatment retention and better outcomes.

Treatment Barriers

Several treatment factors, however, may also contribute to premature termination from cannabis treatment programmes. Treatment providers may lack an adequate training in cannabis issues. Indeed, in Flintoft's (1994) survey the most commonly cited suggestion for improved treatment outcomes was improved staff training. Specific deficits identified by clinicians were up-to-date knowledge and accurate understanding of the psychological and physiological effects of cannabis (Albeit, as Hall [1997] succinctly observed, effective education about the health risks of cannabis presupposes a consensus on what, in fact, these health risks are!). Further training in cannabis detoxification was but one of the recommendations made by treatment providers in Flintoft's survey.

Flintoft (1994) identified a lack of culturally-responsive treatment services for Maori as a further barrier to cannabis change. A similar criticism can be directed at treatment services that fail to include a gender-sensitive perspective or provide programmes appropriate for adolescent populations. While women currently represent over 40 percent of clients of New Zealand alcohol and drug treatment services (Adamson et al., 1998), both women and adolescents form a significant and expanding subgroup among the cannabis clientele, as the present study clearly demonstrates. Studies have shown that attrition for women was strongly related to treatment variables such as programme and treatment philosophy and suitability, treatment modality, childcare, lack of women-only services, and acceptable treatment goals (Copeland, 1997; Copeland & Hall, 1992; Stark, 1992).

Cannabis researchers (e.g. Miller et al., 1989) have emphasized that including the entire family/whanau in the treatment process is critical. Addicted persons who are more likely to be retained in treatment and recover are those who have the support and involvement of their significant others and families. Partners and family could be recruited into the treatment setting for periodic joint sessions to elicit appropriate family/supportive behaviour (see e.g., Barber & Crisp, 1995). Consistent with these notions were counsellor notes, "relationship/partner problems triggers", "under

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stress at home - learning alternative strategies to deal with saying 'no', "changing relationships, cannabis-connected", "used after family issues caused considerable discomfort" and "relationship problems, partner doesn't smoke".

However, while emphasizing the critical importance of engaging the help of clients' family/significant others, Stark (1992) cautions that this is true only to the extent that others support treatment. Studies have shown that living with other drug abusers is a predictor of dropout/relapse. Stark suggests clinicians be selective in recruitment of others to support treatment as they have proven to be potentially as damaging as supportive of client continuation. Clearly, living with a partner who also used cannabis regularly was a negative predictive factor for a sizeable minority (20 percent) of this sample at treatment entry.

A major barrier to retention and a successful outcome, however, may be the lack of appropriate and effective treatment options offered to clients for problems with cannabis use. Failure to find reliable profiles of 'dropout' has led many clinicians and researchers (e.g. Craig, 1985; Miller, 1985, 1989; Steer, 1980; Stark, 1992) to take the *interactionist* perspective which conceives dropout as resulting from an interaction between clients' needs and clinics' offerings. The current treatment approaches in New Zealand outpatient drug services based on individual counselling modalities developed in the alcoholism treatment area, may need to be modified and refined to match and address the unique and complex characteristics of the drug cannabis and its idiosyncratic effects on clinically-meaningful subgroups among the primary cannabis clientele. Clinicians themselves are quite aware of this necessity, as training in alternative treatment modalities and a broader repertoire of skills to offer cannabis clients were among the recommendations by treatment providers in Flintoft's (1994) survey. Indeed, improved expertise of drug treatment workers is a foremost priority articulated in our National Drug Policy (MOH, 1998). At the very minimum, drug workers need sufficient skills to work eclectically and integratively with clients, implementing different approaches when, and if, necessary.

The planning of new forms of psychosocial treatments to match client admission needs has been formally identified as a project of urgent priority in the illegal drug area both overseas and in New Zealand (Chrits-Christoph & Siqueland, 1996;

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Hubbard, 1997; MOH, 1998). It has been argued that the range of treatment options available for illicit drug abusers is currently too narrow and insufficiently attractive (e.g., Sellman et al., 1996). Clearly, individual differences require individualised programmes incorporating planned combinations of various methods, objectives and therapy contexts corresponding to the capacities, potentials and limitations that each client presents at treatment admission. Perforce, dropout rates in this study attest to the critical importance of responding to *individual* client needs to attract and retain cannabis clients in treatment.

SUGGESTED STRATEGIES FOR RETENTION AND THERAPEUTIC ENHANCEMENT

General Strategies

From the *interactionist* perspective, counsellors and other programme staff can influence the probability of desired client response to treatment (Miller, 1985). Stark (1992) has reviewed studies (including cannabis clients) that have explored retention-enhancing strategies, and concluded that both immediate and long-term retention could be dramatically improved by: a rapid initial response (Stark et al., 1990); a warm, welcoming atmosphere, and shorter wait-time for initial appointments (Simpson, 1979); continuity of care, and meeting in small groups in friendly, comfortable environments. Other strategies include maximizing personalized contact with letters and cards (such as "I missed you" cards) or telephone calls (Miller, 1985). The researcher's experience, however, was that most of these important considerations were established procedures at the participating agencies, and serve as a commendable index of the care, respectful regard and goodwill extended to clients of New Zealand drug treatment services.

A number of other strategies have been suggested to prevent premature termination. In the wider addiction field, offering clients a choice of treatment modalities and change strategies, (often called the "cafeteria" approach), client-generated goals, and a wide range of ancillary services during the admission procedure has been

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empirically validated as an effective 'matching' strategy (Miller, 1985, 1989; Hser et al, 1999; McLellan et al., 1994). Attendance requirements are also established or contracted through negotiated discussion during the intake interview. Research has shown that clients' requests for a particular treatment dictated how well they fared in treatment, and studies have shown a superior outcome at one year follow -up if a client chose his/her options for change and/or received desired services (Miller, 1985, 1989; Hser et al., 1999; McLellan et al., 1994)

Employing the *interactionist* perspective requires clients' views on the nature of their drug use problems and their perceptions of the value of treatment must be addressed. A recent English study (Clark & Wilkes, 1997) captures the essence: "Listening to consumer's opinions provides an essential tool for gaining the clients' views and achieving the best match for this within organizational constraints" (p. 161). Clients' expressed preferences are particularly important since compliance with a treatment plan is a "powerful predictor of it's effectiveness" (APA, 1995, p. 21). Clearly, taking an approach that deals directly with their everyday, concrete concerns and articulated needs in planning treatment for the rapidly-expanding cannabis clientele at New Zealand drug treatment services offers a potentially effective approach to achieving longer-term retention and by extension, improved outcomes.

In the 'real world' of New Zealand community-based treatment programmes , however, implementation of the "cafeteria" approach is idealistic, as access to treatment is primarily predicated on availability and cost, and is hence a time- and place-limited proposition. A major obstacle is the perennial funding constraint which dictates programme and modality availability, staff/client ratios, training and education, referral networks and service diversity. These, in turn, affect treatment capacity, treatment alternatives, wait-lists, staff morale, and inevitably – staff recruitment and retention (see Sellman et al., 1996). All of these factors contribute to the paucity of client-treatment matching in community-based drug treatment programmes (Finney & Moos, 1986).

Stark 's (1992) review concludes, "the most important factor in preventing attrition is the clinician who is committed to clients' treatment continuation" (p. 111). The researcher's experience throughout this study's duration, however, was that of remarkably dedicated, caring counsellors, with exhausting caseloads and demanding schedules. It was often difficult to establish immediate contact due to counsellors' priority ordering of their attention to clients' needs. There were periods, furthermore, when "in crisis" was the agency's *modus operandi*, a result of influx of severely symptomatic presentations and problem cases. Yet, in spite of this committed, professional stance to the clients' needs and interests, as the present study has shown, individual counselling (and all the extra-therapeutic efforts invested) appear insufficient to engage many cannabis clients long enough to facilitate adequate during-treatment change to permit any confidence about the durability of treatment gains. An expanded model would include advocacy/social services and social supports which are almost universally a central concern for the clients' recovery in addictions treatment.

Client factors which appear to contribute to retention difficulties include their relatively low level of psychological and social functioning, their substantial cannabis-related problems and service needs, their unstable living situation and status, and associated anomie. In order to facilitate client retention in the cannabis treatment programmes, proactive, focused efforts clearly need to be devoted to the engagement and stabilization process from the moment of the very first contact. A crucial task involves finding an appropriate and effective way to induct or introduce clients into the process, content, and the culture of treatment. A supportive environment is clearly needed even *before* treatment begins, in which clients can start the process of self-diagnosis, observe others engaging in their own self-diagnosis, and begin to consider a lifestyle that does not include or "need" the prop of cannabis or other drugs.

There is clearly an urgent need for fresh and creative retention-enhancing and 'matching' strategies to facilitate treatment longevity among the cannabis clientele of our local drug treatment services. Of particular interest in the present context is drug-specific 'role induction' or pre-therapy orientation, which has been shown to have a positive impact on prevention of attrition from outpatient drug treatment (see

e.g., Siegal, Rapp, Fisher, Cole, & Wagner, 1993; Stark & Kane, 1985; Zweben & Li, 1981). This procedure involves educating clients about the procedures and aims of treatment, clarifying clients' understanding and agreement about their responsibilities in the treatment process, and anticipating and negotiating constructive solutions to any attendance problems. It is believed the procedure works because it reduces cognitive inaccuracies about the nature of treatment, provides a more accurate reflection of the clients' experience and current needs, and enhances the clients' perception of the therapist's credibility, competence and empathy (Stark & Kane, 1985).

Given the cognitive/communication difficulties likely to be experienced by cannabis clients, careful attention to this initial induction process could begin their socialisation into the treatment environment on a positive footing, particularly if augmented by takeaway printed educational and programme information and appointment schedules. When asked to make suggestions for improvement to the cannabis treatment programmes, several clients made clear indications that more cannabis-specific education was needed. Provision of up-to-date (simplified and graphically vivid) educational information about cannabis and its effects during treatment role induction could be a timely, awareness-raising pretreatment motivational strategy. In view of the characteristic memory deficits in the early stages of cannabis detoxification, a friendly reminder telephone call the evening before or on the day of the scheduled appointment (similar to that routinely made by other health services to avoid the costs of missed appointments) might also be productive.

A 'Social Support' Group Programme

Albeit in diverse ways, the remaining client suggestions for programme improvement indicated the felt need for more support. Accordingly, it is suggested that in order to augment individual counselling, a programme model with considerable potential in terms of both client appeal and effectiveness to match their substantial needs for support is a synthesis of the Monash (Melbourne) Cannabis

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Treatment Group programme (Wood, 1997/1998; reviewed in chapter two) and a similar group intervention that has been offered in a New Zealand treatment service to cannabis users wanting to quit or reduce their use (Cannabis Quit Group; A.L. Flintoft, personal communication, November 18, 1999). The legacy of group support in behaviour change is renowned, and may be particularly powerful because it provides multiple opportunities for support (Stephens & Roffman, 1993).

Both the Monash and the Cannabis Quit group incorporate self-disclosure and sharing of experiences, Motivational Interviewing, Relapse Prevention and other cognitive-behavioural techniques as required, according to the Prochaska and Di Clemente Stages of Change Model (Wood, 1997/1998). In the nonjudgmental supportive peer group environment, members can share information, concerns and frustrations, receive encouragement, and celebrate successes as they grapple with new coping strategies and make difficult lifestyle changes (Stephens & Roffman, 1993).

Most importantly, both group programmes emphasize the centrality of the social aspects in building group cohesion and promoting trust (Wood, 1997/1998). Social activities such as shared meals, pre- and post-meeting socialising, and other group outings are believed to be the key issue in helping clients succeed and provide alternative reward systems when urges to use are strong. While the novel element in the Monash programme is the 'buddy' system for between-session support, the New Zealand group features ex-cannabis users as guest speakers who relate their experiences on the road to recovery. For group members, successful role models are a valuable source of identification, optimism, inspiration, hope and courage that their problem can be overcome. Research has shown that clients who befriend ex-addicts who serve as role models are more likely to remain abstinent (Vaillant, 1970).

Other features addressing commonly-reported barriers to treatment include flexible meeting venues and times to accommodate clients' attendance needs, such as those of employed clients, and parents with childcare responsibilities (A.L. Flintoft, personal communication, November 18, 1999). Cannabis clients are invited and prepared for involvement in the peer support groups in the individual counselling

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context. Any interpersonal anxiety, cognitive, social skills (or other) deficits can therefore be screened and addressed before clients' integration in the group. Group programmes, however, may not be appropriate for all cannabis clients. For most clients, individual counselling sessions continue on an as-required basis (McCrady & Delaney, 1995).

A consistent finding in the literature on relapse to drug use is the critical protective influence of an adequate network of social/environmental supports (e.g., Marlatt & Gordon, 1985; Moos et al., 1990). The peer support group approach views drug abuse to be in part a disease of isolation, and involvement in behaviour associated with addiction more prevalent among those lacking functional support. It is suggested that the building and sustaining of relationships, the common bond of shared experience and understanding, the appropriate expression of feelings in a nondestructive way, the fellowship and the reciprocal instrumental support in this group approach can provide the alternative to cannabis and other drug use in a population with typically failed or dysfunctional relationships, lack of adequate environmental support, and related anomie and powerlessness. For, as Miller (1995) observed, without some form of optimism that change can be achieved, there *is* no motivation to begin the process of self-help. Healers have long recognized that hope and faith are important elements of change.

CLINICAL AND RESEARCH RECOMMENDATIONS

Researchers often comment that a study stimulates more questions than it answers (Cone & Foster, 1993). This study, it seems, is no exception. Since good clinical research and sound clinical practice are inextricably linked, clinical and research issues arising from this study are addressed in tandem.

This first New Zealand cannabis treatment-outcome study has raised a number of pressing clinical issues. Of foremost concern is the unprecedented attrition from treatment which highlights the urgency for systematic, proactive attention to

retention-enhancing strategies to maximize treatment longevity and improved outcomes. The finding that more treatment is better treatment makes treatment retention for cannabis clients a first priority. Identification and gratification of individual cannabis client needs from the very first point of contact is imperative. Clients should be asked directly about their treatment needs and preferences, including their everyday needs and concerns. Concurrent screening for any comorbid anxiety and depression, cognitive deficits, low self-efficacy and self-esteem, and other domains likely to interfere with adequate treatment implementation, engagement, and compliance should also be routinely be made.

This study has articulated the rationale for a flexible, problem-specific 'broad spectrum' intervention package tailored to match individual client needs. Such an approach would include components such as adjunctive therapy for anxiety and depression, innovative compensatory techniques to accommodate cognitive deficits, impaired information processing abilities and different learning styles, and the development of an advocacy/client assistance approach to link clients with other primary social services needed for rehabilitation (e.g., medical, housing, employment/vocational rehabilitation, income support, legal, relationship and other counselling, etc.). Treatment providers should create, keep updated and nurture their network of community contacts and resources to be able to facilitate the delivery of these basic human services in a timely, well-planned coordinated manner. The community should be viewed as a reservoir of resources, not an enemy to be avoided, fought with, or destroyed.

As an initial retention-enhancement procedure, the cannabis-specific 'role induction' can provide the optimal context for laying the foundation for a quality therapeutic alliance; client's socialization into the cannabis treatment programme by demystifying treatment procedure, content, and expectations; preliminary awareness-raising education about cannabis and the withdrawal process; negotiating individualized attendance criteria and goal-setting; motivation- and trust-building. The clear association between Motivational Interviewing and satisfaction with services in this study underscores the importance of initiating motivation-building at the earliest opportunity. Most important, however, is the optimism and hope

imparted by counsellor assurance that there is a realistic and effective change strategy available, and all the support resources needed to achieve individual goals.

The provision of more cannabis education explicitly requested by clients in this study highlights the necessity for treatment providers to keep abreast of the ever-developing research literature in this topical (and controversial) drug area. This will equip counsellors to relay accurate credible information with confidence, to help dispel the trenchant myths and factual inaccuracies with which clients present. Different educational strategies may be needed for 'at risk' client subgroups such as adolescents, women, Maori, and those with comorbid psychiatric illnesses to emphasize the special risks and vulnerabilities of these client groups to the potentially detrimental effects of cannabis on their health and wellbeing.

Clients in this study affirmed their need for, and their satisfaction with, the cannabis treatment programmes, and almost universally indicated they would return to the programme if necessary. Several individuals, however, indicated the need for more support. This study suggested that the individual counselling modality in which cannabis treatment programmes are currently delivered in New Zealand drug treatment services may be insufficient to provide the multidimensional range of support this clientele appears to need. To supplement and extend the (confirmed) benefits of individual counselling, a peer support group intervention is suggested as an appropriate and promising source of all the various dimensions of social support cannabis clients need to make and sustain the difficult changes to their cannabis-using lifestyle. Specifically, the beneficence of identification, shared information and goals, a common bond, reciprocal instrumental support, and the optimism, hope and courage typically generated within these groups appears unique and potent.

The agencies that participated in this study are to be commended for their valued contribution to this research endeavour. At the same time it is imperative that ongoing evaluation and follow-up procedures are incorporated as routine practice to maintain continuous feedback about the acceptability, suitability and helpfulness of the cannabis treatment programmes for cannabis clients and the various client subgroups among this rapidly-expanding clientele. Creative programmes especially designed for youth should be explored in an effort to engage adolescent clients in

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treatment and arrest the potential graduation from cannabis to more serious drug use. Attention to gender-specific issues and treatment needs is obligatory as the year 2000 begins and females constitute an increasingly larger proportion of the cannabis (and other drug) clientele at New Zealand drug treatment services. Similarly, treatment should be continually reviewed to ensure delivery of culturally-appropriate services that enhance the process of "cultural linkage" (Sellman, Huriwai, Ram & Deering, 1997), so vital to the health and wellbeing of Maori clients.

It is also crucial that different modalities, different combinations of components in the treatment package, and alternative methods of service delivery be continually explored and evaluated, especially as clients progress through the (theoretical) stages of change and their needs alter accordingly. Treatment services should accurately match clients' needs at each successive stage of change. For example, as relationship problems were prominent among clients in this study, partners and/or significant others should be incorporated (if appropriate) into periodic sessions or into group 'training' sessions to educate and facilitate supporter-assisted coping techniques and supportive behaviour from these significant network members for the client's quit effort. These significant others are a crucial aftercare resource. As a relapse prevention/maintenance strategy, support from the client's personal network outside the intervention context is critical for any realistic hope of lasting change (see Miller et al., 1989).

These clinical considerations, in turn, raise several research issues. Replication of this study is required to further investigate the effectiveness of the cannabis treatment programmes, and to identify client characteristics (that may be) associated with differential attrition from treatment. This would ascertain specific junctures in the treatment process where innovative retention-enhancing strategies should systematically be targeted. While retaining the ecological validity of the naturalistic study context, a larger sample and specified session attendance criteria before inclusion in the analyses as a treatment 'completer' (as in the American studies) would clearly enhance the scientific evaluation of the treatment programmes and the identification of a 'high-risk-of-attrition' profile among treatment-seeking cannabis clients. (Perhaps an appropriate monetary reward contingent on completing a finite

number of sessions would prove to be a fruitful recruitment technique!). Acknowledging the ethical veto on a wait-list control group, the researcher suggests the incorporation of some form of comparison group would help strengthen any inferences that could be drawn.

Further research would subsequently be required to test the generalisability of findings to other geographically diverse outpatient drug treatment services throughout New Zealand. Additional research would then be necessary to evaluate the efficacy of different attrition-prevention techniques designed and implemented at these various junctures in the treatment trajectory for different client subgroups. Follow-on 'predictor' research would ultimately be needed to test the efficacy of matching clients to treatment packages based on these findings.

Clearly, ongoing evaluation research should be routinely incorporated to test the efficacy of any therapeutic enhancement strategies implemented to target depression and anxiety, cognitive/learning, and self-efficacy deficits detected at pretreatment screening. All research should carefully examine differential responses to these innovations among client subgroups, and adapt the interventions where indicated. The provision of social services in response to clients' expressed needs as a retention-enhancement strategy should also be systematically evaluated. Research should also investigate the treatment outcome enhancement effect achieved by the integration of a peer support group intervention with the individual counselling programmes. For example, clients choosing not to receive the benefit of the group intervention could (ethically) serve as a 'natural' comparison/control group.

This study has confirmed the need for further controlled investigation into the association between cannabis use and psychological distress to help clarify the "protracted abstinence syndrome"/"self-medication hypothesis" debate. In conjunction with cannabis use, anxiety and depression should be assessed carefully at treatment intake for diagnostic accuracy, and these variables monitored continuously over the duration of abstinence-oriented treatment. This raises the issue of the psychometric adequacy of the HAD Scale for cannabis clients, as used in this study. This aspect should be tested against other instruments widely-used for this purpose in the drug treatment field (e.g., the Beck Depression Inventory).

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Research should also consider other measurement issues raised in this study. In common with other cannabis research (e.g., Stephens et al., 1993, 1994; Swift et al., 1997) this study was limited by the lack of a cannabis-specific measure of cannabis dependence/abuse similar to that validated for use in other drug areas. Research is urgently needed in this important diagnostic area.

Given the pivotal role of both self-efficacy and motivation in theories of the change process, further empirical work needs to be done to improve assessment instruments and techniques to help individuals make realistic and accurate self-appraisals in these critical predispositional areas. For example, given the lack of demonstrated predictive validity of the RCQ for cannabis clients in this study, further validation research is needed in relation to this instrument, or development of alternative assessment instrument(s) and techniques explored. In this regard, perhaps the psychometrically-validated 'self-rating form' (see Simpson et al., 1993) prepared specifically for drug treatment clients could be trialled as a brief but complete self-administered assessment of all the important domains believed to be important for prediction of drug treatment outcomes (self-esteem, depression, anxiety, decision-making, social functioning, self-assessment of drug use, desire for help, and treatment readiness).

