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EFFECTIVENESS OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE OF NURSES REGARDING NEONATAL RESUSCITATION IN DHQ AND THQ HOSPITALS OF PUNJAB

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Abstract

Introduction

Birth asphyxia is recognized as an important cause of neonatal morbidity and mortality throughout the world. Most of them occurring in low and middle income countries. Effective Neonatal Resuscitation has potential to prevent neonatal deaths as well as to improve the outcomes of newborns with birth asphyxia (Shikuku et al., 2017).

Purpose of the study

The purpose of this study was to evaluate the effectiveness of structured teaching program on knowledge of nurses regarding neonatal resuscitation in DHQ and THQ hospitals of Punjab.

Research methodology

The proposed study design for this study was quasi experimental (pre and post) study design. A sample of 30 nurses working in DHQ and THQ hospitals of Punjab were selected by using non-probability convenience sampling method. Pre and post data was collected by questionnaire. Data was presented in the form of figures, tables and graphs while McNemar and paired t-test was used to evaluate the effectiveness of structured teaching session. A p-value of ≤0.05 was considered as significant.

Findings and Discussion;

Majority of nurses working in DHQ and THQ hospitals have poor knowledge as evident by scores in pre-test. While the structured teaching program in improving knowledge of nurses regarding neonatal resuscitation was highly effective and significant improvement in knowledge was observed in post- test score.

Conclusion

It is concluded that structured teaching program regarding neonatal resuscitation in DHQ and THQ hospitals of Punjab can be very effective for improving the knowledge of nurses towards neonatal resuscitation.

INTRODUCTION

This chapter is composed of background of study, problem statement, significant of study to nursing, objectives of study, study questions and hypothesis.

The most precious gift of nature is birth of a healthy newborn baby. A newborn is not only valuable for its parents but also important for the whole nation and to the world. Improvement and maintenance of level of child's health is now not only positively appreciated but it also has become a goal of all communities. One theme of WHO is "A healthy child has a sure future" (Kaur and Jangwal, 2016).

A newborn period is a most delicate and risky part of life because it is associated with increased number of deaths as related to any other period of life (Ezenduka et al., 2016). Birth is a process in which newborn initiates its life as a separate being. Newborn undergoes different physiological transitions from fetal to neonatal life. In this process newborn leaves the highly protected intra uterine environment and get an independent existence (Khalid et al., 2015).

After birth, the newborn baby has to adjust in the external environment, therefore different changes occur in all body systems of a baby (Ezenduka et al., 2016). Newborn has to adapt the air filled environment from fluid filled environment, so it is important for the survival of new born that its system of heart and lungs initiate their function immediately and independently within few minutes (Parvinder et al., 2015).

The initial first one minute of life after birth for a baby is very important which is called the "golden minute" in which the breathing of the newborn should be started. The inability of the new born to start and sustain respiration at first minute of life leads to the condition known as birth asphyxia. Birth asphyxia leads to hypoxemia (decreased oxygen in the blood) and acidemia (increased acid in the blood) from carbon dioxide retention and accumulation of lactic acid. A large number of newborns are affected by birth asphyxia that is why it is known as a most important cause of neonatal mortality and morbidity particularly in developing countries (Ezenduka et al., 2016). Birth asphyxia also leads to major developmental problems like epilepsy, cerebral palsy, cognitive impairment and chronic illness later in life (Chikuse et al., 2012). Intra partum-related hypoxia contributes to an unknown number of disabilities (Moshiro et al., 2018).

Birth asphyxia may occur due to many reasons. The perinatal risk factors increasing the likelihood of birth asphyxia are pre eclampsia, eclampsia, anaemia, premature rupture of membrane, gestational diabetes, etc. Intrapartum risk factors are breech or other abnormal lie, prolapsed umbilical cord, prolonged labor, etc and the fetal factors are prematurity or cardiopulmonary problems (Ezenduka et al., 2016).

