From Theory to Practice: Enhancing Nurses' Performance in Phenolization Dressing through Kern's Six-Step Training Program

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Abstract

Background: Sacrococcygeal pilonidal sinus disease (SPSD) patients should have the following treatment: By increasing granulation and fibrosis, phenol treatment speeds up healing because of its mild sclerosing actions and simplicity of administration. An efficient method for health care education is simulation training, directed by Kern's six-step curriculum-building process. It increases decision-making abilities, lowers the chance of errors, and strengthens clinical practice**. Hence, the** current study aimed to evaluate the effect of a nursing orientation training program based on Kern's Six-Step approach on nurses' performance regarding Phenolization dressing application. **Design:** Quasi-experimental research design was used to achieve the aim of this study. **Setting**: The current study was applied in the General Surgery Department at Sohag University Hospital. **Subjects**: Fifty nurses employed in the preselected settings were included in the study using a convenient sample procedure. Three tools were used for data collection; Tool (1): Nurses' data; Tool (2): Nurses' knowledge regarding Phenolization dressing technique (pre/post); Tool (3): Nurses' practice regarding phenolization dressing technique (pre/post). **Results:** The findings of the study demonstrated a highly statistically significant difference in nurses' knowledge and practices about the penalization dressing technique between the pre-and post-Kern Six-Step training programs. Furthermore, the study nurses' total knowledge and total practice scores regarding the Phenolization dressing technique showed a statistically significant positive correlation. **Conclusion:** Using Kern's Six-Step Approach to design a nursing orientation training program had a positive effect on the enhancement of surgical nurses' knowledge and practice regarding phenolization dressing technique**s. Recommendations**: Nurses working in surgical facilities should get a nursing orientation training program that adheres to Kern's Six-Step method, emphasizing the significance of the phenolization dressing technique.

Keywords: Nurses' performance, Kern's Six-Step training program, Phenolization dressing technique

Introduction:

A prevalent ailment affecting the sacrococcygeal region, sacrococcygeal pilonidal sinus disease (SPSD) is hirsute and is more common in young and middle-aged men **(Duman et al, 2019)**. The most effective technique to treat SPSD is a controversial topic. The surgeon and nurses find it challenging, and the patient finds it bothersome. The primary closure method and surgical excision, if the problem is found early, involve the local excision of the midline sinuses, which span the center cavity and allow access to the lateral tracts. Broad-spectrum antibiotics are often administered cautiously when infection and pain occur. However, local excision of the midline sinuses, which cross the central cavity, and laying open lateral tracts if infection is required are part of the surgical excision and primary closure procedure in the event of infection and discomfort **(Ekici et al., 2019).**

The granulations inside the cavity are scraped away, along with all sinus hairs. The wound can take six weeks to six months to heal because of the high risk of infection. Simple, painless, with the highest chance of recovery and the lowest likelihood of local recurrence, avoiding hospitalization or general anesthesia, and requiring little, inexpensive wound care would be the characteristics of the perfect treatment plan. Due to the financial ramifications, people with pilonidal disease should return to work as soon as feasible because maintaining their quality of life is their primary goal. Treatment should not alter routine activity. According to **Isik et al. (2020)**, phenolization can offer each of these benefits.

The application of phenol enhances granulation and fibrosis and speeds up recovery because of its mild sclerosing actions and simplicity of administration. Phenol's anesthetic effect helps patients feel less uncomfortable during the post-procedure phase. The main advantage of this treatment is that it reduces the need for surgery, yields more aesthetically attractive results, and has the lowest recurrence rate while causing less tissue loss and associated problems. To operate as a chemical sclerosing agent and cause localized damage to the sinus's inner lining (endothelium), liquid phenol is injected into the sacrococcygeal pilonidal sinus during the phenolization technique **(Aygen et al., 2021).**

A less intrusive method of treating pilonidal sickness is the use of phenol. Because of its speedy operation and recovery period, this procedure outperforms other surgical techniques. Moreover, the aesthetic results following surgery are excellent. Crystalline phenol presents itself as a feasible treatment option for pilonidal disease, as an alternative to surgical techniques including primary closure and modified Limberg flap **(Girgin & Kanat, 2019).**

The number of sessions required to administer crystalline phenol may have a direct correlation with the success rate of therapy. Given the large dissecting area beneath the Limberg flap, crystalline phenol may be administered multiple times in recurring cases. Therefore, a single application of crystalline phenol may be the cause of the 47.37 percent treatment failure rate in recurrent pilonidal illness. Surgical procedures including excision plus primary closure and modified Limberg flap necessitate the elimination of the pilonidal cavity with all visible pilonidal pits. However, the high treatment failure rate following crystalline phenol therapy may be due to interruption of the routes between the epidermis and the pilonidal cavity during surgical intervention **(Mentes et al., 2021)**.

In the intricate and demanding treatment of a patient with sacrococcygeal pilonidal sinus, the nurse has a major role to play. This includes a comprehensive nursing assessment of the wound, taking into account the patient's history, vital signs, daily activities, pain, surgical site infection, and wound epithelization that are connected to quality of life. Educating and talking about therapy options that enhanced anxiety, self-esteem, and body image. Talking about infection and recurrence is important **(Salih et al, 2021)**.

Enhancing nurses' professional knowledge and abilities is mostly dependent on in-service training, which is synonymous with professional development. It guarantees that nurses stay current with market advancements by providing them with access to the most recent data, research, and best practices in the healthcare sector. Higher quality patient care can be provided by nurses as they gain experience managing a variety of patient requirements and difficult circumstances. Furthermore, in-service training supports nurses' professional growth and career success. Nurses can broaden their skill sets, become eligible for particular responsibilities, and gain access to leadership positions by taking part in pertinent educational programs. This demonstrates their commitment to professional development.

