

Effect of an Educational Nursing Program on Nurses' Performance Regarding Burn Injury Management

Rasha Kamel Mohammed ⁽¹⁾, Manal Salah Hassan ⁽²⁾, Inshrih Roshdy Mohammed ⁽³⁾

⁽¹⁾ Clinical instructor- Technical Institute of Nursing – Beni-Suef University

⁽²⁾ Professor of Medical Surgical Nursing Faculty of Nursing Department – Ain Shams University

⁽³⁾ Assistant Professor of Medical Surgical Nursing Department Faculty of Nursing - Minia University

Abstract: Burn is bodily injury resulting from exposure to heat, electricity, or some radiations, marked by varying degrees of skin destruction and hyper anemia often with the formation of watery blisters. Aim of study: the study aimed to evaluate the effect of educational nursing program on nurses' performance regarding burn injury. Subjects and methods: A quasi experimental design. The study was conducted at two hospitals (Beni-Suef general hospital, Minia general hospital and, Minia university hospital) first and second hospital affiliated to ministry of health, the third one affiliated to ministry of higher education. Forty nurses were included in the current study sample. Three tools of data collection were used to carry out this study namely, tool 1): Structured Self-Administered Questionnaire that include two parts; part 1): demographic characteristics, and part 2): nurse's knowledge, Tool II:- Nurses' observational checklists procedure, and Tool III: Structured nurse's attitude scales. Results: Most of nurses had unsatisfactory knowledge regarding burn in the pre intervention phase. While majority of them had satisfactory knowledge regarding burn in the posttest (1&2). All of nurses had unsatisfactory practice regarding burn in the pre intervention phase. While majority of them had satisfactory practice regarding burn in immediate, posttest (1) & posttest (2). Conclusion and Recommendations: All of nurses had negative attitude regarding burn in the pre intervention phase. While, majority of them had positive attitude regarding burn in immediate, posttest (1) & posttest (2) A positive correlation between nurses' total knowledge, practice and attitude scores. Educational nursing program regarding burn injury have a positive effect on nurses' performance, providing continuous education and update for nurses regarding evidence based nursing practices about burn patients, giving current study booklet to burn units in the study settings to use as a guide for nurses during their care of patients as it was valid, applicable and, reliable.

Keywords: Educational nursing Program, Nurses' performance, and burn injury.

1. INTRODUCTION

Burn is defined as destruction found in the epidermal tissue, dermal tissue, or deeper tissues, due to contact with thermal, chemical, or electrical agents. Burns are caused by Fire, hot liquid or steam, hot metal, glass or other objects, electrical currents, radiation, such as that from X-rays, sunlight or other sources of ultraviolet radiation, such as a tanning bed, chemicals such as strong acids, lye, paint thinner or gasoline and, abuse (Bozorgnejad, et al., 2019).

Burns are a global public health problem, accounting for an estimated 180 000 deaths annually. The majority of burn injury occur in low- and middle-income countries. Burns are among the leading causes of disability in adjusted life-years (DALYs) lost in low- and middle-income countries, nearly 11 million people worldwide were burned severely enough to require medical attention, burning is one of the common problems, especially in the developing countries Mortality,

inability, pain, physical, mental and economic problems were considered as the effects caused by the burning. Providing high quality caring is the right of the patient that depends to the proper management and caring (Mohammad, 2018).

According to the Ahl Masr Foundation, 100,000 people get burned yearly in Egypt, and only a few manage to afford the care needed to survive, the numbers are harrowing, the mortality rate of burn victims in Egypt is as high as 37%, compared to the average of 5% in other countries in the region. Moreover, the majority who do survive find it hard to carry on with their daily activities due to their physical disfigurement and physiological trauma there are 300 burns sufferers per day in Egypt, and death rates reach 38% as a result of wrongly dealing with burns pointing out that the patient in the developed world can survive although the percentage of burns is 80% and he may die in Egypt with a 30% burn rate as a result of delaying medical intervention or wrong treatment (Mamashli, et al., 2019) .

The basis of burn classification is depth. When examining a burn, there are four components needed to assess depth: appearance, blanching to pressure, pain, and sensation. Superficial (first-degree) involves the epidermis of the skin only, it appears pink to red, there are no blisters, and it is dry, it is moderately painful. Superficial burns heal without scarring within 5 to 10 days. Superficial partial-thickness (second-degree) involves the superficial dermis, it appears red with blisters and is wet, the erythema blanches with pressure, the pain associated with superficial partial-thickness is severe, healing typically occurs within 3 weeks with minimal scarring (Lam, et al., 2018).

Deep partial-thickness (second-degree) involves the deeper dermis, it appears yellow or white, is dry, and does not blanch with pressure, there is minimal pain due to a decreased sensation, healing occurs in 3 to 8 weeks with scarring present. Full-thickness (third-degree) involves the full thickness of skin and subcutaneous structures, it appears white or black/brown. with pressure, no blanching occurs, the burn is leathery and dry, there is minimal to no pain because of decreased sensation. Full-thickness burns heal by contracture and take greater than 8 weeks. Full-thickness burns require skin grafting (Park, et al., 2020).

