Effect of Pediatric Nursing Excellence Model application on Nurses' Knowledge and Practice Regarding Care of Children Undergoing Surgical Repair of Genitourinary Anomalies

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Abstract

Context: Genitourinary anomalies account for the most common urogenital disorders in children. Therefore, pediatric nursing excellence model will continue to be central to excellence in nursing practice and optimal childcare. **Aim:** To evaluate the effect pediatric nursing excellence model on nurses' knowledge and practice regarding care of children undergoing surgical repair of genitourinary anomalies. **Research design:** Researchers utilize a quasi-experimental research. **Setting:** The present study was conducted at the inpatient pediatric surgical department, at Benha Specialized Pediatric Hospital in Benha city. **Study sample:** All available nurses, they composed of 60 nurses working at the previously mentioned settings were included in the current study regardless of their personal characteristics. **Study tools:** Three tools were used for data collection, *Tool I:* A structured interviewing questionnaire developed to assess nurses' personal characteristics and level of knowledge regarding care of children undergoing surgical repair of genitourinary anomalies. *Tool II:* An observational checklist to assess nurses' practice regarding care of children undergoing surgical repair of genitourinary anomalies *Tool III:* A structured questionnaire based on Pediatric Nursing Excellence (PNE) model regarding care of children undergoing surgical repair of genitourinary anomalies. **Results:** The majority of the studied nurses had satisfactory level of knowledge and competent level regarding their total practice post PNE model application. Also, the majority of them had high excellence level post PNE model application, while less than three-quarters had low excellence level pre PNE model application. **Conclusion:** It could be concluded that nurses' level of knowledge and practice improved regarding the care of children undergoing surgical repair of genitourinary anomalies, which emphasize that PNE model application was effective. **Recommendation:** Developing strategies to improve nursing care for children undergoing surgical repair of genitourinary anomalies is needed to achieve high competent nurses' performance

Keywords: Children, Pediatric nursing excellence model, Nurses' knowledge and practice, Genitourinary anomalies, Surgical repair.

Introduction

Genitourinary anomalies are birth defects involving the urological and genital system. The external genitourinary anomalies are easily recognized at birth, but internal structural anomalies can't be identified till later in infancy or the childhood period, when symptoms arise **(Kyle & Carman, 2018).**

Classification of genitourinary anomalies includes cryptorchidism, hypospadias, hydrocele, vaginal anomalies, bladder anomalies, Prune-belly syndrome, renal anomalies, and ureteral anomalies. Cryptorchidism is the most common genitourinary anomaly in pediatric males. Furthermore, 1- 3% of full-term male neonates possess a primary undecided testis **(Cravero et al., 2019).**

Some genitourinary disorders begin with direct involvement of the kidney. Others involve various parts of the urinary tract, this could have a permanent impact on the kidneys and their function,

especially when left untreated or treated insufficiently **(Tasian et al., 2018).**

The exact aetiology of genitourinary anomalies is unknown but may include genetic factors, endocrine factors as low level of hormones, and environmental factors as exposure to teratogenic agents during fetal development **(Kraft et al., 2019).** Meanwhile, the complications rate of genitourinary anomalies of surgical correction is considerable, complications as early infection, bleeding, wound dehiscence, flap or graft necrosis, urinary tract obstruction, and urinary tract infections, or late complications such as; meatal stenosis, urethral fistula, testicular atrophy and recurrent urethral stricture **(Wilcox & Warne, 2020).**

Nurses should be knowledgeable about pediatric genitourinary anomalies to provide early recognition, efficient nursing care, education, and guidance to the children and to their families as

well. Furthermore, discharge instructions for the parents including how to care for the reconstructed area, such as dressing, stenting and preventing adhesion, administering medications regularly, hygienic care, and activities allowed *(The Institute of Pediatric Urology, 2018).*

The perioperative nursing role involves a wide variety of nursing responsibilities involved with the children's surgical nursing care. Considering this context, excellent understanding of guides and standards of care related to surgery, invasive procedures, anesthesia, surgical instruments, infections, and child safety is required. It is a specialized nursing area where the nurse collaborates with other surgical health care professionals *(Salazar-Maya, 2022).*

It is essential that nurses be aware of the various investigations that could take place during the preoperative assessment phase. Without adequate diagnostic tests, the child cannot be adequately prepared and assessed for risk factors and mortality. Once the child is admitted for surgery, the preparation might be seen as standard preoperative nurse duty *(Ferrantella et al., 2021).*

Post-operative nursing role is crucial in assessing and maintaining child hemodynamic stability. Also, the nurse has a vital role in evaluating the respiratory system, monitoring the circulation, within the immediate post-operative phase, starting intravenous access, monitoring fluids balance, managing pain, nausea, vomiting and anesthetic emergencies. Basic excellence in care pertains to professional development, continuity of quality care, and effective communication *(Bolkan et al., 2017).*

According to the American Association of Critical-Care Nurses (AACN), nursing excellence is defined as; helping the nurses make their optimal contribution to patients and their working environments with respect for their efforts **(AACN, 2022).**

Nursing excellence requires well-planned steps, and introducing change in an effective manner. Also, improvements in workplace settings and child outcomes are frequently linked to nursing excellence. *(Arthurs et al., 2017).*

Fawcett (2020) suggested strategies for strengthening nursing excellence recognition in the practice area. Furthermore, nursing excellence could be used by clinical settings to establish principles of practice, construct models of professional practice, determine pediatric-specific quality indicators and detect elements for clinical advancement programs.

