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Effect of Multimedia Self-Care Strategy on Outcomes among Patients with Burn

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Background: Burn injuries still negatively affect the varied aspects of life such as physical performance and quality of life. Major burn has long term impact on physical, psychological and social wellbeing. The purpose of the present study is to evaluate the effect of multimedia self-care strategy on functional outcomes among patients with burn. **Design**: A quasi experimental research design was utilized. **Setting**: The study was conducted in Burn Unit at Menoufia University Hospital (Emergency Hospital), Menoufia governorate, Egypt. **Sample**: A purposive sample of 60 adult patients with burn (30 patients in the study group and 30 in the control group). Two instruments were used in data collection Instrument one was a Structured Interviewing Questionnaire Instrument two was World Health Organization of Quality of Life Brief (WHOQOL-Brief). **Results**: After intervention of multimedia self-care strategy for study group, the mean score of all domains of quality of life improved from 44.67 ± 19.36 to 66.63 ± 11.89 for physical health , 38.47 ± 17.16 to 67.40 ± 15.13 for psychological health , 51.93 ± 21.64 to 64.97 ± 16.81 for social relation and 53.03 ± 18.81 to 68.70 ± 12.50 for environmental aspect with statistically significant (P<0.001). But the changes in the quality of life of the patients in the control group were not statistically significant (P>0.05). **Conclusion**: The multimedia self-care strategy for burn patients improved quality of life outcomes among patients with burn. **Recommendation**: A multimedia self-care strategy should be developed and made available for each patient with burn to increase patient's knowledge, decrease strain and improve coping skills and quality of life.

***Key words**: Multimedia; Self-care strategy; Outcomes; Burn*

Introduction

The burn is the most destructive physical and psychosocial traumatic injuries. It is life-threatening and associated with long-term disability and disfigurement especially in low and middle-income countries. Rybarczyk et al., (2017). Currently, 90% of burn occurs in moderate and low-income countries due to lack of facilities and failings in the management of this event. Mirza et al., (2018).

Burn is the fourth leading cause of injuries worldwide, after road traffic collisions, falls, and violence. Murray et al., (2020). Burn injury is under-appreciated trauma that can affect anyone, anytime, and anywhere. The injuries can be caused by heat, cold, chemicals, electricity, friction, radiation or the sun, but the majority of burn injury is caused by heat from hot fluids, steam, solids, or fire. Although all burn injuries involve tissue destruction due to energy transfer, different causes can be associated with different physiological and pathophysiological responses. American Burn Association & National Burn Repository, (2019).

The burns are a devastating injury and associated with impairment of Quality of Life (QOL), emotional well-being, and morbidity. Smolle et al., (2017). Burn trauma is a critical event for the burned patient, their families, the community, and the nation as a whole. Bayuo et al., (2016). Multimedia programs have mentions of advantages such as making use of contexts and audio or video elements like videos, icons, and graphics. Multimedia actions encourage patients to work in groups, solve problems, improve their own behavior, and construct knowledge. Mamashli et al., (2019).

The management of burn patients is with an inter-professional team that consists of a surgeon, burn specialist, dietitian, physical therapist, nurses, wound care specialists, pulmonologist and plastic surgeon. It is best to care for burn patients in a specialized center. The key is to prevent complications and improve outcomes. The outcomes of burn patients depend on the degree and extent of the burn. Most second and third-degree burns require prolonged admission and slow recovery. In burn patients a mental health consultation should be made before discharge. Mason et al., (2017).

Treatment of minor burn, patients being transferred to burn centers does not need extensive debridement or topical antibiotics before transfer. Whether transferring or referring to a burn center, we should contact them before beginning extensive local burn care treatments. Regan & Hotwagner, (2019).

Notifying health education given to the patient is not enough and asking many questions about his/her condition may make them forget instructions when they are in pain or upset by their burn injury. Written information should be provided at the key stages of management to help patients and their families or careers make informed decisions about their care. It should be clear, understandable, evidence-based and culturally sensitive Tetteh et al., (2020).

In advanced years, multimedia has played a significant role in patient education. Healthcare providers have progressed patient quality of life outcomes through multimedia-based health education programs Maier et al., (2018). Improving the patients' knowledge regarding their condition through a multimedia educational program has valuable outcomes such as improved QOL. Therefore, an educational program planned to help patients both during hospitalization and after discharge, should be designed to propose this information. Mansouri et al., (2020).

Previous studies recommended that educational nursing interventions is effective methods to enhance the clinical outcomes of the patient with burn, improve the quality of life effectively American College of Burn Surgeons, (2019).

Significance of the Study

Burn injury is a prevalent and burdensome critical care problem with many consequences ranging from physical, functional, and occupational to cosmetic and psychosocial damage. Rouzfarakh et al., 2021). Worldwide, 195,000 deaths occur annually from the burn. Over 96% of fatal fire-related burn occurs in developing countries. Beside the high death rate, millions of patients suffer lifelong disability and disfigurement resulting from burn. Sarbazi et al., (2019).

In Egypt; according to the statistical reports, approximately 100,000 people get burned yearly .The numbers of burned people are harrowing; the mortality rate of burn

injuries in Egypt is as high as 37%, compared to the average of 5% in other countries in the district. Moreover, the majority who do survive find it difficult to perform their daily activities due to their physical disfigurement and physiological disabilities. Kandeel (2019). The annual statistical report in Menoufia University hospitals particular that the number of patients with burn admission is1656 in 2018 and 1975 case in 2020. (Statistical Department in Shebin ELkom University Hospital). Thereby improving their self-management, self-performance, and QOL, also to reduce stress, pain, complications, and other injuries. So, this study is done to evaluate the effect of multimedia self-care strategy on functional outcomes among patients with burn.

Purpose of the Study

The purpose of this study is to evaluate the effect of multimedia self-care strategy on outcomes among patients with burn.

Research Hypotheses:

- Patients having burn who follow multimedia self-care strategy (study group) will have higher QOL scores as compared to the control group (only receive routine hospital care).
- Patients having burn who follow multimedia self-care strategy (study group) will have fewer burn complications as compared to the control group.
- Patients having burn who receive multimedia self-care strategy will have a higher level of QOL following multimedia self-care strategy than before.

Operational definition:

- Multimedia Self-care strategy: defined as teaching program that used multimedia (written texts , audio, images, animations, video and interactive sources) to help patients how to care for himself / herself through: Gaining knowledge bout disease process and how to cope with symptoms, demonstrating wound dressing, Performing regular physical activity, following healthy diet and caring graft site once discharged.
- Outcomes: They are quality of life outcomes (physical, psychological, social and environmental). It is assessed by instrument two entitled WHOQOL Brief.

Methods

Research design:
A Quasi-experimental research design was utilized in this study (study & control group).

Research Setting:
This study was conducted at the Menoufia University Hospital (Emergency Hospital), at Menoufia governorate, Egypt. The Burn Unit which consists of one hydrotherapy room, three burn rooms (16 beds), ICU room, storage and nursing station

Sample:
A purposive sample of 60 adult patients with burn who fulfilled the inclusion criteria was selected. They were randomly assigned into two equal groups (study & control group) 30 patients for each.

Inclusion criteria:

The inclusion criteria included the following:

Patients with all burn degrees' patients, except first degree and are diagnosis of burn injury who were hemodynamically stable and, able to

communicate and aged 18–60 years were selected.

Exclusion criteria:

Patients with severe complications such as traumatic brain injury, spinal cord injury, serious fracture, amputation or severe infection. Patients with chronic diseases that may affect patient physically, psychologically and socially. History of psychiatric disorders.

