

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

*UTILIZING DISTRACTION
STRATEGIES TO RELIEVE PAIN
AND DISTRESS IN CHILDREN
UNDERGOING MEDICAL
PROCEDURES*

A thesis presented in partial fulfilment
of the requirements for the degree of
Masters of Arts in Psychology
at Massey University

Selwyn Mason
1994

ABSTRACT

Attention diversion or distraction is a strategy which has been shown to be effective and safe in the control of pain and distress. The purpose of the present study was to assess the utility of distraction in reducing children's pain and distress during medical procedures. The study was divided into two experiments. The first experiment involved eight oncology patients ranging in age from 2.5 to 4.5 years. Three conditions, baseline, brief film, short story, were delivered in a randomized counterbalanced sequence. The second experiment involved three oncology patients ranging in age from 6.5 to eleven years. A single case design was used to assess the efficacy of video games as distractors during painful medical procedures. The dependent measures for both experiments included observer ratings of behavioural distress scored on the Observational Scale of Behavioural Distress (*OSBD*) as well as overall ratings of behavioural distress and self reported pain ratings from the children in experiment two. Results showed that in experiment one both distractors were attended to. Statistically significant reductions in observed distress were found with the short story condition. In experiment two the video game produced high levels of attention diversion which had an observable effect on behaviour. The results are discussed in relation to the sensitivity of the measures and the reason for the efficacy of the short story in experiment one.

ACKNOWLEDGEMENTS

Deepest appreciation and acknowledgement to colleagues, associates, friends, parent's and children who have made this research possible:

My thesis supervisors, Cheryl Woolley and Malcolm Johnson of the Psychology Department, Massey University, who guided and supported this research, putting many hours into the editing and final presentation of the manuscript. My grateful thanks for their personal interest in my study.

To the children, parents and the staff of the Children's Ward Wellington Hospital who took part in this research. I am especially grateful for their courage, participation, support and sharing throughout the study.

People I would like to thank for their encouragement and support not only in this research but also my personal life;

Jenny my partner for your gentle patience, loving support and belief in my ability. Mum for your ability of being able to identify the essence of my ideas. My sister Virginia and brothers, Callun and Bradley thank you for being there. And friends who have offered their comments, suggestions and helped generally, Mark Sullman, Bernie Pearce, Rhonda Warmsley, Gillian Grew, Tracy and Martin Eagle, and Karen Ramsay.

Dad for your gentle strength in our family. Your responsible attitude to life has shown me how to be in the world. You were always there to listen and see the good in me and in people. Your loving encouragement, guidance and support continued through your illness showing me your personal dignity and strength of your love. I am humbled by the honour of being with you during your illness and dying process Dad. Your death has brought a deep understanding of the effects of cancer on the patient and their family and friends. As you did in life your death will continue to guide me. Dad I dedicate this to you.

To those supporting companies who donated materials making this study viable. Thanks to, Sega - Ozisoft New Zealand Ltd, for the Sega Master System and games, Psychology Supplies Department, Childrens Pain Trust for use of the pain thermometer and Whitcoulls Ltd for the Golden Sound story books.

CONTENTS

TITLE	i
ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
LIST OF CONTENTS	v
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDICES	xi
OVERVIEW	1

CHAPTER ONE

Pain

Theoretical Concepts of Pain	3
Gate Control Theory	4
Acute and Chronic Pain	5

CHAPTER TWO

Pain and Distress in Children with Cancer

Developmental Aspects of Pain in Children	7
Children's Pain and Distress	8
Procedure-related Pain and Distress	10
Treatment-related Pain and Distress	12
Malignancy-related Pain and Distress	14
Parental Involvement	15

CHAPTER THREE

Management of Pain and Distress in Children with Cancer

Myths and Incorrect Assumptions	19
---------------------------------------	----

Coping in Children with Cancer

Coping and Control	21
Enhancement of Coping	22
Children's Spontaneous Coping Mechanisms	23
Coping and Attention Diversion	23
Psychological Interventions	24
Physical Interventions	27

