

**QUALITY OF LIFE AFTER BURN INJURY; A DEVELOPING COUNTRY PERSPECTIVE**Muhammad Rehman Wali<sup>1</sup>, Gulsanga<sup>1</sup>, Sundas<sup>1</sup>, Seema Gul<sup>1</sup>, Shahid Alam Awan<sup>1</sup>**ABSTRACT**

**Introduction:** Millions of people experience severe form of burn that is often life threatening and requires extensive medical care and rehabilitation. The debilitating effect of burn is not confined to physical health only; rather it has a profound impact on a person's functional, social and psychological health. This study was designed to assess the quality of life among individuals with burn injuries from different areas of Khyber Pakhtunkhwa, Pakistan.

**Material & Methods:** This was a cross sectional study conducted on burn survivors. The data was collected from patients who were visiting outpatient department of 'Burn and Plastic Surgery Center Hayatabad Peshawar'. This center is the first and the only center specialized in dealing burn casualties. After applying inclusion criteria (both gender, age  $\geq 18$ , %TBSA  $\leq 40\%$ , type of burn, duration and out-patient only) and exclusion criteria (not participating, %TBSA  $>40\%$ , in-patient, not fulfilling inclusion criteria), a total 109 patients were recruited in the study using non-probability convenience sampling technique. Informed consent was taken from all the participants. Burn-Specific-Health-Scale (BSHS) was used to assess the impact of burn on quality of life (QOL). SPSS version 22 was used for data analysis.

**Results:** The mean age of the participants was  $26.58 \pm 11.37$  years. The male to female ratio was 70:39. Independent t-test was used to identify the difference among different domains of BSHS. The study revealed that 67 to 69% of patients were extremely affected in work domain. On a scale of severity from 0= extremely affected to 4= not affected at all; Males were affected more in simple abilities like dressing / bathing as compared to females ( $p=0.03$ ). Lack of sexual desire was reported in married people ( $p= 0.01$ ). Percentage of total burn surface area (TBSA), duration and type of burn had significant effect on QOL.

**Conclusion:** This study concluded that burn has severely limited individuals working capacity encompassing both house chores and occupation. It has also adversely affected individual's sensitivity to environmental temperature, self-care, sexuality and body image.

**Key Words:** Burn, Burn Specific Health Scale, Quality of Life

**Authors' Declaration:** The authors declared no conflict of interest and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors contributed substantially to the planning of research, question designing, data collection, data analysis and write-up of the article.

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**INTRODUCTION**

Burn is one of the most occurring traumatic injuries in the world, ranked at 4<sup>th</sup> number by WHO Global Burden of Disease Database.<sup>1</sup> In 2004, the incidence of burn was reported to be 11 million people worldwide. The incidence is even higher in underdeveloped countries that make 90% of the total global burden of burn.<sup>2</sup> Severe burn injuries result in more than 0.3 million deaths each year while 40% mortalities after burn have been reported in South-Asia.<sup>2,3</sup> Advances in health care regarding management of burns in the last few decades have markedly improved the survival rate even after major burn injury.<sup>4</sup> Interventions like fluid resuscitation, control of infection, wound debridement, lavage and proper dressing have been proved to be effective in decreasing mortality after burn.<sup>5</sup> In spite of that burn is still a major health problem in middle and lower income countries owing to the fact that the treatment of burn is costly, for instance, total cost of scald related burn deaths and injuries is more than 2 billion dollars per annum.<sup>6</sup> This high cost is extremely challenging for third world countries owing to increase

level of poverty, other basic health issues, over-population and lack of provision of basic needs like food and shelters.<sup>7,8</sup>

