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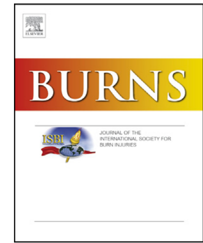

# Predictors of post-traumatic stress disorder among burn patients in Pakistan: The role of reconstructive surgery in post-burn psychosocial adjustment

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ABSTRACT

*Background:* Burns are a common cause of morbidity and mortality worldwide. Post-traumatic stress disorder (PTSD) is among the most prevalent psychopathologies documented among burn patients. However, little is known regarding the risk factors for post-burn PTSD outside the well-documented Western world context. The present study aims to elucidate the biopsychosocial correlates of PTSD among burn patients in Pakistan.
*Methods:* A total 343 burn patients were evaluated across four teaching hospitals in the Punjab province of Pakistan between August and December of 2016. "Patients aged 18 years or older, with no major comorbid illnesses, presenting for burn care at burn units or surgical departments of the listed hospitals were interviewed by trained healthcare providers using a validated questionnaire." Uni- and multivariate statistical analyses were used to evaluate associations between patient characteristics and PTSD symptomatology, as measured by the validated Urdu version of the Impact of Event Scale-Revised (IES-R).
*Results:* The prevalence of PTSD among our cohort was 69%. Lower educational attainment, ethnic minority status, unemployment, large burn surface area, prior suicidal ideation, and domestic violence were all associated with increased PTSD symptomatology. On the other hand, social support, ego resiliency, and reconstructive surgery were all associated with decreased PTSD symptomatology.
*Conclusion:* There is a remarkably high prevalence of PTSD among burn patients in Pakistan. Improving accessibility to reconstructive surgery and social support may help to alleviate this burden.

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## 1. Introduction

Burns are among the most frequent causes of morbidity and mortality worldwide [1]. While the vast majority of worldwide burn injuries is unintentional and due to routine household and workplace accidents, burn by assault is becoming increasingly common in certain parts of the world. According to the Human Rights Commission of Pakistan, as many as 49% of reported burns among Pakistani women are intentional, often in the context of domestic disputes [2]. Burns in Pakistan, therefore, constitute a major sociocultural problem indicating careful attention from researchers and policy makers alike.

The complex burden of burn injuries in Pakistan brings with it a broad spectrum of psychosocial consequences. Multiple independent studies have demonstrated clinically significant levels of anxiety, depression, and post-traumatic stress disorder (PTSD) among burn patients worldwide [3,4]. PTSD is among the most well-established post-burn psychopathologies among these. Recent estimates place the lifetime prevalence of post-burn PTSD at as high as 45%, as compared to the 3.9% reported among the worldwide general population [4–6]. The literature has further demonstrated a wide range of risk factors for the development of post-burn PTSD. Prominent among them are female sex, large burn surface area, ineffective coping behaviors, low psychological resiliency, and inadequate social support [7–10].

Despite strong methodology and instructive results, the existing literature on PTSD among burn patients has been conducted almost exclusively in the limited context of high income countries (HIC) in the Western world. Studies of post-burn PTSD in the socially, culturally, and economically unique context of low and middle income countries (LMICs), however, have been few and far between. A review of the literature, for example, reveals only a single study of post-burn PTSD in Pakistan — the world's sixth most populated country and a major contributor to the global burden of burn injuries [11]. What's more, this sole study was constrained by a number of methodological limitations, such as its exclusion of patients who were not admitted to the hospital as a part of their burn care. The study also failed to demonstrate statistical significance in its assessment of risk factors for the development of post-burn PTSD.

This demonstrated gap in the burns literature is especially troubling given the vastly disproportionate burden of burn injuries accounted for by LMICs. A recent WHO report attributes upwards of 90% of worldwide burn-related injuries, disabilities, and fatalities to LMICs [1]. This LMIC-predominance is further complicated by the generally inadequate mental health facilities that exist there, setting the stage for a potentially staggering burden of post-burn psychopathologies. This study seeks to shine a light on this neglected area of burn research so as to catalyze equitable efforts in global burn care. Specifically, we aim to investigate PTSD and its biopsychosocial determinants among burn patients in Pakistan.

## 2. Methods

A cross-sectional study at four publicly-funded teaching hospitals in Pakistan's Punjab province was conducted between August and December of 2016. All respondents consented to participate in the study in accordance with ethical approval by the CMH Lahore Medical College institutional review board.

Power analysis was performed on the basis of previous literature reporting low to moderate associations between post-burn PTSD and a range of demographic and psychosocial variables. We estimated a minimum sample of 172 participants to achieve a desired power of 95% given moderate effect size $\theta = 0.15$, significance level $\alpha = 0.05$, and $k = 10$ estimated predictors. Ultimately, a total of 343 burn patients presenting within our designated study period were conveniently sampled for evaluation by six medical students under the guidance of a clinical psychologist. There were no exclusion criteria for participant selection.

Patients aged 18 years or older, with no major comorbid illnesses, presenting for burn care at burn units or surgical departments of the listed hospitals were interviewed by trained healthcare providers using a validated questionnaire. The multi-part questionnaire consisted of sections related to demographics, clinical features, and PTSD symptomatology as measured by the validated Urdu translation of the Impact of Events Revised scale (IES-R).

The IES-R is a widely used self-report scale used to quantify a patient's experience of PTSD symptoms throughout the week prior to evaluation [12,13]. The Urdu language version of the IES-R has demonstrated excellent internal consistency and construct validity among the Pakistani populace in previous studies [14]. It also yielded a Cronbach's alpha of 0.94 in the present study population, demonstrating its excellent reliability. The IES-R consists of 22 items including three symptom clusters: intrusion, avoidance, and hyperarousal. Each item is rated on a scale of '0' (not at all) to '4' (extremely). Total scores range from 0 to 88, with higher scores corresponding to increased PTSD symptomatology. In accordance with the literature, we apply a cutoff of 33 for making the diagnosis of PTSD in our cohort [13,15].

Patient evaluation also included measures of ego resiliency and perceived social support as potential predictors of post-burn PTSD. Ego resiliency is the dynamic capacity to systematically optimize the personality system according to environmental context [16]. Ego resiliency was measured via the validated Urdu translation of the Ego Resiliency Scale (ER-89), which consists of 14 self-report items rated on a 4-point Likert scale [17]. The Urdu language version of the ER-89 has demonstrated excellent psychometric properties in previous studies among Pakistani patients [17]. It also demonstrated excellent internal consistency in the present study population, yielding a Cronbach's alpha value of 0.84. Total scores on the ER-89 range from 14 to 56, with higher scores corresponding to higher levels of ego resilience. Perceived social support was measured via the validated Urdu translation of the Multidimensional Scale of Perceived Social Support (MSPSS), which consists of 12 self-report items rated on a 7-point Likert scale. The Urdu language version of MSPSS validated by Akhtar et al.,

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