
Effect of Rehabilitation Program on Knowledge and Practice for Patients with Burn

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ABSTRACT

Background: Burn is one of the most brutal harms to the human body and mind and its wide-ranging complications have many adverse effects on the patient's quality of life. Burns are a widespread health issue that mostly affects low- and middle-income nations, with about two thirds of cases happening in Africa. Burns continue to be a prevalent and serious public health issue. A multidisciplinary approach is necessary to optimize the patient's knowledge and practice level in order to enhance healing following an accident. Rehabilitation is an essential and integral part of burn treatment. **The study aimed** to evaluate the effect of rehabilitation program on knowledge and practice for patients with burn. **Design:** A quasi-experimental research design was used in this study. **Setting:** The study was conducted in Plastic & Reconstructive Burn Center at Mansoura University Hospitals. **Sample:** A purposive sample of 60 patients with 2nd degree burn admitted to above mentioned setting was included in the study. **Tool of data collection:** The data collected through the following tools, tool I socio-demographic data of patients II: Patients' Knowledge questionnaire, III: Burn patients' practice Checklist **The results:** The total mean scores of burn patients' knowledge and practice pre and post the rehabilitation program showed significant difference. **Conclusions:** The present study concluded that burn rehabilitation programs positively affect total mean scores knowledge and practice for patients with burn. **Recommendation:** Comprehensive burns rehabilitation programs should be implemented from the first day of hospital admission, to improve patient's knowledge and to increase his/her awareness regarding appropriate health practices that restore his or her functional abilities, prevent future complications and improve quality of life.

Keywords: Knowledge and Practice; Patients with Burn; Rehabilitation Program.

INTRODUCTION

Nearly two thirds of burn cases worldwide occur in low- and middle-income nations. Burns are a global health concern. Even though burns can be prevented in over 90% of cases, they are still widespread and a serious public health concern (Seliman, Fouad, & Mohamed 2022). The World Health Organization reports that burn trauma ranks as the fourth most common type of accidental injury, accounting for around 11 million burn injuries globally each year and over 180,000 fatalities. Every year, there are over 500,000 burn injuries in the United States of America (USA), leading to roughly 40,000 hospital admissions and 3,400 fatalities (World Health Organization, 2020).

The goal of a rehabilitation program is to enable the patient to return to life with the least possible physical and psychological stress. Rehabilitation programs include activities that maintain mobility and muscle mass so that the patient can best regain the ability to maintain autonomy and self-care, return to previous daily activities and work, and adapt to social and cosmetic changes. An important component of the rehabilitation process is improving post-burn knowledge and practice (Gamal et al., 2023; Rhman, Aziz, & Mohamed, 2023)

Rehabilitation therapy includes positioning, splinting, exercises, compression, and massage, which are an integral part of burn care and are designed to address the adverse effects of burns, including maintaining range of motion, minimizing the development of scars and contractures, maximizing functional ability, and improving general aspects of physical and psychosocial functioning (Schneider et al., 2023).

Nurses play a crucial role in assisting patients in adjusting to their new body image and creating coping mechanisms for the changes in their lives brought on by their injuries and enhance rehabilitation process. Informing patients about the care they will receive is an important part of nursing practice in this area of care. Patients and clinicians both gain from increased patient understanding of their condition and course of treatment (Ibrahim, Ibrahim, Abdel Hamid, & Omar, 2021).

In the past, clinicians involved in the treatment of burn victims have given them written or spoken instructions in pamphlets regarding rehabilitation and how to avoid the creation of hypertrophic scars. The body of research shows that in order to optimize wound healing and increase adherence to treatment, patients must continue to receive education about their burn injuries and nurses caring for patients who have burns, patient

education responsibilities are therefore becoming more and more crucial, although this presents workload issues (Karahan, Demir, Tuncbilek, Cetintas, & Senel, 2023; Kiecolt-Glaser, 2022).

Practically, nurses provide burn survivors with social interaction skills training to help them feel more comfortable and secure in social situations once they leave the hospital. When patients interact with others in any setting, including public spaces or the workplace, there are certain strategies that they can employ. These include behaving positively and projecting confidence through their body language when speaking to others, making eye contact, smiling, and speaking in a friendly tone of voice (Bayuo, Wong, & Chung, 2021).

Significance of the study

Burn injury can often cause dramatic changes in body presentation because of disfigurement and disability. Rehabilitation planning and interventions begin upon admission to a burn center. Early care by specialist nurses and the multidisciplinary team of the burn unit plays a vital role in the patient's subsequent physical and emotional well-being. During the initial care phase, the patient's attitude, knowledge and practice are important factors in the recovery process. Patients need to be educated about their wounds to reduce their anxiety and improve compliance with wound care. An important aspect of nursing practice in this area of care is rehabilitation patients about the care they will receive to improve the recovery process and quality of life. The goals of rehabilitation program are to increase patient knowledge, practice, teaching specific coping skills and enhancing self-care behaviors to reduce patient's complication so improve compliance with therapy. (Wiechman et al., 2023).