In addition, some refinements are clearly needed to other measures used in this study. The one-item index of general health/treatment-seeking yielded ambiguous data and failed to tap the various dimensions of general health measured by other psychometric scales commonly used in the drug treatment field. The uniformly high client ratings of satisfaction with treatment and the therapeutic alliance were likely (at least in part) due to response styles probably influenced by situational demand characteristics. Although explicitly encouraged to respond honestly, for example, not one client reported a "dislike" about treatment services, which is not really plausible in the real world of community-based services. Items such as these with highly skewed response distributions and variance restrictions need continued work and, perhaps, alternative data collection methods or venues.

Exploratory research attention clearly needs to be directed towards the measurement of client 'engagement in treatment', given the status accorded this concept in the drug treatment field. This construct has traditionally been measured as the number of treatment sessions attended (analogous to the concept of treatment "dose"). However, this was a confounding factor in this cannabis treatment study. Rather than relying solely on counsellor records of session attendance, other methods of tapping this rather imprecise concept need to be developed. It is suggested that clients themselves would be a cogent (subjective) source of "engagement in treatment" phenomena to contribute to an expanded model.

Finally, as part of the routine evaluation strategy suggested earlier, the importance of systematic follow-up research cannot be overstated. Drug dependence is a chronic relapsing condition, hence treatment is a long-term process which cannot be viewed as a simple one-off intervention. Miller (1989) has astutely conceptualized follow-up as aftercare in the form of a "booster" session to maintain the client-treatment programme relationship. Follow-up research contact can also serve as a timely detector of imminent relapse and can therefore facilitate reentry back into the programme. One client's comment at posttreatment assessment seems to capture the significance: "Please follow up after court sentence is over".

Despite the discouraging response rates in this study it is therefore crucial that posttreatment follow-up of cannabis clients is assiduously pursued. Follow-up research is essential for adequate evaluation of the cannabis treatment programmes including any variations or 'matching' strategies attempted, and for testing the natural history of satisfaction with services. It is also a timely opportunity for sensitive, direct enquiry about clients' reasons for dropping out of treatment, and for eliciting any 'dislikes' about the treatment services. Given the cognitive (and perhaps reading and writing) skills deficits likely among the cannabis clientele, attention should be given to finding the most pragmatic format for follow-up. It is suggested that implementation of the peer support group intervention could resolve at least some of the historical tracking problems.

CONCLUSIONS

This first cannabis treatment outcome study conducted in New Zealand yielded a typical profile of relatively young presentations with a history of chronic, regular cannabis use accompanied by substantial comorbid psychopathology and dysfunction in several interrelated life domains. Despite these manifest multiple needs for a variety of treatment services to help with their cannabis use and other pressing life problems, however, most in this sample evinced a singular inability (or disinclination) to engage in treatment long enough to accrue the potential benefits of extended treatment participation.

Regrettably, therefore, given the empirical evidence for a minimum requirement of at least three months in treatment before progress towards recovery begins to occur, the major attrition that occurred in this period permits treatment providers little confidence in favourable long-term outcomes for the cannabis clientele. This predicament extends to treatment graduates, with most exiting treatment before attending a minimum number of sessions to ensure adequate assimilation of the therapeutic content.

Although anticipated to a lesser degree, the excessive attrition from this study was both disappointing in terms of the research objectives, and vexatious for treatment providers. Early dropouts represent a major threat to the overall efficacy and cost-efficiency of drug treatment services, delay admission of others on the wait-list, and can have a negative effect on counsellor and programme morale (Roffman et al., 1993).

Across all modalities and drug categories, improving client retention in treatment is the key to improving drug treatment outcomes (Simpson, 1979, 1981, 1993). However, consumer appeal and perceived suitability, and satisfaction are major factors in client demand for, and retention in, treatment programmes (Copeland, 1997; De Leon & Jainchill, 1986; Sellman et al., 1996; Simpson & Joe, 1993; Stephens et al., 1993). That some clients in this study did, in fact, report being "mildly dissatisfied" with treatment, or that treatment "made no difference", together with commonly reported unmet treatment goals and relatively unchanged

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cannabis use at treatment follow-up, seems to convey a clear and timely alert to these issues. Alternative treatment services or other modifications to the cannabis treatment programmes may be needed to better meet client needs. Several promising retention- and therapeutic-enhancement models and strategies validated in the drug treatment literature have been suggested in the body of this paper. Arguably, all those outlined coalesce into one major principle: the systematic, careful tailoring of treatment services to 'match' individual client needs and deficits identified at intake assessment. Client opinions have been shown to be a crucial source of information for identifying their treatment needs and planning service provision.

Accordingly, treatment providers are urged to explore every possible creative therapeutic stratagem to enhance cannabis treatment longevity, and by extension, treatment outcomes. This is considered essential if the philosophy and the goals of the cannabis treatment programmes are to be attained. The challenge is to accomplish these worthy, humane objectives in face of perennial budget constraints, external cost-reduction pressures and managerial incentives to treat more individuals.

In addition to validating the effectiveness of the existing treatment programmes for a subset of cannabis clients in this sample and offering suggestions for retention and therapeutic enhancement, this study has provided comprehensive and affirmative feedback to the participating agencies. Client satisfaction with both treatment services and the therapeutic alliance was remarkably high. Treatment providers are exhorted to incorporate an evaluation component into the cannabis treatment programme as routine practice to provide continual feedback to ensure services and innovations continue to satisfy individual client needs. Continuity of care is emphasized, and an adequate aftercare plan essential. Identification of and linkage to appropriate social support and self-help groups are critically important at this stage. Should the client relapse or be vulnerable to relapse, follow-up can reengage the client in an appropriate level of treatment.

Responding to the call for dialogue and improved communication between researchers and treatment providers (e.g., Heather & Tebbutt, 1989; Mattson &

Donovan, 1994; Woody et al., 1991), this first study to address the treatment needs and experiences of cannabis clients of New Zealand community-based drug treatment services has generated a wealth of information, all of which is a timely contribution to the drug field, and the cannabis area in particular. The study is especially timely as it has coincided with yet another surge of active societal concern and debate about cannabis use and problems directly associated with its use, and the ongoing quest to determine the most appropriate and effective approaches to treatment for these problems. Current indications are that there has been no mitigation in presentations for help with these problems in recent months (CIRU, 1999).

The need for ongoing research to further understanding of how best to assist clients with cannabis use problems is clear. Several promising areas for research attention have been delineated. However, this worthy endeavour promises to be no small challenge for, despite the substantial treatment needs they manifest, this researcher's experience was that cannabis clients are a transient, difficult-to-study population.

REFERENCES

Abbott, A. (1990). The switch that turns the brain on to cannabis. *New Scientist, 11*, 31.

Abel, E.L. (1977). The relationship between cannabis and violence: a review. *Psychological Bulletin, 84*, 193-211.

Abel, S. & Casswell, S. (1993). *Cannabis Policy in New Zealand: A background paper.* Auckland: Alcohol and Public Health Research Unit, University of Auckland.

Abel S. & Casswell, S. (1998). Cannabis policy: issues and options. *The New Zealand Medical Journal, 111 (1074)*, 367-369.

Abood, M.E. & Martin, B.R. (1992). Neurobiology of marijuana abuse. *Trends in Pharmacological Sciences, 13*, 201-206.

Adams, P. (1987). *A Review of Outcome Evaluation Research into Treatment of Substance Misusers: Methods, Measures and an Annotated Bibliography.* Business and Applied Research Services.

Adams, I.B. & Martin, B.R. (1996). Cannabis: pharmacology and toxicology in animals and humans. *Addiction, 91 (11)*, 1585-1614.

Adamson, S., Sellman, J.D., Collier, A., Huriwai, T., Deering, D., Todd, F. & Robertson, P. (1998). A profile of alcohol and drug clients in New Zealand: Results from the 1998 National Telephone Survey. Paper presented at the Cutting Edge Conference, 30 August -1 September, Wellington.

Adlaf, E.M., Ivis, F.J. & Smart, R.G. (1994). *Alcohol and other drug use among Ontario adults in 1994 and changes since 1977.* Toronto: Addiction Research Foundation.

Alexander, L.& Luborsky, L. (1984). Research on the helping alliance. In L. Greenberg & W. Pinsof (Eds.), *The psychotherapeutic process: A research handbook.* New York: Guilford Press.

Ali, R. & Christie, P. (Eds.). (1994). *Report of the National Task Force on Cannabis.* National Drug Strategy. Canberra: Australian Government Publishing Service.

Allebeck, P. (1993). Schizophrenia and cannabis: cause-effect relationship? In : G.G.Nahas & C.Latour (Eds.), *Cannabis: physiopathology, epidemiology, detection* (pp. 73-77). Boca Raton, FL: CRC Press.

Allison, M. & Hubbard, R.L. (1985). Drug abuse treatment process: A review of the literature. *The International Journal of the Addictions, 20 (9),* 1321-1345.

American Medical Association (1981). Marijuana: It's health hazards and therapeutic potentials. *Journal of the American Medical Association, 246 (16),* 1823-1827.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders, 4th edition (DSM-IV).* Washington, DC: Author.

American Psychiatric Association (1995). Practice guidelines for the treatment of patients with substance use disorders: alcohol, cocaine, opioids. *American Journal of Psychiatry, 152 (11),* 1-59.

Anderson, G. (1990). *Fundamentals of educational research.* Great Britain: The Falmer Press.

Anglin M.D. & Hser, Y. (1992). Drug abuse treatment. In: R.R.Watson (Ed.), *Drug and Alcohol Abuse Reviews,* (pp. 1-36). New York: The Humana Press Inc.

Annis, H.M. & Davis, C.S. (1989). Relapse prevention. In R. K..Hester & W. R. Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (2nd ed., pp.170-182). USA: Allyn & Bacon.

Anthony, J.C., Warner, L.A. & Kessler, R.C. (1994). Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: Basic findings from the National Comorbidity Survey. *Experimental and Clinical Psychopharmacology, 2,* 244- 268.

Ashery P. & McAuliffe, W.E. (1992). Implementation issues in randomized trials of outpatient psychosocial treatment for drug abusers. *American Journal of Drug and Alcohol Abuse, 18,* 305-329.

Attkisson, C.C.& Zwick, R. (1982). The client satisfaction questionnaire: Psychometric properties and correlations with service utilization and psychotherapy outcome. *Evaluation and Program Planning, 5,* 233-237.

Auckland Regional Alcohol & Drug Services Clinical Information & Research Unit (CIRU) (1999). Unpublished Statistics.

Australian Bureau of Statistics (1996). *National Health Survey: User's Guide.* Canberra: Australian Government Publishing Service.

Babbie, E. (1992). *The practice of social research (6th ed.).* CA: Wadsworth Publishing Company.

Babor, T. F. (1988). Unitary vs. multidimensional models of alcoholism treatment outcomes: an empirical study. *Journal of Studies on Alcohol, 49,* 167-177.

Babor T. F. & Del Boca, F.K. (1992). Just the facts: Enhancing measurement of alcohol consumption using self-reports. In: R. Litten & J. Allen (Eds.), *Measuring alcohol consumption (*pp. 3-19). New Jersey: Humana Press.

Babor, T.F., Stephens, R.S. & Marlatt, G.A. (1987). Verbal report methods in clinical research on alcoholism: response bias and its minimization. *Journal of Studies on Alcohol, 48,* 410-424.

Bale, R.N., Arnoldussen, B.H. & Quittner, A.M. (1984). Follow-up difficulty with substance abusers: Predictors of time to locate and relationship to outcome. *The International Journal of the Addictions, 19 (8),* 885-902.

Ball, J.C. (1994). What I would most like to know: Why has it proved so difficult to match drug abuse patients to appropriate treatment? *Addiction, 89,* 263-265.

Ball J.C. & Ross, A. (1991). *The effectiveness of Methadone Maintenance treatment.* New York: Springer-Verlag.

Bandura, A. (1977). *Social learning theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bandura, A. (1984). Recycling misconceptions of perceived self-efficacy. *Cognitive Therapy and Research, 8,* 231-255.

Bandura A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice Hall.

Barber, J. G. & Crisp, B. R. (1995). The 'pressures to change' approach to working with the partners of heavy drinkers. *Addiction, 90,* 269-276.

Barlow, D.H. (1988). *Anxiety and its disorders.* New York: Guilford Press.

Barlow, D.H., Hayes, S.C. & Nelson, R. O. (1984). *The scientist practitioner.* New York: The Pergamon Press.

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Basham, R.B. (1986). Scientific and practical advantages of comparative design in psychotherapy outcome research. *Journal of Consulting and Clinical Psychology, 54 (1),* 88-94.

Beautrais, A.L. (1998). *The role of substance abuse in serious suicidal behaviour.* Paper presented at the Cutting Edge Conference, 30 August –1 September, Wellington.

Beautrais, A., Joyce, P.R. & Mulder, R.T. (1999). Cannabis abuse and serious suicide attempts. *Addiction, 94 (8),* 1155-1164.

Beck, A.T., Ward, C. H., Mendelson, M., Mock, J. & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4,* 561-571.

Bell, D.C., Williams, M.L., Nelson, R. & Spence, R. T. (1995). A pilot study of client progress in short-term drug abuse treatment. *Journal of Psychoactive Drugs, 27 (3),* 211-221.

Bien, T.H., Miller, W.R. & Tonigan, J.S. (1993). Brief interventions for alcohol problems: A review. *Addiction, 88,* 315-336.

Black, S. & Casswell, S. (1993). *Drugs in New Zealand – a survey, 1990.* Auckland: Alcohol and Public Health Research Unit, University of Auckland.

Bootsmiller, B. J., Ribisl, K.M., Mowbray, C. T., Davidson, W. S., Walton, M. A. & Herman, S. E. (1998). Methods of ensuring high follow-up rates: Lessons from a longitudinal study of dual diagnosed participants. *Substance Use and Misuse, 33 (13),* 2665-2685.

Boyle, A. (1990). *Springhall Centre outcome evaluation.* Hawkes Bay Area Health Board: Community Health Services.

Breslin, F.C., Sobell, S.L., Sobell, L.C. & Sobell, M.B. (1997). Alcohol treatment outcome methodology: state of the art 1989-1993. *Addictive Behaviors, 22,* 145-155.

Brown,J., Kranzler, H.R. & Del Boca, F.K. (1992). Self-reports by alcohol and drug abuse inpatients: factors affecting reliability and validity. *British Journal of Addiction, 87,* 1013-1024.

Budney, A., Novy, P.L. & Hughes, J. R. (1999). Marijuana withdrawal among adults seeking treatment for marijuana dependence. *Addiction, 94 (9),* 1311-1321.

Budney, A., Radonovich, K.J., Higgins, S.T. & Wong, C.J. (1998). Adults seeking treatment: for marijuana dependence: a comparison to cocaine-dependent treatment seekers. *Experimental and Clinical Psychopharmacology, 6,* 419-426.

Bushnell, J., Carter, H. & Howden-Chapman, P. (1994). *A review of the epidemiology of substance use disorders in New Zealand.* Research Report No. 2. Wellington: Health Services Research Centre, Department of Public Health.

Caddy, G. (1980). Problems in conducting alcohol treatment outcome studies: A review. In L. Sobell, M.Sobell, & E.Ward (Eds.), *Evaluation of alcohol and drug treatment effectiveness: Recent advances* (pp. 151-176). New York: Pergamon Press.

Campbell, D.T. (1984). Can we be scientific in applied social science? *Evaluation Studies Review Annual, 9,* 26- 48.

Campbell, D.T. & Stanley, J.C. (1963). *Experimental and quasi-experimental designs for research.* Chicago, Illinois: Rand McNally.

Castle, D.J. & Ames, F.R. (1996). Cannabis and the brain. *Australian and New Zealand Journal of Psychiatry, 30 (2),* 179-183.

Caswell, A. (1991). Marijuana as medicine. *Medical Journal of Australia, 15,* 497-498.

Chait, L.D. & Pierri, J. (1992). Effects of smoked marijuana on human performance: a critical review. In L.Murphy & A. Bartke (Eds.), *Marijuana / Cannabinoids: Neurobiology and Neurophysiology.* Boca Raton: CRC Press.

Chaudry, H.R., Moss, H.B., Bashir, A. & Suliman, T. (1991). Cannabis psychosis following bhang ingestion. *British Journal of Addiction, 86 (9),* 1075-1081.

Chen, H.T. (1990). *Theory- driven evaluations: A comprehensive perspective.* Newbury Park, CA: Sage.

Chen, K., Kandel, D.B. & Davies, M. (1997). Relationships between frequency and quantity of marijuana use and last year proxy dependence among adolescents and adults in the United States. *Drug and Alcohol Dependence, 46,* 53-67.

Chen, K., Mattick, R.P. & Baillie, A. (1993). *Clients of treatment service agencies: March 1992 Census findings.* Canberra: Commonwealth Department of Health, Housing, Local Government and Community Services.

Clark, C.A. & Wilkes, G. (1997). Listening to clients: the role of consumer opinion in designing drugs services. *Journal of Substance Misuse, 2,* 158-162.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, P. & Cohen, J. (1984). The clinician's illusion. *Archives of General Psychiatry, 41,* 1178-1182.

Cohen, S. (1986). Effects of long term marijuana use. International Symposium on Marijuana, Cocaine and Traffic Safety (1986, Santa Monica, California). *Alcohol, Drugs and Driving: Abstracts and Reviews, 2 (3-4),* 155-163.

Collier, A., Sellman, J.D., Adamson, S., Huriwai, T., Deering, D., Todd, F. & Robertson, P. (1998). *Current and optimal treatment practices of New Zealand alcohol and drug clinicians: Results from the National Telephone Survey.* Paper presented at the Cutting Edge Conference, 30 August – 1 September, Wellington.

Compton, D.R., Dewey, W.L. & Martin, B.R. (1990). Cannabis dependence and tolerance production. *Advances in Alcohol and Substance Abuse, 9 (1/2),* 129-147.

Cone, J.D. & Foster, S.L. (1993). *Dissertations and theses from start to finish: Psychology and related fields.* Washington, DC: American Psychological Association.

Cook D.T. & Campbell, D.T. (1979). *Quasi-experimentation: Design and Analysis Issues for field settings.* Chicago: Rand McNally.

Copeland, J. & Hall, W. (1992). A comparison of treatment drop-out of women seeking drug and alcohol treatment in a specialist women's and two traditional mixed-sex treatment services. *British Journal of Addiction, 87 (6),* 883-890.

Copeland, J. (1997). A qualitative study of barriers to formal treatment among women who self-managed change in addictive behaviours. *Journal of Substance Abuse Treatment, 14 (2),* 183-190.

Copolov, D., Bradbury, R., Dong, P., Dean, B. & Lim, A. (1999). *The interaction between cannabis and dopamine in the brain: Possible mechanisms related to psychosis.* Paper presented to the Inaugural International Cannabis and Psychosis Conference, 16-17 February, East Melbourne.

Cottler, L.B.(1993). Comparing DSM-III-R and ICD-10 substance use disorders. *Addiction, 88,* 689-696.

Cottler, L. B., Shuckit, M. A., Helzer, J.H. Crowley, T., Woody, G., Nathan, P. & Hughes, J. (1995). The DSM-IV field trial for substance use disorders: Major results. *Drug and Alcohol Dependence, 38,* 59-69.

Cowen, E.L. (1978). Some problems in community program evaluation research. *Journal of Consulting and Clinical Psychology, 46 (4),* 792-805.

Coynash, N. (1997). Adaptation of the Readiness to Change Questionnaire. Unpublished thesis submitted to the Victoria University of Wellington.

Craig, R. (1979). Locating drug addicts who have dropped out of treatment. *Hospital and Community Psychiatry, 30 (6),* 402-404.

Craig, R. J. (1984). Personality dimensions related to premature termination from an inpatient drug abuse treatment program. *Journal of Clinical Psychology, 40,1,* 351-355.

Craig, R. (1985). Reducing the treatment drop out rate in drug abuse programs. *Journal of Substance Abuse Treatment, 2,* 209-219.

Creason, C.R. & Goldman, M. (1981). Varying levels of marijuana use by adolescents and the amotivational syndrome. *Psychological Reports, 48 (2),* 447-454.

Crits-Christoph, P. & Siqueland, L. (1996). Psychosocial treatment for drug abuse. Selected review and recommendations for national health care. *Archives of General Psychiatry, 53,* 749-756.

Cronbach, L. (1982). *Designing Evaluations of Educational and Social Programs.* San Francisco, California: Jossey- Bass Inc.

Cunningham, J.A., Sobell, L.C., Sobell, M.B., Agrawal, S. & Toneatto, T. (1993). Barriers to treatment: Why alcohol and drug abusers delay or never seek treatment. *Addictive Behaviors, 18,* 347-353.

Davidson, R. (1992). Editorial: Prochaska and Di Clemente's model of change: a case study? *British Journal of Addiction, 87,* 821-822.

Deahl, M. (1991). Cannabis and memory loss. *British Journal of Addiction, 86,* 249-252.

Deane, F. (1993). Client satisfaction with psychotherapy in two outpatient clinics in New Zealand. *Evaluation and Program Planning, 16,* 87- 94.

De Jong, G. (1997). Value perspectives and the challenge of managed care. In M.J. Fuhrer (Ed.), *Assessing medical rehabilitation practices.* Baltimore: Paul H. Brookes Publishing Co.

