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Los Angeles

Improving the Quality of Burn Care Through Wound Education for Urgent Care Providers

A dissertation submitted in partial satisfaction of the  
requirements for the degree  
Doctor of Nursing Practice

by

Hien Thi Ho

2024

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# ABSTRACT OF THE DISSERTATION

Improving the Quality of Burn Care Through Wound Education for Urgent Care Providers

by

Hien Thi Ho

Doctor of Nursing Practice

University of California, Los Angeles, 2024

Professor Wendie A. Robbins, Chair

**Background:** Studies have shown a knowledge deficit of appropriate initial burn treatment. There is a need for evidence-based wound care education rooted in new recommendations for providers to promote better patient outcomes. **Objectives:** To determine if an education module on burn wound management can improve Urgent Care providers' knowledge and confidence in burn care, a pre-post intervention quality improvement project was implemented in three Urgent Care locations in Orange County from February 2024 to March 2024. **Methods:** All participants engaged in a 30-minute in-person wound care education intervention and completed the pre-and post-test the same day. There was a 4-week follow-up post-test to assess for retention. Participants' demographics, burn care knowledge, and

confidence in burn care were collected using pre- and post-test surveys. Data was analyzed using descriptive statistics and the Wilcoxon test. **Results:** Of the 19 participants, 2% had 1-5 years, 53% had 6-10 years, 37% had 11-15 years of experience in UC practice, and 21% of participants completed a CME course concerning burn care within the past two years. Participants were 16% MD, 10% DO, 32% NP, 42% PA. Of the 19 participants, 58% were between age group 30-39 years and 42% were between 40-49 years. There was a statistically significant increase in mean knowledge and confidence scores. Mean wound care knowledge score (4.2, SD 1.9 vs. 6.6, SD 1.5;  $p=.001$ ) and mean confidence score (2.5, SD 0.7 vs. 3.4, SD 0.6;  $p=.001$ ) from pre- to post-test, respectively. There was also a significant increase in mean wound care knowledge score (4.2, SD 1.9 vs. 6.7, SD 1.2;  $p<.001$ ) from the pre-test to the 4-week follow-up post-test.

**Conclusion:** An education intervention improved providers' immediate and follow-up knowledge and confidence in burn care practice among urgent care providers. This study provides an effective burn wound education model for UC providers. Future studies are needed to assess the effectiveness of a burn education module across all outpatient settings and to assess changes in clinical practice and patient outcomes.

The dissertation of Hien Thi Ho is approved.

Mary-Lynn Brecht

Sophie Sokolow

Wendie A. Robbins, Committee Chair

University of California, Los Angeles

2024

## DEDICATION

This dissertation is dedicated to my loving family and friends, as well as my unconditional source of love, Kenobi. To my amazing mother, I hope I have made you proud. You have taught me to work hard and achieve more. Your sacrifice and love know no bounds, and I am who I am because of your love and dedication to our family. To my siblings, you motivate me daily to be a better sister, Aunt, and human being. I am blessed to have you as my built-in best friend and forever confidant. To my wonderful friends, I would not have any sustainability without our dedication to friendship, laughter, and relaxation. And to my 75lb Pitbull of love, goofiness, and slobber. Kenobi, if only you knew how much happiness, purpose, and motivation you provide me. You are the ultimate meaning of unconditional love. I am so blessed because of the people and doggies in my inner circle; you all enrich my life, and I love each of you very much.

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BLS	American Heart Association <i>Basic Life Support</i>	Exp: November 2025
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## CHAPTER ONE: INTRODUCTION

Approximately half a million burn patients require professional assessment and medical treatment in the Emergency Department (ED), resulting in 40,000 hospitalizations and 3,800 deaths each year (Yu et al., 2020). Most minor burn injuries can be managed in an outpatient setting and do not require specialized burn care or consultation follow-up (Wiktor & Richards, 2022). Untreated and mismanaged burn wound treatment can lead to preventable infection, increasing unnecessary patients' risk of morbidity and mortality (Long et al., 2015). According to the American Burn Association (ABA) (2017), minor burns generally are isolated, do not involve the face, hands, perineum, or feet, do not cross major joints, and are not circumferential. The ABA defines minor burns as <10 percent total body surface area (TBSA) partial thickness burns in patients 10-50 years old, <5 percent TBSA partial thickness burns in patients under ten or over 50 years old, and <2 percent TBSA total thickness burns in any patients without other injury and should have airway and hemodynamic stability. The criteria and classification of burns are determined by the depth of the injury (Appendix B).

Topical antimicrobial ointments are one of the best choices for wound treatment; however, there is no standard as to which topical agent or dressing is most effective for burn care (Long et al., 2015). Commonly used topical ointments for partial-thickness burns include silver sulfadiazine (SSD), topical antibiotics, and chlorhexidine, and of these choices, SSD is one of the most commonly used in treating partial-thickness burns (Lloyd et al., 2012). Historically, SSD was thought to decrease bacterial colonization by creating a pseudo-eschar around the wound (Long et al., 2015). However, studies have shown that SSD delays wound healing and has multiple adverse effects (Long et al., 2015). The ideal dressing for burn wounds does not exist, and there is no set standard or guidelines for its use. It is essentially up to the provider to decide

and consider all the multiple factors that exist when it comes to burn management (Chipp, 2023). Studies have also shown that if outpatient healthcare providers in primary care and ambulatory care centers have strong knowledge of basic concepts of burn care, excellent results can be achieved in wound healing and management (Bigley et al., 2015). There is wide variation in practice, including assessment, wound debridement/excision timing, and the products and procedures used to achieve definitive wound healing. While innovation in burn care has flourished and improved patient outcomes through the years, there remain opportunities to improve healing and clinical outcomes (Kruger et al., 2020).

The area of clinical interest for this Doctoral Nursing Practice (DNP) scholarly project is to promote improved minor burn wound management in the outpatient setting through an evidence-based education modality offered to healthcare providers. Changes in practice and evolving evidence-based research have led to a need to translate evidence into practice in burn wound management. Burn care knowledge and management need to be more consistent among healthcare providers (Delaplain et al., 2018). The initial care or point of entry for burn patients is usually through a local outpatient healthcare facility and initially assessed and managed by a non-burn specialist provider (Lanham et al., 2020). If a provider can see a burn victim with the expertise, resources, and knowledge of burn management, healing results, and patient outcomes are favorable. The most significant impact on patient outcomes is the training and education of nonburn specialist providers in the proper initial treatment and management of mild burn wounds (Markiewicz-Gospodarek et al., 2022). A multimodal wound education and intervention program in treating burn patients is needed in the outpatient setting. The proposed project will provide formal minor superficial burn wound education to increase confidence and knowledge in Urgent Care (UC) providers, including medical doctors (MDs), Doctor of Osteopathic Medicine (DO),

Nurse Practitioners (NPs), and Physician Assistants (PAs). The potential short-term implication of this program is to improve the current understanding of burn care, with the long-term goal of promoting a change in the practice of the initial treatment of mild to moderate burn wounds, steering away from the historic use of SSD. Empowering providers with burn education resources will result in improved patient outcomes and reduced healthcare costs and resources.

### **Problem Statement**

Studies have shown a knowledge deficit of appropriate initial burn treatment due to a lack of formalized education and exposure to burns in current medical and nursing curricula (Delaplain et al., 2018). There is a need for evidence-based wound care education rooted in new recommendations for providers in the outpatient setting to promote better patient outcomes (Delaplain et al., 2018). This quality improvement (QI) project aims to answer the following Population-Intervention-Comparison-Outcome-Time (PICOT) question: Among healthcare providers (NP, PA, MD/DO) in a UC setting, how does an evidence-based education program on burn wound care compared to the current practice of no education, affect burn wound care knowledge and confidence over a 4-week period?

### **DNP Essentials**

This DNP scholarly project aligns with the American Association of Colleges of Nursing (AACN) DNP Essentials II, which highlights organizational and systems leadership for quality improvement and systems thinking (AACN, 2021). A gap in knowledge and practice can be filled by qualified advanced practice registered nurses (APRN) in delivering education modalities and programs to healthcare providers to increase knowledge and translate evidenced-based data into practice over time. At its scientific core, nursing contributes to the positive and evidence-based care of patients and the health community. The DNP-prepared nurses are well-



trained and educated to conduct and implement clinical research and use evidence-based research to guide patient care. The role of the DNP focuses on translational frameworks and emphasizes collaborative models for knowledge, so there is a formalized process in how knowledge is exchanged into practice change (Graves et al., 2021). The DNP or APRN acts as a vessel for clinical and institutional change. The DNP-prepared nurse is equipped with the skills to do a literature search and review of evidence-based research to determine what interventions are supported by evidence to change practice based on expertise in implementing various frameworks, theories, and process models (Graves et al., 2021). The DNP Essential II focuses on the nurse leader to create change in a healthcare organization by advancing burn care knowledge, educating providers on new guidelines based on evidence-based practice (EBP) findings, and promoting improved patient outcomes through systematic change.

## CHAPTER TWO: THEORETICAL FRAMEWORK

Lewin's Change Theory is the guiding theoretical framework for the proposed QI project. Lewin's theory is used throughout nursing literature as a framework to transform healthcare. Approximately 70% of QI projects and initiatives fail within the first year of implementation, most likely due to the failure to recognize the complexity of QI processes and lack of knowledge to achieve meaningful and sustainable change (O'Donoghue et al., 2021). An emphasis on the change process is necessary to manage the introduction and implementation of change. Change management is transitioning people from one current state to a changed future desired state (O'Donoghue et al., 2021).