Instruments:

1. **Instrument one: Structured interviewing questionnaire**; this instrument developed by the investigator after reviewing related literature WHO, (2018) to assess socio-demographic and medical data. It includes two parts as the following.

- **Part one: Socio-demographic data:** It included age, sex, level of education, occupation, marital status, residence, number of family members and income.
- **Part two**: **Medical data:** This included series of questions to elicit patient's information related to burn past and present medical history such as site of burn, causative factors, burn degree, percent of burn, previous hospitalization, and date of admission and duration of hospitalization.

2. **Instrument two: World Health Organization of Quality of Life Brief (WHOQOL-Brief);** It was developed by WHO, (1991). The WHOQOL- Brief is a shorter version of the original instrument WHOQOL-100. The WHOQOL-BREF questionnaire contains as total of 26 questions, two items from the Overall QOL and General Health and 24 items of satisfaction that are divided into four domains: Physical health with 7 items (DOM1:-6-Q3 + 6-Q4 + Q10 + Q15 + Q16 + Q17 + Q18), psychological health with 6 items (DOM2:- Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26), social relationships with 3 items (DOM3:- Q20 + Q21 + Q22) and environmental health with 8 items (DOM4:- Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25).(Group, W. H. O. Q. O. L, 1994). Some modifications were done by the investigator which include (Re-arrangement of all items to its specific domain).

Scoring system:

Each domain is comprised of multiple questions that are considered together in the derivation of each domain score. Each item of the WHOQOL-BREF is scored from 1 to 5-point on a Likert scale, which is stipulated as a five-point ordinal scale. Domain scores are scaled in a positive direction (i.e., higher scores denote higher QOL). (WHO, 1996). The WHOQOL-BREF domain scores demonstrate good discriminant validity, content validity, internal consistency, and test–retest reliability. Using Cronbach's alpha test reliability of this instrument was 0.884.

Content validity:

All instruments were tested for content validity by five experts in the field of medical surgical nursing including (teaching staff members and burn specialist to ascertain relevance and completeness. Then modifications were done accordingly. It's statistically significant for all instruments were <0.001.

Reliability of the instruments:

All instruments were tested for reliability using test retest method to ascertain consistency: All instruments were tested using Cronbach's alpha test .The period between each test was two weeks. It was 0.884 for instrument WHOQOL Brief.

Ethical Consideration A written approval from ethical and research committee was obtained to carry out the study then an official letter from Menoufia Faculty of Nursing was delivered to the responsible authorities of Menoufia university hospital (Emergency hospital), hospital administrators and the head nurses of burn department to obtain written approval to conduct this study from them after explaining the of study. All patients were informed about the aim of the study and their rights that they were free to decide whether or not they would participate in the study. Then a written informed consent was obtained from each patient. Confidentiality was ensured by not sharing the information linked to the participants name with other individuals.

Pilot study: - A pilot study was carried out on 6 patients (10%) in order to test clarity, feasibility and applicability of the instruments. The pilot study was also used to estimate the time needed for each subject to fill in the questionnaire. Modifications were done based on the results of the pilot study. Patients who participated in the pilot study were excluded from the main study sample.

Procedure:

- Data collection extended over a period of 6 months (from the beginning of July 2019 to the end of December 2019).
- At the beginning of the study baseline assessment of patient's social & medical data was performed using instrument one. Also subjects of all both groups were assessed for QOL using instrument two.
- Individualized plan for patients of group I was developed based on the findings of the assessment. Goals, priority of care & expected outcomes criteria were formulated.
- An illustrative designed multimedia (audio, video, brochure and demonstrations) were prepared to be introduced to each patient of the study group as a guide for all data related to interventions.
- All subjects in the study group were interviewed in the burn department during certain days (Sunday, Wednesday) for four sessions for two weeks to give them the strategy of the study as follows: Each session took from 45 to 60 minute Designed multimedia presentation (audio, video, brochure and demonstrations) was used.
- **1st** session included giving verbal instruction about burn (definition, causes, degree, complications and treatment). These instructions were supplemented by multimedia presentation, animation and sound.
- **2nd** session included giving instructions about nutrition as well as infection control and reinforcing the need for adherence with nutrition and infection control, that's supplemented by an illustrative guidance through (brochure, video and text) for more clarification to patients.
- **3rd session** included demonstration and re-demonstration about dressing technique It was supplemented by using brochure, audio and video.
- **4th session** included giving instructions about exercise and psychological management that's supplemented by video.
- At the beginning of each session, the investigator had refreshed the previously given instructions then started the new one so.
- Each patient was allowed to ask any question and also they were

advised to carry out the routine hospital care as prescribed by the treating physicians. The patients were checked for acquisition of knowledge and practice.

- Each patient was followed up by the investigator using telephone to be sure that they follow the instructions as illustrated by the investigator.
- Evaluation was done for both groups pre, post intervention. (At the beginning of the study and immediately before discharge).

Statistical analysis:

Data was fed to the computer and analyzed using IBM SPSS software package version 20.0. Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, and standard deviation. Significance of the obtained results was judged at the 5% level.

Two types of statistics were done:

I. Descriptive statistics: They were expressed as mean and standard deviation (X+SD) for quantitative data or number and percentage (No & %) for qualitative data.

II.Analytic statistics: Chi-square test was used for categorical variables, to compare between different groups. Fisher's Exact or Monte Carlo correction: Correction for chi-square was when more than 20% of the cells have expected count less than 5. Marginal Homogeneity Test: Used to analyze the significance between the different stages. Student t-test: For normally distributed quantitative variables, to compare between two studied groups. Paired ttest & F-test (ANOVA): For normally distributed quantitative variables, to compare between more than two groups. Mann-Whitney test (non-parametric test) was used for comparison between two groups of not normally distributed quantitative variables.

By using the following power analysis equation

n

$$\geq \frac{\left(z_{1-\sigma/2} + z_{1-\beta}\right)^2 \left(\sigma\frac{2}{1} + \sigma\frac{2}{2}/r\right)}{(\mu 1 - \mu 2)^2}$$

- N= number of sample
- Z alpha= 1.96 (95%)
- Z beta= 0.84
- Sigma= standard deviation
- Mu=mean

Table 3: showed distribution of physical health domain of WHOQOL-BREF among studied groups on pre and post-intervention. It clarifies that, in the study group, there are highly statistically significant differences at 1% level of significance between pre and post-intervention regarding "Activities of daily living, Dependence on medicinal substances and medical aids and Work Capacity". While there are statistically significant differences between pre and post-intervention regarding "Energy and fatigue, Mobility, Pain and discomfort & Sleep and rest". This reveals that there is an improvement in the physical health of the study group

after intervention. Also, there are statistically significant differences between study and control group post-intervention regarding "Activities of daily living, Dependence on medicinal substances and medical aids, Sleep and rest and Work Capacity". Otherwise, there are no statistically significant differences regarding "Energy and fatigue, Mobility and Pain and discomfort".

Table 4: showed distribution of psychological health domain of WHOQOL-BREF among studied groups on pre and post-intervention. It clarifies that, in the study group, there are highly statistically significant differences at 1% level of the significance between pre and post-intervention regarding "Bodily image and appearance, Negative feelings, Positive feelings, Self-esteem &Spirituality / Religion / Personal beliefs". While there are statistically significant differences between pre and post-intervention regarding "Thinking, learning, memory, and concentration". This reveals that there is an improvement in the psychological health of the study group after intervention. Also, there are statistically significant differences between study and control groups post-intervention regarding "all items of psychological health".