De Leon, G., Inciardi, J.A. & Martin, S. (1995). Residential drug abuse treatment research: Are conventional control designs appropriate for assessing treatment effectiveness ? *Journal of Psychoactive Drugs, 27 (1),* 85-91.

De Leon, G. & Jainchill, N. (1986). Circumstance, motivation, readiness and suitability as correlates of treatment tenure. *Journal of Psychoactive Drugs, 18, 3,* 203-208.

Derogatis, L. R. (1983). *SCL-90-R: Administration, scoring and procedures Manual II.* Towson, MD: Clinical Psychometrics Research.

Desmond, D.P., Maddux, J.F., Johnson, T.H. & Confer, B.A. (1995). Obtaining follow-up interviews for treatment evaluation. *Journal of Substance Abuse Treatment, 12 (2),* 95-102.

De Vaus, D.A. (1991). *Constructing Questionnaires: Surveys in Social Research* (3rd ed.). London: Allen & Unwin.

Dewey, W.L. (1986). Cannabinoid pharmacology. *Pharmacological Reviews, 38,* 151-178.

Di Clemente, C. C., Carbonari, J. P., & Velasquez, M. M. (1992). Alcoholism treatment mismatching from a Process of Change perspective. In R. R. Watson (Ed.), *Drug and Alcohol Abuse Reviews, 3: Alcohol Abuse Treatment.* (pp. 115-141). The Humana Press Inc.

Di Clemente, C.C.& Hughes, S.L. (1990). Stages of Change profiles in alcoholism treatment. *Journal of Substance Abuse, 2,* 217-235.

Didcott, P., Flaherty, B. & Muir, C. (1988). *A profile of addicts in residential treatment in New South Wales* (In House Report Series). Sydney: Directorate of the Dug Offensive, New South Wales Department of Health.

Didcott, P., Reilly, D., Swift, W. & Hall, W. (1997). *Long-term cannabis users on the New South Wales North Coast.* Monograph No. 30. Sydney: NDRAC.

Dimeff, L.A. & Marlatt, G.A. (1995). Relapse prevention. In R.K.Hester & W.R.Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (2nd ed., pp. 176-194). USA: Allyn & Bacon.

Donnelly N. & Hall, W. (1994). *Patterns of Cannabis Use in Australia.* National Drug Strategy Monograph Series No. 27. Canberra: Australian Government Publishing Service.

Drugs Advisory Committee, New Zealand Drug Foundation, Public Health Commission (1995). *Cannabis and Health in New Zealand.* Wellington: Public Health Commission.

Drummond, D.C. (1997). What I would most like to know. Alcohol interventions: do the best things come in small packages ? *Addiction, 92 (4),* 375-379.

Duffy, A. & Milin, R. (1996). Case study: Withdrawal syndrome in adolescent chronic cannabis users. *Journal of American Academy of Child and Adolescent Psychiatry, 35 (12),* 1618-1621.

Dupont, H. & Niewijk, A. (1996). Self-control training for young smokers: Cannabis project. *Jellinek Quarterly, 3,* 11.

Edwards, G. & Gross, M. M. (1976). Alcohol dependence: provisional description of a clinical syndrome. *British Medical Journal, 1,* 1058-1061.

Edwards, G., Arif, A. & Hodgson, R. (1981). Nomenclature and classification of drug- and alcohol-related problems: A WHO memorandum. *Bulletin of the World Health Organisation, 59,* 225-242.

Einstein, S. (1981). Understanding drug user treatment evaluation: some unresolved issues. *International Journal of the Addictions, 16 (3),* 381-400.

Elley, W.B. & Irving, J.C. (1985). The Elley-Irving Socio-Economic Index 1981 Census Revision. *New Zealand Journal of Educational Studies, 20 (2),* 115-128.

Engstrom, A., Allebeck, P., Rodwall, Y. & Rydberg, V. (1985). Adverse psychic effects of cannabis – with special focus on Sweden. In D.J.Harvey, W.Paton & G.Nahas (Eds.), *Marihuana '84: Proceedings of the Oxford Symposium on Cannabis* (pp. 593-604). Oxford: IRL Press.

Estroff T.D. & Gold, M.S. (1986). Psychiatric presentations of marijuana abuse. *Psychiatric Annals, 16 (4),* 221-224.

Feehan, M., McGee, R., Nada Raja, S. & Williams, S. (1994). DSM-III-R disorders in New Zealand 18 –year-olds. *Australian and New Zealand Journal of Psychiatry, 28,* 87-99.

Fergusson, D. (1993). *The prevalence and co-morbidities of cannabis use in a birth cohort of Christchurch 15 year olds.* Paper presented to the Conference on Cannabis and Health, Wellington, 4-6 October.

Fergusson, D.M. & Horwood, L. J. (1997). Early onset cannabis use and psychosocial adjustment in young adults. *Addiction, 92 (3),* 279-296.

Fergusson, D., Lynskey, M. & Horwood, J. (1993). Patterns of cannabis use among 13–14 year old New Zealanders. *New Zealand Medical Journal, 106,* 247-250.

Fergusson, D., Lynskey, M. & Horwood, J. (1996). The short-term consequences of early onset cannabis use. *Journal of Abnormal Child Psychology, 24 (4),* 499-512.

263

Field, A. & Casswell, S. (1999). *Drug use in New Zealand: Comparison surveys, 1990 & 1998.* Alcohol & Public Health Research Unit, University of Auckland. (a)

Field, A. & Casswell, S. (1999). *Drugs in New Zealand: National survey, 1998.* Alcohol & Public Health Research Unit, University of Auckland. (b)

Finney, J.W. (1995). Enhancing substance abuse treatment evaluation: Evaluating mediators and moderators of treatment effects. *Journal of Substance Abuse, 7,* 135-150.

Finney J.W. & Moos, R.H. (1986). Matching patients with treatments: Conceptual and methodological issues. *Journal of Studies on Alcohol, 47,* 122-134.

Finney, J.W. & Moos, R.H. (1989). Theory and method in treatment evaluation. *Evaluation and Program Planning, 12,* 307-316.

Fletcher, J.M., Page, J.B., Francis, D.J., Copeland, K., Naus, M.J., Davis,C., Morris, R. et al. (1996). Cognitive correlates of long-term cannabis use in Costa Rican men. *Archives of General Psychiatry, 53,* 1051-1057.

Flintoft, A. (1994). Clients who use cannabis: Incidence, counselling strategies and arising issues. *Social Work Review,* June, 10-14.

Fox, K. (1998). *An Health Funding Authority perspective on alcohol and drug services in New Zealand.* Paper presented at the Cutting Edge Conference, 30 August -1 September, Wellington.

Frawley, P.J. (1991). Developing standardized measures of treatment outcome. *Alcohol Health and Research World, 15,* 201-203.

Fried, P.A. (1989). Postnatal consequences of maternal marijuana use in humans. *Annals of the New York Academy of Sciences, 562,* 123-132.

Gardner, E. L. (1997). Brain reward mechanisms. In J.H. Lowinson, P.Ruiz, R.B. Millman & J.G.Langrod (Eds.), *Substance abuse: A comprehensive textbook* (3rd ed., pp. 51-84). Baltimore: Williams & Wilkins.

Geller, A. (1997). Comprehensive treatment programs. In J.H. Lowinson, P Ruiz, R.B.Millman & J.G. Langrod (Eds.), *Substance abuse: A comprehensive textbook* (3rd ed., pp. 425-429). Baltimore: Williams & Wilkins.

Gerstein, D. & Harwood, H. (Eds.), (1990). *Treating drug problems (Vol. 1).* Washington, DC: National Academy Press.

Ghodse,A.H. (1986). Cannabis psychosis. *British Journal of Addiction, 81,* 473-478.

Ginzburg, H.M., Craddock, G.G., Hubbard, R. & Glass, J. (1984). Characteristics, behaviors, and outcomes for marijuana users seeking treatment in drug abuse programs. In S.H.Agurell, W.L.Dewey & R.E.Willette (Eds.), *The cannabinoids : Chemical, pharmacologic, and therapeutic aspects* (pp. 47-62). San Diego, CA: Academic Press.

Glaser, F. B. (1980). Anybody got a match? Treatment research and the matching hypothesis. In G. Edwards & M. Grant (Eds.), *Alcoholism treatment in transition* (pp. 178-196). Baltimore: University Park Press.

Glass, M., Dragunow, M. & Faull, R. (1997). Cannabinoid receptors in the human brain: A detailed anatomical and quantitative autoradiographic study in the fetal, neonatal and adult human brain. *Neuroscience, 77 (2),* 299-318.

Gold, M. (1991). Marijuana. In N.S.Miller (Ed.), *Comprehensive Handbook of Drug and Alcohol Addiction* (pp. 353-382). New York: Macal Dekker.

Goldfried, M. (1980). Toward a delineation of therapeutic change principles. *American Psychologist, 35,* 931- 950.

Goldfried, M. (1982). *Converging themes in psychotherapy.* New York: Springer.

Goldman, M.S. (1983). Cognitive impairment in chronic alcoholics. *American Psychologist, 38,* 1045-1054.

Goldman, M.S. (1987). The role of time and practice in recovery of function in alcoholics. In O.A. Parsons, N. Butters & P.E.Nathan (Eds.), *Neuropsychology of alcoholism: Implications for diagnosis and treatment* (pp. 291-321). New York: Guilford.

Goldstein, P., Abbott, W., Paige, W., Sobell, I. & Soto, F. (1977). Tracking procedures in follow –up studies of drug abusers. *American Journal of Drug and Alcohol Abuse, 4 (1),* 21-30.

Gordis, E. (1987). Accessible and affordable health care for alcoholism and related problem: strategy for cost containment. *Journal of Studies on Alcohol, 48 (6),* 579-585.

Gossop, M., Darke, S., Griffiths, P., Hando, J., Powis, B., Hall, W. & Strang, J. (1995). The Severity of Dependence Scale (SDS): psychometric properties of the SDS in English and Australian samples of heroin, cocaine and amphetamine users. *Addiction, 90,* 607-614.

Gottheil, E., Thornton, C.C. & Weinstein, S.P. (1997). Treatment structure, client coping methods, and response to brief individual counseling: Preliminary findings in a substance dependent sample. *Journal of Addictive Diseases, 16 (3),* 51-65.

Gowing, L., Ali, R.L., Christie, P. & White, J.M. (1998). Therapeutic use of cannabis: clarifying the debate. *Drug and Alcohol Review, 17,* 445-452.

Graham, K. (1994). Guidelines for using standardized outcome measures following addictions treatment. *Evaluation and the Health Professions, 17 (1),* 43-59.

Grant, K.A., Arciniega, L.T., Tonigan, J.S., Miller, W.R. & Meyers, R.J. (1997). Are reconstructed self-reports of drinking reliable? *Addiction, 92 (5),* 601-606.

Greenfield, T.K. & Attkisson, C.C. (1989). Steps toward a multidimensional satisfaction scale for primary care and mental health services. *Evaluation and Program Planning, 12,* 271-278.

Grenyer, B.F.S., Luborsky, L. & Solowij, N. (1995). *Treatment manual for supportive-expressive dynamic psychotherapy: Special adaptation for treatment of cannabis (marijuana) dependence.* NDARC Technical Report No.26. Sydney: University of New South Wales.

Grenyer, B.F.S., Solowij, N. & Peters. R. (1996). A comparison of brief versus intensive treatment for cannabis dependence. *Australian Journal of Psychology, 48,* 106.

Grenyer, B.F.S., Solowij, N. & Peters, R. (1997). Brief versus intensive psychotherapy for cannabis dependence. In L. S. Harris (Ed.), *Problems of Drug Dependence 1996.* Proceedings of the 58th Annual Scientific Meeting of the College on Problems of Drug Dependence, NIDA Research Monograph 174. Rockville, MD: National Institute of Health, U.S. Department of Health and Human Services,108.

Grenyer, B.F.S., Solowij, N. & Peters, R. (1997). *Treating cannabis dependence: findings from the first Australian controlled trial.* Paper presented at the 1997 Conference of the Australian Professional Society on Alcohol and other Drugs, Adelaide, Australia.

Grinspoon, L. & Bakalar, J.B. (1997). Marihuana. In J.H.Lowinson, P.Ruiz , R.B. Millman & J.G.Langrod (Eds.), *Substance abuse: A comprehensive textbook* (pp. 199-206). Baltimore: Williams & Wilkins.

Grinspoon, L.,Bakalar, J.B., Zimmer, L. & Morgan, J.P. (1997). Marijuana Addiction. *Science, 277,* 749-752.

Grossman, J. & Tierney, J. (1993). The fallibility of comparison groups. *Evaluation Review, 17 (5),* 556-571.

Haas A.P. & Hendin, H. (1987). The meaning of chronic marijuana use among adults: a psychosocial perspective. *The Journal of Drug Issues, 17 (4),* 333-348

Hall, W. (1995). The health risks of cannabis. *Australian Family Physician, 24 (7),* 1237-1240.

Hall, W. (1997). The recent Australian debate about the prohibition on cannabis use. *Addiction, 92 (9),* 1109-1115.

Hall, W. (1998). Cannabis use and psychosis. *Drug and Alcohol Review, 17,* 433- 444.

Hall, W. & Degenhardt, L. (1999). *Cannabis use and psychosis.* Paper presented to the Inaugural International Cannabis and Psychosis Conference, 16-17 February, East Melbourne.

Hall, W. & Solowij, N. (1998). Adverse effects of cannabis. *The Lancet, 352,* 1611-1616.

Hall, W. & Solowij, N. (1997). Long term cannabis use and mental health. *British Journal of Psychiatry, 171,* 107-108.

Hall, W., Solowij, N. & Lemon, J. (1994). *The health and psychological consequences of cannabis use*. National Drug Strategy Monograph Series No. 25. Canberra: Australian Government Publishing Service.

Hall, W., Solowij, N. & Lemon, J. (1996). The health and psychological consequences of cannabis use (extract) followed by five commentaries. *Addiction, 91 (6),* 759-770.

Hannifin, J. (1990). *National policies and strategies on drug problems: what about cannabis ?* Paper presented at the 18th International Institute on the Prevention of Drug Dependence, 10 –16 June, West Berlin.

Hasin, D.,Grant, B.F.& Weinflash, J.(1988). Male/female differences in alcohol-related problems: alcohol rehabilitation patients. *The International Journal of the Addictions, 23,* 437-448.

Heather, N. (1995). Interpreting the evidence on brief interventions for excessive drinkers: the need for caution. *Alcohol and Alcoholism, 30,* 287-296.

Heather N. & Tebbutt, J. (Eds.). (1989). *The effectiveness of treatment for drug and alcohol problems:: An overview.* National Campaign Against Drug Abuse Monograph Series No. 11. Canberra: Australian Government Publishing Service.

Heather, N., Rollnick, S. & Bell, A. (1993). Predictive validity of the Readiness to Change Questionnaire. *Addiction, 88,* 1667-1677.

Heishman, S.J., Heustis, M.A., Henningfield, J.E. & Cone, E.J. (1990). Acute and residual effects of marijuana profiles of plasma THC levels, physiological, subjective, and performance measures. *Pharmacolgy, Biochemistry and Behaviour, 37,* 561-565.

Hendin, H., Haas, A.P., Singer, P., Ellner, M. & Ulman, R. (1987). *Living high: daily marijuana use among adults.* New York: Human Sciences Press.

Herkenham, M., Lynn, A.B., Little, M.D., Johnson, M.R., Melvin, L.S., De Costa, B.R. & Rice, K.C. (1990). Cannabinoid receptor localization in the brain. *Proceedings of the National Academy of Sciences, USA, 87,* 1932-1936.

Holder, H.D., Longabaugh, R., Miller, W.R. & Rubonis, A.V. (1991). The cost-effectiveness of treatment for alcoholism: A first approximation. *Journal of Studies on Alcohol, 52 (6),* 517-540.

Hollister, Leo E. (1986). Health aspects of cannabis. *Pharmacological Reviews, 38,* 1-20.

Hollister, Leo E. (1988). Marijuana and immunity. *Journal of Psychoactive Drugs, 20,* 3-8.

Hollister, Leo E. (1990). Treatment outcome: a neglected area of drug abuse research. *Drug and Alcohol Dependence, 25,* 175-177.

Howden-Chapman, P. & Huygens, I. (1988). An evaluation of three treatment programmes for alcoholism: an experimental study with 6 and 18 month follow-ups. *British Journal of Addiction, 83,* 67-81.

Hser,Y.I., Anglin, M.D.& McGlothin, W. (1987). Sex differences in addict careers. 1. Initiation of use. *American Journal of Drug and Alcohol Abuse, 13,* 33-57.

Hser, Y.I., Polinsky, M.L., Maglione, M. & Anglin, M.D. (1999). Matching clients' needs with drug treatment services. *Journal of Substance Abuse Treatment, 16, 4,* 299-305.

Hubbard, R.L. (1997). Evaluation and treatment outcome. In J.H. Lowinson, P. Ruiz, R.B. Millman & J.G.Langrod (Eds.), *Substance abuse: A comprehensive textbook* (pp. 499-513). Baltimore: Williams & Wilkins.

Hunt, C.A. & Jones, R.T. (1980). Tolerance and disposition of
tetrahydrocannabinol in man. *Journal of Pharmacology and Experimental
Therapy, 215,* 33-34.

Inciardi, J.A., Tims, F. & Fletcher, B. (Eds.). (1993). *Innovative approaches to the
treatment of drug abuse: Program models and strategies.* Westport, CT:
Greenwood Press.

Institute of Medicine (1990). *Broadening the base of treatment for alcohol
problems.* Washington, DC: National Academy Press.

Isenhart, C. E. (1997). Pretreatment readiness for change in male alcohol
dependent subjects: Predictors of one-year follow-up status. *Journal of
Studies on Alcohol, 58 (4),* 351-357.

Jacobsen, N.S. & Traux, P. (1991). Clinical significance: A statistical approach to
defining meaningful change in psychotherapy research. *Journal of
Consulting and Clinical Psychology, 59 (1),* 12-19.

Jaffe, J.H. (1985). Drug and addiction abuse. In L.S.Goodman, A.G.Gilman,
T.W.Rall & F.Murad (Eds.), *The pharmacological bases of therapeutics*
(7th ed., pp. 532- 581). New York: MacMillan.

James, R., Duignan, P., Casswell, S. & Crosbie, D.(1992). *Evaluating
community-based drug and alcohol programs.* June, National Centre for
Research into the Prevention of Drug Abuse.

Jessor, R. & Jessor, S. (1977). A social-psychological framework for studying
drug use. In D.J. Lettieri, M. Sayers & H. Wallenstein-Pearson (Eds.),
Theories on drug abuse: Selected contemporary perspectives. Rockville,
MD: National Institute on Drug Abuse.

Johnston, C. & Hannifin, J. (1987). *A review of drug treatment services in New
Zealand.* The National Drug Treatment Research Project. Palmerston North:
Manawatu Society on Alcohol and Drug Abuse.

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Johnson, B. (1991). Cannabis. In I.Glass (Ed.), *The international handbook of addiction behaviour.* London: Routledge.

Jonas, S. (1989). Is the drug problem soluble? *American Behavioral Scientist, 32 (3),* 295-315.

Jonas, S. (1997). Public health approaches. In J.H.Lowinson, P.Ruiz & R.B. Millman (Eds.), *Substance abuse: A comprehensive textbook* (3rd ed., pp. 775-786). Baltimore: Williams & Wilkins.

Jones, R.T. (1984). Marijuana: Health and treatment issues. *Psychiatric Clinics of North America, 7,* 703-712.

Kalant, H., Corrigal, W.A., Hall, W. & Smart, R. (Eds.) (1999). *The health effects of cannabis.* Toronto, ONT: Centre for Addiction and Mental Health.

Kandel, D.B. (1975). Stages in adolescent involvement in drug use. *Science, 190,* 912- 914.

Kandel, D.B. (1988). Issues of sequencing of adolescent drug use and other problem behaviors. *Drugs and Society, 3,* 55-76.

Kandel, D.B., Chen, K., Warner, L.A., Kessler, R.C. & Grant, B. (1997). Prevalence and demographic correlates of last year dependence on alcohol, nicotine, marijuana, and cocaine in the United States population. *Drug and Alcohol Dependence, 44,* 11- 29.

Kandel, D.B. & Davies, M. (1992). Progression to regular marijuana involvement: Phenomenology and risk factors for near daily use. In M. Glantz & R. Pickens (Eds.), *Vulnerability to drug abuse.* Washington, DC: American Psychological Association.

Kandel, D.B., Davies,M., Karus, D. & Yamaguchi, K. (1986). The consequences in young adulthood of adolescent drug involvement: an overview. *Archives of General Psychiatry, 43,* 746-754.

Kandel, D.B. & Logan, J.A. (1984). Patterns of drug use from adolescence to young adulthood: period of risk for initiation, continued use and discontinuation. *American Journal of Public Health, 74,* 660-666.

Kearns, N.P., Cruickshank, C.A., McGuigan, K.J., Riley, S.A., Shaw, S.P. & Snaith, R. (1982). A comparison of depression rating scales. *British Journal of Psychiatry, 141,* 45-49.

Keppel, G. (1991). *Design and analysis.* (3rd ed.). Englewood Cliffs, N.J: Prentice-Hall.

Kerssemakers, R. (1996). Treatment of hashish addicts: Hashish problem still too often underestimated. *Jellinek Quarterly, 3,* 4-5.