Healthcare education can benefit greatly from the use of simulation training, which is facilitated by Kern's six-step curriculum-building technique. It helps with clinical practice, lowers mistake rates, and strengthens decision-making abilities. Clarifying learning objectives is facilitated by aligning educational content with contemporary practices and research. Widely accepted and applied in a variety of healthcare environments, simulation-based training is a technique that keeps developing and getting better (**Mentes et al., 2021).**

Kern’s curriculum development process involved **the Problem Identification and General Needs Assessment** step, we defined the learning objectives for the simulation-based orientation and clarified its purpose. At Acıbadem Health Group, nurses identified the fundamental skills required and the goal was to standardize training and enhance nurses' professional development **(Bourque et al., 2021)**.

In the Determination of the Target Audience and Goals step, which was to identify the target audience and establish clear goals, the institution developed an educational needs assessment form. This tool was used to assess the current skill levels of nurses and identify their learning needs. Clinical training nurses were involved in this step to identify skills gaps and strengths among the nursing staff **(Singh et al., 2021)**.

The Nursing Orientation Training program is designed for new nurses who begin to work outside the operating room and central sterilization unit. The primary objectives for these new employees are as follows: Understanding the mission, vision, and organizational structure of AHG nursing services, Familiarizing themselves with the orientation process, Learning essential procedures and instructions, Recognizing the significance of nursing records, and Gaining foundational nursing knowledge and skills **(Bourque et al., 2021)**.

In the Development of Instructional Strategies and Materials phase, instructional strategies and learning materials for clinical skills training were thoughtfully designed. A collaborative working group composed of trained nurses and educators played a crucial role in this process. **The working group accomplished the**

following tasks: Identified training topics tailored for the simulation laboratory. Defined the competencies, proficiencies, and sub-competencies to be acquired, Established clear learning objectives, Developed realistic scenarios for practical applications, and Created skill assessment forms to evaluate performance **(Singh et al., 2021)**.

In **the application** phase, the primary focus was the development and implementation of educational materials and tools to teach orientation skills to nurses. The training covered various critical topics, including scenario preparation, instructional methodologies, simulation techniques, and the planning of simulation-based training. After the trainer training, a one-year fellowship program was established for the instructors, which was overseen by the core staff, which included field-specific doctors and nurses from the center This program offered essential guidance and feedback on scenario preparation, scenario execution, and the analysis conducted by the trainers **(Bourque et al., 2021)**.

In **the Evaluation** phase, the focus was on assessing and enhancing the skills of the participants. Evaluation and feedback were collected from participants who observed and engaged in the scenarios. After the program, all participants were provided with a "Training Program Evaluation Survey," through which feedback on the training program and the instructors was gathered and assessed. The training program initially encompassing basic nursing practices underwent significant updates and improvements. These revisions were driven by evolving needs, valuable feedback, and participant input. The curriculum was continuously adapted to stay current and responsive to the changing landscape, ensuring that it remained effective and met the expectations and requirements of the participants **(Singh et al., 2021).**

Significance of the study:

education and serves as a valuable guide for curriculum development in diverse fields. In nursing education, Kern's approach is instrumental in clinical teaching, quality enhancement, specialty training, professional development, and continuing education. It aligns educational content with current nursing practices and research, thereby ensuring a higher standard of education for nurses. Kern's approach is particularly valuable for defining clear learning objectives in simulation training [28]. It aids in the selection of training materials and learning strategies, making it a valuable tool in curriculum development. Pilonidal sinus disease, on the other hand, has a lot of morbidities like abscess formation, purulent discharge, pain, and discomfort, even though there is no clear consensus on which surgical methods are best, with higher hospital costs, longer hospital stays, extended time away from health care providers, and a high recurrence rate (**Jamal et al., 2021**).

Aim of the study

To evaluate the enhancement of nurses' performance in penalization dressing through Kern's Six-Step training program through:

- Assessing nurses' knowledge regarding phenolization dressing technique pre and post-Kern's Six-Step training program implementation.
- Assessing nurses' practice regarding penalization dressing technique pre and post-Kern's Six-Step training program implementation.
- Determine the effect of Kern's Six-Step training program on nurses' performance regarding phenolization dressing technique pre and post-implementation.

Research Hypothesis:

Kern's Six-Step training program will have a positive effect on the enhancement of nurses' knowledge and practice regarding penalization dressing technique post-implementation rather than pre-implementation.

Subjects and Method

Design:

A Quasi-experimental research design was used to achieve the aim of this study. Quasi-experimental designs are experimental designs that resemble actual experimental designs, except for the elimination of one criterion: control, manipulation, or randomization. This design is important to the nature of the study issue, having one or more group subjects observed on pre and post-manipulations (**Creswell, 2012).**

Setting:

The current study was applied in the General Surgery Department at Sohag University Hospital. There are thirty beds available for operating patients, and they are located on the second and third floors of the Sohag University Hospital. These settings serve the largest portion of the population and were chosen due to the significant prevalence of patients in these settings.

Subjects:

Fifty nurses who worked in the previously selected setting were recruited for the study using a convenient sample technique.

Tools of the study: three tools were used for data collection:

Tool (1): Nurses' data: was adopted by the researchers after an extensive review of recent and relevant literature and then translated into the Arabic language by a specialist

in English language translation. It included nurses' age, gender, qualification, andyears of experience.

Tool (2): Nurses' knowledge about phenolization dressing technique (pre/post): It was developed by the researchers after an extensive review of recent and relevant literature **(Girgin & Kanat, 2019; Ertan et al., 2019; Mentes et al., 2021)**; It had questions designed to test nurses' understanding of the phenolization dressing procedure for patients suffering from pilonidal sinus disease in the sacrococcygeal region. Ten multiple-choice questions concerning the definition, goals, applications, and outcomes of the phenolization dressing procedure were included in the test.

Scoring system:

The following was used to calculate the nurse's knowledge assessment for the penalization dressing technique: (2) for the "correct" answer and (0) for the "incorrect" answer. The overall score is between 0 and 20. When it came to knowledge, there were two categories for the overall score: unsatisfactory for scores below 75% and satisfactory for scores above 75%. The items' scores were added together for each section, and the total was divided by several items to determine the area's mean score. The mean and standard deviations were calculated, and these results were translated to a % score. A percentage score was created from these scores.

