

Effectiveness of an Interventional Program on Nurses' Practices regarding Removing and Cleaning Burn Dead Tissue

فاعلية البرنامج التداخلي على ممارسات الممرضين حول إزالة وتنظيف الأنسجة الميتة للحرق

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المستخلص

الاهداف: تهدف الدراسة إلى قياس فاعلية البرنامج التداخلي على ممارسات الممرضين في إزالة الأنسجة الميتة لمرضى الحروق.
المنهجية: الدراسة ذات تصميم كمي (تجريبي واحد) من خلال تطبيق نهج الاختبار القبلي والبعدي خلال الفترة من 17 تشرين الأول 2020 إلى 20 اذار 2022. تم اختيار عينة غير احتمالية (غرضية) مكونة من 24 ممرضاً يعملون في مركز الحروق والجراحة التجميلية التابع لمستشفى ازادي التعليمي. تم تصميم البرنامج التداخلي وأداة الدراسة بناءً على حاجة تقييم ممارسة الممرضة ومراجعة الأدبيات والمحاضر العلمي والدراسة السابقة. تم تقييم محتوى البرنامج والأداة من قبل 16 خبيراً في الدراسة السابقة الحالية مع مجال مختلف ويتم تحديد موثوقية الأداة من خلال استخدام الاختبار وإعادة الاختبار، وقياس فاعلية برنامج تعليم التمريض المنفذ من خلال (22) عنصراً يتعلق إرشادات الحروق السريرية. تم إجراء تحليل البيانات من خلال تطبيق الإحصاء الوصفي وكذلك الإحصاء الاستدلالي باستخدام الحزمة الإحصائية للنسخة 22 من العلوم الاجتماعية.
النتائج: أظهرت النتائج أن معظم عينة الدراسة كانوا من الذكور، 30-39 سنة، خريج ثانوي، أقل من 5 سنوات خبرة، معظم العينات يشاركون في دورات الحروق، دورة واحدة في العدد، ودوراتهم داخل العراق أيضاً. كمقارنات، كانت الفروق الهامة فيما يتعلق بإزالة الأنسجة الميتة وتنظيف الحروق فروق ذات دلالة إحصائية عند $P < 0.01$

الاستنتاجات: خلصت الدراسة إلى أن ممارسة الممرضين فيما يتعلق بإدارة الحروق الأولية قد تحسنت بسبب تطبيق البرنامج التداخلي المقترح.
التوصيات: توصي الدراسة بضرورة توفير برنامج تعليمي حول إزالة وتنظيف الأنسجة الميتة المحترقة كجزء من المناهج في مركز الحروق والجراحة التجميلية.
الكلمات المفتاحية: الحرق، أنسجة ميتة، جلد، المعالجة العناية التمريضية

Abstract

Objective(s): The study aims to measure the effectiveness of the interventional program on nurses' practices on removing dead tissue for burn patients.

Methodology: The study is quantitative in nature (one experimental) and will employ pre- and post-testing techniques between October 17th, 2020 and March 20th, 2022. A non-probability (purposive) sample of 24 nurses working in the Azadi Teaching Hospitals, Burns and Plastic Surgery Center was chosen. The experimental survey of nursing practice, a literature review, scientific records, and previous research were all taken into consideration when developing the training program and study's conclusion. The program's information and tool are reviewed by sixteen experts representing a variety of areas, and the instrument's dependability is established through test and retest. The effectiveness of the nurse education program is evaluated using 22 clinical criteria for first burn treatment. In SPSS version 22, descriptive and inferential statistics are used to analyze the data.

Results: The findings show that men between the ages of 30 and 39, graduates of high school, and people with less than five years of experience made up the vast majority of the sample. The majority of the samples participated in a burn course that was conducted in Iraq. In addition to significant comparisons, there were significant differences at $P < 0.01$ in the removal of necrotic tissue and the cleaning of burns.

Conclusions: study concludes that nurses' practice regarding initial burn management improved due to implementing the suggested intervention program.

Recommendations: Providing of an educational program about removing and cleaning burn dead tissue as part of the curriculum in burns and plastic surgery center is essential.