AIM OF THE STUDY

The present study aimed to explore the effect of rehabilitation program on knowledge and practice for patients with burn. This aim was achieved through:

1. Assess the knowledge of the patient with burn.
2. Evaluate the practice for patients with burns.
3. Implement a rehabilitation program for patients with burns.
4. Evaluate the effect of rehabilitation program on knowledge and practice for patients with burn.

Research hypothesis

Patients with burns who participated in the planned rehabilitation program exhibited improvement in knowledge and practice.

SUBJECTS AND METHOD

Study Design

A quasi-experimental research design was used in this study.

Study Setting

This current study was conducted at the Plastic and Reconstructive Burn Center in Mansoura University Hospitals in the inpatient department and the outpatient clinics for patients follow up.

Study Subjects

A purposive sample of 60 patients with burns admitted to above mentioned setting was included in this study. The study subjects received routine hospital care and the designed burn rehabilitation program. This study included recently admitted patients from the first 48 hours until full recovery diagnosed with a moderate degree of burn, aged between 20 and 60 years old from both genders, without inhalation injury, chronic disease, or other co-morbid diseases such as diabetes mellitus, heart diseases, psychological problems, and mental disabilities, and conscious, with the ability to communicate and cooperate with the program.

Tools for Data Collection

Data were collected using the following tools:

Tool I: A self-Administered Questionnaire about Patients' Demographic Data and Burn Parameters:

It was developed by the researcher in an Arabic language after reviewing recent related literature Elsherbiny, El Fahar, Weheida, Shebl, & Shrief (2018); Asghar et al., (2023) which included:

Part I: Demographic data of patients as name, gender, level of education, occupation, economic status and marital status.

Part II: Burns parameters of studied patients included; length of hospital stays, type of burns, circumstances of injury, site of burns, total body surface area (%TBSA) of burns, and degree of burns according to role of nine assessment burn (Giretzlehner et al.,2021& Moore et al .,2024).

Tool II: Patients' Knowledge Questionnaire:

The tool was developed by the researcher after reviewing relevant and current national and international scientific literature which were reviewed by the researcher before developing this tool (University of Maryland Medical Center, 2015; Hassan, 2015; Mohamed, 2014; Elsherbiny et al., 2018; Seliman Zakeria et al., 2022) which was intended to assess and evaluate patients' knowledge before and after implementation of the targeted rehabilitation program.

It contains (33) questions covering three clearly defined areas:

1. Common knowledge about burns, seven questions were assessing patient's knowledge about skin importance, layers, burn degree and What are the physiological changes and complications that happen in body after burns.
2. Knowledge about burn rehabilitation, sixteen questions were assessing patient's knowledge about concept regarding burn rehabilitation, rehabilitation modalities, positions, in structured followed for exercise and importance of using splints after burns.
3. Knowledge about healthy lifestyles related to burns, ten questions were assessing patient's information about burn follow up visits after discharge, healthy foods must be eaten and wound care at home.

The scoring system for burn health knowledge questionnaire:

Each question has a set of answer points, one point for each correct answer, and zero points for unable to answer, incorrect answer, or missing answer. The scores obtained for each question were added together to obtain the patient's total knowledge score. Out of a total point of 167, the grades were computed. Better understanding was

reflected by a higher score.

Tool III: Burn Patients' Practice Observational Checklist:

This tool was developed by the researchers after reviewing the current extensive national and international literatures (Gautam, R., Rajoura, O.P., Sharma, A.K., and Bhatia, M.S. 2022) to facilitate the application of rehabilitation skills by patients after admission to the hospital and thereafter to evaluate the application of the program and achieve the purpose of this study.

I- The checklist consists of (32) steps covering three clearly defined skills:

1. Anti-contracture positioning with a score ranged from 0 to 16 {eight steps, 1:8}. contracture positioning observational checklist for Lying on the back with head of bed flat, extend all arm joint such as shoulder, elbow and wrist, abduct legs and arms away from body with pillow, lie on one side (right, left) with elevate head up, elevate legs up and down (45degree) and elevate arms above heart level on a pillow.

2. Therapeutic exercises with a score ranged from 0 to 24 {fourteen steps, 9:22}. Therapeutic exercise about early ambulation and walking, Ranged from motion exercise for affected limb and breathing exercise.

3. Massage therapy with a score ranged from 0 to 20 {ten steps, 23:32}. Massage therapy observational checklist contained structure for massage therapy like lubricant scare before massage, start massage in circular motion from inside to outside, Place the fingers above the scar, and then making gentle circular pumping motions on the scar itself, Repeat scar massage 2-3 times daily.

The patient's exercises were scored on a 3-point scale ranged from 0 to 2, where 0 means the skill was not performed, 1 means incomplete, and 2 means complete. The individual's scores for each step of each skill were added together and the total score was calculated and reported out of 64 grades. The score < 30 are poor, 30-45 are Moderate and the score \geq 45 are good.

