

# Effect of Rehabilitation Program on Quality of Life of Patients With Burn Injury

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**Abstract.** Burns are some of the most challenging injuries to manage because they frequently require long time for hospitalizations, multiple surgeries, and extensive rehabilitation. To determine the effect of the rehabilitation program on patients with burns injury through: 1- Assessing quality of life (QoL) for patients with burns injury (pre/post implement the program). 2- Developing rehabilitation program for patients with burns based on need assessment. 3-Evaluating the effect of the rehabilitation program on patients with burns injuries regarding their quality of life. We used Quasi-experiments design. Setting: It was conducted at the outpatients' clinics of the burn unit at El-Demerdash Surgical Hospital. A purposive sample of 50 patients with second and third degree burn Follow-up in burn unit on outpatient clinic. Tools: 1- Patient's knowledge interview questionnaire. 2- Modified Barthel Index questionnaire. 3- World Health Organization Quality Of Life Brief (WHOQOL-brief). 4-Patients' Observational checklist. Results: There are highly statistically significant relations of patients' with satisfactory level of total knowledge regarding burn injury pre and post implementation of the rehabilitation program. There were a highly statistically relations between total quality of life (QoL) of studied patients and total modified barthel index (MBI) post implementing the rehabilitation program. Regarding the QOL, the study had indicated that there was a statistically significant relation of patients' regarding level of total quality of life (QoL), pre and post implementing the rehabilitation program. There were a highly statistically relations between patients' knowledge and observational practice post implementing the rehabilitation program. Using the rehabilitation program for patients with burn injury had improved their quality of life in all dimensions. And the greatest domains of the QOL improved seen in physical domains. Recommendations: Replication of the current study on a larger probability sample is recommended to achieve generalization of the results.

**Keywords:** Burns; Rehabilitation; quality of life.

## Introduction

Burns are tissues injuries caused due to heat. According to the source of the injury, the burn is described as thermal (i.e., flame, scalding, flash, liquids, and hot objects), chemical, electrical, radiation and inhalation. Burns are a leading cause of accidental death despite the improvement in survival rates. The burn injuries could have been prevented by seventy five percent (Linton, 2015).

The burn severity can determine by the extent and depth of the burn and the cause, time, and circumstances surrounding the burn. To evaluate the severity of the burn, many factors must be considered: the percentage of body surface area burned, the depth of burn, the anatomical site of the burn, the person's age, the person's medical history, the presence of concomitant injury, the presence of inhalation injury (Jeschke, et al., 2020).

Rehabilitation is defined by WHO as a number of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment. 'Health condition'

refers to disease (acute or chronic), disorder, injury or trauma. A health condition may also, include other circumstances such as pregnancy, ageing, stress, congenital anomaly, or genetic predisposition (WHO, 2017).

Rehabilitation includes an active multi-disciplinary program to enhance the physical, mental, and social status of the patient and prepares the patients for return to society again and to routine life (Cacio, and Dewey, 2023). The World Health Organization (WHO) give definition to health as not merely the absence of disease or infirmity, but a state of complete psychical, mental and social wellbeing. The definition of Quality of Life (QoL) is more complex. According to WHO, QoL is defined as individuals' perceptions of their position in life in the context of the culture and value systems which they live in and in relation to their goals, expectations, standards and concerns (Alex, 2014). Skin lesions, pain, stress, low self-esteem, anxiety, depression, and post-traumatic stress disorder (PTSD) are some of the physical, psychological,

social, and financial effects of burns that persist after treatment (Mohaddles, et al., 2017).

### Significance of the Study

Burns are a very serious public health problem in the world. An estimated 265000 deaths occur each year from fires alone, with more deaths from scalds burns, electrical burns, and other forms of burns, for which global data are not available. More than 96% of fatal fire-related burns occur in low-and middle-income countries. Millions more are left with lifelong disabilities and disfigurements. In addition to those who die (WHO, 2019).

The people is burned each year in Egypt reach 100.000 cases, the mortality rate of burn victims in Egypt is as high as thirty seven percent, compared to the average of five percent in other countries in the region. Moreover, the majority who do survive find it difficult to carry on with their daily activities because of their physical disfigurement and physiological trauma (Ministry of health and population, 2019).

