

BURN INJURIES VERSUS ROAD ACCIDENTS: PSYCHOLOGICAL OUTCOMES, SUBJECTIVE VITALITY, HEALTH LOCUS OF CONTROL, AND PSYCHOLOGICAL DISTRESS

Nazish Sajid ^a, Syeda Nadia Shah ^{b*}, & Hayat Muhammad ^c

^a Department of Psychology, Islamia College, Peshawar, Pakistan. Email: nazishsajid25@gmail.com

^b PhD, Department of Psychology, Islamia College, Peshawar, Pakistan. Email: nadiashah@icp.edu.pk

^c PhD, Department of Psychology, University of Peshawar, Pakistan. Email: hayat-bangash@uop.edu.pk

*Correspondence to: Ms. Syeda Nadia Shah, PhD, Department of Psychology, Islamia College, Peshawar, Pakistan. Email: nadiashah@icp.edu.pk

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ABSTRACT

This study examines the effects of subjective vitality and health locus of control on psychological distress among patients with road accidents and burn injuries. We recruited a total sample of 300 individuals, both male and female, aged 18–40 years, from Peshawar and Mansehra. We used three scales to collect data: the Subjective Vitality Scale (SVS), the Multidimensional Health Locus of Control Scale (MHLoCS), and the Kessler Psychological Distress Scale (K10). Data were analysed by using SPSS version 26. The findings revealed a significant negative association between Subjective Vitality and Health Locus of Control and psychological distress. Additionally, results suggest that burn patients display lower subjective vitality, diminished internal health locus of control, and elevated psychological distress than road accident patients.

I. INTRODUCTION

A traumatizing experience refers to an event that overwhelms someone's psychological stability and leads to shock, denial, bodily, mental, and behavioral transformations. It is usually caused by accidents, violence, or natural disasters and can have serious, long-term effects on an individual's physical health and mental well-being (Tull, 2023). Trauma is an event that you perceive as harmful or life-threatening and continues affecting your mental, emotional, social, or spiritual wellness. Studies show enough evidence that damage to the body causes trauma and is a reason for mental health issues like feeling despair and anxiety (Keane et al., 2006; Kilpatrick et al., 2013; Atwoli et al., 2015). Globally, physical injuries are considered a major cause of mortality, including in Pakistan, causing 1 in 10 deaths due to physical injuries. The most common physical injuries in Pakistan are road accidents, falls, social violence, and burn injuries (Siddiqui et al., 2015). It seriously matters that the rate of death by road accidents in Pakistan is the world's worst. The country experiences the largest number of individuals dying from road traffic accidents, leading to physical trauma that tops the causes of disability, the primary factor contributing to the loss of healthy years, and the main cause of premature death (Mahmud et al., 2009). Abbasi (2021) highlighted that physical trauma is the second most common cause of disability in the country and the fifth most significant contributor to the loss of healthy years of life, and the eleventh leading cause of early death.

Studies show that road accidents are the most common cause of physical injury; in Pakistan, Khyber Pakhtunkhwa accounts for up to 37% of yearly road accidents, ranking second in number (Abbasi, 2021). Another study by Tanoli and team (2021), conducted in Khyber Pakhtunkhwa, Peshawar, found that road accidents (46%) are the most prevalent cause of physical injury. Physical injuries from road accidents are commonly categorized as a traumatic experience, which results in extensive psychological distress. Physical injuries not only cause physical disabilities and a reduction in self-reported health but can also have severe and long-term mental health implications (Craig et al., 2016). Common psychological issues reported after road accidents include depression, heightened anxiety, and symptoms of post-traumatic stress (Kenardy et al., 2018). Indeed, research shows that mental health issues following traffic-related injuries can be as high as 30% to 50% (Kenardy, 2018). On the other hand, burn injuries rank as the fourth most prevalent type of physical trauma globally, following road traffic accidents, falls, and interpersonal violence. Burn wounds remain a serious global health burden with an estimated 180,000 annual deaths, as reported by the World Health Organization (WHO, 2018). A recent extensive study reported by the Global Burden of Disease, an analysis between 1990 and 2019, showed that 117 million burns were experienced by Asian countries alone. South Asia and Southeast Asia accounted for almost 40% of the worldwide burden of burn injuries, highlighting the uneven burden in these areas. In fact, people in lower-income areas are reported to be afflicted by burns at a rate seven times that of more highly developed countries (Zachary et al., 2022).

