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The Psychological Impact of
Motor Vehicle Accidents:
A New Zealand Study

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ABSTRACT

The present research attempted to identify those factors which predispose victims of severe motor vehicle accidents to develop PTSD, and explored the relationship between mental health and health care utilisation. A multistage probability sample of 167 New Zealand victims of motor vehicle accidents were included for analysis, the data being obtained as part of a larger nation-wide study looking at trauma and health care utilisation. Past research has identified factors which predispose the development of PTSD, such as prior psychological disorders, prior trauma, intensity, and extent of injury. The main statistical technique employed was multiple regression analysis, with the dependant variables being mental health and health care utilisation of the victims. Findings indicated that victims of MVAs are more likely to experience physical and mental health difficulties. The results showed a relationship between experience of trauma and the existence of PTSD, with victims of motor vehicle accidents suffering from more ill-health and PTSD-related symptoms than non-victims. Adverse life events, disclosure of feelings, extent of injury, and especially physical symptoms were all significant predictors of PTSD symptoms, however experience of previous trauma and intensity of the accident were not. A relationship between PTSD symptoms and health care utilisation also exists, with accident victims having more days confined to bed.

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1. INTRODUCTION

1.1 Motor Vehicle Accidents And New Zealand Society

According to the Land Transport Safety Authority (1994) there were 10,994 reported casualty vehicle accidents in New Zealand in 1993. These accidents resulted in 600 deaths and 15,108 injuries, at a rate of 429 injuries per 100,000 population. On average, one person was killed every 14.6 hours and one person injured every 35 minutes during 1993 (Land Transport Safety Authority, 1994). More recent figures show a modest improvement, with the 1995 death toll standing at 581 fatalities (Barton, 1996). Forty percent (230) of those killed in 1995 were rural people, although they make up only 15 percent of the population (Barton, 1996).

In 1991, road crashes were the single biggest potential cause of loss of life for both males and females below the age of 65 in New Zealand. In 1993, nearly seven thousand casualties of motor vehicle accidents were hospitalised, resulting in over 57,000 total days stay in hospital, with the average stay being 8 days (Land Transport Safety Authority, 1994). The hospitalisation rate for motor vehicle accidents in 1992 stood at 336 people per 100,000 population. The hospitalisation rate for vehicle accidents among Maori was twice as high as that for non-Maori (Statistics New Zealand, 1993). Motor vehicle accidents represent the largest cause of trauma related admissions to Australian hospitals (Gordon, 1995).

An estimated 230,000 people world-wide die on the roads each year, and annually 10 million people are involved in motor vehicle accidents. These motor vehicle accidents are the major cause of death for people under the age of 30 in western societies (Brom, Kleber & Hofman, 1993; Richards, 1996). Travel by road is

indispensable to modern living, however it is one of the most common hazards which brings about much death, injury, pain and damage (Kuch, Cox, Evans & Shulman, 1994).

By international comparison, New Zealand has one of the worst driving records of the western world. The number of people killed per head of population by motor vehicle accidents in New Zealand exceeds that of Australia, the United Kingdom, the U.S.A., Japan, Germany and Canada (Statistics New Zealand, 1995).

The above figures demonstrate the scope of the physical impact of motor vehicle accidents, resulting in much destruction, injury and death each year. However, in the wake of a serious accident, the consequences of such accidents are seldom confined to the physical aspects alone. There is often a complex interaction of many psychological factors subsequent to a traumatic accident, such as feelings of guilt, blame, grief and despair. How an individual deals with these thoughts, feelings and emotions is totally unique, with no two people having exactly the same psychological responses or coping strategies. It is these psychological effects and factors that become the focus of the ensuing review of the effects that motor vehicle accidents have on New Zealand victims.

The following introduction explores and reviews the psychological effects of motor vehicle accidents, including the characteristics and symptoms of Posttraumatic Stress Disorder. The links between the development of Posttraumatic Stress Disorder (PTSD) and subsequent health care utilisation are reviewed and the importance of understanding this linkage is emphasised with respect to limited health care funding, and the need for recognition and rehabilitation of sufferers. Characteristics of both the accident and victim that have been identified in previous research as factors which may make an individual susceptible to the onset of PTSD are presented and reviewed. Finally, a summary is presented, and some

research goals are specified which endeavour to further the understanding of the relationships between motor vehicle accidents, PTSD, and health care utilisation.