### Aim of the Study

The aim of this study was to determine the effect of the rehabilitation program on patients with burns injury through:

- Assessing quality of life (QoL) for patients with burns injury (pre/post the program implementation).
- Developing rehabilitation program for patients with burns based on need assessment.
- Evaluating the effect of the rehabilitation program on patients with burns injuries regarding their quality of life.

Research hypothesis:

The current study hypothesized that:

There will be a positive effect for the rehabilitation program on the quality of life of patients with burn injuries.

### Subjects and Methods

#### I-Technical design

The technical design includes; study design, setting, subjects and tools for data collection.

#### Study design

A quasi-experimental research design (one group pre-post assessment). This type of design aims to establish a cause and effect relationship between independent and

dependent variables (Schweizer, Braun, and Milstone, 2016).

#### Setting

This study was conducted in the outpatients clinic of the burn unit at El-Demerdash Surgical Hospital affiliated to Ain shams University Hospitals. The burn unit was included two outpatients clinics for follow up and dressing of the burn injury in the ground floor. The burn unit consists of fourth floors included; ward, dressing hydrotherapy room, operation room and burn intensive care unit in addition to physiotherapy room. The outpatient clinics receive patients every week on Saturday, Sunday, Monday, Wednesday and Thursday.

#### Subjects

A purposive sample of 50 patients with second and third degree burn Follow-up On outpatient clinic of the burn unit. They will be recruited based on retrospective statistical data at the year 2018, the number of adult patients with burns follow this criteria of selection and follow up on outpatient clinic in the burn unit at EL-Demerdash Hospital affiliated to Ain Shams University Hospitals were 1000 patients a year.

$$N = \frac{2x(z(1-\alpha/2) + z_\beta) \sqrt{2 \times \sigma^2}}{\Delta^2}$$

The sample size calculation done based on power analysis.

Type I error with significant level ( $\alpha$ ) =0.5.

Type II error by power test (1-B) =90%

Inclusion criteria

(a) Adult aged 18-60 years.

(b) The burn injury occurred during the previous 1-12 months.

(c) The depth of burn was deep second degree or third degree.

Exclusion criteria:

Patients with severe complications, such as:

(a) Traumatic brain injury.

(b) Spinal cord injury.

(c) Serious fracture.

(d) Amputation.

(e) Severe infection.

Tools for data collection:

Four tools were used to collect data of this study as follow:-

I- Patient's knowledge interview questionnaire (pre/posttest):

It was developed by researcher in Arabic language after reviewing the recent related literature from (Lukusa, & Allorto, 2021), (Geo, et al., 2021).

It includes three parts:

**First part:** Is concerned with patients' demographic characteristics; it consists of 6 closed ended questions related to gender, age, Residence, marital status, occupation and level of education.

**Second part:** Concerned with assessment of burn characteristics of the studied patients, it consisted of six closed ended questions related to degree of burns, surface area, causes of burn injury, site of burn injury, complications of burn injury and skin graft.

**Third part:** It concerned with patients' knowledge related to burn injury, that include general knowledge about burn injury (10 questions), first aid and treatment (15 questions), burn complications (10 questions), nutrition (10 questions), rehabilitations (15 questions), and quality of life (10 questions).

Scoring system:

Regarding scoring of the third part of the patient's knowledge assessment questionnaire regarding the burn injury.

This part consisted of 70 questions were true and false. The correct answer was given "1" one scores while the wrong answer was given "0" Zero scores".

The total scores for all subgroups of the questionnaire were calculated (70).

$\geq 70\%$  = 50 grade or more was considered satisfactory.

$<70\%$  = 50 grade or less was considered unsatisfactory.

II- Modified Barthel Index questionnaire: It is widely used to test the ADL abilities of people with different types of disability.

Scoring system:

This tool consists of 10 items. The response were on a scale ranged from 0 (dependent), 1 (Need assistance) and 2 (Independent).

This score classify into 3 subscoring categories as follows:

15-20 Independent of need for personal attendant care.

5-14 Moderately dependent of need for personal attendant care.

0-4 totally dependent of need for personal attendant care.