In Pakistan, burn injuries continue to pose a serious public health challenge, with an alarmingly high rate of 1,388 cases per 100,000 individuals, as reported by Ali (2016). This figure far exceeds the global average, highlighting the severity of the problem. Moreover, information from the Global Burden of Disease Study (2010) indicates that 5.8 out of every 100,000 people in Pakistan lose their lives to thermal injuries. However, the actual burden of burn injuries is difficult to quantify, as existing data primarily focuses on patients who seek treatment at specialized burn centers (Adil et al., 2016). Beyond the physical trauma, burn victims in Pakistan face a host of challenges that often go unnoticed. The psychological impact of burn injuries can be just as devastating, with survivors who often face challenges such as depression, anxiety, post-traumatic stress disorder (PTSD), and body image issues (Ali, 2019). Systematic reviews have shown that around 30% of individuals who survive burn injuries develop Acute Stress Disorder, and as many as 45% experience symptoms of PTSD. Additionally, more than half of burn victims—around 54%—experience at least mild depressive symptoms; this can greatly affect their ability to function in daily life and diminish their overall quality of life (Gibran et al., 2013).

Recognizing the mental health impact of burn injuries, developed countries like the United States have integrated psychological screening into the care of burn patients, ensuring that early signs of acute stress disorder and depression are identified and treated (Giannoni et al., 2016). In contrast, Pakistan still lacks a structured approach to addressing the psychological distress of burn survivors. Studies conducted within the country highlight the urgency of this issue. Research from Wah Medical College found that 58% of burn patients exhibited symptoms of psychological distress following their injuries (Athiyah, 2009). Similarly, a study at DOW University in Karachi revealed that depression is a prevalent condition among burn survivors, affecting 31.9% of patients (Ali, 2019). Physical trauma patients often face untreated anxiety and depression, yet research comparing psychiatric outcomes across injury types (e.g., road accidents, burns, other injuries) is scarce. Wiseman et al. (2012) found that most such patients show these issues, which go undetected during hospitalization, highlighting the need for better investigation and tailored interventions.

Subjective Vitality

Subjective vitality refers to feeling energetic and alive, without fatigue, burnout, or low energy. The concept is mainly based on self-determination theory. It is a key part of a meaningful and purposive life, meaning living a fulfilling life alongside sanity and a positive state (Ryan & Deci, 2001). People with more energy and vitality typically feel active and aware, use better coping strategies for stressful events, and report better mental health (Ugur et al., 2024). It is an important marker of the body and mind and is used as the main measure of health-related quality of life (Deng, 2015). Lavrusheva (2019) notes that subjective vitality isn't just a transient feeling of euphoria or enthusiasm, but a persistent, durable sense of well-being that encompasses psychological and physiological energy levels.

Health Locus of Control

Health locus of control is a construct that explains the extent to which people feel they control their health. Rotter identified two forms of control: feeling in control of life events and taking full responsibility for them, which is an internal health locus of control. In contrast, feeling that outside factors determine what happens in life is known as an external health locus of control (Devin & Ghahramanlou, 2012). Individuals with an internal health locus of control firmly believe that they have personal control over their health outcomes. They understand that their lifestyle choices, habits, and personal efforts- such as maintaining a balanced diet, exercising regularly, and seeking medical attention when needed- play an important part in their overall health (Wallston, 2014). Conversely, some people possess an external health locus of control, meaning they feel that external factors like luck, fate, or the influence of authoritative figures like doctors dictate their health.