In 2020, the Society of Pediatric Nurses (SPN) initiated a project to define the construct of pediatric nursing excellence. They concluded that more accuracy was required to identify the attributes of an excellent pediatric nurse. Two years after that, the SPN published its Pediatric Nursing Excellence (PNE) model, which consists of five domains, including engagement, values, principles, care delivery, and continuous improvement. This model focuses mainly on the care of children and their families *(McDowell et al., 2022).*

An excellent nurse provide a central role in the delivery of healthcare services, and involving all aspects of care, which puts them in a crucial role for delivering healthcare services *(Salahat et al., 2019).*

Pediatric nurses could apply the PNE model when developing direct childcare policies to perform best practices, especially for children undergoing surgeries. The PNE model provide a framework for application, especially when orienting new nurses and writing recommendations. Furthermore, this framework could provide a simple guide for developing nursing strategic plans. The PNE model sets guiding principles and provides a primary clinical practice *(McDowell et al 2022).*

Pediatric Nursing Excellence (PNE) model assist nurses in providing the optimal care possible to children, their work environments, also to recognize their efforts to enhance childcare through system improvement. Also, nursing excellence model provide nurses the necessary knowledge and practice to deliver high-quality nursing care. as well to carry out their responsibilities efficiently and to identify the recent trends in specialty nursing excellence *(Academy of Hospital Administration, 2022).*

Significance of the study

In numerous countries, congenital anomalies contribute a major factor in childhood mortality, chronic disease, and disability. Congenital abnormalities have rapidly become one of the main worldwide concerns **(Agarwal et al., 2017).** The incidence of children requiring surgical repair of genitourinary anomalies at Benha University Specialized Pediatric Hospital were 205 cases during 2021, this number increased to 220 conditions during 2022 **(The official statistics at Benha Specialized Pediatric Hospital, 2022).**

The researchers observed that children with

genitourinary anomalies undergoing surgical repair were at high risk for a variety of complications. So that, the present study undertaken to evaluate the effect of pediatric nursing excellence model application on nurses' knowledge and practice regarding care of children undergoing surgical repair of genitourinary anomalies.

Aim of the study

The current study aimed to evaluate the effect of pediatric nursing excellence model application on nurses' knowledge and practice regarding care of children undergoing surgical repair of genitourinary anomalies through:

- Assessing nurses' knowledge and practice regarding the care of children undergoing surgical repair of genitourinary anomalies.
- Implementing a pediatric nursing excellence model regarding the care of children undergoing surgical repair of genitourinary anomalies.
- Evaluating the effect of pediatric nursing excellence model application on nurses' knowledge and practice regarding the care of children undergoing surgical repair of genitourinary anomalies.

Research hypotheses

1- Nurses who participate in the PNE model application are expected to have an improvement in their knowledge and practice, regarding the care of children undergoing surgical repair of genitourinary anomalies.

3- Nurses who participate in the PNE model application are expected to have a high level of excellence, regarding the care of children undergoing surgical repair of genitourinary anomalies.

Operational Definitions:

Nursing Excellence:

It is a strengths-based approach that provides extensive nursing care that starts with an in-depth assessment of children, continues with an appreciation of variance, and progresses within ages in providing care to maintain each child's optimum well-being.

Pediatric nursing excellence model:

It is a model that can be applied in all aspects of pediatric nursing and is centered on creating standards of pediatric nursing excellence and measuring outcomes for pediatric patients.

Genitourinary anomalies:

The genitourinary anomalies are birth defects involving the urological and genital systems. The external genitourinary anomalies are easily

recognized at birth, but internal structural anomalies couldn't be identified till later in infancy or the childhood period, when symptoms arise

Subject & Methods

Research design

The present study was carried out utilizing a quasi-experimental research design.

Research setting

The current study was conducted at the inpatient pediatric surgical unit at Benha Specialized Pediatric Hospital affiliated to Ministry of Health in Benha City. It included two pediatric surgical departments that were located at Building B of the hospital on the second and third floors, each department comprises five rooms, each room contains four beds, and the recovery room contains two beds.

Subject

All available nurses, composed of 60 nurses, were included in the previously mentioned settings regardless of their personal characteristics. All working nurses participated.

Tools of data collection

Three tools were used to obtain data relevant to the current study.

These included the following tools:

Tool (I): A structured interview questionnaire:

This tool was developed by the researchers after reviewing the scientific and relevant literature. That was written in Arabic and consisted of two parts:

Part (1): Nurses' characteristics such as; age, gender, academic qualifications, years of experience at the surgical unit, and previous attendance at training courses regarding the care of children undergoing surgical repair of genitourinary anomalies.

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Part (2): Nurses' knowledge regarding the care of children undergoing surgical repair of genitourinary anomalies. It contained (38 questions) in the form of multiple choice and true/false. It included four sections as following:

Section (1) Nurses' knowledge regarding genitourinary anomalies. It consisted of (11) multiple choice questions, which included types of genitourinary anomalies (1 question), causes (1 question), complications (5 questions), and diagnostic methods (4 questions).

Section (2) Nurses' knowledge regarding preoperative nursing care. It included (9) true/false questions such as; assess general body condition,

vital signs, intake and output, measurement of weight, investigations and diagnostic tests …..etc.