III- World Health Organization Quality of life Brief (WHOQUALITY OF LIFE-brief, 1996) For evaluating the multidimensional concept of QoL that includes the personal perception of health, psychosocial status, and other aspects of life of an individual. Questionnaire it was adapted from WHO (1996).

It include 4 domains; physical (7 items), psychological (6 items), social relationship (3 items), and environment (8 items).

Scoring system:

The total scores for all items of the questionnaire were calculated (72) and categorized into poor, average, and good.

-Weak Quality of life, 0 <50 % or less than grade 36.

-Average Quality of life, 50 <75% (Less than grade 54).

-High Quality of life >75% (More than grade 54).

IV: Patients' Observational checklist. This checklist aimed to assess the patient practice for deep breathing exercise, coughing exercise and range of motion (ROM)...etc. And developed by researcher in an English language after reviewing the recent related literature.

Scoring system:

This part consists of 3 items, the responses were on a scale ranged from 0 (Not done), and 1(Done).

The items were categorized into satisfactory and unsatisfactory as follow:

$\geq 70\%$  was considered satisfactory.

$<70\%$  was considered unsatisfactory.

## II- Operational Design:

The operational design includes preparatory phase, validity and reliability, pilot study and field work.

Preparatory phase:

It included reviewing of the current and recent national and international literature concerning care of patients with

burn injury and the rehabilitation programs in order to develop the data collection tools.

Tools' validity and reliability:

Content validity was conducted to determine whether the tools, content cover the aim, validity was tested through a jury of seven experts from medical surgical nursing department, Ain shams university (7 professors). The experts reviewed the tools for clarity, relevance, comprehensiveness and simplicity; minor modifications were done.

Reliability test of the developed tools were done by alpha cronbach test. Alpha Cronbach for patients' knowledge assessment questionnaire, it was reliable at .901, for Modified Barthel Index questionnaire, it was reliable at .880, for World Health Organization Quality of Life-BREF (WHOQOL-BREF, 1996) questionnaire., it was reliable at .989, and Observational checklist about patient practice, it was reliable at .987 those values indicated to high reliability of the used tools.

#### **Pilot study:**

A pilot study was conducted on 10% of total study subjects (5 patients) in order to test the applicability of the study, the clarity of the tools, and estimating the average time needed to complete all questions. No modifications were made for the study tools. The Patients included in the pilot study were included in the study subjects.

#### **Field work:**

Field work included three phases: assessment, implementation and evaluation phases.

##### **A. Assessment phase:**

The data collection during this phase took about (26 weeks). It carried out through the following sequence:

The researcher visits the selected setting three days per weeks (Saturday, Wednesday and Thursday); In the morning. A purposive sample of 50 patients with second and third degree burn Follow-up on outpatient clinic of the burn unit were recruited in the study.

##### **B. Implementation phase:**

This phase started by interviewing each patients with burn injury in the previously mentioned setting and explaining the aim of the study, the effect of this study on their quality of life and obtaining their oral approval to participate in the study prior to any data collection.

Implementation phase: will be done in a period of six months divided as two week and half for each patient

group, the total numbers of patient groups were 10 groups, every patient group is 5 patients. The program include 9 session for each patient group (5 session for theoretical part and 4 session for practical part), to become the total program session for all patient groups was 90 session (50 session for theoretical part and 40 sessions for practical part).Based on that, the total hours of program implementation was about two hour for each patient group (take about 1hrs for theoretical part and 1hrs for practical part).

#### **III. Administrative Design:**

An official letter was issued from the faculty of Nursing, Ain Shams University to the director of burn unit, at which the study was conducted, explaining the purpose of the study and requesting the permission to conduct this study.

Ethical considerations:

The ethical considerations in the study included the following:

The research approval was obtained from the ethical committee of faculty of nursing, Ain Shams University before initiating the study work.

The researcher clarified the objectives and aim of the study to nurses included in the study.

Patients' consent to participate in the study was obtained orally.

The researcher assured maintaining anonymity and confidentiality of subjects' data.

Patients were informed that they are allowed to withdraw from the study at any time.

