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Research Article

A Pre-experimental Study to Assess the Effectiveness of NRP Training Programme on the Knowledge and Skills regarding Neonatal Resuscitation Practice among BSc Nursing Interns in Selected Colleges of Nursing, District Faridkot, Punjab, India

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A B S T R A C T

Introduction: Neonatal resuscitation (NR) is a paediatric emergency procedure used to resuscitate a baby who is unable to begin or sustain regular breathing and respiration. Nurses have a central part in neonatal resuscitation and avoiding complications. This study has been done to assess the knowledge and skills of BSc Nursing interns regarding neonatal resuscitation practice (NRP).

Method: The current study was done following a quantitative research approach and pre-experimental with one group pre-test post-test design. 60 BSc Nursing interns of a selected college of district Faridkot, Punjab were selected using purposive sampling technique. A knowledge questionnaire and observational checklist were used to assess the knowledge and skills regarding NRP. A post-test was conducted on the 8th day after the administration of an educational training programme regarding NRP.

Results: The result revealed that there was a significant improvement in knowledge and skills of BSc Nursing interns after the administration of educational training programme regarding neonatal resuscitation practice. Paired t-test was used to check the effectiveness of the educational training programme and t value for knowledge and skills were found statistically significant at p value < 0.001.

Conclusion: Educational training programme regarding NRP is effective in improving the knowledge and skills of BSc Nursing interns.

Keywords: Neonatal Resuscitation, Educational Training Programme, Newborn, Effectiveness, Knowledge, Skills, BSc Nursing Interns

Introduction

Neonatal resuscitation is a paediatric emergency procedure used to revive a baby when the baby is unable to initiate or maintain normal breathing and respiration. The main purpose of resuscitation is to initiate respiration in an infant who is asphyxiated.

Birth and death are mystic phenomena. The birth of a child imparts happiness as a new person joins the family. The death of a person creates sorrow as it creates a loss. Death may happen for any reason but sometimes death can be avoided using careful techniques, for example, demise due to birth asphyxia and meconium aspiration.

Neonatal resuscitation implies revival or restoration of life to a baby from the deficient supply of oxygen or asphyxia. The neonatal resuscitation programme aims at teaching the necessary steps to help a newborn baby breathe who is suffering from asphyxia. Ninety per cent of newborn infants face no difficulty during the change from intrauterine to extrauterine life. They respire spontaneously and regularly with no additional help. An estimated 10% of newborn babies need certain help to start respiration at birth and only approximately 1% may require using a resuscitative technique to survive.[1]

The neonatal mortality rate is used as an indicator of the country's social, educational and health care standards. Every year approximately 130 million infants are born globally, out of which, 4 million die within the first 4 weeks after birth. In India, out of 26 million babies born annually, 1.2 million die during the first four weeks, constituting 30 per cent of global neonatal deaths.[2] 75% of neonatal mortality is observed in the first week, and greater than 25% within the primary 24 hours. Birth asphyxia is the cause of approximately 20% to 25% of neonatal deaths. It is established that more than one million children who survive birth asphyxia suffer from disorders such as cerebral palsy, difficulty in learning and other disabilities. The primary cause for birth asphyxia and related disorders is poor management during and immediately after baby birth. The prevalence of birth asphyxia is reported to be greater in developing countries than in the developed ones.[3]

Every birth must be considered a medical emergency. Perinatal hypoxia is one of the primary reasons of perinatal mortality in developing countries. Birth asphyxia is the main cause of neurological handicaps in both term and preterm infants. In the labour room, a newly born baby should be helped to establish independent breathing without delay because within two minutes of tying the cord the arterial O_2 tension falls to 1-2 mm of Hg. Management of a baby suffering from asphyxia at birth ascertains the immediate morbidity and quality of life among survivors. The health professionals working in the delivery room and neonatal intensive care units should have adequate knowledge and skills to resuscitate a newborn effectively and efficiently.[4]

The neonatal resuscitation procedure has four sections: airway, breathing, circulation, and drugs. Initial steps of neonatal resuscitation include placing the baby under radiant warmer, drying the baby, clearing the airway and stimulating the baby to breathe. After assessing the baby, if the heart rate is less than 100 beats/minute, positive pressure ventilation should be provided. After 30 sec of effective positive pressure ventilation, the baby should be reassessed. If the baby has still not improved, then chest compression should be provided along with positive pressure ventilation. If the baby is unable to breathe, then epinephrine should be administered and the baby should be intubated.[5]

All healthcare providers should gain neonatal resuscitation skills required in the delivery of newborns. Intervention by a skilled person is needed during delivery. 80% of infants with low birth weight need resuscitation and stabilisation at birth. Neonatal resuscitation procedure requires managing temperature, forming of an open airway, starting breathing, and management of circulation. In case the infant is devoid of spontaneous breathing, then positive pressure ventilation (PPV) is required with a bag and mask followed by chest compression and endotracheal intubation. Nurses play a major part in neonatal resuscitation and avoiding complications.[6]

Sufficient ventilation is needed more than additional oxygen; rapidly using a bag and mask is instantly needed. Even if oxygen is not obtainable, starting resuscitation is the primary need. Resuscitation fails primarily because of the failure to identify the problem immediately, slow action, and ineffective ventilation.[2]

WHO survey 2018 reported that among 2.5 million neonatal mortality, 23% were directly caused by asphyxia and associated complications and they lead to the death of approximately 7000 babies before the age of one month every year.