Psychological Distress

Psychological distress is characterized by negative emotions that arise in reaction to a traumatic or intensely stressful event, where the person feels sad and anxious. Psychological distress is defined by the American Psychological Association (2023) as a broad range of symptoms similar to anxiety and depression symptoms until impairment occurs, with personality traits that go beyond confusion, as well as disturbances in behavior. Experiencing psychological distress after an injury is incredibly common, regardless of the severity or type of injury. The physical pain, lengthy hospital stays, and trauma of the event can take a serious toll on mental health. However, one of the most significant challenges many individuals encounter isn't just the immediate physical pain- it's the emotional weight of adjusting to life afterward (Altius Group, 2023).

Rationale of the Study

Investigating the connection between subjective vitality and health locus of control (HLOC) in relation to psychological distress provides valuable insights into health psychology. This research is especially important for understanding how these psychological factors influence recovery and overall well-being in individuals facing physical trauma. As psychological distress is a significant concern among individuals who have sustained physical trauma due to road accidents and burn injuries, such traumatic experiences often result in various emotional and psychological difficulties, including increased levels of stress, anxiety, and depression. However, there is limited literature that compares the psychological outcomes between road accident patients and burn injury patients. Therefore, results achieved from this study will assist in health psychology by establishing related interventions targeted at enhancing subjective vitality and fostering adaptive health beliefs amongst physical trauma survivors, with particular attention to the specific needs of different trauma types.

Theoretical Background

Deci and Ryan developed Self-Determination Theory back in 1985. According to this theory, three fundamental needs play a crucial role in human motivation and overall wellness. The first is Autonomy, or the capacity to make autonomous decisions and maintain a sense of control over one's behavior. The second key need is Competence, closely linked to self-efficacy- the belief in one's ability to accomplish goals. Subjective vitality, a concept rooted in Self-Determination Theory, reflects an individual's sense of energy and enthusiasm for life, and it is often linked to a strong sense of competence (Ryan & Frederick, 1997). The third essential need, Relatedness, highlights the importance of meaningful social connections. By emphasizing autonomy, relatedness, and competence, Self-Determination Theory shows how these factors profoundly shape an individual's well-being.

Hypothesis

H1: There will be a significant difference in Subjective Vitality, Health Locus of Control, and Psychological Distress between patients with burn injuries and those with road-accident injuries.

II. METHOD

Participants

This research was conducted in Mansehra and Peshawar, cities of Khyber Pakhtunkhwa (KPK). Participants of the study were patients with physical trauma who have experienced road accidents and burn injuries. The total sample size for this study was 200 (N=200), with an age range between 18 and 40 years. To calculate the sample size for

this study, the sample size computational tool, Raosoft, was used. The final sample for this study was 200 participants recruited from hospitals. The study sample was grouped into two categories. Group one (n1=100) included participants who had experienced road accidents, and Group two (n2=100) included participants who had experienced burn injuries. The study used purposive sampling to select participants based on specific criteria. Data were collected through a quantitative survey of the study participants. Those individuals who have suffered from physical trauma in the form of road accidents and burn injuries in the past year were included in the present study. We also included individuals aged 18 to 40 years who were residents of Mansehra and Peshawar (KPK). We excluded individuals who refused to participate. Similarly, individuals below 18 years or above 40 years, and those who did not belong to Mansehra or Peshawar, were not included. Furthermore, individuals with a history of cardiac issues, other chronic diseases, psychological illness or disorder, and substance dependency were also excluded from this research.

Measures

The demographic sheet was used to collect the personal data of the participants, such as gender/identity, residence, literacy, duration of trauma, and type of physical trauma. **[I]** Subjective Vitality Scale (SVS): This scale was constructed by Ryan & Frederick (1997). The developers reported a reliability by Cronbach's alpha = 0.94, with item consistency of Cronbach's alpha = 0.96. The scale has two versions, individual differences level and state level version; for this study, the individual differences level version is used, which is specifically negative to anxiety and depression. The scale consists of seven items on a 7-point Likert scale, ranging from (1) not at all true to (7) very true. **[II]** Multidimensional Health Locus of Control Scale (MHLCS): In 1978, Wallston, Wallston and DeVellis introduced the Multidimensional Health Locus of Control Scale. This scale consists of 3 forms: A and B for general health, and C for a specific condition. In this study, we used form A. It is based on a 6-point Likert scale, with scores ranging from (1) strongly disagree to (6) strongly agree. **[III]** Kessler Psychological Distress Scale (K10): Kessler and Marcza (1992) developed the scale for psychological distress that measures non-specific distress to identify the level of anxiety and depression for future mental health evaluation. The Kessler scale consists of 10 items. The developers reported a reliability by 0.84 and a validity of 0.96 (Cronbach's alpha). It is a 5-point Likert scale, which ranges from (1) all of the time to (5) none of the time.

