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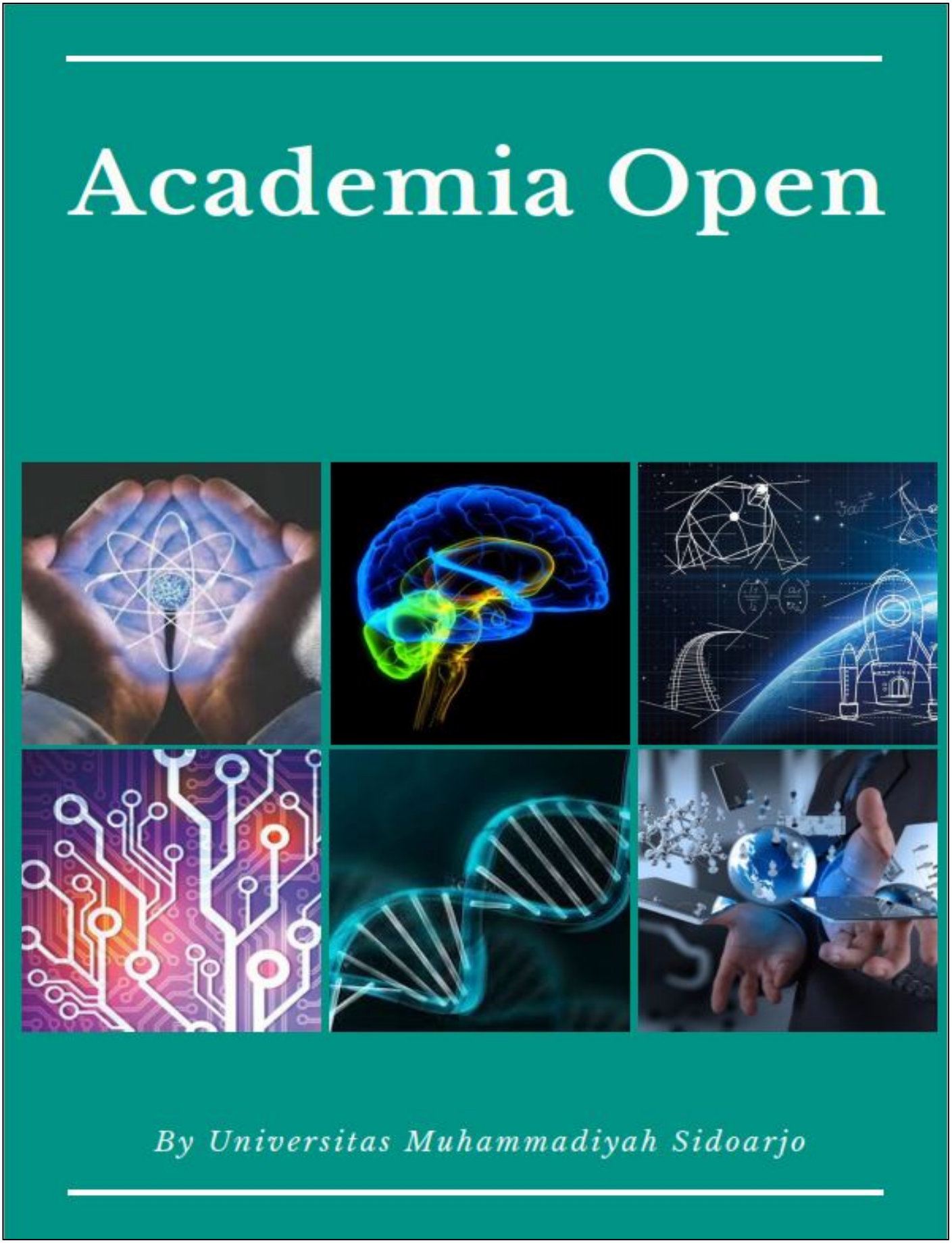

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Originality Statement

The author[s] declare that this article is their own work and to the best of their knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the published of any other published materials, except where due acknowledgement is made in the article. Any contribution made to the research by others, with whom author[s] have work, is explicitly acknowledged in the article.