Keywords: Burn, dead tissue, skin, management, nursing care

Introduction

A burn occurs when the body's tissues are injured by ultraviolet radiation, heat (from fire, electricity, radiation, hot water, or steam), or chemicals. It is possible for infected burns. By placing pressure on tissues, nerves, and blood arteries, infected burns and the swelling that results can cause significant damage to the organs and tissues below the burned area⁽¹⁾.

Burn debridement removes damaged tissue to promote healing and avoid further harm or infection. Burn debridement can take several forms. Tissue removal via surgery, chemical, mechanical, or autolytic means. Debridement may be required several times to cure the burned area properly⁽²⁾. Cleaning the burn wound reduces bacterial colonization, removes loose skin, removes exudate and previous dressings, and prepares the wound for dressing⁽³⁾.

Debridement is an essential component of the natural healing process because it reduces the risk of infection and stimulates the formation of healthy granulation tissue, which aids in recovery⁽⁴⁾.

Ascariasis is a skin disorder defined by the presence of dead tissue and a dry discharge from a wound produced by a burn or an infectious disease. Scratching protects and covers the wound temporarily. Necrosis frequently resolves after a month or self-dissolves⁽⁵⁾.

Eschar development is a possible complication of burn injury. Escharotomy and eschar debridement may be necessary for definitive management. Following the removal of the eschar, the wound can be covered with a skin graft or reepithelialization⁽⁶⁾.

The initial bandage change is one of the most difficult components of burn wound care. The nurse was now faced with the difficult task of determining the optimal method for dewatering the burn wound. Necrosis is made up of injured necrotic skin, coagulated protein from the exudate plasma, and growing bacterial exudate⁽⁷⁾.

Typically, the eschar loosens around the second or third week, and the granulation base appears beneath the eschar. However, the earlier this granulation base forms, the sooner a transplant can be placed⁽⁸⁾.

Nurses are the most in contact with patients, and they are the ones who treat the effects that occur because of the burn from the physical changes that accompany the burn, fluid imbalance, disorders that occur to the heart, and neurological changes, as well as considered the ideal person to assist a patient with psychological requirements, such as pain management and anxiety management⁽⁹⁾.

The nurses in the burn unit need a diverse training program in order to update the basic knowledge and expertise they have, and these training programs include workshops related to burns or international or national seminars and conferences, and this update is very important in order to provide the best ways to treat patients, identify potential risks and complications, and provide preventive care⁽¹⁰⁾.

There is a lot of research on nurses' skills, but there is still an urgent need to increase nurses' expertise in the field of deep burns. One of the benefits of exploring and understanding the experiences of burn unit nurses is to find appropriate and valuable solutions around the problems and challenges they may encounter⁽¹¹⁾.

Methodology

Design of the Study:

The present study utilized a quantitative (pre-experimental) design with a pre-post-test technique to measure the effectiveness of an interventional program on nurses' practices regarding removing and cleaning burn dead tissue covers the period from October 17th, 2020 and March 20th, 2022

Setting of the Study:

The Burns and Plastic Surgery Center at Azadi Teaching Hospital in Kirkuk city was where the study was carried out.

Samples of the Study:

As the non-probability (purposive) study sample, 24 nurses employed by Azady Teaching Hospital's burns and plastic surgery center were selected.

Ethical Considerations: The University of Baghdad's, College of Nursing's, Scientific Research Ethical Committee has given the study its blessing. All nurses who have participated in the study have signed consent form for their agreements to participate in the study

The Study Instrument and Interventional Program:

The Australian guideline of burn patient management served as the foundation for the creation of the study instrument and interventional program. The instrument was made up of three parts; these parts are:

Part I: Demographical Characteristics of the Nurses:

This part contains four items of: the nurses' age, gender, level of education, and years of experience.

Part II: Burn Courses

This section consists of four items: participation in burn courses, course number, course length in days, and course location.

Part III: Evaluation of Removing Dead Tissue and Cleaning the Burn Practice

This section consists of eighteen items due to who removing dead tissue and cleaning the burn.

The Interventional Program

The interventional program was performed from 10th July up to 10th August ,2021. It was presented in 8 sessions (2 sessions per week), and each session took about 60 minutes from 12.00 pm up to 1 pm. The interventional program consists the following sessions:

Validity of the Study: To confirm the instrument's and the interventional program validity, a panel of (16) experts in a variety of nursing fields reviewed the instrument's and the interventional program. Experts were consulted regarding the nurses' procedures for removing dead tissue and cleaning burns in order to examine the watch list and planned intervention program. Their suggestion is taken and some changes are made according to their opinion.