CHAPTER FOUR**Distraction**

Role of Attention	28
Focusing on Auditory Stimulus	29
Focusing on Visual Stimulus	29
Focusing on Internal Stimulus	31

CHAPTER FIVE**The Proposed Research**

Children, Pain and Distress	33
Assessment of Pain	33
Children and Distraction	34

CHAPTER SIX**Method**

Subjects	36
Setting	37
Equipment	38

Measures

Assessment Instruments and Procedures	38
Observational Scale of Behavioural Distress	38
Level of Distraction	39

Interobserver Agreement	39
Qualitative Observations	39
Wong and Baker Faces Scale	40
Procedure Phases	40

Procedures

Experiment One	
Conditions	42
Design Randomization	43
Experiment Two	
Conditions	43
Experimental Design	44
Pilot Study	44

CHAPTER SEVEN

Results

Experiment One	
Case One	46
Case Two	47
Case Three	48
Case Four	49
Case Five	51
Case Six	53
Case Seven	54
Case Eight	55
Summary of Table and Graph Trends	56
Statistical Analysis Experiment One	56
Young Children's Spontaneous Coping Strategies	57

Experiment Two	
Case One	60
Case Two	64
Case Three	69
Pilot study	72
Summary of Table and Graph Trends	74
Parent, Nurse, and Child Interaction	74
CHAPTER EIGHT	
Discussion	
Experiment One	76
Experiment Two	82
General Discussion	84
Recommendations to Medical Personnel	85
Research Summary	87
Future Research	88
REFERENCES	89
APPENDICES	103

TABLES

TABLES

Table 1 Subject Data for Experiment One

Table 2 Subject Data for Experiment Two

EXPERIMENT ONE

Table 3 Treatment Duration and Level of Distraction: Case One

Table 4 Treatment Duration and Level of Distraction: Case Two

Table 5 Treatment Duration and Level of Distraction: Case Three

Table 6 Treatment Duration and Level of Distraction: Case Four_(a)

Table 7 Treatment Duration and Level of Distraction: Case Four_(b)

Table 8 Treatment Duration and Level of Distraction: Case Five_(a)

Table 9 Treatment Duration and Level of Distraction: Case Five_(b)

Table 10 Treatment Duration and Level of Distraction: Case Six

Table 11 Treatment Duration and Level of Distraction: Case Seven

Table 12 Treatment Duration and Level of Distraction: Case Eight

Table 13 Friedman Two-Way ANOVA: OSBD Scores.

Table 14 Friedman Two-Way ANOVA: Observer Ratings.

EXPERIMENT TWO

Table 15 Treatment Duration and Level of Distraction: Case One_(a)

Table 16 Treatment Duration and Level of Distraction: Case One_(b)

Table 17 Treatment Duration and Level of Distraction: Case Two_(a)

Table 18 Treatment Duration and Level of Distraction: Case Two_(b)

Table 19 Treatment Duration and Level of Distraction: Case Three

PILOT STUDY

Table 20 Treatment Duration and Level of Distraction: Pilot Study

FIGURES

EXPERIMENT ONE

- Figure 1 Child Behavioural Distress: Case One
Figure 2 Child Behavioural Distress: Case Two
Figure 3 Child Behavioural Distress: Case Three
Figure 4 Child Behavioural Distress: Case Four_(a)
Figure 5 Child Behavioural Distress: Case Four_(b)
Figure 6 Child Behavioural Distress: Case Five_(a)
Figure 7 Child Behavioural Distress: Case Five_(b)
Figure 8 Child Behavioural Distress: Case Six
Figure 9 Child Behavioural Distress: Case Seven
Figure 10 Child Behavioural Distress: Case Eight

EXPERIMENT TWO

- Figure 11 Child Behavioural Distress and Self Reported Pain: Case One_(a).
Figure 12 Child Behavioural Distress and Self Reported Pain: Case One_(b).
Figure 13 Child Behavioural Distress and Self Reported Pain: Case Two_(a).
Figure 14 Child Behavioural Distress and Self Reported Pain: Case Two_(b).
Figure 15 Child Behavioural Distress and Self Reported Pain: Case Three.