Table 5: showed distribution of social relationship domain of WHOQOL-BREF among studied groups on pre and post-intervention. It clarifies that, in the study group, there are statistically significant differences between pre and post-intervention regarding "Personal relationships, Social support& Sexual activity". This reveals that there is an improvement in the social relationship of the study group after intervention. Also, there are statistically significant differences between study and control groups post-intervention regarding "Personal relationships Social support". Otherwise, there are no statistically significant differences regarding "Sexual activity".

Table 6: showed distribution of environmental domain of WHOQOL-BREF in the studied groups on pre and post-intervention. It clarified that, in the study group, there are highly statistically significant differences at 1% level of the significance between pre and post-intervention regarding "Financial resources, Opportunities for acquiring new information and skills & Participation in and opportunities for recreation/leisure activities". While there were statistically significant differences between pre and post-intervention regarding "Freedom, physical safety and security, health and social care: accessibility and quality, Home environment, Physical environment (pollution/noise/traffic/climate) & Transport". This revealed that there was improvement in the environmental aspect of the study group after intervention. Also, there were statistically significant differences between study and control groups post-intervention regarding "Financial resources, Freedom, physical safety and security, health and social care: accessibility and quality, Opportunities for acquiring new information and skills & Participation in and opportunities for recreation/leisure activities". Otherwise, there were no statistically significant differences regarding "Home environment, Physical environment (pollution/noise/traffic/climate) & Transport".

Table 7: Showed mean and standard deviation of WHOQOL-

BREF score for studied group's pre and post intervention .It clarified that at pre-intervention, the mean of physical health for the study and control group was 44.67 ± 19.36 & 46.43 ± 19.59 respectively, Regarding Psychological aspect, the mean of both groups was 38.47 ± 17.167 & 40.0 ± 18.30 respectively. Concerning Social relationships, the mean of the study and control group was 51.93 ± 21.64 & 53.33 ± 19.99 respectively. For Environmental aspect, the mean of both groups were 53.03 ± 18.81 & 54.70 ± 18.17 respectively. There was no statistically significant difference between the study and control groups on pre-intervention. On post-intervention, the mean of Physical health for the study group was 66.63 ± 11.89, for the control group the mean was 49.07 ± 16.63. Regarding Psychological aspects, the mean of the study group was 67.40 ± 15.13 and 40.83 ± 17.10) for the control group. Concerning Social relationships, the mean of the study group was 64.97 ± 16.81 while in the control group, the mean was 53.33 ± 19.99. Regarding Environmental aspects, the mean of the study group was 68.70 ± 12.50 and 55.30 ± 18.18 for the control group. There were highly statistically significant differences between the two groups on post-intervention related to physical health dimensions and psychological dimensions with p-value ($p \leq 0.001$), and psychological dimensions with p-value ($p \leq 0.002$) but there were statistically significant differences between the two groups related to social relationships with p-value ($p \leq 0.018$). This revealed that the study group subjects had higher QOL scores after intervention as compared to the control group.

Figure (1): **showed mean scores of WHOQOL-BREF among the study group pre and post program implementation**. It revealed that on pre-intervention, the mean of Physical health was 44.67 ± 19.36, (38.47 ± 17.16) for Psychological health, (51.93 ± 21.64) for social relationships and 53.03 ± 18.81 for environmental aspect. On post-intervention, the mean of Physical health was 66.63 ± 11.89. Psychological health was 67.40 ± 15.13. Social relationships was 64.97 ± 16.81 and Environmental aspect for the study group was 68.70 ± 12.50. There was a significant increase in their mean scores in domains of total WHOQOL-BREF score after implementation of the intervention of the study group.

Figure (2): illustrated distribution of studied patients in the study and control groups according to complications on pre and post intervention. It clarified that, about one-third (33.3%) of the study group had infection, while less than one-third (30.0%) of the control group had break down of skin integrity on pre intervention. Meanwhile, on post-intervention, 73.3% of the study group had no complications and 46.6% of the control group had infection & break down of skin integrity. So, there was a statistical significant difference at 1% level of significance between pre and post-intervention for the study group. Also, there was a statistical significant difference at 5% level of significance between the study and control groups on post-intervention. It meant that the patients in the study group had fewer burn complications as compared to the control group

Table 1: Distribution of studied groups (study and control) according to their social characteristics

Social Characteristics	Study (n=30)		Control(n=30)		Test	P
	No.	%	No.	%		
Age (years)						
18- 29	19	63.3	17	56.7	χ^2= 0.365 ns	0.879
30 – 39	7	23.3	8	26.7		
40- 49	2	6.7	3	6.7		
50- 65	2	6.7	2	10.5		
Range	18.0 – 52.0		19.0 – 51.0		t=0.642 ns	0.524
Mean ±SD.	30.03 ±8.27		31.43 ± 8.63			
Sex						
Male	23	76.7	22	73.3	FET 0.089 ns	0.766
Female	7	23.3	8	26.7		
Marital status					χ^2=	
Married	8	26.7	9	30.0	3.480 ns	.323
Divorced	1	3.3	4	13.3		
Single	21	70.0	17	56.7		
Education						
Illiterate	3	10.0	6	20.0	1.176 ns	FET 0.472
Literate	27	90.0	24	80.0		
Occupation						
Worker	17	56.7	16	53.3	.601 ns	FET303
Non-worker	13	43.3	14	46.7		
Residence						
Rural	20	66.7	18	60.0	0.287 ns	FET 0.592
Urban	10	33.3	12	40.0		
Number of family						
Range	1.0 – 7.0		2.0 – 7.0		t=0.443 ns	0.660
Mean ±SD.	4.77 ± 1.55		4.93 ± 1.36			
Rooms number						
Range	2.0 – 7.0		2.0 – 7.0		t=1.984 ns	0.052
Mean ±SD.	3.80 ± 1.10		3.20 ± 1.24			

Income						
Enough	**4**	**13.3**	**5**	**16.7**	**0.131 ns**	**FET 0.718**
Non-enough	**26**	**86.7**	**25**	**83.3**		
Previous hospitalization						
Yes	**2**	**6.7**	**6**	**20.0**	**2.308 ns**	**FET 0.254**
No	**28**	**93.3**	**24**	**80.0**		
Crowding index						
Min. – Max.	**0.33 – 2.0**		**0.57 – 3.0**		**t=0.356**	**0.723**

***Note:* χ^2: Chi-square** **test t: Student t-test**

FET: Fisher Exact Test. ***ns= not significant (p>0.05)***

Table2: Distribution of the studied groups (study and control) according to medical data

Patient history	**Study (n=30)**		**Control (n=30)**		**χ^2**	**P**
	No.	**%**	**No.**	**%**		
Burn place						
Home	**17**	**56.7**	**19**	**63.3**	**0.455 ns**	**0.860**
Work	**10**	**33.3**	**9**	**30.0**		
Other (cold, friction, surgical, cosmetics)	**3**	**10.0**	**2**	**6.7**		
Causes						
Flame	**11**	**36.7**	**12**	**40.0**	**2.479 ns**	**0.695**
Hot fluid	**10**	**33.3**	**9**	**30.0**		
Chemical	**2**	**6.7**	**5**	**16.7**		
Electrical	**4**	**13.3**	**3**	**10.0**		
Other	**3**	**10.0**	**1**	**3.3**		
Percentage TBS						
Less than 15%	**11**	**36.7**	**14**	**46.7**	**0.889 ns**	**0.641**
15– 25%	**10**	**33.3**	**7**	**23.3**		
More than 25%	**9**	**30.0**	**9**	**30.0**		
Area						**FET**
Head	**4**	**13.3**	**9**	**30.0**	**2.455 ns**	**0.117**