#### **Statistical Design**

All Data were collected, tabulated and subjected to statistical analysis. Statistical analysis is performed by SPSS in general (version 20), also Microsoft office Excel is used for data handling and graphical presentation. Quantitative variables are described by the Mean, Standard Deviation (SD), while qualitative categorical variables are described by frequencies and Percentage. Pearson correlation coefficient is used to measure the correlation between quantitative variables while student t test: is used for comparing the means of two groups. ANOVA F-test: is used for comparing the means of more than two groups of quantitative variables. Significance level is considered at  $P < 0.05$ .

#### **Results**

Table 1. Shows: 60% of studied patients were aged from 25 < 35 with mean  $\pm$  SD 33.96 $\pm$  7.96, 58% of studied patients were males, 82% of studied patients married, 80 % of studied patients resident in rural area, and, 78% of studied patients had secondary education, and 48% of studied patients occupation were manual work.

Table 2. Shows that 82% of the studied patients had mixed second and third degree of burns, 64% of the studied patients had 20 < 40%. Regarding the total body surface area, 58% of the studied patients had flame burn, 46% of studied patients had burn in the hands, 52% of the studied patients had suffer from contractures while, 40% of the studied patients had suffer from scars, and 10 % of studied patients received skin graft.

Table 3. Shows that, there are highly statistically significant relations of patients' with satisfactory level of total knowledge regarding burn injury, general knowledge about burn injury, first aid & treatment, burn complications, nutrition for patients with burn injury. Significant relation in rehabilitation for patients with burn injury. Non-significant relation in quality of life for patient with burn injury pre and post implementation of the rehabilitation program.

Table (4) illustrates that, there was a highly statistically significant relation of patients' regarding level of total MBI, nutrition (preparing and eating foods),

dressing, Ability to do manual and professional/ mental work, playing sports, significant relation in transfer from chair to bed and from bed to chair, going up and down the stairs. Nonsignificant relation in personal hygiene and showering, going shopping, and urination and defecation ability, and equal values in urination and defecation control pre and post implementing the rehabilitation program.

Table (5) illustrates that, there was a statistically significant relation between number of studied patients regarding level of total quality of life (QoL), psychological, and environmental domains. High Significant relation in physical health. Non-significant relation in social relationships.

Table (6) this table shows: there were a highly statistically relations between patients' knowledge and observational practice pre and post implementing the rehabilitation program.

Table (7) shows: there were a highly statistically relations between total quality of life (QoL) of studied patients and total modified barthel index (MBI) pre and post implementing the rehabilitation program.

Table (8) shows: there were a highly statistically significant relations between total quality of life (QoL) of studied patients and total observational practice pre and post implementing the rehabilitation program.

Table 1. Frequency and distribution of studied patients' demographic characteristics (n=50).

Items	No	Percent (%)
<b>Age (Years):</b>		
18 < 25.	4	8
25 < 35.	30	60
35 < 45.	9	18
>45	7	14
<b>Mean <math>\pm</math> SD 33.96<math>\pm</math>7.96</b>		
<b>Gender:</b>		
Male	29	58
Female	21	42
<b>Marital status:</b>		
Single	9	18
Married	41	82
<b>Residence:</b>		
Rural	40	80
Urban	10	20

<b>Level of education:</b>		
Illiterate	4	8
Secondary	39	78
University	7	14
<b>Occupation:</b>		
Not working	19	38
Manual work	24	48
Employee	7	14

**Table 2.** Frequency and distribution of the patients regarding the burn characteristics (n=50).

Items	No	Percent (%)
<b>Degree of burns</b>		
Second degree	4	8
Third Degree	5	10
Mixed Second & Third	41	82
<b>Percentaged burn area (%).</b>		
10 < 20 %.	9	18
20 < 40 %.	32	64
> 40 %.	9	18
<b>Causes of burn injury</b>		
Flame	29	58
Scald	11	22
Electrical	3	6
Chemical	7	14
<b>Site of burn injury</b>		
Head & neck.	4	8
Hands	23	46
Elbows.	8	16
Abdomen	1	2
Back.	2	4
Thigh	4	8
Legs	2	4
Foots.	2	4
Groin area	4	8
<b>Complications of burn injury</b>		
Infection	4	8
Scars	20	40
Contractures	26	52
<b>Skin graft</b>		
Yes	5	10
NO	45	90

**Table 3.** Frequency and distribution of patients' level of knowledge regarding the burn injury, pre and post implementing the rehabilitation program (n=50).