Operational design

It was entailed under the following four points: Preparatory phase, validity and reliability of the tool, pilot study, and field work.

Preparatory Phase:

Reviewing the past and current related literatures covering various aspects of the problem using all official websites as PubMed, Google scholar, available scientific books, articles, periodicals and magazines to get acquainted with the research problem.

Tools Validity and Reliability

Tools Validity

The tool was tested for its content validity, comprehensiveness, and applicability by 9 experts in medical-surgical from the Faculty of Nursing, Port Said, Mansoura University, and from the Faculty of Medicine, Mansoura University, and needed modifications were done according to their opinions.

Tools Reliability:

Reliability was measured to evaluate whether all items of the study tools measured the same variable, and fit together conceptually. The reliability of the study tools was tested by Marginal Homogeneity test, Fisher's exact test, MCT: Monte Carlo exact test to measure the internal consistency of tool I: $r = 0.985$, tool II: $r = 0.901$, tool III: $r = 0.889$.

Pilot study

A pilot study was carried out on 6 adult's patients with hand burns (10% of the study sample) selected from burn center at Mansoura University Hospital to evaluate the feasibility, objectivity, and clarity of the study tools, as well as to determine their applicability. Additionally, it aimed to identify potential challenges that might arise during the study's implementation and to estimate the time required for data collection. Subsequently, these patients were excluded from the main study.

Field of work

Patients who met the study criteria and visited the study facility during data collection period were matched as much as possible for sociodemographic characteristics and burn-related data with control variables that could affect the study results.

Data collection phases (procedure)

After regulatory approval, data collection began and continued for 6 months from January 2022 to June 2022. The data collection work plan followed the stages of the nursing process. The nursing process is a deliberate problem-solving approach, creating curriculum to meet people's teaching and learning needs.

Assessment phase

The aim of this phase was to collect baseline data using Tool I, Social Record Characteristics, Tool II (Burn Patients' Health Knowledge Questionnaire), which was collected through interviews and self-administered questionnaires by patients. The researcher read each question to the illiterate and marked the exact answer they gave. Patients who were able to read and write were asked to fill in the questionnaire. The researcher then ensured that the questionnaire was completed and asked the participants to complete it as needed. Tool III (Burn Patients' Exercise Checklist) was administered in the morning by observing the patient while sleeping or bedridden to assess anti-contracture positioning of the affected body part. Therapeutic exercises and skin massage were observed during dressing changes by asking the patient to demonstrate these skills, as the large number of dressings hindered proper exercises and skin massage. The observational checklist is an unstructured observation, intermittent and carried out at different time of day according to time of dressing change.

Implementation phase

In addition to the proposed burn rehabilitation program, patients received standard hospital care. Routine hospital care: included history taking, physical examination, assessment of burn wounds to estimate the extent, size and body surface area (TBSA) of burns, hydrotherapy, daily wound care and dressing changes, medical therapy for wound healing, infection control and pain management.

Proposed burn patient rehabilitation program: The program was implemented individually for the group and was linked to the planned interventions, which included knowledge and practice of burn patient rehabilitation methods and healthy lifestyle changes to support patient recovery.

Burn Rehabilitation Program

The program included both training and education components. The education component included general information about burns, post-burn rehabilitation techniques, and healthy behaviors and lifestyle changes. During the practical phase, patients received instructions on massage therapy, therapeutic exercises, and body positions to avoid contractures. The researcher, burn surgeons, and physical therapists developed a practical instructional plan that included discussion on when it is best to teach patients how to position themselves to prevent contractures, how to safely perform range of motion in joints, and massage therapy to use safely.

The proposed burn rehabilitation program was conducted in groups of three to five (3-5) patients. Each group received instructions in four knowledge sessions and four practical sessions. The program consisted of eight sessions in total, two sessions per week for four weeks (one session for practice and one knowledge acquisition session), the duration for each session took approximately 45 to 60 minutes.

Practical and Training Sessions

The treatment was conducted once a week in 4 sessions and included upper limb contracture prevention positioning, therapeutic exercises, early ambulation, range of motion exercises (ROM), strengthening exercises, stretching exercises, functional exercises, and strength training. It was carried out in 4 sessions, once a week and includes patient's training through:

- **First session. Anti-contracture positioning of the upper limbs:** It was held in the first week, the researcher put the patient in the anti-contracture positioning early since the first day post injury. The benefits of the positioning in maintaining tissue elongation, preventing contracture and deformities were emphasized by the researcher every session until the burn wounds completely healed. The researcher

demonstrated the steps of correct positioning to patient and family member as follow:

- joints supported and fully extended.
 - Upper and lower limbs abducted away from the body with a pillow and knee and elevated above heart level to reduce edema.
 - Forearm supported and supinated (hand palm downward).
 - Ankle and Foot supported.
 - Fingers separated away from each other.
- **Second session. Therapeutic exercises:** It was held in the second week and it covered training regarding early ambulation, range of motion (ROM), strengthening, stretching and functional exercises.
 - **Early ambulation and walking:** The patients and family members were instructed about ambulation as follows; getting out of bed gradually, then to a chair, around the bed, and finally start walking as illustrated. The researcher emphasized on early ambulation and instructed patients to walk for a short distance twice daily then increased according to their ability. The patients and family member were provided with instructions about safety measures during ambulation.