1.2 The Psychological Effects Of Motor Vehicle Accidents

The effects that motor vehicle accidents can have on people are somewhat disturbing. Not only are there the physical injuries that are customarily sustained in major crashes, but they also often bring with them significant psychological complications (Scotti et al., 1992; cited in Taylor & Koch, 1995). Motor vehicle accidents (MVAs) are unfortunately a common phenomenon, and any ensuing psychological problems often far outlast the physical injuries themselves. Whilst medical and technological advances have increased survival rates among injured patients, such advances have resulted in a rise in the number of survivors confronted with the task of long term physical and psychological recovery (Gordon, 1995). This problem is emphasised by a recent report (Vasil, 1996) which stated that the number of people hurt in motor vehicle accidents continues to grow in New Zealand, despite a much praised drop in the road-death toll.

People have been found to frequently develop acute stress reactions after being involved in a MVA, even when they suffer only slight physical injuries or even no injuries at all (Nguyen, 1995). According to Richards (1996), accident victims often suffer a variety of afflictions, including driving phobias, headaches when no overt head trauma has occurred, and pain problems as a result of injuries received. Depressive symptoms, insomnia, increased arousal and flashbacks have also been found to be prevailing problems (Malt, Høivik & Blikra, 1993; Nguyen, 1995).

One of the most noticeable effects of MVAs is the effect on driving itself. Driving phobias are a common consequence of motor vehicle accidents and are the most

prevalent ensuing anxiety disorder (Ehlers, Hofmann, Herda & Roth, 1994; Nguyen, 1995). Driving phobia is characterised by an avoidance or reduction in driving, or the tolerance of driving only with marked discomfort after a MVA (Blanchard, Hickling, Taylor & Loos, 1995; Nguyen, 1995). Further evidence suggests that those who suffer from PTSD show greater subjective distress and greater impairment of role function. Their lives are curtailed by avoidance of discretionary travel as either a driver or passenger. Many also endure substantial subjective discomfort to carry out essential travel (Blanchard, Hickling, Taylor & Loos, 1995; Burnstein, 1989). This is a largely ignored group of people in need of assistance.

Victims of motor vehicle accidents have reported a variety of psychological symptoms which include affective disturbances, generalised and phobic anxiety and avoidance, feelings of irritability and resentment, intrusive and disturbing recollections and dreams, and poor concentration and attention (Nguyen, 1995). Behavioural changes such as social withdrawal and substance abuse may also emerge. In its more severe and chronic form, a symptom pattern may emerge which warrants a formal psychiatric diagnosis of Posttraumatic Stress Disorder.

Clearly a great deal of anxiety and stress is associated with motor vehicle accidents. As Feinstein and Dolan (1991) point out, the majority of individuals can deal with these symptoms by themselves, and over time, the problems cease to **become** an intrusion into everyday functioning. But what of the longer term effects of **motor vehicle accidents**? Psychological reactions involving acute stress **or anxiety** reactions are to be expected within a relatively short time after a serious **accident**, especially one which involves serious injury or death. However, for **many** individuals these debilitating symptoms do not dissolve with time, and in some cases these symptoms become worse as time from the event passes, greatly affecting their normal everyday functioning.

These individuals are a minority in the population, indeed a minority amongst those that have been subject to a serious MVA, but their numbers are still significant to warrant much further study to identify any universal problem areas, so that help is quickly targeted towards those individuals who need it.

1.2.1 The long term consequences: Posttraumatic Stress Disorder

The emphasis now moves away from the initial anxiety, phobias and fears suffered as the result of a traumatic event, and turns toward the long term effects of motor vehicle accidents. Posttraumatic Stress Disorder (PTSD) is the diagnosis bestowed upon those people who are still severely affected by a traumatic event months or even years after its occurrence. What constitutes PTSD is outlined shortly, but Green (1993) describes PTSD as a combination of intrusive and avoidant thoughts, and physiological arousal symptoms that arise following extremely stressful events. The severely disabling effects of PTSD should not be underestimated, despite having received little empirical investigation (Bryant & Harvey, 1996).

Vincent, Long and Chamberlain (1991) provided some insightful research as to the New Zealand prevalence of PTSD in Vietnam war veterans, but there is limited data available on the prevalence of this disorder in general population New Zealand, especially with respect to motor vehicle accidents.

The first step in understanding the relationship between motor vehicle accidents and PTSD is the understanding of what constitutes PTSD symptoms. Therefore, the following section outlines the criteria for identifying PTSD. This section is then followed by a comment on the limitations of defining individuals in such a manner, and the importance of accurate diagnosis.