Section (3) Nurses' knowledge regarding postoperative nursing care. It included (12) true/false questions such as; complications after surgery, pain management, wound care, intake and output, health education for caregiver and follow up after surgery.

Section (4) Nurses' knowledge regarding precautions to prevent infection It consisted of (6) multiple choice questions included hand washing upon entering the unit, when dealing with any invasive procedures, when preparing instruments, and when changing wound (4 questions), time for wound care (1 question) and time for cannula care (1 question).

Scoring system:

The nurses' knowledge was checked with the model answer after completing the interview questionnaire. The correct answers scored (1), and the incorrect or do not know answers scored (0). The total degree ranges from 0-38 (38 questions). The nurses' total knowledge was classified as the following:

- ≥75% was considered a satisfactory level of knowledge
- <75% was considered an unsatisfactory level of knowledge.

Tool (II): An observational checklist for nurses' practice

It was developed by the researchers according to **Betz *et al.*, (2018), Salazar & Ángela (2022) & Kyle (2021)** to assess nurses' practice regarding the care of children undergoing surgical repair of genitourinary anomalies including 4 parts:

Part I: Nursing care for children on admission (4 items); hand washing (9 steps), vital signs (24 steps); axillary temperature (11 steps), heart rate (7 steps), respiratory rate (6 steps), assessment of child's weight (8 steps), collection of venous blood sample (14 steps), care of intravenous infusion (17 steps).

Part II: Preoperative nursing care (4 items); Physical preparation (9 steps), emotional preparation (8 steps), safety indicators (5 steps), parent education for the postoperative care (7 steps).

Part III: Nursing care in the trans-operative (3 items); child's preparation in the surgical room (8 steps), prepare venous lines and give prophylactic antibiotics (10 steps), preparation of the skin for surgery (6 steps).

Part IV: post-operative nursing care (6 items); immediately post-operative nursing care (9 steps), Discharge from the recovery room (7 steps),

pain management (5 steps), 24 hours post-operative nursing care (20 steps), wound care (12 steps), health education for the care giver (7 steps)

Scoring system:

Each step was evaluated as; done correctly taken (1 score), and not done taken (0 score). The total score ranged from 0 to 43. Total practice scores are transformed into percentages.

- ≥ 90% considered competent practice.
- <90% considered incompetent practice.

Tool III: A structured questionnaire based on Pediatric nursing excellence (PNE) model developed by the researchers and adapted from **McDowell et al., (2022)**. It was written in an Arabic language and consisted of (15) Likert-type questions to assess nurses' general excellence level regarding the care of children undergoing surgical repair of genitourinary anomalies grouped under five main categories including engagement, values, principles, care delivery and continuous improvement.

Each one of these categories had 3 sub items as following:

Engagement: [collaboration, professionalism, and professional development], **Values** [advocacy, ethics, and quality of life], **Principles** [equity, holistic care and family centered care], **Care delivery** [care coordination, care planning and health promotion] and **Continuous improvement** [evidence-based practice, outcomes, and quality standards].

Each sub item had sub questions such as Journey for nursing excellence need full support from the unit management, nurses and parents adapted the level of collaboration when preserving routines in everyday situations depending on the severity of the child's illness and treatment, The nurse should develop family-centered relationships, where all children are treated ethically with respect for diversity while advocating for health equity. Nurses' continuing professional development improves the quality of nursing care, child's safety, and nurses' satisfaction …etc.

Scoring system for nurses' excellence level:

The nurses' excellence level was evaluated from 0 to 30 as; low excellence level 0-9, moderate excellence level 10-19, high excellence level 20-30. The questionnaire rating through a 3-point Likert scale, including agree (2), neutral (1), and disagree (0).

Preparatory phase:

This phase included a review of relevant local and international literature and recent studies to get more acquainted with the several aspects of the study and developing the tools of the study using periodicals, scientific books, magazines and evidence-based articles. This period started from the beginning of May 2022 to the end of June 2022.

Tools validity and reliability:

The validity of the study tools was reviewed by a panel of three experts in the pediatric nursing field, Faculty of Nursing, Benha University, to test the sequence of items clarity, applicability, and relevance. The modifications were done to ensure their relevance and accuracy. The internal consistency of the measures was calculated using Cronbach's alpha test. It was 0.77 for knowledge and 0.82 for practice.

Ethical considerations:

The proposal was approved by the Ethical Research Committee at the Faculty of Nursing, Benha University, prior to beginning the actual work. The submission of an official letter from the hospital manager and the supervisors of the surgical unit was done. All of the studied nurses were assured that their participation in the study was voluntary. Then, oral consent had been obtained from each nurse to participate in the study.

Pilot study:

It was conducted on 10% of the study subject (6 nurses) over one month (July 2022) to test the applicability of the study tools and estimate the required time needed to complete the study tools. Based on the pilot study results, no radical modifications were made to the study tools. Consequently, the nurses within the pilot study were added to the study sample.

Procedure for data collection:

The researchers were found in the study settings by using rotation two days per week (Sunday and Tuesday) during the morning shift to gather data using the previously mentioned tools. The fieldwork was completed over a six-month period, from the beginning of August 2022 to the end of January 2023.

Application of PNE model proceeded through four phases [assessment, planning, implementation and evaluation].