Range of motion exercise (ROM) (Appendix V):

- Implementation of ROM exercises early from the first day of admission until discharge, the researcher started by emphasizing on the benefits of exercises. ROM training were performed individually for each patient in presence of family member and in group training to motivate patient's practice and give patient chance to share experiences. Exercise program was carried out 15-20 minutes for each one. The patients were instructed to repeat each motion at least 3 times twice daily and increase frequency of motion gradually.
- **Active ROM exercises:** The researcher was started training patients on active ROM initially after burns. Passive ROM was delayed after healing to avoid further injury to joints, tendon, and nerves.
- **Active assistive and passive ROM:** When the wound tolerated pressure, and the healing process came to an end, the researcher started an active assistive and passive ROM exercises to help the patients reach full range of motion.

- **Strengthening exercises:** They were started after the burn wounds healed (14-21day) to increase the hand muscle strength. It was performed by contracting the hand muscles by pressing on a sponge rubber ball by palm of hand for 5-15 seconds, then completely relaxing hand. Then dig each fingertips,one at a time into the ball five to ten times for each.
- **Stretching exercises:** The researcher holded each joint and stretched skin at the end of motion for several seconds then relax to achieve the maximum muscle's straightening, and lengthening. The researcher instructed patients and family member that stretches need to be in low repetitions, but long in duration to provide a sustained stretch.
- **Functional exercises:** It was performed by integrating exercise into activities of daily living (ADLs) by using the hand for light self-care activities, this based on the principle that everyday activities promote regular movement patterns of the affected hand. the researcher incorporated exercises into the patient's daily routine and instructed the patients to use arms and hands in eating, bathing, carrying simple light such as bottles and cups, cutting things, combing hair and writing simple sentences to encourage independence and fasten their return to pre injury activities.
- At the end of exercise sessions, the researcher demonstrated each type of exercises for every patient in presence of family member.
- A family member was asked to redemonstrate exercises to their patients until the researcher assured that the family member had fully gained the skills.
- The family were instructed to carry out each series of exercises regulary, 3 times daily according to patient tolerance.
- A written schedule specifying date, time, and type of exercises were provided to the family to remind them regarding daily exercise practice.
- exercise precautions; patients should be taught to check the skin after each exercise and adjust the type or duration of exercise accordingly. It is also recommended to be cautious in the case of sensory impairment or transplanted areas.
- **Theird seation : Massage therapy:** This was conducted in the third week and included massage therapy training. Before starting massage training, researchers emphasized that massage should only be started when the wound is completely healed and the burn scar can withstand pressure and friction. Massage instructions were also provided to patients.

First, apply the specified ointment on the burn scar and then rub it slowly in a circular motion with the fingertips.

- Gently rub the scar area and rub the skin at each joint in a circular motion for 5 minutes.
- Researchers emphasized that massage should be performed twice a day for 15 to 20 minutes each time.

● **Fourth reinforcement training session:** It was held in the fourth week, during this session

- The researcher was emphasized on the importance of correct positioning, therapeutic exercises and scar massage on preventing hand complications, in addition to answering patient questions, discussion of rehabilitation barriers and provide alternative plan to promote patient's adherence to rehabilitation therapy and carrying responsibility of healthy practice.
- The researcher provided the patients with pre discharge instructions as following home care, exercise and massage program. Also patients and family member were instructed about the importance of follow-up visit to outpatient clinic and its importance in solving problems and preventing complications. Schedule for follow up were emphasized for each patient before discharge.

Evaluation Phase

Finally, patient's response evaluation regarding the proposed program and the extent to which the results were achieved should be carried. The patients were evaluated three times using the study instruments:

The first evaluation phase (pretest) was conducted immediately after enrollment using all the study instruments. One month later, the second evaluation phase (posttest) was conducted in both groups using instrument I parts 2, II, and III. The third phase (follow-up) was conducted three months after enrollment using instrument I parts 2, II, and III.

Data were collected, analyzed and compared with the results to evaluate the effect of rehabilitation program on knowledge and practice of patients with burn by using the proper statistical analysis

Administrative Design:

A formal letter from the vice dean of Port Said University's Faculty of Nursing was submitted to the administrative staff of Mansoura University Hospital in order to request official approval for data collection. The researcher met the nursing administration staff and talked with them about goals and objectives of the study to gain their cooperation during its execution phase. Additionally, before beginning data collection, patients' oral consent was obtained.