Procedure

To comprehensively understand differences between road accident and burn injury patients on subjective vitality, health locus of control, and psychological distress in Khyber Pakhtunkhwa, Pakistan, a structured procedure was followed. The study was conducted in Peshawar and Mansehra, and participants (N=200) were recruited from hospitals through purposive sampling. The researchers obtained formal permissions from the respective centers. After ethical approval and consent, participants completed a demographic sheet, followed by the Subjective Vitality Scale (Ryan & Frederick, 1997), Multidimensional Health Locus of Control Scale (Wallston et al., 1978), and Kessler Psychological Distress Scale (Kessler, 1992). We checked all forms for completeness and analysed the data using IBM SPSS version 26. Before initiating data collection for this study, we obtained ethical approval from the respective institutions. Before administering the questionnaires, we obtained informed consent, and we briefed participants on the study's objective and procedure. Participants were assured that the information obtained would remain confidential and would be used solely for research purposes.

III. RESULTS

Table I: Demographic Characteristics of the Participants

Demographics	Categories	N	%
Gender	Male	150	50%
	Female	150	50%
Age	18-25	97	32.3%
	25-40	203	67.7%
Residence	Peshawar	180	60%
	Mansehra	120	40%
Education	SSC/HSC	82	27.3%
	Bachelors	141	47.0%
	Masters	77	25.7%
Physical Trauma	Road Accidents	100	33.3%
	Burn Injuries	100	33.3%
	General Population	100	33.3%

Note. N= no of participants, %= percentage

Table II: Mean, standard deviation, and t-value showing differences between Burn Injuries and road accidents in subjective vitality, Health Locus of Control, and Psychological Distress

Variables	Burn Injury (n=150)		Road Accident (n=150)		t(198)	P	Cohen's d
	M	SD	M	SD			
Subjective Vitality	23.44	6.059	26.94	5.530	4.26	.001	0.60
Health Locus of Control	59.70	6.178	61.81	6.319	2.38	.014	0.34
Psychological Distress	54.41	8.513	50.63	12.71	2.47	.018	0.35

Note. M = mean; SD = standard deviation; t = t-test statistic; p = significance level; Cohen's d = effect size.

Independent-samples t-tests compared burn injury patients (n = 100) and road accident patients (n = 100) on subjective vitality, health locus of control, and psychological distress. Results indicate that Burn injury patients reported significantly lower subjective vitality (M = 23.44, SD = 6.06) than road accident patients (M = 26.94, SD = 5.53), with a medium effect size (Cohen's d = 0.60). This signals that burn injury patients experience a low level of energy and motivation compared to patients with road accidents. Burn injury patients reported a statistically lower score (M = 59.70, SD = 6.18) than road accident patients (M = 61.81, SD = 6.32) on health locus of control, with a small-to-medium effect size (Cohen's d = 0.34). This shows that burn injury patients feel less control over their health outcomes compared to road accident patients. Finally, burn injury patients reported significantly higher psychological distress (M = 54.41, SD = 8.51) than road accident patients (M = 50.63, SD = 12.71), with effects in a small-to-moderate range (Cohen's d = 0.35). This emergent insight shows that burn injuries are linked with greater psychological distress as compared to road accidents. Thus, the current study hypotheses also prove significant differences between patients with burn injuries and those with road accidents, where burn injury patients reported decreased vitality, with a lower Health locus of control and higher psychological distress.