UNICEF statistics reveal that about 9000 babies die within the first month of life after birth. 33 million neonatal deaths occur every year in the world, which is 41% of all mortalities of children below 5 years.[7]

Material and Method

Quantitative research approach and pre-experimental study design using one group pre-test post-test were used to assess the effectiveness of neonatal resuscitation practice training programme on knowledge and skills regarding neonatal resuscitation practice among BSc Nursing interns of selected colleges of district Faridkot in Punjab from December 2019 to February 2020. The total sample size

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was 60. Students of selected colleges of district Faridkot who were willing to participate in the study were included.

The study used the following tools:

Tool 1 - Sociodemographic profile: It consisted of 6 items, namely age, gender, residence, number of neonatal procedures assisted, previous exposure to neonatal advanced life support (NALS) training, and previous exposure to video instruction learning related to neonatal resuscitation.

Tool 2 - Structured questionnaire: It consisted of 42 items to assess the knowledge of BSc Nursing interns regarding neonatal resuscitation practice.

Tool 3 - Observational checklist: It consisted of 19 items to assess the practice of BSc Nursing interns regarding neonatal resuscitation.

Ethical Consideration

Ethical approval was taken from the Ethical Committee of the University College of Nursing and Baba Farid University of Health Sciences, Faridkot, Punjab. The participants were informed of the objectives and written consent was obtained. Confidentiality was maintained throughout the study.

Statistical Methods

The analysis and interpretation of the data were done as per the objectives laid down for the study. SPSS version 17, descriptive statistics (frequency, percentage) and inferential statistics (Chi-square and t-test) were used for the analysis of data. A p value of < 0.05 was considered statistically significant.

Results

Table 1 depicts the frequency and percentage distribution of socio-demographic variables.

Majority (85%) of the BSc Nursing interns were in the age group of 21-23 years, were females (90%) and were from a rural area (55%). 90% of BSc Nursing interns had assisted neonatal resuscitation 1-2 times in the last year and 10% had assisted 2-3 times.

Majority (91.7%) of the participants did not have any previous exposure to neonatal advanced life support training, and 66.7% had not received any previous video instruction of learning related to neonatal resuscitation.

Table 1.Distribution of Study Subjects by their Selected Sociodemographic Variables

n = 60

S. No.	Sociodemographic Characteristics	Frequency (N)	Percentage (%)
1.	**Age (years)**		
	18-20	9	15.0
	21-23	51	85.0
2.	**Gender**		
	Male	6	10.0
	Female	54	90.0
3.	**Area of residing**		
	Rural	33	55.0
	Urban	27	45.0
4.	**Number of times the participant assisted neonatal resuscitation in the last year**		
	1-2	54	90.0
	2-3	6	10.0
	3-4	0	0.0
	More than 4	0	0.0
5.	**Previous exposure to neonatal advanced life support training**		
	Yes	5	8.3
	No	55	91.7
6.	**Previous exposure to video instruction method of learning related to neonatal resuscitation**		
	Yes	20	33.3
	No	40	66.7

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Table 2.Pre-interventional Knowledge and Skills Score regarding Neonatal Resuscitation Practice among BSc Nursing Interns

n = 60

S. No.	Level of Knowledge regarding NRP	Maximum Possible Score	Maximum Obtained Score	Minimum Obtained Score	Mean Score	Mean Score Percentage (%)	Median	SD
1.	42 questions regarding NRP	42	32	12	22.62	53.85	23	4.844
2.	19 skills steps regarding NRP	19	11	03	6.73	35.42	7	2.154

Table 2 depicts that the knowledge scores ranged from 12 to 32. The maximum obtained score was 32 and the minimum was 12 with a mean score of 22.62, and median of 23 with a standard deviation of 4.844. The mean percentage score was 53.85% depicting the inadequacy of knowledge of BSc Nursing interns regarding neonatal resuscitation practice.

On the other side, this table also depicts that the skills scores ranged from 03 to 11. The maximum obtained score was 11 and the minimum was 03 with a mean score of 6.73, and median of 7 with a standard deviation of 2.154. The mean percentage score was 35.42% depicting the inadequacy of skills of BSc Nursing interns regarding neonatal resuscitation practice.

Table 3 shows that the knowledge score ranged from 22 to 41 after the intervention. The maximum obtained score was 41 and the minimum was 22 with a mean score of 34.15, and median of 34 with a standard deviation of 4.352. The mean percentage score was 81.30% depicting the adequacy of knowledge of BSc Nursing interns regarding neonatal resuscitation practice in post-test.

