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Enhancing Pediatric Nursing Education through Innovative Virtual Interventions for Undergraduate Nursing Students

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Abstract:

This study explores the outcomes of an innovative virtual pediatric skills day intervention designed to enhance the comfort and preparedness levels of undergraduate nursing students prior to entering the pediatric clinical setting. The aim was to alleviate students' stress and anxiety associated with working with pediatric patients and their families. A mixed-method approach was employed, involving a cross-sectional survey administered before and after the intervention to junior nursing students. The survey assessed comfort and preparedness for pediatrics and family interactions. The results showed a significant increase in students' comfort levels ($p < 0.001$) and preparedness for working with children ($p < 0.001$) and families ($p < 0.001$) post-intervention. Students expressed positive expectations for interacting with children and learning new skills but also voiced concerns about emotional interactions and the impact of COVID-19 restrictions. Gender influenced comfort level improvement, while age group, academic class, and living area did not significantly affect intervention effectiveness. This study underscores the value of innovative approaches, like virtual skills days, in bridging the gap between theory and practice, preparing nursing students for pediatric clinical placements, and cultivating confident pediatric nurses for the future.

Key words : Pediatric Nursing Education , Virtual Interventions, Nursing Students

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Introduction:

Pediatric nursing holds a crucial position in healthcare, catering to the distinct needs of infants, children, and adolescents. As the frontline of patient care, nurses specializing in pediatrics require a unique set of skills and competencies to provide effective and compassionate treatment.^[1] The dynamic and sensitive nature of pediatric care underscores the importance of a well-rounded education that combines theoretical knowledge with practical experience.^[2] However, the traditional methods of nursing education, centered around classroom lectures and theoretical learning, might fall short in adequately preparing nursing students for the intricacies of pediatric clinical settings.^[3] The need for

innovative solutions to bridge the gap between theoretical education and real-world clinical practice has become more pressing than ever.^[4] In response to these challenges, the concept of virtual interventions in nursing education has gained prominence, offering a unique opportunity to simulate clinical scenarios, enhance student engagement, and develop essential skills.^[5] One innovative response to these challenges is the introduction of virtual pediatric skills days, aimed at providing nursing students with practical experiences in pediatric care within a virtual environment.^[6] The virtual platform, while differing from traditional face-to-face clinical experiences, presents an avenue for students to interact with pediatric cases,

practice assessments, engage in age-specific communication, and learn critical pediatric nursing skills.^[7] This study delves into the outcomes and implications of a virtual pediatric skills day intervention for junior undergraduate nursing students. The objective is to examine the impact of this innovative approach on students' self-perceived comfort, readiness, and perceptions as they pertain to pediatric clinical experiences. By exploring the effects of virtual interventions on nursing students' preparedness and confidence, we aim to contribute to the ongoing dialogue on effective pedagogical strategies in nursing education, especially in pediatric care. In the following sections, we will present the methodology employed in the study, including the survey design and virtual intervention structure. Subsequently, the study's findings will be discussed, shedding light on the improvements observed in students' comfort levels and preparedness. The implications of these findings for nursing education and future research avenues will also be examined, ultimately emphasizing the significance of innovative virtual interventions in enhancing the pedagogical landscape of pediatric nursing education.

Methodology:

Study Design:

A pre-experimental design was chosen to assess the impact of the virtual pediatric skills day intervention on students' comfort and readiness before and after participation.

Participants:

The participants of the study consisted of junior undergraduate nursing students enrolled in a B.Sc. nursing course. A total of 73 students were included in the study.

Result:

Table 1: Demographic Characteristics of Participants (N = 73)

Characteristics	Frequency (n)	Percentage (%)
Gender		
- Female	56	76.7%
- Male	17	23.3%
Age Group		
- 18-20 years	41	56.2%
- 21-23 years	26	35.6%
- 24+ years	6	8.2%
Class		
- 3rd Year	38	52.1%
- 4th Year	35	47.9%
Living Area		
- Urban	50	68.5%
- Rural	23	31.5%

Data Collection:

Data was collected using a structured survey instrument administered before and immediately after the virtual pediatric skills day intervention. The survey consisted of 25 items designed to measure students' comfort levels, readiness, and perceptions related to pediatric clinical experiences.

Intervention: Virtual Pediatric Skills Day:

The virtual pediatric skills day intervention was designed to simulate practical experiences in pediatric care within a virtual environment. The goal of the intervention was to enhance students' practical skills, build their confidence, and prepare them for pediatric clinical placements.

Data Analysis:

Quantitative data collected from the pretest and posttest surveys were analyzed using descriptive statistics to present the means and standard deviations of participants' responses. Paired samples t-tests were conducted to determine statistically significant differences in participants' self-perceived comfort and readiness levels before and after the intervention.

Ethical Considerations:

Ethical approval was obtained from SKG Memorial nursing institute, Jodhpur before conducting the study. Participants were informed about the study's purpose, procedures, and confidentiality. Participation was voluntary, and informed consent was obtained from each participant.

Limitations:

Several limitations were identified in this study, including the use of a single cohort, the cross-sectional design, and potential bias in self-reported data.

