

Post-traumatic stress disorder and cognitive functioning of female burn survivors by cause, severity and health complaints

Iram Naz, Zaqia Bano, Ishtiaq Ahmed

Department of Psychology, University of Gujrat and Al Nafees Medical College Isra
University, Islamabad, Pakistan

Objective: To investigate the relationship between burn cause, severity and health complaints with post-traumatic stress and cognitive functioning of female burn survivors.

Methodology: In this cross sectional observational study, data were collected at Department of Psychology, University of Gujrat from November 15 to July 25 2018. Among the post burn female survivor's, causes of burn injury, burn severity and health complications were assessed. Post-Traumatic Stress Disorder Checklist and Montreal Cognitive Assessment scale was used to measure the constructs of Post-Traumatic Stress and cognitive functioning of domains of attention, abstraction, naming and memory.

Results: Among 200 post burn victims, the model fit summary confirmed ($p=0.003$) the structural

relationship of causes of burn injury with post-traumatic stress and post-traumatic stress relationship with the cognitive functioning and burn severity association with the cognitive function of attention and memory. The causative agent ($p=0.750$) and health complaints ($p=0.605$) had non-significant relation with post-traumatic stress while post-traumatic stress had non-significant relationship with attention ($p=0.190$) and memory ($p=0.112$).

Conclusion: Burn cause, burn severity and health complaints were the leading factors of post-traumatic stress disorder in female burn survivors. Further, the post-traumatic stress induced cognitive impairment was present in them. (Rawal Med J 202;45:561-564).

Keywords: Burn injury, post-traumatic stress, structure equation modeling.

INTRODUCTION

The burn trauma brings numerous factors like causative agent, severity and health complaints which can affect the cognitive functioning of the victims. Among them, the cause of burn injury is very important which can lead to disastrous consequences.¹ The burn severity i.e. superficial or deep or degree of burn from 1st to 4th is another important factor considered to affect the health outcome of the burn victim.² Further, even after successful treatment of burn injuries, most of the survivors develops a number of chronic complications ranging from physical problems like contractures, disfigured body, chronic infections, restricted mobility, defective temperature control, dermatological issues, psychological concern like emotional and higher mental functions upset.³

Post-Traumatic Stress Disorder (PTSD) is considered as the most evident problem in burn trauma.⁴ It is a disorders which directly develops symptoms after the exposure to one or more than

one stressors.⁵ These symptoms could be categories as re-experiencing traumatic event, escaping trauma, problems in cognitions and mood and hyperactive stimulation,⁶ and PTSD can directly hinder the cognitive functioning of burn victims.⁷ The cognitive abilities which may be affected have been listed as language, attention ability, perception, memory, executive functioning and psychomotor speed.⁸

The prevalence of PTSD in European countries, most Latin American, African and Asian countries are in the range of 0.5 to 1.0 %.⁵ The risk of developing PTSD in female is higher (20.4%) as compared to male (8.2%).^{9,10} Many studies have confirmed the role of PTSD in developing the problems in cognitive abilities of a person.^{11,12} In addition, the burn severity is also considered to be linked with the problems of cognition in the burn victims. The previous researches also confirmed that about half of the population with flame burns developed PTSD symptoms after the burn injuries.¹²

On the other hand, there is relationship of severity of burns i.e. higher total body area and PTSD.¹³ Due to more involvement in household activities, females are at high risk of burn trauma. In Pakistan, statistically, the female to male ratio was 105:07.¹⁴ After physical recovery from the burns, the psychological and emotional rehabilitation will be lowering the burn injury burden encountered by women in terms of its related consequences so it is very important to identify the problems of burn injured females in Pakistan.¹⁵ There is very limited literature available in Pakistan that discussed the issues of female burn injuries. Therefore, the objective of this study was to assess the psychological problems to investigate the relationship between burn cause, severity and health complaints with post-traumatic stress and cognitive functioning of female burn survivors.

METHODOLOGY

This cross-sectional observational study was conducted at Department of Psychology, University of Gujrat from Nov 15, 2017 to July 25, 2018. The data were collected from female burn survivors, aged more than 18 years, with unintentional burn injury and duration of burn was at least 6 months to 2 years old. The burn survivors who had any other psychological disorders, physical problems or physical diseases before the burn injury were excluded from the study. Further, age below 18 years, male and intentional burn injury females were also excluded. A total of 200 women burn survivors were selected for the study from different Burn Centers of NGO's and community of Gujrat, Lahore, Rawalpindi and Islamabad by using purposive sampling.

The causative agent of burn, burn severity (first degree, second degree and third degree) and different health complaints after the burns were carefully asked in details along with other demographic details. The abbreviated Post-Traumatic Stress Disorder (PTSD) Checklist Civilian Urdu¹⁶ and Montreal Cognitive Assessment Urdu version¹⁷ were used for data collection. The data was gathered with face to face interviews. The respondents were tempted to listen the items carefully and choose the responses that fits their true

expression. The identity of the participants was kept anonymous with ensured privacy.