Ethical Considerations

The research ethics committee at Port Said University's College of Nursing approved. Furthermore, after delineating the purpose of the study, hospital director provided permission to participate. Additionally, consent was obtained from each participant (patient) following an explanation of the purpose of the study and the specifics of the data collection procedure so that she understood the significance of her involvement. Patients were also given a thorough and concise explanation of the study, along with an assurance that the data collected would be kept private and utilized solely for that purpose. Patients who took part in the trial were told that it was choice for them to do so and that they might leave the study at any time, for any reason. Furthermore, all information gathered from the research participants was handled with complete confidentiality. Furthermore, the data collection technique did not compromise the coherence of the work in the aforementioned scenario.

Statistical Analysis

After being collected, the data was reviewed, collated, saved, and examined using distributions of numbers and percentages. Statistical analysis was performed on a computer using version 18 of the Statistical Package of Social Science application (SPSS). Appropriate statistical tests were employed to ascertain whether the study's variables showed a statistically significant difference. Figures and tables with the data were displayed. Consideration is given to significance level values when the p-value is less than 0.05; however, a p-value below 0.05 suggests that the result is not significant.

Data Analysis: The following statistical tests were used:

- **Descriptive Statistics:**

Data are reported as range, mean and standard deviation (SD) for descriptive numerical data, while percentages are used to describe the frequency of each category in categorical data.

- Analysis of Numerical Data:

The tests implemented by the program used to compare each post include:

1. Independent Samples T-Test: This is a parametric statistical test used to compare the means of numerical variables (knowledge scores, practice scores or other scales) between two independent groups (study groups or demographic characteristics) (when the variables follow a normal distribution).

2. Repeated Measures ANOVA: Used to compare means of quantitative data. The variables measured at different stages of the study (knowledge values, practice values or other scales) follow a normal distribution.

- Analysis of Categorical Data:

1. Monte Carlo Exact Test and Fisher Exact Test: They are used as alternatives to Pearson's Chi-square test to determine the difference between the two groups. When many small expected values are observed, the characteristics of the study sample and the knowledge or practice levels of different groups at different stages of the study.

2. Fisher's exact test determines whether there is a statistically significant association between two categorical variables. Is there a relationship between gender (male/female) and yes or no .

3. Marginal homogeneity test: This is a nonparametric statistical test used to compare the categories of variables (knowledge/practice) at different stages of the study in each study group to obtain multiple dichotomous answers (poor, average, and good).

4. Friedman's test: This is a nonparametric statistical test used to compare the categories of variables (treatment) at different stages of the study in each study group to obtain dichotomous answers. Correlation analysis:

Correlation is used to test the nature and strength of the relationship between two quantitative variables and ordinal variables. Spearman correlation coefficient "rho" is expressed as the Pearson coefficient. The sign of the coefficient indicates the type of relationship (positive or negative), while the value indicates the strength of the relationship, as follows: (rho) is less than 0.25 for a weak correlation, moderate correlation values are between 0.25 and 0.74, and a strong correlation is between 0.75 and 0.99

RESULTS

Table (1) : represents the Socio-demographic data of the study sample which revealed that; there were 60 participants enrolled in the current study the highest age category belonged to 51 - 60 years 33.3% but as regards gender the females contributed about 66.7%, between them 41.7% were housewife. According to residence, the participants live in rural area were 58.3%, the majority of participants were married 41.7%. Regarding the level of education, participants who had either secondary or read and write were 33.3% and 31.7%, respectively, and rendered the family income the majority of participants 75% were low, with the same percentage as regards the participants live with family

Table (2): shows burn parameters data of the study patients discovered that; the majority of burn types was thermal burn 83.3%, with all of them due to accidental, but according to the degree of the burn was a second-degree burn 58.3%, where the high effect part was Upper limbs 41.7%, with all participants were need the treatment (conservative), no Post-burn complications and all of them needed physical and psychological rehabilitation.

Table (3): displays the comparison of burn patients' health knowledge pre and post the rehabilitation program, it revealed that; as regards to all items of comparison included general knowledge related to rehabilitation, healthy lifestyles and overall knowledge the intervention program was effective and there was significant different between before intervention and post intervention after one month and follow up after 3 months, which the p value < 0.05 of Friedman test.

Table (4): displayed the comparison of the total mean score of burn patients' practice pre and post-rehabilitation program which reported that as regards burn

management included anti-contracture positioning scores, therapeutic exercises scores, massage therapy scores, and overall practice there were significant differences before and after rehabilitation program as Friedman test was <0.05 so the program was effective

Table (5): exhibited the total knowledge category post-program (at 3 months) according to socio-demographic characteristics of the study patients which revealed the association between socio-demographic characteristics as regards age, residence, family income, and living status no significant difference with total knowledge on the other hand the association are significant toward sex, ever married, level of education, and occupation.