Kleber, H. D. (1989). Treatment of drug dependence: What works? *International Review of Psychiatry, 1,* 81-100.

Klein, T.W., Friedman, H. & Specter, S. (1998). Marijuana, immunity and infection. *Journal of Neuroimmunology, 83 (1-2),* 182-115.

Kleinman, P.H., Wish, E.D., Deren, S., Rainone, G. & Morehouse, E. (1988). Daily marijuana use and problem behaviours among adolescents. *International Journal of the Addictions, 23 (1),* 87-107.

Kranzler, G. & Moursand, J. (1995). *Statistics for the terrified.* Englewood Cliffs, NJ: Prentice Hall.

Larsen,D.L., Attkisson, C.C., Hargreaves, W.A. & Nguyens, T.D. (1979). Assessment of client/patient satisfaction: Development of a general scale. *Evaluation and Program Planning, 2,* 197-207.

Lebow, J.L. (1982). Consumer satisfaction with mental health treatment. *Psychological Bulletin, 91,* 244-259. (a).

Lebow, J.L. (1982). Models of evaluating services and community health centres. *Evaluation and Program Planning, 33 (12),* 1010-1014. (b)

Lebow, J.L. (1982). Pragmatic decisions in the evaluation of consumer satisfaction with mental health treatment. *Evaluation and Program Planning, 5,* 349-356. (c).

Lebow, J.L. (1983). Research assessing consumer satisfaction with mental health treatment: A review of findings. *Evaluation and Program Planning, 5,* 211-236.

Lebow, J.L. (1987). Acceptability as a simple measure in mental health program evaluation. *Evaluation and Program Planning, 10 (3),* 191-95.

Lennox, R.D. & Dennis, M.L. (1994). Measurement error issues in substance abuse services research. *Evaluation and Program Planning, 17 (4),* 399-407.

Lenton, S. & Single, E. (1998). The definition of harm reduction. *Drug and Alcohol Review, 17,* 213-219

Lex, B. (1993). Women and illicit drugs: Marijuana, heroin, and cocaine. In E.S. Gomberg & T. D. Nirenberg (Eds.), *Women and substance abuse* (pp. 162-190). New Jersey: Ablex Publishing Corporation.

Linzen, D.H., Dingemans, P.M. & Lenior, M.E. (1994). Cannabis abuse and the course of recent-onset schizophrenic disorders. *Archives of General Psychiatry, 51,* 273-279.

Longabaugh, R. (1991). Monitoring treatment outcomes. *Alcohol Health and Research World, 15,* 189-200.

Luborsky, L., McLellan, A.T., Woody, G.E., O'Brien, C.P. & Auerbach, A. (1985). Therapist success and its determinants. *Archives of General Psychiatry, 42,* 602-611.

Lundquist, T. (1993). *Treatment of cannabis problems.* Paper presented at the Cannabis and Health in New Zealand Conference, 4 –6 October, Wellington.

Lundquist, T. (1995). Chronic cannabis abuse and the sense of coherence. *Life Sciences, 56 (23/24),* 2145-2150. (a).

Lundquist, T. (1995). Specific thought patterns in chronic cannabis smokers observed during treatment. *Life Sciences, 56 (23 / 24),* 2141-2144. (b).

Lux, J., King, L., Lux, D. & Makowharemahihi, J. (1993). *Maumau hinengaro: Maori cannabis use and research implications for the 1990's. A psychosociological approach.* Paper presented at the Cannabis and Health in New Zealand Conference, 4-6 October, Wellington.

Lyons, M.J., Toomey, R., Meyer, J.M., Green, A.I., Eisen, S.A., Goldberg, J., True, W.R. & Tsuang, M.T. (1997). How do genes influence marijuana use? The role of subjective effects. *Addiction, 92 (4),* 409-417.

Maisto, S.A. & Connors, G.J. (1988). Assessment of treatment outcome. In D.M. Donovan & G.A. Marlatt (Eds.), *Assessment of addictive behaviours* (pp. 421-453). New York: The Guilford Press.

Maisto, S.A., McKay, J. R. & Connors, G. J. (1990). Self-report issues in substance abuse: State of the art and future directions. *Behavioral Assessment, 12,* 117-134.

Makkai, T. & McAllister, I. (1993). *Patterns of drug use in Australian society: An analysis of national trend data.* Canberra: Australian Government Publishing Service.

Makowharemahihi, J. (1993). *Survey on marijuana use in a Wellington community services organisation.* Wellington: Te Hau Ora Tinana.

Marlatt, G.A. & Gordon, J.R. (1985). *Relapse prevention.* New York: Guilford Press.

Martin, G.W., Wilkinson, D.A. & Kapur, B.M. (1988). Validation of self-reported cannabis use by urine analysis. *Addictive Behaviors, 13,* 147-150.

Mataira, A. (1993). *Language, luggage and spirituality: communication networks and cannabis in Aotearoa.* Paper presented to the Cannabis and Health in New Zealand Conference, 4 –6 October, Wellington.

Mattick, R.P. & Jarvis, T. (1993*). An outline for the management of alcohol problems: Quality assurance in the Treatment of Drug Dependence Project.* National Drug Strategy Monograph Series No. 20. Canberra: Australian Government Publishing Service

Mattson, M.E. & Donovan, D.M. (1994). Clinical application: The transition from research to practice. *Journal of Studies on Alcohol,* (Suppl. 12), 163-166.

McCormick, R.A. & Smith, M. (1995). Aggression and hostility in substance abusers: The relationship to abuse patterns, coping style, and relapse triggers. *Addictive Behaviors, 20 (5),* 555–562.

McCrady, B. & Delaney, S.I. (1995). Self-help groups. In R.K.Hester & W.R.Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (2nd ed. pp.160-175). USA: Allyn & Bacon.

McGee, R. (1993). *Cannabis use: findings from a longitudinal study of New Zealand youth.* Paper presented to the Conference on Cannabis and Health in New Zealand, 4 –6 October, Wellington.

McGee, R. & Feehan, M. (1993). Cannabis use among New Zealand adolescents. *New Zealand Medical Journal, 106,* 345.

McKay, J. R., Alterman, A. I., McLellan, A. T. & Snider, E. C. (1994). Treatment goals, continuity of care and outcome in a day hospital substance abuse rehabilitation programme. *American Journal of Psychiatry, 151 (2),* 254-258.

McLellan, A.T. (1983). Patient characteristics associated with outcome. In: J. R. Cooper, F. Altman, B.S. Brown & D. Czechowicz (Eds.), *Research in the treatment of narcotic addiction* (pp. 500-529). NIDA Treatment Research Monograph Series. Rockville, MD: United States Department of Health and Human Services.

McLellan, A. T., Alterman, A. I., Cacciola, J., Metzger, D. S. & O'Brien, C. P. (1992). A new measure of substance abuse treatment: initial studies of the Treatment Services Review. *Journal of Nervous and Mental Disorders, 180,* 101-110.

McLellan, A.T., Alterman, A.I., Metzger, D.S., Grissom, G.R., Woody, G.E., Luborsky, L. & O'Brien, C.P. (1994). Similarity of outcome predictors across opiate, cocaine, and alcohol treatments: Role of treatment services. *Journal of Consulting and Clinical Psychology, 62 (6),* 1141-1158.

McLellan, A.T., Arndt, I.O., Metzger, D.S., Woody, G.E. & O'Brien, C.P. (1993). The effects of psychosocial services in substance abuse treatment. *Journal of the American Medical Association, 269,* 1953-1959.

McLellan, A.T., Luborsky, L., O'Brien, C.P. & Woody, G.E. (1980). An improved evaluation instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous and Mental Disorders, 168,* 26-33.

McLellan, A.T., Luborsky, L., Woody, G.E., O'Brien, C.P. & Druley, K.A. (1983). Predicting response to alcohol and drug abuse treatments. *Archives of General Psychiatry, 40,* 620-625.

McLellan, A.T., Woody, G.E., Luborsky, L. & O'Brien, C.P. (1982). Is treatment for substance abuse effective? *Journal of the American Medical Association, 247,* 1423-1427.

McLellan, A.T., Woody, G.E., Luborsky, L., O'Brien, C.P. & Druley, K.A. (1983). Increased effectiveness of substance abuse treatment: A prospective study of patient-treatment "matching". *Journal of Nervous and Mental Disease, 171,* 597- 605.

McLellan, A.T., Woody, G.E., Metzger, D., McKay, J., Durell, J., Alterman, A. & O'Brien, C.P. (1996). Evaluating the effectiveness of addictions treatments: Reasonable expectations, appropriate comparisons. *Milbank Quarterly, 74,* 51-85.

McLelland, G.H. & Judd, C.M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114,* 376-390.

McNemar, Q. (1962). *Psychological statistics.* New York: Wiley.

Mechoulam, R. & Feigambaum, J.J. (1987). Towards cannabinoid drugs. *Progress in Medicinal Chemistry, 24,* 159-207.

Miller, N.S. & Gold, M.S. (1989). The diagnosis of marijuana (cannabis) dependence. *Journal of Substance Abuse Treatment, 6,* 183 -192.

Miller, N.S., Gold, M.S. & Mahler, J.C. (1991). Violent behaviors associated with cocaine use. *International Journal of the Addictions, 26,* 1077-1088.

Miller, N.S., Gold, M.S. & Pottash, A.C. (1989). A 12-Step treatment approach for marijuana (cannabis) dependence. *Journal of Substance Abuse Treatment, 6,* 241- 250.

Miller, N.S. & Potter-Effrom, R.T. (1989). Aggression and violence associated with substance abuse. *Journal of Chemical Dependence Treatment, 3 (1),* 1-38.

Miller, W.R. (1983). Motivational interviewing with problem drinkers. *Behavioural Psychotherapy, 1,* 147-172.

Miller, W.R. (1985). Motivation for treatment: A review with special emphasis on alcoholism. *Psychological Bulletin, 98,* 84-107.

Miller W.R. (1989). Matching individuals with interventions. In R. K. Hester & W.R. Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (pp. 261-271). New York: Pergamon Press Inc.

Miller W.R. (1989). Follow-up assessment. In R. K. Hester & W.R.Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (pp. 81-89). New York: Pergamon Press Inc.

Miller W.R. (1992). Client/treatment matching in addictive behaviors. *Behavior Therapist, 15,* 7-8.

Miller, W.R. (1993). What I would most like to know: What really drives change? *Addiction, 88,* 1479 -1480.

Miller, W.R. (1995). Increasing motivation for change. In R.K.Hester & W.R.Miller (Eds), *Handbook of alcoholism treatment approaches: Effective alternatives.* (2nd ed., pp .89 -104). USA: Allyn & Bacon.

Miller, W.R. (1997). Should there be aromatherapy for addiction? *Addiction, 92 (4),* 486-487.

Miller, W.R, Brown, J.M.,Simpson, T.L., Handmaker, N.S., Bien, T., Luckie, L.F.,
Montgomery, H.A. et al. (1995). What works? A methodological analysis of
the alcohol treatment outcome literature. In R.K.Hester & W.R.Miller (Eds.),
Handbook of alcoholism treatment approaches: Effective alternatives
(2nd ed., pp. 12- 41). USA: Allyn & Bacon.

Miller W.R. & Hester, R.K. (1986) The effectiveness of alcoholism treatment
methods: What research reveals. In W.R.Miller & N.Heather (Eds.),
Treating addictive behaviors: Processes of change (pp. 121-174).
New York: Plenum Press. (a).

Miller W.R. & Hester, R.K. (1986). Matching problem drinkers with optimal
treatments. In W.R. Miller & N. Heather (Eds.), *Treating addictive behaviors:
Processes of change* (pp. 175-203). New York: Plenum Press. (b).

Miller W.R. & Rollnick S. (1991). *Motivational interviewing: Preparing people to
change addictive behaviors.* New York: Guilford Press.

Miller, W.R. & Sanchez-Craig, M. (1996). How to have a high success rate in
treatment: advice for evaluators of alcoholism programs. *Addiction, 91,*
779-785.

Miller W.R., Westerberg, V. & Waldron, H.B. (1995). Evaluating alcohol problems
in adults and adolescents. In R.K.Hester & W.R.Miller (Eds.), *Handbook of
alcoholism treatment approaches: Effective alternatives* (2nd ed., pp. 61-88),
USA: Allyn & Bacon.

Ministry of Education (1990). Derivation of Elley-Irving codes from census
occupations. Unpublished Paper.

Ministry of Health (1995). *National drug and alcohol policy: A draft for public
consultation.* Wellington: Author.

Ministry of Health (1996). *Cannabis: the public health issues 1995 – 1996.* Wellington: Public Health Group, Ministry of Health.

Ministry of Health (1998). *National Drug Policy 1998 – 2003.* Wellington: Author.

Mirin, S. M., Weiss, R.R., Griffin, M.L. & Michael, J.L. (1991). Psychopathology in drug abusers and their families. *Comprehensive Psychiatry, 32 (1),* 36-51.

Mohr, L.B. (1995). *Impact analysis for program evaluation.* (2nd ed.). Newbury Park, California: Sage Publications.

Moncher, F.J. & Prinz, R.J. (1991). Treatment fidelity in outcome studies. *Clinical Psychology Review, 11,* 247-266.

Moncrieff, J. & Drummond, D.C. (1998). The quality of alcohol treatment research: an examination of influential controlled trials and development of a quality rating system. *Addiction, 93 (6),* 811- 823.

Monti, P. M., Abrams, D. B., Kadden, R. M. & Cooney, L. (1989). *Treating alcohol dependence: A coping skills training guide.* New York: Guilford Press.

Moos, R.H. (1997). How to become a true scientist: a guide to minimizing pesky treatment effects. *Addiction, 92,* 481-482.

Moos R.H. & Finney, J.W. (1988). Alcoholism program evaluations: The treatment domain. *Drugs and Society, 2,* 31- 51.

Moos, R.H., Finney, J.W. & Cronkite, R.C. (1990). *Alcoholism treatment: Context, process and outcome.* New York: Oxford University Press.

Mueser, K.T. (1999). *Co-morbid cannabis use and serious mental illness –
therapeutic challenges.* Paper presented to the Inaugural International
Cannabis and Psychosis Conference, 16-17 February, East Melbourne.

Musty, R.E. (1988). Individual differences as predictors of marijuana
phenomenology. In G. Chesher, P. Consroe & R.E.Musty (Eds.),
Marihuana: An international research report. Monograph Series No. 7
(pp. 201-206). Canberra: Australian Government Publishing Service.

Musty, R.E. & Kaback, L. (1995). Relationships between motivation and
depression in chronic marijuana users. *Life Sciences, 56, (23/24),*
2151-2158.

Nahas, G.G. & Latour, C. (1992). *Marihuana in science and medicine.* New
York: Raven Press.

Nathan P.E. & Lansky, D. (1978). Common methodological problems in research
on the addictions. *Journal of Consulting and Clinical Psychology, 46 (4),*
713-726.

National Advisory Committee on Core Health and Disability Support Services
(1994). *The treatment of people with drug and alcohol problems.* A
Consensus Development Report to the National Advisory Committee on
Core Health and Disability Support Services, Wellington, New Zealand.

National Campaign Against Drug Abuse (1992). *Future directions for alcohol and
other drug treatment in Australia.* NCADA Monograph Series No. 17.
Canberra: Australian Government Publishing Service.

National Drugs Intelligence Bureau. (1997). *Cannabis plant seizure data.* New
Zealand Police National Headquarters, Wellington.

National Drug Strategy (1996). *Household survey: Survey report, 1995.*
Canberra: Australian Government Publishing Service.

Negrete, J.C. (1988). What's happened to the cannabis debate? *British Journal of Addiction, 83,* 359-372.

Negrete, J.C. (1989). Cannabis and schizophrenia. *British Journal of Addiction, 84,* 349-351.

Nelson, P.L. (1993). A critical review of the research literature concerning some biological and psychological effects of cannabis. In Advisory Committee on Illicit Drugs (Eds.), *Cannabis and the law in Queensland : A discussion paper* (pp. 113-152). Brisbane: Criminal Justice Commission of Queensland.

Newbold, G. (1992). *Crime and deviance.* Auckland: Oxford University Press.

New Zealand Psychologists Board. (1986). *New Zealand psychological society's code of ethics.* New Zealand: New Zealand Psychological Society.

Ngata, P. (1993). *Nga Take Maori:: Issues for Maori.* Paper presented to the Conference on Cannabis and Health in New Zealand, 4 –6 October, Wellington.

Nguyen, T.D., Attkisson, C.C.& Stegner, B.L. (1983). Assessment of patient satisfaction: Development and refinement of a service evaluation questionnaire. *Evaluation and Program Planning, 6,* 299- 314.

Noel, N. E., McCrady, B.S., Stout, R. L. & Fisher-Nelson, H. (1987). Predictors of attrition from an outpatient alcoholism treatment programme for couples. *Journal of Studies on Alcohol, 48,* 229- 235.

Ogbourne, A. (1984). Issues in follow-up. In F. Glaser et al. (Eds.), *A system of health care delivery,* Vol. III, (pp. 173-215). Toronto: Addiction Research Foundation.

Oppenheim, A.N. (1992). *Questionnaire design, interviewing and attitude measurement* (new edition). London: Pinter Publishers.

Page, J.B., Fletcher, J. & True, W.R. (1989). Psychosocial perspectives on chronic cannabis use: The Costa Rican follow-up. *Journal of Psychoactive Drugs, 20 (1),* 57-65.

Pandina, R.J., Labouvie, E.W., Johnson, V. & White, H.R. (1988). The impact of prolonged marijuana use on personal and social competence in adolescence. In G.Chesher , P.Consroe & R.Musty (Eds.), *Marihuana : An international research report.* Monograph Series No. 7 (pp. 183-200). Canberra: Australian Government Publishing Service.

Pascoe, G.C., Attkisson, C.C.& Roberts, R.E. (1983). Comparison of indirect and direct approaches to measuring patient satisfaction. *Evaluation and Program Planning, 6,* 359- 371.

Paton-Simpson, G. (1997). *Using client feedback to evaluate and improve treatment: The experience at Auckland Regional Alcohol and Drug Services.* Paper presented at the Cutting Edge Conference, New Zealand.

Patrick, G., Straumanis, J.J., Struve, F., Nixon, F., Fitzgerald, M.J., Manno, J.E. & Soucair, M. (1995). Auditing and visual P300 Event Related Potentials are not altered in medically and psychiatrically normal chronic cannabis users. *Life Sciences, 56 (23/24),* 2135-2140.

Peele, S. (1985). *The meaning of addiction.* Lexington, MA: Lexington Books.

Penning, M. & Barnes, G.E. (1982). Adolescent marijuana use: a review. *International Journal of the Addictions, 17,* 749-791.

Pertwee, R.G. (1997). Pharmacology of cannabinoid CB1 and CB2 receptors. *Pharmacology and Therapeutics, 74,* 129-180.

Pertwee, R.G. (1999). Medical uses of cannabinoids: the way forward. *Addiction, 94 (3),* 317- 320.

Platt, J. & Hermalin, J. (1989). Social skills deficit interventions for substance abusers. *Psychology of Addictive Behaviors, 3,* 114-133.

Pope, H.G., Gruber, A.J. & Yurgelun-Todd, L. (1995). The residual neuropsychological effects of cannabis: the current status of research. *Drug and Alcohol Dependence, 38,* 25- 34.

Poulton, R.G., Brooke, M., Moffitt, T.E., Stanton, W.R. & Silva, P.A. (1997). Prevalence and correlates of cannabis use and dependence in young New Zealanders. *New Zealand Medical Journal, 110,* 68-70.

Prendergast, M., Podus, D. & McCormack, K. (1998). Bibliography of literature reviews on drug abuse treatment effectiveness. *Journal of Substance Abuse Treatment, 15 (3),* 267-270.

Prochaska J.O. & Di Clemente, C.C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51,* 390- 395.

Prochaska, J.O. & Di Clemnente, C.C. (1984). *The transtheoretical approach: Crossing traditional boundaries of therapy.* Homewood, IL: Dorsey Press.

Prochaska, J.O. & Di Clemente, C.C. (1986). Toward a comprehensive model of change. In W.R.Miller & N. Heather (Eds.), *Treating addictive behaviors: Processes of change.* (pp. 3- 27). New York: Plenum Press.

Prochaska J.O., Di Clemente, C.C. & Norcross, J.C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist, 47 (9),* 1102-1114.

Project MATCH Research Group (1997). Matching alcoholism treatments to client heterogeneity: Project MATCH posttreatment drinking outcomes. *Journal of Studies on Alcohol, 58 (1),* 7- 29.

Project MATCH Research Group (1998). Matching alcoholism treatment to client heterogeneity: Project MATCH three-year drinking outcomes. *Alcoholism: Clinical and Experimental Research, 22,* 1300-1311.

Quality Assurance Project. (1992). *An outline for approaches to smoking cessation: Quality Assurance Project.* NCADA Monograph No.19. Canberra: Australian Government Publishing Service.

Rainone, G.A., Deren, S., Kleinman, P. & Wish, E.D. (1987). Heavy marijuana users not in treatment: The continuing search for the "pure" marijuana user. *Journal of Psychoactive Drugs, 19 (4),* 353- 359.

Rees, V., Copeland, J. & Swift, W. (1998). *A brief cognitive-behavioural intervention for cannabis dependence: Therapists' treatment manual.* NDARC Technical Report No. 64. Sydney: NDARC.

Rees, V., Copeland, J., Swift, W., Roffman, R. A. & Stephens, R.S. (1998). *Brief cognitive-behavioural interventions for marijuana dependence.* Paper presented at the Sixtieth Annual Scientific Meeting of the College on Problems of Drug Dependence, Arizona, June, 1998.

