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ORIGINAL ARTICLE

Educational Efficacy of Diverse Strategies on Knowledge and Skill of Nursing Students Regarding Neonatal Resuscitation

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ABSTRACT

Background: The educational efficacy in resuscitation could be improved by enhancing instructional design through different innovative approaches especially in resource-limited settings.
Aim: To determine the educational efficacy of diverse strategies on knowledge and skill of nursing students regarding neonatal resuscitation.
Study design: Quasi-experimental study.
Place and duration of study: School of Nursing, Allama Iqbal Medical College, Lahore from 1st November 2020 to 30th April 2021.
Methodology: Sixty-five nursing students of 1st and 2nd professionals were selected. The education on neonatal resuscitation consists of diverse educational strategies including didactic lecture, video, simulation, and self-practice sessions in the simulation laboratory of a public school of nursing in Lahore, Pakistan. The data on knowledge and skill was assessed two times before and after the intervention.
Results: The study showed a significant ($p<0.001$) change in knowledge and skill after education. Nearly, all students had poor knowledge and skill before education. The knowledge had been improved as 40.0%of students achieved good, and 53.3% achieved fair knowledge level.
Conclusion: The diverse educational strategies in neonatal resuscitation significantly improve nursing students' knowledge and skill.
Keywords: Neonatal resuscitation, Education, Nursing students, Knowledge, Skill

INTRODUCTION

Neonatal resuscitation is the most common neonatal emergency at the time of birth.1 Nearly, 1 in 10 newborns requires some form of resuscitation and <1% required more advanced measures including chest compressions and medications.[2] Effective resuscitation at birth is associated with reducing neonatal morbidity and mortality.[3] Therefore, skilled health professionals must be present on-site to handle these emergencies.[4] That is not possible without frequent training and education in the field of resuscitation.

Since many studies reported the improvement of cognitive and technical skills in neonatal resuscitation among health care providers after educational training.[5-7] However, the educational efficacy is inclined by the instructional design including but not limited to skill learning, deliberate practice, mentoring, feedback, evaluation, and other advanced educational approaches[8] that are crucial to optimize learning outcomes.[9] Consequently, enhancing instructional design in different innovative approaches can improve educational outcomes.

Nursing is an evolving profession searching continuously for evidence-based strategies to advance clinical practice and patient outcomes. The role of effective supervision, mentorship, and new strategies for improving knowledge and skill are crucial for improving nursing practice.[10] Nursing students expose to neonatal resuscitation during their clinical rotation. Yet, often less prepared to handle paediatric emergencies such as neonatal resuscitation[11]. The knowledge regarding neonatal resuscitation was assessed by Malarvizhi et al[12] among 85 nursing students in Coimbatore and found that 52% of them had insufficient knowledge and 48% had nearly adequate knowledge while no student had enough information on neonatal resuscitation. Thus, expressing a dire need of developing effective educational strategies in the field of resuscitation especially in the preservice areas. Hence, the current study determines the educational efficacy of diverse strategies on knowledge and skill of nursing students regarding neonatal resuscitation.

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MATERIALS AND METHODS

The study was a quasi-experimental (one group pre-posttest) conducted between December 2020 to May 2021. Sixty-five nursing students of 1st and 2nd professionals were selected. The setting was the simulation lab at a public school of nursing in Lahore, Pakistan. Written informed consent was taken from all the students. The nursing students enrolled in the first and second year of Bachelor of Science in Nursing were selected through convenient sampling. The nursing students who gave informed consent had ages between 18-24 years and did not receive any previous training and education in neonatal resuscitation were included in the study. A 12 weeks educational intervention consists of theoretical lectures on neonatal resuscitation, video, Scenario-based simulation session, and self-learning practice session were given by trained instructors. The students were divided into groups for practice sessions and each group contained 5-6 students. Data on knowledge and skill were collected two times before and after the educational intervention through validating tools.