Globally 130 million newborn babies are born each year, three million newborns die within first four weeks of life (Moshiro et al., 2018). In Pakistan more than five million children are born each year. A large number of newborns are delivered at homes , that is why the disease burden in Pakistan is unreliable (Kiyani et al., 2014). However, It is estimated that in Pakistan, neonatal mortality rate is about 41 deaths per 1000 live births (Khalid et al., 2015). Pakistan has eighth highest rate of neonatal mortality and included in the list of those five countries that contribute about 49% of all childhood deaths (Noor et al., 2014). In 2001 neonatal mortality due to birth asphyxia was 35%, 14% and 11% in Lahore, Karachi and Khyber Pukhtunkhwa respectively(Kiyani et al., 2014).

Birth asphyxia leads to 11% neonatal deaths and it is the third leading cause under five mortality (Organization, 2015). Birth asphyxia accounts for roughly one-quarter (21%–28%) of all neonatal deaths (Reisman et al., 2016).

The incidence of birth asphyxia in developing countries is 100-250/1000 live births compared to developed countries is 5-10/1000 live births(Kiyani et al., 2014). A large number of neonatal deaths about 98% reported in middle and low income countries (Pammi et al., 2016). It is an important cause of loss of life and bad developmental outcome (Kiyani et al., 2014).

A large number of newborns pass through the transitional phase from fetal to neonatal life smoothly, initiate their breathing spontaneously and need no help or assistance. It is estimated that 90% of neonates do not need any help in transitional phase, about 10% of newborns need some support to initiate breathing and approximately 1% or more need extensive resuscitation (Kaur and Jangwal, 2016).

Neonatal mortality rate can be reduced and more than 1 million new born babies can be saved by application of simple resuscitative techniques (GS, 2014). It is estimated that about 4 million newborns per year are affected by inappropriate resuscitation steps (Noor et al., 2014). Therefore, appropriate neonatal resuscitation steps are essential in reducing neonatal deaths due to birth asphyxia especially in developing world (Lee et al., 2011).

Neonatal resuscitation is currently a biggest challenge in our health care system because health care workers are not appropriately competent in techniques used during resuscitation and the health care providers who are attending deliveries are not competent in resuscitation skills and the resuscitation equipments are also not available or not working properly (Koonwar et al., 2016). For the transition from the fetus to neonate requires intervention by a skillful person. Neonatal resuscitation skills are essential for all health care providers who are involved in the delivery of newborns (Kaur and Jangwal, 2016).

The American Heart Association (AHA) created a Neonatal Resuscitation Program (NRP) to provide guidance in the practice of resuscitating newborns and to reduce the occurrence of asphyxiation after birth. Globally, 92 countries use some variation of the NRP model to teach and/or use neonatal resuscitation (Uwakah and Smee, 2017).

Nurses are the health care personnel and part of health care team who are present at the time of birth and initially manage the newborn baby at the time of birth. In our health care institutions, undermining their role may lead to inadequate or low level of care and results in poor out come, increased death rates and persistent high rates of infant mortality (Ezenduka et al., 2016).

Correct assessment of newborn to start resuscitation is very important for successful neonatal resuscitation. At each delivery, Nurse should be present who has appropriate knowledge and competence about different steps of neonatal resuscitation including basic steps, positive pressure ventilation, chest compressions and administration of medications (Koonwar et al., 2016).

In order to prevent the neonatal deaths, the nurses must perform resuscitation procedure at a high level of professional competence and thus, the nurses must be trained regarding proper skills and technique of routine care and neonatal resuscitation (Parvinder et al., 2015). Inappropriate practices in our health care system are contributory factor to the occurrence and severity of birth asphyxia (Ezenduka et al., 2016). Every nurse must have training and expertise to resuscitate an apneic or asphyxiated newborn baby (Kaur and Jangwal, 2016).

Effective newborn resuscitation helps in reducing the complications due to birth asphyxia. For resuscitation to be successful, it requires careful understanding by the nurses working in the labor room, maternity and newborn units to have adequate knowledge and skills for neonatal resuscitation (Murila et al., 2012). Complications related to birth asphyxia can only be overcome if the newborn handling health care providers, especially nurses have appropriate knowledge and adequate skills about neonatal resuscitation (Noor et al., 2014).