Tool (3): Nurses' practice about phenolization dressing technique (pre/post); It was developed by the researchers after an extensive review of recent and relevant literature (Schneideret al., 2018; Thaler, 2020; Jamal et al., 2021; Salih et al., 2021); It had tools for evaluating the phenolization dressing technique used by nurses for patients suffering from sacrococcygeal pilonidal sinus illness. There were fifteen items (multiple choice questions) about the processes of the phenolization dressing technique, documentation, assessment, and pre-processing preparation.

Scoring system:

The practices of the nurses were evaluated as either done or not done, with a score of one for correctly completed practices and a score of zero for incomplete practices. These scores were then transformed into a percentage score. If the percentage score was 75% or over, the nurses' practice was deemed competent; if it was less than 75%, it was deemed incompetent. The items' scores were added together for each section, and the total was divided by several items to determine the area's mean score. A percentage score was created from these scores.

Tool Validity and Reliability:

Five professional professors—three in medical-surgical

Nursing and two in medical-surgical medicine—reviewed the instruments' content validity as well as their clarity, comprehensiveness, appropriateness, and relevance. The panel's decision was followed without any changes. By administering the same tool to individuals under the same conditions multiple times, test-retest reliability was utilized to evaluate the internal consistency of the instruments. According to Cronbach's alpha, the correlation value for practice was 0.898 and for knowledge was 0.942.

Procedure:

The actual study included three phases:

A-Preparatory phase:

To create the instruments for gathering data and constructing the instructional guideline, the researchers looked through both recent and older material that was accessible as textbooks, papers, periodicals, and online searches. After putting Kern's Six-Step training program into practice, an Arabic-language booklet about sample size was produced and distributed.

Pilot study:

The previously described tools were used in pilot research to assess the applicability, clarity, and estimated time for each instrument on 10% of the nurses (5 nurses) from the chosen units. Among the primary study subjects were nurses who participated in the pilot study.

Ethical consideration:

Ethics committee approval was acquired before the commencement of the research by Sohag University's Faculty of Nursing. A formal letter from the dean of Sohag University's faculty of nursing granted authorization to carry out this investigation. After outlining the purpose of the study, the directors of the aforementioned setting were asked for their written approval. Before beginning the study, the researchers obtained an informed consent form from the nurses and gave a brief explanation of its goals. They also informed the participants that participation in the study was voluntary, they could refuse to participate, they could leave the study at any time, for any reason, and they would remain anonymous and confidential.

Implementation phase:

The dean of the nursing faculty sent a formal letter of authorization to the director of Sohag University

Hospital. Data collection took place over six months, from March 1, 2023, to August 30, 2023; all subsequent phases were completed. When the researchers conducted their initial interviews with the nurses, they explained the purpose, design, and anticipated results of the research.

The purpose of gathering all the data was to assess how well nurses applied Phenolization dressings after completing a nursing orientation training program that followed Kern's Six-Step method. The instrument was employed twice: initially, before Kern's Six-Step training program, it was used to gauge the nurses' familiarity with and proficiency with the phenolization dressing technique. Subsequently, it was utilized again during a follow-up one month later to assess the program's impact.

The training session covered the phenolization dressing technique in an easy-to-understand manner, utilizing Kern's Six-Step approach. It also involved creating instructional resources including PowerPoint presentations, films, and images. The researchers created an Arabic booklet, which they presented to the nurses after the sessions along with instructional directions about the phenolization dressing technique.

- During this phase, a 12-week Kern's Six-Step training program on the phenolization dressing technique was implemented. The course material has been organized into three sessions, lasting between forty and fifty minutes each (two for theoretical content and one for practice). Each of the seven groups of nurses who participated in the study spent a total of around two hours together. There were seven or eight nurses in each group.
- Many teaching techniques, including lectures, brainstorming sessions, small-group discussions, photographs, demonstrations and re-demonstrations with the aid of the required tools and a simulation manikin that was accessible in the faculty clinical lab to use for simulated education programs. Handouts, PowerPoint, figures, flipcharts, and animated films about pediatric gavage feeding were among the teaching tools used.

Contents of sessions:

Session 1:

Before discussing the session's learning objectives, each researcher gave an overview of the session's contents. The researchers conducted the lesson in an Arabic language suitable for the nurse to grasp the attention. The researchers elucidated the significance of the dressing strategy for phenolization. The researchers begin by evaluating nurses' practices and knowledge of the phenolization dressing procedure (pre-test).

Session 2:

Teach the nurses the definition, general information, and impact of the penalization dressing technique on sacrococcygeal pilonidal sinus disease were all included in the theoretical section's content. On average, nurses took between forty and fifty minutes to complete the data-gathering tools. Posters, PowerPoint presentations, films, and images were used to implement it.

Kern's Six-Step training program included knowledge regarding penalization dressing techniques as follows:

- Phenolization dressing technique definition
- General information regarding the phenolization dressing technique
- Effect of phenolization dressing technique on the sacrococcygeal pilonidal sinus disease

Session 3:

Teach the nurses information on how modern nurses apply the phenolization dressing technique was included in the practical section. It was put into practice through phenolization dressing technique lectures, posters, and instructional movies.

Session 4:

The fourth session was practical and involved the faculty clinical lab's clinical demonstration and re-demonstration of the phenolization dressing procedure by the nurses under study. The simulation manikin served as the tool for these exercises. The trainees moved to the previously chosen environment at Sohag University Hospitals following the faculty lab sessions. There, they received real-time re-demonstration under the supervision of the researchers, which helped to build their confidence and validate their competency in carrying out the operations for the patients.