1.3 What is Posttraumatic Stress Disorder?

1.3.1 PTSD outlined

Posttraumatic Stress Disorder is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV: American Psychiatric Association, 1994). In short, the criteria for PTSD has four major components: exposure to a recognisable stressor or trauma; recurrent and intrusive recollections or dreams of the stressful event; emotional numbing or withdrawal from the external world; and associated symptoms such as flatness of affect, sleep disturbance, memory impairment, and hyperalertness (Breslau, Davis, Andreski & Peterson, 1991; Long, Chamberlain & Vincent, 1992; McGuire, 1990).

Strict diagnosis of this disorder is not the aim of the present research and is beyond the scope of the study. Indeed much debate exists over the criteria used and the utility of the 'caseness' approach as defined by the DSM-IV (discussed in the next section). The present study looks at PTSD symptoms as indicators of further psychological problems, rather than the rigid DSM-IV criteria.

Summarising several studies of the trauma-PTSD relationship, Green (1994) concluded that on average, about a quarter of individuals given exposure to an extreme stressor go on to develop PTSD, although certain types of exposure, rape for example, routinely produce much higher rates of PTSD. In a break down of potential causes of PTSD, Norris (1992) estimated that the resulting rates of PTSD in the United States general population given exposure to a variety of experiences were 14% from sexual assault, 13% from physical assault, 12% from motor vehicle accidents, 5% from disaster, and 8% from tragic death. In support of such figures, Breslau et al. (1991) found that the lifetime prevalence of PTSD from all traumatic events in their sample of young adults was over 9%. This would place the

diagnosis among the more common psychiatric disorders of young adults, surpassed only by phobia, major depression, and alcohol and drug dependence (Breslau, et al., 1991). However, much discrepancy still exists as to an exact figure. For example, Helzer, Robins and McEvoy (1987) found a 1% PTSD lifetime rate in their sample of the general United States population.

1.3.2 PTSD and the problem of 'caseness'

There are perhaps inherent problems with defining someone as a PTSD 'case' or not. There may well be clinical advantages to this form of classification, however it is only as accurate as the stringent and somewhat binding criteria themselves, and the skills of the diagnostician. The presenting symptoms themselves may well provide an abundance of information which can lead to positive treatment, rather than just ignoring those who fall below the DSM-IV cut-off criteria. It is this rationale which is employed in the present study.

There are also inherent statistical arguments against dichotomising continuous variables, and PTSD is one of those afflictions that affects people both in varying degrees and varying presenting symptoms, making clear distinctions very difficult, if not impossible. This would indicate that PTSD is not a disorder which can be simply classified, and the labelling should be treated as a continuous variable rather than one with a 'cut-off' value.

1.3.3 Diagnosis

Accurate diagnosis of PTSD is not a simple task as there many confounding factors have been identified which may hinder the medical practitioner. For example, accident victims who suffer from PTSD may try to avoid discussion of the trauma

as they often feel too embarrassed to report that they are experiencing psychiatric distress as a result of a motor vehicle accident, which they consider to be a relatively common occurrence (Burnstein, 1989). The diagnosis of PTSD is often complicated by the high proportion of coexisting psychiatric illnesses such as depression, generalised anxiety, phobias and panic disorders that coexist with the disorder (Nguyen, 1995). Also, all too often the patient and the physician are focused on the patient's physical injuries, instead of the traumatic experience and ensuing psychological disturbances (Burnstein, 1989). According to Jones and Peterson (1993), physicians should be aware that PTSD can occur at any age and can result from what is often regarded as relatively minor physical trauma.

Another barrier to the effective diagnosis of PTSD is the potential for its symptoms to be confused with post-concussional effects such as anxiety, irritability, sleep disturbances, and memory and concentration problems (Burnstein, 1989). Posttraumatic Stress Disorder may be overlooked in the hustle and bustle of medical treatment, and it may also be confused with other disorders such as depression and anxiety due to symptom overlap (Burnstein, 1989; Nguyen, 1995). In some cases, PTSD symptoms have been found to actually increase over time following accidental injury (e.g., Roca, Spence & Munster, 1992), therefore follow-up of victims is very important.

1.4 The Symptoms Of PTSD

So what are some of the presenting symptoms characteristic of PTSD? The role that PTSD plays on an individual's health is the fundamental question of importance, with the list of health problems being vast and varied. Insightful research by Friedman and Schnurr (1995) has furthered our understanding the relationship

between stress and physical health, demonstrating that PTSD is a the major mediator between trauma and health.

The following sections outline research proposing an array of PTSD symptoms which result after severely distressing events such as motor vehicle accidents.