Knowledge of nurses helps in identifying the need for resuscitation early and skillful resuscitation of the asphyxiated newborns helps to restore health and prevent further complications. Early diagnosis, appropriate management and reduction of adverse consequences resulting from birth asphyxia may depend on adequate knowledge and awareness about neonatal resuscitation among nurses (Ezenduka et al., 2016).

Knowledge of nurses about neonatal resuscitation and skillful management are essential for reducing the neonatal mortality and

morbidity. Therefore, the purpose of this study was to assess the knowledge of nurses on newborn resuscitation and to discover gaps between standard guidelines and actual practices that inhibit successful reduction in neonatal deaths.

OBJECTIVE OF THE STUDY:

To evaluate the effectiveness of structured teaching program on knowledge of nurses regarding Neonatal Resuscitation among nurses of DHQ and THQ hospitals of Punjab.

METHODOLOGY

Study Design:

A study design is a specific plan, protocol or proposal for guiding the study, which permits the researcher to transform the abstractly hypothesis in to a functioning one. The proposed design for this study was Quasi-experimental design (pre and post design). A quasi-experimental design is one that looks a bit like an experimental design but lacks the key ingredient-random assignment. In this type of study design researcher intervene something and demonstrate its effect on the selected sample population but the plasticity of this design is that sample selection is based on non probability convenience sampling technique.

Sample size:

Sample size is a number of participants that need to be studied in a research work. A sample of 30 nurses was selected based on inclusion and exclusion criteria. Sample size was calculated with support of literature and following formula was applied.

The sample size was calculated by the following formula keeping the power of study equal to 90% and level of significance equal to 5%.

$$n = \frac{\left(Z_{1-\beta} + Z_{1-\frac{\alpha}{2}}\right)^2 \left(\sigma_1{}^2 + \sigma_2{}^2\right)}{(\mu_1 - \mu_2)^2}$$

(Sample Size determination in health studies version 2.0.21 WHO)

$Z_{1-\beta}$ = Desired Power of study = 90%
$Z_{1-\frac{\alpha}{2}}$ = Desired Level of Significance = 5%
μ_1 = Mean value of knowledge pretest =57
μ_2 = Mean value of knowledge posttest =80
$\sigma^2{}_1$ = Standard Deviation of pretest= $(14)^2$
$\sigma^2{}_2$ = Standard Deviation of posttest = $(12)^2$
Minimum Sample size =7

The calculated sample size was too small to conduct a study that's why it was decided to take a sample of 30 nurses to conduct this study because in one workshop room 30 nurses can be gathered to provide teaching session, after discussing with a biostatistician.

Study Duration:

The duration of the study was 6 months after the approval of synopsis from synopsis review committee.

Research Setting:

(Beck and Polit, 2003) stated that research setting defines the location in which study take place .The study was conducted in THQ and DHQ hospitals of Punjab and research work was sustained and supervised for proper direction and assistance in the institute of nursing ,university of health sciences, Lahore.

Sample Technique:

Non probability convenience sampling technique was used for this study. According to, a convenience sampling is a non-probability sampling method in which researcher select

participants conveniently based on availability of required sample size.

Sample Selection:
Sample is a subset or fraction of a population. The following criteria were established for the selection of the participants
Inclusion Criteria:

- Registered nurses working in THQ and DHQ hospitals of Punjab.
- Having a working experience of more than 1 year.
- Working in newborn units, labor room and postnatal ward.

Exclusion Criteria:

- Clinical instructors and having specialization in pediatrics.
- Nurses who are not involved in direct patient care e.g. Head Nurses.
- Have attended any previous workshop or training on neonatal resuscitation.

RESULTS
Pakistan is included in the list of those countries that are contributing a large number of neonatal deaths. Therefore, it was extremely important to conduct a study to assess knowledge and to develop guidelines/strategy in the form of structured teaching program /session to improve knowledge. The study was carried out to evaluate the effectiveness of structured teaching session regarding neonatal resuscitation among nurses and to assess the knowledge level before and after teaching session.
This chapter focuses on the analysis, interpretation of the data collected for the existing study. This chapter informs the data construal in four sections as under
Section-A refers to general characteristics (demographics) which include age, experience and institution/hospital.
Section-B refers to evaluate the effectiveness of structured teaching program on knowledge of nurses regarding neonatal resuscitation in DHQ and THQ hospitals of Punjab.
Section -C refers to comparisons made with pre and post knowledge score of participants to their working experience.
Section-D refers to assess the knowledge level about Neonatal Resuscitation among nurses of DHQ and THQ hospitals of Punjab.