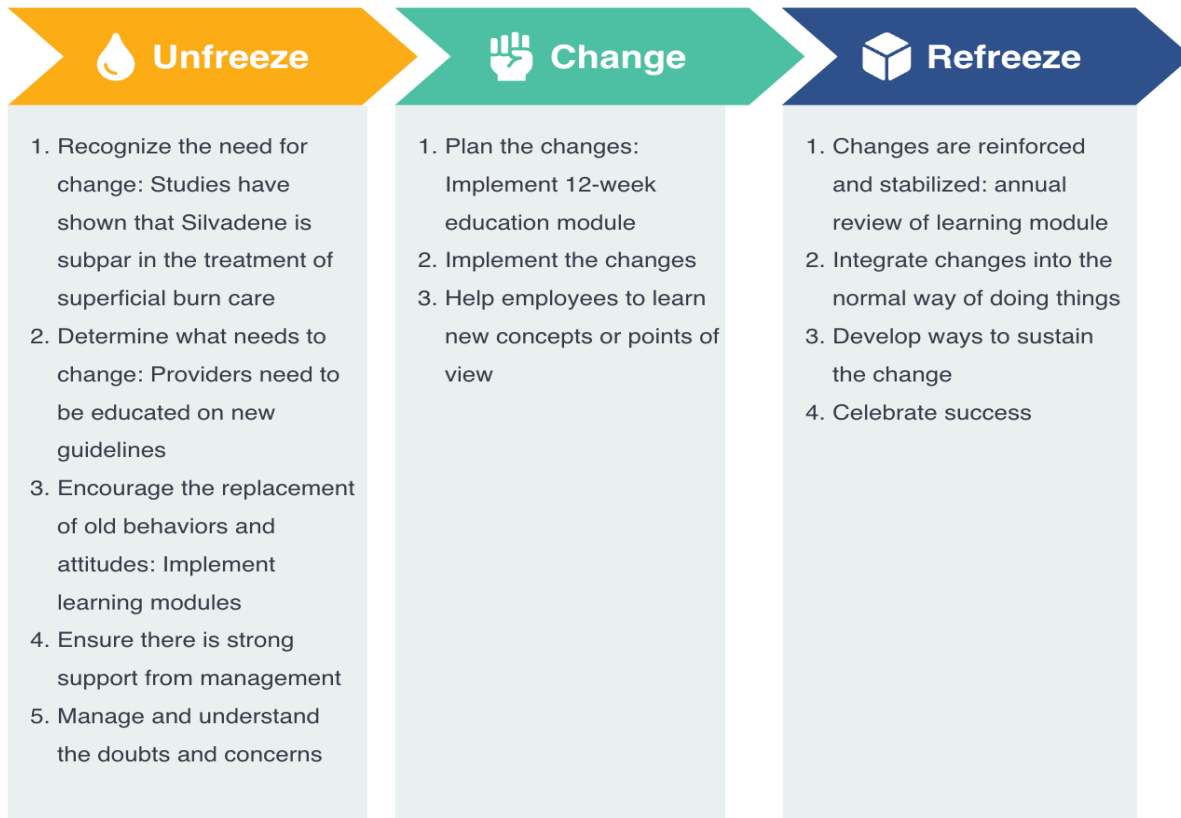
Lewin's Change Theory encompasses a three-stage model known as unfreeze-change-refreeze. It also has three major concepts: driving forces, restraining forces, and equilibrium (Petiprin, 2020). In the unfreeze stage, there needs to be an increase in the driving force to change behavior away from the status quo or current practice and a decrease in restraining forces that negatively affect the proposed change (Petiprin, 2020). In the second stage, the process of change in thoughts, feelings, and behavior is implemented. Refreeze, the third and final stage, describes a method to establish the shift into a sustainable standard of care. This final stage is crucial as it prevents the target subject from reverting to old practices and behavior (Petiprin, 2020) (see Figure 1).

Lewin's Model Change Theory allows for success in implementing change in healthcare. With each step during the project's development, planning implementation, and information-gathering aspects, Lewin's theory of evolution was used as a guiding framework. Mismanaged initial burn care and intervention can lead to delayed and prolonged wound healing and increase the financial burden for the patient and the organization. The driving force for providers and

health administrators in the unfreeze stage is to help reduce costs and improve patient outcomes. Although change is inevitable, it is usually met with resistance. These barriers or restraining forces are identified as a lack of interest and time, awareness of updated recommendations, and formal training.

The first phase of Lewin's change theory focuses on challenging the status quo. An education intervention addresses the identified barriers to decrease the restraining forces and push forward the driving force. The successful implementation of and the transition of change depends on the approval and involvement of key stakeholders. These stakeholders include clinic administrators, UC providers, nurses, ancillary support staff, and other healthcare administration professionals. It is essential to ensure that all stakeholders are on board with the project and understand the potential benefits and challenges of the venture. This will ensure proper support and engagement. In the change stage, the QI project focuses on implementing the evidence-based burn education module for UC providers. The goal and the set of measurable outcomes are to increase knowledge on managing minor burn wounds and confidence to change practice after enhanced knowledge. The last stage, known as refreezing, establishes the change implementation as the new status quo. The refreezing stage engages the UC providers to change their burn wound care management based on the evidence-based research presented. The goal of this last stage is to sustain the implemented change and to retain knowledge to improve patient outcomes through incentivizing improved burn wound management of providers. The UC providers receiving this educational module through this project will enhance their burn care knowledge and gain confidence in providing care through evidence-based practice. In the Refreezing stage, it would become standard of practice in the study's UC setting to provide clinicians annual burn care education through a virtual platform in order to improve patient outcome.

**Figure 1: Lewin's Theory of Change**



Note: Lewin's Theory of Change application to the current QI project

## CHAPTER THREE: REVIEW OF LITERATURE

High-quality, evidence-based practice articles were reviewed using PubMed, Cumulated Index in Nursing, and Allied Health Literature (CINAHL) database search. The keywords used include: “burn care”, “burn treatment”, “healthcare providers”, “education”, “outpatient”, and “Silvadene”. The papers were filtered and organized by most recent publications within the last ten years, and only articles written in English were included. This search resulted in 794 results. To narrow the literature search, Boolean operators were used: “healthcare providers” AND “burn care,” “burn treatment” AND “education,” “burn care” AND “Silvadene”. The search yielded 298 results. After a review of the titles and abstracts, studies related to burn referral, resuscitation, trauma, and burn prevention were eliminated. The remaining articles were again reviewed to focus on burn education, burn treatment, and the use of Silvadene. The articles and studies were included based on relevant and current knowledge and critically appraised for the value of evidence and strength of quality using the Johns Hopkins Research Evidence Appraisal Tool. The PRISMA analysis yielded five articles that included both burn wound education interventions and evidence-based interventions for burn wounds. Of the five studies chosen, three were Level I, and two were Level II, according to the Johns Hopkins Research Evidence Appraisal Tool. These findings are displayed in the Table of Evidence (TOE) (Appendix A).

### **Literature Review**

McWilliams et al. (2015) used a two-phase design study to evaluate the effectiveness of an education program in increasing provider knowledge of burns assessment and management. Multidisciplinary non-burn specialist providers in Western Australia were surveyed to identify learning deficits as it relates to pediatric burn care. The researchers developed the education program intervention to be delivered live via videoconference. The pre-post-test analysis

evaluated changes in knowledge due to attendance at each education session. The authors sent out one thousand surveys to over 180 healthcare facilities, and 281 completed surveys were returned. The results indicated a statistically significant improvement in providers' knowledge in all pre-test and post-test answer comparisons, especially in responses to questions on burn wound management. The study supports the idea that education implemented using a videoconference platform was effective in increasing provider burn care knowledge, with statistically significant ( $p < 0.05$ ) growth in knowledge (McWilliams et al., 2015). This article was included as it provides data supporting an education program aimed at increasing provider knowledge. The limitation of this study is that it is only representative of clinicians in Western Australia and is not tracked over time. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level II Evidence.

Farthing et al. (2022), in a quasi-experimental, one-group, pretest-posttest design, evaluated the effect of an education intervention on novice nurses' knowledge of pediatric nursing burn care. The study used the online training center employed in the Pediatric Surgical-Trauma and Burn Unit of the Sainte-Justine Pediatric University Hospital in Montreal, Quebec, Canada, between March and July 2020. Using a convenience sampling method, 16 novice nurses were recruited. The intervention was implemented using an online training platform of the study setting. Participants had two months to complete the program, the knowledge questionnaire, and the level of satisfaction. Results showed that the intervention was feasible with an online platform, and all the participants were satisfied with the developed virtual learning. Results also showed increased knowledge of pediatric nursing burn care after the intervention; t-tests for paired samples indicated that there was a significant difference from pre-intervention to post-intervention for all sections ( $p < .001$ ) (Farthing et al., 2022). The study's limitations are that the

design did not include a control group, there was a small sample size, and there is a concern for content validity as the instruments used to measure burn care knowledge and satisfaction were developed by the study's author. This article was included as it supports the idea that evidence-based e-learning appears to fill a gap in current training and can increase the knowledge levels of healthcare professionals regarding various topics. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level II Evidence.

Fathuldeen et al. in a cross-sectional study, assessed the knowledge and management of burn injuries among healthcare providers in various specialties in Ha'il region of Saudi Arabia (2023). The study used in-person mock simulations with a burn mannequin displaying varying burn degrees to assess the providers' hands-on management of the burn case scenarios and an interviewer-administrated face-to-face questionnaire. 119 physicians from different specialties participated in the study, including emergency medicine, dermatology, surgery, intensive care medicine, and family medicine. The participants were evaluated on various parameters such as circulation maintenance, injury identification, degree of burn estimation, and appropriate burn referrals. 46.2% of the participants scored 6-10 out of 20; the maximum score was 16/20, and the minimum score was 0/20 (Fathuldeen et al., 2023). When comparing the mean evaluation scores between providers who had a previous burn management course to those who had not, it was found that providers who had previously taken training courses had a much greater degree of expertise than the rest, although not found to be statistically significant ( $p=0.131$ ). The researchers concluded that most physicians lacked practical knowledge of proper burn management and did not have burn first aid training. The study limitations included being in a single city in Saudi Arabia which may not represent all physicians' knowledge and responses. This article was included as it supports the idea that more basic training programs for providers

who encounter burn injuries and cases are required. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level III Evidence.

Toussaint et al. (2015), in a prospective, randomized controlled study, compared the effects of petrolatum-based triple antibiotic ointment with silver-based foam dressing in the porcine model. The study aimed to prove that topical antimicrobial ointment is superior to silver-containing occlusive foam dressing in time to heal and less scarring in second-degree burns. Sixty burns were created on 3 live porcine model; 30 burns were randomized to triple antibiotics, and 30 were randomized to the silver-based dressing. The study showed that excised deep partial-thickness burns on porcine treated with petrolatum-based topical antibiotic ointment heal significantly faster and with less scarring than when treated with a silver-based foam dressing (Toussaint et al., 2015). At day 21 of the study, all wounds treated with the antibiotic ointment were re-epithelialized entirely, while only 55% of those treated with the silver dressing were re-epithelialized ( $p < 0.001$ ) (Toussaint et al., 2015). One of the main limitations of this study is that it needs to be clarified if these findings are generalizable to humans. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level I Evidence.