Reilly, D., Didcott, P., Swift, W. & Hall, W. (1998). Long-term cannabis use: characteristics of users in an Australian rural area. *Addiction, 93 (6),* 837- 846.

Relman, A.S. (1982). Marijuana and health. *New England Journal of Medicine, 306,* 603- 605.

Rinaldi, R.C., Steinder, D.M., Willford, B.B. & Goodwin, D. (1988). Clarification and standardization of substance abuse terminology. *JAMA, 259 (4)*, 555-557.

Robins, L.N. (1984). The natural history of adolescent drug use. *American Journal of Public Health, 74,* 656-657.

Robins, L.N., Davis, D.H. & Goodwin, D.W. (1974). Drug use by U.S. Army enlisted men in Vietnam: a follow-up on their return home. *American Journal of Epidemiology, 99,* 235-249.

Robins, L.N. & Regier, D.A. (Eds.). (1991). *Psychiatric disorders in America.* New York: Free Press.

Roffman, R. A. (1982). *Marijuana as medicine.* Seattle, Washington: Madrona Publishers.

Roffman, R.A. & Barnhart, R. (1987). Assessing need for marijuana dependence treatment through an anonymous telephone interview. *International Journal of the Addictions, 22,* 639-651.

Roffman, R.A.& George, W.H. (1988). Cannabis abuse. In D.M. Donovan & G.A. Marlatt (Eds.), *Assessment of addictive behaviors* (pp. 325-363). New York: The Guilford Press.

Roffman, R.A., Stephens, R.S., Simpson, E.E. & Whitaker, D. L. (1988). Treatment of marijuana dependence: Preliminary results. *Journal of Psychoactive Drugs, 20,* 129-137.

Roffman, R.A., Klepsch, R., Wertz, J., Simpson, E. & Stephens, R.S. (1993). Predictors of attrition from an outpatient marijuana-dependence counselling program. *Addictive Behaviors, 18,* 553-566.

Rog, D.J. (1994). Constructing natural "experiments". In J.S. Wholey, H.P. Hatry & K.E.Newcomer (Eds.), *Handbook of practical program evaluation* (pp. 119-132). San Francisco: Jossey-Bass Inc.

Rollnick, S. (1997). Whither motivational interviewing? *Journal of Substance Misuse for Nursing, Health and Social Care, 2 (1),* 1-2.

Rollnick S. & Heather, N. (1982). The application of Bandura's self-efficacy theory to abstinence-oriented alcoholism treatment. *Addictive Behaviors, 7,* 243-250.

Rollnick, S., Heather, N., Gold, R. & Hall, W. (1992). Development of a short "readiness to change" questionnaire for use in brief, opportunistic interventions among excessive drinkers. *British Journal of Addiction, 87,* 743- 754.

Rollnick, S. & Miller, W.R. (1995). What is Motivational Interviewing ? *Behavioural and Cognitive Psychotherapy, 23,* 325 -334.

Rosenthal, E. (Ed.). (1994). *Hemp today.* Oakland, California: Quick American Archives.

Rossi, P.H. (1993). *Evaluation: A systematic approach.* (5th edition). Newbury Park, California: Sage.

Rossi, P.H. & Freeman, H.E. (1989). *Evaluation: A systematic approach.* Newbury Park, California: Sage.

Rotgers, F. (1996). Behavioral theory of substance abuse treatment: Bringing science to bear on practice. In F. Rotgers, D. Kellar & J. Morgenstern (Eds.), *Treating substance abuse: Theory and technique* (pp. 174-201). New York: The Guilford Press.

Rothman, K.J. *Modern epidemiology.* Boston: Little, Brown and Company.

Rounsaville, B.J., Bryant, K., Babor, T., Kranzler, H. & Kadden, R. (1993). Cross-system agreement for substance use disorders. *Addiction, 88,* 337-348.

Sanchez-Craig, M., Leigh, G., Spivak, K. & Lei, H. (1989). Superior outcome of females over males after brief treatment for reduction of heavy drinking. *British Journal of Addiction, 84,* 395-404.

Sanchez-Craig, M. & Walker, K. (1982). Teaching coping skills to alcoholics in a coeducational halfway house: I. Assessment of programme effects. *British Journal of Addiction, 77,* 35- 50.

Scallett, A.C. (1991). Neurotoxicology of cannabis and THC: A review of chronic exposure in animals. *Pharmacology, Biochemistry and Behavior, 401,* 671-676.

Scheirer, M.A. (1994). Process evaluation. In J.S.Wholey, H.Hatry & K.Newcomer (Eds.), *Handbook of practical program evaluation* (pp. 40-67). San Francisco, California: Jossey-Bass.

Schwartz, R.H. (1993). Chronic marihuana smoking and short-term memory impairment. In G.G.Nahas & C. Latour (Eds.), *Cannabis: physiopathology, epidemiology, detection* (pp. 61-71). Boca Raton, FL: CRC Press.

Schwartz, R.H., Gruenewald, P., Klitznerm, M. & Fedio, P. (1989). Short-term memory impairment in cannabis-dependent adolescents. *American Journal of Diseases of Childhood, 143,* 1214-1219.

Segal, M. (1986). Cannabinoids and analgesia. In R. Mechoulam (Ed.), *Cannabinoids as therapeutic agents* (pp. 105-120). Boca Raton, Florida: CRC Press.

Seligman, M.E. (1995). The effectiveness of psychotherapy: The Consumer Reports Study. *American Psychologist, 50 (12)*, 965-974.

Sellman, J.D. (1993). *Alcoholics who use cannabis.* Paper presented to the Conference on Cannabis and Health in New Zealand, 4 –6 October, Wellington.

Sellman, J.D., Hannifin, J., Deering, D. & Borren, P. (1996). *Delivery of treatment for people with opioid dependence in New Zealand: Options and recommendations.* A commissioned paper for the Ministry of Health, New Zealand, September, 1996.

Sellman, J. D., Huriwai, T. T., Ram, R. S. & Deering, D. E. (1997). Cultural linkage: Treating Maori with alcohol and drug problems in dedicated Maori treatment programmes. *Substance Use and Misuse, 32 (4)*, 415-424.

Siegal, H. A., Rapp, R. C., Fisher, J., Cole, P. & Wagner, J. H. (1993). Treatment dropouts and noncompliers: Two persistent problems and a programmatic remedy. In J. Inciardi, F. Tims & B. Fletcher (Eds.), *Innovative approaches in the treatment of drug abuse* (pp. 109-122). Westport , CT: Greenwood Press.

Siegal, R.K. (1984). Chronic patterns of cocaine use: longitudinal observations, consequences and treatment. In J. Grabowski (Ed.), *Cocaine: Pharmacology effects and treatment of abuse.* NIDA Research Monograph No. 50. Rockville, MD: Department of Health and Human Services.

Siegel, S. & Castellan, N.J. (1988). *Nonparametric statistics for the behavioral sciences* (2nd ed.). New York: McGraw-Hill, Inc.

Silove, D., Parker, G. & Manivasagar, M. (1990). Perceptions of general and specific therapist behaviors. *The Journal of Mental and Nervous Disease, 178 (5)*, 292-299.

Simpson, D.D. (1979). The relation of time spent in drug abuse treatment to posttreatment outcome. *American Journal of Psychiatry, 136, 11,* 1449-1453.

Simpson, D. D. (1981). Treatment for drug abuse: Follow-up outcomes and length of time spent. *Archives of General Psychiatry, 38 (8),* 875-880.

Simpson, D.D. (1993). Drug treatment evaluation research in the United States. *Psychology of Addictive Behaviors, 7,* 120-28.

Simpson, D.D., Chatham, L. R. & Joe, G. W. (1993). Cognitive enhancements to treatment in DATAR: Drug abuse treatment for AIDS risks and reductions. In J. A. Inciardi, F. M. Tims & B. W. Fletcher, (Eds.), *Innovative approaches in the treatment of drug abuse,* (pp. 161-177). Westport, Connecticut: Greenwood Press

Simpson, D.D. & Joe, G. (1993). Motivation as a predictor of early dropout from treatment. *Psychotherapy, 30,* 357-368.

Simpson, D.D., Joe, G., Rowan-Szal, G. & Greener, J. (1995). Client engagement and change during drug abuse treatment. *Journal of Substance Abuse, 7,* 117-134.

Smith, D.E. (1968). Acute and chronic toxicity of marijuana. *Journal of Psychedelic Drugs,* 237-247.

Smith, P.F. (1995). Cannabis and the brain: Recent developments. *New Zealand Journal of Psychology, 24 (1),* 5-12.

Smith, D.E. & McCrady, B.S. (1991). Cognitive impairment among alcoholics: Impact on drink refusal skill acquisition and treatment outcome. *Addictive Behaviors, 16,* 265- 274.

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Smith, J.W., Schmelling, G. & Knowles, P.L. (1988). A marijuana smoking cessation clinical trial utilizing THC-free marijuana, aversion therapy, and self-management counselling. *Journal of Substance Abuse Treatment, 5,* 89-98.

Snaith, R.P. & Taylor, C.M. (1985). Rating scales for depression and anxiety: A current perspective. *British Journal of Pharmacotherapy, 19,* 17S-20S.

Sobell, M.B., Brochu, S., Sobell, L.C., Roy, J. & Stevens, J.A. (1987). Alcohol treatment outcome evaluation methodology: State of the art 1980-1984. *Addictive Behaviors, 12,* 113-128.

Solowij, N. (1993). *Long-term cognitive effects of chronic cannabis use.* Paper presented to the Conference on Cannabis and Health in New Zealand, 4 – 6 October, Wellington.

Solowij, N. (1995). Do cognitive impairments recover following cessation of chronic cannabis use ? *Life Sciences, 56 (23/24),* 2119- 2116.

Solowij, N. (1996). *Cannabis and cognitive functioning.* International Research Monographs in Addiction. Cambridge: Cambridge University Press.

Solowij, N. (1996). The long-term effects of cannabis on the central nervous system. I. Brain function and neurotoxicity. *World Health Organization Project on Health Implications of Cannabis Use.* Geneva: WHO (a).

Solowij, N. (1996). The long-term effects of cannabis on the central nervous system. II. Cognitive functioning. *World Health Organization Project on Health Implications of Cannabis Use.* Geneva: WHO (b).

Solowij, N., Grenyer, B.F., Chesher, G. & Lewis, J. (1995). Biopsychosocial changes associated with cessation of cannabis use: a single case study of acute and chronic cognitive effects, withdrawal and treatment. *Life Sciences, 56 (23/24),* 2127- 2134.

Solowij, N., Grenyer, B.F., Peters, R. & Chesher, G. (1997). Long term cannabis use impairs memory processes and frontal lobe function. In *1997 Symposium on the Cannabinoids,* (p. 84). International Cannabinoid Research Society, Burlington, Vermont.

Solowij, N., Michie, P.T. & Fox, A.M. (1991). Effects of long-term cannabis use on selective attention: an event-related potential study. *Pharmacology, Biochemistry and Behavior, 40,* 683-688.

Spier, P. (1997). *Conviction and sentencing of offenders in New Zealand: 1987 to 1996.* Wellington: Ministry of Justice.

Sprent, P. (1981). *Quick statistics: An introduction to non-parametric methods.* Great Britain: Penguin Books.

SPPS Inc. (1999). SPSS base 9.0 Applications Guide. Chicago, IL: Author.

Stark, M. (1992). Dropping out of substance abuse treatment: A clinically oriented review. *Clinical Psychology Review, 12,* 93-16.

Stark, M. & Campbell, B.K. (1988). Personality, drug use, and early attrition from substance abuse treatment. *American Journal of Drug and Alcohol Abuse, 14,* 475-485.

Stark, M., Campbell, B.K. & Brinkerhoff, C.V. (1990). "Hello, may we help you?" A study of attrition prevention at the time of the first phone contact with substance-abusing clients. *American Journal of Drug and Alcohol Abuse, 16 (1/2),* 67-76.

Stark, M. & Kane, B.J. (1985). General and specific psychotherapy role inductions with substance-abusing clients. *The International Journal of the Addictions, 20,* 1135-1141.

Statistics New Zealand (1997). 1996 *Census of population and dwellings.*
Statistics New Zealand: New Zealand Government Publishing Service

Steer, R.A. (1983). Retention in drug-free counselling. *The International Journal of the Addictions, 18 (8),* 1109-1114.

Steketee, G. & Chambless, D.L. (1992). Methodological issues in prediction of treatment outcome. *Clinical Psychology Review, 12,* 387-400.

Stephens, R. S., Curtin, L., Simpson, E. E. & Roffman, R. (1994). Testing the abstinence violation effect construct with marijuana cessation. *Addictive Behaviors, 19 (1),* 23-32.

Stephens R.S. & Roffman, R.A. (1993). Adult marijuana dependence. In J.S.Baer, G.A.Marlatt & R.J.McMahon (Eds.), *Addictive behaviors across the lifespan: prevention, treatment and policy issues* (pp. 202-218). Newbury Park, CA: Sage Publications.

Stephens, R.S., Roffman, R.A., Cleaveland, B.L., Curtin, L. & Wertz, J. (1994). *Extended versus minimal intervention with marijuana dependent adults.* Paper presented to the 28th Annual Convention of the Association for Advancement of Behavior Therapy, November 1994, San Diego, USA.

Stephens R.S., Roffman, R.A. & Simpson, E.E. (1993). Adult marijuana users seeking treatment. *Journal of Consulting and Clinical Psychology, 61,* 1100-1104.

Stephens, R.S., Roffman, R.A. & Simpson, E.E. (1994). Treating adult marijuana dependence: A test of the relapse prevention model. *Journal of Consulting and Clinical Psychology, 62,* 92-99.

Stephens R.S., Wertz, J.S. & Roffman, R.A. (1993). Predictors of treatment outcomes: The role of self-efficacy. *Journal of Substance Abuse, 5,* 341-353.

Stephens, R.S., Wertz, J.S. & Roffman, R.A. (1995). Self-efficacy and marijuana cessation: A construct validity analysis. *Journal of Consulting and Clinical Psychology, 63 (6)*, 1022-1031.

Stewart, L. & Casswell, S. (1992). Treating alcohol problems in New Zealand: Changes in policies, practices and perspectives. In H. Klingemann, J.P. Takala & G. Hunt (Eds.), *Cure, care or control: Alcoholism treatment in sixteen countries* (pp. 131-149). New York: State University of New York Press.

Substance Abuse and Mental Health Services Administration (1999). *National Household Survey on Drug Abuse 1998.* Rockville, MD: Department of Health and Human Services.

Sutton, S. (1996). Can 'stages of change' provide guidance in the treatment of addictions ? A critical examination of Prochaska and Di Clemente's model. In G. Edwards & C.Dare (Eds.), *Psychotherapy, psychological treatments and the addictions.* (pp. 189-205). Great Britain: Cambridge University Press.

Swift, W., Hall, W. & Copeland, J. (1997). *Cannabis dependence among long-term users in Sydney, Australia.* NDARC Technical Report No. 47. Sydney: National Drug and Alcohol Research Centre.

Tabachnick, B.F. & Fidell, L.S. (1989). *Using multivariate statistics (2nd ed.).* New York: Harper Collins.

Tashkin, D.P. (1993). Is frequent marijuana smoking harmful to health? *Western Journal of Medicine, 158,* 635-637.

Tashkin, D.P. (1993). *Pulmonary effects of cannabis.* Paper presented to the Conference on Cannabis and Health in New Zealand, 4 –6 October, Wellington.

Teeson, M. (1998). *Measuring consumer outcome in Drug and Alcohol.* Paper presented to the Cutting Edge Conference '98, 30 August – 1 September, Wellington.

Tennant, F.S. (1986). The clinical syndrome of marijuana dependence. *Psychiatric Annals, 16 (4),* 225-234.

Te Puni Kokiri (Ministry of Maori Development). (1996). *Nga Ia O Te Oranga Hinengaro Maori (Trends in Maori Mental health): 1984 – 1993. A discussion document.* Wellington, NZ: Te Puni Kokiri.

Te Runanga o Te Rarawa (1995). *Cannabis project report.* Wellington: Te Puni Kokiri.

Te Urikore Lux, J., King, L., Lux, D. & Makowharemahimahi, J, (1993). *Maumau hinengaro : Maori cannabis use and research implications for the 1990s : A psychological approach.* Paper presented to the Conference on Cannabis and Health in New Zealand, 4 – 6 October, Wellington.

The National Center on Addiction and Substance Abuse (1999). *Non-medical marijuana- Rite of passage or Russian roulette?* White Paper Report. New York: CASA, Columbia University.

Thomas, H. (1991). "Cannabis psychosis". *Psychiatric Bulletin, 15,* p.504.

Thomas, H. (1993). Psychiatric symptoms in cannabis users. *British Journal of Psychiatry, 163,* 141-149.

Thorley, A. (1981). Longitudinal studies of drug dependence. In G. Edwards & C.Rush (Eds.), *Drug problems in Britain: A review of ten years.* London: Academic Press.

Thornicroft, G. (1990). Cannabis and psychosis: Is there epidemiological evidence for an association ? *British Journal of Psychiatry, 157,* 25- 33.

Tinkleberg, J. R. (1974). Marihuana and human aggression. In L.L. Miller (Ed.), *Marijuana: Effects on human behaviour* (pp. 339-357). New York: Academic Press.

Torres, M.L., Mattick, R.P., Chen, R. & Baillie, A. (1995). *Clients of treatment service agencies: March 1995 Census findings.* Canberra: Commonwealth Department of Human Services and Health.

Trimpey, J. (1992). *The small book: A revolutionary alternative for overcoming alcohol and drug dependence* (3rd edition). New York: Delacorte Press.

Tunving, K. (1985). Psychiatric effects of cannabis use. *Acta Scandinavia, 72,* 209-207.

Tunving, K. (1987). Psychiatric aspects of cannabis use in adolescents and young adults. *Pediatrician, 14,* 83-91.

Tunving, K., Lundqvist, T. & Ericsson, D. (1988). " A way out of the fog": An outpatient program for cannabis users. In G. Chesher, P. Consroe & R. Musty (Eds.), *Marijuana: An international research report.* (pp. 207- 212). Canberra: Australian Government Publishing Service.

United Nations (1998). Drug statistics: Cannabis consumption. *United Nations Chronicle, 35 (2),* p. 43.

United States Office of National Drug Control Policy. (1996). *Pulse check: National trends in drug abuse.* December, 1996. Washington,DC: Office of National Drug Control Policy.

Vaillant, G.E. (1970). The natural history of narcotic drug addiction. *Seminars in Psychiatry, 2,* 486- 498.

Vaillant, G. (1983). *The natural history of alcoholism: Causes, patterns, and paths to recovery.* Harvard: Cambridge University Press.

Van Hoozen B.E.& Cross, C.E. (1997). Marijuana. Respiratory tract effects. *Clinical Reviews in Allergy and Immunology, 15 (3),* 243-269.

Vereby, K., Gold, M.S.& Mule, S.J. (1986). Laboratory testing on the diagnosis of marijuana intoxication and withdrawal. *Psychiatric Annals, 16 (4),* 235-242.

Walker, L., Cocklin, C., Blunden, G., Davis, P., Kearns, R. & Scott (1998). *Cannabis highs and lows: Sustaining and dislocating rural communities in Northland.* Auckland: Department of Geography, University of Auckland.

Wardlaw, G. (1992). Overview of National Drug Control Policies. In *Comparative analysis of illicit drug strategy.* National Campaign Against Drug Abuse Monograph Series No. 18. Canberra: Australian Government Publishing Service.

Wechsberg, W.M., Craddock, S.G. & Hubbard, R.L. (1998). How are women who enter substance abuse treatment different than men? A gender comparison from the Drug Abuse Treatment Outcome Study. *Drugs and Society, 13 (1/2),* 97-115.

Weil, A.T. (1975). *The natural mind.* Victoria, Australia: Penguin Books.

Weil, A.T. & Zinberg, N.H. (1969). Acute effects of marijuana on speech. *Nature, 222,* 434-437.

Weisback, G.A., Shuckit, M.A., Kalmijn, J.A., Tipp, J.E., Bucholz, K.K. & Smith, T.L. (1996). An evaluation of the history of a marijuana withdrawal syndrome in a large population. *Addiction, 91 (10),* 1469-1478.

Weller, R.A. (1985). Marijuana: Effects and motivation. *Medical Aspects of Human Sexuality, 19 (3),* 92-104.

Weller, R.A. & Halikas, J.A. (1985). Marijuana use and psychiatric illness: a follow-up study. *American Journal of Psychiatry, 142,* 848-850.

Wells, J., Bushnell, J., Hornblow, A.R., Joyce, P.R. & Oakley-Browne, M.A. (1989). Christchurch psychiatric epidemiology study, Part 1 : methodology and lifetime prevalence for specific disorders. *Australian and New Zealand Journal of Psychiatry, 23,* 315-326.

Wells, J.E., Bushnell, J.A., Joyce, P.R., Oakley - Browne, M.A. & Hornblow, A.R. (1992). Problems with alcohol, drugs and gambling in Christchurch, New Zealand. In M.Abbott & K.Evans (Eds), *Alcohol and drug dependence and disorders of impulse control.* Auckland: Alcohol Liquor Advisory Council.

Wert, R. & Raulin, M.L. (1985). The chronic cerebral effects of cannabis use. II: psychological findings and conclusions. *International Journal of the Addictions, 605,* 629-642.