PILOT STUDY

- Figure 16 Child Behavioural Distress and Self Reported Pain: Pilot.

LIST OF APPENDICES

APPENDIX	Page
A	Information Sheet: Experiment One 103
	Information Sheet: Experiment Two 105
B	Parental Consent Form: Experiment One 107
	Parental Consent Form: Experiment Two 110
C	Child Consent Form: Experiment Two 113
D	Visual Analogue Pain Rating Scale 115
E	Observational Scale of Behavioural Distress 116
F	Implantable Drug Delivery System (<i>Port-A-Cath</i>) 131
	External Semi-Permanent Catheter (<i>Hickman Line</i>) 131
G	Certificates; Experiment One 132
H	Certificates; Experiment Two 133
I	Musical Story Book 134

OVERVIEW

"Disease can destroy the body but pain can destroy the soul."

(Lission, 1987, p. 649).

Annually approximately 120 children aged 0-14 are diagnosed with cancer which is the main non accidental cause of childhood death in New Zealand (Macfarlane, 1991). The most common childhood cancers are acute leukaemia (31% of the total), central nervous system tumours (22%), neuroblastoma (7%), lymphomas (6%), and Wilms' tumour (6%), (Dockerty & Elwood, 1991). With improved treatment methods and supportive care there has been a dramatic improvement in outcome for children diagnosed with cancer in the last 20 years. This success is often at the cost of repeated painful medical procedures (Adams, 1990).

Many children with cancer will suffer pain from the disease, from the diagnostic and monitoring procedures, and from treatment (McGrath, et al., 1990). The recent interest in childhood pain has stemmed in part from inadequacies in the management of pain resulting from treatment and diagnostic procedures. It seems with our preoccupation with survival and improved outcome, little attention has been paid to pain and its control (Fletcher, 1988) and consequently analgesia and anaesthetic agents maybe withheld (Elliott and Jay, 1987; McGrath et al., 1990).

Procedure associated pain is a fact of life for children with particular medical conditions such as burns, cancer, or children who are insulin dependent. For most children the pain, distress, and fear associated with repeated procedures does not diminish with increased exposure, and habituation does not occur (Katz, Kellerman and Siegel, 1980). That is, past experience with procedures does not decrease the discomfort of subsequent ones.

Medical procedures that are painful can have a traumatic impact on the child, parents and medical staff. As a result health professionals today are becoming increasingly concerned about the relief of pain and distress associated with invasive medical procedures. Reduction of pain and distress is considered a key element in providing a child with a better quality of life. The present study investigates the use of distraction (diverting the child's attention from his or her present discomfort) to alleviate pain and distress in children undergoing medical procedures.

CHAPTER ONE

PAIN

The word pain is derived from the greek word "poine" meaning punishment or penalty. In the past pain was often thought to occur as a consequence of wrongdoing by the sufferer. The International Association for the Study of Pain, Subcommittee on Taxonomy in 1979 defined pain as;

"an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"

(p. 250).

Pain in these terms is not simply somatic or nociceptive but a complex psychophysiological event involving nociception, pain perception, and pain expression. Conceptually, the definition accepts the notion that pain consists of sensory, behavioural and emotional components. Pain is viewed as being a subjective psychological state and as an unpleasant experience. The current definitions of pain generally consider two components, the physiological message acting as a warning of tissue damage which is the pain sensation, and the perception or experience of pain, that is, how much suffering the sensation engenders.

Theoretical Concepts of Pain

Historically, there have been many theories of pain. Prior to 1965 the two main approaches were the specificity and pattern theories. The traditional specificity theory of pain proposed that pain is a specific sensation and that the intensity of pain is proportional to the extent of tissue damage. The theory implies a fixed direct transmission from pain receptors to a pain centre. The pattern theory opposes the notion that pain has its own set of specialized receptors. This theory suggests that pain perception is based on a summation of a pattern of input. More recent psychological

and neurological data discredits the concept of a single straight through "pain pathway". This traditional concept implies that human pain perception is determined only by the quality and extent of tissue damage. However, both theories have been criticised for their failure to account for pain for which no noxious input can be specified, notably phantom limb pain.