1.4.1 Presenting symptoms

According to the literature, the most frequently resulting symptoms of PTSD are disturbed sleep including nightmares and insomnia, intrusive recollections, depression, feelings of guilt, feelings of anger and anxiety, behavioural changes, hyperalertness, trouble concentrating, and avoidance of activities prompting a possible recall of the original event (Brom et al., 1993; Helzer et al., 1987; Kuch, Swinson & Kirby, 1985). These debilitating symptoms can continue for months and sometimes even years (Brom et al., 1993), and additional symptoms or behaviours reported include driving phobia, muscle pain, and analgesic or anxiolytic use (Kuch et al., 1985). A study by Burnstein, Ciccone, Greenstein, Daniels, Olsen, Mazarek, et al. (1988) indicated that those classified as having PTSD had an inability to tolerate reasonable levels of everyday stress and reminders of the trauma.

Research suggests that PTSD may be a very long lasting disorder without proper treatment intervention (Green, 1994). Up to half of those who develop the disorder may, without treatment, continue to suffer decades later. On the other hand, rates of PTSD can decline over time, even without treatment, but this decrease may still not be a return to normal levels (Green, 1994). In most cases, MVAs involve a mixture of psychological, medical, and legal consequences that interact in a complex way (Brom et al., 1993).

1.4.2 Comorbidity

Comorbidity occurring in those suffering from PTSD is a major complicating factor in the diagnosis and treatment of this disorder. Comorbidity is the occurrence of other psychiatric disorders such as depression, in a person diagnosed as having PTSD.

There are many varied and complicated interactions that occur when PTSD is presented by an individual. Blanchard, Hickling, Taylor and Loos (1995) found that among the MVA victims in their study, there were strong interrelated mood effects. Those MVA victims with PTSD were much more likely to meet the criteria for current major depression. In fact, 53% of those with full PTSD also met the criteria for current major depression. Eighty-two percent of these depressions began after the accident occurred. However, more of the MVA victims who went on to develop PTSD were significantly depressed at the time of the MVA than victims who had a lesser reaction to the accident. Secondly, development of PTSD was more prevalent in MVA victims who had previously suffered from a major depressive episode (Blanchard, Hickling, Taylor & Loos, 1995).

Davidson, Hughes, Blazer and George (1991) found that 62% of individuals with PTSD resulting from a variety of traumas also suffered from another psychiatric illness, compared to only 15% of their control group. They found PTSD to be significantly associated with the diagnosis of somatisation disorder, schizophrenia, panic disorder, obsessive compulsive disorder, drug abuse, major depression, panic disorder, social phobia, and generalised anxiety. Individuals with PTSD were also 8 times more likely to have attempted suicide, even after controlling for depression (Davidson et al., 1991).

A study by Long et al. (1992) of New Zealand Vietnam veterans, found that sufferers of PTSD reported lower scores on physical and mental health scales than those without PTSD symptoms, indicating poorer health. PTSD sufferers also rated significantly higher on anxiety, depression, loss of control measures, and lower on well-being measures, indicating negative overall health consequences.

The identification of PTSD is clearly very important, as many other psychological problems go hand-in-hand with this affliction. If those who suffer from PTSD-like symptoms could be identified early, and appropriate remedial treatment given, the prevalence of the associated disorders could well be reduced.

1.4.3 Motor vehicle accidents and PTSD

Motor vehicle accidents have been found to be a typical stressor associated with the development of PTSD, and as travel by road is indispensable to modern living, it is one of the most common of all hazards (Blanchard, Hickling, Taylor & Loos, 1995; Kuch et al., 1994). Although PTSD is perhaps best known following experiences such as combat or rape, the DSM-IV (American Psychiatric Association, 1994) recognises motor vehicle accidents as a situation with which PTSD is likely to be associated. The severe trauma of MVAs often results from the threat of death, and the provocation of intense fear, helplessness or horror (Nguyen, 1995). Many theoretical and empirical studies of the psychological effects of serious life events indicate that the disturbances caused by traffic accidents are comparable to the posttraumatic stress disorders that may occur after various situations of extreme helplessness, acute disruption and distress, such as combat stress, bereavement, and acts of violence (Brom et al., 1993).

1.5 Why Look At PTSD?

This section examines two key arguments of why more information is needed on the impact and repercussions of PTSD from motor vehicle accidents. These areas are the restraints on health care resources and the existence of possible predisposing factors.

