Effect of Instructional Guidelines on Nurses Performance Regarding Burn Injury Management in Children

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Abstract

Background : Burns are wounds in skin as well as the supporting tissues brought through electricity, fire, coming into touch with hot water, or objects, or receiving therapy of radiation. Also the burns can occur in kids of any age. **Aim:** was to evaluate the effect of instructional guidelines on nurses' performance regarding burn injury management in children. **Method:** In the actually research, a quasi-experimental research approach was utilized. **Sample:** A convenient sample will be used in this research (45 nurses). **Setting:** The research was conducted at Minia University as well as General Hospitals which is associated with the Ministry of health as well as population. **Tools:** The 3 tools utilized to gather the research data; these tools composed of (first tool 1st part): Predesigned Questionnaire (second part): knowledge of nurses, (second tool): observational checklists for the nurses (third tool): Design the instructional guidelines regarding burn injury management in children. **Results:** More than half of nurses had poor knowledge in pre-test, while the majority of the participants had good knowledge in the post-test. Most of the nurses had incompetent practices in the pre-test, while all of them had competent practice in post-test, positive correlation between participants' total scores of knowledge, as well as practices. **Conclusion:** According to the results of the actual research instructional guidelines on nurses' performance had a positive impact on raising the knowledge of nurses as well as practices related to burn injury management in children in the post-test. **Recommendation:** Application of educational principles over time to improve nurses' expertise and performance in managing burn injuries in children.

Keywords: Burn injury management in children, Instructional guidelines, Nurses performance

Introduction

Soon after they become mobile and can discover their surroundings as well as interact with novel objects, children are innately curious. Children learn the skills necessary to endure in the real world in this way. However, children are also exposed to hazards like utilizing a sharp item, fire, or contacting with hot objects that could cause burn injuries, which can end in serious injuries. These are a crippling ailment coupled with excruciating pain as well as frequently by a longer-term diseases that result in suffering for the kid, the family, as well s the society as a whole **(Sachdev et al., 2016) & (Abdelrahman, et al., 2021).**

The third most common reason for unintentional mortality in children is burns. About eighty percent of all burn injuries happen at house, with hot water or flame exposure being the most common causes. : Burns are wounds in skin as well as the supporting tissues brought through electricity, fire, coming into touch with hot water, or objects, or taking radiation treatment. All ages of children can get burns. These are categorized based on the degree, origin, and surface involvement. Most burn injuries typically affect youngsters under the age of five **(Ali, et al., 2018).**

An estimated six million children worldwide seek medical treatment each year for burns, yet the majority receives their care in outpatient facilities. The extent of the burn and the patient's overall health determine whether inpatient care in a specific burn department is necessary. **(American Burn Association, 2018).**

Burns are categorized based on their severity, cause, and surface involvement. The symptoms of burn injuries vary according to the depth of the skin damage. However, categorized by depth (as the superficial, or the partial-thickness on the surface, or the thick partial depth, as well as thickness full) can help determine how quickly the signs and symptoms of a serious burn appear. Burns of the first degree are superficial and are red, painful, and dry. All that was damaged in these burns was the epidermis. Burns of the 2nd degree that are superficially partial in thickness affect the entire epidermis and superficial dermis. All layers of the skin are affected by full-thickness (3rd degree) burns. They are colored gray, white, brown, or black **(Reid and Ha, (2019) & (Mehmet and Aytekin, 2023).**

Burn injury complication include infection of the burn wound, sepsis, shock from hypovolemia, decreased of the body temperature, laryngeal edema, poisoning from carbon monoxide, cardiac diseases, Unusual ossification, failure of central nervous system, poisoning cyanide, syndrome of compartment, contractures, state of hypermetabolism, renal diseases, anemia, short-term diuretics, psychological trauma, lung infiltrations, pulmonary edema, as well as hypermetabolism **(World Health Organization (WHO), 2017)**

Research's Significance:

In Egypt, burn wounds in children are a serious issue, particularly in households with bad socioeconomic standing. These individuals frequently use kerosene stoves, live in cramped apartments, and lack safety precautions. Over a 20-month period, 350 kids with burn wouns visited the burn center at the Hospital of Ain Shams University. Boys were hurt proportionally more than girls **(Elbadawy, 2018)**. The most frequent reasons for death from inhalation burns are

airway blockage and damage. Youngsters are more affected than adults by burn edema because of the smaller airway diameter in youngsters. Hoarseness in the voice, stridor, and wheezing are symptoms of inhalation burns. Children displaying these symptoms need to be intubated right away. Otherwise, the increased edema could cause an airway obstruction, which would prevent intubation and result in mortality **(Güney, et al., 2022)**. From the perspective of the researcher it is essential to illuminate the pediatric nurses' practice related to burn injury management in children.

Aim of the Study: was to evaluate the effect of instructional guidelines on nurses' performance regarding burn injury management in children.

Research hypotheses

H1: Nurses' who receive instructional guidelines will have higher level of knowledge as well as practices in post-test.

H2: Nurses' who receive instructional guidelines will have positive correlation between total score level of nurses' knowledge as well as practices regarding burn injury management in children.

Subjects and Method

Design of the Research: A quasi-experimental (included pretest as well as posttest) research approach was employed.

Setting*:* The research was conducted at Minia University as well as General Hospitals which is associated with the Ministry of health as well as population.

Sample*:* A convenient sample utilized in these study (45) nurses, will be with multi educational categories represented as well as all must participate voluntarily in the current study.

Tools: Three tools was utilized to gather research data

First Tool: Predesigned Questionnaire Sheet. It was created by the researchers in straightforward Arabic in the light of relevant studies based on **Stewart et al. (2020),** it was composed of the parts as following:

Part one: Nurses' characteristics: for example: age, position, gender, years of experiences, level of education, as well as previous training about burn injury management in children).

Second part: Knowledge of study nurses about burn injury management in children

Abdelrahman, et al., (2021), It included burn's definition, causes, burn's degree, signs as well as symptoms, complication of the burn, first aid as well as discharge instructions.

So the scoring system: The correct answers were take one, as well as those incorrect were take zero. These total Scoring systems divided into: Score from zero to less than sixty percent mean poor knowledge. While score from sixty to less than seventy -five percent mean average knowledge. Finally the score from more than seventy-five to hundred percent mean good knowledge.

Second Tool: Observational Checklist. Used with permission from (Clinical Skills Manual for Pediatric Nursing Caring for Children) **(Ruth, 2016)**. Checklists about dressing of burn, intravenous therapy, transfusion of the plasma, as well as vital sign monitoring were included to evaluate the nurses' procedures for caring for children with burns.

So the scoring system: The correct answers were take one, as well as those incorrect were take zero. These scores were summed-up as well as transformed into a percent score: Score from zero to less than eighty- five percent referred to incompetent performance. Score from more than eighty- five to hundred referred to competent performance.

Third Tool: Design the instructional guidelines related to burn injury management in children **(Abdelrahman, et al., (2021)**. Depend on an actual requirements assessment of the examined nurses, the researcher developed instructional instructions for treating burn injuries in children, including warming the youngsters and cooling the burn with cool tap water and cling wrap. Each nurse underwent a pre- and post-test evaluation of the execution of instructional instructions for caring for children with burn injuries while utilizing the tools listed above.

Validity as well as Reliability:

A committee of three specialists from the pediatric nursing department reviewed the content's validity to guarantee its completeness, accuracy, clarity, and relevance. Accordingly, the necessary adjustments were made. The Cronbach Alpha Test was utilizing to determine the reliability of the tools, as well as the findings were 0.89 for the questionnaire and 0.83 for the observational Checklists, indicating that the tool was reliable.

Pilot study:

At Minia University and General Hospitals' burn unit, a pilot research with four nurses (10%) was carried out. A pilot sample was applied to evaluate the research tools' completeness and clarity as well as to ascertain the time needed to accomplish each tool. The essential modifications or omissions were made in response to the pilot's results. Before beginning the actual study, the end forms were approved by committee of the jury, as well as a pilot study was conducted to evaluate the reliability of the forms by calculating their internal consistency utilizing the Cronbach's alpha coefficient.