- Assisting the client in a comfortable posture, and evaluating the wound's color, quantity, odor, sinus discomfort frequency, and surrounding tissues were all part of the assessment.
- - Applying the proper dressing was one of the steps in the phenolization dressing procedure. Disposed of used equipment, took off gloves, and washed my hands.
- - To create an 80% phenol solution, 70% ethyl alcohol and phenol (CAS is 108-95-2) were dissolved in one liter of 70% ethyl alcohol using the phenol dressing procedure **(Ozturk & Karakose, 2019).**
- -After placing the patient in the prone position, the area was cleaned with a povidone-iodine solution. The targeted sinus area was wrapped with gauze and the remainder of the area was generously covered with vaseline. A large piece of cotton was utilized to protect the anus.
- The researchers gave the nurses instructions to begin the surgery by infiltrating the sinus's lateral tract with a sufficient amount of lignocaine and adrenaline, along with the skin and sacrococcygeal fascia. After a local anesthetic, the sinus entrance was widened with a

mosquito clamp if its diameter was less than 3 mm; otherwise, enlargement was not necessary. After identifying the sinus, the researchers begin using the same clamp to extract the hairs. If a sinus abscess was found, the sinus tract had to be curetted with a biopsy curette after the pus and hair were removed.

- The researchers gave nurses instructions to inject 80% phenol into the main sinus using a 5 mL disposable syringe. The syringe's snugly fitting nozzle was used to insert a plastic or metallic cannula into the sinus opening, providing the nurse with protection for the surrounding skin while manipulating the sinus.
- The phenol was left in place for about three to five minutes, during which time the nurse applied pressure to remove any excess phenol and clean out the sinus, then covered the wound with a piece of gauze to apply phenol dressing. The researchers gave the nurses instructions to perform phenol instillation slowly and with the least amount of pressure possible to prevent the phenol from being forced into the tissue surrounding the sinus and causing a local inflammatory reaction.
- Documentation for any abnormalities.

Simulation Score Averages: Participants engaged in simulation exercises as part of the training. Their performance in these simulations was quantified, and the average scores were calculated. This provided insights into the practical application of the acquired knowledge and skills.

Training Evaluation Form: An institution-developed training evaluation form was distributed to participants, comprising 10 items. These items were designed to assess both the training program (5 items) and the trainers (5 items). Participants were asked to rate their agreement with each statement on a 5-point Likert scale (1: Strongly disagree to 5: Completely agree).

Numerical Value Assignment: Each Likert scale response provided by the participants was assigned a numerical value for analysis purposes. 'Strongly disagree' was assigned a score of 1, 'Disagree' a score of 2, 'Partially agree' a score of 3, 'Agree' a score of 4, and 'Completely agree' a score of 5.

Calculation of Overall Scores: The scores for the 5 items related to the training program and the 5 items assessing the trainers were averaged separately for each participant. This process yielded overall scores reflecting participant perceptions of the training program and the effectiveness of the trainers.

This combination of pre-and post-test scores, simulation performance assessments, and participant feedback via the Likert scale-based evaluation form provided a comprehensive dataset for evaluating the training program and trainers.

The evaluation phase:

The evaluation of research sample knowledge and practice was conducted one month after Kern's Six-Step training program was put into place. The same format of tools (tools II and III) that were used in the pre-test to assess the impact of Kern's Six-Step training program were used.

Statistical analysis:

Data entry and statistical analysis were performed using SPSS for Windows, version 20. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and mean and SDs for quantitative variables. Differences between the two means tests (t-test) were used. Statistical significance was considered at P- value < 0.05.

Results:

Table (1) shows that 52% of the studied nurses were between 20 to less than 30 years old with a mean age was 31.44±6.22, and 64% of the studied nurses were female. More than two-fifths of the studied nurses (46%) have a Nursing technical institute nursing education. Regarding years of experience**,** 44% of the studied nurses have less than tenyears of experience.

Figure (1): Shows that 80% of the studied nurses didn't have previous training regarding phenolization dressing application

Figure (2): Illustrates that 88% of the studied nurses reported that their main source of knowledge regarding phenolization dressing application was doctors**.**

Table (2): Illustrates that there were highly statistically significant differences found between nurses' knowledge regarding phenolization dressing technique pre/post-Kern's Six-Step training program (P<0.001).

Figure (3): Demonstrates that 40% of the studied nurses had satisfactory knowledge regarding phenolization dressing technique pre-Kern's Six-Step training program which improved post-implementation of Kern's Six-Step training program and 98% of them had satisfactory knowledge.

The comparison of the studied nurses' practice regarding phenolization dressing technique **table (3)** illustrated that there were highly statistically significant differences between nurses' practice at pre and post-implementation of Kern's Six-Step training program (p<0.001) regarding all aspects of phenolization dressing technique.

Figure (4): Shows the total amount of practice that the nurses had with the phenolization dressing technique both

before and after they attended Kern's Six-Step training program. It shows that 50% of the studied nurses had competent practice before attending Kern's Six-Step training program, but 90% of them did so afterward.

Table (4): Demonstrated that the total knowledge and total practice scores of the nurses under study about the phenolization dressing technique before and after completing Kern's Six-Step training program exhibited a statistically significant positive correlation ($p<0.001^{**}$).

Table (1): Distribution of the Studied Nurses Regarding Their Data (n=50)

Variables.	The Studied Nurses(n=50)	
	N	%
Age:		
• 20 < 30	26	52.0
• 30 < 40	11	22.0
• ≥40	13	26.0
(X±SD): 31.44±6.22		
Gender:		
• Male	18	36.0
• Female	32	64.0
Qualification:		
• Nursing Diploma.	17	34.0
• Nursing technical institute	23	46.0
• Bachelor of nursing.	7	14.0
• Master of Nursing.	3	6.0
Years of experience:		
• < 5	18	36.0
• <10	22	44.0
• >10	10	20.0