1.5.1 The health care dollar

Accurate predictions of who is likely to develop a mental disorder following a motor vehicle accident could provide the basis for decisions about who is given priority to psychological help as soon as practicable after the event. In Posttraumatic Stress Disorder, where the commonly accepted causal agent is an extremely stressful or traumatic event, anticipation of who is likely to develop PTSD would allow for the optimal allocation of mental health resources (Blanchard, Hickling, Vollmer, Loos, Forneris & Jaccard, 1996; Gordon, 1995). The careful allocation of scarce health care resources is especially important in this time of escalating health care costs and associated efforts to contain health care expenditure, because PTSD often complicates the recovery of accident victims, and is associated with substantial additional personal and public health costs. As previous studies have shown, large numbers of patients do indeed suffer long term disability from trauma associated with motor vehicle accidents.

As seen from the perspective of chronic care and rehabilitation, apparently minor MVAs generate considerable suffering and disproportionately large social costs. The primary reason for this is the psychological consequences that result from being involved in an accident, which often outlast any physical injuries. Blanchard, Hickling, Taylor, Loos and Gerardi (1994) report that they were struck by the

intensity of the psychological responses requiring treatment of individuals who were involved in what one might consider 'minor' MVAs, let alone if the accident involved a fatality. Apparently minor MVAs are often shrugged off as commonplace. Accident-related driving fears are rationalised as 'understandable', and impairment of normal daily living from phobias and PTSD is subsequently ignored (Kuch et al., 1994). The longer these debilitating symptoms go unrecognised, the more time, effort and expense is required to achieve rehabilitation.

Long et al. (1992) reported that individuals classified as PTSD sufferers had substantially more ill-health symptoms, more chronic illness, more disability days, and a lower self-rated health status. They also made nearly three times as many contacts with health care providers, especially psychiatrists, psychologists and counsellors, and they reported more hospital contact (Long et al., 1992). Therefore, illustrating the links between MVAs and PTSD, and their subsequent effect on health care utilisation would provide important information in the attempt to optimise the allocation of scarce health care resources.

1.5.2 Are there factors which could make PTSD more likely?

It is important to keep in mind that not everyone who is involved in a MVA goes on to suffer long term psychological problems. Little is known about why some MVA victims are relatively unaffected, whereas others develop phobias, and others still develop many debilitating PTSD-like symptoms. There has been some suggestion that pre-accident personality traits may play a role, and perceived severity of the stressor is likely to be important. Accidents associated with readily visible injuries and irreparable vehicle damage may also be likely to produce PTSD symptoms (Scotti et al, 1992; cited in Taylor & Koch, 1995), as too the intensity of the

experience and physical proximity to the stressor (American Psychiatric Association, 1994).

Why do some individuals develop PTSD and not others? Case reports and general population surveys indicate that PTSD symptoms such as intrusive memories, avoidance and distress occur in a minority, yet significant number of MVA victims (e.g., Mayou, Bryant & Duthie, 1993; Norris, 1992). Malt et al. (1993) found that symptoms suggesting PTSD occurred in less than 5% of their subjects who had had a serious MVA, and 15% met the criteria for PTSD in a study by Kuch et al. (1994). March (1993) supported this notion, claiming that even under horrific circumstances, the majority of individuals do not develop PTSD.

What factors influence the fact that a minority of individuals who are subjected to a serious motor vehicle accident go on to develop potentially incapacitating post-traumatic symptoms? This question is the driving force behind the present study, and shall be covered in more depth in section 1.6 below.

1.6 Characteristics Of The Victim And Accident That Predispose An Individual To Develop PTSD

This section explores the characteristics of Posttraumatic Stress Disorder, including the complications of associated psychological disorders, and presents a list of predisposing factors that have been identified by past research.

A plethora of personality and psychological factors have been proposed by researchers as precursors of PTSD in certain individuals. This section outlines some of the prominent factors which have been identified in various studies to predispose PTSD. These are broken up into two parts, the first being contextual

and demographic factors, the second part being aspects of the event and its subsequent effects.

1.6.1 Contextual and demographic factors

Gender has been found to be an influencing factor of PTSD. Norris (1992) found that women showed a rate of PTSD more than twice that exhibited by men, as too did Blanchard, Hickling, Taylor and Loos (1995). Breslau et al. (1991) also found being female to be a risk factor, confirming other studies by Helzer et al. (1987), and Green (1994).

The age of the individual has had some empirical support as a precursor of PTSD. Norris (1992) and Blanchard Hickling, Vollmer, Loos, Forneris and Jaccard (1996) found that age was a strong predictor of PTSD, with elderly people showing consistently lower rates of PTSD in regard to an accident. However, Malt et al., (1993) found that 'nervousness' was more common in elderly people.