Bennett et al. used a prospective cross-sectional study to identify and compare first aid practices in pediatrics who present to the Emergency Department with burn injuries (2019). The authors determined that there are discrepancies between recommendations for burns first aid in the United Kingdom (UK) and the US, and these discrepancies may cause confusion regarding initial first aid treatment. The study was conducted in two pediatric emergency departments: Cardiff, UK, and Denver, USA, and over a 30-month period from May 2015 to October 2017. 500 participants were assessed for the proportion of children who had received first aid and the quality of the first aid by non-medical personnel. Study researchers classified first aid as



anything applied to the burn by anyone other than a medical professional. The quality of first aid followed the national guidelines; UK recommendations from the British Burn Association (BBA) and US recommendations came from the ABA. The study found that children in Cardiff were 1.47 times more likely to have had some form of first aid than those in Denver. Of the participants who had any first aid treatment, those from Denver were 4.7 times more likely to have a dressing and twice as likely to have had the wound covered with a topical ointment than those in Cardiff, consistent with each national guideline recommendation (Bennett et al., 2019). The study concluded that there was poor application of recommended first aid for burns, and only 26% of caregivers in Cardiff and 6% in Denver followed their country's national recommendations. This study was included because it shows a knowledge gap around appropriate first-aid use in burn injuries. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level III Evidence.

Mohammed et al. used a quasi-experimental design to evaluate the effectiveness of an educational nursing program on nurses' performance regarding burn injury (2021). The study was conducted in two hospitals in Egypt and included a total of 40 participants. The educational program was conducted in 20 sessions over 10 weeks and focused on theoretical and practical burn care knowledge using virtual and tangible media. The post-test was given immediately after, 3 months, and 6 months after the completion of all sessions to evaluate nurse's knowledge and comprehension of practice related to burn patient care. The authors found 82.5% of nurses had unsatisfactory knowledge and 100% unsatisfactory practice regarding burn in the pre-intervention phase. Their study found that there is a statistically significant improvement and satisfaction of knowledge (82.5%), practice (85%), and attitude (92.5%) regarding burn care immediately post-intervention ( $p < .000$ ). There is a need for education programs for nurses as it

has a positive effect on nurse's knowledge and thus burn patient outcomes. The authors recognize that there should be continuous education and updates to integrate evidence-based nursing practices into the burn units (Mohammed et al., 2021). The study's limitations are that the results are only generalizable to the specific department in Egypt and the nursing profession. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level III Evidence.

Heyneman et al. (2016) used a systematic review of randomized control trials to evaluate the available evidence on silver sulphadiazine (SSD) in the conservative treatment of burns, specifically in comparison with the newer burn dressings. The study only included randomized controlled trials (RCTs) from the MEDLINE database, and only RCTs studying the effect of conservative treatment on burns were selected. At least one of the two comparative groups was treated with SSD. Fifty-two studies were included in this systematic review. The authors found that despite the significant differences in study design and methodology of the randomized controlled trials, most viscous, solid, and biological dressings have better healing outcomes and cause less pain when compared to silver sulphadiazine. SSD is no longer the first choice in burn treatment, but it can be a considered alternative if treatment with the newer advanced dressings is not an option (Heyneman et al., 2016). This article was included as it provides data to support the concept of a new practice in burn care from the traditional learned use of Silvadene. The authors did not acknowledge limitations. However, they noted no conflict of interest. According to the Johns Hopkins Research Evidence Appraisal Tool, this article demonstrates Level I Evidence.

### **Synthesis of Literature Review**

The reviewed literature found that burn wound care intervention and knowledge of burn treatment varied. Appropriate burn treatment can significantly affect the outcome and morbidity

of these injuries. However, there is a consensus that most healthcare professionals lack the necessary skills and knowledge to treat and manage burn injuries (Fathuldeen et al., 2023). Variations in guidance and best remedies for burns may delay appropriate initial treatment. Increasing non-specialty burn providers, such as the UC provider population in this DNP study, awareness and knowledge of evidenced-based burns treatment of minor superficial burn injury is critical in managing burns (Bennett et al., 2019). Non-specialized providers may not be up to date on current burn management recommendations, and there are no formal guidelines to guide practice. The reviewed literature reaffirms the need for an educational program for healthcare providers to improve knowledge and comprehension of burn management.

A theme found in the articles in this literature review was that burn treatment using Silvadene is inferior to topical antimicrobial ointment and dressing (Toussaint et al., 2015 & Heyneman et al., 2016). Access to expensive wound dressings, such as biological dressings, is limited in UC outpatient and other non-specialized outpatient settings. Toussaint et al. specifically studied petrolatum-based topical antibiotic ointment versus silver-based dressings directly and found that SSD is inferior in scarring and healing. This is substantial as petrolatum-based topical antibiotics are easily accessible and well-stocked in most clinics. These findings are consistent with the systematic review by Heyneman et al.(2016) that dressings containing silver delay the re-epithelization of wounds and can lead to more scarring.

The studies that involved an education intervention in burn care for healthcare providers support the use of education modules (Farthing et al., 2022 & McWilliams et al., 2015). Three of the reviewed studies found a lack of general knowledge and understanding of burn care among their limited populations (Farthing et al., 2022, Fathuldeen et al., 2023, & Bennet et al., 2019). An education module can offer an additional resource to improve patient outcomes positively. A

virtual platform that is accessible and acceptable to the project's target audience of healthcare providers can promote learning success (McWilliams et al., 2015). Farthing et al. study targeted pediatric nurses, and thus, the results of increased knowledge level regarding pediatric nursing burn care after the education intervention may not be transferable to this study's targeted participants of UC providers (2022). Although McWilliams et al. study involved multi-disciplinary non-burn specialists, it was conducted in Western Australia, which has a different medical and nursing curriculum than the US (2015). This leaves a gap for more research to be conducted to assess knowledge and practice of burn injury management among all healthcare providers in the UC system in the U.S.

Due to the lack of formal training and guidelines for outpatient healthcare providers in evidence-based burn wound care, there is a need to establish a nurse-organized education and change process for UC providers to change their current practice and/or enhance their burn care knowledge. An educational virtual modality as a strategy to promote the use of evidence-based recommendations, such as using simple petrolatum antibiotics over Silvadene in minor burn treatment can be successful.

The findings in the literature review support the idea that DNP-prepared nurses can utilize their knowledge to educate and promote evidence-based practice policies and guidelines. Studies indicate a need for further knowledge of appropriate initial burn treatment in outpatient, non-burn specialized settings. This DNP QI project was designed to promote better patient outcomes and providers' confidence in providing evidence-based burn wound management in the outpatient setting. The DNP leaders are well-equipped to address knowledge gaps, synthesize available evidence, and translate knowledge into practice. DNP nurses are well prepared to evaluate knowledge deficits in burn care knowledge, challenge outdated practices, and educate

healthcare providers on updated recommended guidelines to improve patient outcomes and safety. Future studies can extend to allied health professionals such as nurses, medical assistants, and non-specialized providers in any of the outpatient settings.

## CHAPTER FOUR: METHODS

The project was a pre-post-intervention QI project to improve UC providers' knowledge of burn care in minor burn wounds, adherence to updated guidelines on the use of Silvadene versus topical antibiotics, and confidence in treating minor burn wounds. An evidence-based burn wound education program was developed utilizing educational materials to create online modules on the initial treatment and management of minor first and second-degree burns. Study participants completed a baseline knowledge and confidence pre-test prior to administration of the education intervention. Immediately after the educational intervention, a post-test was completed, and then again, a 4-week knowledge follow-up post-test via an online survey was sent to participants' e-mail.

### **Sample and Setting**

The sample for this project included outpatient UC providers NP, PA, MD, and DO working in a large healthcare organization in Southern California at three specific clinics. Participants were recruited through e-mail from the health system's employee mailing list. Convenience sampling was done. Data was collected from a total of 19 participants. The inclusion criteria for the study are healthcare providers with an NP, PA, MD, or DO degree who are currently working in one of the three UC clinics and have seen and treated patients with a chief complaint of "burn wound and/or burn injury" within the last two years. The exclusion criteria are individuals who do not meet the inclusion criteria.

### **Instrument**

The project lead developed pre- and post-test surveys to measure burn wound knowledge and provider confidence. The surveys included evidence-based and practice-based clinical questions. The pre-test included 15 questions focused on provider demographics, wound care

knowledge, and self-reported confidence in practicing burn wound care. The breakdown of the 15 questions is 5 demographic, 1 confidence, and 9 knowledge questions. The post-test included 10 questions re-assessing the provider's wound care knowledge and self-reported confidence in practicing burn wound care. The breakdown of the 10 questions is 1 confidence and 9 knowledge. The knowledge questions will be multiple choice with a mixture of true and false questions. The self-assessed confidence question is based on a Likert scale. The clinical knowledge questions were adapted from Best Practice Guidelines: Effective Skin and Wound Management of Non-Complex Burns (Atiyeh et al., 2014). There are no current standardized guidelines for treating burns in the outpatient setting. Aityeh et al. guidelines were used as they are published for international best practices for providers who are non-burn specialists (2014). Please see Appendix C. After the questionnaire was developed, the lead invited three experts in burn wound care to review the questionnaire for content validity and then piloted the questionnaire with four clinical providers. The project lead chose the experts based on the criteria of at least 2 years in clinical practice and direct clinical experience managing burn wound patients. All experts gave a percentage on their review of the study's content and questionnaire and its validity relevant to the aim of the study.

### **Intervention**

The burn wound care education intervention was presented internally to UC providers through an in-person presentation, and materials were delivered via PowerPoint. The education module included a brief review of types of burns, emphasizing first and second-degree minor burn wounds and the appropriate evidence-based management of minor burn wounds. The education intervention was presented in four one-hour sessions between two different days. The

education session timeframe was 20 minutes for the presentation, with an additional 10 minutes for pre- and pre-post-testing.