Table (6): shows the Practice post- program (at 3 months) according to socio-demographic characteristics of the study patients which revealed that the association between the sociodemographic characteristics and practice, there were significant differences for all its parameters except concerning Ever married the association insignificant different $P=0.098$.

Table (7): displayed the correlation between total knowledge and total practice score pre- and post-rehabilitation program. As regards the correlation after one month the correlation was negative moderate with significant but after 3 months became a positive strong correlation with significant difference.

Table (1): Socio-demographic data of the study sample

Variable	N N=60	%
Age (years)		
20 - 30 years	15	25
31 - 40 years	10	16.7
41 - 50 years	15	25
51 - 60 years	20	33.3
Sex		
Male	20	33.3
Female	40	66.7
Residence		
Rural	35	58.3
Urban	25	41.7
Marital Status		
Single	14	23.3
Married	25	41.7
Divorced	11	18.3
Widowed	10	16.7
Level of education		
Illiterate	10	16.7
Read and write	19	31.7
Secondary	20	33.3
University	11	18.3
Occupation		
Manual work	15	25
House Wife	25	41.7
Employee	10	16.7
Not work	10	16.7
Family income		
Low	45	75
Moderate	15	25
Living status		
Live alone	15	25
Live with family	45	75

Table (2): Burn parameters of studied patients

Variable	N (%)	%
	N=60	
Type of burns		
Thermal burn	50	83.3
Chemical burn	10	16.7
Circumstances mode of injury		
Accidental	60	100
Degree of burns		
Moderate second degree burn	25	41.7
Sever Second degree burn	35	58.3
Affected site		
Head & Neck	15	25
Upper limbs	25	41.7
Anterior trunk	5	8.3
Lower Limbs	15	25
Treatment (conservative)	60	100
Post burn complications (No)	60	100
Need for physical and psychological rehabilitation (yes)	60	100

Table (3): Patients' Knowledge pre and post the rehabilitation program

Items	Pre-rehabilitation	1- month post-rehabilitation	3- month post – rehabilitation	P value
General knowledge	0(0-0.75)	11(10-11)	18(14-18)	<0.001
		P1<0.001	P1<0.001 P2<0.001	
Rehabilitation knowledge	0(0-3.5)	31(25-35)	51(43-51)	<0.001
		P1<0.001	P1<0.001 P2<0.001	
Healthy lifestyles knowledge	0(0-0)	27(24-30)	39(38-41)	<0.001
		P1<0.001	P1<0.001 P2<0.001	
Overall knowledge	0(0-8.5)	67.5(60-75)	107(98-107)	<0.001
		P1<0.001	P1<0.001 P2<0.001	

Table (4): Total practice of studied patients pre and post the rehabilitation program

Items	Knowledge category			P value##
	Pre-rehabilitation	1- month post-rehabilitation	3- month post – rehabilitation	
Anti-contracture positioning scores	0(0-0)	8(8-14)	16(16-16)	<0.001
		P1<0.001	P1<0.001 P2<0.001	
Therapeutic exercises scores	0(0-0)	14(14-24)	28(28-28)	<0.001
		P1<0.001	P1<0.001 P2<0.001	
Massage therapy scores	0(0-0)	10(10-17.5)	20(20-20)	<0.001
		P1<0.001	P1<0.001 P2<0.001	
Overall practice	0(0-0)	32(32-56)	64(64-64)	<0.001
		P1<0.001	P1<0.001 P2<0.001	

Table 5: Relation between total knowledge of patients after rehabilitation program and socio-demographic characteristics.

Variable	Knowledge category				Test of significance	P value
	Moderate N=49		Good N=11			
	N	%	N	%		
Age					FET	0.9
≤ 40	20	80	5	20		
>40	29	82.9	6	17.1		
Sex					FET	0.01
Male	20	100	0	0		
Female	29	72.5	11	27.5		
Residence					FET	0.9
Rural	29	82.9	6	17.1		
Urban	20	80	5	20		
Ever married					FET	0.05
No	14	100	0	0		
Yes	35	76.1	11	23.9		
Level of education					MCT	<0.001
Illiterate	10	100	0	0		
Read and write	19	100	0	0		
Secondary	20	100	0	0		
University	0	0	11	100		
Occupation					MCT	0.004
Manual work	9	60	6	40		
House Wife	20	80	5	20		
Employee	10	100	0	0		
Not work	10	100	0	0		
Family income					FET	0.051
Low	34	75.6	11	24.4		
Moderate	15	100	0	0		
Living status					FET	0.051
Live alone	15	100	0	0		
Live with family	34	75.6	11	24.4		

Table 6: Practice post- program at three months related to socio-demographic characteristics of the studied patients.