The role of prior trauma and prior PTSD in predisposing PTSD after a motor vehicle accident has also received substantial empirical support. Having previously suffered from PTSD was identified as a risk factor for developing PTSD from an accident (Blanchard Hickling, Vollmer, Loos, Forneris & Jaccard, 1996; Breslau et al., 1991). Prior trauma or prior PTSD have been claimed to sensitise the individual, leaving them more vulnerable when a new trauma occurs (Blanchard, Hickling, Taylor & Loos, 1995; Breslau, Davis & Andreski, 1995).

Prior psychological disorders have received empirical support for their association with PTSD risk (e.g., Blanchard Hickling, Vollmer, Loos, Forneris & Jaccard, 1996; Blanchard, Hickling, Taylor & Loos, 1995; McNally & Saigh, 1993; Mayou, 1992;

McFarlane, 1989). According to Blanchard, Hickling, Taylor and Loos, (1995) this comorbidity has been mostly mood disorders (especially major depression) and anxiety disorders. This relationship appears to be positive in nature, the higher the prevalence of prior psychological disorders, the higher the risk of PTSD following a serious MVA.

Further expanding on the influence of prior diagnosable depression, it would seem that those who suffer from PTSD are extremely likely to meet the criteria for depression according to Blanchard, Hickling, Taylor, Loos and Gerardi (1994; also Blanchard, Hickling, Vollmer, Loos, Forneris & Jaccard, 1996). Blanchard, Hickling, Taylor and Loos (1995) found that those MVA victims who developed PTSD were more likely to have a history of major depression than were the MVA victims who had lesser responses to the trauma. They found that 59% of their sample of MVA victims with a history of major depression developed PTSD in an injury-causing MVA. They also found that 75% of the MVA victims who were in the midst of a major depression at the time of the accident developed PTSD. Similar results were found by Breslau et al. (1991).

There are also numerous characteristics of the accident that have been proposed by previous researchers, and these factors are discussed in the next section.

1.6.2 Characteristics of the accident

Intensity of the MVA has been found to be associated with the development of PTSD. High intensity refers to the eliciting of extreme fear and the perception of absolute helplessness. Low intensity would be an accident where neither of these factors were present. In a review by March (1993) of 19 articles looking at the effect of stressor intensity, 16 endorsed an intensity-response relationship with

PTSD across a variety of settings. In other words, he proposes that increasing intensity of exposure is proportional to PTSD risk.

Initial horrific and intrusive memories of the MVA are also factors that have been found to effect the onset of PTSD. Mayou et al. (1993) support such an association, which has widespread confirmation from other researchers. For example, those who were more seriously distressed initially showed a slower recovery than those who were less distressed initially in a study by Blanchard, Hickling, Vollmer, Loos, Buckley and Jaccard (1995). Feinstein and Dolan (1991) suggest that the way an individual initially assimilates and deals with a traumatic event ultimately has the greatest influence in determining outcome, and it has been claimed that perhaps this is the strongest first assessment predictor for the development of PTSD (Mayou, 1992). Brom et al. (1993) suggest that severe emotional reactions in the early phases of coping are an indication that psychological disorders will eventually develop. Also, the victim's fear of dying in the accident has been found to play a key role in the development of PTSD (Blanchard Hickling, Vollmer, Loos, Forneris & Jaccard, 1996; Bryant and Harvey, 1996; March, 1993).

The extent of injury sustained in the accident is another major factor identified in a profusion of research. Blanchard, Hickling, Vollmer, Loos, Forneris and Jaccard (1996) stated that one was more prone to developing PTSD if the accident was likely to have caused death or bodily harm. This concept was also supported by Blanchard, Hickling, Mitnick, Taylor, Loos and Buckley (1995), and Friedman and Schnurr (1995). McNally and Saigh (1993) also state that one of the major contributing factors of PTSD is the extent of injury to the victim. However, there have been many conflicting views on this topic, as many researchers have failed to support such a relationship between injury severity and risk of PTSD (e.g., Bryant & Harvey, 1996; Taylor & Koch, 1995; Green, 1994; Green, McFarlane, Hunter & Griggs, 1993; Feinstein & Dolan, 1991).

As the last two sections have alluded to, various researchers have identified many factors that could be associated with PTSD. Age, sex, prior psychological disorders, and prior traumas are some of the broader demographic and individual factors. An abundance of characteristics of the event which influence the likelihood of PTSD have been proposed, the most widely supported ones being stressor intensity, extent of injury sustained, and the initial wellbeing of the individual.