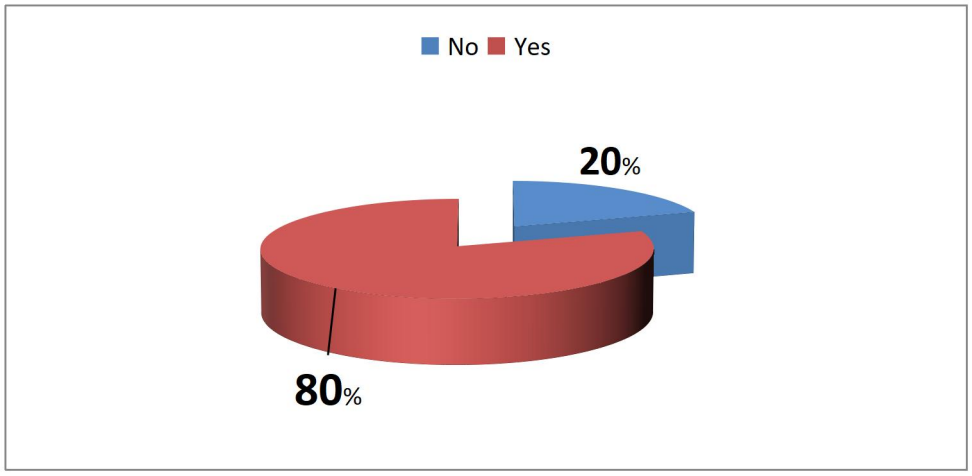

Figure (1): Distribution of the Studied Nurses Regarding Their Attending Previous Training Program Relating to Phenolization Dressing Application (n=50).

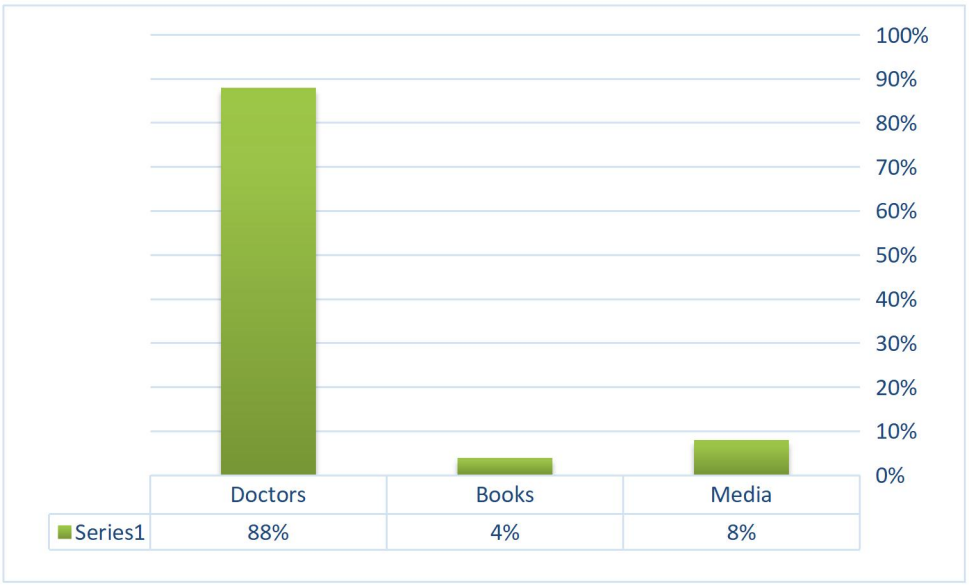

Figure (2): Distribution of the Studied Nurses Regarding the Source of Knowledge Related to Phenolization Dressing Application (n=50).

Table (2): Comparison Between Nurses' Knowledge Score Regarding Phenolization Dressing Technique Pre and Post Kern's Six-Step Training Program (N-50)

Knowledge items	Pre-		Post		X^2	P-value
	No	%	No	%		
Definition of phenolization dressing technique	23	46	50	100	98.43	<0.001**
Purposes of phenolizationdressing technique.	22	44	48	96	78.22	<0.001**
Uses of phenolization dressing technique	26	52	48	96	88.22	<0.001**
Effect of phenolization dressing technique	28	56	49	98	79.24	<0.001**

**; Highly significant at p-value < 0.001

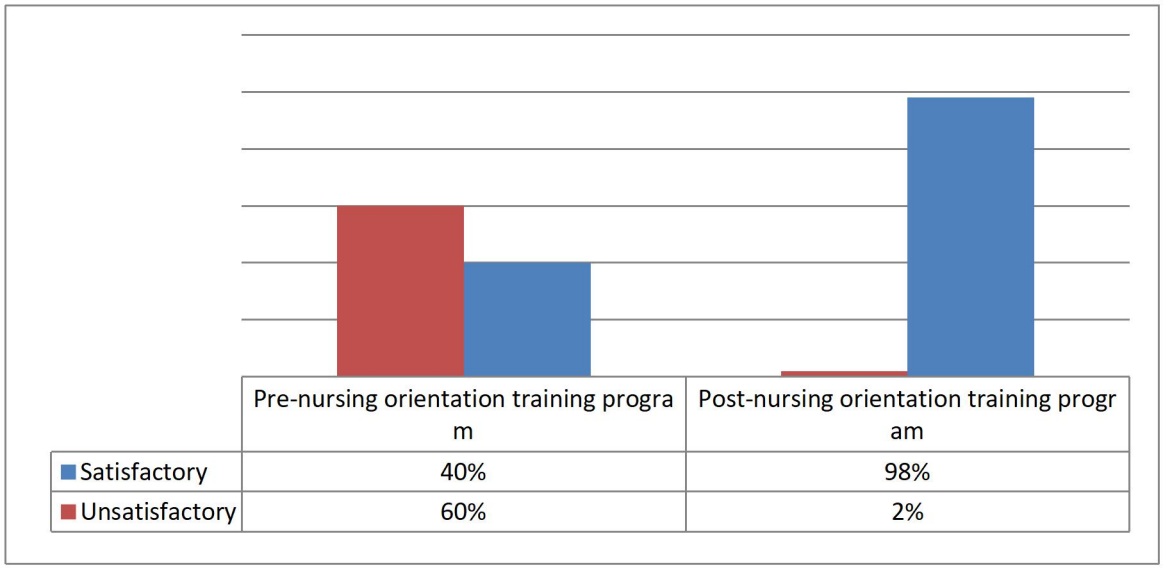

Figure (3): Percentage Distribution of the Studied Regarding Their Total Knowledge Level About Phenolization Dressing Technique Pre and Post-- Kern's Six-Step Training Program (N-50)