Face	**15**	**50.0**	**10**	**33.3**	**1.714 ns**	**0.190**
Neck	**6**	**20.0**	**6**	**20.0**	**0.00 ns**	**1.000**
Anterior chest	**11**	**36.7**	**13**	**43.3**	**0.278 ns**	**0.598**
Posterior chest	**4**	**13.3**	**7**	**23.3**	**1.002 ns**	**0.317**
Anterior abdomen	**8**	**26.7**	**11**	**36.7**	**0.693 ns**	**0.405**
Posterior abdomen	**3**	**10.0**	**4**	**13.3**	**0.162 ns**	**1.000**
Upper extremities	**19**	**63.3**	**15**	**50.0**	**1.086 ns**	**0.297**
Lower extremities	**11**	**36.7**	**14**	**46.7**	**0.617 ns**	**0.432**
Buttocks	**1**	**3.3**	**3**	**10.0**	**1.071 ns**	**0.612**
Genital organs	**2**	**6.7**	**2**	**6.7**	**0.00 ns**	**1.000**
Second degree of burn						
Yes	**22**	**73.3**	**23**	**76.7**	**0.089 ns**	**FET =0.766**
No	**8**	**26.7**	**7**	**23.3**		
Third-degree of burn						
Yes	**19**	**63.3**	**21**	**70.0**	**0.300 ns**	**FET = 0.584**
No	**11**	**36.7**	**9**	**30.0**		

***Note:*χ^2: Chi-square** **test t: Student t-test**

FET: Fisher Exact Test. ***ns= not significant (p>0.05)***

N.B: One patient with burn may have more than degree of burn in different surfaces of the skin. E.g. second with third degree of burn.

Table (3): Distribution of studied groups (study and control) according to their physical health

Physical health	**Study (n=30)**					**Control(n=30)**					$\chi^2 2$ (P2)
	Pre		**Post**		$\chi^2 1$ (P1)	**Pre**		**Post**		$\chi^2 1$ (P1)	
	No.	**%**	**No.**	**%**		**No.**	**%**	**No.**	**%**		
Activities of daily living											
• not at all	2	6.7	4	13.3	24.32 .000	1	3.3	2	6.7	4.90 >0.05	12.66 .005
• a little	7	23.3	20	66.7		10	33.3	12	40.0		
• a moderate amount	4	13.3	6	20.0		2	6.7	6	20.0		
• very much	16	53.3	0	.0		16	53.3	10	33.3		
• an extreme amount	1	3.3	0	.0		1	3.3	0	.0		
Dependence on medicinal substances and medical aids											
• not at all	1	3.3	13	43.3	19.68 .000	0	.0	3	10.0	4.09 >0.05	15.58 .001
• a little	9	30.0	11	36.7		11	36.7	10	33.3		
• a moderate amount	14	46.7	6	20.0		12	40.0	8	26.7		
• very much	6	20.0	0	.0		7	23.3	9	30.0		
Energy and fatigue											
• not at all	2	6.7	0	.0	16.41 .001	3	10.0	0	.0	4.76 >0.05	4.35 >0.05
• a little	12	40.0	2	6.7		9	30.0	8	26.7		
• moderately	14	46.7	16	53.3		13	43.3	12	40.0		
• mostly	2	6.7	12	40.0		5	16.7	10	33.3		
Mobility					13.36					5.67	5.54

• very poor	7	23.3	0	.0	.010	6	20.0	4	13.3	>0.05	>0.05
• a little	7	23.3	3	10.0		7	23.3	2	6.7		
• neither poor nor good	7	23.3	10	33.3		8	26.7	8	26.7		
• good	8	26.7	17	56.7		9	30.0	15	50.0		
• very good	1	3.3	0	.0		0	.0	1	3.3		
Pain and discomfort											
• very dissatisfied	7	23.3	0	.0	12.93 .012	6	20.0	4	13.3	3.74 >0.05	5.27 >0.05
• dissatisfied	3	10.0	2	6.7		4	13.3	3	10.0		
• neither satisfied nor dissatisfied	11	36.7	7	23.3		11	36.7	8	26.7		
• satisfied	8	26.7	18	60.0		9	30.0	13	43.3		
• very satisfied	1	3.3	3	10.0		0	.0	2	6.7		
Sleep and rest											
• very dissatisfied	9	30.0	0	.0	14.18 .007	8	26.7	5	16.7	3.49 >0.05	9.835 .043
• dissatisfied	4	13.3	2	6.7		5	16.7	3	10.0		
• neither satisfied nor dissatisfied	8	26.7	9	30.0		10	33.3	11	36.7		
• satisfied	9	30.0	17	56.7		7	23.3	9	30.0		
• very satisfied	0	.0	2	6.7		0	.0	2	6.7		
Work Capacity											
• very dissatisfied	7	23.3	0	.0	23.50 .000	8	26.7	5	16.7	6.38 >0.05	11.34 .023
• dissatisfied	4	13.3	0	.0		6	20.0	2	6.7		
• neither satisfied nor dissatisfied	13	43.3	7	23.3		10	33.3	11	36.7		
• satisfied	6	20.0	19	63.3		6	20.0	10	33.3		
• very satisfied	0	.0	4	13.3		0	.0	2	6.7		

***Note**: (HS = (p≤ 0.001) (S)=(p≤ 0.05) ns= not significant (p>0.05*)

$\chi^2 1$&p$_1$*: differences between* pre and post intervention in each group.

$\chi^2 2$&p2: *differences between* study and control post-intervention

Table (4): Distribution of studied groups (study and control) according to their psychological health

Psychological health	Study (n=30)					Control(n=30)					$\chi^2 2$ (P2)
	Pre		Post		$\chi^2 1$ (P1)	Pre		Post		$\chi^2 1$ (P1)	
	No.	%	No.	%		No.	%	No.	%		
Bodily image and appearance											
• not at all	5	16.7	0	.0	24.52 .000	6	20.0	3	10.0	2.56 >0.05	14.66 .005
• a little	15	50.0	2	6.7		14	46.7	12	40.0		
• a moderate amount	3	10.0	13	43.3		4	13.3	8	26.7		
• very much	7	23.3	14	46.7		6	20.0	7	23.3		
• an extreme amount	0	.0	1	3.3							
Negative feelings											
• not at all	6	20.0	18	60.0	21.02 .000	7	23.3	6	20.0	1.85 >0.05	13.66 .003
• a little	12	40.0	2	6.7		12	40.0	8	26.7		
• a moderate amount	7	23.3	10	33.3		6	20.0	8	26.7		
• very much	5	16.7	0	.0		5	16.7	8	26.7		
Positive feelings											
• not at all	5	16.7	0	.0	22.50 .000	6	20.0	4	13.3	2.45 >0.05	19.94 .001
• a little	7	23.3	0	.0		8	26.7	9	30.0		
• a moderate amount	12	40.0	8	26.7		11	36.7	9	30.0		
• very much	5	16.7	14	46.7		4	13.3	4	13.3		
• an extreme amount	1	3.3	8	26.7		1	3.3	4	13.3		
Self-esteem											
• not at all	4	13.3	0	3	20.38 .000	6	20.0	3	10.0	2.97 >0.05	12.37 .015
• a little	14	46.7	3	10.0		13	43.3	10	33.3		
• a moderate amount	7	23.3	7	23.3		7	23.3	9	30.0		
• mostly	4	13.3	13	43.3		3	10.0	6	20.0		
• completely	1	3.3	7	23.3		1	3.3	2	6.7		
Spirituality / Religion					23.26					4.74	10.55

/ Personal beliefs					.000					>0.05	.032
• very dissatisfied	4	13.3	0	.0		4	13.3	1	3.3		
• dissatisfied	6	20.0	3	10.0		7	23.3	5	16.7		
• neither satisfied nor dissatisfied	16	53.3	5	16.7		14	46.7	13	43.3		
• satisfied	3	10.0	15	50.0		4	13.3	10	33.3		
• very satisfied	1	3.3	7	23.3		1	3.3	1	3.3		
Thinking, learning, memory, and concentration											
• never	3	10.0	7	23.3	10.33	4	13.3	6	20.0	.600	12.34
• seldom	13	43.3	20	66.7	.035	11	36.7	9	30.0	>0.05	.006
• quite often	9	30.0	2	6.7		8	26.7	8	26.7		
• very often	4	13.3	1	3.3		7	23.3	7	23.3		
• always	1	3.3	0	.0		0	.0	0	.0		

***Note**: (HS)= (p≤ 0.001) (S)=(p≤ 0.05) ns= not significant (p>0.05*)

$\chi^2 1$&p$_1$*: differences between* pre and post intervention in each group.