The findings of this past research play an important part in the present study, as it is these factors which become the basis for the assumptions of the relationship between motor vehicle accidents and PTSD.

1.7 Summary

To summarise previous findings, this section is a synopsis of what has been previously stated in the introduction, and makes some suppositions about those findings and the relationships that exist between PTSD, motor vehicle accidents and health care utilisation.

An individual does not exist in isolation, but is continually being subjected to many influencing factors. These include such things as experiences of other previous traumas, adverse life events, their mental and physical health and well-being, and their demographic details including such factors as gender and ethnicity. If this individual experiences a traumatic motor vehicle accident, it brings about a new and usually frightening and disturbing experience for all involved (Bryant & Harvey, 1996), and how these people deal with this experience depends on a

complex interaction of many factors. For example, how much control a person had over the situation, who was at fault, or the initial level of distress it caused, are all factors which may affect how a person deals with the situation and are important details in a person's attempt to somehow make sense and order of what has happened. Needless to say that how an individual deals with this event is highly idiosyncratic, with no two people dealing with a traumatic event in an identical manner.

The reactions of the individual is also a function of time since the accident. This implies that a person copes through a series of dynamic stages. Initially, there will be overwhelming anxiety and possibly grief, especially if they, or someone else was hurt or killed. This initial anxiety is often compounded if they believe that their own life was in danger.

These short-term reactions are quite likely to develop into phobias: fear of situations and stimuli similar to the accident, and trepidation about further driving. This is to be expected, however they are generally short-lived. For the majority of individuals, these debilitating symptoms and reactions to the accident begin to dispel over time. An individual's coping strategies take over, and the accident victim deals with the situation the best they can and carries on with life. Memories about the accident just make up one of the many learning experiences that the individual will have faced in their lifetime.

However, there is a sub-group of people whose coping strategies are not sufficient after a traumatic event to allow them to function properly for any of a number of reasons. If such debilitating after-effects continue for many months, maybe even years, the person is likely to be suffering Posttraumatic Stress Disorder. This group of individuals have characteristics in common that allow researchers to predict a likelihood of a given individual developing PTSD after a motor vehicle accident.

Should the debilitating effects of PTSD continue indefinitely, the drain on health care resources would be immense. Any long-term mental or physical problems sustained as a result of a serious MVA means more access is required to health care professionals, thus placing increased demands on the health care system. Perhaps the best way to prevent this from occurring is to identify any problems with the early phases of the coping process in an individual so that measures can be taken toward providing prompt assistance early in the piece, before any symptoms become manifest in such a way that treatment is complicated and difficult. As Brom et al. (1993) state, prompt psychological assistance after serious traumatic events will help to detect problems in the primary phases of coping so that serious disorders can be prevented. Severe emotional reactions in the early phases of coping are an indication that disorders will eventually develop (Brom et al., 1993). A small and timely investment of health care resources implemented early in an individual's coping process could save large spending of these precious resources if an individual becomes severely debilitated by PTSD.

1.8 The Thesis

Coping with traumatic events is an inherent human process. People respond to and deal with traumatic situations in an individual way, often rationalising or denying aspects of the event to maintain their psychological integrity. The initial shock, disbelief and bewilderment of an event is sometimes met with coping mechanisms such as intrusion, avoidance or denial. Victims often temporarily suffer from negative symptoms which disrupt their lives in varying ways. Most people will struggle with some psychological and/or physical ailments, but in general they will handle these problems and recover without professional help (Brom & Kleber, 1989). The occurrence and severity of these symptoms diminish

over time, and the event becomes integrated into the life and personal history of the individual. Some victims however, struggle with severe post-traumatic stress symptoms as a consequence of the event they endured, suffering from such debilitating symptoms as those outlined in section 1.4.

So what are the factors which lead certain individuals and not others to develop PTSD? The literature is mixed in terms of definitive causal factors, and researchers have not been very successful in separating and quantifying these factors and their effects on PTSD. As McGuire (1990) points out, the way that PTSD presents itself is both complex and ambiguous, making accurate diagnosis difficult.

However, despite many complicating factors that have been outlined in this introduction, the attempt to identify those factors which lead to PTSD is not a hopeless cause. Posttraumatic Stress Disorder is not randomly distributed in the population, as some individuals are at a higher risk of suffering from post-traumatic stress symptoms than others (Breslau et al., 1991). The topic of identifying those at risk and in need of specific help is a very important task. As Burnstein (1989) points out, because so many individuals are involved in motor vehicle accidents, the number of potential cases of PTSD is very large.