Variable	Practice category				Test of significance	P value
	Moderate N=10		Good N=50			
	N	%	N	%		
Age						
≤ 40	0	0	25	100	FET	0.003
>40	10	28.6	25	71.4		
Sex						
Male	0	0	20	100	FET	0.02
Female	10	25	30	75		
Residence						
Rural	10	28.6	25	71.4	FET	0.003
Urban	0	0	25	100		
Ever married						
No	0	0	14	100	FET	0.098
Yes	10	21.7	36	78.3		
Level of education						
Illiterate	10	100	0	0	MCT	<0.001
Read and write	0	0	19	100		
Secondary	0	0	20	100		
University	0	0	11	100		
Occupation						
Manual work	0	0	15	100	MCT	0.003
House Wife	0	0	25	100		
Employee	0	0	10	100		
Not work	10	100	0	0		
Family income						
Low	0	0	45	100	FET	<0.001
Moderate	10	66.7	5	33.3		
Living status						
Live alone	10	66.7	5	33.3	FET	<0.001
Live with family	0	0	45	100		

Table 7: Correlation between total knowledge score and total practice score pre and post the rehabilitation program.

Knowledge total score	Practice total score			
	1 month post rehabilitation		3 months post rehabilitation	
	R	P value	r	P value
Pre-rehabilitation	-0.4	0.002	0.3	0.02
One month post rehabilitation	-0.5	<0.001	0.7	<0.001
Three months post rehabilitation	-	-	0.7	<0.001

DISCUSSION

Burn victims experience a variety of effects, including their bodily and mental well-being, their capacity for (daily activities, and medical performance). Regarding burn victims, psychological and functional outcomes are assessed far less frequently than the medical impacts, which are well-studied and typically handled over a lengthy period of time in outpatient care. Therefore, the effects of burn injuries on functional outcomes are important and variable. Most burn patients return to their pre-burn employment, and between 21 and 50 percent of them experience some kind of occupational problem as a result of their burns. (McAleavey AA et al, 2018)

The current study included 60 patients, the largest age group belonged to those aged 51 to 60 years (one third of sample), in relation to gender, the females contributed approximately two thirds, nearly half of participants were married, one third out of total participants were housewife's. More than half of study sample lived in rural area, regarding level of education, one third, and less than one third were either from secondary or read and write respectively, the most of participants had low family income, also most of them lived with their family.

Concerning the effectiveness of the intervention program, the current study stated significant differences between pre-intervention, one month after, and at three-month follow-up., which came in the same line with (Seyedshohadaee et al., 2022) who studied the impact of implementing a rehabilitation nursing program on the daily lives of patients with hand burns. Their results showed a significant difference in overall performance scores of the two groups, with the intervention group scoring significantly higher after the implementation of the nursing rehabilitation program. In addition, there were significant differences in performance indicators before and after the intervention, as well as the rehabilitation group values.

Also study findings were in agreement with (Paratz et al., 2012) who showed that functional and physical outcomes in burn patients were improved after a physical therapy training program which also had a positive impact on their psychological outcomes. As regards to the health knowledge category for burn patients, this study revealed that most participants had low knowledge before the program, but after one

month, all participants had a moderate level of knowledge, and after three months, (nearly a quarter) of the patients had good knowledge.

The results of this study highlighted the importance of designated nurses in educating patients about burns and their treatment because most of studied patients had only an elementary school education and little knowledge of other sources (e.g., mass media). the overall mean score for first aid knowledge for burn patients as (**Tolouei et al., 2024**) reported that there was a statistically significant difference between the variables of age, sex, marital status, place of residence, level of education, and history of receiving first aid training with the participants' knowledge level and that was in same line with current study.

According to the burn characteristics of study patients, there were no significant differences in terms as type or degree of the burn in relation to the total knowledge category three months after the program began. However, there was a significant association between the total knowledge and the affected site. Same findings were found by (**Spronk et al., 2019**) who conducted a study in the Netherlands titled "Health Related Quality of Life 5–7 Years after Minor and Severe Burn Injuries" and found a highly statistically significant relationship between the participants' health issues and their overall burn knowledge. however, (**Fathy Mohamed et al., 2021**) showed that there was a statistically significant relationship between the clients' overall health concerns and their comprehensive knowledge of second-degree burns. In the same line, there was a highly significant correlation between the total reported practices of customers regarding second-degree burns and their overall health concerns.

Regarding burn management included; anti-contracture positioning scores, therapeutic exercises scores, massage therapy scores and overall practice there was significant difference before and after rehabilitation program. In the same line (**Fathy Mohamed et al.2021**) reported that there was a positive correlation between clients' total health needs and problems regarding second-degree burn but they showed that, two thirds of the studied clients had incorrect level of total reported practices towards burn care. While one third of them had correct level of total reported practices regarding care of burn.