### **Data Collection**

Data from the pre-test was collected 10 minutes before the education presentation, and data from the post-test was collected 10 minutes after the presentation. Four weeks after the educational session, participants received a link via email to complete the same post-test knowledge questionnaire to evaluate their retained knowledge. Confidence scores were collected at the pre-test and post-test mark, whereas knowledge scores were collected at the pre-test, post-test, and four-week follow-up post-test. Due to the time constraint and limitations of this study, a 4-week period was found to be practical, and the author recognizes that it poses a limitation of the study. At the end of the study, all identifying data used to contact participants was destroyed, and only coded, de-identified data remained for analysis.

### **Analysis**

Demographic data included the provider's degree, age, experience in years in clinical practice in UC, and if they attended a previous burn education class within the last 5 years. Descriptive statistics were used to present the demographic data. Healthcare demographic information and knowledge scores were entered into an Excel file for data analysis. Demographic data age (ratio) and degree (ordinal), as well as interval data (test scores), are described with frequency distributions. After reviewing the frequency distribution, several demographic categorical variables were collapsed for analyses. Correct answers to the wound care knowledge questions were summed for a composite score. The composite knowledge pre-test and post-test scores were compared using the Wilcoxon test. The answer to the self-reported confidence question was rated on a 5-point Likert scale, with "1" reflecting beginner and "5"



expert. The pre-and post-test confidence scores were compared using the Wilcoxon test. The level of significance was set at  $p < 0.05$ .

## CHAPTER FIVE: RESULTS

This project reports on 19 UC providers who participated in the one-hour brief burn wound care education intervention and completed the pre-test, post-test, and 4-week follow-up post-test. All participants who completed the pre-test completed both the post-test immediately following the intervention and the post-test four weeks after the intervention. Participants were 16% MD, 10% DO, 32% NP, 42% PA. Of the 19 participants, 58% were between age group 30-39 years and 42% were between 40-49 years (Table 1). Of the 19 participants, 2% had 1-5 years, 53% had 6-10 years, 37% had 11-15 years of experience in UC practice, and 21% of participants completed a CME course concerning burn care within the past two years.

**Table 1: Patient Demographics**

Participant characteristics (N=19)	%(n)
Age in years	
30-39	58% (11)
40-49	42% (8)
Degree	
Nurse Practitioners	32% (6)
Physician Assistants	42% (8)
Doctor of Osteopathic	10% (2)
Medical Doctor	16% (3)
Years in urgent care	
1-5	10% (2)
6-10	53% (10)
11-15	37% (7)
CME	
yes	21% (4)
no	79% (15)

### **Burn wound care knowledge and confidence**

Table 2 and Table 3 present the findings for burn wound care knowledge and confidence, respectively. As a group, the 19 participants demonstrated a statistically significant increase in mean wound care knowledge score ( $4.2 \pm SD 1.9$  vs.  $6.6 \pm SD 1.5$ ;  $p=.001$ ) and mean confidence score ( $2.5 \pm SD 0.7$  vs.  $3.4 \pm SD 0.6$ ;  $p=.001$ ) from pre- to post-test, respectively. There was also

a significant increase in mean wound care knowledge score ( $4.2 \pm \text{SD } 1.9$  vs.  $6.7 \pm \text{SD } 1.2$ ;  $p < .001$ ) from the pre-test to the 4-week follow-up post-test.

**Table 2: Wound care knowledge results**

	Pre-test	Post-test	4-Week Follow-up	Difference (b – a)	p-value <sup>€</sup>
	mean (sd)				
	a	b	c	d	
All	4.2 (1.9)	6.6 (1.5)	6.7 (1.2)	2.5 (2.6)	.001
Age 30-39	4.1 (2.2)	6.7 (1.8)	7.0 (1.5)	2.6 (2.9)	.009
Age 40-49	4.2 (1.7)	6.5 (1.1)	6.2 (0.7)	2.2 (2.4)	.028
NP/PA	4.3 (2.0)	6.4 (1.4)	6.6 (1.2)	2.1 (2.8)	.012
DO/MD	3.8 (1.9)	7.4 (1.5)	7.0 (1.6)	3.6 (1.7)	.028
1-10 years UC	4.8 (1.6)	6.6 (1.2)	6.7 (1.1)	1.8 (1.9)	.010
11-15 years UC	3.1 (2.1)	6.7 (2.0)	6.7 (1.6)	3.6 (3.5)	.031
CME	4.5 (1.9)	7.0 (2.4)	6.8 (1.5)	2.5 (2.4)	.049
No CME	4.1 (2.0)	6.5 (1.2)	6.7 (1.2)	2.5 (2.7)	.005

Difference (column d) is post-test score (column b) minus pre-test score (column a).

<sup>€</sup>p-value for Wilcoxon signed rank test of pre-test (column a) versus post-test scores (column b).

**Table 3: Wound care confidence results**

	Pre-test	Post-test	Difference	p-value
	mean (sd)			
All	2.5 (0.7)	3.4 (0.6)	0.8 (0.8)	.001
Age 30-39	2.6 (0.8)	3.5 (0.5)	0.9 (0.8)	.010
Age 40-49	2.4 (0.5)	3.1 (0.6)	0.8 (0.9)	.047
NP/PA	2.5 (0.7)	3.3 (0.6)	0.8 (0.8)	.006
DO/MD	2.6 (0.9)	3.6 (0.5)	1.0 (1.0)	.087
1-10 years UC	2.6 (0.8)	3.3 (0.7)	0.8 (0.9)	.016
11-15 years UC	2.4 (0.5)	3.4 (0.5)	1.0 (0.8)	.027
CME	2.8 (1.0)	3.5 (0.6)	0.8 (1.0)	.186
No CME	2.5 (0.6)	3.3 (0.6)	0.9 (0.8)	.004

Difference is post-test score minus pre-test score. Wilcoxon signed rank test of pretest versus post-test scores.

Related to knowledge change, statistically significant increases were found for the younger and older age categories, both categories of degree (NP/PA and DO/MD), years at UC, and CME participation categories (Table 2). Results showed a significant pre-post change in

confidence scores for the sample as a whole and within several, but not all, subgroups (Table 3). There was greater variability in change scores across subgroups in confidence scores than for knowledge. In particular, the physician group (DO/MD) and those who participated in a previous CME group did not experience a significant increase in confidence (Table 3). For age groups, the pre- to post-difference in confidence scores were a mean of  $0.9 \pm \text{SD } 0.8$  ( $p = 0.01$ ) for the younger group and a mean of  $0.8 \pm \text{SD } 0.9$  ( $p = 0.047$ ) for the older group. Degree NP/PA showed an increased mean confidence score of  $0.8 \pm \text{SD } 0.8$  ( $p=.006$ ), whereas the DO/MD change score was  $1.0 \pm \text{SD } 1.0$  ( $p = 0.087$ ). There were only 5 participants in the DO/MD group. Similarly, the CME group had 4 participants and a confidence change score of  $0.8 \pm \text{SD } 1.0$  ( $p=.186$ ) without statistical significance, compared to the no CME with a confidence change score of  $0.9 \pm \text{SD } 0.8$  ( $p = 0.004$ ).

## CHAPTER SIX: DISCUSSION

The results showed that overall, UC providers' knowledge and confidence significantly increased after a brief in-person educational session. The knowledge score increase was observed immediately following the education intervention and was maintained for the sample at the 4-week follow-up. Notably, there was a significant increase in knowledge scores across all participants' demographic subgroups of age, degree, years of experience in UC, and prior CME training. The results are consistent with the Mohammed et al. study, which also used educational sessions to improve burn injury knowledge. However, their study focused on nurses' knowledge and aptitude, and their intervention was broken up into 20 sessions over 10 weeks (Mohammed et al., 2021). This study's significant results are consistent with the study by Farthing et al., which showed a significant increase in nurse pediatric burn care knowledge after a two-month education intervention (2022). McWilliams et al.'s study focused on provider knowledge, similar to this current QI project study. However, their educational intervention was completely virtual; even so, both studies found significant increases in providers' knowledge and confidence (2015). Fathuldeen et al. found that providers who had a previous burn management course, compared to those who did not, had a better understanding and expertise of burn management reflected in their pre-test (2023). Their results are different than the results of this study; participants' CME status did not relatively affect their knowledge results in the pre-test. However, the current QI project found that participants without previous CME showed statistically significant improvement in wound knowledge and confidence post-intervention. The difference in results could be because Fathuldeen et al. only had physician participants from various specialties, including Emergency Department and Dermatology, which can affect baseline knowledge from previous training (2023).

This project is unique from the extensive literature review as the setting takes place in the UC setting in Southern CA, focused solely on UC providers. It is also unique in the demographics of the participants. Unlike the previous reviewed studies, this study's participant sample included NP, PA, DO, and MD. Not all the previous studies included years of experience in their data results and analysis. The other studies either focused on registered nurses alone (Mohammed et al., 2021, Farthing et al., 2022), physicians alone (Fathuldeen et al., 2023), or a mixture of nurses, physicians, physical/occupational therapists (McWilliams et al., 2015).

This project is similar to the reviewed studies that used an in-person education module (Mohammed et al, 2021; Fathuldeen et al., 2023) and a pre-test and post-test (Mohammed et al, 2021; Fathuldeen et al., 2023; Farthing et al., 2022; McWilliams et al., 2015) for data collection. It is also similar to the study by Farthing et al. in that the sample size was 16 participants, whereas this study had 19 (2022).

Burn injuries significantly burden public health worldwide since burns affect everyone, no matter the age and demographic. Although recommendations for burn care and management exist, there is no standardized, universal guideline for healthcare providers. Each healthcare clinic and provider practices differently and utilizes their institution and clinic's specific resources and practice protocols. The ABA has published guidelines focusing on major burns and inpatient assessment, treatments, and referrals; the guidelines are often inaccessible to practitioners specializing in burns. By creating and sharing an educational module with UC providers, the project lead's goal is to offset the public health's burden of mismanaged burn care and provide UC providers with an accessible resource to better care for and improve outcomes for their burn patients.

## **Limitations**

Voluntary participation can lead to self-selection bias and may affect the generalizability of the results of this project. Although a small sample size can have statistical significance, it can lack generalizability to the population. Data may be skewed if the pool of participants has a proficient to advanced understanding of wound care principles. However, the participants may not be current on the evidence-based recommendations and practices of burn care. Selection bias exists in UC providers who voluntarily participated. The project lead developed the wound care knowledge questionnaire from evidence-based recommendations, which could affect the validity of the newly established questionnaire, ultimately affecting the project's validity.