The present study attempts to identify some key factors, both of the accident and the individual, which lead to PTSD in individuals who have experienced a MVA. The study also considers the impact on health care utilisation of PTSD victims following such accidents. The distress following motor vehicle accidents clearly diminishes the quality of peoples lives, judging from the symptoms they report. In this context, research which throws light on the dynamics of PTSD following an MVA would appear both useful and warranted.

The following section looks at the research objectives of the present thesis. These were born from deficiencies identified in past research and points that needed to be clarified because of contradictory research findings. In short, the objectives in the present thesis look at the following areas, identified as areas in need of clarification stemming from deficiencies in previous research. There is general lack of population based studies, with samples often being those admitted to medical care with physical injuries. There is also a lack of New Zealand studies. There is a lack of information surrounding the relationship between MVAs and health care utilisation, and the potential drain on resources that can be drawn from this single factor. In general, there are many ambiguous and contradictory findings, often depending on the varying circumstances, samples used, method of collection, and measures used.

1.9 The Research Goals

In a previous section, a summary of the findings of other research, looking at both personality and psychological factors which possibly predisposes an individual to develop PTSD, was outlined. These findings formed the basis from which the current research objectives were derived. As research is sometimes contradictory, some issues have required further scrutiny, hence forming the research objectives. A brief outline follows each objective, attempting to explain the rationale behind each objective.

Objective 1.

To confirm the relationship between experience of trauma and PTSD in New Zealand motor vehicle accident victims.

In line with the findings of many overseas researchers (e.g., March, 1993; Feinstein & Dolan, 1991; Blanchard, Hickling, Vollmer, Loos, Forneris & Jaccard, 1996), it is suggested that PTSD symptoms will be more prevalent among those who had experienced motor vehicle accidents which involved serious threat to the victims integrity or where serious danger, damage, injury or distress occurred. A New Zealand sample had never come under scrutiny, especially a large-scale population-based investigation. These studies were also largely clinically based, with those who had recently been admitted to a medical establishment included in the sample. Population-based studies are the best method to ascertain the impact of motor vehicle accidents.

Objective 2.

To assess whether PTSD symptoms will be more prevalent among those individuals who have had previous exposure to traumatic events.

The second objective involves traumatic events which the individual may have encountered previously in their lives, which may include exposure to any of a multitude of traumas, both motor vehicle accidents and other traumatic events, as well as the impact of life events such as adverse health, relationships or finances. This objective stems from the findings of many researchers (e.g., Blanchard Hickling, Vollmer, Loos, Forneris & Jaccard, 1996; Blanchard, Hickling, Taylor & Loos, 1995; Breslau et al., 1991; McFarlane, 1989), who reported that having had other traumatic events occur before the accident would predispose victims to an increased severity of subsequent PTSD symptoms. For example, someone who had recently had a spouse die, had lost their job, and had been the subject of a mugging only two months previously, would be more likely to have their everyday functioning affected more than someone who had not had to face a multitude of problems before the event. However, this is not a clear-cut result, with many

unclear and ambiguous findings. Other researchers have failed to even find support for such a relationship.

Objective 3.

To determine the relationship between perception of the degree of danger, damage, injury or distress as a result of the event, and mental health status.

Based on the findings of Brom et al. (1993), it is expected that a person's mental health status will be inversely correlated with the perceived impact of the event, such that if a person deems that the event had a extreme effect on their life, or it posed serious danger, damage, injury or distress, then this will contribute to poorer mental health. Although this relationship has widespread support, there are still contentious findings. For example, Green et al. (1993) found that injuries in MVA victims with PTSD were no more severe than those of MVA victims without PTSD, reflecting the findings of many studies who have failed to find a relationship between injury severity and risk of PTSD (Taylor & Koch, 1995).

Objective 4.

To ascertain if those with more PTSD symptoms access more health care services.

This objective looks at the effect on the longer-term health of accident victims, in particular the amount of health care utilisation. The work of Friedman and Schnurr (1995) is fundamental to this objective, as they state that PTSD is a major mediator of the relationship between trauma and health. The findings of Long et al. (1992) suggest that those with more PTSD symptoms will access more health care services such as visits to General Practitioners, and the requirement of prescription items. Further it is expected that these same people will also have

spent more days at home confined to bed because of their ill-health. Very few studies looking at MVAs have investigated the important aspect of health care utilisation of victims.