Quality of life of burn patients after burn

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Abstract

Burn injuries are among the most traumatic types of injuries, often resulting in long-term physical, psychological, and social consequences. Understanding the Quality Of Life (QoL) of burn patients is essential for delivering comprehensive care and effective rehabilitation. This study aimed to assess The Health-Related Quality Of Life (HRQoL) of burn patients and to examine the relationship between QoL domains and patients' demographic, psychological, and clinical characteristics. A descriptive cross-sectional study was conducted among 150 burn patients attending several hospitals in Palestine. Data were collected using the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF), which measures four domains: physical health, psychological health, social relationships, and environment. Structured interviews were used for data collection, and statistical analysis was performed using SPSS software. The sample consisted of 65% males and 35% females, with 66% aged between 30 and 49 years. The most affected areas were the lower limbs (88%) and upper limbs (80%), with varying burn depths and Total Body Surface Area (TBSA) percentages. Patients reported low levels of satisfaction in areas such as happiness, healthcare services, and dietary adherence. Moderate impairments were observed across all QoL domains: physical (mean = 3.20), role (3.05), cognitive (3.18), social (3.35), and emotional (3.45). A statistically significant correlation was found between TBSA and the physical (p=0.033) and cognitive (p=0.035) domains. However, age showed no significant correlation with any QoL domain. Burn injuries significantly affect multiple aspects of patients' quality of life, particularly the physical and emotional domains. The extent of burn injury (TBSA) plays a crucial role in determining the level of impairment. These findings emphasize the need for multidisciplinary rehabilitation programs focusing on physical recovery, psychological support, and social reintegration.

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Introduction

Burn injuries are a major cause of trauma worldwide, with profound and lasting effects on survivors' physical, emotional, and social well-being.[1] Understanding the Quality Of Life (QoL) of burn patients after injury is essential, as it offers insight into their comprehensive needs and guides effective rehabilitation strategies to enhance recovery and reintegration into society.[2] Burn scars are often irregular in shape, and survivors must adapt to changes in their physical appearance and self-image. In addition, the traumatic nature of burn events and the associated painful treatments can trigger various psychopathological responses.[3]

Although the QoL of burn survivors is initially lower than that of the general population, it often improves over time.[4] However, severe burns may lead to a range of long-term complications, including scarring, contractures, muscle weakness, itching, pain, sleep disturbances, body image dissatisfaction, and psychological challenges.[5] The psychological burden is significant, with many burn survivors experiencing distress even in the absence of diagnosable psychiatric disorders.[6]

The International Council of Nurses has identified health as a core theme in nursing research – encompassing health promotion, chronic condition management, enhancing QoL, and caring for individuals undergoing significant health-related changes.[7]

In Palestine,[8] conducted the first study to describe the epidemiology and outcomes of burn patients at a major burn center in the South West Bank (2016-2017). Their findings highlighted the urgent need for more effective prevention efforts, especially targeting children under 14, females, and incidents occurring during winter or involving scalds. They also recommended tailored pre-

vention and treatment strategies, with attention to risk factors such as full-thickness burns, larger Total Body Surface Area (TBSA) involvement, older age, and the number of required surgeries.

The role of socioeconomic status in health outcomes is well documented; individuals from lower socioeconomic backgrounds tend to experience worse health outcomes and reduced QoL.[9] Therefore, medical care should aim not only to treat illness and alleviate symptoms but also to support and enhance patients' overall quality of life. Burn rehabilitation begins on the first day of treatment and continues throughout the care process, including during intensive care. Active surgical management of wounds and scars, combined with physiotherapy and occupational therapy, is critical and often extends beyond hospital discharge. These interventions are essential for facilitating the patient's return to normal life. Concurrently, addressing psychosocial issues is vital to identify and manage comorbidities such as Post-Traumatic Stress Disorder (PTSD), mood disorders, substance use disorders, and other psychological conditions that may hinder recovery.[10]

The QoL of burn survivors is influenced by numerous factors, including their psychological and physical response to injury, the timing and quality of treatment, support from family and friends, nutritional status, and the effectiveness of physical, occupational, and psychological therapies.[11]

The concept of "quality of life" encompasses a broad range of dimensions, including physical and mental well-being, autonomy, social relationships, personal values, and interaction with the environment. It evaluates the effects of illness and disability on daily function, behavior, perceived health, and overall life satisfaction.[11]

Materials and Methods

Study design and setting

This study employed a descriptive cross-sectional design and was conducted at a tertiary care hospital in Palestine. Patients were recruited from the Burns Ward during their hospitalization and were subsequently assessed at a three-month follow-up in the Burns Outpatient Department. The aim was to evaluate the quality of life (QoL) of burn injury patients at two distinct time points: during initial hospitalization and three months post-discharge.