$\chi^2 2$&p2: *differences between* study and control post-intervention.

Table (5): Distribution of studied groups (study and control) according to their social relationships

Social relationship	**Study (n=30)**					**Control(n=30)**					$\chi^2 2$ (P2)
	Pre		**Post**		$\chi^2 1$ (P1)	**Pre**		**Post**		$\chi^2 1$ (P1)	
	No.	**%**	**No.**	**%**		**No.**	**%**	**No.**	**%**		
Personal relationships											
• very dissatisfied	1	3.3	0	.0		1	3.3	1	3.3		
• dissatisfied	4	13.3	1	3.3		6	20.0	5	16.7		
• neither satisfied nor dissatisfied	14	46.7	5	16.7	13.89 .008	14	46.7	8	26.7	3.68 >0.05	12.35 .015
• satisfied	10	33.3	16	53.3		9	30.0	16	53.3		
• very satisfied	1	3.3	8	26.7							
Social support											
• very dissatisfied						1	3.3	1	3.3		
• dissatisfied	4	13.3	2	6.7		5	16.7	5	16.7		
• neither satisfied nor dissatisfied	14	46.7	4	13.3	12.05 .007	13	43.3	8	26.7	2.27 >0.05	10.91 .028
• satisfied	9	30.0	12	40.0		9	30.0	14	46.7		
• very satisfied	3	10.0	12	40.0		2	6.7	2	6.7		
Sexual activity											
• very dissatisfied	1	3.3	0	.0		2	6.7	2	6.7		
• dissatisfied	5	16.7	5	16.7		6	20.0	5	16.7		
• neither satisfied nor dissatisfied	9	30.0	8	26.7	7.87 .096	10	33.3	6	20.0	2.17 >0.05	5.57 >0.05
• satisfied	10	33.3	17	56.7		9	30.0	14	46.7		
• very satisfied	5	16.7	0	.0		3	10.0	3	10.0		

***Note**: (S)= (p≤ 0.05) ns= not significant (p>0.05*)

$\chi^2 1$&p$_1$*: differences between* pre and post intervention in each group.

$\chi^2 2$&p2: *differences between* study and control post-intervention

Table (6): Distribution of studied groups (study and control) according to their environmental domains on pre and post test

Environmental	Study (n=30)					Control(n=30)					$\chi^2 2$ (P2)
	Pre		Post		$\chi^2 1$ (P1)	Pre		Post		$\chi^2 1$ (P1)	
	No.	%	No.	%		No.	%	No.	%		
Financial resources											
• a little	8	26.7	1	3.3	22.36 .000	7	23.3	5	16.7	1.22 >0.05	15.41 .001
• a moderate amount	7	23.3	2	6.7		10	33.3	8	26.7		
• very much	15	50.0	13	43.3		12	40.0	15	50.0		
• an extreme amount	0	.0	14	46.7		1	3.3	2	6.7		
Freedom, physical safety, and security											
• not at all	3	10.0	0	.0	15.13 .004	5	16.7	2	6.7	2.84 >0.05	17.78 .001
• a little	11	36.7	1	3.3		14	46.7	12	40.0		
• a moderate amount	11	36.7	19	63.3		7	23.3	8	26.7		
• very much	4	13.3	8	26.7		4	13.3	8	26.7		
• an extreme amount	1	3.3	2	6.7		30	100.0	30	100.0		
Health and social care: accessibility and quality											
• not at all	0	0	0	0	13.55 .004	2	6.7	2	6.7	.484 >0.05	17.79 .001
• a little	3	10.0	0	.0		4	13.3	5	16.7		
• moderately	7	23.3	0	.0		5	16.7	5	16.7		
• mostly	7	23.3	16	53.3		7	23.3	5	16.7		
• completely	13	43.3	14	46.7		12	40.0	13	43.3		
Home environment											
• not at all					15.84 .001	2	6.7	1	3.3	1.39 >0.05	8.69 >0.05
• a little	2	6.7	0	.0		2	6.7	3	10.0		
• moderately	14	46.7	2	6.7		10	33.3	7	23.3		
• mostly	8	26.7	18	60.0		10	33.3	11	36.7		
• completely	6	20.0	10	33.3		6	20.0	8	26.7		
Opportunities for acquiring new information and skills											
• a little	2	6.7	0	.0	21.14 .000	4	13.3	3	10.0	3.44 >0.05	9.49 .023
• moderately	12	40.0	1	3.3		8	26.7	7	23.3		
• mostly	13	43.3	12	40.0		14	46.7	10	33.3		
• completely	3	10.0	17	56.7		4	13.3	10	33.3		
Participation in and opportunities for recreation/leisure activities											
• very dissatisfied					20.08 .000	1	3.3	1	3.3	.710 >0.05	12.25 .016
• dissatisfied	7	23.3	1	3.3		6	20.0	5	16.7		
• neither satisfied nor dissatisfied	5	16.7	6	20.0		7	23.3	5	16.7		
• satisfied	17	56.7	8	26.7		13	43.3	15	50.0		
• very satisfied	1	3.3	15	50.0		3	10.0	4	13.3		

Continue Table (6): Distribution of studied groups (study and control) according to their environmental domains on pre and post test

Environmental	Study (n=30)					Control(n=30)					$\chi^2$2 (P2)
	Pre		Post		$\chi^2$1 (P1)	Pre		Post		$\chi^2$1 (P1)	
	No.	%	No.	%		No.	%	No.	%		
Physical Environment (pollution / noise / Traffic / climat)											
• very dissatisfied	14	46.7	7	23.3	10.47 .015	11	36.7	8	26.7	1.31 >0.05	7.25 >0.05
• dissatisfied	6	20.0	15	50.0		6	20.0	8	26.7		
• neither satisfied nor dissatisfied	6	20.0	8	26.7		10	33.3	9	30.0		
• satisfied	4	13.3	0	.0		3	10.0	5	16.7		
Transport											
• very dissatisfied	1	3.3	0	.0	15.96 .003	.0	.0	.0	.0	.144 >0.05	6.96 >0.05
• dissatisfied	9	30.0	1	3.3		8	26.7	7	23.3		
• neither satisfied nor dissatisfied	5	16.7	3	10.0		5	16.7	5	16.7		
• satisfied	13	43.3	13	43.3		11	36.7	11	36.7		
• very satisfied	2	6.7	13	43.3		6	20.0	7	23.3		

Note: *(HS)= ($p \leq 0.001$)* *(S)=($p \leq 0.05$) ns= not significant ($p>0.05$)*

$\chi^2$1&p1*: differences between* pre and post intervention in each group.

$\chi^2$2&p2: *differences between* study and control post-intervention

Figure (1): Mean scores of WHOQOL-BREF score among the study group pre and post program implementation.