Ethical consideration:

Before beginning the research, the Scientific Research Ethical Committee of the Faculty of Nursing at Minia University gave its clearance. Each participant in the research gave their verbal agreement after the researcher made sure they understood the purpose of the investigation and earned their trust. The researcher guaranteed that the subjects' data would remain anonymous and private. The nurses were informed that participation was entirely up to them.

Field work:

The program's implementation occurred throughout the course of 4 months, from January 2023 to April 2023, during which the field work was completed. Pre/post tests will be conducted after 15 days, and the program will be in place

for 3 months. Ten small groups of five nurses each were formed from the nurses. Each group took about 6 sessions, which different in length from 20 to 30 minutes during the morning and afternoon shifts. Each participant receives a copy of the whole procedure checklist. A recap of the lessons from the previous sessions as well as the goals of the recent one normally comes at the beginning of each session. During program execution, the interested nurses were encouraged by being praised as well as/or recognized.

The actual research began when the researcher met with the nurses at the burn unit at Minia University and General Hospitals. The researcher provided them a full overview on the research and its objectives before distributing the format of pre-test to get the necessary information. Anytime more data was required, the researchers were on hand to provide it. Then, using the results from the questionnaire of pre-test, then the instructional guidelines was created. The instructional guidelines plan was created based on the demands of the nurses, put into practice, and evaluated for how many the nurses' conditions had improved.

The 1st session's topics involved personal interviews with the study's nurses, a clarification of the research's purpose as well as time frame from the researchers in person, a discussion, as well as a pre-test. The 2nd lesson focused on identifying different types of burns, their causes, symptoms, exposed areas, and complications. First Aid procedures, estimating TBSA and burn depth are covered in session 3. Procedures for fluid resuscitation, wound cleaning and blister debridement, and wound dressings are covered in session 4. Procedures, Splinting needs, Nutrition, Pain Management, and Discharging a Pediatric Burn Patient were covered in Session 5's curriculum. Revision is the topic of session six. Different instructional techniques, including lectures, discussions, explanatory images on a laptop, and films, as well as demonstration as well as re-demonstration, were utilized. To gather the necessary information, a post-test designee was at last distributed.

Statistical Design:

Statistical Package for Social Sciences version 24 (SPSS) was utilized to combine, analyze, and show the information in the shape of tables as well as figures. Quantitative factors were provided as mean and SD, whereas qualitative elements were presented as frequencies as well as percentages. The significance level of the Chi-square test was used to compare the proportions between 2 qualitative measures. The strength of the association between the two sets of variables was assessed using Spearman's rank correlation coefficient (r), depending on whether one or both sets of variables were skewed. The confidence interval was set at ninety-five percent, while the allowed margin of error was set at five percent. Therefore, p-value was considered significant: when P value of 0.05 or less was mean significant. P value less than 0.001 was mean a highly significant. Also the P value more than 0.05 mean insignificant.

Results

Table (1): Distribution of nurses personal traits (N=45)

Personal traits	(n=45)	
	N	%
Age / years		
20-30yrs.	25	55
31-40yrs.	12	27
More than 40 yrs.	8	18
Mean ± SD	29.18± 6.05	
Gender		
Male	19	42
Female	26	58
Qualification		
Diploma of Schools in Nursing	14	31
Diploma Technical Institute in Nursing	20	45
Bachelor in Nursing Science	11	24
Experience / years		
<3 yrs	8	18
3:6 yrs	23	51
>6yrs	14	31
Mean ± SD	5.15±5.04	
Training Courses		
Yes	37	82
No	8	18

Table (1): explains that, higher half of nurses (55%) were in the age group from twenty to thirty yrs. with mean age 29.18± 6.05, higher half of them (58%) were females. Meanwhile, the highest percentage of nurses (45%) were Diploma Technical Institute in Nursing, higher one third of the them (51%) were having experience between three to six yrs. in nursing field as well as 82% of them taking a training program about burn injury management in children.