Sample and participants

The study included 100 patients with varying degrees of burn injuries. Inclusion criteria required participants to be in stable physical and mental health and free from chronic conditions such as hypertension, diabetes, cancer, asthma, or epilepsy. Patients with severe cognitive impairment or those unable to provide informed consent were excluded. Only individuals who met the inclusion criteria and provided written informed consent were included in the study.

Data collection

Data were collected in two stages.

Initial hospitalization

During hospitalization, trained researchers collected sociodemographic and clinical data using a structured data sheet. Variables collected included age, gender, marital status, educational level, occupation, place of residence, burn site and severity, and the percentage of total body surface area (TBSA) affected. Burn severity was assessed using the "Rule of Nines," a standardized method for estimating the TBSA affected.

Three-month follow-up

At the three-month follow-up, participants attended the Burns Outpatient Department for a face-to-face interview. During this session, the WHOQOL-BREF (Hindi version) Quality of Life Questionnaire was administered. This tool assesses four domains: physical health, psychological well-being, social relationships, and environmental conditions. Higher scores indicate better perceived quality of life. Only patients who attended the follow-up were included in this stage of data collection.

To ensure consistency and reduce interviewer bias, all interviews were conducted by the same trained personnel familiar with the study protocol.

Instruments

WHOQOL-BREF (Hindi Version)

The WHOQOL-BREF, developed by the World Health Organization, is a widely used instrument for assessing quality of life across multiple domains. In this study, it was administered at the three-month follow-up. The tool comprises 26 items measuring four domains: physical health, psychological well-being, social relationships, and environmental conditions. Each domain is scored positively, with higher scores reflecting better quality of life.

Sociodemographic and clinical data sheet

A structured data sheet was used during initial hospitalization to collect information on sociodemographic and clinical variables, including age, gender, marital status, education level, occupation, place of residence, and burn characteristics. Burn severity was measured using the "Rule of Nines," a clinically accepted method for estimating TBSA affected by burns.

Validity and reliability of tools

The WHOQOL-BREF (Hindi version) has demonstrated good internal consistency, with Cronbach's alpha values around 0.87. Its construct and criterion validity have been confirmed in multiple studies across different languages and populations. The Hindi version used in this study has shown reliable psychometric properties and is suitable for diverse cultural and health backgrounds.

The "Rule of Nines" is a standardized and widely accepted tool in clinical practice for estimating burn severity and has been validated through extensive use in burn care assessments.

Ethical considerations

Ethical approval was obtained from the hospital's ethics committee in accordance with established clinical research standards. All participants received comprehensive information regarding the study's purpose, procedures, and potential risks. Written informed consent was obtained prior to participation. Participants were assured that their involvement was voluntary, their data would remain confidential, and they could withdraw from the study at any time without consequences.

Data analysis

Data were analyzed using SPSS version 23. Descriptive statistics (means, standard deviations, frequencies, and percentages) were used to summarize participant characteristics. Inferential statistics, including correlation analysis, were conducted to explore associations between QoL scores and variables such as burn severity, age, and sociodemographic characteristics. A p-value of <0.05 was considered statistically significant.

Results

The findings of this study are presented in three main sections. The first section outlines the general characteristics and health status of the study sample. The second section presents the health-related quality of life (QoL) scores of the participants, and the third section offers the results of the correlational analysis between the QoL findings and the biological, psychological, and socioeconomic characteristics of the participants.

Demographic and socioeconomic characteristics

The study sample consisted of 100 participants, with 35% females and 65% males. This distribution reflects a slight predominance of male patients, though this was due to random selection during questionnaire distribution. The age distribution of the participants was as follows: 24% were aged 20-29 years, 66% were aged 30-49 years, and 10% were aged 50 years or older. Regarding marital status, 75% of participants were married, and 25% were single. Educationally, 75% of participants had completed at least secondary school education, with 50% having achieved a Bachelor's degree or higher. Geographically, 49% of participants lived in rural areas, and 51% lived in urban areas. Regarding occupation, 24% of participants were students, 35% were housewives or unemployed, 20% were employed, and 21% worked in manual labor (Table 1).