Conflict of Interest Statement

The author[s] declare that this article was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Enhancing Pediatric Nursing Skills by Top Learning Strategies

Meningkatkan Keterampilan Keperawatan Anak dengan Strategi Pembelajaran Terbaik

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Abstract

Background: The efficacy of educational strategies is crucial for nursing students to competently perform pediatric procedures like nasogastric tube insertion. **Specific Background:** This study evaluates the effectiveness of simulation, blended, and self-directed learning strategies in enhancing these skills among nursing students. **Knowledge Gap:** Previous research lacks a comprehensive comparison of these strategies' impacts on skill development in pediatric nursing contexts. **Aims:** The study aims to assess the effectiveness of different educational strategies on nursing students' ability to perform pediatric nasogastric tube insertions. **Methods:** A pre-experimental design was employed at the College of Nursing, University of Baghdad, involving 60 students divided into three groups. Data were collected via an observational checklist from October to December 2023 and analyzed using SPSS. **Results:** Significant improvements in students' skills were observed across all groups. Simulation strategy showed highly significant differences with p-values of .001 and large effect sizes (Partial Eta Squared: .887, .902, .582). Blended strategy also demonstrated significant results with p-values of .001 and large effect sizes (Partial Eta Squared: .813, .936, .883). The self-directed strategy was similarly effective, with p-values of .001 and large effect sizes (Partial Eta Squared: .871, .739, .667). Descriptive statistics revealed a notable increase in mean scores in post-tests, indicating the effectiveness of these strategies. **Novelty:** This study uniquely compares the effectiveness of simulation, blended, and self-directed learning strategies, providing comprehensive insights into their impacts on pediatric nursing education. **Implications:** The findings underscore the importance of incorporating diverse learning strategies in nursing curricula to enhance practical skills, suggesting that a combination of these methods could be most beneficial for student learning and competence in clinical settings.

Highlights:

Effective Strategies: Simulation, blended, and self-directed learning enhance pediatric nursing skills.
Significant Improvement: All methods showed highly significant skill development with large effect sizes.
Unique Comparison: The study provides valuable insights for nursing education curricula.

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Introduction

One of the primary responsibilities of the nursing education system is to offer high-quality education to nursing students and enhance their competence to deliver safe and appropriate nursing care to patients [1]. Developing students' skills is one of the main objectives of academic education, as well as, information gain and experience to assist in developing the learner's thoughts, emotions, and views about a certain topic. Furthermore, it is the outcome of acquiring new skills and achieving new objectives [2-4]. Academic education provides students with the specific skills and knowledge they need to make choices and take action to offer services and solve issues in the labor market [5-7].

The education strategies used in the educational process are divided into two categories: teacher-centered or conventional methods, and student-centered methods, or current methods [8,9]. Traditional teaching techniques allow the instructor to regulate the lecture and its content, allowing students to learn information quickly; nevertheless, pupils lose focus within the first 10 minutes of the presentation and remember only 20% of the material [10]. Student-centered teaching approaches, such as case-based learning, problem-based learning, and simulation-based learning, involve students in the educational process while also increasing their autonomy and confidence. Furthermore, it helps students improve their problem-solving, clinical judgment, and communication skills [11-13].

The portion of students' abilities required to deliver nursing care is critical in nursing education, particularly before interacting with real patients, to boost student competence and confidence and prevent medical mistakes [14,15]. Inadequate clinical practices may result in insufficient nursing care and an increase in errors in nursing processes, putting patient safety at risk. Furthermore, it raises the burden of care on health institutions, healthcare professionals, and patients ([16]. the most significant factor in ensuring that children receive adequate nursing care is the presence of nurses who are adequately qualified [17]. Although it is imperative to reduce the gap between theory and practice during training, nursing educators encounter numerous challenges in managing the educational process, particularly in the clinical setting [18].

Today, researchers are still interested in the application of contemporary and appropriate educational strategies, particularly in the field of pediatrics. Possibly, the scarcity of nurses in the healthcare environment is more of a desire than a necessity, as stated by pediatric patients [19,20]. The educational procedure can be conducted using a variety of methods. Nevertheless, the decision to select the standardized is a contentious one. Several of the novel strategies were implemented and evaluated in an academic setting. Blended learning, which integrates traditional classroom instruction with online resources, has been demonstrated to be an effective educational approach [21-23].

In nursing education, the simulation training method is a critical priority, as it allows students to exercise their abilities in a secure environment [24]. Real-world scenarios are typically presented in simulations, and various pediatric nursing procedures may be implemented. This approach is intended to improve the practical decision-making abilities of pediatric care nursing students by cultivating critical thinking [25].

The self-directed learning strategy is a contemporary educational and learning approach that empowers students. This approach enables students to independently acquire knowledge, evaluate their educational requirements, and identify learning objectives [26]. In the pediatric nursing context, this method enables students to customize their training by concentrating on their identified strengths and interests, thereby fostering both autonomy and engagement in lifelong knowledge acquisition [27]..

Methods

Study design:

A pre-experimental design was used to achieve the goals of the investigation. For the study groups, the study used pre-test, post-test 1, and post-test 2 techniques. This kind of research was selected to determine the effectiveness of instructional techniques on students' knowledge of nasogastric tube insertion.