## **Implications for Practice**

This doctoral project aims to improve current practices and educate healthcare providers on the evidence supported by research to improve patient outcomes. The potential short-term implications will be improved competency of burn care and a change in practice for the initial treatment of minor burn care in a UC setting. The long-term implications are to improve patient satisfaction and outcomes using evidence-based research in treating and managing minor burn wounds. Reducing ineffective treatment of burn wounds will lessen the healthcare system's burden on wastes and resources and decrease costs (Long et al., 2015). Another potential long-term implication is encouraging providers to improve current practices by implementing change guided by evidence-based research. This study can empower providers to improve current practices, create a blueprint to implement change and incentivize administrators to continue to use education programs to increase provider knowledge and improve patient outcomes.

## CONCLUSION

The identification of a learning need and change of practice in the UC setting by the project author triggered the development of this scholarly QI project. As a clinician in the UC providing initial and follow-up burn care and treatment to patients, it was evident that there was no standardized practice. It was also evident that not every provider is current on the clinical treatment of burn wounds. A relevant education module was needed to encourage best practices for burn wound care. This burn wound education intervention demonstrated immediate and sustained improved knowledge over a 4-week interval and immediate confidence in the burn knowledge of UC providers. Studies have demonstrated that burn wound knowledge needs improvement concerning the use of SSD in partial-thickness burn wounds in the UC setting. A brief education module highlighting updated evidence-based recommendations on minor burn care management to challenge current practices can have a positive impact. A formal burn wound training for non-specialized health care providers utilizing standardized guidelines in treating topical dressings in burn wounds was needed. Many healthcare providers in UC do not have formal training in their graduate studies, and many are not updated on guidelines and research regarding burn care. This scholarly project aimed to provide effective burn wound care education for UC providers.



## APPENDICES

## Appendix A: Classification of burns by depth of injury

Depth	Degree	Appearance	Sensation	Healing time
Superficial (epidermal)	First	Dry, red Blanches with pressure	Painful	3 to 6 days
Superficial partial-thickness	Second	Blisters Moist, red, weeping Blanches with pressure	Painful to temperature and air and touch	7 to 21 days
Deep partial-thickness	Second	Blisters (easily unroofed) Wet or waxy dry Variable color (patchy to cheesy white to red) Blanching with pressure may be sluggish	Painful to pressure only	>21 days, usually requires surgical treatment
Full-thickness	Third	Waxy white to leathery gray to charred and black Dry and inelastic No blanching with pressure	Deep pressure only	Rare, unless surgically treated
Deeper injury	Fourth	Extends into fascia and/or muscle	Deep pressure	Never, unless surgically treated

**Appendix B: Questionnaires**

**Identification #:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Pre-test Questionnaire**

**Demographics:**

**Please Circle One:**

**Degree:**

MD

DO

NP

PA

Other

**Age:**

18-29

30-39

40-49

50-59

>60

**Years in practice as a health care provider with your current degree:**

<1 year

1-5 years

6-10 years

11-15 years

16-20 years

>20 years

**Years in practice as a health care provider in Urgent Care:**

<1 year

1-5 years

6-10 years

11-15 years

16-20 years

>20 years

**Have you attended a lecture/presentation, read practice guidelines, and/or completed any CMEs in relation to burn wound/care in the last 5 years?**

No

Yes

**Knowledge Questions:**

**I would rate my current knowledge and confidence in assessing and treating non-complex burns**

5 (Expert)

4 (Proficient)

3 (Intermediate)

2 (Adequate)

1 (Beginner)

- 1. Total Burn Surface Area (TBSA) (expressed as a percentage) establishes the need for fluid resuscitation and monitoring healing progress. What are the common methods used to calculate TBSA?**
  - a. Lund and Browder chart
  - b. Wallace's "rule of nines"
  - c. Palmar surface
  - d. All of the above
- 2. When estimating TBSA, you should include simple erythema (reddening of the surrounding skin) in your calculation.**
  - a. True
  - b. False
- 3. Superficial/epidermal (also known as superficial first degree) can be defined as:**
  - a. Only the epidermis is damaged
  - b. No blistering
  - c. A&B
  - d. None of the above
- 4. Wound infections are one of the most severe problems that occur in the acute phase after a burn injury. Topical antimicrobials can be used to prevent infection in extended burns and are indicated in signs of infection. What are the signs and symptoms of local infection?**
  - a. Slough
  - b. Hyper granulation tissue
  - c. Dark and friable granulation tissue
  - d. All of the above
- 5. Assuming no complication, when should the first dressing change be after injury?**
  - a. 12 hours
  - b. 24 hours
  - c. 36 hours
  - d. 48 hours
- 6. Any non-complex burn wound that has not healed within how long should be referred to a burn clinic/specialist?**
  - a. 2 days
  - b. 1 week
  - c. 2 weeks
  - d. 3 weeks
- 7. The goals of local wound management are what?**
  - a. Prevention of desiccation of viable tissue
  - b. Control of bacteria through moist wound healing
  - c. Start prophylactic oral antibiotics
  - d. A&B
- 8. Petrolatum gel may be at least as effective as silver sulfadiazine (SSD) gauze dressings concerning time to re-epithelialization and incidence of infection.**
  - a. True
  - b. False

9. **Although SSD is the most commonly used antimicrobial in burn wounds, SSD can delay healing due to its toxic effect**
- True
  - False

Identification #: \_\_\_\_\_

Date: \_\_\_\_\_

### Post-test Questionnaire

**I would rate my current knowledge and confidence in assessing and treating non-complex burns**

5 (Expert)      4 (Proficient)      3 (Intermediate)      2 (Adequate)      1 (Beginner)

- 1. Total Burn Surface Area (TBSA) (expressed as a percentage) establishes the need for fluid resuscitation and monitoring healing progress. What are the common methods used to calculate TBSA?**
  - Lund and Browder chart
  - Wallace's "rule of nines"
  - Palmar surface
  - All of the above
- 2. When estimating TBSA, you should include simple erythema (reddening of the surrounding skin) in your calculation.**
  - True
  - False
- 3. Superficial/epidermal (also known as superficial first degree) can be defined as:**
  - Only the epidermis is damaged
  - No blistering
  - A&B
  - None of the above
- 4. Wound infections are one of the most severe problems that occur in the acute phase after a burn injury. Topical antimicrobials can be used to prevent infection in extended burns and are indicated in signs of infection. What are the signs and symptoms of local infection?**
  - Slough
  - Hyper granulation tissue
  - Dark and friable granulation tissue
  - All of the above
- 5. Assuming no complication, when should the first dressing change be after injury?**
  - 12 hours
  - 24 hours
  - 36 hours
  - 48 hours
- 6. Any non-complex burn wound that has not healed within how long should be referred to a burn clinic/specialist?**

- a. 2 days
  - b. 1 week
  - c. 2 weeks
  - d. 3 weeks
- 7. The goals of local wound management are what?**
- a. Prevention of desiccation of viable tissue
  - b. Control of bacteria through moist wound healing
  - c. Start prophylactic oral antibiotics
  - d. A&B
- 8. Petrolatum gel may be at least as effective as silver sulfadiazine (SSD) gauze dressings concerning time to re-epithelialization and incidence of infection.**
- a. True
  - b. False
- 9. Although SSD is the most commonly used antimicrobial in burn wounds, SSD can delay healing due to its toxic effect**
- a. True
  - b. False

**Appendix C: Project Timeline**

<b>Task</b>	<b>Start Date</b>	<b>End Date</b>	<b>Duration</b>
<b>N470A: DNP Project Course I: Project Conceptualization &amp; Planning</b>	<b>30-Jun</b>	<b>25-Aug</b>	<b>56</b>
<b>N597: Written Qualifying Examination</b>	<b>30-Jun</b>	<b>25-Aug</b>	<b>56</b>
<b>Formulate Committee</b>	<b>30-Jun</b>	<b>25-Aug</b>	<b>56</b>
<b>Teams Meeting w/ KP Director of Ambulatory Practice &amp; DA for Education Department</b>	<b>30-Jun</b>	<b>8-Jul</b>	<b>8</b>
<b>N470B: DNP Project Course II: DNP Project Proposal</b>	<b>29-Sep</b>	<b>8-Dec</b>	<b>70</b>
<b>Work on Burn Education Material/powerpt</b>	<b>30-Jun</b>	<b>25-Aug</b>	<b>56</b>
<b>Start working on IRB application approval with KP</b>	<b>30-Jun</b>	<b>8-Dec</b>	<b>161</b>
<b>Approval of Education Material from KP Education Dept</b>	<b>25-Aug</b>	<b>8-Sep</b>	<b>14</b>
<b>Final Proposal for Written Qualifying Exam</b>	<b>25-Aug</b>	<b>8-Sep</b>	<b>14</b>
<b>Prepare to Orally defend DNP project to committee members</b>	<b>1-Oct</b>	<b>30-Nov</b>	<b>60</b>
<b>Teams Meeting w/ KP Manager and Supervising Physician</b>	<b>15-Dec</b>	<b>16-Dec</b>	<b>1</b>
<b>N410: Dissemination and Translation of Clinical Scholarship</b>	<b>12-Jan</b>	<b>8-Mar</b>	<b>56</b>
<b>N470C: DNP Scholarly Project Course III: DNP Project Implementation</b>	<b>12-Jan</b>	<b>8-Mar</b>	<b>56</b>
<b>Project Implementation (staff mtg)</b>	<b>3-Jan</b>	<b>5-Jan</b>	<b>2</b>

<b>Project Implementation (staff mtg)</b>	<b>7-Feb</b>	<b>9-Feb</b>	<b>2</b>
<b>Analyze Results</b>	<b>12-Feb</b>	<b>29-Mar</b>	<b>46</b>
<b>N470D: DNP Project Course IV: DNP Project Evaluation</b>	<b>5-Apr</b>	<b>31-May</b>	<b>56</b>
<b>Present findings to DNP Committee</b>	<b>5-Apr</b>	<b>17-May</b>	<b>42</b>
<b>File final DNP Scholarly Project</b>	<b>27-May</b>	<b>31-May</b>	<b>4</b>



# Appendix D: Educational Intervention

## Burn Wound Care Education for Urgent Care Providers

Mimi Hien Ho, FNP-C

1

## Disclosure

None

2

## Learning Objectives

- Recognize different types of burns
- Understand the management of minor burn wounds
- Understand the role of antimicrobials in minor burn wounds

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## Introduction

Burns are a common type of skin injury encountered at all levels of medical facilities from private clinics to care hospitals.