Burns can be classified according to the body surface area that is involved as, minor, moderate, major and, sever burn. Minor Burns involve 10% TBSA or less. Moderate Burns involve 11% to 20 of TBSA. Major Burns involve 20% to 60% of TBSA. Severe Burns involve >60% of TBSA. Severe burns, one or more of the following parameters: Involving more than 10% of the body surface area (BSA) in children and 15% in adults, inhalation injury (smoke, hot air, particles, toxic gas, etc.), major concomitant trauma (fracture, head injury, etc.), location: face, hands, neck, genitalia/perineum, joints (risk of functional deficit), electrical and chemical burns or burns due to explosions and, age < 3 years or > 60 years or significant co-morbidities (e.g. epilepsy, malnutrition). Minor burns: involving less than 10% of the BSA in children and 15% in adults, in the absence of other risk factor (Mahran, et al., 2019).

Burns are characterized by the degree to which they affect the skin, First-degree burns, affects only the outer layer of skin, known as the epidermis. Skin that has suffered a first-degree burn is typically red and dry, but lacks blister formation. A first-degree burn is usually very painful, but usually heals within three to five days without significant long-term consequences. A mild case of sunburn is an example of a first-degree burn where the injured epithelium peels away from the healthy skin during the healing process. Second-degree burns, it can be superficial, partial or, deep partial thickness and will include the epidermis and part of the dermis, the layer of skin below the surface. In a partial-thickness second-degree burn, some of the upper dermis is affected, while a deep partial-thickness second-degree burn will destroy all of the lower dermis (El Khamali, et al., 2018).

Care for phases of burn: **Pre-hospital Phase:** primary concerns are ABC's (airway, breathing, circulation), Remove from the burn source, check patency of airway and for adequate ventilation, Check for adequate circulation, flush the skin for chemical injuries, remove clothing, Prevent hypothermia. **Emergent phase:** This phase begins immediately at the time of injury and ends with the restoration of capillary permeability(24-48 hrs.), the main goal of this phase is to prevent hypovolemic shock, and preserve vital organ functioning, the management involving resuscitation, the amount of fluid administered to the patient is based on the client's weight and extent of injury and prevent shock through the initiation of fluids to maintain adequate circulating blood volume and maintain vital organ perfusion (Abd Elalem, et al., 2018).

Acute Phase: when the client is hemodynamically stable, has restored capillary permeability and has been showing signs of diuresis, acute phase took place. During this time, the emphasis is placed on restoration of the patient's capillary permeability and the phase continues until the wound is totally closed. Main goal of the acute phase is focused on

prevention of infection, wound care, optimum nutrition and physical therapy. **Rehabilitative Phase:** it is the final phase of managing a burn injury. Most frequently, it overlaps the acute phase and it goes on after hospitalization. Main goals during this phase are helping the client gain independence and achieve maximal function and, prevention of scar contracture (Elsherbiny, et al., 2018).

A nurse who cares for a patient with burn injury should be knowledgeable about changes that occur after a burn, as well as astute assessment skills to detect subtle changes in the patient's condition and know how to deal with patients. Providing care to the burn-injured patient is a very challenging and, ultimately, rewarding profession for a nurse. Skills needed is varied and includes comprehensive clinical assessment and monitoring, pain management, wound care and psychosocial support. Burn nurse cares for the burn survivor throughout the continuum of care from entry into the hospital through to discharge home and reintegration into the community (El-Sayed, et al., 2019).

Meanwhile, the nurses play an important role in this regard. The nurses who provide care services for the burn patients should obtain adequate knowledge on the physiologic effects after caused burning and possess the rapid analysis and decision-making on trivial changes occurred in the patient status. The beginning of the rehabilitation could establish compassionate and sympathetic relationship with the patients and their families. The audit cycle is a quality improvement intervention used to decrease evidence-practice gaps (Ghezalje, et al., 2019).

Burn care nurses help treat burn victims from the initial trauma treatment to recovery and post-trauma therapy. Burn unit nurses can get a position with only an associate's degree, but certification and higher education can provide an edge over other candidates (Ali, et al., 2018). From my observation the new employment nurses at burn units in previous places developed a lot of knowledge and practices regarding burn care and be qualified nurses able to managing burn patient.

A burn care nurse specializes in the care of patients who suffer from burn injuries, and in many cases, have also experienced other kinds of trauma. The burn care nurse treats and monitors burn wounds, and plays a critical role in the assessment of emotional and psychological trauma that so often accompanies a burn injury. Optimal care of the burn patient requires a distinctive multidisciplinary approach. Positive patient outcomes are dependent on the composition of the burn care team and close collaboration among its members, at the center of this team is the burn nurse, the coordinator of all patient care activities (Tirgari, et al., 2018).