Burn injury characteristics

The majority of burn injuries in this sample affected the lower limbs (88%), followed by upper limbs (80%), abdomen (30%), back (30%), chest (25%), and face/neck (20%). Regarding the depth of the burns, 33% of patients had first and second-degree burns, 32% had second and third-degree burns, and 35% had burns of varying degrees. In terms of Total Body Surface Area (TBSA), 49.3% of participants had a TBSA of 5-10%, 24.7% had a TBSA of 16-25%, and 10% had a TBSA higher than 26%. The majority of participants had TBSA less than 35% (Table 2).

The result from these questions indicates a low level of satisfaction in patients' burn (Table 3). Most of them don't feel happy in their lives and are not satisfied with their healthcare providers; also, they don't commit to a diet, but on the other hand, they do commit to treatment in a high percentage and attend follow-ups.

QOL Domains & GQOL

All functional scales were calculated to be on 0-100 scale in which the higher score is calculated as follows.

$$RawScore = RS = (I_1 + I_2 + ... + I_n)/n$$

Functional scales: $$S = \left\{1 - \frac{(RS-1)}{range}\right\} \times 100$$

Symptom scales / items: $$S = \{(RS-1)/range\} \times 100$$

Table 1. Demographic variable for the study.

Demographic variable	n=100	Percent
Age group		
20-29 years	24	24
30-39 years	36	36
40-49 years	30	30
50+ years	10	10
Gender		
Male	35	35
Female	65	65
Marital status		
Single	25	25
Married	75	75
Level of education		
School	25	25
Diploma	25	25
Bachelor's or more	50	50
Area of residence		
Rural	49	49
Urban	51	51
Occupation		
Student	24	24
Housewife/Unemployed	35	35
Employee	20	20
Worker	21	21

Table 2. Information on the burn injury.

Parameter	n=100	Percentage (%)
Site of burn injury		
Face and head, Neck	20	20
Chest	25	25
Back	30	30
Abdomen	30	30
Upper limbs	80	80
Lower limbs	88	88
Depth degree of burn		
First and second degree	33	33
Second and third degree	32	32
Different degree	35	35
Total body surface area		
Less than 5	5	5
05-10	29	29
16-25	30	30
26-35	25	33
36-45 or more	11	11

Table 3. Questions to test level of satisfaction with the patients.

Question	Strongly disagree	Disagree (%)	Agree (%)	Strongly agree (%)
Are you happy in your life	18.4	25.3	35.4	20.9
Are you satisfied about your relationships with people?	9.5	26.6	40.5	23.4
Are you suffering from lack of adaptation to changes in your life	13.3	20.3	27.2	39.2
Are you satisfied with the health care provided to you?	12	26.6	39.9	21.5
Are committed to the treatment prescribed by a physician?	10.1	22.2	31	36.7
Are you committed to diet prescribed to you by a doctor	20.9	31	22.2	25.9
Are you go to follow up	6.3	27.2	38.6	27.8

QOL Domains and Global Quality of Life (GQOL)

All functional scales were transformed to a 0-100 scale, where higher scores indicate better functioning. As illustrated in Figure 1, higher scores represent higher levels of function. Following previous studies, a 33% cut-off point was used to categorize the scale into different levels.

The findings from Table 4 reveal that burn patients experience moderate impairment across various QoL domains, including physical, role, social, cognitive, and emotional functioning. Physical difficulties such as fatigue and reduced mobility were commonly reported. Role functioning was affected by limitations in work and leisure activities. Social challenges included strained family relationships and financial stress, while cognitive issues like poor concentration were also evident. Emotional disturbances such as sadness, anxiety, and feelings of burden were prevalent. These results highlight the multifaceted impact of burn injuries on patients' lives, emphasizing the need for comprehensive rehabilitation and psychosocial support.

In Table 5 the correlation analysis revealed statistically significant associations between Total Body Surface Area (TBSA) and both the physical (p=0.033) and cognitive (p=0.035) domains of quality of life. This suggests that as TBSA increases, impairments in physical functioning and cognitive ability become more pronounced. However, no significant correlations were found between TBSA and the social (p=0.089) or emotional (p=0.360) domains. Additionally, age did not show any significant correlation with any QoL domain. These findings underscore the importance of targeted interventions for patients with larger burn areas, particularly in addressing physical and cognitive rehabilitation needs.