The demographic form contains information regarding year of study, language, residential area, marital status, and status on previous neonatal resuscitation exposure. Data on knowledge was collected through a knowledge

questionnaire.[13,14] The total score of each student's knowledge was graded[15] as 0-49% poor, 50-74% fair, and 75-100% score with a good level of knowledge. The skill was assessed through a checklist by Rovamo et al.[16] The total score of each student skill was graded[15] as 0-49% unsatisfactory, 50-74% satisfactory, and 75-100% score with good skill. The two assessors evaluate students' skills before and after intervention in the simulation lab.

The data analysis was performed by using the SPSS-24. Chi-square was used for categorical data. While, paired sample t-test was used to compare the difference in knowledge and skill in pre-and post-educational intervention. A p-value ≤ of 0.05 was taken as significant.

RESULTS

The mean age was 22.1±0.97 years. Only 2(3.1%) participants had Punjabi as the primary language while 63(96.9%) participants had Urdu as a primary language. 64(98.5%) participants were unmarried while only 1 participant was married. Five (7.7%) participants were from rural areas and 60(92.3%) participants were from urban areas. Nine (13.8%) participants had previous neonatal resuscitation exposure and 56(86.2%) had no such exposure (Table 1).

Paired sample t-test was used to compare the mean change in knowledge and skill score pre- and post-intervention. Results indicated that the post-training sessions mean change in knowledge and skill scores was significant among participants (Table 2).

Results indicated that before the training session 60 participants have poor knowledge level while 5 participants had fair knowledge level. After the training session, out of 60 participants who had poor knowledge, 24 achieved good knowledge level and 32 achieved fair knowledge level whereas 4 participants did not improve their knowledge level. Out of 5 participants who had fair knowledge level, only 1 achieved a good knowledge level whereas 4 participants did not improve their knowledge level (Table 3)

Figure 1 showed that before the training session all participants have an unsatisfactory skill level. After the training session, out of 65 participants who had unsatisfactory skill level, 25 achieved good skill level and 34 achieved satisfactory levels whereas 6 participants did not improve their skill levels (Table 4).

Table 1: Demographic information of the participants

Variable	No.	%
Age (years)	22.1±0.97	
Year of professional education		
3rd	32	49.2
4th	33	50.8
Primary language		
Urdu	63	96.9
Punjabi	2	3.1
Marital status		
Unmarried	64	98.5
Married	1	1.5
Residential area		
Rural	5	7.7
Urban	60	92.3
Previous neonatal resuscitation exposure		
Yes	9	13.8
No	56	86.2

Table 2: Comparison of mean knowledge and skill score pre- and post-intervention

Variable	Pre	Post	Difference	p-value
Knowledge score	5.95±1.88	11.58±2.10	5.63±2.72	<0.001
Skill score	3.28±1.11	20.32±5.15	17.05±4.98	<0.001

Table 3: Comparison of knowledge level pre- and post-intervention

Knowledge Level		Post Training Session		
		Poor	Fair	Good
Pre-Training Session	Poor	4 (6.7%)	32 (53.3%)	24 (40.0%)
	Fair	-	4 (80.0%)	1 (20.0%)
	Good	-	-	-

Table 4: Comparison of skill level pre- and post-intervention

Skill Level		Post Training Session		
		Unsatisfactory	Satisfactory	Good
Pre-Training Session	Unsatisfactory	6 (9.2%)	34 (52.3%)	25 (38.5%)
	Satisfactory	-	-	-
	Good	-	-	-