Wilkinson D.A. & Sanchez-Craig, M. (1981). Relevance of brain dysfunction to treatment objectives: Should alcohol-related cognitive deficits influence the way we think about treatment ? *Addictive Behaviors, 6,* 253-260.

Wilson, S.R. & Maguire, F. (1985). Self-esteem and subjective effects during marijuana intoxication. *Journal of Drug Issues, 15,* 263-271.

Wood, C. (1997/1998). Cannabis: Beating Dependence. *Connexions: The Journal of Drug and Alcohol Issues, 17 (6),* 8-11.

Woody, G.E., Cottler, L.B. & Cacciola, J. (1993). Severity of dependence data from the DSM-IV field trials. *Addiction, 88,* 1573-1579.

Woody, G. E., McLellan, A. T., Alterman, A. A. & O'Brien, C. P. (1991). Encouraging collaboration between research and clinical practice in alcohol and other drug abuse treatment. *Alcohol Health Research World*, *15,* 221-227.

Woody, G.E., McLellan, A.T. & Luborsky, L. (1984). Psychiatric severity as a predictor of benefits from psychotherapy. *American Journal of Psychiatry*, *141,* 1171-1177.

World Health Organization (1993). *WHO Expert Committee on Drug Dependence. Twenty-eighth report.* WHO Technical Report Series No. 836. Geneva: World Health Organization.

Wright, V. (1994). The Rational Recovery Programme as an approach to treatment in addictions. *Social Work Review, September,* p. 53.

Yamaguchi, K. & Kandel, D.B. (1984). Patterns of drug use from adolescence to early childhood. II. Sequences of progression. *American Journal of Public Health, 74,* 668-672.

Yska, R. (1990). *New Zealand Green – the story of marijuana in New Zealand.* Auckland: David Bateman.

Zablocki, B., Aidala, A., Hansell, S. & White, H. (1991). Marijuana use, introspectiveness, and mental health. *Journal of Health and Social Behaviour, 32,* 65 -79.

Zastowny, T.R., Roughman, K.J. & Cafferata, G.L. (1989). Patient satisfaction and the use of health services: Explorations in causality. *Medical Care, 27 (7),* 705-723.

Zigmond, A.S.,& Snaith, R.P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavia, 67,* 361-370.

Zinberg, N.E. (1984). *Drug, set, and setting: the basics for controlled intoxicant use.* New Haven: Yale University Press.

Zuckerman, B., Frank, D., Hingson, R., Amaro, H., Levenson, S.M., Kayne, H., Parker, S. et al. (1989). Effects of maternal marijuana and cocaine use on fetal growth. *The New England Journal of Medicine, 320 (12),* 762-68

Zweben, J. E. & Li, S. (1981). The efficacy of role induction in preventing early dropout from outpatient treatment of drug dependency. *American Journal of Drug and Alcohol Abuse, 8,* 171-183.

Zweben, J.E. & O'Connell, K. (1988). Strategies for breaking marijuana dependence. *Journal of Psychoactive Drugs, 20 (1),* 121-127.

APPENDICES

APPENDIX I

SUBSTANCE DEPENDENCE AND SUBSTANCE ABUSE

DSMIV criteria for Substance Dependence

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

1   tolerance, as defined by either of the following:

     a.   a need for markedly increased amounts of the substance to achieve intoxication or desired effect

     b.   markedly diminished effect with continued use of the same amount of the substance

2   withdrawal, as manifested by either of the following:

     a.   the characteristic withdrawal syndrome for the substance

     b.   the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms.

3   the substance is often taken in larger amounts or over a longer period than was intended.

4   there is a persistent desire or unsuccessful efforts to cut down or control substance use.

5   a great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects.

6   important social, occupational, or recreational activities are given up or reduced because of substance use.

7   the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.

Specify if:

With Physiological Dependence: evidence of tolerance or withdrawal (**i.e.,** either item 1 or 2 is present)

Without Physiological Dependence: no evidence of tolerance or withdrawal (i.e., neither item 1 nor 2 is present).

DSMIV criteria for Substance Abuse

A   A maladaptive pattern of substance use leading to clinically significant impairment or distress , as manifested by one (or more) of the following, occurring within a 12-month period:

1   recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences; suspensions; or expulsions from school; neglect of children or household).

2   recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use)

3   recurrent substance-related legal problems (e.g. arrests for substance-related disorderly conduct)

4   continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights).

B   The symptoms have never met the criteria for Substance Dependence for this
    class of substance.

Source: DSMIV (APA, 1994, pp.181-183).

Several important assumptions are associated with the drug dependence
syndrome:

1   Not all the components need always be present, or not always present in the
    same intensity (Edwards et al, 1981).

2   The syndrome occurs with variable intensity; the degree of dependence
    experienced can vary along a continuum from low to high severity, with more
    dependent users exhibiting more symptoms (Institute of Medicine, 1990).

3   A 'dependence syndrome' is conceptually differentiated from an 'abuse
    syndrome' (problematic use in the absence of compulsive use, tolerance and
    withdrawal) which is based on a set of distinct, specifiable behaviours and seen
    as reflecting the harmful *social consequences* of repeated use (APA, 1994). As a
    residual diagnosis, substance abuse is a lesser degree of impairment more likely
    in individuals who have begun using substances only recently. Abuse of a
    particular drug, however, often evolves into dependence (APA, 1994).

4   The drug dependence syndrome is not necessarily considered to be a major
    disability since it may cause little damage or social impairment. Just as
    dependence is conceptualised as a continuous variable, current scientific
    understanding of drug and alcohol problems is that they exist on a continuous
    basis throughout the entire population of individuals using drugs, i.e.
    substance-related problems are matters of *degree* and not of kind (Heather &
    Tebbutt, 1989). An individual with high dependence may not have problems in
    other realms, while another individual with low dependence may have severe
    problems in these other areas (Edwards et al., 1981). The effect of this
    reconceptualisation has been a progressive move towards a problem-oriented'

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treatment approach in which dependency may be but one of the problems to be treated (Heather & Tebbutt, 1989).

5   An individual's pattern of substance use may meet criteria for multiple diagnoses at any particular time, e.g. Alcohol Dependence and Cannabis Abuse (or vice-versa); Polysubstance Dependence, etc. (APA, 1994). Substance use disorders often involve several substances used simultaneously, concurrently or sequentially (APA, 1994; Heather & Tebbutt, 1989; WHO, 1993). The majority of illicit drug users will show consumption patterns involving several different substances e.g. cannabis, cocaine, opioids and alcohol (WHO, 1993) while the correlation between heavy drinking and cigarette smoking is well known. 6. There is not a simple 'line' which can be drawn around dependence, abuse, or both syndromes, which equates precisely with 'need for treatment', either as self-defined by the user, or by others. In particular, the abuse syndrome is broadly defined, and may include individuals who have encountered self-limiting, transient or relatively mild problems related to their substance use (Bushnell et al., 1994; Wells et al., 1992).

CLARIFICATION OF TERMINOLOGY AND A CAVEAT

Various definitions of substance 'use', 'misuse' and 'abuse' confound the literature (Lex, 1993) and confuse the reader. A complex matrix of individual, social and cultural factors shape and determine general patterns of substance use in a society in any particular historical period (WHO, 1993). Diverse societies worldwide represent different drug cultures with substantial variation between dominant drug classes in use, patterns and levels of consumption, and profiles of substance-related problems and pathology (WHO, 1993). Drug control policies shape the ways in which people view the use of particular drugs (Abel & Casswell, 1998). Accordingly, the concepts 'misuse' and 'abuse' used to describe excessive use of any psychoactive substance clearly involve temporal, value-laden, culture-specific judgements about different drugs in different contexts (Edwards et al., 1981). For example, in many societies 'use' often implies a pejorative judgement, and hence *any* use of marijuana/cannabis, cocaine and heroin has become synonymous with 'misuse' and

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marijuana/cannabis, cocaine and heroin has become synonymous with 'misuse' and 'abuse' simply because use of these substances is socially unsanctioned, i.e., 'illicit' (Lex, 1993). The World Health Organisation Expert Committee on Drug Dependence has suggested alternative terms which describe problematic use of drugs with some clarity: i.e., unsanctioned, hazardous, dysfunctional, and harmful use (see Edwards et al., 1981, for definitions).

It is important to emphasise the distinction between any substance use, misuse ("any use of a drug that varies from a socially or medically accepted use" [Rinaldi et al, 1988, p. 557]) and abuse and dependence ("maladaptive patterns" of substance use [APA, 1994]). Placing the dependence syndrome into perspective avoids making a falsely alarmist (and biased!) impression that *all* substance users run a high risk of becoming dependent (Sellman et al., 1996; Swift et al., 1997). It is a well-documented observation that for most users of most drugs non-problematic controlled use (harmfree) is the norm (Zinberg, 1984). Most users of psychoactive substances manage their drug use and/or maintain a functional or productive lifestyle. Most users do not become abusers.

It is recognised, however, that all of the commonly used recreational mood-altering drugs are harmful in one way or another to *some* of those who use them. *Any* use of *any* drug increases the risk of harmful use later. Albeit, substance-related harm varies in degree and kind on a dimension which differs between individuals, and even within the same individual over time (Bushnell et al., 1994). Zinberg (1984) describes the relevant variables as those of 'drug, set, and setting'. The important point is that the only certain negative of recreational drug use is an increase in the *risk* and not the certainty, of harm.

However, this position is qualified by a caveat. The one drug form that is universally harmful to *all* users (active consumers and 'passive' users alike) is tobacco - hence *all* tobacco consumption is now seen as 'abuse' (Heather & Tebbutt, 1989; Jonas, 1997).

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CANNABIS TREATMENT - OUTCOME STUDY
CLIENT INFORMATION/CHECKLIST

Office Use Only

Client Code Number: ☐   Gender: 1 = Male   ☐

Age: ☐   2 = Female

Age	
Gender	

Ethnicity: 1 = European   ☐
               2 = Maori
               3 = Pacific Islander
               4 = Other (Specify)

☐

Source of Referral: 1 = Self   ☐
                     2 = Partner/Family
                     3 = Friends
                     4 = GP
                     5 = School
                     6 = Probation
                     7 = Lawyer
                     8 = Court Mandated
                     9 = Other (Specify)

☐

Agency: 1 = Nelson   ☐   3 = Auckland Central
           2 = Taranaki   4 = Auckland West

☐

Counsellor: _____

Intake/Assessment Date   ☐

First Treatment Session Date   ☐

Checklist	Yes	Date
Briefing/Information Sheet Supplied	☐	
Consent/Confidentiality Form Signed	☐	
Second Contact Person/Address Recorded	☐	
Pretreatment Urine Test Taken	☐	
Pretreatment Questionnaires Completed	☐	
Treatment Sessions Recorded	[1] [2] [3] [4] [5]	
	[6] [7] [8] [9] [10]	
Pre-Exit Session Urine Test Taken	☐	
Exit Session Questionnaires Completed	☐	☐
Follow-up Survey Posted	☐	☐
Second Follow-up Survey Posted	☐	☐
Survey Returned? No ☐	☐	☐

CANNABIS/OTHER DRUG USE

1. How old were you when you __first__ used cannabis?

2. At what age did you begin using cannabis regularly?

> Note: Ascertain clients' regular use pattern (eg. daily, near daily, etc)
> Specify _____

3. On average, how often have you used any of the drugs listed below in the last three months?

	No Use	Less than 1 day per week*	1 day per week	2 days per week	3 days per week	4 days per week	5 days per week	6 days or more per week	Don't Know
Cannabis									
Tobacco									
Alcohol									
Heroin/Opiates									
Cocaine/Crack									
Amphetamines									
Hallucinogens									
Inhalants/Solvents									
Benzodiazepines									
Pain Killers									
Other (specify)									

* Note: ie. fortnightly, monthly

4. For cannabis only, how many times would you use this on a typical day?

5. Are you having problems with the use of any drugs apart from cannabis?
   - Yes ☐
   - No ☐
   - Don't know ☐

6. If yes, which drug(s)? Please specify: _____

    _____

7. Apart from cannabis, have you <u>ever</u> been dependent on, or had problems because of the use of, any drug?

    Yes ☐

    No ☐

    If yes, please specify drug(s) _____

8. If yes, did you have treatment for these problems?

    Not applicable ☐

    Yes ☐

    No ☐

9. What is your personal goal for future cannabis use?

    Abstinence - stop using altogether ☐

    To reduce consumption ☐

    To control consumption ☐

    To continue as before ☐

    Don't know ☐

10. How confident do you feel in your ability to achieve your personal goal?

    Very confident ☐

    Somewhat confident ☐

    Not sure - neutral ☐

    Not much confidence ☐

    No confidence at all ☐

SOCIAL & ECONOMIC STATUS

11. What is your current occupation? _____

12. What is your partner's occupation? _____

Note: If client has no partner, write N/A.

CANNABIS/OTHER DRUG USE

1. How old were you when you <u>first</u> used cannabis?

2. At what age did you begin using cannabis regularly?

> Note: Ascertain clients' regular use pattern (eg. daily, near daily, etc)
> Specify _____

3. On average, how often have you used any of the drugs listed below in the last three months?

	No Use	Less than 1 day per week*	1 day per week	2 days per week	3 days per week	4 days per week	5 days per week	6 days or more per week	Don't Know
Cannabis									
Tobacco									
Alcohol									
Heroin/Opiates									
Cocaine/Crack									
Amphetamines									
Hallucinogens									
Inhalants/Solvents									
Benzodiazepines									
Pain Killers									
Other (specify)									

* Note: ie. fortnightly, monthly

4. For cannabis only, how many times would you use this on a typical day?

5. Are you having problems with the use of any drugs apart from cannabis?

Yes ☐

No ☐

Don't know ☐

6.   If yes, which drug(s)? Please specify: _____

_____

7.   Apart from cannabis, have you <u>ever</u> been dependent on, or had problems because of the use of, any drug?

Yes   ☐

No   ☐

If yes, please specify drug(s) _____

8.   If yes, did you have treatment for these problems?

Not applicable   ☐

Yes   ☐

No   ☐

9.   What is your personal goal for future cannabis use?

Abstinence - stop using altogether   ☐

To reduce consumption   ☐

To control consumption   ☐

To continue as before   ☐

Don't know   ☐

10. How confident do you feel in your ability to achieve your personal goal?

Very confident   ☐

Somewhat confident   ☐

Not sure - neutral   ☐

Not much confidence   ☐

No confidence at all   ☐

SOCIAL & ECONOMIC STATUS

11. What is your current occupation? _____

12. What is your partner's occupation? _____

| Note: If client has no partner, write N/A. |

13. What is your main source of income? (Tick only one)

None	☐
Full time employment	☐
Part time employment	☐
Unemployment benefit	☐
Sickness/Disability benefit	☐
Domestic Purposes benefit	☐
Superannuation	☐
ACC	☐
Spouse	☐
Other family	☐
Criminal/illegal	☐
Other (specify)	☐

_____

14. Do you have a secondary source of income? (Tick only one)

None	☐
Full time employment	☐
Part time employment	☐
Unemployment benefit	☐
Sickness/Disability benefit	☐
Domestic Purposes benefit	☐
Superannuation	☐
ACC	☐
Spouse	☐
Other family	☐
Criminal/illegal	☐
Other (specify)	☐

_____

15. Do you have any difficulties making ends meet/paying your bills?

Always	☐
Often	☐
Sometimes	☐
Rarely	☐
Never	☐

16. How many homes have you lived in during the last 2 years? _____

17. What is your current living situation?

Own home ☐

Rental accommodation ☐

Parent's home ☐

Homeless ☐

Other (specify) ☐

_____

☐

18. How long have you lived in your present home? (Specify in years and/or months)

[   ]

Years	
Months	

19. Are you married or currently in a relationship?

Yes ☐

No ☐

If no, go to question 23

☐

20. Of what duration is your relationship? (Specify in years and/or months)

[   ]

Years	
Months	

21. Has your cannabis use created problems between you and your partner?

Always ☐

Often ☐

Sometimes ☐

Rarely ☐

Never ☐

Specify types of problems: _____

_____

_____

☐

22. Does your partner use cannabis regularly?

Yes ☐

No ☐

Don't know ☐

☐

23. How many jobs have you held in the last 12 months?

None	☐
One	☐
Two	☐
Three	☐
Four	☐
Five or more	☐
Don't Know	☐

Note: This may be paid or unpaid work.

24. What is the longest time any of these jobs lasted?

No job	☐
Less than 1 month	☐
1 - 3 months	☐
4 - 6 months	☐
7 - 12 months	☐
More than 12 months	☐ Specify _____
Don't Know	☐

25. Has your cannabis use created problems in your job(s)?

Always	☐
Often	☐
Sometimes	☐
Rarely	☐
Never	☐
Not applicable	☐

Specify types of problems: _____

_____

_____

26. Have you ever been imprisoned or convicted of any offence?
    Not applicable ☐
    Drug Related ☐
    Violence (rape, assault, homicide, etc) ☐
    Crimes for gain (robbery, theft, etc) ☐
    Other (specify) ☐

    Specify: _____

    _____

27. Have you been convicted of any offences in the last 12 months?
    No ☐
    Drug Related ☐
    Violence (rape, assault, homicide, etc) ☐
    Crimes for gain (robbery, theft, etc) ☐
    Other (specify) ☐

    Specify: _____

    _____

28. Are you currently awaiting a court hearing or trial?
    Not applicable ☐
    Drug Related ☐
    Violence (rape, assault, homicide, etc) ☐
    Crimes for gain (robbery, theft, etc) ☐
    Other (specify) ☐

    Specify: _____

    _____

29. How often have you sought treatment for any medical or psychological problems in the last 12 months?

Not at all ☐

Less than 3 times ☐

3 - 6 times ☐

7 - 9 times ☐

10 times or more ☐

Specify type(s) of problem(s): _____

_____

_____

30. Do you believe your cannabis use has created any medical or psychological problems?

Yes ☐

No ☐

Don't Know ☐

Specify: _____

_____

_____

31. To what extent has your cannabis use created any problems with your thinking processes (eg. memory, concentration, problem-solving etc)?

Always ☐

Often ☐

Sometimes ☐

Rarely ☐

Never ☐

Specify: _____

_____

_____

EXIT TREATMENT SESSION CLIENT DATA
* COUNSELLOR - ADMINISTERED QUESTIONNAIRE *

CANNABIS/OTHER DRUG USE

1. On average, how often have you used any of the drugs listed below in the last three months?

	No Use	Less than 1 day per week*	1 day per week	2 days per week	3 days per week	4 days per week	5 days per week	6 days or more per week	Don't Know
Cannabis									
Tobacco									
Alcohol									
Heroin/Opiates									
Cocaine/Crack									
Amphetamines									
Hallucinogens									
Inhalants/Solvents									
Benzodiazepines									
Pain Killers									
Other (specify)									

* Note: ie. fortnightly, monthly

2. For cannabis only, how many times would you use this on a typical day ?

3. Are you having problems with the use of any drugs apart from cannabis?
   Yes   ☐
   No   ☐
   Don't Know   ☐

4. If yes, which drug(s)? Please specify: _____

   _____

5. What is your personal goal for future cannabis use?
   Abstinence - stop using altogether   ☐
   To reduce consumption   ☐
   To control consumption   ☐
   To continue as before   ☐
   Don't know   ☐

6. How confident do you feel in your ability to achieve your personal goal?

Very confident ☐
Somewhat confident ☐
Not sure - neutral ☐
Not much confidence ☐
No confidence at all ☐

☐

SOCIAL & ECONOMIC STATUS

7. What is your current occupation? _____

☐ ☐

8. What is your partner's occupation? _____

☐ ☐

Note: If client has no partner, write N/A.

9. What is your main source of income? (Tick one box only)

☐ ☐

None ☐
Full time employment ☐
Part time employment ☐
Unemployment benefit ☐
Sickness/Disability benefit ☐
Domestic Purposes benefit ☐
Superannuation ☐
ACC ☐
Spouse ☐
Other family ☐
Criminal/illegal ☐
Other (specify) ☐

_____

10. Do you have a secondary source of income? (Tick one box only)

None ☐
Full time employment ☐
Part time employment ☐
Unemployment benefit ☐
Sickness/Disability benefit ☐
Domestic Purposes benefit ☐
Superannuation ☐
ACC ☐
Spouse ☐
Other family ☐
Criminal/illegal ☐
Other (specify) ☐
_____

11. Do you have any difficulties making ends meet/paying your bills?

Always ☐
Often ☐
Sometimes ☐
Rarely ☐
Never ☐

13. What is your current living situation?

Own home ☐
Rental accommodation ☐
Parent's home ☐
Homeless ☐
Other (specify) ☐
_____

14. Have you shifted home/changed your accommodation since you began treatment?

Yes ☐
No ☐

If yes, how many times? ☐

15. Are you married or currently in a relationship?

Yes ☐
No ☐

16.   Of what duration is your relationship? (Specify in years and/or months)

Years	
Months	

17.   Since you began treatment has your cannabis use created problems between you and your partner?

Always	☐
Often	☐
Sometimes	☐
Rarely	☐
Never	☐

Specify: _____

_____

_____

18.   Does your partner use cannabis regularly?

Yes	☐
No	☐
Don't Know	☐

EMPLOYMENT

19.   How many jobs have you held since you began treatment?

No job	☐
In the same job	☐
One job	☐
Two jobs	☐
Three or more jobs	☐

> Note: This may be paid or unpaid work.