Table (3): Comparison between Nurses' Practice Score Regarding Phenolization Dressing Technique Pre and Post Kern's Six-Step Training Program (N-50)

Steps of Phenolization Dressing Technique Practices	Studied nurses (n=50)				X2	P-value
	Pre		Post			
	N	%	N	%		
Preparation						
• Done	33	66.0	50	100	75.07	<0.001**
• Not done	17	34.0	0	0.0		
Assessment						
• Done	38	76.0	46	92.0	123.02	
• Not done	12	24.0	4	8.0		<0.001**
Steps	31	62.0	48	96.0	67.92	
• Done	19	38.0	2	4.0		<0.001**
• Not done						
Documentation for any abnormalities.						
• Done	35	70.0	49	98.0	67.34	<0.001**
• Not done	15	30.0	1	2.0		

**; Highly significant at p-value < 0.001

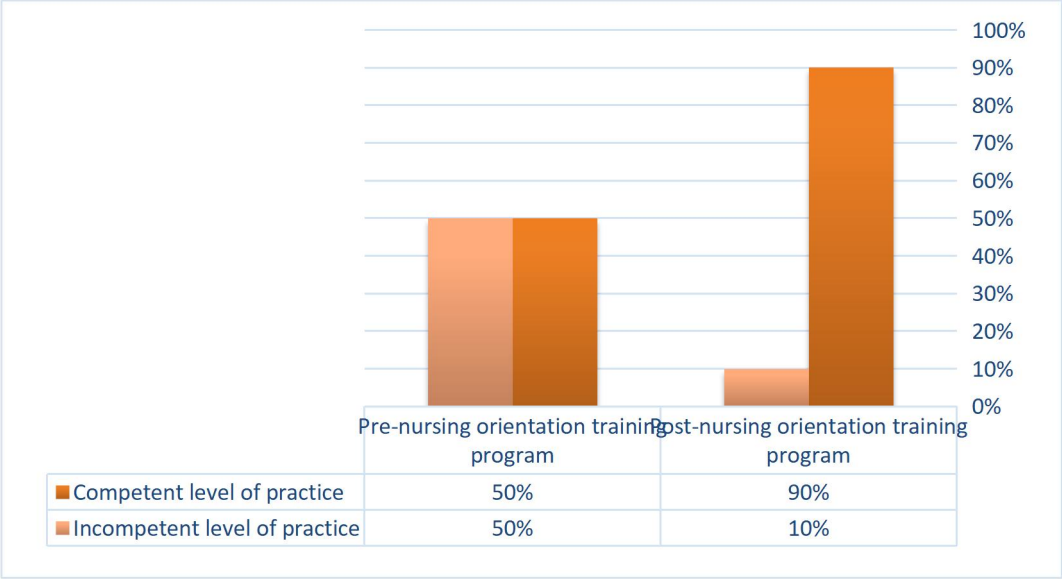

Figure (4): Percentage Distribution of the Studied Regarding Their Total Practice Level about Phenolization Dressing Technique Pre and Post- Kern's Six-Step Training Program (N-50)

Table (4): Correlation between Total Knowledge and Total practice scores of the Studied Nurses Pre and Post Kern's Six-Step Training Program.

(n=50).

	Total Knowledge			
	Pre		Post	
	R	P-value	r	P-value
Total practices	0.25	0.01*	0.73	0.001**

**; highly significant at p < 0.001

Discussion:

In-service training, synonymous with professional development, plays a vital role in enhancing nurses' professional knowledge and skills. It offers access to the latest information, research, and best practices in healthcare, ensuring that nurses remain updated with industry developments, simulation training, guided by using Kern's six-step curriculum development approach, is an effective approach in healthcare education. It enhances clinical practice reduces the risk of errors and improves decision-making skills. It aligns educational content with current practices and research and aids in defining clear learning objectives **(Guerrero et al., 2021)**.

Phenolization is a safe and effective minimally invasive therapeutic option for individuals with symptomatic main chronic SPSD. It has been demonstrated to be beneficial for patients with primary SPSD. According to **AL-Khamis et al. (2020)**, there have been two randomized trials conducted so far that compare the use of phenol application versus excision for primary SPSD. The trials have demonstrated equal rates of surgical site infection and recurrence after penalization, as well as reduced postoperative pain, a quicker return to normal daily activities, and faster wound healing. Similar findings have been reported in several other cohort studies on the effects of phenol treatment on primary SPSD. Only two published cohort studies, comprising 36 and 26 patients, respectively, have evaluated the use of phenol in patients with recurrent SPSD following prior surgical excision **(Aygen et al., 2020)**. These investigations are quite rare.

Phenol is inexpensive, causes little tissue excision with a lower recurrence rate, requires little time in the hospital, minimizes workforce loss, allows for a speedy return to normal life, and speeds up the healing process after wounds **(Akan et al, 2018)**. Young individuals with pilonidal sinuses are often affected by this expensive, debilitating ailment, which lowers their quality of life and creates social challenges **(Humphries & Duncan, 2019)**.

The study's data revealed that the majority of the nurses were female and that over half of them were between the ages of 20 and 30. Their mean age was 31.44±6.22. This could be because there are more women than men in nursing education, according to the researcher. The results of **Seferoglu et al. (2021)** were similar to these, showing that 80 percent of the nurses were female. Additionally, these results were in line with those of Abo **Elezz et al. (2021)**, who found that the mean age of the nurses under study was 26.75±5.08, with nearly half being between the ages of 20 and 25.