Assessment phase [Pre PNE model application phase]: the researchers conducted interviews with each nurse introducing themselves to each nurse incorporated into the study and explained the aim and duration of the study. Next, Each nurse was asked to complete a the structured interviewing questionnaire (tool I) individually; it took between 15 and 25 minutes. Then, the researchers observed nurses when they demonstrating nursing care for children undergoing surgical repair of genitourinary anomalies *(tool II)*; it took between 20 and 30 minutes. Also, the researchers assess the nurses' excellence level based on PNE the model (tool III).

Planning phase:

An Arabic booklet concerning the care of children undergoing surgical repair of genitourinary anomalies was developed by the researchers based on nurses needs identified during the assessment phase. It covered theoretical knowledge, practical nursing procedures, and PNE model domains.

The general objectives of the Pediatric Nurse Excellence (PNE) model application were to improve nurses' knowledge and practice regarding the care of children undergoing surgical repair of genitourinary anomalies.

Specific objectives:

At the end of the PNE model application, the studied nurses were able to:

- Mention components of the PNE model.
- Illustrate concepts and relation—between PNE model components.
- Explain strategies that promote consideration of nursing excellence in the practice area.
- Enumerate types of genitourinary anomalies.
- Illustrate causes and complication of genitourinary anomalies.
- List the diagnostic ways for genitourinary anomalies.
- Mention complications after surgery.
- Discuss pain management.
- List precautions to avoid infection.
- Apply steps of hand washing and vital signs.
- Apply steps of immediate pre-operative preparation for children undergoing surgical genitourinary repair.
- Demonstrate steps of trans-operative and post-operative nursing care.
- Demonstrate steps of infection control measures.
- Apply steps of family-centered preoperative care before the day of surgery.
- Apply the core principles of excellence, altruism, justice, caring, and respect for children and their families.
- Apply ethical issues concerning childcare services and quality management of nursing care.
- Apply communication skills and leadership of team.

Implementation phase:

It was completed in six sessions [four sessions for the theoretical part and two sessions for the practical part]. Also, a timetable was established for nurses, containing the titles, date, time, and duration of each session.

The time commitment of each theoretical and practical session ranged between 45 and 60 minutes. Each session began with an explanation of the previous session and the objectives of the current one, taken into account the usage of the Arabic language appropriate for the nurses' educational level. Each nurse was given the opportunity to ask questions, to which the researchers responded clearly.

Small group discussions, brain storming, flip charts, role-playing, demonstration, and re-demonstration were all utilized as instructional approaches. Videos and a Power Point presentation were utilized as instructional aids.

In addition, flashcards had been used as a teaching method by the researchers. It is a collection of small note cards meant to help nurses enhance their ability to remember. The flashcards were two-sided, that had the title on one side and the title's items on the opposite side, and they featured titles, concepts, and vocabulary.

Throughout the study period, a direct channel for communication was maintained between the researchers and nurses using mobile and personal meetings in the inpatient surgery departments for any inquiries, missed information, and confirmation of knowledge and practice.

Contents of the sessions:

The Theoretical part:

- The first theoretical sessions focused on:
- The general and specific objectives.
- A clarification of PNE model and its intended purposes.
- Components of PNE model.
- PNE model concept definitions.
- Basics of PNE model's general application.
- Approaches for promoting nursing excellence identification in the practice area.

The second theoretical sessions focused on:
- Types of genitourinary anomalies include cryptorchidism, hypospadias, hydrocele, vaginal anomalies, bladder anomalies, prune-belly syndrome, renal anomalies, and ureteral anomalies.
- Signs of each type of genitourinary anomalies.

- Causes and complications of genitourinary anomalies.
- Diagnostic methods of genitourinary anomalies.
- Preoperative preparation for the children.

The third theoretical sessions focused on:
- Nursing care during trans operative period.
- Nursing care in the first postoperative day.
- Pain management.
- Precautions to avoid infection.
- Signs and symptoms of wound infection.
- Evaluation of early and late complications after surgery.
- Nursing care for children at the 7th day after surgical repair.

The fourth theoretical sessions focused on:
- Excellence needs of nursing care through perioperative period.
- Excellence criteria of nursing care for child safety, and prevention of medication errors.
- The importance of nursing records and nursing audit through perioperative period.
- Functional needs in the clinical area which affecting nursing care provided for children undergoing surgical genitourinary repair.
- The quality requirements in managing human and material resources including equipment handling and nursing care.
- Latest trends in health care services affecting nursing care provided for children undergoing surgical genitourinary repair.

The Practical part:

The first practical sessions focused on:
- Steps of hand washing and vital signs.
- Steps of blood sampling withdrawal.
- Steps of intravenous infusion.
- Steps of diaper care.

The second practical sessions focused on:
- Steps of one day preoperative preparation.
- Steps of immediately preoperative preparation.
- Steps of immediately postoperative nursing care.
- Steps of the first 24 hours postoperative nursing care.
- Steps of wound care.
- Steps of infection control measures.

PNE model application for nurses in the clinical area through five domains of the model.

Figure (1): Components of PNE Model

The first domain (Engagement):
1- Facilitation of collaboration between the child's family and healthcare professionals.
2- Interprofessional collaboration during transitions of childcare.
3- Develop communication skills and leadership team building.
4- Respect the child's dignity and protection of privacy through pre and postoperative care.
5- Respect for the child's autonomy.
6- Respect the principle of justice while providing pre and postoperative care for the children.