20. Since you began treatment, has your cannabis use created problems in your job(s)?

Always ☐
Often ☐
Sometimes ☐
Rarely ☐
Never ☐
Not applicable ☐

Specify types of problems: _____

_____

_____

LEGAL/CRIMINALITY

21. Have you been convicted of any offences since you began treatment?

None ☐
Drug-related ☐
Violence (rape, assault, homicide, etc) ☐
Crimes for gain (robbery, theft, etc) ☐
Other (specify) ☐

Specify: _____

_____

22. Are you currently awaiting a court hearing or trial?

Not applicable ☐
Drug-related ☐
Violence (rape, assault, homicide, etc) ☐
Crimes for gain (robbery, theft, etc) ☐
Other (specify) ☐

Specify the case pending: _____

_____

23. How often have you sought treatment for any medical or psychological problems since you began treatment?

Not at all ☐

Less than 3 times ☐

3 - 6 times ☐

7 - 9 times ☐

10 times or more ☐

Specify: _____

_____

_____

24. Do you believe your cannabis use has created any of these problems?

Yes ☐

No ☐

Don't Know ☐

Specify types of problems: _____

_____

_____

25. Since you began treatment, to what extent has your cannabis use created any problems with your thinking processes (eg. memory, concentration, problem-solving etc)?

Always ☐

Often ☐

Sometimes ☐

Rarely ☐

Never ☐

Specify: _____

_____

_____

26. Have you attended any other forms of counselling/therapy since your treatment in this programme began? (eg. other counsellor, group, marital/family therapy, etc)

Yes ☐

No ☐

If yes, please give details: _____

_____

_____

CANNABIS TREATMENT PROGRAMME
FOLLOW-UP AND CLIENT SATISFACTION
SURVEY

Dear Research Participant

Three months have passed since your last treatment session on _____
(date). I am now sending you the Follow-up Satisfaction Questionnaire as the final part of
the study.

Your answers and comments to the following items will be used to examine the helpfulness
of treatment and your satisfaction with the programme.

I remind you that your identity and your responses are **CONFIDENTIAL** and will not be
seen by your counsellor or anybody else related to your treatment.

We are interested in your honest opinion, whether it is positive or negative. Please answer
all the questions as honestly as possible. For each question tick (✓) the box which best
indicates your opinion. We also encourage and welcome your comments and suggestions in
the spaces provided.

CANNABIS TREATMENT PROGRAMME
FOLLOW-UP AND CLIENT SATISFACTION
SURVEY

1. Are you married or currently in a relationship?

   Yes ☐

   No ☐

2. Of what duration is your relationship? (Specify in years and/or months)

Years	
Months	

3. Have there been any changes in your relationship since your treatment programme?

   Yes ☐

   No ☐

   If yes, in what ways? Comment: _____

   _____

   _____

   _____

4. What is your current living situation?

   Own home ☐

   Rental accommodation ☐

   Parent's home ☐

   Homeless ☐

   Other (specify) ☐

   _____

5. Have you shifted home/changed your accommodation since your treatment programme?

   Yes ☐

   No ☐

   If yes, how many times? ☐

6. Did you achieve your personal goals set in treatment for cannabis use?

Yes ☐

No ☐

7. On average, how often have you used any of the drugs listed below in the last three months? (Tick each category that applies to you):

	No Use	Less than 1 day per week*	1 day per week	2 days per week	3 days per week	4 days per week	5 days per week	6 days or more	Don't Know
Cannabis									
Tobacco									
Alcohol									
Heroin/Opiates									
Cocaine/Crack									
Amphetamines									
Hallucinogens									
Inhalants/Solvents									
Benzodiazepines									
Pain Killers									
Other (specify) _____									

*Note: ie. fortnightly, monthly

8. For cannabis only, how many times would you use this on a typical day ?

9. What is your personal goal for future cannabis use?

Abstinence - stop using altogether ☐

To reduce consumption ☐

To control consumption ☐

To continue as before ☐

Don't know ☐

10. How confident do you feel in your ability to achieve your personal goal?

Very confident ☐

Somewhat confident ☐

Not sure - neutral ☐

Not much confident ☐

No confidence at all ☐

11. To what extent has your treatment programme met your needs?

Almost all of my needs have been met □

Most of my needs have been met □

Only a few of my needs have been met □

None of my needs have been met □

12. To what extent did the treatment programme help you deal with the problems you were having in the following areas of your life? (Tick the box in each category that applies to you):

	It made things much worse	It made things a bit worse	It made no difference	It helped a bit	It helped a lot	Not applicable	
My job/employment	□	□	□	□	□	□	□
My relationship	□	□	□	□	□	□	□
My involvement with the legal system	□	□	□	□	□	□	□
My finances/ economics	□	□	□	□	□	□	□
My general health/ well-being	□	□	□	□	□	□	□
My thinking abilities	□	□	□	□	□	□	□

Other areas in my life. Specify: _____

_____

Comments: _____

_____

_____

13. To what extent did you feel your counsellor understood the kind of help you wanted from him/her?

Always □

Most of the time □

Sometimes □

Hardly at all □

Not at all □

14. To what extent did you feel your counsellor acted in a caring way toward you?

Always	☐
Most of the time	☐
Sometimes	☐
Hardly at all	☐
Not at all	☐

15. To what extent did you feel your counsellor tried to control/set your goals and put pressure on you to achieve, in counselling?

Always	☐
Most of the time	☐
Sometimes	☐
Hardly at all	☐
Not at all	☐

16. To what extent did you feel your counsellor disapproved of your behaviour or was judgmental toward you?

Always	☐
Most of the time	☐
Sometimes	☐
Hardly at all	☐
Not at all	☐

17. In an overall, general sense, how satisfied are you with the treatment you received?

Very satisfied	☐
Mostly satisfied	☐
Indifferent or mildly dissatisfied	☐
Quite dissatisfied	☐

18. To what extent did the various components of treatment help you in dealing with your cannabis use? (Tick the box in each category of treatment that applies to you):

	It made things much worse	It made things a bit worse	It made no difference	It helped a bit	It helped a lot	Not applicable		For office use only
Assessment	☐	☐	☐	☐	☐	☐		☐
Cannabis information/ education	☐	☐	☐	☐	☐	☐		☐
Detoxification/ acupuncture	☐	☐	☐	☐	☐	☐		☐
Urine analysis feedback	☐	☐	☐	☐	☐	☐		☐
Understanding why I use cannabis	☐	☐	☐	☐	☐	☐		☐
Presenting alternatives to cannabis use	☐	☐	☐	☐	☐	☐		☐
Resist triggers/urges to use	☐	☐	☐	☐	☐	☐		☐
Resist peer pressure to use	☐	☐	☐	☐	☐	☐		☐
Problem solving skills	☐	☐	☐	☐	☐	☐		☐
Social skills	☐	☐	☐	☐	☐	☐		☐
Referral to other support	☐	☐	☐	☐	☐	☐		☐
Goal setting	☐	☐	☐	☐	☐	☐		☐
Other (specify)	☐	☐	☐	☐	☐	☐		☐

_____

Comments: _____

_____

_____

_____

_____

19. If you were to seek help again, would you come back to this treatment programme?

No, definitely not ☐

No, I don't think so ☐

Yes, I think so ☐

Yes, definitely ☐

20. Since your cannabis treatment programme, have you been involved in any other treatment programmes?

Yes ☐

No ☐

If yes, give details: _____

_____

21. Do you have any suggestions for improvement to the cannabis treatment programme?

Please comment: _____

_____

_____

_____

_____

_____

_____

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. YOUR HELP IS APPRECIATED. PLEASE SEND IT BACK TO ME IN THE POST-PAID ENVELOPE PROVIDED AS SOON AS POSSIBLE.

CANNABIS RTC QUESTIONNAIRE

Please read the sentences below carefully. For each one please tick the answer that best describes how you feel. Your answers will be private and confidential.

		Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
1.	My cannabis use is OK as it is	☐	☐	☐	☐	☐
2.	I am trying to use cannabis less than I used to	☐	☐	☐	☐	☐
3.	I enjoy my cannabis, but sometimes I use too much	☐	☐	☐	☐	☐
4.	I should cut down on my cannabis use	☐	☐	☐	☐	☐
5.	It's a waste of time thinking about my cannabis use	☐	☐	☐	☐	☐
6.	I have just recently changed my cannabis use	☐	☐	☐	☐	☐
7.	Anyone can talk about wanting to do something about using cannabis, but I am actually doing something about it	☐	☐	☐	☐	☐
8.	I am at the stage where I should think about using less cannabis	☐	☐	☐	☐	☐
9.	My using is a problem	☐	☐	☐	☐	☐
10.	It's alright for me to keep using cannabis as I do now	☐	☐	☐	☐	☐
11.	I am actually changing my cannabis habits right now	☐	☐	☐	☐	☐
12.	My life would still be the same, even if I used cannabis less	☐	☐	☐	☐	☐

**Northern Regional Alcohol &
Drug Service**

Plummer Court
Carliol Place
Newcastle upon Tyne
NE1 6UR

Tel. (0191) 219 5600
Fax: (0191) 219 5601

24Hr Helpline: (0191) 219 5610

Centre for Alcohol & Drug Studies
Director: Professor Nick Heather

Mrs. Jan Bashford,

New Zealand.

18 November 1997

Dear Mrs. Bashford,

Readiness to Change Questionnaire (Cannabis)

Thank you for your letter of 12 November about this adaptation of the RCQ.

I am surprised to hear that the adaptation is in use in NZ A&D clinics since I do not recall giving permission for this. However, I hereby give you formal permission to use the adaptation you sent me for the purposes of your research study.

My only advice to you is as follows. You cannot assume that merely substituting "cannabis" for "alcohol" in the questionnaire will preserve its psychometric soundness. It is possible that some of the items will acquire a rather different meaning for cannabis users and be answered differently. What you should do when your data are gathered in is to repeat the conventional psychometric analyses (principal components analysis, internal consistency, if possible test-retest reliability) to confirm that it is still a reliable measure of the stages of change. You could also try to provide some evidence of predictive validity by seeing if it predicts response to treatment.

I hope this is useful. Good luck with your project. Let me know if I can be of further help.

Yours sincerely

Nick Heather PhD
Consultant Clinical Psychologist

HAD Scale

Name: ~~Name:~~   Date:

1. **I feel tense or wound up:**
   Most of the time
   A lot of the time
   Time to time, occasionally
   Not at all

2. **I still enjoy the things I used to enjoy:**
   Definitely as much
   Not quite as much
   Only a little
   Hardly at all

3. **I get a sort of frightened feeling as if something awful is about to happen:**
   Very definitely and quite badly
   Yes, but not too badly
   A little, but it dosen't worry me
   Not at all

4. **I can laugh and see the funny side of things:**
   As much as I always could
   Not quite so much now
   Definitely not so much now
   Not at all

5. **Worrying thoughts go through my mind:**
   A great deal of the time
   A lot of the time
   From time to time but not too often
   Only occasionally

6. **I feel cheerful:**
   Not at all
   Not often
   Sometimes
   Most of the time

7. **I can sit at ease and feel relaxed:**
   Definitely
   Usually
   Not often
   Not at all

(please turn over)

HAD Scale (continued)

8. **I feel as if I am slowed down:**
   Nearly all of the time
   Very often
   Sometimes
   Not at all

9. **I get a sort of frightened feeling like butterflies in my stomach:**
   Not at all
   Occasionally
   Quite often
   Very often

10. **I have lost interest in my appearance:**
    Definitely
    I don't take so much care as I should
    I may not take quite as much care
    I take just as much care as ever

11. **I feel restless as if I have to be on the move:**
    Very much indeed
    Quite a lot
    Not very much
    Not at all

12. **I look forward with enjoyment to things:**
    As much as ever I did
    Rather less than I used to
    Definitely less than I used to
    Hardly at all

13. **I get sudden feelings of panic:**
    Very often indeed
    Quite often
    Not very often
    Not at all

14. **I can enjoy a good book or radio or TV programme:**
    Often
    Sometimes
    Not often
    Very seldom

TREATMENT SESSIONS COMPONENT RECORD

SESSION NO	COMPONENTS				
	☐ Assessment	☐ Education	☐ Motivational Interviewing	☐ Relapse Prevention	☐ Social Skills
DATE	☐ Urine Testing/ Feedback	☐ Problem Solving Skills	☐ Referral (eg. to group or other service)	☐ Goal Setting	Other (specify)

Comments: _____
_____
_____
_____
_____
_____

SESSION NO	COMPONENTS				
	☐ Assessment	☐ Education	☐ Motivational Interviewing	☐ Relapse Prevention	☐ Social Skills
DATE	☐ Urine Testing/ Feedback	☐ Problem Solving Skills	☐ Referral (eg. to group or other service)	☐ Goal Setting	☐ Other (specify)

Comments: _____
_____
_____
_____
_____
_____

SESSION NO	COMPONENTS				
	☐ Assessment	☐ Education	☐ Motivational Interviewing	☐ Relapse Prevention	☐ Social Skills
DATE	☐ Urine Testing/ Feedback	☐ Problem Solving Skills	☐ Referral (eg. to group or other service)	☐ Goal Setting	☐ Other (specify)

Comments: _____
_____
_____
_____
_____
_____

SATISFACTION WITH CANNABIS TREATMENT PROGRAMME QUESTIONNAIRE

Your answers and comments to the following items will be used to examine the helpfulness of treatment and your satisfaction with the programme.

I remind you that your identity and your responses are **CONFIDENTIAL** and will not be seen by your counsellor or anybody else related to your treatment.

I am interested in your honest opinion, whether it is positive or negative. Please answer all the questions as honestly as possible. For each question tick (✓) the box which best indicates your opinion. Your comments about treatment and/or suggestions for improvement to the programme are welcome.

1. To what extent has your treatment programme met your needs?

   Almost all of my needs have been met ☐

   Most of my needs have been met ☐

   Only a few of my needs have been met ☐

   None of my needs have been met ☐

2. In an overall, general sense, how satisfied are you with the treatment you received?

   Very satisfied ☐

   Mostly satisfied ☐

   Indifferent or mildly dissatisfied ☐

   Quite dissatisfied ☐

3. If you were to seek help again, would you come back to this treatment programme?

   No, definitely not ☐

   No, I don't think so ☐

   Yes, I think so ☐

   Yes, definitely ☐

4. Do you have any comments about or suggestions for improvement to the Cannabis treatment programme?

   _____

   _____

   _____

   _____

   _____

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. YOUR HELP IS APPRECIATED. PLEASE FOLD THE QUESTIONNAIRE AND SEAL IT IN THE ENVELOPE PROVIDED.

MASSEY
UNIVERSITY

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Palmerston North
New Zealand
Telephone +64-6-350 51?
Facsimile +64-6-350 22(

**FACULTY OF
SOCIAL SCIENCES**

—

DEPARTMENT OF
REHABILITATION
STUDIES

The Effectiveness of Cannabis Treatment Programmes

Information Sheet

2nd December 1996

Researcher Information: The sole researcher is a Massey **University graduate enrolled in a Masterate programme.** The research project will form the thesis in the M.Phil degree in the Rehabilitation Studies Department. **The project is being supervised** and both the researcher's Supervisor, Ann Flintoft, and the Head of Department, Professor La Grow, may be contacted at the above address, telephone or fax number.

Participation: I am trying to find out how effective cannabis **treatment programmes are at Alcohol and Drug Centres.** Along with all clients presenting for cannabis treatment during the time of the study, **you are invited to take part. Your participation is entirely voluntary.** You can have plenty of time to consider whether to take part or not. If you do agree to take part, you have the right to withdraw at any time. If you choose not to take part, or if you do and then withdraw, your treatment will go ahead as usual; your care will not be affected in any way. Your counsellor will answer any questions that you may have about the study at any time during your participation.

Study Aims and Procedures: The study will examine the effectiveness of treatment programmes available for cannabis clients at both the Nelson and the New Plymouth Alcohol and Drug Centres. The study also aims to find out participants' views about how helpful the programmes are for themselves. I hope that 50 clients at each centre will agree to participate. Participants will be assessed in the usual way at the Alcohol and Drug Centres, then given 2 brief questionnaires to fill in (approximately 10 - 15 minutes). Treatment will then go ahead as usual. (8 - 10 weekly sessions). At each participants' final treatment session, the assessment process will be repeated.

Follow - up: 3 months after your last treatment session, all participants will be posted a short questionnaire asking how you are getting along since treatment, and how satisfied you were with the cannabis treatment programme. Participants will be invited to make comments about the programmes, and to make any suggestions you might have for improvements to the programmes.

A stamped, addressed return envelope will be enclosed. I ask that participants return the questionnaires just as quickly as possible.

Confidentiality / Anonymity: All client records held at Alcohol and Drug Centres are confidential and kept in locked, secure storage. To be able to do the study, the researcher must have the participants' permission to have access to his/her records. Permission is also required to send the postal follow-up questionnaire. The researcher will be bound by the agencies' ethical code of practice and confidentiality, and no names or any kind of identification will appear on any research information forms. A code only will be used. Agency staff will send out the postal questionnaires to keep participants' addresses confidential. No material which could identify you personally will be used in any reports on this study.

Results: A summary of the study's results will be provided for all participants and made available at the Alcohol and Drug Centres. It is also intended to present the results in several professional publications in the area of treatment for addictions and that of mental health.

Risks / Benefits: No potential risks to participants can be reasonably foreseen. Participants will be receiving the standard treatment provided all cannabis clients at the agencies. However, **several benefits are associated with participation in the study.**
Participants will:

- be contributing to the evaluation of treatment programmes
- have the opportunity to comment on programmes and make suggestions for improvements to treatment
- be helping Alcohol and Drug Centres to develop the best service possible for clients

Approval from Ethics Committees:
This study has received ethical approval from:

The Massey University Human Ethics Committee
The Nelson - Marlborough Ethics Committee
The Taranaki Ethics Committee

Consent to Participate: **Your written consent is required for participation in this study.** Your signature alongside "The Researcher" box on the Consent / Confidentiality Form indicates that you have read or had read to you, and have understood, the Information Sheet; that you have had the details explained to you by your Counsellor, and had any questions answered to your satisfaction; and that you agree to participate in the study according to the conditions covered in this Information Sheet.

* If you have any further questions about this study, please ask your counsellor. Your counsellor will contact the research supervisor in the Rehabilitation Studies Department at Massey University to provide the information you want.

The Effectiveness of Cannabis Treatment Programmes

Information Sheet

1 May 1998

Researcher Information: The sole researcher is a Massey University graduate enrolled in a Masterate programme. The research project will form the thesis in the M.Phil degree in the Rehabilitation Studies. **The project is being supervised** and both the researcher's Supervisor, Ann Flintoft, and the Head of Rehabilitation Studies, Professor La Grow, may be contacted at the above address, telephone or fax number.

Participation: I am trying to find out how effective cannabis treatment programmes are at Alcohol and Drug Centres. Along with all clients presenting for cannabis treatment during the time of the study, you are invited to take part. Your participation is entirely voluntary. You can have plenty of time to consider whether to take part or not. If you do agree to take part, you have the right to withdraw at any time. If you choose not to take part, or if you do and then withdraw, your treatment will go ahead as usual; your care will not be affected in any way. Your counsellor will answer any questions that you may have about the study at any time during your participation.

Study Aims and Procedures: The study will examine the effectiveness of treatment programmes available for cannabis clients at the Auckland, Nelson and New Plymouth Alcohol and Drug Centres. The study also aims to find out participants' views about how helpful the programmes are for themselves. I hope that 50 clients at each centre will agree to participate. Participants will be assessed in the usual way at the Alcohol and Drug Centres, then given 2 brief questionnaires to fill in (approximately 10 minutes). Treatment will then go ahead as usual. (8 - 10 weekly sessions). At each participants' final treatment session, the assessment process will be repeated.

Follow - up: 3 months after your last treatment session, all participants will be posted a short questionnaire asking how you are getting along since treatment, and how satisfied you were with the cannabis treatment programme. Participants will be invited to make comments about the programmes, and to make any suggestions you might have for improvements to the programmes.

A stamped, addressed return envelope will be enclosed. I ask that participants return the questionnaires just as quickly as possible.

Confidentiality / Anonymity: All client records held at Alcohol and Drug Centres are confidential and kept in locked, secure storage. To be able to do the study, the researcher must have the participants' permission to have access to his/her records. Permission is also required to send the postal follow-up questionnaire. The researcher will be bound by the agencies' ethical code of practice and confidentiality, and no names or any kind of identification will appear on any research information forms. A code only will be used. Agency staff will send out the postal questionnaires to keep participants' addresses confidential. No material which could identify you personally will be used in any reports on this study.

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Participants will:

- be contributing to the evaluation of treatment programmes
- have the opportunity to comment on programmes and make suggestions for improvements to treatment
- be helping Alcohol and Drug Centres to develop the best service possible for clients

Approval from Ethics Committees:

This study has received ethical approval from:

The Auckland Ethics Committee
The Massey University Human Ethics Committee
The Nelson - Marlborough Ethics Committee
The Taranaki Ethics Committee

Consent to Participate: Your written consent is required for **participation in this study.** Your signature alongside "The Researcher" box on the Consent / Confidentiality Form indicates that you have read or had read to you, and have understood, the Information Sheet; that you have had the details explained to you by your Counsellor, and had any questions answered to your satisfaction; and that you agree to participate in the study according to the conditions covered in this Information Sheet.

* If you have any further questions about this study, please ask your counsellor. Your counsellor will contact the research supervisor in the Rehabilitation Studies Department at Massey University to provide the information you want. If you have any queries or concerns regarding your rights as a participant in this research you may contact the Health Advocates Trust Phone:(09) 623 5799.