Section-A: Demographic Variables Analysis
Distribution of participants according to Education
To analyze the number of participants according to their professional education, it was noted that 30 out of 30 were having Diploma in General Nursing and Midwifery. B.Sc, nursing recently introduced in Pakistan So, these nurses are very small in number. Most of the nurses working in public health care facilities in DHQ and THQ hospitals are registered nurses having diploma in General nursing and Midwifery.

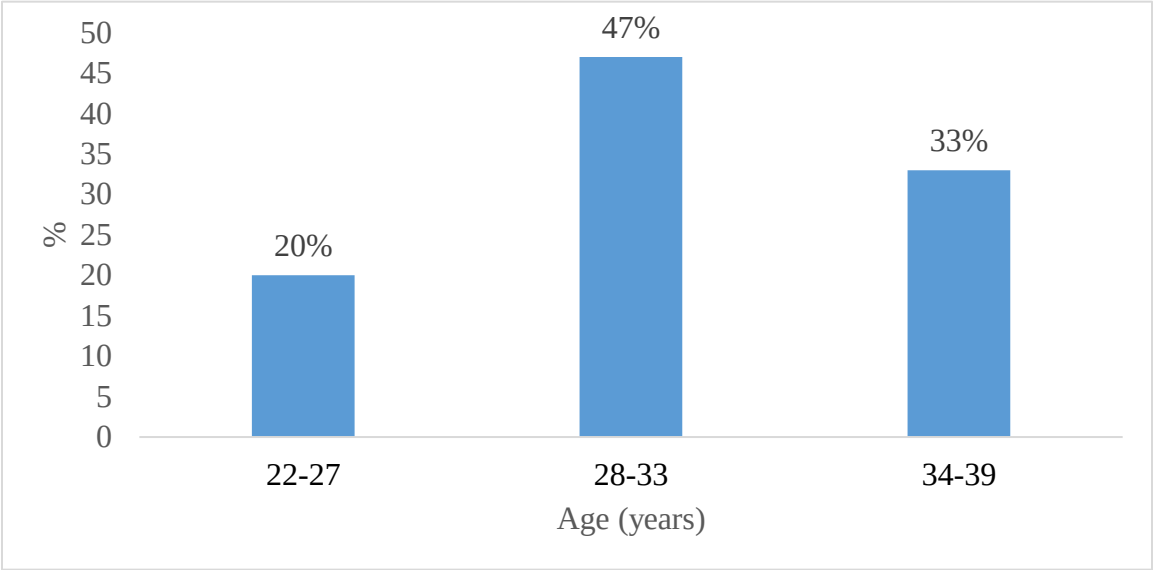


Figure 4.1 Distribution of participants according to Age

To analyze the number of participants according to their age it was noted that 6 out of 30 (20%) were having age in age of 22-27 years category; 14 out of 30(47 %) were having age in age of 28-33 years category; 10 out of 30 (33%) were having age in age of 34-39 category.