Once survived, burn can have significant effect on a person's physical and psychological health. Changes in their appearance, scars formation,<sup>9</sup> disabilities<sup>10</sup> and body image has been recognized as important variables that have the most negative effect on a person's life.<sup>11</sup> Some patients reported of persistent pain during cleansing and debridement of burn wound. Anxiety, depression, low self-esteem, emotional problems and post-traumatic stress disorder were also associated with burn injury.<sup>12</sup> The number of burn survivors has been increased due to advancement in health care but patients are dependent on lifetime extensive reconstruction and rehabilitation therapies even after their discharge, hence affecting their quality of life.<sup>13,14</sup>

Quality of life can be defined as a measure of a person's health as well as to determine the impact of injury or illness on an individual's life.<sup>15</sup> It comprises of a complex relationship between various factors like

physical, psychosocial and functional abilities.<sup>16</sup> QOL is considered as one of the key determinants for measuring the effectiveness of medical treatment given to burn patients.<sup>2</sup> The purpose of medical treatment is to reduce functional as well as cosmetic disabilities. It also aims at reducing the need for plastic surgery.<sup>12</sup> Burn injury, if not managed properly, can lead to deformities, formation of contractures, scar and functional limitations that can be depicted in the form of poor QOL.<sup>14,17</sup>

As far local scenario is concerned, rural areas of Pakistan like mountainous community of Northern area has shown high incidence of burn casualties. It has been estimated to be around 1388 per 100,000 persons per year. Individuals affected in these cases of burns consisted a very large number of young children(46%).<sup>18</sup> On other hand in urban areas of Pakistan like Karachi the prevalence of burn was reported to be 23 burn injuries per 1000 persons per year.<sup>19</sup> While in one of the tertiary care hospitals of Peshawar Pakistan, the prevalence was reported to be much higher (10.9%).<sup>20</sup> Like in rural areas, urban areas of Pakistan also show high prevalence of burn in young children. Burn has been declared as the 2nd most common cause of death among children of age below 5 years affected with burns in home settings.<sup>17</sup> In spite of these high statistical evidences, very little work has been done in local region to assess the consequences of burn among survivors. Ibran et al reported that 77% of patients with burn admitted at hospital were at risk of developing post-traumatic stress disorder.<sup>21</sup>

Burn not only affects one's physical health but it has a profound impact on one's self esteem, social acceptance, functional capacity, and ability to work. Therefore, this study aimed at determining the post-burn consequences and its effect on quality of life of burn survivors.

#### **MATERIAL AND METHODS**

This study was a cross-sectional study conducted on burn survivors. The study was approved by the review committee of Institute of Physical Medicine and Rehabilitation Khyber Medical University. Permission was taken from the Ethical Committee of the Burn and Plastic Surgery center Peshawar. The data was collected from patients who were visiting outpatient department of Burn and Plastic Surgery Center of Hayatabad, Peshawar Pakistan. All patients were screened for eligibility criteria.

*Inclusion criteria:* Both male and female patients with age 18 and above were included in the study. The inclusion criteria consisted of having total burn surface area (TBSA) equal to or less than 40%. Patients having burn due to flame, electricity, chemical, radiation or suicide burns were included in the study. Both superficial and deep burns were included in the study. The chronicity of burn injury varied among the participant. Patients with at least 1 month old burn injury were included in the study.

*Exclusion criteria:* Patients were excluded from the study if they refused to participate. Patients having TBSA more than 40% were also excluded from the study.

After fulfilling the criteria, consent was taken from the patients and the details of the study and data processing

was explained to the patients. A total of 109 patients were recruited in the study through nonprobability convenience sampling. "BSHS-B" (Burn Specific Health Scale-Brief) questionnaire was used to assess quality of life in burn patients. It is a disease specific questionnaire with an excellent internal consistency (Cronbach's alpha ranging between 0.75-0.93). It consists of nine domains. The list of domains are as follows 1) Affect 2) Heat sensitivity 3) Hand function 4) Treatment regimen 5) Work 6) Sexuality 7) Interpersonal relationship 8) Simple Abilities 9) Body Image. Each domain consisted of several questions each scored/graded according to severity: Extreme=0, Quite a bit=1, Moderate=2, A little bit=3 and none=4. The entire questionnaire was explained to all the participants and was filled by investigator.