The second domain (Values):

1- Listen to the child's family request and apply their opinions to the point where they are not at risk.
2- Develop trust relationship with the child's family.
3- Maintain ethical issues concerning pre and postoperative nursing care for child undergoing surgical genitourinary repair.

The third domain (Principles):
1- Assess the child's physical and psychological status during perioperative period.
2- Provide health education to child's family to increase their knowledge and decrease anxiety level.
3- Maintain family-centered preoperative care before the day of surgery.
4- Provide emotional support for child and his family especially during trans operative period.

5- Ensure parental presence during anesthesia induction.
6- Allow parents' presence in the recovery room.

The fourth domain (Care delivery):
1- Organize the pre- and post-operative nursing care to achieve the best outcomes for child and his family.
2- Allow the child's family to discuss and review the action plan to achieve the agreed-upon goals.
3- Maintain nutritional status balanced to promote child's health.
4- Utilize basic nursing care principles to prevent early and late post-operative complications.

The fifth domain (Continuous improvement): -
1- Maintain children clean, comfortable, and safe.
2- Provide parents with the information about the expectations of their role in post-operative period and how to care for their child at home at the discharge time.
3- Answer family questions regarding the discharge plan.
4- Assess the family needs for follow-up care.
5- Familiar with hospital policy and rules.
6- Familiar with the hospital vision, mission, and goals.
7- Tidy in professional appearance.
8- Develop and update nursing care plans (nursing care pre and postoperatively).
9- Maintain effective teamwork with other professions.

Evaluation Phase [Post PNE model application phase]:
The nurses' knowledge and practice were immediately evaluated after the application of PNE model. The same pretest collection tools were used to conduct the post-tests.

Data analysis
The data had been coded and transformed into a particularly designed format for computer entry using [SPSS version 22]. Descriptive statistics were applied as frequency, percentages, mean, and standard deviation. Also, chi-square was utilized to test the hypothesis of the study.

Quantitative continuous data were compared using paired t-test. A highly statistical difference had been determined at p-value ≤ 0.001.

Results
Table 1. Shows that, the nurses mean age was 29.45 ± 9.13 years old, and more than one third (38.3%) of them were qualified from a Technical

Institute of Nursing. Moreover, the majority (88.3%) of the studied nurses were females, and more than two-fifth (43.3%) of them had experience ranging from 5->8 years.

Figure 2. Shows that, less than three quarters (73.3%) of the studied nurses attended one training course as regards the care of children undergoing surgical repair of genitourinary anomalies.

Table 2. Illustrates that the majority (83.3%) of the studied nurses had a satisfactory level of knowledge concerning the care of children undergoing surgical repair of genitourinary anomalies post PNE model application, compared to one-third (30.0%) pre PNE model application.

Table 4. clarifies that, there were highly statistically significant differences observed in all items of the total score of practice regarding the care of children undergoing surgical repair of genitourinary anomalies in pre compared to post PNE model application (P≤0.001).

Figure 3. shows that, the majority of the studied nurses (86.7%) had a competent level of total

practice post PNE model application, compared to more than one third (35.0%) pre PNE model application.

Figure 4. Shows that, the majority of the studied nurses (81.6%) had high excellence level post PNE model application, while less than three quarters (70.0%) had low excellence level pre PNE model application.

Table 5. Represents that, there was a positive correlation between nurses' total knowledge and total practice in pre and post PNE model application.

Table 6. Portrays that, there was a positive correlation between total nurse excellence level score with the nurses' total knowledge score, and total practice pre and post PNE model application.

Table 1. Percentage distribution of the studied nurses according to their characteristics (n=60).

| Nurses' characteristics	No.	%
Age in years		
<2o	5	8.3
20-<30 years	18	30.0
30-<40 years	29	48.3
≥ 40 years	8	13.4
Mean ±SD	29.45 ± 9.13	
Gender		
Male	7	11.7
Female	53	88.3
Academic qualifications		
Diploma of nursing school	20	33.3
Technical Institute of nursing	23	38.3
Bachelor in nursing sciences	15	25.0
Post graduate studies in nursing	2	3.4
Years of experience at surgical unit		
< 2	8	13.4
2-<5	11	18.3
5-<8	26	43.3
≥ 8	15	25.0
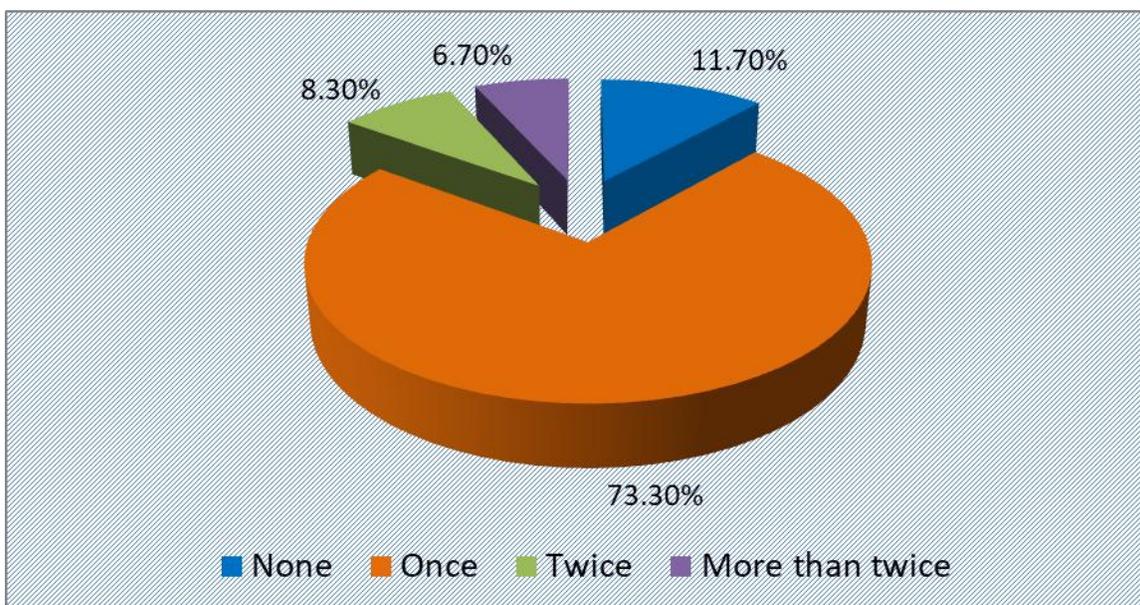
Figure 2. Nurses' attendance to training courses regarding care of children undergoing surgical repair of genitourinary anomalies (n=60).