Table (2): Comparison knowledge of nurses in pre-and post-test about burn injury management in children (N=45)

Questions	Pre-test		Post-test		P. value
	No	%	No	%	
knowledge about definition of burn injuries					X2=4.14 0.06
Correct	23	51	45	100.0	
Incorrect	22	49	0	0.00	
knowledge about causes of burn injuries					X2=6.13 0.12
Correct	24	53	43	96	
Incorrect	21	47	2	4	
knowledge about signs and symptoms of burn injuries					X2=3.12 0.05*
Correct	22	49	43	96	

Questions	Pre-test		Post-test		P. value
	No	%	No	%	
Incorrect	23	51	2	4	
knowledge about degrees of burn injuries					X2=5.15 0.04*
Correct	11	24	45	100.0	
Incorrect	34	76	0	0.00	
knowledge about burn complication					X2=3.07 0.02*
Correct	13	29	42	93	
Incorrect	32	71	3	7	
knowledge about first aid management					X2=4.13 0.13
Correct	26	58	41	91	
Incorrect	19	42	4	9	
Knowledge about discharge instructions.					X2=3.12 0.56
Correct	20	44	43	96	
Incorrect	25	56	2	4	

Table (2) clear that, 49% of the nurses had correct knowledge about signs and symptoms of burn injuries in the pre-test, whereas 96% in post-test. 24% of the most nurses had correct knowledge about degrees of burn injuries in pre-test while100.0 % in post-test. Nurses' knowledge about burn complication in pre-test was 29% while in post-test 93%. Also, this raise reached difference that is statistically significant between the nurses' knowledge in pre test as well as post with signs as well as symptoms, burn degrees, as well as complication of burn wounds, (P. 0.05, 0.04, and 0.02); respectively.

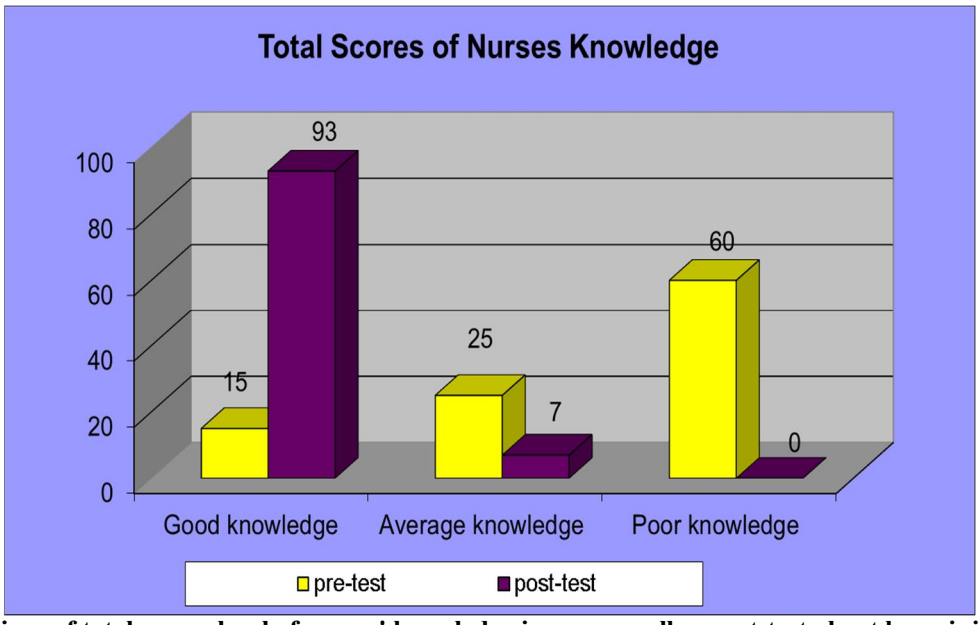

Figure (1): Comparison of total scores level of nurses' knowledge in pre-as well as post-test about burn injury management in children (N=45)

Figure (1): illustrates that, 45% of the nurses had average knowledge in pre-test, while 93%of nurses had good knowledge in post-test. Nonetheless, the gap between the nurses' pre-test and post-test knowledge reached a statistically significant level. with (P. 0.05).