#### **RESULTS**

Data was analyzed using IBMSPSS statistics (version 22). Mean score  $\pm$  S.D of each domain was calculated using descriptive statistics. For statistical differences between different variables and each domain, independent t-test and ANOVA was used. The outcomes were considered to be significant if p value was less than 0.05( $p < 0.05$ ).

The baseline characteristics of our sample are as follows the mean age  $\pm$  S.D of participants was 26.58  $\pm$  11.37 years with range between 18- 63 years. Out of total 109 participants, 70 (64.2%) were males with the mean age of 27.5 years  $\pm$  13.03 S.D while 39 (35.8%) were females with the mean age of 24.87 years  $\pm$  7.395 S.D. According to the type of burns, majority were flame burns with the frequency of 48 (44.0%), scald=24 (22.0%), electric=21 (19.3%), thermal=12 (11.0%), friction=2 (1.8%) and chemical burns = 2 (1.8%) respectively. Participants were categorized into two subcategories on the basis of duration of burn. The first category included participants from 1-6 months and the second category included participants from 7 months and above. Out of total 109 participants, 88(80.8%) were in the first category and 21(19.3%) were in the second category. On the basis of marital status, 43 (39.4%) were married and 66 (60.6%) were unmarried. The baseline characteristics were obtained using descriptive statistics as explained (table 1).

The mean score of each domain was calculated through descriptive statistics (MEANS  $\pm$  SD). In this study the most affected aspect related to quality of life was work domain. About 67-69% participants in the study reported (on a scale of 0=extremely affected to 4=not affected at all) that their ability to work in their old job performing the old duties were extremely (mean score  $\pm$  S.D of 0.97  $\pm$  1.48) affected by burn injury. Questions related to heat sensitivity (59-60%=extremely affected) and about simple abilities like bathing, dressing and grooming were also affected (55-58%=extremely affected).

Around 23 – 50% participants complained of severe feeling of sadness, emotional breakdown and lack of interest in social interactions. 8 to 9 % of participants reported loss of interest in sex or display of affection via hugging and kissing (table 2).

As part of Pushtoon culture where a man dominates the society, we were interested to find the differences in responses of male and female to BSHS questionnaire.

Independent t-test was used in order to find the differences. The only domain that showed significant difference between male and female groups was simple abilities like independency in bathing, self-care and getting in and out from chair/bed or floor ( $p=0.03$ ). The mean response of male and female groups to this was  $1.53\pm 1.62$  and  $2.25\pm 1.70$ , respectively. This represented that male group was affected more than female in terms of simple abilities. From this information, we concluded that simple abilities were one of the domains which affected QOL especially in males (table 3).

Comparison of QOL of burn patient on the basis of marital status showed no significant difference in all domains except the domain of sexuality which showed significant difference among married and unmarried groups ( $p=0.01$ ). For the below statistics, ANOVA was used to calculate the P values of %TBSA, type of burn and duration of burn in order to know the mean response. For %TBSA, the P values of domains i.e. hand function, treatment regimen, work, sexuality and simple abilities were found to be less than 0.05 which showed that there were significant differences, on the basis of which we can say that these domains affected the QOL in terms of %TBSA (table 3).

### DISCUSSION

The findings of this study revealed that after burn injury the extremely affected domain related to quality of life was work (67-69%) followed by heat sensitivity, body image and simple abilities whereas the least affected domains were interpersonal relationship, sexuality, hand function and affect. The young age of our sample and the greater number of male participants in the sample can be considered as factors behind low work score. Owing to the fact that in Khyber Pakhtunkhwa culture, the bread earners of families are young people and males.