Significance of the study:

Great advances have been made in the care of patients with burn injury . In the mid-twentieth century, burn shock claimed many patients' lives. If shock did not cause death, infection or respiratory insufficiency did. With improvements in fluid resuscitation, better critical care management, and the trend toward early excision and grafting, mortality rates have decreased. To provide comprehensive, holistic care to patients with burn injury , close collaboration is required among members of the multi- disciplinary team. The patient's response to a major burn injury is dramatic and involves multisystem alterations. Knowledge of local and systemic changes associated with patient needs is essential in providing care, which places extraordinary demands on the nurse in a burn practice who must be both a specialist and a broad-based generalist (Kenetra, et al., 2013).

The researcher proposed that the nurses are new graduate and the place new and need qualified nurses, also increase students number in faculty and institute compare with decreased training places in hospital will not give chance for student to train and be qualified in skills.

Aim of the study

The aim of this study is to evaluate the effect of educational nursing program on nurses' performance regarding burn injury. This aim achieved through the following:

- To evaluate nurses' knowledge regarding the burn injury.
- To evaluate nurses' practices and attitude regarding the care of patient with burn injury pre and post program study.
- Design and implement the educational nursing program toward nursing care of patient with burn injury.

Research hypotheses:

Ha 1: The implementation of educational nursing program may increase mean scores of nurses' knowledge regarding burn injury.

Ha 2: The implementation of educational nursing program may increase mean scores of nurses' practices towards care of patients with burn injury.

Ha 3: The implementation of educational nursing program may increase nurses' positive attitude towards care of patients with burn injury

2. SUBJECTS AND METHODS**Research design:**

A- Quasi experimental research design was used in carrying out the current study.

Setting:

The current study was conducted at three hospitals first hospital (Beni-Suef general hospital) (burn and emergency unit). Beni-Suef general hospital affiliated to the ministry of health, Beni-Suef government The study was at emergency department is located at first floor it consist of 7 rooms according to each specialty surgery emergency room contain 3 beds, burn unit is located at third floor it consist of 7 rooms each one contains 5 beds.

Second and third hospital (Minia university hospital and Minia general hospital) , Minia university hospital at (burn unit). Which affiliated to the ministry of higher education Minia government , the burn unit is located at fourth floor it consist of 5 rooms each one contains 6 beds. Minia general hospital (burn unit) . Which affiliated to the ministry of health Minia government , the burn unit is located at second floor it consist of 4 rooms each one contains 8 beds. In all hospitals found assess service such as X-ray department (CT, MMR, chest X-ray), lab department and pharmacy for inpatient & out patient.

In all hospitals found assess service such as X-ray department (CT, MMR, chest X-ray), lab department and pharmacy for inpatient & out patient

Subjects:

Studied sample include all staff nurses who were on duty in previous three hospitals mentioned in study setting, their total number were (40) subject

Data collection tools:

Three tools were used in the current study developed by researcher after reviewed extensive relevant literature and constructed in Arabic form:

Tool I: Structured Self-Administered Questionnaire: (Appendix 1) it included two part:

Part I; its purpose to assess personal characteristics of nurses such as (age, sex, and level of education, year of graduation and, years of experience)

Part II; Nurses Knowledge:

To evaluate nurses' knowledge regarding burn injury care, it includes eighty (80) multiple choice questions regarding burn injury regard pre/post studied program such as: Anatomy and physiology of the skin, pathophysiology of burn, causes of burn, degrees of burn and, clinical manifestation and management of burn in each burn stage.

Scoring system: items total global score of 80 for 80 items, was rated on (correct choice or in correct choice) with scoring (**correct choice =1, incorrect choice= 0**). The total score of this scale classified into two results based on the following:

Satisfactory * Equal or > 60% this mean (48 / 80 scores)

Un satisfactory * < 60% this mean (48 / 80 scores)

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Tool II:- Nurses' observational checklists: (Appendix 2)

It was ben used to evaluate nurses' practice regarding care of patients with burn injury, it consists of three parts:

1-Burn wound dressing procedure: it was included 41 steps, as (e.g. preparation of patient and, preparation of environment and equipment, assessment, pre dressing medication/ pain relief, and, burns dressing steps)

2-Scar management procedure: it was included 17 steps, as (e.g. Massage, Pressure garments, Splints and, Stretching).

3-Rehabilitations exercises according to their burn site: it was included 42 steps, as (e.g. stretching exercises, aerobic walk exercises, muscles strengthening exercises and, , Stretching exercises to help with tightness).

Scoring system: all nursing practice checklist procedure were rated on (**done or not done**) with scoring (**done =1, not done= 0**), total global score of steps 100 for 100steps, total score classified into two results based on the following:

Satisfactory * Equal or > 70% this mean (70/100 scores)

Un satisfactory * < 70% this mean (70/100 scores)

Tool III: Structured nurse's attitude scale: (Appendix 3)

It has been used to assess nurses' attitude during providing the care to the patients with burn injury pre / post the current study program.

Scoring system: items total global score of 60 for 20 items, was rated on three rank as (always =3, sometimes = 2, never=1). The total score of this scale classified into two results based on the following:

Positive * Equal or < 60% this mean (36/60 scores)

Negative * > 60% this mean (36/60 scores)

Validity

The current study tools were examined by a panel of five academic experts opinion in the field of medical surgical nursing departments (assistant prof of medical surgical) (Helwan university and, Banha university) All jury members (100%) were agreed that current study tools and its validity relevant with the aim of the study.