Table (3): Comparison practice of nurses in pre-and post-test about burn injury management in children (N=45)

Questions	Pre-test		Post-test		P. value
	No	%	No	%	
Practice about burn dressing					X2=6.29 0.05*
Competent	12	27	45	100.0	
Incompetent	33	73	0	0.00	
Practice about Intravenous therapy					X2=7.10 0.03*
Competent	14	31	45	100.0	
Incompetent	31	69	0	0.00	
Practice about plasma transfusion					X2=4.13 0.05*
Competent	19	42	45	100.0	
Incompetent	26	58	0	0	
Practice about measuring vital signs					X2=6.15 0.04*
Competent	20	44	45	100.0	
Incompetent	25	56	0	0.00	

Table (3) clear that, 27% of the nurses had competent practice about burn dressing in pre-test, while 100.0% in post-test. 31% of the most nurses had competent practice about Intravenous therapy in pre-test while100.0 % in post-test. 42% in pre-test of nurses had competent practices about measuring vital signs while in post-test all of the nurses had competent practices.

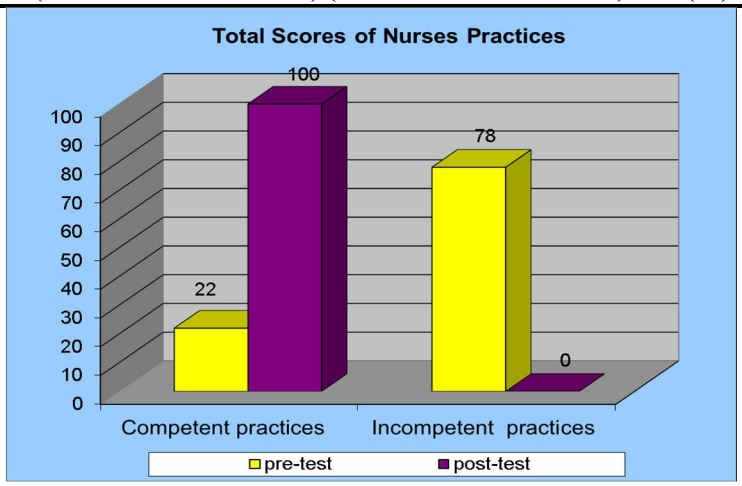

Figure (1): Comparison of total scores level of nurses' practices in pre-as well as post-test about burn injury management in children (N=45)

Figure (2): clears that, 22% of the nurses had competent practices in pre-test, while 100.0% in post-test. Nevertheless, the difference between the nurses' practices before and after the test reached a statistically significant level due to this rise with (P. 0.05).

Table (4) Correlation between total scores of nurses' knowledge and practices about burn injury management in children (N=45)

Knowledge	Performance	
	R	P. value
Pre-test	0.58	0.34
Post-test	0.95	0.001*

Table (4): discuss that, there were positive correlation in post-test between total nurses' knowledge as well as practices regarding burn injury management in children (r= 0.95 & P=<.001)

Discussion

There are various ways in which burns in children and adults are different. A rule of nine, that is utilize to determine the proportion of adult burn patients who have burns, is not applied to kids because of changes in body proportions with age. The most utilized tool for calculating the proportion of burns in youngsters is the Lund and Browder chart (**Mehmet and Aytekin, 2023).**

Acute pediatric patients are typically cared for by burn unit nurses at burn centers, units of critical care, trauma hospitals, as well as emergency rooms. It is their responsibility to clean and patch the wound while keeping the sufferers severely sedated to lessen the excruciating pain. After the traumatic event, burn department nurses and provide psychological support for the children's family. In order to safeguard burn sufferers' physical wellbeing, burn department nurses are responsible for notice, monitoring, as well as frequently ventilating them **(Reid and Ha, 2019)** They concentrate on assisting patients with recovering from severe 2nd and 3rd degree burns or, if necessary, offering the end of life care. The majority of burn department nurses treat injured patients one-on-one throughout their recovery. They take vital signs, evaluate the burn's damage, and start the IV fluids. However, this work entails more than just applying salve and bandaging wounds. Children's discomfort will be reduced, complications will be avoided, families will be informed about their children's prognosis, and children and their families will receive emotional support from burn unit nurses. Some even conduct burn prevention classes for the general public **(Mohammed, et al., 2021).**

Aim of the Study: was to evaluate the effect of instructional guidelines on nurses' performance regarding burn injury management in children.