Inappropriate initial treatment can cause adverse effects on the subsequent treatment and course and patient outcomes. Accurate initiation of appropriate treatment is necessary:

- More than 500,000 patients present to the ED each year for burn-related injury.
- More than 95% of burn wounds and injuries can be successfully managed on an outpatient basis.

Burn care is one of the highest financial costs in health care; it is estimated that the mean total healthcare cost per burn patient in high-income countries is approximately \$66,218<sup>2</sup>

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## Types of Burns

**Non Complex (minor) Burns:** any partial thickness thermal burn <15% total body surface area (TBSA) in adults or <10% in children (<5 in children younger than 1 year) that does not affect a critical area. Includes deep dermal burns covering <1% of the body

**Complex (major) Burns:** any thermal burn injury affecting a critical area or covering >15% TBSA in adults or >10% in children (>5% in children younger than 1 year). All chemical and electrical burns are considered complex

**Critical area:** hands, feet, face, perineum or genitalia, burns crossing joints and circumferential burns

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## Burn Types

Burn Type	Appearance	Blisters	Capillary	Sensation	Treatment
Superficial epidermal (superficial/first degree)	Red and glistening ( moist)	Not present	Blisk	Painful	Usually heals within 7 days with conservative treatment. No scarring
Superficial dermal (superficial partial thickness)	Red/pale pink	Large blisters	Blisk, but with slower return	Painful	Usually heals within 14 days with conservative treatment. No scarring
Deep dermal (deep partial thickness)	Dry, blotchy/mottled and cherry red/leathery appearance	May be present	Absent	Variable	Although can heal with conservative treatment, complex burns may require surgical intervention. Possible scarring
Full thickness (third degree)	Dry, leathery, white or black (charred). Eschar may be present	Not present	Absent	Absent	Complex full-thickness wounds seldom heal with conservative treatment. Usually requires surgical intervention

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## Assessing Burn Area

Total burn area = % of the TBSA  
Lund and Browder Chart  
Wallace's Rule of Nines  
Palmar surface

The slide contains three diagrams for burn assessment. The 'Lund and Browder Chart' shows a human figure with a table for calculating burn area by region. The 'Wallace Rule of Nines' shows a human figure with a table for calculating burn area by body part. The 'Palmar Method' shows four hands with percentages: 1% for fingers, 0.5% for thumb, 0.5% for palm, and 0.5% for back of hand.

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## Management of minor burn wounds

**Goals of minor burn injuries should be aimed at:**

- Preventing or reducing the risk of wound infection
- Applying moist wound care
- Optimizing pain relief
- Providing patient education

**Goals of local wound management are:**

- Prevention of desiccation of viable tissue
- Control of bacterial through moist wound healing

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## Management of MINOR Burns

**Cleanse the burn**

- Keep sterile
- Solution: soap/water, saline, dilute chlorhexidine

**Debridement**

- Large (>1cm) blisters: debride; smaller keep intact
- Blisters on palm of hand: keep intact, unless restrict movement

**Dressing Changes**

- Wound recheck in 24-48H
- 1-2 dressing change in 48H, and then every 2-5 days

**Follow Up**

- assess for wound healing
- assess for infection
- referral if needed

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## Types of Dressings

- Characteristics of good burn wound dressing:

- Moist environment
- Contours easily, retains close contact to wound
- Non-adherent, easy to apply/remove
- Cost-effective
- A simple non-adhesive wound contact layer with a secondary absorbent layer is effective for most non-complex superficial dermal burns

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## Role of antimicrobials

**Topical antimicrobials**

- Silver Sulfadiazine (SSD) – may delay healing due to toxic effect
- Bacitracin, Mupirocin

**Systemic antimicrobials**

- Prophylactic use is not recommended





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## Silver Sulfadiazine (SSD)

- One of the most commonly used topical microbial
- Can not be used in children younger than 2 months or pregnant/breastfeeding
- Should not be used around the eyes/face due to ocular toxicity/scarring effects
- Thought to decrease bacterial colonization
  - Studies have found that SSD delays wound healing time and increases the need for dressing changes

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## Treatment available in UC

 <p><b>Polysporin</b> can be used for superficial burns involving the face/perineum - does not stick to tissue - active against MRSA</p>	 <p><b>Mafenide</b> - prevent bacterial/fungal infection - low risk for allergic reaction - metabolized</p>	 <p><b>Chlorhexidine</b> - soak with gauze dressing - does not interfere with wound epithelialization</p>	 <p><b>Proviadine-Iodine</b> - has broad-spectrum antibacterial activity in moist environment - cytotoxic and delays wound healing</p>
<p><b>Bismuth-based gauze</b> - preferred for clean partial-thickness wound - acts as microbarrier to prevent infection - inexpensive and safe</p>	<p><b>Dakin's solution</b> - broad spectrum antimicrobial, can be used against MRSA - inexpensive and cytotoxic - live - painful</p>	<p><b>Update Tetanus</b> within the last 5 years</p>	<p><b>Pain Management</b> - Tylenol - NSAIDs</p>

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## Summary

Topical silver sulfadiazine (Silvadene) was the standard antimicrobial treatment for partial-thickness burns. However, over the years numerous studies have shown that newer occlusive dressings resulted in faster healing, decrease pain, fewer dressing changes, and improved patient satisfaction as compared to silver sulfadiazine!

Improve patient satisfaction and outcomes by using evidence-based research in treating and managing minor burn wounds.

Reducing ineffective treatment of burn wounds will lessen the healthcare system's burden on waste and resources and decrease costs.

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## Thank you

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TABLE OF EVIDENCE

Author, Year	Purpose	Sample & Setting	Methods Design Interventions Measures	Results	Discussion, Interpretation, Limitation of Findings
<p>Toussaint, J., Chung, W. T., Osman, N., McClain, S. A., Raut, V., &amp; Singer, A. J. (2015). Topical Antibiotic Ointment Versus Silver-containing Foam Dressing for Second-degree Burns in Swine. <i>Academic Emergency Medicine, 22</i>(8), 927-933.  <a href="https://doi.org/https://doi.org/10.1111/acem.12723">https://doi.org/https://doi.org/10.1111/acem.12723</a></p>	<p>Designed to determine which of two commonly used comparator therapies (a silver-containing advanced dressing or a topical antibiotic ointment) resulted in faster epithelialization and less scarring.</p>	<p><u>Sample</u>            Three female Yorkshire pigs weighing 20 to 25 kg</p> <p>A total of 60 burns created, 20 on 3 experimental animals</p> <p>30 burns were randomized to triple antibiotics, and 30 were randomized to the silver-based dressing.</p> <p><u>Setting:</u>            Study was performed in a laboratory</p>	<p><u>Design:</u>            prospective, randomized controlled study</p> <p><u>Procedure:</u>            Deep partial-thickness burns created on flanks of three anesthetized female domestic pigs</p> <p><u>Intervention:</u>            wound beds treated with thin layer of triple-antibiotic petrolatum-based ointment (changed three times weekly) or silver-containing foam dressing (changed once weekly).</p>	<p><u>Statistical Analysis:</u>            primary outcome percentage of completely re-epithelialized wounds at day 21, compared between groups with chi-square and Fisher's exact tests.</p> <p>A Kaplan-Meier analysis using log-rank test to determine changes in re-epithelialization over time two study groups.</p> <p>Secondary outcome scar depth 28 days after burn injury. level of significance set at 0.05.            At day 21 all wounds treated with the ointment were re-epithelialized entirely, while only 55% of those treated with the silver dressing were re-epithelialized (p &lt; 0.001).</p> <p>Scar depth at day 28 was also significantly less in wounds treated with the topical antibiotic ointment (4.3 mm vs. 5.1 mm, difference = 0.7 mm; 95% confidence interval [CI] = 0.1 to 1.4 mm). There was less scar contraction in wounds treated with the topical antibiotic compared with the silver-based</p>	<p>Excised deep partial-thickness burns, a triple-antibiotic ointment enhanced re-epithelialization and reduced scar depth and contraction compared with a silver-based foam dressing.</p> <p>Deep partial-thickness porcine burns that are excised heal faster and with less scarring when treated with a petrolatum-based topical antibiotic ointment than when treated with a silver-based foam dressing</p> <p><u>Limitations</u>            it is unclear if these findings are generalizable to humans whose burns generally have more exudate than porcine burns</p> <p>results may not be representative of other advanced or silver-coated dressings</p>

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				dressing (mean ± SD = 25.0% ± 14.6% vs. 38.9% ± 16.9%, difference = 13.9%; 95% CI = 5.7% to 22.0%)	
<p>Farthing, J., May, S. L., Gauvin-Lepage, J. (2022). "Developing and Pilot Testing E-Learning Training for Pediatric Nursing Burn Care." <i>The Journal of Continuing Education in Nursing</i> 53(5): 232-240.</p>	<p>Develop a pediatric nursing burn care e-learning training for novice nurses; Assess the feasibility and acceptability of this educational intervention; and Evaluate the preliminary effects of this intervention on novice nurses' knowledge of pediatric nursing burn care.</p>	<p><u>Sample:</u> Convenience sampling method, 16 novice nurses were recruited</p> <p>The inclusion criteria were working in the study setting and having 1 year or less of clinical practice experience with pediatric burn patients. No specific exclusion criteria were determined for this study.</p> <p><u>Setting:</u> The study was conducted using the online training center employed on the Pediatric Surgical-Trauma and Burn Unit of the CHU Sainte-Justine Pediatric University Hospital in Montreal, Quebec, Canada, between March and July 2020.</p>	<p><u>Design:</u> A quasi-experimental, one-group, pretest–posttest quantitative design</p> <p><u>Procedure:</u> The intervention was delivered using the online training platform of the study setting from May to July 2020. Participants had 2 months to complete the entire e-learning program, the questionnaire on the level of knowledge, and the survey on the level of satisfaction. The e-learning lasted 4½ hours and was divided into five asynchronous e-learning modules</p> <p><u>Intervention:</u> The first module introduced the participant to the instructor, the training plan and objectives, and the case study.</p>	<p>Data were analyzed using the Statistical Package for the Social Sciences, version 26 (SPSS, Inc.).</p> <p>For data regarding pediatric nursing burn care knowledge level, t tests for paired samples were used to compare pre- and post-intervention values. A p value of less than .05 was considered statistically significant.</p> <p>As for the nurses' mean levels of knowledge on pediatric nursing burn care, t tests for paired samples indicated that there was a significant difference from pre-intervention to post-intervention for all sections of the questionnaire and overall (effect size: <math>d = 1.94</math>; <math>p &lt; .001</math>)</p> <p>The overall mean pediatric nursing burn care knowledge level score was 58.6% (SD = 14.5%) before the e-learning and 87.7% (SD = 8.7%) after the e-learning.</p>	<p>Results showed an increase in knowledge level regarding pediatric nursing burn care after the intervention.</p> <p>The intervention increased novice nurses' knowledge regarding pediatric burn dressing changes.</p> <p><u>Limitations</u> The sample was small the findings might not be generalizable to other settings The research design did not include a control group the instruments used to measure pediatric nursing burn care knowledge and satisfaction were developed by the main author and not validated.</p>