However, these results were contradict by (*Yilmaz & Andsoy 2020*) in their study in Turkey titled "Traditional and modern practices in wounds and burn injuries in a population of Northwestern Turkey" as they discovered that more than one third of the participants had incorrect total levels of burn care practices, while nearly two thirds had correct total levels of burn care practices. As regards to burn patients' practice observational categories pre and post the rehabilitation program, the overall effectiveness of program was significant and all of the participants before the program had poor practice but after one month of rehabilitation program, three quarters of participants their level of practice became moderate and a quarter became good, after 3 months, most of the participants belonged to good practice.

However, other study by (*Yilmaz & Andsoy 2020*) about Traditional and modern practices in wounds and burn injuries in a population of Northwestern Turkey", conducted in Turkey and they found that nearly two thirds of the participants had correct total level of practices regarding care of burn, while nearly half of them had incorrect total level of practices.

Hospital length and Burn Specific Health Scale-Brief (BSHS-B) scores of studied patients were improved before and after rehabilitation program and the difference were significant. (*Mohamed ., et al 2011*) reported the same findings as the association between length of hospital stay, location of burn, percentage of burn, and pain on admission in BSHS-B were statistically significant links: the physical, mental, and social domains of affect, work, and personal relationships were negatively correlated in patients with prolonged hospital stays. The percentage of burn showed a negative connection with the social domain at work as well as with the social domain in interpersonal interactions. Furthermore, a positive link has been shown between the mental domain on emotion and pain.

CONCLUSION

The findings of the current study led to the conclusion that burn rehabilitation program had a positive effect on improving total mean scores of knowledge and practice of patients. Furthermore, it was proven its success in lowering post-burn complications, and patient's need for surgical intervention. In addition, a positive direct relationship was found between the patient's total knowledge, and practice for patient with burn.

RECOMMENDATIONS

- Comprehensive burns rehabilitation programs should be implemented from the first day of hospital admission, to improve patient's knowledge and to increase his/her awareness regarding appropriate health practices that restore his or her functional abilities, prevent future complications and improve quality of life.
- Continuous patient's education by providing audiovisual materials such as T.V programs, video tapes, models and pictures should be available at inpatient department and outpatient clinic to ensure continuity of indirect learning and promote patient's adherence to treatments modalities within and outside the hospital.
- Inpatient peer education can improve the educational process and motivate patients for learning by training burn survivors who are motivated, fearless, and willing to learn to become a part of the burn team in order to educate, motivate and support other burn patients.

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تأثير البرنامج التأهيلي علي المعرفة والممارسة لمرضى الحروق

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الخلاصة

الحروق هي واحدة من أكثر الأضرار وحشية لجسم الإنسان وعقله ومضاعفاتها واسعة النطاق لها العديد من الآثار السلبية على جودة حياة المريض. الحروق هي مشكلة صحية واسعة النطاق تؤثر في الغالب على الدول ذات الدخل المنخفض والمتوسط، حيث تحدث حوالي ثلثي الحالات في أفريقيا. تظل الحروق مشكلة صحية عامة شائعة وخطيرة. هناك حاجة إلى نهج متعدد التخصصات لتحسين مستوى معرفة المريض وممارسته لتعزيز الشفاء بعد وقوع حادث. إعادة التأهيل جزء أساسي ومتكامل من علاج الحروق. **هدفت الدراسة:-** هو استكشاف تأثير برامج إعادة التأهيل على المعرفة والممارسة لمرضى الحروق. **التصميم:** تم استخدام تصميم بحث شبه تجريبي في هذه الدراسة. **مكان الدراسة:** أجريت الدراسة في مركز الحروق التجميل بمستشفيات جامعة المنصورة. **عينه البحث:** تم تضمين عينة مقصودة من 60 مريضاً مصابين بحروق من الدرجة الثانية تم إدخالهم إلى مركز الحروق التجميل بمستشفيات جامعة المنصورة. **ادوات جمع البيانات:** البيانات التي تم جمعها من خلال الأدوات التالية، الأداة الأولى: البيانات الاجتماعية والديموغرافية للمرضى، الأداة الثانية: استبيان معرفة المرضى، الأداة الثالثة: قائمة مراجعة ممارسات مرضى الحروق. **النتائج:** أظهرت النتائج أن متوسط الدرجات الإجمالية لمعرفة مرضى الحروق وممارساتهم قبل وبعد برنامج إعادة التأهيل كان له فرق كبير. **الاستنتاجات:** خلصت الدراسة الحالية إلى أن برامج إعادة تأهيل الحروق تؤثر بشكل إيجابي على متوسط الدرجات الإجمالية لمعرفة وممارسة مرضى الحروق. **التوصيات:** يجب تنفيذ برامج إعادة تأهيل الحروق الشاملة منذ اليوم الأول لدخول المستشفى، لتحسين معرفة المريض وزيادة وعيه بالممارسات الصحية المناسبة التي تعيد له قدراته الوظيفية وتمنع المضاعفات المستقبلية وتحسن نوعية الحياة.

الكلمات المرشدة: المعرفة والممارسة؛ مرضى الحروق؛ برنامج إعادة التأهيل