Setting and period:

The research was conducted at the University of Baghdad's College of Nursing from 14 September 2023, 4 until July 2024.

Study Sample

Students from the University of Baghdad's College of Nursing's third level made up the study sample. The purposive sample was selected using a set of criteria, such as high school graduation, age ranges of 20 to 30 for both genders, and the exclusion of students working in hospitals, nursing homes, and schools that prepare future

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nurses.

The Raosoft database management system specification was used to determine the size of the study sample, which was a minimum of 60 participants, with a margin error of 5%, a confidence level of 95%, and an expected frequency of 50%.

Study instruments and Data collection procedure:

Two devices were used to get the required data.

student sociodemographic information, such as age, gender, and prior academic standing. The majority of the modifications and adaptations made to the pediatric nasogastric tube insertion checklist come from [28]. This enumeration, which has fourteen points, represents the phases in the process. To evaluate the level of students' skill items, the threshold points for the mean score of each item in the scale were determined. Three categories were assigned to the scale: fair (from 10.67 to 21.33), good (from 21.34 to 32), and bad (0–10.66).

The consent was obtained from the relevant authority of the Faculty of Nursing as well as the Ethical Research Committee of Baghdad University's College of Nursing. A panel of subject-matter experts assessed the tools' content validity, and the Cronbach's Alpha test was used to confirm their reliability, which was determined to be satisfactory (0.90). In a pilot study involving ten nursing students (who were not included in the sample), the researchers evaluated the study's viability and the existence of any barriers.

Educational strategies implementation

The students were divided into three groups based on the study design. Each group participated in three educational sessions (simulation, blended, and self-directed) for the nasogastric tube insertion procedure.

The simulation-based learning strategy was implemented on the mannequin in the pediatric nursing laboratory for a duration of 20-30. Subsequently, students implemented the same procedure with the same instrument as the researcher.

The blended learning strategy was implemented by conducting a 20-30-minute online lecture via PowerPoint application and videos regarding the procedure. The following day, the same procedure was implemented on the mannequin in the pediatric laboratory of the college. The PowerPoint and videos contain identical information.

The self-directed learning strategy was implemented by assigning each group a situation in which a child is experiencing a problem and requires a solution. One of the solutions is to implement the nasogastric tube insertion procedure. The students were presented with the situation on the classroom application the day before, and the following day, they were able to apply the procedure on the mannequin in the pediatric nursing department lab. The students were able to learn about the procedure through social media, books, lectures, and previous studies.

Ethical considerations

To get formal authorization to conduct the research at the College of Nursing, the researcher submitted a description of the study, including the goals and instructional methodologies, to both the College of Nursing and the Ministry of Planning (Central Statistical Organisation). The University of Baghdad's College of Nursing Committee's scientific and research committee gave its ethical clearance and permission (No. 7/1/2024-7). Patients were informed that participation was completely optional and that their answers would be kept private. They have to provide their informed permission in writing.

Data analysis

With the help of a statistical professional, the academics carried out the statistical study as follows: The data was analysed and interpreted using version 26.0 of the Statistical Package for Social Sciences (SPSS). The Mean (M), Percentage, and Frequency (F) were used to analyse the descriptive data. Cronbach Alpha (α), repeated measure ANOVA, analysis of variance ANOVA, and Scheffe's multiple comparison test were used to evaluate the efficacy of instructional methodologies

Result and Discussion

In total, 60 students participated in the study. More than half of the participants (90%) were female and the remaining were males, with an average age of 21±2.6 years in which 70% are seen with the age group of “less than 22 years”

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Characteristics		F	%
Age M±SD= 21±2.6	Less than 22 year	42	70
	22 years and more	18	30
Sex	Male	6	10
	Female	54	90
Total		60	100

Figure 1. *Distribution of Students according to their Socio-demographic Characteristics*

Skills	Blended Learning BL						Self-Directed Learning SDL						Simulation Based Learning SBL					
	Pre-test		Post-test I		Posttest II		Pre-test		Post-test I		Posttest II		Pre-test		Post-test I		Posttest II	
	F	%	F	%	f	%	f	%	F	%	F	%	f	%	f	%	f	%
Poor	20	100	0	0	0	0	20	100	0	0	5	25	20	100	0	0	0	0
Fair	0	0	6	30	8	40	0	0	17	85	14	70	0	0	4	20	13	65
Good	0	0	14	70	12	60	0	0	3	15	1	5	0	0	16	80	7	35
Total	20	100	20	100	20	100	20	100	20	100	20	100	20	100	20	100	20	100
Mean	7.15		23.20		22.60		7.30		18.45		12.90		7.15		24.00		18.95	
SD	1.599		2.931		3.470		1.490		3.531		5.088		2.033		3.129		4.071	

Table 1. *Overall Evaluation of Students' Skills during Nasogastric Tube Procedure by Educational Strategies*

f: Frequency, %: Percentage, M: Mean of total score, SD Standard deviation of total score Poor= 0 – 10.66, Fair= 10.67 – 21.33, Good= 21.34– 32

table (2) related to BL, students showed a poor level of skills during the pre-test time (100%, M±SD= 7.15 ± 1.599), while at post-test 1 they showed a good level of skills (70%, M±SD= 23.20 ± 2.931), and post-test 2 (60%, M±SD= 22.60 ± 3.470).