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			<p>The second module described burn pathophysiology</p> <p>The third module outlined the roles and interventions of the interprofessional burn care team</p> <p>The fourth module focused on nursing roles and interventions during hydrotherapy care</p> <p>The fifth module detailed techniques on burn dressing change</p> <p>During the e-learning, the participants had to perform different tasks: read, watch videos, and validate their newly acquired knowledge by answering online practice questions.</p> <p>Once the five modules were completed by the participants, they were granted access to the pediatric nursing burn care knowledge level questionnaire and the satisfaction survey</p>	<p>The pediatric burn dressing change section of the questionnaire had the greatest significant difference from pre-intervention to post-intervention (40.7). On this section, the score ranged from 33.3% (SD = 22.8%) before the intervention to 74.0% (SD = 33.3%) after the intervention (effect size: <math>d = 0.85</math>; <math>p = .004</math>).</p> <p>The nurses expressed a high level of satisfaction regarding the e-learning. The overall mean score for satisfaction was 3.8 (SD = 0.2; 95.5%) post-intervention. The item categories that had the strongest satisfactory scores were in relation to pediatric nursing burn care knowledge level achieved post-intervention (<math>M = 3.9</math>; <math>SD = 0.2</math>; 97.3%) and the design, structure, and content of the e-learning (<math>M = 3.9</math>; <math>SD = 0.2</math>; 97.3%)</p>	
McWilliams, T., Hendricks, J., Twigg, D., Wood, F. (2015).	To evaluate the effectiveness of an education program in	A state-wide survey of multidisciplinary non-burn specialist clinicians	A targeted education program was developed	Spearman rank correlation coefficient was used to compare perceived relevance and	Statistically significant improvements in clinician knowledge were observed in all

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"Burns education for non-burn specialist clinicians in Western Australia." <i>Burns</i> 41(2): 301-307.	increasing clinician knowledge of burns assessment and management	<p>throughout Western Australia</p> <p>1000 surveys were sent out to over 180 healthcare facilities and 281 completed surveys were returned.</p>	<p>and delivered live via videoconference.</p> <p>Pre-post-test analysis evaluated changes in knowledge as a result of attendance at each education session.</p>	<p>confidence in all aspects of burn care.</p> <p>Wilcoxon matched pairs signed rank test was used to analyze non-parametric data to determine if a statistically significant increase in knowledge occurred as a result of attendance at the education session. Significance level was set at 0.05 (<math>p &lt; 0.05</math>).</p> <p>High levels of both pre and post test knowledge were found in responses to questions on burn wound management (correct post test scores for 88–100%), pain and itch (correct post test scores for 92%) and questions 4, 6 and 7 of the chemical and electrical burns session (correct post test scores for 100%), which resulted in non-significant increases in knowledge following attendance at the session</p>	<p>pre-test post-test answer comparisons for clinicians attending sessions on burns prevention and first aid, airway and inhalation injury, circulation, and fluid resuscitation.</p> <p>High levels of both pre and posttest knowledge were found in responses to questions on burn wound management. The results of the study support the assertion that education delivered via videoconference was effective in increasing clinician knowledge of burn care, with statistically significant (<math>p &lt; 0.05</math>) increases in knowledge demonstrated in pre-post tests for most of the burns education topics delivered</p>
Bennett, C. V., Maguire, S., Nuttall, D., Lindberg, D. M., Moulton, S., Bajaj, L., Kemp, A. M., & Mullen, S. (2019). First aid for children's burns in the US and UK: An urgent call to establish and promote international standards.	To identify, and compare first aid practices in children who present to Emergency Departments (ED) with a burn	<p>Sample: 500 children (0-16 completed years) presenting with a burn to a pediatric ED in the UK (Cardiff) and the USA (Denver, Colorado), during 2015-17</p> <p>All children (0-16 years) who attended with a burn</p>	<p>Design: prospective cross-sectional study</p> <p>Intervention: All eligible participants were screened with Burns and Scalds Assessment Template (BASAT). The BASAT is an evidence based proforma detailing</p>	<p>Children attending hospital with a burn in Cardiff were 1.47 times more likely (RR 1.47; CI 1.36, 1.58), to have had some form of first aid than those in Denver.</p> <p>Denver patients were 4.7 time more likely to use a dressing and twice as likely to apply ointment/gel/aloe vera than the Cardiff cohort. First aid</p>	<p>With 90% in Cardiff, and 61% in Denver attempting first aid, but only 26% and 6% respectively actually delivering first aid consistent with national recommendations</p> <p>There is a need for the International Burns community to agree on a single evidence based First Aid strategy for</p>

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<p><i>Burns</i>, 45(2), 440-449.  <a href="https://doi.org/https://doi.org/10.1016/j.burns.2018.09.003">https://doi.org/https://doi.org/10.1016/j.burns.2018.09.003</a></p>		<p>(excluding house and fires fatalities) were eligible</p> <p>Setting:  Paediatric Emergency Department, University Hospital of Wales, Cardiff, Wales and the Paediatric Emergency Department Children's Hospital Colorado in Denver</p>	<p>demographics, developmental skills up to age 3, clinical aspects of the burn, its circumstances and severity together with the timing and nature of first aid given</p> <p>Study data were collected and managed using REDCap (Research Electronic Data Capture) tools</p>	<p>consistent with local recommendations was only administered to 26% (128/500) of children in Cardiff and 6% (31/500) in Denver.</p> <p>Potentially harmful first aid e.g. application of food, oil, toothpaste, shampoo or ice was applied to 5% of children in Cardiff and 10% in Denver.</p>	<p>burns, which should be widely disseminated</p> <p>Limitations:  it reflects those who attended pediatric emergency departments with a burn, thus may not be representative of all burns cases.</p> <p>This analysis considers data from two specific sites, Cardiff and Denver, and the results may not be generalizable outside these sites to the wider U.K. and U.S. populations</p>
<p>Fathuldeen, A. A., Alduheim, M. A., Alqahtani, A. S., Alshammari, K. M., Alsamaan, S. S., Althagafi, A. H., &amp; Alanazi, Z. H. (2023). Knowledge and Practice of Burn Management Among Physicians Using Burn Manikin in Ha'il, Kingdom of Saudi Arabia. <i>Cureus</i>, 15(3), e36196.  <a href="https://doi.org/10.7759/cureus.36196">https://doi.org/10.7759/cureus.36196</a></p>	<p>To assess the knowledge and practice of burn injuries management among healthcare workers in different specialties in Hail city.</p>	<p>Sample:  119 physicians from different specialties (Dermatology, Emergency Medicine, Family Medicine, Intensive Care Medicine, and Surgery)</p> <p>Setting:  different healthcare facilities in Ha'il city, Saudi Arabia, including governmental hospitals, private hospitals, and primary healthcare centers</p>	<p>Design:  Cross-sectional study was conducted for one year, from November 2021 to November 2022</p> <p>Intervention:  Every participant was given a paper containing a burn case scenario with a brief history and the burn mannequin used as a real patient; the participant was recorded while approaching the mock case</p> <p>Data Collection:  Demographic data which included: case code, age, gender, workplace,</p>	<p>71 (59.7%) were male, and 48 (40.3%) were female. mean score of females (8.08) was higher than that of males (7.41). However, this difference was not statistically significant (<math>p = 0.353</math>)</p> <p>The age of the physicians was grouped into categories, with 38 (31.9%) falling in the 35-39 year age group</p> <p>55 (46.2%) were specialists, while the rest were consultants or residents. Surgery and family medicine were the most common fields of specialization, with 35 physicians (29.4%) in each category.</p>	<p>Doctors who had previously taken training courses had a much greater degree of expertise than the rest.</p> <p>Dermatologists score less in acute burn management, while surgeons and family medicine physicians scored the highest.</p> <p>the current study demonstrated that there were no statistically significant differences in the level of knowledge and practice of managing burn injuries</p> <p>Suggest compulsory basic first aid courses for all physicians who may encounter burn cases on commencement of their</p>



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			<p>nationality, educational level, specialty, experience year, and participation in burn management course.</p> <p>Video recording of the physician while approaching the case. A board-certified plastic surgeon reviewed the video recording and made a Google Form using questions extracted from an article by Alharbi Z et al. (2012) to evaluate each participant. The evaluation had 15 questions.</p>	<p>no significant difference was observed in the mean evaluation scores among physicians of different age groups (<math>p = 0.970</math>, educational levels (<math>p = 0.127</math>, specialties (<math>p = 0.871</math>, or professional experience (<math>p = 0.118</math></p> <p>Only 15 (12.6%) physicians had participated in a burn management course</p> <p>Out of 119 respondents, 55 (46.2%) scored 6-10 out of 20. The maximum score was 16/20, and the minimum was 0/20</p>	<p>employment in the health service coupled with frequent refresher courses</p> <p>Limitations: This study lacks generalizability as it was conducted in a single center</p>
<p>Mohammed, R., Hassan, M., &amp; Mohammed, I. R. (2021). Effect of an Educational Nursing Program on Nurses' Performance Regarding Burn Injury Management. <i>International Journal of Novel Research in Healthcare and Nursing</i>, 8(2), 50-63.</p>	<p>To evaluate the effect of educational nursing program on nurses' performance regarding burn injury.</p> <p>To evaluate nurses' knowledge regarding the burn injury.</p> <p>To evaluate nurses' practices and attitude regarding the care of patient with burn</p>	<p>Conducted at three hospitals in Egypt (burn and emergency unit), Beni-Suef general hospital, Minia University Hospital and Minia General Hospital</p> <p>Studied sample include 40 staff nurses in the three hospitals</p>	<p>Design: Quasi experimental research design</p> <p>Intervention: Participants attended educational 20 (10 session for theoretical, 10 practical) classes in regards to burn injury and care over 10 weeks (2 session/week for about 2 hours)</p> <p>Data Collection:</p>	<p>82.5% of nurses had unsatisfactory knowledge regarding burn in the pre intervention phase.</p> <p>Post intervention: 82.5%, 65% &amp; 62.5% (immediately after, 3 months, 6 months respectively) of nurses had satisfactory knowledge regarding burn in the posttest</p> <p>100% had unsatisfactory practice regarding burn care in the pre intervention phase. Post intervention 85%, 77.5%, &amp;</p>	<p>Educational nursing program regarding burn injury have a positive effect on nurses' performance, knowledge, and attitude</p> <p>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</p> <p>All of nurses had unsatisfactory practice regarding burn in the pre intervention phase. While</p>