IV. DISCUSSION

The primary objective of this study was to compare patients who have experienced physical trauma as a result of road accidents with patients with burn injuries on the basis of subjective vitality, health locus of control, and psychological distress. The study included both male and female participants from the cities of Peshawar and Mansehra, Khyber Pakhtunkhwa, Pakistan. To investigate the objective of the study, three scales were used: Subjective Vitality Scale (SVS) constructed by Ryan & Frederick (1997), Multidimensional Health Locus of Control scale (MHLoCS) by Wallston & DeVellis (1978), and Kessler Psychological Distress Scale (K10) by Kessler and Marczak (1992). Table 1 presents participant demographics, and Table 2 shows the scales' psychometric properties,

including acceptable reliability coefficients. The hypothesis of the study stated that there would be a significant difference in terms of subjective vitality, health locus of control, and psychological distress among patients with burn injuries and those who experienced injuries due to road accidents. As shown in Table 2, independent samples t-tests comparing burn injury patients and road accident patients revealed significant differences on all key variables. Findings revealed that patients with burn injury reported significantly lower subjective vitality, with a mean of 23.44 (SD = 6.06) compared to road accident patients with a mean of 26.94 (SD = 5.53), $t(198) = 4.26$, $p = .001$, with a moderate effect (Cohen's $d = 0.60$). This leads to the suggestion that burn injury patients experience reduced energy and motivation as compared to road accident patients.

For health locus of control, burn injury patients were also seen to score significantly lower, with a mean of 59.70 (SD = 6.18), than road accident patients at a mean of 61.81 (SD = 6.32), $t(198) = 2.38$, $p = .014$, with a small-to-moderate effect (Cohen's $d = 0.34$). This indicates that burn injury patients feel less control over their health outcomes compared to road accident patients, which may impact their coping strategies. Finally, burn injury patients reported significantly higher psychological distress, with a mean of 54.41 (SD = 8.51), than road accident patients, with a mean of 50.63 (SD = 12.71), $t(198) = 2.47$, $p = .018$, with a small-to-medium effect (Cohen's $d = 0.35$). This suggests that burn injuries are associated with greater psychological distress compared to road accidents. The study shows significant differences between road accident patients and burns injury patients on subjective vitality, health locus of control, and psychological distress, which clearly indicates that patients affected by burn injury experience lower vitality, lower health locus of control, and greater psychological distress, having less energy to perform daily tasks and bounce back from difficult situations, in contrast to road accident patients. This can be due to multiple reasons such as changes in physical appearance, discomfort, itching, and a lengthy recovery period, along with multiple surgeries and hospital visits that can cause fear and anxiety. Burn survivors may experience loss of identity and self-concept as they may find it difficult to reconcile with changes and being mindful of their pre-burn self, leading to higher psychological distress and lower subjective vitality and health locus of control. Road accident patients, while also experiencing distress, may have fewer long-term psychological impacts, depending on the severity and nature of their injuries.

These findings are supported by past studies. Research from Wah Medical College found that 58% of burn patients exhibited symptoms of psychological distress following their injuries (Athiyah, 2009). Similarly, a study at DOW University in Karachi revealed that depression is a prevalent condition among burn survivors, affecting 31.9% of patients (Ali, 2019). Systematic reviews have shown that around 30% of individuals who survive burn injuries develop Acute Stress Disorder, and as many as 45% experience symptoms of PTSD. Additionally, more than half of burn victims- around 54%- experience at least mild depressive symptoms, which can greatly affect their ability to function in daily life and diminish their overall quality of life (Gibran et al., 2013). Giannoni-Pastor and colleagues (2016) also emphasized the prevalence and predictors of posttraumatic stress symptomatology among burn survivors.

V. CONCLUSION

This study elucidates the differences between road accident patients and burns injury patients in subjective vitality, health locus of control, and psychological distress among patients with physical trauma. The study reveals significant differences between the two groups, indicating that patients with burn injury have lower vitality and health locus of control when compared to road accident patients. This may be due to several factors, such as injury severity, a prolonged healing process, and changes in appearance. Results in this study also revealed that individuals with burn injuries experience more psychological distress and emotional vulnerabilities as compared to patients with road accidents. Overall, findings of the study give important insight into the differential impact of trauma type on subjective vitality, health locus of control, and psychological distress, emphasizing the need to enhance subjective vitality and internal locus of control to promote robustness and coping techniques among burn injury survivors specifically.

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