About two-fifths of the nurses under examination had nursing education from a nursing technical institute, according to the study's findings regarding their qualifications. This conclusion was consistent with **Mahdy et al. (2019)** findings that over half of nurses graduated from the Technical Institute of

According to the years of experience results of the current study, almost two-fifths of the nurses under investigation have less than ten years of experience. This result disagreed with **El-Morsy et al. (2020)** finding that over two thirds of nurses had experience ranging from five to fewer than ten years.

The present study results indicated that the majority of the investigated nurses had not previously attended training courses about the application of phenolization dressing. This information was based on the studied nurses attending training courses on the topic. According to the researchers, this demonstrated the requirement for the nurses under study to undertake phenolization dressing application training programs. The results of the study showed that most of the nurses who were studied stated that doctors were the primary source of information on applying phenolization dressings. According to the researchers, this demonstrated that nurses learned from reliable sources.

The current study's findings showed that nurses' pre- and post-Kern's Six-Step training program knowledge of the phenolization dressing technique, varied significantly in a statistically significant way. These results are consistent with research by **Awan et al. (2021)** that examined "Surgical site infection in elective surgery" and found that nurses' understanding of phenolization dressing was lacking. This finding differs from that of **Benson & Powers' (2020)** study, "Your role in Infection Prevention," which found that roughly two-fifths of the sample knew enough about how to heal wounds. This outcome shows how the nursing orientation training program, which implemented Kern's Six-Step strategy, improved participants' understanding of the phenolization dressing procedure, which met the nurse's needs and provided them with sufficient knowledge. This indicates the actual need of the studied nurses for this study.

Regarding the overall knowledge of the nurses under study, two-fifths of them had adequate knowledge of the phenolization dressing technique. This was in the pre-Kern's Six-Step training program. In the post-nursing orientation training program, this knowledge improved, with nearly all of the nurses having satisfactory knowledge. The significance and efficacy of the nursing orientation training program, which is based on the implementation of Kern's Six-Step approach, are deemed by the researchers to be reflected in the improved knowledge and comprehension of the phenolization dressing technique among the nurses under study.

Thaler (2020) corroborated these results with a study titled "Treatment of pilonidal sinuses by Phenol solution injections," which concluded that highlighting the use of crystalline phenol is an effective therapeutic approach for pilonidal sinus disease. Simple surgical techniques, such as minimally invasive surgery or non-excisional treatments, have been associated with decreased rates of morbidity and recurrence when compared to other surgical therapies for pilonidal disease. It was observed that the phenol solution and crystalline form narrowed the skin, sacral fascia, and lipoid tissue, and destroyed the chambers of pilonidal cysts. It promotes granulation and contraction in the pilonidal sinus cavity, irritates its inner wall, and ultimately closes the cavity.

This, in the opinion of the researchers, shows how successful it was to use Kern's Six-Step technique. This illustrated how crucial it is to comprehend why employing Kern's Six-Step method is necessary to increase understanding. Attending training programs that raise nurses' expertise may have something to do with this. This outcome supported **Bourque et al.'s (2021)** findings that curriculum development improved when a systematic strategy based on Kern's six phases was used. This technique proved to be successful in producing a curriculum that was both unique and well-designed.

There were highly statistically significant differences between the nurses' practices before and after Kern's Six-Step training program regarding every facet of the phenolization dressing technique, according to the results of the current study, which compared the practices of the nurses under study. According to the researchers, it demonstrated the beneficial effect of the Kern's Six-Step training program on improving the practices of nurses. The success of Kern's Six-Step training program's primary goals was validated by these successful changes in nurses' practices. The present findings are consistent with the research conducted by **Topuz et al. (2021**) which demonstrated that the application of crystallized phenol therapy for pilonidal disease enhances quality of life and improved pilonidal sinus healing. The study is similar to **Memta et al., (2021**), who stated that Using Kern's 6-Step Approach was effective in Health Systems Science Curricula and Medical Education.

Phenol dressing was found to be an effective alternative surgical technique for treating excision of recurrent pilonidal sinus disease. These findings were further supported by research conducted by **Omer et al., (2021)**, entitled "A useful alternative surgical technique to reconstructing large defects following excision of recurrent pilonidal sinus disease in the intergluteal region."

The findings of the current study portrayed that the nurses' total practice regarding phenolization dressing technique pre and post-Kern's Six-Step training program, and indicated that half of the studied nurses had a competent level of practice pre-Kern's Six-Step training program, but post-Kern's Six-Step training program most of them had a competent level of practice. From the researcher's point of view, it reflected the effectiveness of using Kern's Six-Step approach. This may be due to a lack of adequate knowledge and inadequate training regarding the phenolization dressing technique.

The present study revealed that there was a statistically significant positive correlation between the total knowledge and total practice scores of the studied nurses regarding phenolization dressing technique pre and post-Kern's Six-Step training program. This reflected the importance of improving nurses' knowledge and practices to help them learn and acquire good knowledge and apply it. This association explains that when nurses have sufficient knowledge it can help them practice well which is reflected in their patient care. The findings of the present study have supported the aim and hypothesis of the study and confirmed that the knowledge and practices among the studied nurses have improved. From the researchers' point of view, this is reflected in the success of educational guidelines implementation and its positive effects. Also, reflects the importance and effectiveness of introducing Kern's Six-Step training program for nurses regarding phenolization dressing techniques that are associated with enhancing practice.

Finally, it can be said the study results achieved the aim of the current study. This result was supported by **LeighR & DebraL (2021**) who stated that Kern's six-step approach to curriculum development is an effective method for global health residents to develop educational products for patients and families. In the same line, **Haydeh et al., (2023**) found that Using the Kern model regarding infection control programs helps improving knowledge and performance among undergraduate nursing students. The benefits of phenolization are due to the minimal invasive character; smaller wounds leading to less postoperative pain and quicker skin epithelization at the natal cleft. The benefits of phenolization have been reported before in patients treated for primary SPSD, but not for patients who presented with recurrent SPSD **(Pronk et al., 2019)**. The current study showed that phenolization of the sinus tract in patients with recurrence SPSD is safe as no major perioperative complications occurred along with only an SSI rate of 9%. Two other studies reported results of phenolization in patients with recurrent SPSD reported an SSI rate of 15.4% and 0% without any major complications **(Bayhan et al., 2022)**. The results of the current study also proved the clear benefits of smaller wounds with the phenolization technique in recurrent SPSD; patients experienced less pain with a quick return to normal daily activities and

complete wound healing was achieved in almost 90% of patients 12 weeks after surgery.