APPENDIX XI

CONSENT/CONFIDENTIALITY FORM

I, _____ (FULL NAME)

give my consent for information to be:

SOUGHT about me from:	SIGN	GIVEN: by A & D staff to:	SIGN
TREATMENT AGENCIES (specify)		TREATMENT AGENCIES (specify)	
GP: (specify)		GP: (specify)	
LAND TRANSPORT (Section 30A Assessment) TRAFFIC HISTORY		LAND TRANSPORT (Section 30A Assessment) ASSESSMENT	
COMMUNITY CORRECTIONS (specify)		COMMUNITY CORRECTIONS (specify)	
NZ POLICE:		NZ POLICE:	
LAWYER: (specify)		LAWYER: (specify)	
COURTHOUSE: (specify)		COURTHOUSE:	
FAMILY MEMBERS/FRIENDS		FAMILY MEMBERS/FRIENDS	
Researcher:		Researcher:	

I have read, or had explained to me the confidentiality policy of the Alcohol and Drug Clinic and accept the conditions of confidentiality set out.

CLIENT SIGNATURE: _____   DOB: _____

STAFF SIGNATURE: _____   DATE: _____

Alcohol & Drug Service
25 Vivian Street
NEW PLYMOUTH

PH (06) 7575410

Date: ....

I .... give ....

permission to release information from my file to

.... for the

purpose of ....

signed: ....   Date: ....

signed: ....   date: ....

◢ *Waitemata* HEALTH

AUCKLAND REGIONAL ALCOHOL & DRUG SERVICES

First Floor, Toshiba House
3 Ferncroft Street
Auckland 1, New Zealand
Telephone: 64-9-377 7390
Facsimile: 64-9-377 7399

Date:

I, ... hereby authorise the staff of Community

Alcohol & Drug Services .... to receive from and release information to the
                        (unit)
Researcher of Massey University concerning my treatment.

It is my understanding that this informed consent will apply only to the following

specific information: **Cannabis Study Data**

Signature of Client:...................................   **Date:........**

Signature of Witness:...................................   **Date:........**

CANNABIS TREATMENT - OUTCOME STUDY
COUNSELLOR GUIDE / CHECKLIST

SESSION	ACTIVITIES	COMMENTS
At intake/assessment	Invite all cannabis clients to participate. Provide all clients with Information Sheet to take away. Invite and answer questions. Outline benefits and responsibilities of participation (eg. urine testing, completion of follow-up survey and its prompt return).	Please promote research and answer all questions raised. Contact researcher for information if necessary. Assure confidentiality / anonymity of identity.
Session 1	Consent Form signed? 2nd locator person/address recorded? Any remaining questions answered?	

☞ RESEARCH BEGINS ☜

	Pre-treatment urine test Pre-treatment questionnaire (counsellor administered and completed) RTC and HAD scale (client self administered)	Please ensure all forms are completed, coded, and attached to each clients' research cover sheet

☞ TREATMENT NOW PROCEEDS AS USUAL (8 - 10 SESSIONS) ☜

At end of every session	Record content of each session on Treatment Components Record form	Counsellor comments/impressions are requested (and appreciated) in the space allocated
Penultimate Session	Pre-exit urine test	
Exit Session	Assessment Repeated Exit Treatment Session Questionnaire (counsellor administered and completed) RTC and HAD scale (client self administered) Satisfaction with Treatment Programme Questionnaire (client self administered) Urine Analysis Feedback	Please remind participants of confidentiality/anonymity, especially with regard to the Satisfaction Questionnaire. It is important to ensure all forms are completed, coded, and assembled with the correct client cover sheet

☞ PLEASE THANK CLIENTS FOR PARTICIPATING AND REMIND THEM OF THEIR RESEARCH RESPONSIBILITIES IN COMPLETING THE POSTAL SURVEY AND ITS PROMPT RETURN. CHECK 2ND CONTACT PERSON ADDRESS ☜

CANNABIS TREATMENT - OUTCOME STUDY
CO-ORDINATOR GUIDE / ADMINISTRATION CHECKLIST

RESEARCH PHASE	ACTIVITIES	COMMENTS
Preparation	Please allocate adequate space/appropriate location for research documents (etc). Ensure all counsellors have complete sets of research forms and ready access to further supplies. Implement your own preferred code allocation system (01-60) and your own system of monitoring the systematic follow-through of the research process. Before research begins, please ensure that participants have signed the Consent form and provided a second contact locator person/ address. Allocate each participant a code number to be used consistently.	Pre-treatment set includes: Information Sheet Consent Form Client Cover Sheet Treatment Components Record Form Pre-treatment Questionnaire HAD Scale RTC Questionnaire Urinalysis Request Form

☞ PHASE 1 : RESEARCH BEGINS ☜

Session 1	Please check that all participant forms are coded correctly, completed, and filed securely together in client's research file. Process urine sample (check coded identification).	Upon receipt, ensure that the correct urinalysis laboratory report is attached to client's research file.
After every session (or use own monitoring / bring-up system)	Please check that counsellor has completed Treatment Sessions Components Record.	
Penultimate Session	Urinalysis - process coded sample.	Upon receipt, ensure correct laboratory report is filed with client's research records.

Exit Treatment Session	Ensure counsellors have complete sets of research forms.	Exit Session set includes: Client Cover Sheet
	Ensure all forms are coded correctly, completed, and filed on client's research file (note: sealed envelope contains a CONFIDENTIAL document).	Treatment Components Record Form Exit Session Questionnaire HAD Scale RTC Questionnaire
	Check with client the accuracy of second contact locator person/address (for postal survey to follow).	Satisfaction with Treatment Programme Questionnaire.
	Enter date of exit session on client's research cover sheet.	

☞ PHASE 2 : FOLLOW-UP POSTAL SURVEY ☜

First posting	On the 3-month anniversary of each participant's exit session, send postal survey. Check carefully for correct coding.	To preserve client confidentiality, the researcher will provide stamped envelopes and stamped addressed return envelopes.
	Record dispatch date on Client Cover Sheet. Record date survey returned.	
	If possible, follow up (where necessary) with a friendly reminder phone call to 'slow' responders.	As the Researcher is unable to do this personally, this gesture would be much appreciated.
Second posting (non-responders to first posting)	Approximately two weeks after first posting date, send second posting to non-responders.	
	Record date survey returned.	

☞ AT THIS JUNCTURE, THE DATA COLLECTION PROCESS IS COMPLETE ☜

THE RESEARCHER IS AVAILABLE AT ALL TIMES TO ANSWER ANY QUESTIONS YOU MIGHT HAVE, CLARIFY ANY REMAINING ELEMENTS OR ISSUES, AND TO SUPPORT YOU IN CO-ORDINATING TASKS. YOUR ROLE IN THE STUDY IS CRITICAL TO ITS PROCESS AND SUCCESS. I HOPE YOU FIND THE EXPERIENCE WORTHWHILE AND ENJOYABLE. YOUR CONTRIBUTION IS VALUED.

RATIONALE FOR STATISTICAL ANALYSES USED IN THIS STUDY

PARAMETRIC

Student's t-Test For Independent Samples

The primary purpose of this test is to determine whether the means of two groups of scores differ to a statistically significant degree on a single variable. Tabachnick and Fidell (1989) also consider that when population variances are unknown it is desirable to evaluate the probabilities, using this test rather than Z, even for large samples. The assumptions of this strictly univariate statistic are (1) normally distributed continuous (interval) data (2) homogeneity of variance, and (3) independent scores within each cell (Kranzler & Moursund, 1995). The t-test was implemented to compare the mean scores on all the scales in this study (and all the composite indexes) by gender (e.g. cannabis use variables, anxiety, depression, Problems Index, Social and Economic Stability Index, etc). It was also used for hypotheses testing in this study, to see if there were any significant differences between treatment remainers and dropouts on client variables hypothesized to predict dropout.

T-test for Nonindependent (paired) Samples

The primary purpose of this test is to compare the means of two variables with each other from the same sample to test for pre-post difference and to decide if it is significantly different from 0. Each pretest is logically linked to one posttest score only. According to the SPSS Base 9.0 User's Guide (1999) the two-sample t-test is fairly robust to departures from normality if underlying distributions are symmetric.

Thus this test was appropriate for pre-post treatment comparisons on all the symmetrically distributed scales and composite indexes for those who completed treatment. However, these t-tests were largely used as supplementary to nonparametric tests.

Pearson Product-Moment Correlation Coefficient (R)

This bivariate statistic is the most common measure of the linear relationship between two variables. The squared correlation is the measure of the strength of association between the two variables. As a measure of association there is no implication of cause-effect. The statistic involves rank ordering and assumes (1) normality of distributions (2) interval or ratio data (3) linear relationships (4) independent measures. The statistic also allows for prediction/estimation of the exact value of one variable when the value of another is known (Tabachnick & Fidell, 1989). In this study r was used to calculate the pretreatment correlates of the cannabis use variables using key variables that met the assumptions (or were transformed), e.g. DAYS90, USES90 (transformed to U2), age, gender (1,2) ethnicity (1,2), anxiety, depression, Problems Index, Social and Economic Stability, Readiness for Change, General Health, cognitive problems.

NONPARAMETRIC

Although less powerful than parametric tests parametric tests were eminently appropriate in this study as they are not sensitive to departures from normailty and abnormal scores, values which are likely to be found in a non-random sample from an addictions treatment population in an applied setting. Several features of these tests help to compensate for the relative loss of power.

Mann-Whitney U-Wilcoxon Rank Sum W Test

When at least ordinal measurement has been achieved for the variables of interest the Mann-Whitney U test may be used to test whether two independent groups have been drawn from the same population. This is one of the most powerful of the nonparametric tests, and a very useful alternative when the assumptions of the t-test are not met (Siegel & Castellan, 1988). It is appropriate when (1) data is ordinal and rankable, and (2) when imprecise hypotheses are being tested to see whether two groups of ranked data are significantly different from each other. Unlike other statistics a smaller obtained value is likely to be significant, and a major advantage is that it is appropriate with small samples.

This test was used to compare the pretreatment drug use variables by gender, and as a supplementary analysis to various t-tests.

Wilcoxon Matched-Pairs Signed Ranks Test

This is a widely-used statistic appropriate when data are difference scores from two related samples. Used at the ordinal level of measurement this test looks at the differences between related pairs of values by subtracting the score for sample 1 from its paired score in sample 2, and the sign of the difference then affixed. These differences are then rank-ordered (thus weighted). Statistic T is calculated by adding the ranks of the positive and negative differences and taking the smaller sum (Siegel & Castellan. 1988; Sprent, 1981. A major advantage is its use of information about the magnitude of the differences (cf. the Sign Test) and its validity for small samples. Furthermore, the "exact p-value" option can be selected to calculate the exact P rather than an asymptotic approximation. The Z score is also normally distributed, allowing inferences to be made from it. As this study had a reflexive control design in which the sample served as their own control, this test was used for the pre-post comparisons of all data that were at least ordinal and rankable (Siegel & Castellan, 1988).

3

Chi Square Statistic

This test was designed to test hypotheses about category data using the 'goodness-of-fit' technique. The test ascertains whether a significant difference exists between an observed number of responses in (one or two) categories and an expected number based upon the null hypothesis. The chi-square test thus assesses the degree of correspondence between the observed and expected observations in each category (Siegel & Castellan, 1988). The traditional rule of thumb is that the expected frequency must always be equal to or greater than 5 (Kranzler & Moursand, 1995). In this study the chi square statistic was computed to test pretreatment differences in the cannabis use variables by the category of gender (n=63).

Spearman Rank-Order Correlation Coefficients

This nonparametric form of the Pearson correlation involves both ranking and measurement of the degree of association between two variables. Numbers are first ranked, then a Pearson correlation is conducted on the ranks (Kranzel & Moursund, 1995). This test is also more appropriate than the Pearson statistic if one of the variables involves ordinal data and the other variable either ordinal, interval or ratio data (Cone & Foster, 1993; McNemar, 1962). In this study Spearman correlation coefficients were computed to examine (1) the association between the number of treatment sessions clients attended and the composite outcome indexes, (2) sessions attended with client satisfaction, and (3) the degree of correspondence between self-reports of cannabis use and the biochemical laboratory measure of urinary cannabinoids.

Kendall Correlation Coefficients

This test is appropriate for the same sort of data for which the Spearman correlation is useful. Ordinal measures of two variables are ranked in two ordered series and the degree of association computed. Kendall correlation coefficients were computed as an extra test of association between satisfaction and sessions attended.

The Kolmogorov-Smirnov One-Sample Test and the Shapiro-Wilks Test

The one-sample versions of these tests were used to test the 'goodness-of-fit' between variables with a (theoretical) normal distribution. Both tests were used for screening the data to test for normality and homogeneity of variances before data analyses began. As the Shapiro-Wilks test was produced for small samples this was used in preference to the Kolmogorov-Smirnov test for screening the pre-post data (n=18) while both tests were implemented for screening data from the whole sample (n=63).

MASSEY
UNIVERSITY

14 February 1997

Jan Bashford

Dear Jan

Thank you for your amended information sheet.

The amendments you have made now meet the requirements of the Human Ethics Committee and the ethics of your proposal are approved.

I wonder though whether you would consider in the information sheet making it clearer that although you are the sole researcher from Massey University the research does not come from the Alcohol and Drug Centre.

Yours sincerely

Professor Philip Dewe
Chairperson
Human Ethics Committee

NELSON MARLBOROUGH ETHICS COMMITTEE

PO Box 672
Nelson

CENTRAL REGIONAL HEALTH AUTHORITY

Chairperson : Margot Harkness
Phone / Fax : 03 546 8351
E-mail : nmethics@xtra.co.nz

Secretary : Cathy Knight
Phone   03 546 6219
Fax   03 546 7295

24 February 1997

Mrs J Bashford
██████████ █
██████

Dear Jan

re :   **TESTING THE EFFECTIVENESS OF TREATMENT PROGRAMMES FOR CANNABIS CLIENTS AND THE PROBLEM OF ATTRITION**
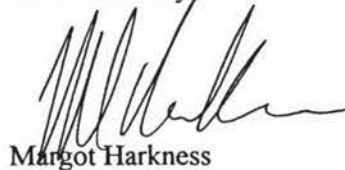
Further to my letter of 17 December 1996 and your response, I advise that your study has now been approved by the Multi-Centre Fast Track Committee. I ask that if any changes are made to the present information sheet, regarding format, please forward a copy to this Committee for its records.

If any changes are made to the wording of the information sheet, I remind you that it will require further approval by the Committee.

Also, the questionnaire will require approval by the Committee before forwarding to participants.

I wish you well in your research.

Yours faithfully

Margot Harkness
Chairperson

cc :   Taranaki Ethics Committee

Chairperson : Margot Harkness
Phone / Fax : 03 546 8351
E-mail : nmethics@xtra.co.nz

Secretary : Cathy Knight
Phone 03 546 6219
Fax   03 546 7295

15 September 1997

Ms J Bashford

Dear Ms Bashford

re :   **TESTING THE EFFECTIVENESS OF TREATMENT PROGRAMMES FOR
         CANNABIS CLIENTS AND THE PROBLEM OF ATTRITION**

The Committee would like to thank you for your attendance at the meeting on Monday last,
and for your verbal report as to the progress of your research.

The Committee asks that you complete a progress report at the conclusion of Part I of the
study. A copy of a progress report is included for completion and return by you.

With regard to Part II of the study and the postal survey for ethical approval, the Committee
suggests that the far right hand column be headed *"For Office Use Only"* on each page. That
being done, Part II is approved.

I remind you that a final report will be required on completion of the study. I have forwarded
a copy of your questionnaire to the Taranaki Ethics Committee.

Yours faithfully

Margot Harkness
Chairperson

TARANAKI ETHICS COMMITTEE

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Melissa Annells – Secretary
Peter Kendrick – Chairperson
P O Box 817, New Plymouth

☎ Telephone Secretary 06–758 9086 Fax 06–758 9278
☎ Telephone/Fax Chairman 06–758 6648

10 April 1997

██████████

Dear Cathy

TESTING THE EFFECTIVENESS OF TREATMENT PROGRAMMES FOR CANNABIS CLIENTS AND THE PROBLEM OF ATTRITION

Our committee has received from Jan Bashford a response to our requests. This application is now unconditionally approved.

It is a requirement of this committee's approval that a full report be furnished upon completion of this research.

Yours sincerely

Melissa Annells
Secretary

Our Ref: PR129/97

APPROVED by the
TARANAKI ETHICS
COMMITTEE

Date _____ 9|4|97

Secretary _____

Health Funding Authori

email: sandrah@hfan.govt.nz

26 June 1998

Ms JL Bashford
███████████████████
████████

Dear Ms Bashford

98/105 Testing effectivenesss of treatment programmes for cannabix clients and the problem of attrition.

The above proposal was considered by Ethics Committee X at the meeting held on 24 June 1998.

I am pleased to inform you that the study is approved until 26 June 1999. It is certified as not being conducted principally for the benefit of a manufacturer and will be considered for coverage under ACC.

Please note that the Committee grants ethical approval only. If management approval from the institution/organisation is required, it is your responsibility to obtain this.

Research approval is for a period of 12 months. Approximately three months prior to the end of this period you will receive a reapproval application which must be completed and submitted to the Ethics Committee before the expiry date.
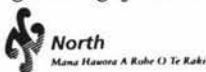
The Committee wishes you well with your research.

Yours sincerely

Sandra Haydon
Administrator
Ethics Committees

g\meetings\jun98ltr

North
Mana Hauora A Rohe O Te Raki

Midland

Central
Te Ihonga Hauora

South
Ko te mana Hauora, Ko te mana Tahete

Northern Office
91–95 Mt Eden Road
Mt Eden
Private Bag 92522
Wellesley Street
AUCKLAND
New Zealand
Telephone 09 357 4300
Facsimile 09 357 4301

ETHICS COMMITTEE   **X**

DATE OF MEETING   **24 JUNE 1998**

Deirdre Milne	Chairperson, Lay Member	Present
Timothy Cundy	Health professional	Present
Helene Leaf	Lay member, Maori	Present
Roger Marshall	Health professional	Present
Lorraine Nelson	Lay Member	Present
Gail Richards	Health professional	Absent
Namisha Waller	Health professional	Present
Jenny Westgate	Health professional	Present
Heather Worth	Lay Member	Absent

All New Zealand Ethics Committees are constituted to National Standards and the total Ethics Committee is responsible for the decisions taken.

g\meetings\jun98ltr

North
Mana Hauora A Rohe O Te Raki

Midland

Central
Te Ihonga Hauora

South
Ko te mana Hauora, Ko te mana Takata

CANNABIS TREATMENT-OUTCOME STUDY

MEMO TO ALL COUNSELLORS

A cultural issue may have arisen during this early stage of the research. Several younger Maori cannabis clients expressed initial interest in participation, but subsequently declined. This change of mind appears directly related to the mandatory urine testing. Though this can (reasonably) be assumed to be a motivational phenomenon, we must acknowledge a possible cultural problem here.

We are ethically bound to conduct culturally sensitive research. Consequently, we **may** have to waive this part of the research in certain specific circumstances, (i.e.):

> The urine sampling component of assessment **will** remain in most instances, and is a highly desirable empirical tool (reliability/validity/objectivity). However, in the particular situation where a potential participant expresses interest in the study but has apparent cultural objections or reservations about providing urine samples, counsellors may waive this component of assessment to promote the client's inclusion in the study.
>
> Please note that this is **NOT** an option for all participants. Rather, it is a strategic accommodation of objections on the basis of culturally sensitive research procedures. Please continue to promote the established research protocol in the first instance. Where urine sampling is waived, record **"N/A - CULTURAL OBJECTIONS"** on the Client Information / Checklist Cover Sheet (in box 'Urine sample taken?').

Clearly we are keen to recruit as many participants as possible, in terms of both overall numbers and that of culturally diverse subgroups. This concession will not only maximise recruitment potential, but may also provide valuable information about possible cultural issues in addictions treatment / research procedures.

For clarification of any points, or further information, please contact me.

THANK YOU AGAIN FOR YOUR ONGOING, VALUED SUPPORT

JAN BASHFORD, Researcher.

20/11/97

APPENDIX XX

CANNABIS TREATMENT OUTCOME STUDY
AUCKLAND SITES
MEMO TO ALL COUNSELLORS RE URINE SAMPLING

5th August, 1998

Details of the urine testing component have now been negotiated and represent a compromise between the desirability (if not absolute necessity) of urine sampling as an objective tool for quality credible research, and counsellor ambivalence towards the procedure involved. It is hoped that the finalised logistics meets with your approval (or at least acceptance) as the success of the study rests largely on counsellor cooperation.

THE PROCEDURE:

Participating clients will provide urine samples on site. Counsellors will give consenting clients the relevant container, but the actual process will be unobserved. The sample is to be promptly coded, packaged, labelled, and dispatched via the Waitemata Health courier to the Auckland Hospital laboratory. Counsellors will receive the laboratory report for feedback to the client, while I receive a copy for my records.

Auckland Hospital will provide the (specially designed) request forms, the containers, temperature strips, and security paks (etc). Clearly, it will be important to ensure request forms are coded correctly (as indeed, this applies to all the study forms).

You will observe that the process involves minimal demands on both counsellors and clients, and represents an innovation to maximise the potential viability of this component of the research protocol in terms of both recruitment and data collection.

Should any points need further clarification, please contact me. Meanwhile, thank you again for your support. Given the acknowledged heavy demands of your everyday workload, your participation and cooperation is especially valued.

JAN BASHFORD