Reliability of the Study Instrument: The Intra-rater reliability is used to measure the reliability of the current study instrument using SPSS version 22.0. The reliability result for the observational checklist (0.94) is statistically acceptable, indicating that the data gathering procedures are sufficiently reliable.

Rating and Scoring of the Study Instrument:

The three levels of scoring (Not apply, Apply False, and Apply True) are scored using integer numbers (1, 2, and 3). Additionally, when evaluating responses, the following three values are used: value one for not applying in all three attempts, value two for applying falsely in at least one of the three attempts, and value three for applying truthfully in at least one of the three attempts.

Data Collection Methods:

The period of data collecting was from June 8th, 2021, to October 16th, 2021. Observational checklist is used to evaluate nurse's practices of removing dead tissue and cleaning the burn. The data collected in 2-time points pre-test, post-test after month of presenting the interventional program.to the nurses.

Statistical Analysis

Descriptive and inferential statistical approaches were used to analyze the data by using SPSS, version22.

Results

Table (1): Distribution of Demographical Information about Nurses with Comparative Analysis

Demographic characteristics	Classes	No	%	C.S. (*) P-value
Gender	Male	15	62.5	P=0.000 (HS)
	Female	9	37.5	
Age Groups per years	< 30	8	33.3	$\chi^2= 31.200$ P=0.000 (HS)
	30 _ 39	10	41.7	
	40 _ 49	6	25	
	Mean \pm SD	34.5 \pm 7.49		
Level of Education	Nursing preparatory graduate	7	29.2	$\chi^2= 31.200$ P=0.000 (HS)
	Nursing high school graduate	12	50	
	Nursing college graduate and above	5	20.8	
Years of Experience Yrs.	< 5	11	45.8	$\chi^2= 31.200$ P=0.000 (HS)
	5 _ 9	6	25	
	≥ 10	7	29.2	

(*) **HS: Highly Sig. at P<0.01; Testing based on One-Sample Chi-Square test, and Binomial test.**

According to the demographic features of the samples in Table 1, the results indicate that the analyzed groups had very significant differences at P0.01 between their observed frequency distribution and their anticipated results for each variable based on the supposition of randomness. The vast majority of subjects were male, accounting for 15 (62.5 %) of the studied sample; most of them are from the age groups of (30-30) years, accounting for 10 (41.7 %) with a mean and standard deviation of (34.5 \pm 7.49) years; nursing high school graduate accounting for (50 %); and finally, the majority of studied subjects were with 5-10 years of experience (45.8 %).

Table (2): Distribution of Researched Subjects Based on (Burn Training Courses) with Comparative Analysis

Burn courses	Classes	No	%	C.S. (*) P-value
Participation in burn courses	No	10	41.67	P=0.000 (HS)
	Yes	14	58.33	
	Total	24		
Course number	One course	9	64.29	P=0.000 (HS)
	Two and more courses	5	35.71	
	Total	14		
Duration of the course per days	5 Days	10	71.43	P=0.000 (HS)
	More than 5 Days	4	28.71	
	Total	14		
Place of the course	Inside Iraq	13	92.86	P=0.000 (HS)
	Outside Iraq	1	7.14	
	Total	14		

(*) HS: Highly Sig. at $P < 0.01$; Testing based on One-Sample Chi-Square test, and Binomial test.

Subjects of study (Burn Training Courses) variables, under the supposition of randomization, the study groups demonstrated significant differences between the observed frequency distribution and an expected result for each variable at $P 0.01$. As a result, only 14 (58.3%) of the nurses in the study sample took part in burn courses; only 9 (64.29%) of them took part in one course, and 10 (71.43%) entered the courses. After five days, 13 (92.86%) of the investigated subjects had eventually registered in classes inside Iraq.

Table (3): Evaluation of Nurses' Practices Regarding Removing Dead Tissue and Cleaning the Burn at Pre-Post Test Phase

Pre-test	No.	Min.	Max.	PGMS	PSD	Ev.
Pre-test	24	50	88.89	66.90	11.05	H
Post-test	24	88.89	100	91.20	4.61	H

(*) HS: Highly Sig. at $P < 0.01$; Testing based on: McNemar test. Observational checklist items

Table (3) shows highly significant differences regarding the observational checklist items about removing dead tissue and cleaning the burn along pre-posttest periods with comparisons significant.