Reliability:-

Cronbach's alpha test ideal average to insure reliability of study, testing internal consistency was performed for evaluating structured self administered questionnaire, nurses' observational checklist and, Structured nurse's attitude scale it was (0.96, 0.71 and 0.86) respectively.

Fieldwork:

The current study was conducted by preparing of different data collection tools, in addition to, obtaining formal paper agreement which was taken in duration one week before conducting the current study. The researcher acted collection of the current study data from its setting on daily basis during morning or afternoon shifts.

Nurses divided into groups according to their shift and load of work, with average was attended 3-4 nurses in every class.

The researcher started data collection before giving program, pre assessment structured self-administered questionnaire (Tool I: Part I : nurses personal characteristics data and, Tool I:part II: nurses knowledge) filled by nurse within 20-30 minute. While (Tool II: Nurses' observational checklist procedure) and (Tool III: Structured nurse's attitude scale) are filled by the researcher within 20-30 minutes for every procedure.

Teaching program which has media (photo and, booklet) carried out in 20 session, 10 session for theoretical part and 10 session for practical part, 2 session/week every session about 2 hours .

During each knowledge session the researcher utilize easy, concise and clear words. At the end of each session, a brief outline given by the researcher, confirm the most important points included in each session. Before starting of each session, researcher asked question to remember the prescript given and to enhance the knowledge.

International Journal of Novel Research in Healthcare and Nursing

Vol. 8, Issue 2, pp: (50-63), Month: May - August 2021, Available at: www.noveltyjournals.com

During each practice session the researcher utilize hospital equipment's, dolls, photo of exercise therapy and, actual application on patients. At the end of each session, a brief outline given by the researcher, confirm the most important points included in each session.

After completing all sessions and ensure their competence, immediately posttest to evaluate nurse's knowledge and practice related to burn patient care after implementing program session, then comprehensive nursing program booklet given to each nurse in the program and Subjects are approached by the researcher then follow up after 3 months, then after 6 months.

Ethical Considerations:

An official permission to conduct the study was obtained from the Ethical committee in the Faculty of Nursing, Dean of Nursing Faculty and the Manager of Minia University Hospital, Minia General Hospital and Beni Suef General Hospital, the Head of the Burn Departments in all hospitals and agreement from Egypt Academic for Research Center and Technology to carry out this study. Subject's participation in this study was voluntary and each involved subject was informed about the purpose, procedure, benefits, and nature of the study, and that he/she had the right to withdraw from the study at any time without any rationale, then oral consents were obtained. Confidentiality and anonymity of each subject were ensured through coding of all data and protecting the obtained data. Subjects were informed that obtained data will not be included at any further researches without a second oral consent.

Statistical analysis:

Data entry and statistical analysis were done using (SPSS) statistical software package. Quality control was at the stage of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentage for qualitative variables; mean and standard deviation for quantitative variable. Qualitative categorical variables were compared Chi-square (X²) test; the hypothesis that the row and column variables are independent, without indicating strength or direction of the relationship, Analysis of variance (ANOVA) test. Statistical significance was considered at (P-value <0.05).

3. RESULTS

Table (1) shows that half (50%) of the studied nurses had 20 to <40 years old, majority (85%) of them were female. Half of the studied nurses (50%) were graduated from technical nursing institute and more than half among them (55% & 60%) had more than 10 years of experience, and they were attended training about burn care

Figure (1) show that majority (82.5%) of nurses had unsatisfactory knowledge regarding burn in the pre intervention phase. While; majority (82.5%, 65% & 62.5% respectively) of nurses had satisfactory knowledge regarding burn in the posttest (1&2).

Figure (2) show that all of nurses had unsatisfactory practice regarding burn in the pre intervention phase. While, reach (85%, 77.5%, & 72.5% respectively) of nurses had satisfactory practice regarding burn in immediate, posttest (1) & posttest (2).

Figure (3) show that all of nurses had negative attitude regarding burn in the pre intervention phase. While,; majority (92.5%, 82.5%, & 75% respectively) of nurses had positive attitude regarding burn in immediate, posttest (1) & posttest (2).

Table (2) shows that there is a statistically significant relation between nurse's knowledge and their qualifications, experiences in burn department, and training on burn care. While, there is no statistically significant relation between nurse's knowledge and their gender and age.

Table (3) shows that there is a statistically significant relation between nurse's practice and their qualifications, experiences in burn department, and training on burn care. While, there is no statistically significant relation between nurse's knowledge and their gender and age.

Table (4) shows that there is a statistically significant relation between nurse's attitude and their qualifications, experiences in burn department, and training on burn care. While, there is no statistically significant relation between nurse's knowledge and their gender and age.

Table (5) shows that there is a positive correlation between nurses' total knowledge, practice and attitude scores.

Table (1): Personal characteristics of the studied nurses (n=40).