Statistical Analysis: The study data were analyzed by using SPSS version 20. The Structure Equation Modeling was run to see the interaction effect of causative agent of burn, burn severity and health complications on the PTSD and role of PTSD and burn severity in affecting cognitive functioning. $p < 0.05$ was considered significant.

RESULTS

The study has 200 patients with age range of 19 to 65 (mean 30.95). Majority of the burns were caused by a scald or hot fluid (41.5%, $n=82$), majority sustained 3rd degree burn (52.5%, $n=105$) and more than half of the women have reported 2 health complaints (57%, $n=114$) after the burn injury. Table 1 shows the model fit summary with the p -value .003 which significantly established the structural relationship of burn injury factor with PTS and PTS association with the cognitive domains. The burn severity effects on the cognitive domains of attention and delayed recall was also proven. The values of model fit indices were in the appropriate limit to confirm the model.

Table 1. Model Fit Summary of Structure Equation Modelling (N=200).

P Value	Chi-Square/df	GFI	CFI	RMSEA	PGFI
0.003	2.236	.955	.929	.079	.425

Table 2. Regression estimates of factors of burn injury (N=200).

Factors	Estimate	P-Value
PTSD<---Burn Severity	4.656	.000
PTSD<---Causative Agent	-.049	.750
PTSD<---Health Complaints	.153	.605
Attention<---PTSD	-.043	.190
Abstraction<---PTSD	-.042	.000
Naming<---PTSD	-.048	.000
Memory<---PTSD	-.042	.112

The causative agent of burn, burn severity and health complaints after burn injury regression estimate was -.05 ($p=0.750$), 4.66 ($p=0.000$) and .15 ($p=0.605$), respectively. It established the fact that

causative agent and health complaints did not predict PTS whereas burn severity significant predicts PTS with 4.66 rate of increase. PTS association with the cognitive domains of attention, abstraction, naming and memory regression estimate was $-.04$ ($p=0.190$), $-.04$ ($p=0.000$), $-.05$ ($p=0.000$) and $-.04$ ($p=0.112$), respectively which means that PTSD was the non-significant predictor of attention and memory. PTSD significantly predicted abstraction and naming cognitive abilities (Table 2).

DISCUSSION

The main objective of the study was to assess the relationship between burn cause, severity and health complaints with post-traumatic stress and cognitive functioning of female burn survivors. The model fit summary showed a p value of 0.003 that specifies that burn injury factors determined Post-traumatic stress and Post-traumatic stress affects the cognitive functioning of women burn survivors. Furthermore, the model fit indices of chi-square/df¹⁸ (2.236), GFI (.955),¹⁹ CFI (.929),²⁰ and RMSEA (.079)²¹ was up to the accepted limit. It is concluded that structural relationship exists between the variables and objective is confirmed. The regression estimates of causative agent ($-.05$, $p=0.750$) concluded that causative agent of burn had a non-significant relationship in developing Post-traumatic stress. Whereas literature was different from the results as it found that PTSD was related to gas cylinder explosions in the burn victims.¹⁸

Burn severity estimates (4.66, $p=0.000$) concluded that burn severity significantly predicts Post-traumatic stress. The result was consistent with the previous research that established the fact that burn surface area affected also predict Post-traumatic stress in the burn persons.⁹ The regression estimate of health complaints (.15, $p=0.605$) here, indicated an in-significant relation with PTSD whereas literature identified that physical problems were present in burn survivors.³

The role of post-traumatic stress in affecting the cognitive domains of attention, abstraction, naming and memory was also checked. The regression estimate of attention and memory was $-.04$ with $p=0.190$ and $-.04$ with $p=0.112$, respectively. It

specifies that PTSD was not the significant predictor of attention and memory. Apart from this research, previous literature confirmed that the burn patient may have the problem of concentration after the trauma¹⁹ and post-traumatic stress has the ability to limit the attention capacity of any trauma population.²⁰

The memory research also confirmed that post-traumatic stress brought problem in the declarative memory.²¹ Researches have established that the burn patient may have the problem of memory after the trauma.²² The literature confirmed that naming is part of language cognitive ability.⁵ It was witnessed that the experience of trauma can trigger language impairment²³ whereas abstraction is a higher order cognitive ability in which a person take-out similarities from particular cases about the formation of general ideas or concepts.²⁴ In the process of using abstraction ability, person must have the information processing ability for identifying similarities, however PTSD might has the ability to develop an obstacle to the information processing of the victim.

CONCLUSION

Causative agent of burn, burn severity and health complaints were the leading factors of post-traumatic stress disorder in female burn survivors. Moreover, the post-traumatic stress induced cognitive impairment in effected female.

Author Contributions:

Conception and design: Iram Naz, Zakia Bano
Collection and assembly of data: Iram Naz, Zakia bano
Analysis and interpretation of the data: Iram Naz, Zakia Bano
Drafting of the article: Ishtiaq Ahmad
Critical revision of the article for important intellectual content: Ishtiaq Ahmad
Statistical expertise: Iram Naz, Zakia Bano
Final approval and guarantor of the article: Zakia Bano
Corresponding author email: Zakia Bano: zaqia.bano@uog.edu.pk
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