Our understanding of how pain is experienced has changed dramatically since the gate control theory postulated by Melzack and Wall in 1965. We now know that the signals from a noxious stimulus can be modified by environmental and psychological variables. Pain can also occur in the absence of tissue damage and therefore not be synonymous with activity in nociceptive pathways or with nociceptive stimulation (Weisenberg, Aviram, Wolf, & Raphaeli, 1984). Therefore, pain is a psychological experience based on actual human perception, whereas nociception is the activity in the neuron system that may lead to pain (McGrath, 1990a). As many variables can alter the final perception of pain, the nociceptive system is regarded as plastic and complex (McGrath & Hillier, 1989).

With the plasticity of the nociceptive system, pain produced by a relatively constant stimulus can be different for each individual. The intensity of pain sensations is not exclusively related to the extent of tissue damage, neuronal activity and pain suppressing systems. Some of the components that affect nociceptive processing are; age of the individual, use of coping strategies, site of injury, analgesic usage, and a variety of environmental and internal factors (McGrath, 1990a). Psychological data lends strong support to the concept of pain as a complex perceptual and affective experience determined by the unique history of the individual, the meaning of the stimulus to this person and their "state of mind" at the time (Jeans & Melzack, 1992).

Gate Control Theory

Gate control theory was developed to explain the variable relationship of pain to the stimulus that produced it. The basic assumption of the gate control theory is that there is, within the substantia gelatinosa of the dorsal horns, a neural mechanism which acts as a pain gate. In principle, Melzack and Wall said that the information resulting from

a painful stimulus is altered in its passage from the peripheral nerves to the spinal cord. This is achieved in the substantia gelatinosa (SG) in the spinal cord where the impulses from the large (L) and small (S) diameter peripheral nerve fibres which are activated by painful and other stimuli alter the flow of impulses through transmission cells (T) to the central nervous system.

Melzack and Wall (1965) proposed two methods by which modification of pain information might occur. The first is through inhibition of pain transmission by the stimulation of low threshold afferents that carry benign information. Secondly, pain information can be modified through the facilitation or inhibition of pain messages by descending channels in the central nervous system (CNS). Sensory input produced by such methods as distraction, imagery and relaxation, can inhibit the pain signals theoretically "closing" the gate to the central nervous system (Tyrer, 1992). Thus psychological interventions produce inputs that inhibit or decrease the pain signals to the central nervous system and modulate the perception of pain at higher levels.

Acute and Chronic Pain

Recently there has been interest in classifying the diversities of pain into meaningful categories to facilitate communication, understanding and therapeutic intervention (Ross & Ross, 1988). We commonly refer to pain experiences as acute or chronic. Acute pains include those caused by tissue damaging stimuli such as trauma, burns and diseases such as sickle cell crises or cancer (Goldman & Lloyd-Thomas, 1991). Acute pain is seen as emanating directly from discrete, time-limited nociceptive stimulus events (Jay, Elliott, & Varni, 1986). McGrath and Hillier, (1989) describe three types of acute pain in children: (1) a relatively brief, mild to moderate pain from common diseases, routine injuries, and typical health treatments; (2) a more prolonged, moderate to strong pain caused by major disease, accidental trauma, invasive treatments and surgery, and (3) varying mild to strong pain caused by repeated invasive procedures.

Chronic pain is defined as pain that persists beyond the period usually required for healing or pain persisting without obvious physical damage. Chronic pain often fails to respond to treatment and may lead to changes in the individual creating "abnormal illness behaviour" (Pilowsky, 1969). Sleep and appetite disturbances, decreased physical and social activity are some of the symptoms associated with chronic pain. Chronic pain occurs in many individuals and is possibly a result of unsuccessful pain management and disease control. Chronic pain may also develop as a consequence of psychological factors, such as anxiety and depression (McGrath & Hillier, 1989).