Items	pre				post				Chi-squared	
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		X <sup>2</sup>	P Value
	N	%	N	%	N	%	N	%		
1-General knowledge about burn injury	6	12.0%	44	88.0%	43	86.0%	7	14.0%	54.78	0.000000**
2-First aid & treatment	12	24.0%	38	76.0%	46	92.0%	4	8.0%	47.45	0.000000**
3-Burn complications	5	10.0%	45	90.0%	45	90.0%	5	10.0%	64.00	0.000000**
4-Nutrition for patients with burn injury	5	10.0%	45	90.0%	49	98.0%	1	2.0%	77.94	0.000000**
5-Quality of life for patient with burn injury	40	80.0%	10	20.0%	46	92.0%	4	8.0%	2.99	0.083778
6-Rehabilitation for patients with burn injury.	37	74.0%	13	26.0%	46	92.0%	4	8.0%	5.74	0.016577*
Total patients Knowledge scale	6	12.0%	44	88.0%	46	92.0%	4	8.0%	64.10	0.000000**

> 0.05 nonsig., \* ≤ 0.05 sig., \*\* ≤ 0.01 highly sig.

**Table 4.** Frequency and distribution of patients' level of practice regarding the activities of daily livings pre and post implementing the rehabilitation program (n=50).

Items	pre						post						Chi-squared	
	Independent		Need assistance		Dependent		Independent		Need assistance		Dependent		X <sup>2</sup>	P Value
	N	O	N	O	N	O	N	O	N	O	N	O		
Personal hygiene and showering	3	70.0%	1	30.0%	0	0.0%	3	78.0%	1	22.0%	0	0.0%	0.83	0.361810
Going shopping	1	28.0%	2	40.0%	1	32.0%	1	32.0%	1	38.0%	1	30.0%	0.19	0.908813
Nutrition (preparing and eating foods)	1	26.0%	3	64.0%	5	10.0%	3	72.0%	1	28.0%	0	0.0%	22.84	0.000011**

Transfer from chair to bed and from bed to chair.	10	20.0%	40	80.0%	0	0.0%	20	40.0%	30	60.0%	0	0.0%	4.76	0.029096*
Urination and defecation control	50	100.0%	0	0.0%	0	0.0%	50	100.0%	0	0.0%	0	0.0%	Equal values	
Urination and defecation ability	8	16.0%	42	84.0%	0	0.0%	11	22.0%	39	78.0%	0	0.0%	0.58	0.444439
Going up and down the stairs	4	8.0%	46	92.0%	0	0.0%	12	24.0%	38	76.0%	0	0.0%	4.76	0.029096*
Dressing	6	12.0%	44	88.0%	0	0.0%	30	60.0%	20	40.0%	0	0.0%	25.00	0.000001**
Ability to do manual and professional/mental work.	6	12.0%	44	88.0%	0	0.0%	32	64.0%	18	36.0%	0	0.0%	28.69	0.000000**
Playing sports	6	12.0%	44	88.0%	0	0.0%	25	50.0%	25	50.0%	0	0.0%	16.88	0.000040**
Total modified barthel index (MBI)	9	18.0%	41	82.0%	0	0.0%	27	54.0%	23	46.0%	0	0.0%	14.06	<b>0.000177**</b>

> 0.05 nonsig., \* ≤ 0.05 sig., \*\* ≤ 0.01 highly sig.

**Table 5.** Patients’ level of quality of life pre and post implementing the rehabilitation program (n=50).

Items	Pre Mean± SD	Post Mean± SD	t	P
I. Physical health	22.43±30.51	42.57±30.30	3.31	0.001296**
II. Psychological	23.50±24.76	36.33±29.24		2.37
III. Social relationships	30.80±36.49	43.20±40.86	1.60	0.112699
IV. Environment	23.25±30.36	36.25±35.42	1.97	0.051624*
Total Quality of life	23.38±27.88	38.08±31.21	2.49	<b>0.014639*</b>

> 0.05 nonsig., \* ≤ 0.05 sig., \*\* ≤ 0.01 highly sig.