Demographic characteristics	No.	%
Age		
- <20	4	10
- 20:<40 years	20	50
- ≥40 years	16	40
Mean ± SD		33.5 ± 9.92
Gender		
- Male	6	15
- Female	34	85
Qualifications		
- Nursing diploma	8	20
- Technical nursing institute	20	50
- Bachelor of nursing	6	15
- Master degree	4	10
- Doctorate degree	2	5
Experience in burn department		
- <5 yrs.	12	30
- 5-10 yrs.	6	15
- >10 yrs.	22	55
Training on burn care		
- Yes	24	60
- No	16	40

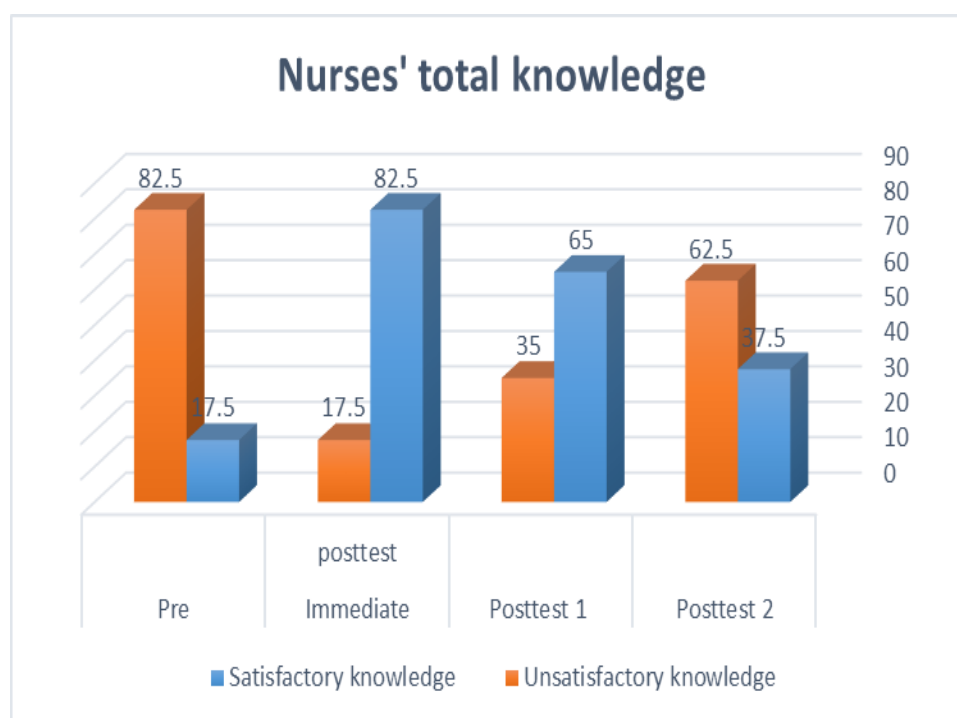


Figure (1): Percentage distribution of nurses' total knowledge regarding burn (n = 40).

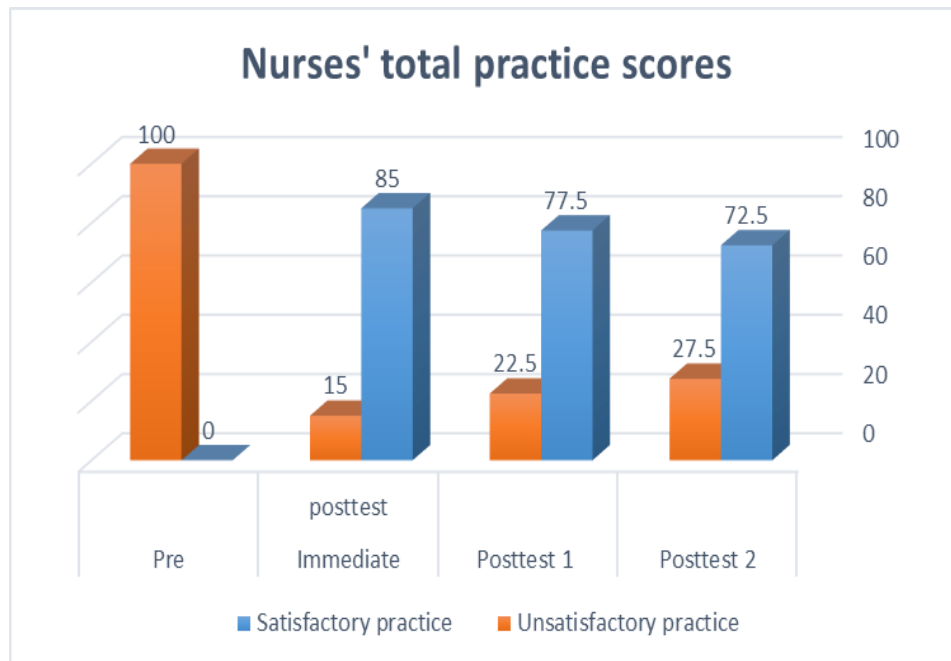


Figure (2): Percentage distribution of nurses' total practice regarding burn (n = 40).