Spronk et al, stated some of the findings in a systematic review that are in accordance with our findings. They concluded that majority of affected domains recover over time after burn injury except physical and emotional role, pain (sensitivity) and anxiety may persist for life long. This directs to the need of mental and physical rehabilitation after burn.<sup>22</sup>

Contrary to that, Elsherbiny et al, conducted a study on burn patients in Mansoura, Egypt. The reported that the most affected domain after burn was heat sensitivity domain that is exposure to sun and hot weathers was difficult among burn patients. This study was carried out to assess the quality of life among post burn survivors and how the QOL was affected in terms of various domains. The Burn Specific Health Scale BSHS questionnaire was used as a tool for this purpose.<sup>23</sup>

Stavrou et al, conducted a study which showed that all domains had significant differences with the gender except simple abilities<sup>14</sup>. But our study found out statistical differences was present among responses of males and females to the questions related to simple abilities. Our study showed that males were specifically affected than female in self-care daily activities. According to an Indian study, female reported significant low scores regarding body image and skin sensitivity.<sup>24</sup> While in our study, no statistical difference was found between the responses of male and female about body image and heat sensitivity. That is both

genders reported an average low score 1.33 (meaning considerably affected by burn injury) in body image and skin sensitivity domain.

In this study, we observed the most common type of burn reporting to OPD of 'Burn and Plastic Surgery Center Hayatabad Peshawar' was flame burn (44%) followed by scald=22% and electric=19%. These findings are in accordance with the findings of Noveli who concluded that flame burn is the most occurring type of burn.<sup>12</sup> Studies conducted by Tahir et.al and Rajeev et.al also concluded that flame is one of the most common type of burn.<sup>24, 25</sup> On other side, Shahid et.al and Ahmad et.al found that burns with boiling water or fluid is one the most common type of burn in children.<sup>2, 17</sup>

A study conducted on burn patients in Italy reported that males were predominantly affected by flame burn<sup>12</sup> but in contrast our results showed females to be more affected by flame burn. The reason behind this contradictory finding could be the involvement of females more in household activities like cooking as compared to males. Another reason might be the clothing style of females in Pakistan making them more vulnerable to catch fire easily.

### CONCLUSION

This study concluded that burn has debilitating effects on individuals working capacity encompassing both house chores and occupation. Burns also adversely affect individual's sensitivity to environmental temperature, self-care, sexuality and body image.

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Table-1: Baseline characteristics of patients

AGE IN YEARS	Mean=26.58 years ± 11.37 Min= 18 years, Max= 63 years
GENDER	Male=70 (64.2%) Female=39 (35.8%)
TYPE OF BURN	Flame=48 (44.0%) Scald=24 (22.0%) Electric=21 (19.3%) Thermal=12 (11.0%) Friction=2 (1.8%) Chemical=2 (1.8%)
DURATION OF BURN	Min= 1day, Max= 13 years 1-6 months= 88 (80.8%) 7 months and above= 21 (19.3%)
MARITAL STATUS	Married=43 (39.4%) Unmarried=66 (60.6%)

Table 2; RESPONSES OF PARTICIPANTS TO BSHS-B

DOMAINS	MEANS ± SD	RESPONSES
Affect	2.18 ± 1.20 Moderate	Extreme= 26-55 (23.9-50.5%) None= 28-69 (25.7-63.3%)
Heat Sensitivity	1.25 ± 1.59 Quite a bit	Extreme= 65-66 (59.6-60.6%) None= 19-28 (17-25.7%)
Hand function	2.36 ± 1.48 Moderate	Extreme= 33-50 (30.3-45.9%) None= 48-68 (44-62.4%)
Treatment Regimen	1.69 ± 1.43 Quite a bit	Extreme= 28-47 (34.9-43.1%) None=21-32 (19.3-29.4%)
WORK	0.97 ± 1.48 Extreme	Extreme= 71-76 (67-69%) None= 13-18 (11-16%)
Sexuality	3.30 ± 1.25 A little bit	Extreme= 9-10 (8.3-9.2%) None= 79-83 (72.5-76.1%)
Interpersonal Relationship	3.70 ± 0.77 A little bit	Extreme= 3-5 (2.8-4.6%) None= 96-97 (88.1-89%)