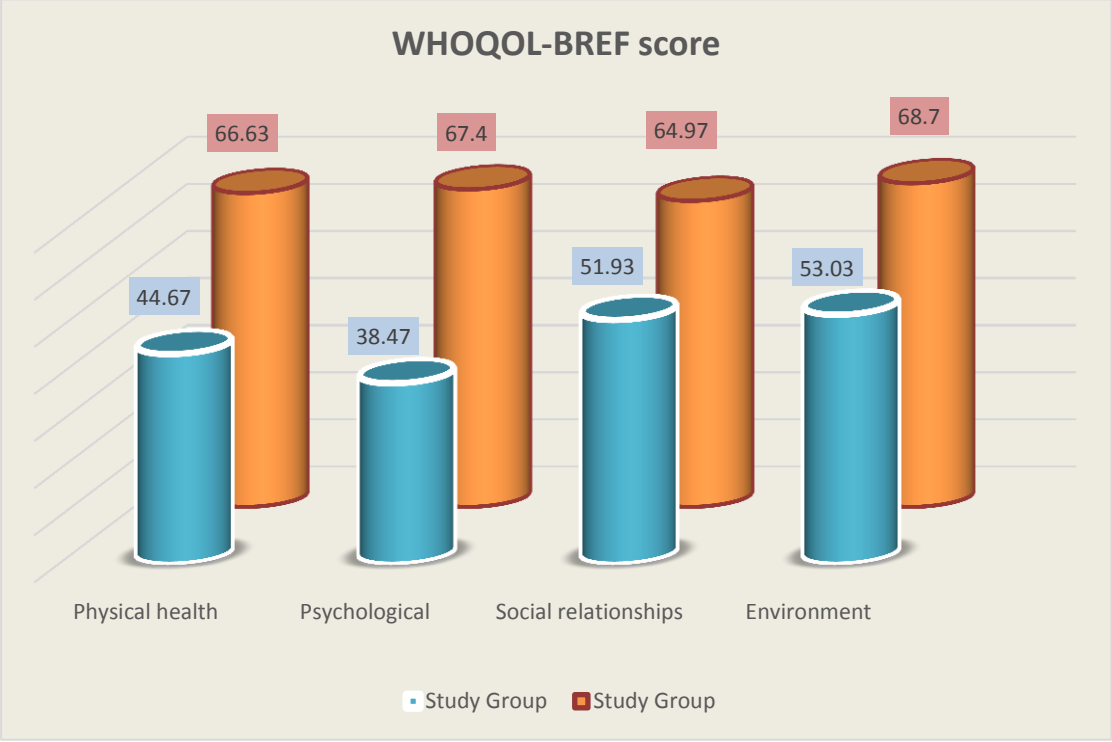
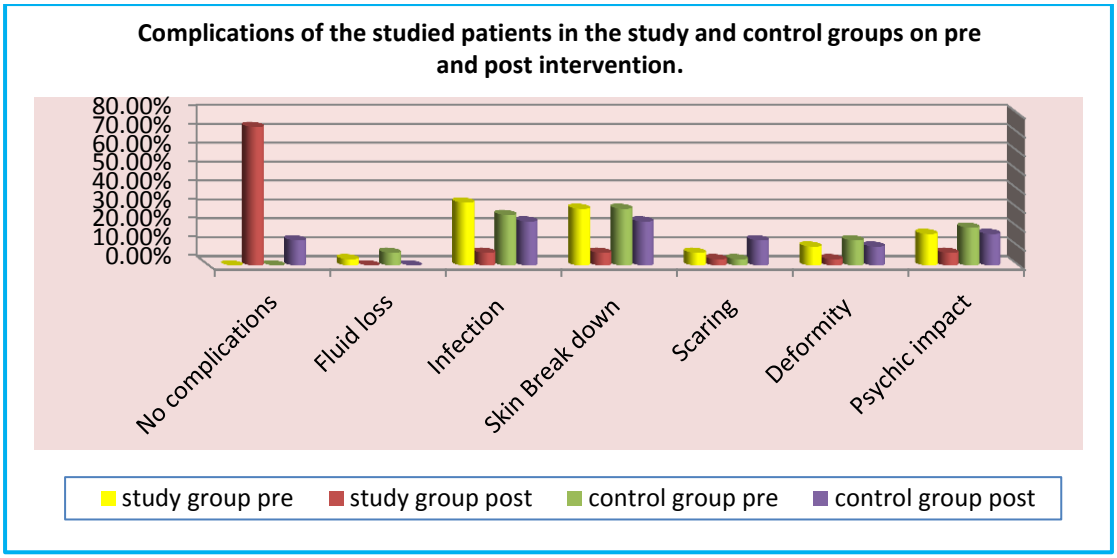


Figure (2): Distribution of studied patients in the study and control groups according to their developed complications on pre and post intervention.



Discussion

Regarding the causes of hospitalization, the results of this study revealed that the most common cause of burn was flame. This coincides with Malik et al., (2012), whose study is entitled "Quality of life in Burn Injury Patients "and stated that most of the patients in the study and control group had a burn that was thermal in nature. Also, the study agrees with Krishnamurthy et al., (2018), who introduced a study entitled "Pattern of Burn Injury Admissions at a Teaching Hospital of Karnataka, India" and found that flame burn was the most common type of burn. From the investigator's point of view, the cultural characteristics in our country such as the use of gas pipelines for cooking, kerosene oil, wood-based fuel, and stove burners have been reported as the most common causes of starting the fire injuries.

In the current study more than half of the incidence of burn is at home. This agrees with Abd Elalem et al., (2018) who carried out a study in Egypt entitled "The Effect of Self-care Nursing Intervention Model on Self-Esteem and Quality of Life among Burn Patients" and showed that more than two-thirds of the patients were burned at homes. Also Rizk & Hassan, (2018), undertook a study entitled "The Effect of Pre-Discharge Multimedia Self-Care Education on Burn Specific Health among Patients with Burn" and revealed that about two-thirds of patients in the experimental and control groups were injured at home. From the investigator's point of view, the domestic chores and unsafe equipment which were utilized at home were main causes of burn. In addition, about half of the studied subjects were not working and were staying at home.

Concerning total body surface area (TBSA), the current study stated that more than one third had >15% of TBSA burn of the study and control groups. This agrees with Abd Elalem et al., (2018), who introduced a study entitled "The Effect of Self-care Nursing Intervention Model on Self-Esteem and Quality of Life among Burn Patients" and showed that more than half of the patients had the extent of burn from 10%-20%. While this is incongruent with Afify et al., (2012), who studied "Fatal Burn Injuries: a Five-year. Retrospective Autopsy Study in Cairo City, Egypt", and showed that most of the victims sustained more than 50% of the total body surface area (TBSA) burns. In addition, Mamashli et al., (2019), who studied "Investigating the Psychosocial Empowerment Interventions through Multimedia Education in Burn Patients" Stated that about one third in the intervention and control group had a

burning percentage of 15-20% and more than one third had a burning percentage of 21-26%.

Regarding the degree of burn, our results showed that the majority was second degree 73%, and third-degree 60%. This finding is supported by Heydarikhayat et al., (2018), who studied "Effect of Post-Hospital Discharge Follow-up on Health Status in Patients with Burn Injuries: A Randomized Clinical Trial" and reported that the most of patients had a mixed burn. While Al Laham et al., (2015) & Melake et al., (2015) were incongruent as they pointed that the majority of burned patients; (more than two thirds) were of the second degree, whereas less than one quarter had third-degree burn and the lowest percentages were of the first degree. Anwar, (2019) concluded that the first-degree burn was the most common type by 71.7%, second 25%, third 2.2%, and fourth-degree represented only 0.5%. From the investigator's point of view, the majority of patients had no enough knowledge about first aid and how to deal with fire sources. This might lead to increased burn wound depth and more complications.