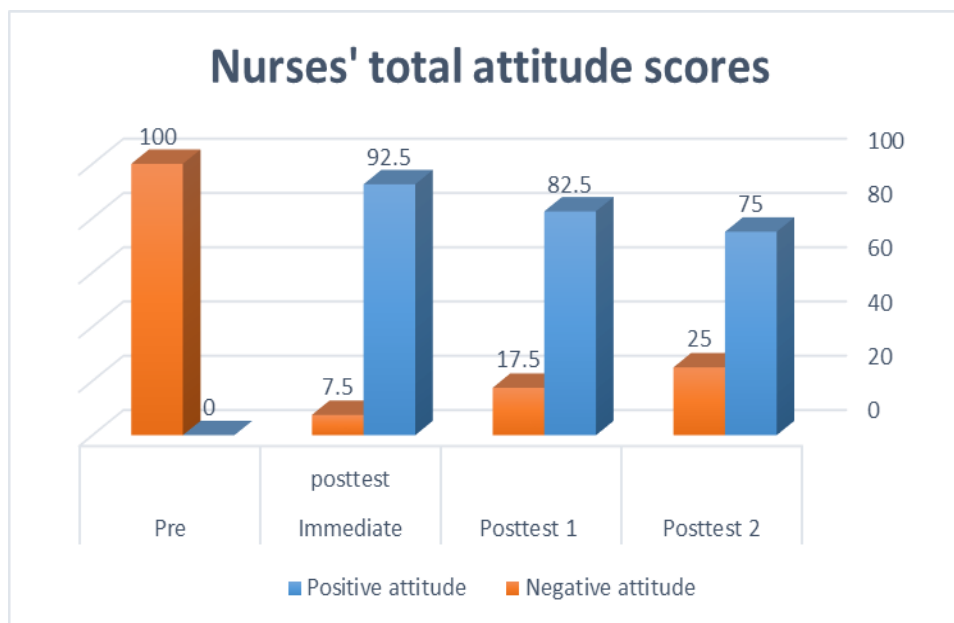


Figure (3): Percentage distribution of nurses' total attitude regarding burn (n = 40).

Table (2): The relation between nurses' knowledge and their personal characteristics

Demographic characteristics		Knowledge	t/f	P
		Mean ± SD		
Age			4.96	.084
- <20	4	0.33 ± 0.57		
- 20:<40 years	20	0.15 ± 0.22		
- ≥40 years	16	0.13 ± 0.35		
Gender			0.222	.399
- Male	6	0.00 ± 0.00		
- Female	34	0.12 ± 0.34		

International Journal of Novel Research in Healthcare and Nursing

 Vol. 8, Issue 2, pp: (50-63), Month: May - August 2021, Available at: www.noveltyjournals.com

Qualifications			2.58	.042*
- Nursing diploma	8	0.25 ± 0.46		
- Technical nursing institute	20	0.11 ± 0.32		
- Bachelor of nursing	6	0.00 ± 0.00		
- Master degree	4	0.00 ± 0.00		
- Doctorate degree	2	0.00 ± 0.00		
Experience in burn department			9.12	.003*
- <5 yrs.	12	0.19 ± 0.32		
- 5-10 yrs.	6	0.17 ± 0.41		
- >10 yrs.	22	0.12 ± 0.36		
Training on burn care			5.28	.014*
- Yes	24	0.54 ± 0.21		
- No	16	0.23 ± 0.47		

 (*) statistically significant $p < 0.05$

 (**) highly statistically significant $p < 0.001$
Table (3): The relation between nurses' practice and their personal characteristics

Demographic characteristics		Practice	t/f	P
		Mean ± SD		
Age			2.41	.254
- <20	4	0.75 ± 0.51		
- 20:<40 years	20	0.85 ± 0.34		
- ≥40 years	16	0.63 ± 0.52		
Gender			0.24	.532
- Male	6	0.68 ± 0.57		
- Female	34	0.76 ± 0.34		
Qualifications			8.16	0.043*
- Nursing diploma	8	0.88 ± 0.53		
- Technical nursing institute	20	0.65 ± 0.49		
- Bachelor of nursing	6	0.83 ± 0.41		
- Master degree	4	0.11 ± 0.00		
- Doctorate degree	2	0.21 ± 0.71		
Experience in burn department			7.42	0.033*
- <5 yrs.	12	0.83 ± 0.39		
- 5-10 yrs.	6	0.67 ± 0.52		
- >10 yrs.	22	0.73 ± 0.46		
Training on burn care			4.35	0.002*
- Yes	24	0.75 ± 0.44		
- No	16	0.67 ± 0.42		

 (*) statistically significant $p < 0.05$

 (**) highly statistically significant $p < 0.0$
Table (4): The relation between nurses' total attitude and their personal characteristics

Demographic characteristics		Knowledge	t/f	P
		Mean ± SD		
Age			0.156	.963
- <20	4	1.00 ± 0.00		
- 20:<40 years	20	0.95 ± 0.22		
- ≥40 years	16	0.88 ± 0.34		
Gender			1.42	0.316
- Male	6	1.00 ± 0.00		
- Female	34	0.91 ± 0.29		