Table 2. percentage distribution of the studied nurses' total knowledge regarding care of children undergoing surgical repair of genitourinary anomalies pre and post PNE Model application (n=60)

Knowledge items	Pre PNE Model application (n=60)				Post PNE Model application (n=60)				X^2	P-value
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	No	%	No	%	No	%	No	%		
Nurses' knowledge regarding genitourinary anomalies										
Total	18	30.0	42	70.0	48	80.0	12	20.0	27.14	0.000**
Nurses' knowledge regarding preoperative nursing care										
Total	15	25.0	45	75.0	50	83.3	10	16.7	24.71	0.000**
Nurses' knowledge regarding postoperative nursing care										
Total	20	33.3	40	66.7	53	88.3	7	11.7	29.11	0.000**
Nurses' knowledge regarding precautions to prevent infection										
Total	16	26.7	44	73.3	51	85.0	9	15.0	25.82	0.000**
Total knowledge level										
Total	18	30.0	42	70.0	50	83.3	10	16.7	26.69	0.000**

(**) Highly statistically significant difference at p-value ≤o.oo1.

Table 3. Mean scores of the studied nurses according to their total score of practice regarding care of children undergoing surgical repair of genitourinary anomalies pre and post PNE Model application (n=60)

Nurses' practice	Pre- PNE Model application (n=60)	Post PNE Model application (n=60)	Paired t-test	P-value
	Mean ± SD	Mean ± SD		
Nursing care for children on admission	34.315± 3.475	59.666±2.579	25.092	0.000**
Preoperative nursing care	37.754± 2.230	63.175±1.974	23.305	0.000**
Nursing care in the trans-operative	32.666± 2.114	56.298±2.293	19.180	0.000**
Postoperative nursing care	40.929± 3.712	61.052±2.325	22.859	0.000**
Total	35.755± 3.475	59.755±2.579	22.609	0.000**

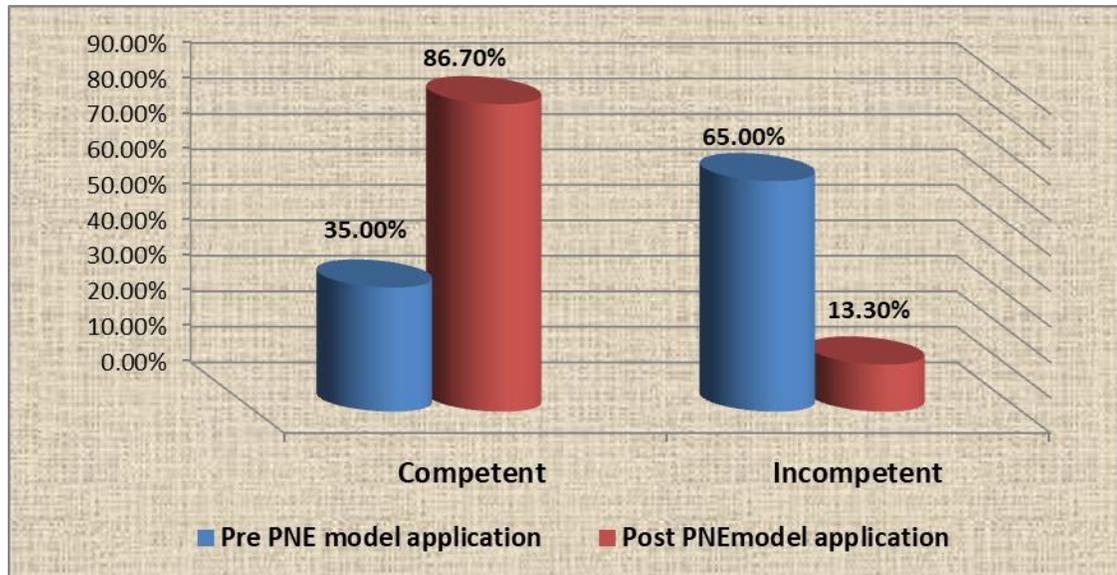**(**) Highly statistically significant at P ≤ o.oo1**

Figure 3. Total score of nurses' practice regarding care for children undergoing surgical repair of genitourinary anomalies pre and post PNE model application (n=60)

Table 4. mean scores of nurses' total general excellence level regarding care of children undergoing surgical repair of genitourinary anomalies pre and post PNE model application (n= 60).