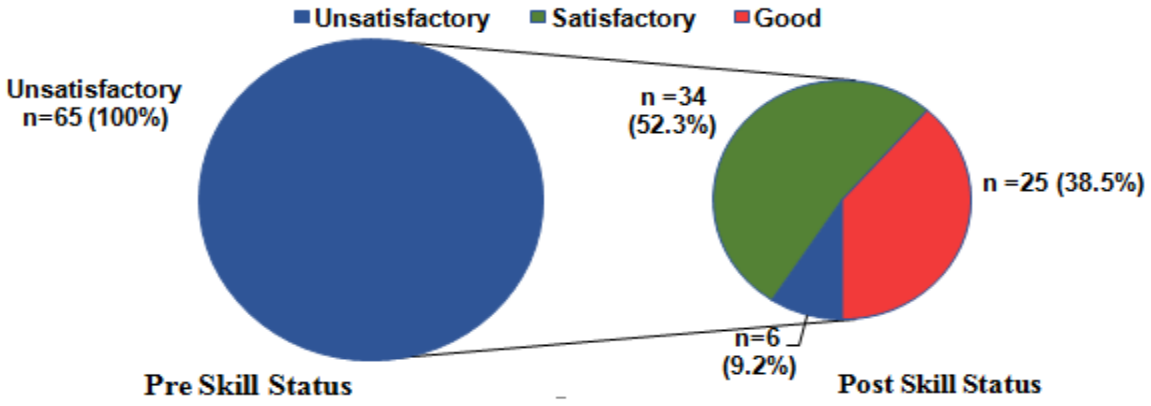

Fig.1: Comparison of mean skill pre- and post-intervention

DISCUSSION

The current study aims to evaluate the effectiveness of diverse educational strategies in learning neonatal resuscitation among nursing students. The study results showed that nearly all nursing students had poor knowledge and skill before education in neonatal resuscitation. The results can be vindicated as nursing students had little exposure with no previous education in this essential skill. The results are also supported by Vural et al[17] showed that 89% of nursing students had poor knowledge regarding ratio, while 84% had inadequate knowledge regarding the depth of chest compressions in India. In the context of Pakistan, the limited published literature is available regarding neonatal resuscitation. A cross-sectional study was conducted by Muneer et al[18] at the Lahore General Hospital. The study reported that 50% of doctors were assisted by nurses during neonatal resuscitation. Although 90% of doctors knew resuscitation. Shockingly, no one had found to follow all the steps of resuscitation.

The study revealed that significant ($p < 0.001$) improvement in knowledge and skill was found after education based on diverse strategies in neonatal resuscitation. The results are in align with the study conducted by Mileder et al[14] reported a significant increase in knowledge from the median in pre-test results was 62.1% while in post-test was 91.7% with $p=0.001$ in Austria. Similarly, the skill was improved significantly with $p<0.001$ was found. The results were in accordance with the study conducted in Turkey by Kose et al.[19] The study reported similar to our study results that the pre-intervention knowledge and skill of nursing students were poor while, after resuscitation training students significantly ($p = 0.000$) improve knowledge and practices in basic life support skills.

The results of the present supported by Helping Baby Breath (HBB) specially designed for developing areas. The HBB is integrated with diverse learning strategies and low dose high-frequency practices have been proven effective in many studies on enhancing knowledge and skills among health care providers.[20-22] A study based on HBB education was conducted by Singhal et al[23] among health professionals of Kenya and Pakistan. The study utilized innovative learning strategies and reported a gain in knowledge and skill in the posttest. Further, the addition of video in learning strategies is validated by Odongkara et al[24] study conducted in Uganda. The authors reported that the addition of video debriefing in HBB education could increase its effectiveness and long-term retention.

To our knowledge, this is the first study to determine the effectiveness of diverse strategies in the education of neonatal resuscitation and evaluating the outcomes concerning knowledge, and skill among nursing students conducted in a Public School of Nursing in Lahore, Pakistan. The study provides valuable information for faculty and program directors who are charged with pre-service curriculum reform in schools of midwifery and nursing. The study is also valuable to those who are responsible for in-service education of the same groups. However, the limitations include single centre study and the control group was not added that may limit its actual efficacy.

CONCLUSION

This study supports the efficacy of diverse educational methods in improving knowledge and skill in neonatal resuscitation. The significant gain in knowledge and skill occurs after educational intervention integrating with diverse strategies.

RECOMMENDATIONS

Neonatal resuscitation is an important emergency skill for nursing students. There is a need to develop strategies for effective training in the pre-service areas for health professionals. Future, multi-cantered randomized controlled trials with a large sample size are recommended for estimating the real efficacy of diverse educational methods in neonatal resuscitation.

Conflict of interest: Nil

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