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	<p>injury pre and post program study.</p> <p>Design and implement the educational nursing program toward nursing care of patient with burn injury.</p>		<p>A pre-test, practical survey, and attitude questionnaire was given pre intervention and the same was conducted post-intervention. Questionnaires were used to collect demographic data, 80 multiple choice questions regarding burn injury, data from an observational checklist, 20 Likert Scale questions on nurse's attitude</p> <p>After completing all sessions, the post-test was given immediately after, 3 months, and 6 months interval for follow up.</p> <p>Statistical Analysis: descriptive statistics in the form of frequencies and percentage for qualitative variables; mean and standard deviation for quantitative variable.</p> <p>Qualitative categorical variables were compared Chi-square (X<sup>2</sup>) test; the hypothesis that the row and column variables are independent, without</p>	<p>72.5% respectively of nurses had satisfactory practice regarding burn care</p> <p>100% had negative attitude regarding burn care in the pre intervention phase</p> <p>Post intervention: 92.5%, 82.5%, &amp; 75% respectively of nurses had positive attitude regarding burn care</p>	<p>majority of them had satisfactory practice regarding burn care</p> <p>All of nurses had negative attitude regarding burn in the pre intervention phase. While majority of them had positive attitude regarding burn care</p> <p>Limitations: This study lacks generalizability as it was conducted in 3 hospitals located in Egypt. The study only assessed nurses</p> <p>The sample might not be generalizable to other settings The research design did not include a control group the instruments used to measure nursing burn care knowledge and satisfaction were developed by the main author</p>

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			<p>indicating strength or direction of the relationship. Analysis of variance (ANOVA) test. Statistical significance was considered at (P value &lt;0.05)</p>		

## REFERENCES

- American Association of Colleges of Nursing: The Essentials. (2021). *Core Competencies for Nursing Education*. Retrieved from <https://www.aacnnursing.org/AACN-Essentials/Download>
- American Burn Association. (2017). Burn incidence fact sheet. [https://ameriburn.org/wp-content/uploads/2017/12/nbaw-factsheet\\_121417-1.pdf](https://ameriburn.org/wp-content/uploads/2017/12/nbaw-factsheet_121417-1.pdf)
- Atiyeh, B., Barret, J., Dahai, H., Duteille, F., Fowler, A., Enoch, S., Greenfield, E., Magnette, A., Rode, H., & Zhao-fan, X. (2014). International Best Practice Guidelines: effective skin and wound management of noncomplex burns. *Wounds International, London*.
- Badr, P., Afsharypuor, S., Tohidinik, H. R., Mohammadi, A. A., & Daneshamouz, S. (2023). Burn Wound Healing Effect of a Sterilized Traditional Formulation of *Boswellia carteri* vs. Silver Sulfadiazine Cream 1% in Patients Presenting Second-degree Burn Wounds: A Randomized, Double-blind Clinical Trial. *Iran J Med Sci, 48(2)*, 137-145.  
<https://doi.org/10.30476/ijms.2022.91853.2307>
- Bennett, C. V., Maguire, S., Nuttall, D., Lindberg, D. M., Moulton, S., Bajaj, L., Kemp, A. M., & Mullen, S. (2019). First aid for children's burns in the US and UK: An urgent call to establish and promote international standards. *Burns, 45(2)*, 440-449.  
<https://doi.org/https://doi.org/10.1016/j.burns.2018.09.003>
- Bigley, A. W., Bailey, J. K., Jones, L. M., Calvitti, K. A., Keller, K. C., & Coffey, R. A. (2015). Refocusing on Outpatient Burn Care. *Austin Journal of Emergency and Critical Care Medicine, 2(4)*.
- Chipp, E. (2023). Outpatient and Minor Burn Treatment. *Surgical Clinics, 103(3)*, 377-387.  
<https://doi.org/10.1016/j.suc.2023.02.006>

- Delaplain, P. T., & Joe, V. C. (2018). Problems and costs that could be addressed by improved burn and wound care training in health professions education. *AMA journal of ethics*, 20(1), 560–566. <https://doi.org/10.1001/journalofethics.2018.20.6.medu1-1806>
- Genuino, G. A., Baluyut-Angeles, K. V., Espiritu, A. P., Lapitan, M. C., & Buckley, B. S. (2014). Topical petrolatum gel alone versus topical silver sulfadiazine with standard gauze dressings for the treatment of superficial partial thickness burns in adults: a randomized controlled trial. *Burns*, 40(7), 1267-1273. <https://doi.org/10.1016/j.burns.2014.07.024>
- Graves, L. Y., Tamez, P., Wallen, G. R., & Saligan, L. N. (2021). Defining the role of individuals prepared as a doctor of nurse practice in symptoms science research. *Nursing outlook*, 69(4), 542–549. <https://doi.org/10.1016/j.outlook.2021.01.013>
- Farthing, J., May, S. L., Gauvin-Lepage, J. (2022). "Developing and Pilot Testing E-Learning Training for Pediatric Nursing Burn Care." *The Journal of Continuing Education in Nursing* 53(5): 232-240.
- Fathuldeen, A. A., Alduheim, M. A., Alqahtani, A. S., Alshammari, K. M., Alsamaan, S. S., Althagafi, A. H., & Alanazi, Z. H. (2023). Knowledge and Practice of Burn Management Among Physicians Using Burn Manikin in Ha'il, Kingdom of Saudi Arabia. *Cureus*, 15(3), e36196. <https://doi.org/10.7759/cureus.36196>
- Heyneman, A., Hoeksema, H., Vandekerckhove D., Pirayesh, A., Monstrey, S. (2016). "The role of silver sulphadiazine in the conservative treatment of partial thickness burn wounds: A systematic review." *Burns* 42(7): 1377-1386.

- Khansa, I., Schoenbrunner, A. R., Kraft, C. T., & Janis, J. E. (2019). Silver in Wound Care—Friend or Foe?: A Comprehensive Review. *Plastic and Reconstructive Surgery – Global Open*, 7(8), e2390. <https://doi.org/10.1097/gox.0000000000002390>
- Kruger, E., Kowal, S., Bilir, S. P., Han, E., & Foster, K. (2020). Relationship Between Patient Characteristics and Number of Procedures as well as Length of Stay for Patients Surviving Severe Burn Injuries: Analysis of the American Burn Association National Burn Repository. *Journal of Burn Care & Research*, 41(5), 1037-1044. <https://doi.org/10.1093/jbcr/iraa040>
- Lanham, J. S., Nelson, N. K., Hendren, B., & Jordan, T. S. (2020). Outpatient Burn Care: Prevention and Treatment. *Am Fam Physician*, 101(8), 463-470.
- Lloyd, E. C., Rodgers, B. C., Michener, M., & Williams, M. S. (2012). Outpatient burns: prevention and care. *American family physician*, 85(1), 25–32.
- Long, D., Long, B., & Koyfman, A. (2015). An Urgent Care Approach to Burns. *The Journal of Urgent Care Medicine*
- Markiewicz-Gospodarek, A., Koziół, M., Tobiasz, M., Baj, J., Radzikowska-Büchner, E., & Przekora, A. (2022). Burn Wound Healing: Clinical Complications, Medical Care, Treatment, and Dressing Types: The Current State of Knowledge for Clinical Practice. *International Journal of Environmental Research and Public Health*, 19(3), 1338. <https://www.mdpi.com/1660-4601/19/3/1338>
- McWilliams, T., Hendricks, J., Twigg, D., Wood, F. (2015). "Burns education for non-burn specialist clinicians in Western Australia." *Burns* 41(2): 301-307.
- Mohammed, R., Hassan, M., & Mohammed, I. R. (2021). Effect of an Educational Nursing Program on Nurses' Performance Regarding Burn Injury Management. *International Journal of Novel Research in Healthcare and Nursing*, 8(2), 50-63.

- O'Donoghue, S. C., DiLibero, J., & Altman, M. (2021). Leading sustainable quality improvement. *Nursing Management*, 52(2), 42-50.  
<https://doi.org/10.1097/01.Numa.0000724940.43792.86>
- Petiprin, A. (2020). Lewin's change theory. *Nursing Theory*.<https://nursing-theory.org/theories-and-models/Lewin-Change-Theory.php>
- Toussaint, J., Chung, W. T., Osman, N., McClain, S. A., Raut, V., & Singer, A. J. (2015). Topical Antibiotic Ointment Versus Silver-containing Foam Dressing for Second-degree Burns in Swine. *Academic Emergency Medicine*, 22(8), 927-933.  
<https://doi.org/https://doi.org/10.1111/acem.12723>
- Wiktor, A., & Richards, D. (2022, October 27). *Treatment of minor thermal burns*. *UpToDate*. Retrieved on 06/09/2023, from <https://www.uptodate.com/contents/treatment-of-minor-thermal-burns>
- Yu, T.-C., Zhang, X., Smiell, J., Zhou, H., Tan, R., Böing, E., & Tan, H. (2020). Healthcare resource utilization, treatment patterns, and cost of care among patients with thermal burns and inpatient autografting in two large privately insured populations in the United States. *Burns*, 46(4), 825-835. <https://doi.org/https://doi.org/10.1016/j.burns.2019.10.019>