Nurses' general excellence level	Pre PNE Model application (n=60)	Post PNE Model application (n=60)	Paired t-test	p-value
	Mean ± SD	**Mean ± SD**		
Engagement	36.82 ± 10.17	80.66 ± 8.63	26.61	0.000**
Values	43.71± 6.20	82.47±4.24	31.09	0.000**
Principles	45.55±4.16	84.06±3.93	33.52	0.000**
Care delivery	31.76±6.67	79.84±4.57	21.32	0.000**
Continuous improvement	29.45±4.76	74.06±3.93	18.52	0.000**
Total mean	37.466±6.392	80.218±5.06	26.21	0. 000**

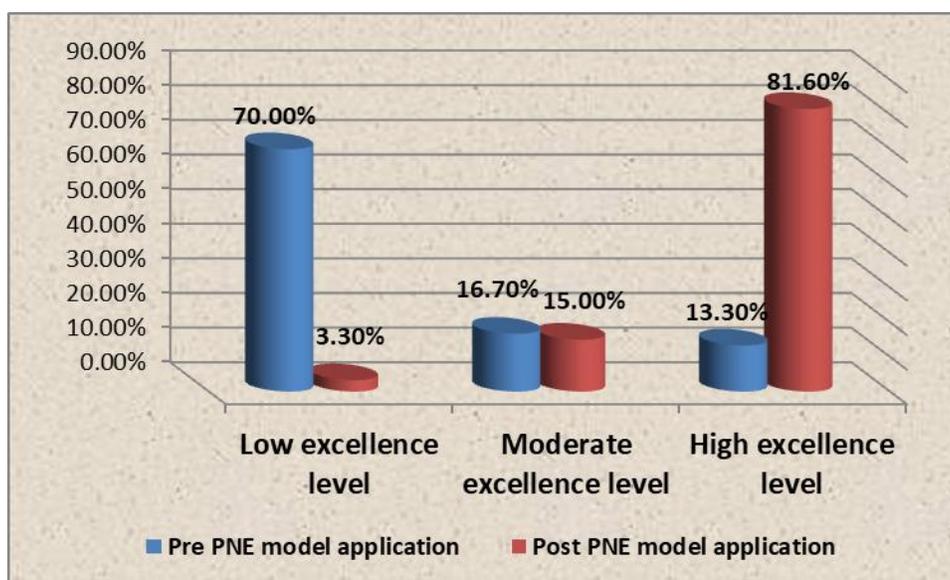**(**) Highly statistically significant at P ≤ o.oo1**

Figure 4. total score of nurses' excellence level regarding care for children undergoing surgical repair of genitourinary anomalies pre and post PNE model application (n=60)

Table 5. Correlation between total knowledge score and total practice score of the studied nurses pre and post PNE model application (n=60).

Variables	Total knowledge score			
	Pre PNE Model application (n=60)		Post PNE Model application (n=60)	
	r	P	r	P
Total practice score	0. 892	0.000**	0.877	0.000**

(**) Correlation is significant at the o. o1 level [2- tailed].

Table 6. Correlation between total nurse excellence level with total nurses' total knowledge, and total practice pre and post PNE model application (n=60).

Total scores	Total nurse excellence level pre PNE Model application (n=60)		Total nurse excellence level post PNE Model application (n=60)	
	r	P-value	r	P-value
Total knowledge	.002	. 000**	.127	. 000**
Total practice	.001	. 000**	.182	. 000**

(**) correlation is significant at the o. o1 level [2- tailed].

Discussion

Genitourinary anomalies contribute significantly to genitourinary disorders among children. Disorders affecting the reproductive organs frequently need early detection and treatment in order to maintain future reproductive functions, as significant genital anomalies of the genitourinary tract could have a significant influence on the quality of life among those children **(Tasian et al., 2018).**

Nurses must be well-versed in guidelines and care standards pertaining to surgery, anesthesia, invasive procedures, and child safety. Similarly, nurses must

have good interpersonal and social relationships within a surgical environment, as well as leadership along with successful communication skills. **(Salazar-Maya, 2022).**

The current study was quasi-experimental and comprised 60 nurses who worked at inpatient pediatric surgical department at Benha Specialized Pediatric Hospital in Benha city. This study aimed to evaluate the effect of pediatric nursing excellence model application on nurses' knowledge and practice regarding the care of children undergoing surgical repair of genitourinary anomalies.

Regarding characteristics of the studied nurses, the present study found that less than one third of the studied nurses were between 20<30 years old. This result agrees with *Stephens & Gillick (2020)* who studied "Preoperative assessment in pediatric surgery" and encountered that one quarter of participants were between 25 to 30 years old.

Concerning the gender of the studied nurses, the current study found that the majority of them were females. This finding was in the same context with *El-Gazar & Zoromba, (2021)* who carried out a study about "Nursing human resource practices and Hospitals' performance excellence: The mediating role of nurses' performance" and noticed that the majority of the staff nurses were females.