**Table 6.** Relation between patients’ knowledge and observational practice post implementing the rehabilitation program (n=50).

	Knowledge		Practice		R	P
	No	%	No	%	<b>0.588</b>	<b>0.000007**</b>



Satisfactory	46	92	45	90		
Unsatisfactory	4	8	5	10		

> 0.05 nonsig., \* ≤ 0.05 sig., \*\* ≤ 0.01 highly sig.

**Table 7.** Relation between total quality of life (QoL) of patients and total modified barthel index post implementing the rehabilitation program (MBI) (n=50).

Total modified barthel index (MBI)						Total quality of life (QoL)						r	p
Independent		Need assistance		Dependent		Weak		Average		High		0.427	0.001993**
No	%	No	%	No	%	No	%	No	%	No	%		
27	54	23	46	0	0	33	66	10	20	7	14		

> 0.05 nonsig., \* ≤ 0.05 sig., \*\* ≤ 0.01 highly sig.

**Table 8.** Relation between total quality of life (QoL) of patients and total observational practice post implementing the rehabilitation program (n=50).

Total observational practice				Total quality of life (QoL)						r	p
Satisfactory		Unsatisfactory		Weak		Average		High		0.503	0.000200**
No	%	No	%	No	%	No	%	No	%		
45	90	5	10	33	66	10	20	7	14		

> 0.05 nonsig., \* ≤ 0.05 sig., \*\* ≤ 0.01 highly sig.

## Discussion

Regarding the studied of patients' demographic characteristics, the findings of the present study had revealed that as regards the gender the current study showed that about more than half of the studied patients' were male; This result is consistent with Ahmed, et al. (2019), who stated that about more than half of the studied patients' were male.

As regard the age, the results indicated that, more than half of the studied patients their age around thirties years old; these results are consistent with A.Rhman, et al., (2017), who stated that; more than two third of the studied patients were around thirties years old.

As regard residence, the current study showed that, the majority of studied patients' residence were in rural area, this finding is consistent with El Sherbiny, et al. (2018), who stated, that the majority of the studied patient residence in rural area.

As regard marital status of the studied patients, the majority of them were married; This finding is in the same line with what was reported by Shahid, et al., (2018), who

stated that, more than half of the studied patients with burns were married.

As regards occupation of the studied patients, more than half of the studied patients were perform manual work; El Sherbiny, et al. (2018), who stated, that about one half of the studied patients their occupation were manual work.

Regarding level of education among studied patients more than three quarter of them were secondary; El Sherbiny, et al. (2018), who stated, that about two third of the studied patients their level of education were secondary level.

As regard to the degree of burn, the current study showed that, more than three quarters of the studied patient were suffer from mixed second and third degree of burns. This finding is consistent with Rouzfarakh, et al., (2021), who stated, that more than three quarters of the studied patient were suffer from mixed second and third degree of burns.

As regard to the total body surface area (TBSA) of the burn injury the current study showed that, more than two third of the studied patients with TBSA of the burn injury was from twenty to less than fourtee percent; This

finding is consistent with Spronk, et al., (2018), who stated that more than half of the studied patients the TBSA of the burn injury was from twenty to less than fourteen percent.

As regards to the cause of the burn injury, the current study showed that, about more than half of the studied patients' were affected by flame as a cause of the burn injury; This might be due to careless handling of gas pipes without safety features; This finding is consistent with A.Rhman, et al., (2017), who stated that; more than two third of the studied patients were affected by flame as a cause of the burn injury.

As regard to the burn complication, about half of the patients had contractures and hypertrophic scars. These findings were supported by A.Rhman,et al., (2017), who stated that; about half of the patients had contractures and hypertrophic scars.

As regard to the skin graft of the burn injury, the current study showed that the minority of the studied patients had skin grafting. This finding is consistent with Alshlash, et al., (2016), who stated that the minority of the patients with burns had skin grafting.

Concerning patients' education our study showed that there were highly statistically significant improvements in their knowledge post implementing the rehabilitation program. This could be due to the program was based on the patients' needs and its clarity and simplicity of its content .This is on the same line with El Sherbiny, et al. (2018), who stated, that there was a positive improvement in the level of knowledge of the study group after applying the burn rehabilitation sessions, in comparison with the control group with a statistically significant difference between them, which indicates the success of the rehabilitation program.