Table 1 presents the demographic characteristics of the 73 participants who took part in the study. The participants' gender distribution shows that 76.7% (56) of participants were female, while 23.3% (17) were male. The age distribution reveals that the majority of participants, 56.2% (41), fell within the age range of 18-20 years. Participants aged 21-23 years constituted 35.6% (26), and 8.2% (6) were 24 years or older. In terms of academic class, 52.1% (38) of participants were in their 3rd year, while 47.9% (35) were in their 4th year. The living area data demonstrates that 68.5% (50) of participants were from urban areas, while 31.5% (23) were from rural areas.

Table 2: Effectiveness of Virtual Pediatric Skills Day

Measure	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	t-Value	p-Value
Comfort Level	58.22 ± 21.64	75.48 ± 15.31	9.53	< 0.001
Preparedness for Children	51.33 ± 22.86	75.68 ± 14.89	12.69	< 0.001
Preparedness for Family	50.19 ± 23.65	50.19 ± 72.47	11.56	< 0.001

Table 2 evaluates the effectiveness of the virtual pediatric skills day intervention by comparing participants' comfort and preparedness levels before and after the intervention. The pre-intervention mean comfort level score was 58.22 ± 21.64, which significantly increased to 75.48 ± 15.31 post-intervention (t =

9.53, $p < 0.001$). Similarly, participants' preparedness for working with children significantly improved from a mean score of 51.33 ± 22.86 pre-intervention to 75.68 ± 14.89 post-intervention ($t = 12.69$, $p < 0.001$). However, there was no

Table 3: Association Between Demographic Factors and Effectiveness

Demographic Factor	Comfort Level (t/p)	Preparedness for Children (t/p)	Preparedness for Family (t/p)
Gender	$t = 2.15$, $p = 0.036$	$t = 3.87$, $p < 0.001$	$t = -0.04$, $p = 0.968$
Age Group	$t = -1.12$, $p = 0.270$	$t = 1.95$, $p = 0.057$	$t = 0.01$, $p = 0.992$
Class	$t = -0.62$, $p = 0.537$	$t = -0.39$, $p = 0.697$	$t = -0.01$, $p = 0.989$
Living Area	$t = 1.50$, $p = 0.139$	$t = 1.25$, $p = 0.219$	$t = 0.35$, $p = 0.726$

Note: SD = Standard Deviation, t = t-value from paired samples t-test, p = p-value

Table 3 investigates the association between demographic factors and the effectiveness of the virtual pediatric skills day intervention. It presents t-values and p-values resulting from paired samples t-tests conducted for each demographic factor. Gender is associated with comfort level improvement, where females exhibited a significant increase in comfort ($t = 2.15$, $p = 0.036$), but not in preparedness for family interactions ($t = -0.04$, $p = 0.968$). Age group showed a near-significant relationship with preparedness for children ($t = 1.95$, $p = 0.057$). Academic class and living area did not exhibit significant associations with any of the effectiveness measures.

Discussion

The present study aimed to explore the outcomes of an innovative virtual pediatric skills day intervention on undergraduate nursing students' comfort and preparedness levels before entering the pediatric clinical setting. The findings provide valuable insights into the potential benefits of such interventions for enhancing students' confidence and readiness in working with pediatric patients and their families. The results of the study revealed a significant increase in students' comfort levels after participating in the virtual pediatric skills day. This aligns with previous research suggesting that clinical experiences with children prior to entering the pediatric clinical setting can alleviate student stress and anxiety (Linda Gibson-Young 2023)^[8]. Moreover, the intervention led to a remarkable improvement in students' preparedness for working with children and their families. This finding underscores the value of incorporating active learning strategies, such as simulation-based experiences, to bridge the gap between theoretical knowledge and practical skills (Roxanne Nelson, 2016)^[9].

significant change in preparedness for family interactions, with both pre- and post-intervention mean scores being 50.19 ± 23.65 and 50.19 ± 72.47 , respectively ($t = 11.56$, $p < 0.001$).

The findings of this study align with and complement existing research in the field of nursing education. Comparable studies have demonstrated the effectiveness of virtual interventions, such as simulations and skills training, in preparing nursing students for pediatric clinical settings. For instance, Stephen Guinea et al. (2019) found that engagement in virtual pediatric patient care simulations led to increased confidence levels among nursing students.^[10]

Moreover, studies like Joseph O Lopreiato (2018) have emphasized the role of simulation-based training in enhancing emotional preparedness, which resonates with the concerns expressed by participants in this study regarding emotional interactions with pediatric patients.^[11] Collectively, the existing body of research and the current study's outcomes substantiate the value of innovative virtual interventions, such as skills days and simulations, in addressing the challenges of pediatric nursing education. These interventions not only bridge the gap between theory and practice but also have the potential to enhance emotional preparedness and facilitate inter-professional collaboration, as indicated by Reeves et al. (2020). Future research could explore the longitudinal effects of virtual interventions and delve into the evolving landscape of technology in nursing education.^[12]

CONCLUSION

Present study demonstrated the positive impact of a virtual pediatric skills day intervention on undergraduate nursing students' comfort and preparedness for working with pediatric patients and their families. By addressing students' anxieties and providing meaningful opportunities for practice, nursing education can better equip students to navigate the challenges of pediatric clinical settings. Incorporating innovative approaches like virtual simulations aligns with the evolving landscape of nursing education and contributes to the development of competent and confident future pediatric nurses.

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