Regarding the site of the burn, the current study revealed that more than half of patients had upper extremities burns. These findings came under Malik et al., (2012), in a study entitled "Quality of life in Burn Injury Patients", and they found that all the cases had a history of burn in the upper extremities. Also, this finding is in the same line with Echevarría-Guanilo et al., (2016), who carried out a study entitled "Assessment of Health-related Quality of Life in the First Year After burn": and mentioned that the most affected body areas were the upper limbs. Also, these findings were supported by Kazemzadeh et al., (2019), who studied "The Quality of Life in Women with Burns in Iran" and stated that, regarding the site of burn, in most of cases, burns were in the upper arms and half of the cases were in the head and neck. Only 0, 5% of the cases reported burns in their genitals. On the other hand, these findings were contradicted by Pavoni et al., (2010), who studied "Outcome Predictors and Quality of Life of Severe Burn Patients Admitted to Intensive Care Unit" who demonstrated that most of the patients had burns to the head associated to the upper and lower extremities. From the investigator's point of view, the upper extremities usually faced the fire source as the patient dealt with arms to control and save him/her self.

The results of the present study supported hypotheses and showed an improvement in QOL outcomes of burn patients after the intervention.

First hypothesis, the study group subjects of burn patients who follow multimedia self- care strategy will have higher QOL scores as compared to control group.

According to the present study; there was an obvious improvement in the mean of total QOL score among study group than control group post intervention. This finding was in line with a study conducted by (Radwan et al, (2011) entitled "Effect of a rehabilitation program on the knowledge, physical and psychosocial functions of patients with burns" in Egypt. It showed that rehabilitation program improved the physical, social and mental functions of patients in the experimental group. The same findings was reported in other studies, as well, (Hashemi et al, (2014), which was entitled "Effect of Orem Self-Care Program on the Life Quality of Burn Patients" They found an improvement in the quality of life of burn patients after the interventions, while no significant changes were observed in the quality of life of the control group. Also, the results of the current study agreed with Lotfi et al, (2018), who reported that the experimental group who received pre-discharge training significantly scored higher QOL than the control group. The results of the present study are consistent

with those of other studies which confirm the positive impact of self-care strategy on promoting the quality of life in burn injuries. Abd Elalem et al, (2018) showed that the mean QOL score was significantly lower in cases pre intervention but in post intervention overall mean score increased. Also, the results of a study by Grisbrook et al, (2012) entitled "Exercise training to improve health related quality of life in long term survivors of major burn injury: A matched controlled study in Australia" showed that accomplishment of exercise program would improve the quality of life of these patients. Heydarikhayat et al, (2018) found an improvement in the health status of burn patients after the intervention. However, Roh et al, (2010) in a study entitled "Effects of a skin rehabilitation nursing program on skin status, depression, and burn-specific health in burn survivors" in South Korea showed that the impact of this program on the quality of life of burn patients was not significant. Perhaps this lack of consistency is related to number of training sessions, since only one training session was held in their studies while four sessions of strategy were held in the present study.

Second hypothesis, the study group subjects who follow multimedia self- care strategy will have fewer burn complications as compared to control group.

According to results of our study, it was reported that infection was the most common complication that followed break down of skin integrity. These findings came in accordance with Barajas-Nava et al., (2013) who stated that wound infections was a serious complication that could contribute to delayed healing, enhanced scaring and persistent infections that could lead to death of the patients. Also Jaiswal et al., (2007) reported that commonest complication was burn wound sepsis (most frequently by gram-negative bacilli). This result was opposed with the findings of Alanazi et al., (2019) who reported that skin disfigurement was the second most common complication that followed bacterial infection of the burn. Other studies conducted by Shahid et al., (2018) and observed that the most common complication was hypertrophic scar and contracture deformity.

Third hypothesis: Burn patients who receive multimedia self-care strategy will have a higher level of QOL following multimedia self-care strategy than before. Results of the current study was in accordance of the hypothesis as there was an improvement in the quality of life of patients in relation to physical health, psychological health, social relationships and environmental health.

Conclusions

Based on the obtained results of this study, designing and implementing a self-care program based on multimedia self-care strategy and the needs of patients with burn will improve their physical and mental health, and QOL. Implementing of multimedia self-care intervention strategy at the burn unit was effective when providing care as it encouraged patient to be an active participant in care and had a significant improvement of QOL among patients with burn.

Recommendations:

1. A multimedia self-care strategy should be developed and be available for each patient with burn to increase patient knowledge, decrease patient strain, improve patient coping skills and outcomes.
2. Simplified booklet on self-care should be available for patient with burn and their families.
3. Nurses need to fulfill their roles as health educator for patient with burn.
4. The Further studies with the use of the program should be done with more samples and in a longer duration.

References

Abd Elalem, S. M., Shehata, O. S. M., & Shattla, S. I. (2018): The effect of self-care nursing intervention model on self-esteem and quality of life among burn patients. Clin Nurs Stud, 6(2), 79-90.

Afify, M. M., Mahmoud, N. F., Abd El Azzim, G. M., & El Desouky, N. A. (2012): Fatal Burn Injuries: A five year retrospective autopsy study in Cairo city, Egypt. Egyptian Journal of forensic sciences, 2(4), 117-122.

Al Laham N., Elmanama A., &Tayh G., (2015): Possible Risk Factors Associated with Burn Wound Colonization in Burn Unit of Gaza Strip Hospitals, Palestine, Annals of Burns and Fire Disasters, vol. (26), and No. (2), P.p68-75.

Alanazi, A. A., Alanazi, A. S., Alanazi, M.S. F., Alanazi, N. A., Qaisy, F. A., Asiri, A. M. A., Albalawi,B.I. &Albugami, M.H. S. (2019): Burn Injuries Prevalence, Causes, Complications and Improvement in Northern Saudi Arabia". EC Emergency Medicine and Critical Care 3.6: 383-393.

American Burn Association& National Burn Repository. (2019): Update, Report of data from 2009–2018 ameriburn.site-ym.com available at: https://ameriburn.siteym.com/store/ViewProduct.aspx?id=14191872.

American College of Surgeons. (2019): Advanced Trauma Life Support. facs.org https://www.facs.org/quality%20programs/trauma/atls

Anwar Ayed Alanazi. (2019):"Burn Injuries Prevalence, Causes, Complications and Improvement in Northern Saudi Arabia". EC Emergency Medicine and Critical Care 3.6: 383-393.

Barajas-Nava, L. A., López-Alcalde, J., i Figuls, M. R., Solà, I., & Cosp, X. B. (2013): Antibiotic prophylaxis for preventing burn wound infection. Cochrane Database of Systematic Reviews, (6). Available at: https://doi.org//10.1002/14651858.CD008738.pub2

Bayuo, J., Agbenorku, P., & Amankwa, R. (2016): Study on acute burn injury survivors and the associated issues. Journal of Acute Disease, 5(3), 206-209.

Echevarría-Guanilo, M. E., Gonçalves, N., Farina, J. A., & Rossi, L. A. (2016): Assessment of health-related quality of life in the first year after burn. Escola Anna Nery-Revista de Enfermagem, 20(1), 155-166.

Grisbrook, T. L., Reid, S. L., Edgar, D. W., Wallman, K. E., Wood, F. M., & Elliott, C. M. (2012): Exercise training to improve health related quality of life in long term survivors of major burn injury: a matched controlled study. Burns, 38(8), 1165-1173.