Qualifications			9.25	.001*
- Nursing diploma	8	0.88 ± 0.35		
- Technical nursing institute	20	0.91 ± 0.34		
- Bachelor of nursing	6	1.00 ± 0.00		
- Master degree	4	1.00 ± 0.00		
- Doctorate degree	2	1.00 ± 0.00		
Experience in burn department			8.22	.007*
- <5 yrs.	12	0.86 ± 0.4		
- 5-10 yrs.	6	1.00 ± 0.00		
- >10 yrs.	22	0.64 ± 0.43		
Training on burn care			6.13	0.028*
- Yes	24	0.91 ± 0.28		
- No	16	0.94 ± 0.25		

(*) statistically significant $p < 0.05$

(**) highly statistically significant $p < 0.001$

Table (5): correlation between nurses' total knowledge, practice and attitude scores

		Total knowledge scores	Total practice scores	Total attitude scores
Total knowledge scores	R	1	.824	.627
	p-value	-	.000**	.000**
Total practice scores	R	.824	1	.620
	p-value	.000**	-	.000**
Total attitude scores	R	.627	.620	1
	p-value	.000**	.000**	-

(*) statistically significant $p < 0.05$

(**) high statistically significant $p < 0.01$

4. DISCUSSION

The American Burn Association reports that an estimated 70,000 hospitalizations each year are contributed to burn injuries. Whether they're first, second, or third degree, burns are serious wounds that must be treated with care immediately to avoid lasting tissue damage. Burn unit nurses are skilled healthcare professionals who specialize in treating patients burned by fire, chemical contact, electricity, scalding water, or another flammable danger. Their hard work has helped the U.S. survival rate among burn victims reach 96 percent. Burn unit nurses typically work in burn centers, intensive care units, trauma hospitals, and emergency rooms to care for acute pediatric and adult patients. Keeping victims heavily sedated to ease the severe pain while cleaning and dressing the wound is their duty. Burn unit nurses also serve as emotional caregivers for patients' families after the harrowing incident. Burn unit nurses are responsible for observing, monitoring, and often ventilating burn victims to protect their physical well-being. They're focused on helping patients recover from severe second and third degree burns, or providing end-of-life treatment if needed. Most burn unit nurses work one-on-one with injured patients from initial admission through recovery. They're involved in assessing the burn's damage, taking vital signs, and starting IV fluids. This job involves more than simply applying salve and dressing wounds though. Burn unit nurses will alleviate patients' pain, prevent complications, educate patients' on their prognosis, and provide emotional support. Some even deliver burn prevention workshops for the greater community(Theme Fusion,2019).

So, the current study aims to evaluate the effect of educational nursing program on nurses' performance regarding burn injury through: to evaluate nurses' knowledge regarding the burn injury, to evaluate nurses' practices and attitude regarding the care of patient with burn injury pre and post program study, design and implement the educational nursing program toward nursing care of patient with burn injury.

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Regarding demographic characteristics, the current study showed that half of the studied nurses had 20 to <40 years old, majority of them were female. Half of the studied nurses were graduated from technical nursing institute and more than half among them had more than 10 years of experience, and they were attended training about burn care

This study was agreement with **Melo, & Lima, (2017)** who conducted entitled "Cost of nursing most frequent procedures performed on severely burned patients" and found majority of nurses were female, and more than half of them were graduated from technical nursing institute. Conversely, this study was disagreement with **Ardebili, et al., (2017)** who conducted entitled "Effect of multimedia self-care education on quality of life in burn patients" and found that majority of nurses had 30 to <40 years old, and more than three quarter had more than 10 years of experience.

Regarding nurses' total knowledge about burn, the current study clarified that majority of nurses had unsatisfactory knowledge regarding burn in the pre intervention phase. From the research point of view, this result may be due to training program were very important for nursing staff and improved their information.

This study was agreement with **Meschial, & Oliveira, (2017)** who conducted entitled "Initial care for burned patients in academic nursing education" and found that majority of nurses had unsatisfactory knowledge regarding burn. Conversely, this study was disagreement with **Carrougher, et al., (2018)** who conducted entitled "Burn nurse competencies: developing consensus using E-Delphi Methodology" and found that majority of nurses had satisfactory knowledge regarding burn.

Regarding distribution of nurses' total performance regarding burn, the current study showed that all of nurses had unsatisfactory practice regarding burn in the pre intervention phase. From the research point of view, this result may be due to nursing staff had bad and poor performance before implantation of training program about burn injury.

This study was agreement with **Utsunomiya, et al., (2020)** who conducted entitled "Mobilization practices for patients with burn injury in critical care" and found that majority of nurses had unsatisfactory practice about burn. Also, this study was accordance with **Elsheerbiny, et al., (2018)** who conducted entitled "Effect of burn rehabilitation program on improving quality of life (QOL) for hand burns patients" and found that majority of nurses had satisfactory practice about burn after implantation of training program.