It also depicts the distribution of skills scores in which the maximum obtained score was 18 and the minimum was 09 with a mean score of 14.28. The mean percentage score was 75.15%, with median of 14 and a standard deviation of 2.233, depicting the adequacy of skills of BSc Nursing interns regarding neonatal resuscitation practice.

Tables 4, 5, and 6 show the change of knowledge and skill scores to the adequate level in post-intervention and significant t values, 23.579 (for knowledge) with df of 59 and 24.622 (for skills) with df of 59 which is found to be statistically significant at $p < 0.001$ level.

Table 3.Post-interventional Knowledge and Skills Score regarding Neonatal Resuscitation Practice among BSc Nursing Interns

n = 60

S. No.	Level of Knowledge regarding NRP	Maximum Possible Score	Maximum Obtained Score	Minimum Obtained Score	Mean Score	Mean Score Percentage (%)	Median	SD
1.	42 questions regarding NRP	42	41	22	34.15	81.30	34	4.352
2.	19 skills steps regarding NRP	19	18	9	14.28	75.15	14	2.233

Table 4.Comparison of the Pre and Post-interventional Knowledge among the BSc Nursing Interns regarding Neonatal Resuscitation Practice

n = 60

Knowledge Score	Inadequate (0-23)		Adequate (24-42)	
	Frequency	Percentage	Frequency	Percentage
Pre-interventional	29	48	31	51.66
Post-interventional	2	3.33	58	96.66

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Table 5.Comparison of the Pre and Post-interventional Skills among the BSc Nursing Interns regarding Neonatal Resuscitation Practice

n = 60

Skills Score	Inadequate (0-7)		Adequate (8-19)	
	Frequency	Percentage	Frequency	Percentage
Pre-interventional	38	63.33	22	36.66
Post-interventional	0	0	60	100

Table 6.Effectiveness of Educational Training Programme regarding Neonatal Resuscitation among BSc Nursing Interns

n = 60

S. No.	Mean	SD	t-test	df	p value
Knowledge pre/ post intervention	22.62/ 34.15	4.844/ 4.352	23.579	59	0.00, S
Skills pre/ post intervention	6.73/ 14.28	2.154/ 2.233	24.622	59	0.00, S

Thus, it can be concluded statistically that educational training programme is highly effective in improving the knowledge and skills of BSc Nursing interns regarding neonatal resuscitation practice for effective management of birth asphyxiated neonates and thus is helpful in the reduction of neonatal mortality rate.

Discussion

The results of the present study show that the educational training programme regarding neonatal resuscitation intervention was effective in improving the knowledge and skills of the BSc Nursing interns. The findings of the present study revealed that the pre-interventional mean score (knowledge - 22.62 and skills - 6.73) improved after the interventional programme (mean score of knowledge - 34.15 and skills - 14.28) respectively. Paired t-test value was found to be 23.579 for knowledge and 24.622 for skills, which was statistically significant at $p < 0.001$.

A similar study conducted by Nirmala[8] to assess the effectiveness of self-instructional module on management of birth asphyxia support the results of the present study and revealed that the mean post-test knowledge score was higher than the mean pre-test knowledge score, and the mean difference was high that showed the effectiveness of the self-structured module.

In a study by Koonwar et al.,[9] 50 nurses participated from the delivery room and neonatal intensive care units. Paired t test showed improved overall mean scores of knowledge and skills of subjects after post-test.

Subbiah N et al.[10] also conducted a pre-experimental study on the effectiveness of educational intervention on neonatal resuscitation among nursing professionals across the country. The results of the study also showed that the overall pre-test and post-test mean scores of knowledge were 19.11% and 30.71% respectively, and the overall pre-test and post-test mean scores of skills were 12.8% and 20.6% respectively. Paired t-test was found to be statistically significant at $p < 0.001$.

Carlo WA et al.[11] conducted a study on the educational impact of the neonatal resuscitation programme in low-risk delivery centres. This study also found a significant improvement in the knowledge and skills of participants regarding neonatal resuscitation.

From the above-cited discussion, overall, it is concluded that the educational training programme has proven to be effective in improving the knowledge and skills regarding neonatal resuscitation practice among the BSc Nursing interns.

Conclusion

Majority of BSc Nursing interns had inadequate knowledge and skills regarding neonatal resuscitation practice before the intervention. Educational training programme regarding neonatal resuscitation practice was highly effective in increasing the knowledge and skills of BSc Nursing interns regarding neonatal resuscitation practice. Hence it can be concluded that such an educational training programme will be helpful in ensuring quality nursing care and will thus lead to a decrease in neonatal mortality.

Recommendations

Further studies can be conducted on a large scale to provide a better picture of knowledge and skills regarding neonatal resuscitation practice. The instrument used to assess knowledge and skills of BSc Nursing interns regarding NRP can be further developed and field-tested for standardising. There should be workshops and seminars to enhance the BSc Nursing interns' knowledge and skills. A similar type of study may be conducted on staff nurses who are working in the clinical area to assess and improve their knowledge and skills in the field of NRP.

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