As regard years of experience of the studied nurses, the current study portrayed that one quarter of the studied nurses had more than eight years of experience. This finding agrees with **KC** *et al., (2019)* who studied "Knowledge on genitourinary fistula among nurses in a tertiary hospital of Eastern Nepal", who reported that 22.5% of nurses had experience of more than 11 years.

According to training courses, the findings of the current study revealed that, less than three quarters of the studied nurses attended one training course regarding caring of children undergoing surgical repair of genitourinary anomalies, while the vast minority of them attended more than twice. On the same line, *Ball et al., (2017)* who studied "Post-operative mortality missed care, and nurse staffing in Nine countries: A cross-sectional study" reported that, lack of training courses for nurses was an early warning indicator of higher risk for poor child outcomes and a substantial predictor of mortality following surgery.

Additionally, **Vasconcelos et al., (2019),** in a study about "A predictive Model of postnatal surgical intervention in children with prenatally detected congenital anomalies of the kidney and urinary tract" stated that, congenital anomalies of the kidney and urinary tract encompass a broad phenotypic spectrum and are significant causes of chronic kidney disease in infants and young children.

So, nurses working in the surgical area should attend continuous training courses that are considered the most suitable method to maintain professional competence, excellence, assuring responsiveness to emerging scientific-technological advancements, and excellent care.

As regards the nurses' total knowledge regarding the care of children undergoing surgical repair of genitourinary anomalies, the finding of the current study illustrated that, the majority of the studied nurses had satisfactory knowledge after PNE model application with a statistically significant difference between the pre and post PNE model application. These findings supported by *Hermida & Sánchez-Herrera, (2018),* who carried out a study about "Nursing care with a human approach: A model for practice with service excellence" and reported that, nursing excellence models allow nurses to develop their knowledge, that affect their level of performance as well. Additionally, they play a role in the generation of change using nurses' own knowledge, and the integration of nursing into the health-care system.

In addition, *Reda, (2018)* mentioned that, it is of great importance to develop nurses' level of knowledge in order to influence the children undergoing surgical repair outcomes. Also, continuous educational training help nurses to deliver excellence in pediatric surgical care. From the points of view of the researcher the PNE model required specialized nurses having knowledge which enable them to provide the best possible care for such group of children who require surgery.

Concerning the nurses' practice regarding the care of children undergoing surgical repair of genitourinary anomalies, the current study clarified that, there were highly statistically significant differences observed between all items of the studied which related to the total score of practice regarding the care of children undergoing surgical repair of genitourinary anomalies in the pre assessment compared to post PNE model application. This finding goes in the same line with *Zhang et al., (2016)* in a study about" Application of performance excellence management model in clinical nursing teaching" who found that there were highly statistically significant differences with (P<0.01) regarding nurses' performance after application of the excellence management model than pre application.

On the same line, this result supported with *Magagi et al., (2020)* who conducted a study entitled "Instructions about congenital urogenital anomalies in children after surgery" and found that there was highly statistically significant improvement in nurses' practice concerning the care of children undergoing surgical repair of genitourinary anomalies.

Concerning nurses' total practice regarding the care of children undergoing surgical repair of genitourinary anomalies, the current study revealed that most of the studied nurses had competent level post PNE model application. This finding may be due to the fact that the applicable PNE model improves the professional skills in a short period of time. Therefore, this finding was matched with *Salahat et al., (2019),* who studied "Nurses perceptions toward nursing excellence program in a Tertiary Hospital" and reported that, nurses were the core of each health care system, and their excellence was recognized during providing high quality of care, which was important and enhanced their clinical practice.

This finding agreed with *Dans et al., (2017),* who studied" Understanding the new pathway to excellence standards" who stated that, empowering nurses to apply quality of care is the key to sustain excellence care, as the study showed fewer negative safety practices, fewer errors, higher overall competence, and less stress.

Concerning nurses' total excellence level regarding the care of children undergoing surgical repair of genitourinary anomalies, the current study found that the majority of the studied nurses had high excellence level post PNE model application. While less than three quarters had low excellence level pre PNE model application. This finding supported by *Zhang et al., (2016),* who showed that the excellence model maintains an opportunity for the studied nurses to become familiar with the demands, advances and become excellent in providing care.

Also the present study finding showed that there was a positive correlation between nurses' total knowledge and total practice at pre and post PNE model application. This finding was supported by *El-Gazar & Zoromba, (2021)* who found that nurses' performance was all significantly correlated with (p < 0.01).

Additionally, this finding goes on the same line with *Khraisat et al., (2020),* who studied " Shared governance: A children's Hospital journey to clinical nursing excellence" and found that, excellence of nursing care integrates the best theoretical knowledge and practice which improve the quality of nursing care offered.

Conclusion

Based on the findings of the current study, it could be concluded that nurses' level of knowledge and practice improved regarding the care of children undergoing surgical repair of genitourinary anomalies, which emphasize that PNE model application was effective.

Recommendations

1. Conducting a periodical educational program for the nurses who are working at the pediatric surgical departments is mandatory to improve the quality of nursing care offered.
2. Guideline booklet in simple Arabic language should be available for nurses in to guide them while dealing with children undergoing surgical repair of genitourinary anomalies.
3. Developing strategies to improve nursing care for children undergoing surgical repair of genitourinary anomalies is needed to achieve high competent nurses' performance.

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