Table (4): Overall Evaluation of Nurses' Practices of Dressing Burns Wounds at the Pre and Post Test

Main Domain	No.	Pre		Post		C.S. P-value
		PGMS	PSD	PGMS	PSD	
Removing dead tissue and cleaning the burn	24	66.90	11.05	91.20	4.61	P=0.000 (HS)

(*): HS: Highly Sig. at $P < 0.01$; S: Sig. at $P < 0.05$; NS: Non Sig. at $P > 0.05$; Testing based on: Wilcoxon Signed Ranks Test.

Table (4) summarizes the statistics on eliminating dead tissue and cleaning the burn associated with the checklist questions created during the examined (Pre, and Post) periods as a result of implementing a planned interventional program for the studied participants, with significant comparisons. The results of significant testing comparisons for the studied items, as well as evaluation scoring scales, indicated highly significant differences at $P < 0.01$ in favor of the effectiveness of a proposed program for removing and cleaning burn dead tissue for the studied nursing staff at post period, which could be used to confirm the proposed program's importance and success.

Discussion

Respect to the nurses' demographical characteristics in table 1. The findings revealed that there were statistically significant discrepancies between the frequency distributions observed for each variable and the expected outcomes of the study groups for each variable under the assumption of random distribution. As a result, 15 (62.5%) of the sample under study were male, making up the majority of the sex variable. The first and second groups were dominated by the age range of 18 years (75%) with a mean and standard deviation of 34.5-7.49 years, and the educational level was the primary focus. Low levels of education were present, as shown by the fact that only 19 (79.2%) of the subjects had finished at least primary or secondary school. Last but not least, the vast majority of individuals questioned kept track of how many years they spent working at the burn center.

The study come along with a descriptive study done on nurses who were working at burn units in Baghdad City Hospitals, Al-Kindy, Al-Yarmook, Al-Qadisiya, Al-karkh, and Al-Karama hospital, they concluded that majority (60%) of these nurses were male, (30%) at age of the (30-40) years old, (55%) had diploma in nursing,

(37.5%) had (1-5) years of experience in burn unit⁽¹²⁾.

The result of the study disagrees with a survey on 3545 nurses regarding clinical work environment at burn unit in the United States, they came to the conclusion that 42.5% of respondents had more than five years of job experience since completing nursing school. However, just 10.2% of participants had gone through first aid and burn management training. Furthermore, the results of their study differed with the results of this study with regard to training course about burns, where (85%) of the nurses who participated in their study did not participate in educational courses about burns, while (41%) of the nurses did not participate in courses about burns⁽¹³⁾.

Additionally, a survey on 353 registered nurses working in emergency and trauma departments of district and Provincial Hospitals in Vietnam. A significantly higher knowledge level was recorded among nurses who had attended training courses. Place and employment history had little impact on knowledge level, though. to enhance nurses' burn emergency management. Meanwhile, work experience and place did not influence

knowledge level to improve the burn emergency management of nurses⁽¹⁴⁾.

Table 3,4,5 shows descriptive statistics concerning nurses practice regarding dressing burn wound at pre-posttest phase, such that significant comparisons, the percentile grand/global mean of scores, and the standard deviation are taken into account. The effectiveness of applying an educational program on removing dead tissue and cleaning burn wound.

The multidisciplinary team's main members are the nurses, hyperbaric oxygen providing and treatment for burn

The care of burned patients demands more responsibility than it does for the majority of seriously ill patients, which presents considerable difficulties for health staff in burn units. Nurses are an integral part of a multidisciplinary team of care for the burned patients and they spend more time to care for removing dead tissue⁽¹⁶⁾.

Moreover, improvement in the management of patients with severe burns, including fluid resuscitation, pain management, removing of decrements, modern dressing products, nutritional support, various surgical interventions, infection control and early rehabilitation programs, the survival rate has been increasing in the last decades⁽¹⁷⁾.

Conclusions

The study concluded that nurse's practices regarding initial burn management improved due to applying of the proposed interventional program.

Recommendations

The study recommends that providing of an educational program about removing and cleaning burn dead tissue as part of the curriculum in burns and plastic surgery center is essential.

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