Concerning patients' practice regarding modified barthel index (MBI) of activities of daily livings (ADLs) the results revealed that, there were highly statistically significant improvement of level of independency regarding the activities of daily livings (ADLs) post implementing the rehabilitation program. This result was in agreement with Tang, et al., (2016) who stated in research that, there were highly statistically significant improvement of level of independency regarding the activities of daily livings (ADLs) post implementing the rehabilitation program.

Regarding the patients' quality of life post implementing the rehabilitation program, the results revealed that, there were statistically significant improvement of total level of quality of life for the patients' under the study in all dimensions (physical, psychological, social and environmental domains). These positive results indicate the success of the rehabilitation program on achieving the favorable results. This result in

the same line with Seyedoshohadaee, et al. (2022), who stated, that after the intervention, the mean quality of life score was significantly higher in the intervention than the control group, indicating a better QoL in the recent group.

Regarding the relation between the patients' knowledge and practice post implementing the rehabilitation program. The result of the present study revealed that, there was a highly significant correlation between level of knowledge and level of practice post implementing the rehabilitation program. The researcher's opinion is that, this may be due to the simplicity and clarity of contents in addition to the educational CD that led to positive effect in improving their level of knowledge and practice together. This findings are supported by Ardebili, et al., (2014). Who stated that there was a highly significant relations between level of knowledge and level of practice post implementing the rehabilitation sessions.

Regarding relations between quality of life (QoL) and modified barthel index (MBI) post implementing the rehabilitation program. The current study showed that there was a highly significant correlation between the quality of life (QoL) and modified barthel index (MBI) post implementing the rehabilitation program. The researcher's opinion is that, this may be due to the effect of increasing independency of performance of activities of daily livings (ADLs) on the quality of life for these patients' under the study. These results were supported by Flores, et al., (2020). Who stated that there was a highly significant correlation between the quality of life (QoL) and modified barthel index (MBI) post implementing the educational sessions that help the learners to perform the activities of daily livings independently or with minimal assistance.

Regarding the relation between the quality of life (QoL) and level of adequacy in performing the breathing, coughing, and range of motion (RoM) exercises. The current study revealed that there was a highly significant correlation between the quality of life (QoL) and level of adequacy in performing the breathing, coughing, and range of motion (RoM) exercises post implementing the rehabilitation program. The researcher's opinion is that, this may be due to the effect of performance of these exercises on improving the general health status of the patients' under the study that reflect on their QoL positively. These findings in consistence with Flores, et al., (2020). Who stated that there was a highly significant correlation between the quality of life (QoL) and the activities the patients' with burn injury performed under directions of the health care team members.

On summary, the results of this study support the hypothesis stating that, there will be a positive effect for the rehabilitation program on the quality of life of patients

with burn injuries. This result is in agreement with Magbool, et al. (2021), who stated, that there was a highly significant statistical difference between pre, post self-care education applications regarding QoL in all domains.

### Conclusion

**Based on findings of the present study, it can be concluded that:**

Using the rehabilitation program for patients with burn injury had improved their quality of life in all dimensions. This means the study hypothesis has been supported. Moreover, there are highly statistically

Significant relations of patients' with satisfactory level of total knowledge regarding burn injury pre and post implementation of the rehabilitation program. there were a highly statistically relations between total quality of life (QoL) of studied patients and total modified barthel index (MBI) post implementing the rehabilitation program Regarding the QOL, the study had indicated that and there was a statistically significant difference between number of patients' regarding level of total quality of life (QoL), pre and post implementing the rehabilitation program. There were a highly statistically relations between patients' knowledge and observational practice post implementing the rehabilitation program. In addition, the greatest domains improved in the quality of life were seen in physical domains.

### Recommendations

**Based on the results of the current research, the following suggestions for future research and practice are proposed:**

- Replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed the rehabilitation program.
- Health education programs about burn prevention should be provided for all communities' members with using new methods of teaching such as computer assisted instructions and home videos to give a better quality of life for all.

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