Concerning SDL, the findings related students evaluated poor skills during the pre-test time (100%, M±SD= 7.30 ± 1.490), while they evaluated fair skills during post-test 1 (85%, M±SD= 18.45 ± 3.531) and post-test 2 (70%, M±SD= 12.90 ± 5.088).

Regarding SBL, the findings related students scored at poor level of skills during pre-test time (100%, M±SD= 7.15 ± 2.033), while they scored at good level skills during post-test 1 (80%, M±SD= 24.00 ± 3.129), and fair level skills during post-test 2 (65%, M±SD= 18.95 ± 4.071).

Discussion

Enhancing students learning outcomes and improving their academic achievement levels is the basic goal of the education process in all areas of nursing learning. Therefore, it is important to improve the quality of nursing education, especially performance skills to ensure that the basics of practical skills, model of excellent practice, and academic guidance are accessible.

The objective of the present study is to find out the impact of nursing educational strategies on the skills of nursing students in the area of pediatric nasogastric intubation. The selection of this group was determined by the necessity of implementing effective educational strategies to reduce the occurrence of practical errors and accidents and to ensure the safety of patients. The present study's findings indicate that the average age of the participants in each of the three categories is 21±2.6 years, with 10% of them being male and 90% being female. Park's research in Korea on the same subject revealed that the majority of participants were female 87.6%, with an average age of 21.45 ± 1.84 years [29].

The researcher provided pediatric nasogastric tube insertion procedures in three different educational methods, to develop their skills by adopting modern educational methods, and investigating their efficacy.

The blended learning strategy in Table (2), shows that the majority of students demonstrated an improvement in

their skills for good skills following the BLS procedure at post-tests 1 and 2, with a score of 70% and 60%, respectively. The researcher attributed this discovery to the flexibility that was offered. The online resources, enable students to examine the materials and contents of the procedure in their free time and to gain a better understanding and accessibility to repeat the procedure. These findings are corroborated by other studies, which demonstrate how BLS is active, motivating, and effective in education [30,31]. In their survey study on the efficacy of BLS in learning, Kumar [32] observed a significant enhancement in the clinical performance of 150 nursing students, as well as an improvement in their competencies in healthcare education. BLS was suggested by the authors as a means of facilitating more profound learning.

The students' skills were primarily developed to a fair level at post-tests 1 and 2 (85% and 70%, respectively), which was consistent with the self-learning method, as demonstrated by Table (2). Based on the researcher's perspective, these findings the method of learning itself may be relevant to this phenomenon. When students assume a proactive role in the learning process and assume the responsibility of learning the NG procedure, they can retain information about the procedure when they independently seek it out. This enhances their capacity to comprehend and recall the procedure.

In their research, Şentürk and Zeybek [33] demonstrated that the SDL is not only a practical instrument for acquiring and educating skills but also a critical factor in the long-term retention and application of knowledge. 32 students in the United Kingdom pursued higher qualifications in pediatric nursing, as demonstrated by this study. Our results are consistent with those of Leary [34], who affirmed a strong correlation between SDL and problem-based learning (PBL) among students. This method enables students to develop a thorough understanding and the necessary skills to solve problems.

The application of simulation-based learning during the nasogastric tube procedure in Table (2) also resulted in the majority of students achieving acceptable skills at post-tests 1 and 2 (80% and 80%, respectively). The researcher associated this enhancement with the methodology of SBL itself, which has the potential to enhance students' academic performance. The students' responses to this method are intriguing, and they suggest that it could be an effective educational approach. This result is consistent with the findings of Pivač [35] in their study, which underscores the importance of hands-on active learning methods, such as simulation methods, in healthcare training. The study demonstrated that simulation learning can enhance students' critical thinking and communication skills. Additionally, it can better equip students to provide secure care in real-world environments. Additionally, Zendejas [36] concluded that the efficacy of SBL as a learning aid provides a strong foundation for long-term skill retention and competence.

Conclusion

The current study's findings indicate that simulation-based learning, blended learning, and self-directed learning strategies were effective in enhancing the skills of nursing students regarding nasogastric tube insertion

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