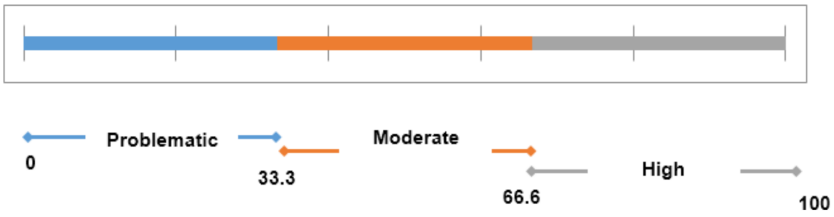

Figure 1. Determination of the optimal cut-off point using Receiver Operating Characteristic (ROC) curve analysis.

Table 4. Physical function domain.

Domain	Question	Never freq (%)	A lot freq (%)	Mean score	Total domain score (%)	Interpretation
Physical	Difficulty with heavy physical work/effort (tired)?	57 (36.1)	101 (63.9)	3.086		
	Trouble walking for a long time?	48 (30.4)	110 (69.6)	3.290	41	Moderate
	Trouble walking for a short period?	97 (61.4)	61 (38.6)	2.322		
	Need to stay in bed/in chair during the day?	95 (60.1)	63 (39.9)	2.365		
Role	Restricted/limited in daily work?	75 (47.5)	83 (52.5)	2.623		
	Suffering from inability to work?	72 (45.6)	86 (54.4)	2.914	43	Moderate
	Limited in hobbies or leisure activities?	62 (39.2)	96 (60.8)	2.322		
	Fewer work hours due to disease?	59 (37.3)	99 (62.7)	3.010		
Social	Illness/treatment affected social life?	84 (53.2)	74 (46.8)	2.376		
	Relationship with family affected?	113 (71.5)	44 (28.5)	1.699		
	Suffer from social/family problems?	118 (74.4)	39 (25.6)	1.656	65	Moderate
	Suffer from financial problems?	85 (53.8)	73 (46.2)	2.451		
Cognitive	Suffer from inability to concentrate?	94 (59.5)	64 (40.5)	2.333		
	Suffer from inability to think?	105 (66.5)	53 (33.5)	2.011		
	Suffer from inability to read/write?	89 (56.3)	68 (43.7)	2.387	59	Moderate
Emotional	Feel bored or repressed?	71 (44.9)	87 (55.1)	2.946		
	Feel sad?	82 (51.9)	76 (48.1)	2.624		
	Feel nervousness?	72 (45.6)	86 (54.4)	2.925		
	Feel anxious/tense?	66 (41.8)	92 (58.2)	2.892		
	Feel like a burden to others?	97 (61.4)	61 (38.6)	2.258	42%	Moderate

Table 5. Correlation Between Total Body Surface Area (TBSA), Age, and Quality of Life (QoL) Domains.

Variable	Physical (p)	Cognitive (p)	Social (p)	Emotional (p)
Total Body Surface Area	0.033	0.035	0.089	0.360
Age	0.910	0.971	0.501	0.149

Discussion

This study assessed the QoL among burn patients and explored associations with demographic, clinical, and psychosocial variables. The findings indicate a moderate impairment across multiple QoL domains – physical, role, cognitive, social, and emotional functioning – highlighting the significant burden that burn injuries place on individuals' lives. The results are consistent with prior literature, emphasizing the multifaceted impact of burn injuries on recovery and long-term wellbeing.

The sample consisted of 100 patients, with a higher proportion of males (65%) than females (35%). This gender disparity reflects regional trends reported in similar settings, where males are more often exposed to occupational hazards resulting in burns.[12] The age group 30-49 years was most prevalent, aligning with the working-age population, which may compound the psychological and socioeconomic consequences of burn injuries due to loss of productivity and financial instability.[13]

Most participants were married (75%) and had attained at least secondary education, with 50% holding a Bachelor's degree. Education level has been positively associated with better health literacy, which may influence treatment compliance and recovery.[10] Nearly equal distribution between rural and urban residency suggests a broad geographic representation, though access to specialized burn care may vary by location, potentially affecting long-term QoL.[14,15]

The burn sites were predominantly the lower (88%) and upper limbs (80%), followed by torso and facial areas. This distribution reflects common domestic and occupational injury patterns. Burns affecting visible and functional parts such as the limbs and face often result in both physical limitations and psychosocial distress due to disfigurement or mobility issues.[30] TBSA analysis showed that the majority of patients had burns covering 5-25% of their body, yet even this moderate extent significantly influenced QoL.