Conclusion:

Based on the findings of the current study, aim, and hypotheses, it was concluded that Kern's Six-Step training program had a positive effect on the enhancement of surgical nurses' knowledge and practice regarding the phenolization dressing technique**.**

Recommendations:

The present study's conclusions led to the following recommendations being put forth:

- Nurses working in surgical units should receive Kern's Six-Step training program about the significance of the phenolization dressing method.

It is advised to repeat the current study using a bigger probability sample to obtain generalizable conclusions.

- When providing care for patients with sacrococcygeal pilonidal sinus illness, nurses should have access to a simple illustrated pamphlet explaining the phenolization dressing procedure.

References:

- **Akan K, Tihan D, Duman Y, Ozgun Y, Erol F, & Polat M. (2018):** Comparison of surgical Limberg flap technique and crystallized phenol application in the treatment of pilonidal sinus disease: a retrospective study *Ulus Cerrahi Derg*, 29 pp. 162-166.
- **Awan M, Dhari F, Laghari A, Bilal, F, & Khaskheli, N. (2021):** Surgical site infection made by phenolisation dressing in elective surgery. *J Surg Pak (Int),* 16, 33-37.
- Aygen E, Arslan K, Dogru O, Basbug M, & Camci C. (2021): Crystallized phenol in nonoperative treatment of previously operated, recurrent pilonidal disease. *DisColon Rectum*;53: 932e935
- **Bayhan Z, Zeren S, Duzgun SA, Ucar BI, Alparslan Yumun HN, Mestan M: (2022):** Crystallized phenol application and modified Limberg flap procedure in the treatment of pilonidal sinus disease: A comparative retrospective study. *Asian J Surg,* 39:172-177. 10.1016/j.asjsur.12.007
- **Benson S, & Powers J. (2020):** Your role in infection prevention. Nursing made incredibly easy, 9(3), 36-41
- **Bourque JM, Wooster E, & Bacha B. (2020):** Implementation of a New Stereotactic Radiation Program in Middle-Income Countries: A Pilot Project using KERN's 6-Step Framework. International Journal of Radiation Oncology Biology Physics; 108(3). doi:10.1016/j.ijrobp.2020.07.2513
- **Creswell J W. (2012):** Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th Ed.). *Boston*, MA: Pearson.
- **Duman K, Ozdemir Y, & Dandin O (2019):** Pilonidal sinus disease – etiological factors, pathogenesis, and clinical features. *Archives of Clinical andExperimental Surgery*; 5(4): 228–32
- **Ekici U, Kanlz M, Ferhatoğlu MF & Kartal A. (2019):** Comparative analysis of four different surgical methods for treatment of sacrococcygeal pilonidal. *Asian J Surg S*: 1015-9584(18)30741–3.
- **Girgin M, & Kanat B. (2019):** The results of a one-time crystallized phenol application for pilonidal sinus disease. *Indian J Surg*. 2019; 76:17e20.
- Guerrero JG, Hafiz AH, Eltohamy NAE, Gomma N, **Jarrah I Al. (2021):** Repeated Exposure to High-fidelity Simulation and Nursing Interns' Clinical Performance: Impact on Practice Readiness. *Clin Simul Nurs;* 60: 18-24. doi:10.1016/j.ecns.2021.06.011
- **Halalau A, Holmes B, & Rogers-Snyr A. (2021):** Evidence-based medicine curricula and barriers for physicians in training: a scoping review. *Int J Med Educ*; 12. doi:10.5116/ijme.6097.ccc0
- **Humphries A & Duncan J. (2019):** Evaluation and management of pilonidal disease. *Surg Clin North Am, (*2019) 90: 113- 124.
- **Isik A, Eryılmaz R, & Okan I. (2020):** The use of crystallized phenol without surgery in the treatment of pilonidal sinus disease. *Int J Clin Exp Med*, 7 (2019), pp. 1047-
- Mentes O, Bagci M, Bilgin T, Coskun I, Ozgul O, & Ozdemir M. (2021): Management of pilonidal sinus disease with oblique excision and primary closure: results of 493 patients. *Dis Colon Rectum*, 2021;
- **Omer T, Ahmad Z, Loh CY, & Tan AM. (2021):** A useful alternative surgical technique to reconstructing large defects following excision of recurrent pilonidal sinus disease in the intergluteal region: An operative approach for the transverse lumbar artery perforator flap. *Int Wound J*. 2019: 15(4): 534–37
- **Pronk AA, Smakman N, & Furnee EJ. (2019):** Short-term outcomes of radical excision vs. phenolisation of the sinus tract in primary sacrococcygeal pilonidal sinus disease: a randomized controlled trial. *Tech Coloproctol*, 23:665-673. 10.1007/s10151-019-02030-w
- **Salih AM, Hamed FH, & Salih R. (2021):** Nonoperative management of pilonidalsinus disease: One more step toward the ideal management therapy—a randomized controlled trial. *ANJ*. 2021a: 164(1): 66–70.

- **Singh MK, Gullett HL, Thomas PA. (2021):** Using Kern's 6-Step Approach to Integrate Health Systems Science Curricula into Medical Education. Academic Medicine; 96(9). doi:10.1097/ACM.0000000000004141
- **Thaler K. (2020):** Treatment of pilonidal sinuses by Phenol solution injections. *IntJ Colorectal Dis* 2020 Pp 20-27
- **Topuz, S. Sozen, M. Tükenmez, S. Topuz U, & Vurdem E. (2021):** Crystallized phenol treatment of pilonidal disease improves the quality of life. *Indian J Surg,* 76 (2021), pp. 81-84.