According to the current study's analysis of demographic data, slightly higher fifty- percent of nurses were in the 20 to 30 year age range, with a mean age of 29.18 6.05, and a majority of them were female. While higher thirty- three percent of the study participants had experience of three to six years in the nursing sector, and the majority of them were enrolled in a training course about the care of burn injuries in children, the largest percentage of the sample investigated was Diploma Technical Institute in Nursing. The researcher claims that secondary schools for nursing train the majority of nurses who work in hospitals in Egypt, as opposed to nursing faculties and technical nursing institutes, which train a smaller percentage of nurses. This research was agreement with **Mohammed, et al., (2021)** claimed that the majority of the participants were females and that fifty-percent of them were between the ages of 20 and 40. Higher fifty-percent of the nurses in the research had more than ten years of experience as well as had completed training in burn management. They were all graduated from technical institute nursing. Also this research was agreement with **Lam, et al., (2018)** that explained that the majority of nurses were female and that technical nursing institutes produced more than half of their graduates.

The actual research clearly shows that, while the majority of nurses had strong knowledge after the test, more than half of them had low understanding before. The difference between the nurses' pre-test and post-test knowledge was statistically significant, nevertheless, at (P. 0.05. According to the research, this outcome can be attributable to the fact that training programs for nursing personnel were crucial and increased their knowledge. This research was agreement with **Mohammed, et al., (2021)** who made that clear, total understanding of burns, the current study made it clear that most nurses in the pre-intervention phase had inadequate knowledge of burns. This research was agreement with **Meschial, & Oliveira, (2017)** who presented that the highest percent of nurses had inadequate knowledge

of burns. Conversely, this research with **Carrougher, (2018)** who discovered that the majority of participants had adequate knowledge of burns.

This study demonstrates that whereas few nurses had competent practices in the pre-test, all nurses had them in the post-test. However, with a statistically significant difference between the nurses' behaviors in the pre-test as well as post-test (P. 0.05), this rise was observed. From a scientific perspective, this outcome can be attributable to the nursing staff's subpar performance prior to the application of a burn injury training program. This research was agreement with **Mohammed, et al., (2021)** who said that the actual study demonstrated that all nurses had unsatisfactory skills addressing burn during the pre phase of intervention. Also agreement with **Utsunomiya, et al., (2020)** that conducted the majority of study sample had unsatisfactory practice related to the burn. In additionally, this research was accordance with **Elsherbiny, et al., (2018)** that mentioned that because following the implementation of the training program, the majority of nurses had sufficient practice dealing with burns.

In the actual research, the overall score level of nurses' knowledge as well as practices about the management of burn injuries in children showed good association in the post-test (r= 0.95 & P=.001). This study supports **Mohammed, et al.'s (2021)** understanding that practice scores and general knowledge scores for nurses are related. This study supports **Melo, & Lima's (2017)** finding that there is a link between nurses' overall knowledge and their practice. However, this study differed from **Lam, et al.'s (2018)** discovery that there was a poor correlation between nurses' attitudes and general knowledge.

Conclusion

More than fifty percent of participants had poor knowledge in the pre-test, but the majority of them had good knowledge in the post-test. None of nurses had competent practice in the pre-test, but all of them had competent practice in the post-test regarding the management of burn injuries in children. There was a positive correlation between nurses' overall knowledge as well as practice scores. So the instructional instructions on nurses' performance for the treatment of burn injuries in children have a very positive impact.

Recommendation

The provision of ongoing training and updates for nurses on evidence-based nursing practices for the treatment of burn injuries in children. Encourage the new personnel to receive ongoing training and updates so they can offer burn children with high-quality care. Providing the burn unit with the tools and resources they need to work safely and effectively, as well as ongoing oversight and accountability from qualified supervision.

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