Depth of burn injury also varied, with approximately one-third of patients in each category – first/second-degree, second/third-degree, and mixed. Previous studies confirm that burn depth correlates with pain severity, healing time, and scarring, which in turn affect psychological outcomes and QoL.[16,17] Our findings support these observations, as patients with more extensive and deeper burns demonstrated lower scores in physical and cognitive functioning. From result revealed that a substantial proportion of patients reported dissatisfaction with life, social relationships, and healthcare services. Notably, only 18.4% of participants reported happiness in life, and just over 20% were satisfied with their healthcare. Such dissatisfaction may reflect unmet needs in pain management, psychological support, and post-discharge rehabilitation, which are common challenges in burn care systems in developing countries.[18,19]

Despite low satisfaction, a relatively high percentage (36.7%) reported adherence to physician-prescribed treatments, and 27.8% attended follow-up visits. This dichotomy suggests that while patients may not be content with care quality, they recognize the necessity of medical adherence for recovery. Nevertheless, dietary compliance was poor (only 25.9%), indicating a potential area for targeted education and nutritional counseling. These findings align with previous research showing that patient satisfaction is a critical predictor of both QoL and treatment adherence.[20,21,22]

Across all five QoL domains – physical, role, social, cognitive, and emotional functioning – the study found moderate impairment, with average scores ranging from 41% to 65%.

Physical functioning

Patients reported substantial difficulty with activities requiring physical exertion, such as walking or heavy work. This finding is consistent with the literature, which underscores prolonged physical disability in burn survivors due to contractures, fatigue, and chronic pain.[23,24] Mean scores above 3.0 on several physical items suggest functional limitations persist even months post-injury.

Role functioning

Patients reported significant impairment in daily work and leisure activities. The highest reported difficulty was in maintaining consistent work hours, which directly impacts economic stability. This supports findings [25] who noted that return-to-work rates are significantly delayed in burn survivors, particularly those with visible scarring or persistent pain.

Social functioning

Despite moderate scores, patients expressed notable concerns about strained family relationships and financial hardship. Burn survivors often experience social stigma, isolation, and changes in family dynamics, especially in patriarchal or conservative societies.[24] These challenges highlight the need for psychosocial rehabilitation and community support programs.

Cognitive functioning

Many participants reported difficulties concentrating, thinking clearly, or reading and writing. Such cognitive impairments are not uncommon post-burn and may be linked to pain, emotional distress, sleep disruption, or medication side effects.[2] These findings suggest the need for comprehensive neuropsychological evaluations during follow-up.

Emotional functioning

The emotional burden was evident, with over half of the patients experiencing sadness, nervousness, and anxiety. The psychological toll of burn injuries has been well-documented, with a high prevalence of depression, PTSD, and suicidal ideation among survivors.[26-28] However, lower scores on feelings of burden suggest a degree of resilience or social support among some patients.

Correlation analysis

Correlation analysis showed a significant relationship between TBSA and both physical and cognitive functioning, indicating that more extensive burns lead to greater disability in these areas ($p<0.05$). However, no significant association was found between TBSA and emotional or social domains, which suggests these aspects may be more influenced by personal coping strategies, social support, or psychological resilience than by the physical severity of the burn.

Age did not show any significant correlation with QoL domains, contradicting some earlier studies that suggest older patients often fare worse in emotional and physical recovery.[27] This discrepancy could be due to the age distribution in our sample, which skewed toward younger, working-age adults.

Implications and recommendations

The results underscore the importance of holistic burn care, addressing not only wound healing but also psychological, social, and functional rehabilitation. Mental health support, peer counseling, vocational training, and family therapy should be integrated into post-burn care programs. Furthermore, improving patient-provider communication and satisfaction with services can enhance treatment adherence and overall outcomes. Future

research should employ longitudinal designs to track QoL changes over time and evaluate the effectiveness of multidisciplinary interventions. Expanding sample sizes and including patients from diverse healthcare settings may also improve generalizability.

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