Group, W. H. O. Q. O. L. (1994): Development of the WHOQOL: Rationale and current status. International Journal of Mental Health, 23(3), 24-56.

Hashemi, F., Dolatabad, F. R., Yektatalab, S., Ayaz, M., Zare, N., & Mansouri, P. (2014): Effect of Orem Self-Care program on the life quality of burn patients referred to Ghotb-al-Din-e-Shirazi burn center, Shiraz, Iran: a randomized controlled trial. International journal of community based nursing and midwifery, 2(1), 40–50.

Heydarikhayat, N., Ashktorab, T., Rohani, C., & Zayeri, F. (2018): Effect of post-hospital discharge follow-up on health status in patients with burn injuries: a randomized clinical trial. International journal of community based nursing and midwifery, 6(4), 293–304.

Jaiswal, A. K., Aggarwal, H., Solanki, P., Lubana, P. S., Mathur, R. K.,

&Odiya, S. (2007): Epidemiological and Socio-cultural Study of Burn Patients in my Hospital, Indore, India. Indian Journal of Plastic Surgery, 40(2), 158-163.

Kandeel, F. (2019). A study of Some Medico-Legal Aspects of Fatal Burn Cases Admitted to Menofia University Hospital over Five Years. Ain Shams Journal of Forensic Medicine and Clinical Toxicology, 32(1), 57-64.

Kazemzadeh, J., Rabiepoor, S., & Alizadeh, S. (2019): The Quality of Life in Women with Burns in Iran. World journal of plastic surgery, 8(1), 33–42.

Krishnamurthy, V. R., Ishwaraprasad, G. D., Sumana, M., & Samudyatha, U. C. (2018): Pattern of Burn Injury Admissions at a Teaching Hospital of Karnataka, India: a three-year retrospective study. International Surgery Journal, 5(12), 3930-3934.

Lotfi, M., Ghahremaneian, A., Aghazadeh, A., &Jamshidi, F. (2018): The Effect of Pre-discharge Training on the Quality of Life of Burn Patients. Journal of caring sciences, 7(2), 107–112.

Maier M, Manduca C, McGoldrick K, Simkins S. (2018): Use Media to Enhance Teaching and Learning. Minnesota: Carleton College. Available at: https://serc.carleton.edu/49639.2014/

Malik, P., Garg, R., Sharma, K. C., Jangid, P., & Gulia, A. (2012). Quality of life in burn injury Patients. Delhi Psychiatry Journal, 15(2), 308-315.

Mamashli, L., Ardebili, F. M., Bozorgnejad, M., Ghezeljeh, T. N., &Manafi, F. (2019): The Effect of Self-Care Compact Disk-Based Instruction Program on Physical Performance and Quality of Life of Patients with Burn At-Dismissal. World journal of plastic surgery, 8(1), 25–32.

Mamashli, L., Ardebili, F. M., Ghezeljeh, T. N., Manafi, F., & Bozorgnejad, M. (2019): Investigating the Psychosocial Empowerment Interventions through Multimedia Education in Burn Patients. World journal of plastic surgery, 8(3), 372–381.

Mansouri, P., Sayari, R., Dehghani, Z., &Hosseini, F. N. (2020): Comparison of the Effect of Multimedia and Booklet Methods on Quality Of Life of Kidney Transplant Patients: A Randomized Clinical Trial Study. International Journal of Community Based Nursing and Midwifery, 8(1), 12–22.

Mason SA, Nathens AB, Byrne JP, Ellis J, Fowler RA, Gonzalez A, Karanicolas PJ, Moineddin R, & Jeschke MG. (2017): Association between Burn Injury and Mental Illness among Burn Survivors: A Population-Based, Self-Matched, Longitudinal Cohort Study. J. Am. Coll. Surg. 225(4):516-524.

Melake N., Eissa N., Keshk T., & Sleem A., (2015): Prevalence of Multidrug-resistant Bacteria Isolated from Patients with Burn Infection, Vol. (28), No. (3), .p 677-684.

Mirza Aghazadeh, A., Lotfi, M., Ghahramanian, A., & Ahadi, F. (2018): Lethal area 50 in patients with burn injuries in North West, Iran. Journal of caring sciences, 7(1), 53-58.

Murray, C. J., Barber, R. M., Foreman, K. J., Ozgoren, A. A., Abd-Allah, F., Abera, S. F. & Del Pozo-Cruz, B. (2020). Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition. The Lancet, 386(10009), 2145-2191.

Pavoni, V., Gianesello, L., Paparella, L., Buoninsegni, L. T., & Barboni, E.

(2010): Outcome Predictors and Quality of Life of Severe Burn Patients Admitted to Intensive Care Unit. Scandinavian journal of trauma, resuscitation and emergency medicine, 18(1), 24.Avaliable at: https://link.springer.com/article/10.1186/1757-7241-18-24#citeas

Radwan, M., Samir, S., Aty, O. A., & Attia, S. (2011): Effect of a rehabilitation program on the knowledge, physical and psychosocial functions of patients with burns. Journal of American Science, 7, 427-434.

Regan, A., & Hotwagner, D. T. (2019): Burn fluid management. Stat Pearls [Internet]. Available at: https://www.ncbi.nlm.nih.gov/books/NBK534227/

Rizk, S. M. A., & Hassan, B. G. A. E. (2018): The Effect of Pre-Discharge Multimedia Self-Care Education on Burn Specific Health among Patients with Burn. American Journal of Nursing, 6(6), 608-615.

Roh, Y. S., Seo, C. H., & Jang, K. U. (2010): Effects of a Skin Rehabilitation Nursing Program on Skin Status, Depression, and Burn-Specific Health in Burn Survivors. Rehabilitation Nursing, 35(2), 65-69.

Rouzfarakh, M., Deldar, K., Froutan, R., Ahmadabadi, A., & Mazlom, S. R. (2021): The effect of rehabilitation education through social media on the quality of life in burn patients: a randomized, controlled, clinical trial. BMC Medical Informatics and Decision Making, 21(1), 1-11.

Rybarczyk, J.M. Schafer, C.M. Elm, S. Sarvepalli, P.A. Vaswani, K.S. Balhara. (2017): A Systematic Review of Burn Injuries in Low- and middle-Income Countries: Epidemiology in the WHO-defined African Region. Afr J Emerg Med, 7 (1), pp. 30-37.

Sarbazi, E., Yousefi, M., Khami, B., Ettekal-Nafs, R., Babazadeh, T., & Gaffari-Fam, S. (2019): Epidemiology and the survival rate of burn-related injuries in Iran: a registry-based study. Annals of burns and fire disasters, 32(1), 3–9.

Shahid, F., Ismail, M., & Khan, S. (2018): Assessment of quality of life in post burn survivors: A cross-sectional single-center first validation study from Pakistan. Burns Open, 2(1), 35-42.

Smolle C, Cambiaso-Daniel J, Forbes AA, Wurzer P, Hundeshagen G, Branski LK, Huss F, Kamolz LP.Burns.(2017):Recent trends in burn epidemiology worldwide: A systematic review. 43(2):249-257.

Tetteh, L., Aziato, L., Mensah, G. P., Vehviläinen-Julkunen, K., & Kwegyir-Afful, E. (2020): Burns pain management in Ghana: The role of nurse-patient communication. Burns. Available at: https://doi.org/10.1016/j.burns.2020.11.011.

World Health Organization. (1996): WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment: field trial version, (No. WHOQOL-BREF). World Health Organization.

World Health Organization. (2018): WHO available at: https://www.who.int/en/news-room/fact-sheets/detail/burns/

World Health Organization. Division of Mental Health. (1991): WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment: field trial version. World Health Organization. https://apps.who.int/iris/handle/10665/63529