Regarding distribution of nurses' total attitude about burn, the current study showed that all of nurses had negative attitude regarding burn in the pre intervention phase. From the research point of view, this result may be due to improve attitude of nursing staff with patients that suffering from burn.

This study was supported with **Klingberg, et al., (2020)** who conducted entitled "Health for Burn Injury Consultations in a Low-Resource Setting: An Acceptability Study among Health Care Providers" and found that majority of nurses had negative attitude regarding burn. Conversely, this study was disagreement with **McCroory, et al., (2018)** who conducted entitled "Characteristics of Burn-Injured in 117 US ICUs (2009–2017)" and found that majority of nurses had negative attitude regarding burn in the pre intervention phase

Regarding relation between nurses' knowledge and their personal characteristics, the current study showed that there is a statistically significant relation between nurse's knowledge and their qualifications, experiences in burn department, and training on burn care. While, there is no statistically significant relation between nurse's knowledge and their gender and age.

This study was supported with **Lam, Huong, & Tuan, (2018)** who conducted entitled "Nurse Knowledge of emergency management for burn and mass burn injuries" and found that there is a statistically significant relation between nurse's knowledge and their qualifications, and training on burn care. Conversely, this study was disagreement with **Mamashli, et al., (2019)** who conducted entitled "The effect of self-care compact disk-based instruction program on physical performance and quality of life of patients with burn at-dismissal" and found that there is a statistically significant relation between nurse's knowledge and their gender, qualifications, and marital status.

Regarding relation between nurses' performance and their personal characteristics, the current study showed that there is a statistically significant relation between nurse's practice and their qualifications, experiences in burn department, and training on burn care. While, there is no statistically significant relation between nurse's knowledge and their gender and age.

International Journal of Novel Research in Healthcare and Nursing

Vol. 8, Issue 2, pp: (50-63), Month: May - August 2021, Available at: www.noveltyjournals.com

This study was congruence with **Abd Elalem, Shehata., & Shattla, (2018)** who conducted entitled "The effect of self-care nursing intervention model on self-esteem and quality of life among burn patients" and found that there is a statistically significant relation between nurse's practice and their ages, experiences in burn department, and training on burn care. Conversely, this result was disagreement with **Ghezaljah, et al., (2019)** who conducted entitled "Investigating the psychosocial empowerment interventions through multimedia education in burn patients" and found that there is highly statistically significant relation between nurse's knowledge and their gender, qualifications, and age.

Regarding relation between nurses' total attitude and their personal characteristics, the current study showed that there is a statistically significant relation between nurse's attitude and their qualifications, experiences in burn department, and training on burn care. While, there is no statistically significant relation between nurse's knowledge and their gender and age.

This study was supported with **Rafii, et al., (2017)** who conducted entitled "The effect of massage on anticipatory anxiety and procedural pain in patients with burn injury" and found that there is a statistically significant relation between nurse's attitude and their experiences in burn department, and marital status. Also, this study was accordance with **Ou, et al., (2021)** who conducted entitled "Clinical Performance of Hydrogel-based Dressing in Facial Burn Wounds" and found that there is no statistically significant relation between nurse's knowledge and their gender.

Regarding correlation between nurses' total knowledge, practice and attitude scores, the current study shows that there is a positive correlation between nurses' total knowledge, practice and attitude scores.

This study was agreement with **Melo, & Lima, (2017)** who conducted entitled "Cost of nursing most frequent procedures performed on severely burned patients" and found that there is a positive correlation between nurses' total knowledge, and their practice. Conversely, this study was disagreement with **Ardebili, et al., (2017)** who conducted entitled "Effect of multimedia self-care education on quality of life in burn patients" and found that there is negative correlation between nurses' total knowledge, and their attitude.

5. CONCLUSION

Most of nurses had unsatisfactory knowledge regarding burn in the pre intervention phase. While the majority of them had satisfactory knowledge regarding burn in the posttest (1&2). All of nurses had unsatisfactory practice regarding burn in the pre intervention phase. While majority of them had satisfactory practice regarding burn in immediate, posttest (1) & posttest (2). All of nurses had negative attitude regarding burn in the pre intervention phase. While majority of them had positive attitude regarding burn in immediate, posttest (1) & posttest (2). A positive correlation between nurses' total knowledge, practice and attitude scores. Educational nursing program regarding burn injury have a positive effect on nurses' performance

6. RECOMMENDATION

For nurses:

- Providing continuous education and update for nurses regarding evidence based nursing practices about burn patients.
- Giving current study booklet to burn units in the study settings to use as a guide for nurses during their care of patients as it was valid, applicable and, reliable .
- Encouraging the new staff to have a continuously training and up data knowledge until they are able to provide high quality of care for burn patients.

For hospital administration:

- Providing supplies and equipment's for burn unit that assist nurses to perform their practice in a high safe and efficient way.
- Continuous observation and accountability by professional supervision.

For further studies:

- Studying nursing burns more broadly in nursing specialty.
- Replicating of the same study in a large probability sample.
- Further programs in this field must be perform in the future to increase burn nurses knowledge and improve their practices.

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