Simple Abilities	1.79 ± 1.67 Quite a bit	Extreme= 60-64 (55-58%) None= 36-43 (33-39%)
Body Image	1.35 ± 1.23 Quite a bit	Extreme= 64-67 (59-62%) None= 10-12 (9-11%)

Table 3: Differences in the response of participants on the basis of gender & marital status

BSHS Domains	GENDER			MARITAL STATUS		
	Male	Female	P value	Married	Unmarried	P value
Affect	2.27±1.12	2.02±1.32	0.29	2.31±1.25	2.10±1.16	0.37
Heat sensitivity	1.36±1.64	1.05±1.49	0.32	1.01±1.46	1.40±1.66	0.20
Hand function	2.17±1.49	2.69±1.40	0.07	2.27±1.45	2.41±1.50	0.63
Treatment regimen	1.59±1.40	1.88±1.47	0.31	1.98±1.38	1.50±1.44	0.09
Work	0.79±1.41	1.28±1.58	0.09	1.04±1.47	0.92±1.50	0.67
<i>Sexuality</i>	3.23±1.32	3.41±1.13	0.47	<u>2.79±1.44</u>	<u>3.63±1.00</u>	<u>0.01</u>
Interpersonal relationship	3.75±0.72	3.63±0.87	0.46	3.76±0.61	3.67±0.87	0.52
<i>Simple abilities</i>	<u>1.53±1.62</u>	<u>2.25±1.70</u>	<u>0.03</u>	2.03±1.62	1.64±1.70	0.23
Body image	1.33±1.19	1.38±1.31	0.83	1.46±1.26	1.27±1.22	0.43

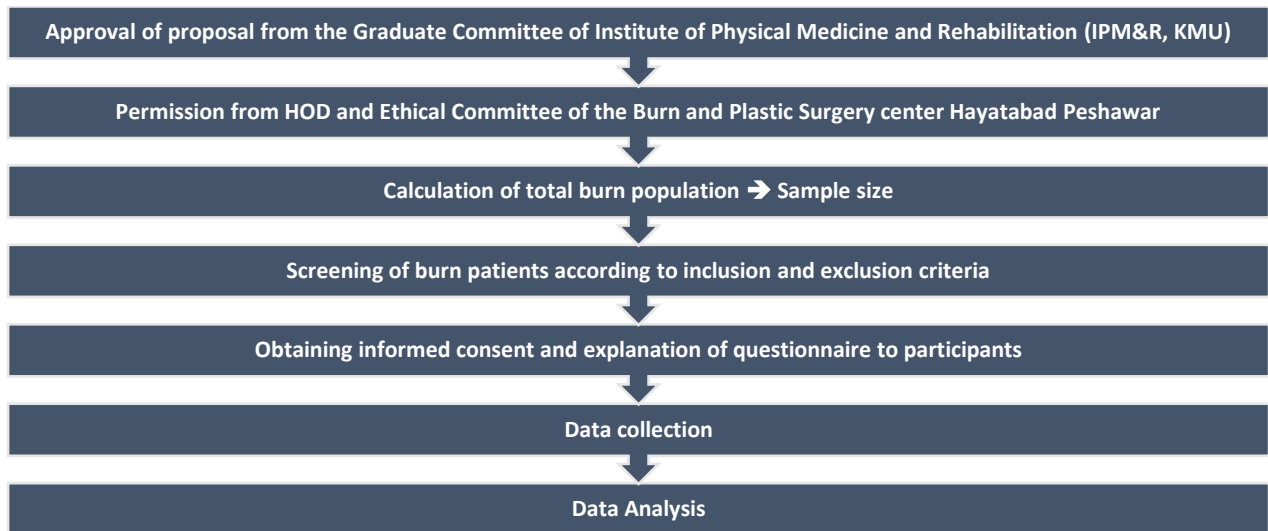


Figure 1: Schematic presentation of research methodology