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

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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.

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"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).