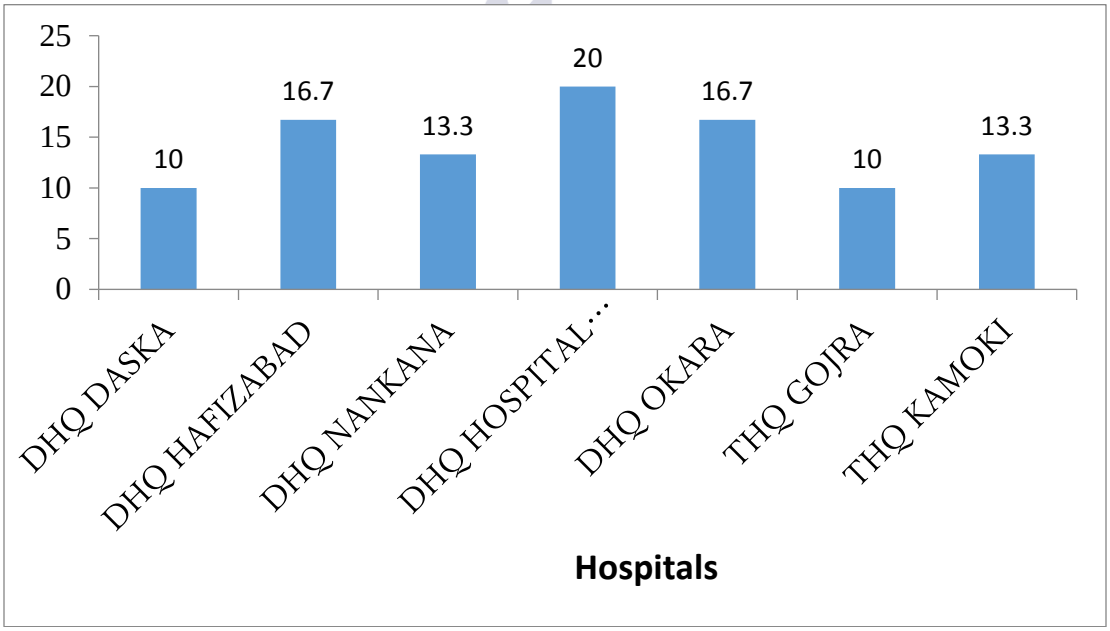


Figure 4.2 Distribution of participants according to Hospitals

To analyze the number of participants according to hospitals it was noted that 3 out of 30 (10%) were from DHQ Daska, 5 out of 30 (16.7 %) were from DHQ Hafizabad, 4 out of 30 (13.3%) were from DHQ Nankana, 6 out of 30 (20%) were from DHQ Narowal ,5 out of 30 (16.7%) were from DHQ Okara,3 out of 30 (10%) were from THQ Gojra,4 out of 30 (13.3%) were from THQ Kamoki.

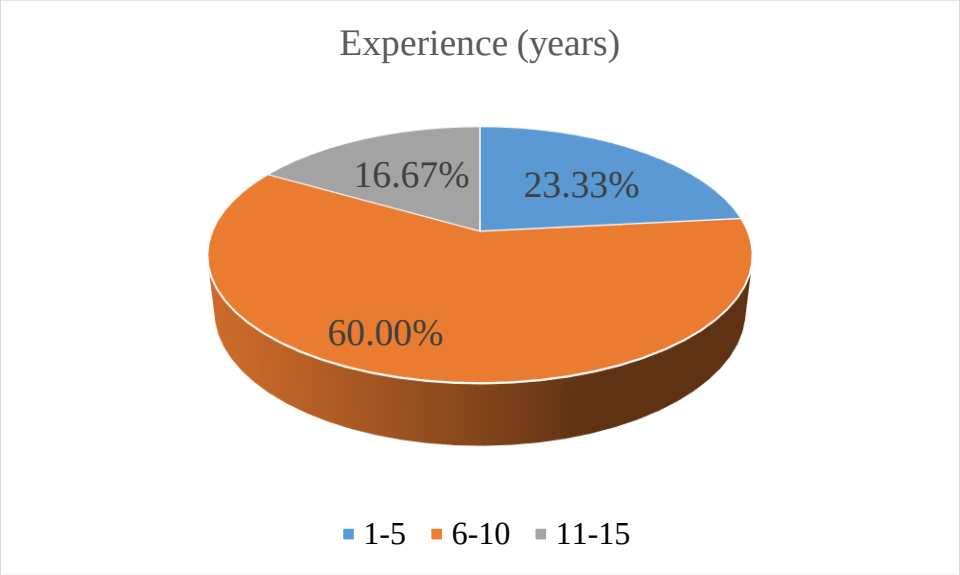


Figure 4.3 Distribution of Participants According to Experience

To analyze the number of participants according to their experience who attended the teaching session it was noted that 7 nurses out of 30 (23%) were having experience in 1-5 years category, 18 out of 30(60%) were having experience in 6-10 years category and 5 out of 30 (17%) having experience in 11-15 years category.

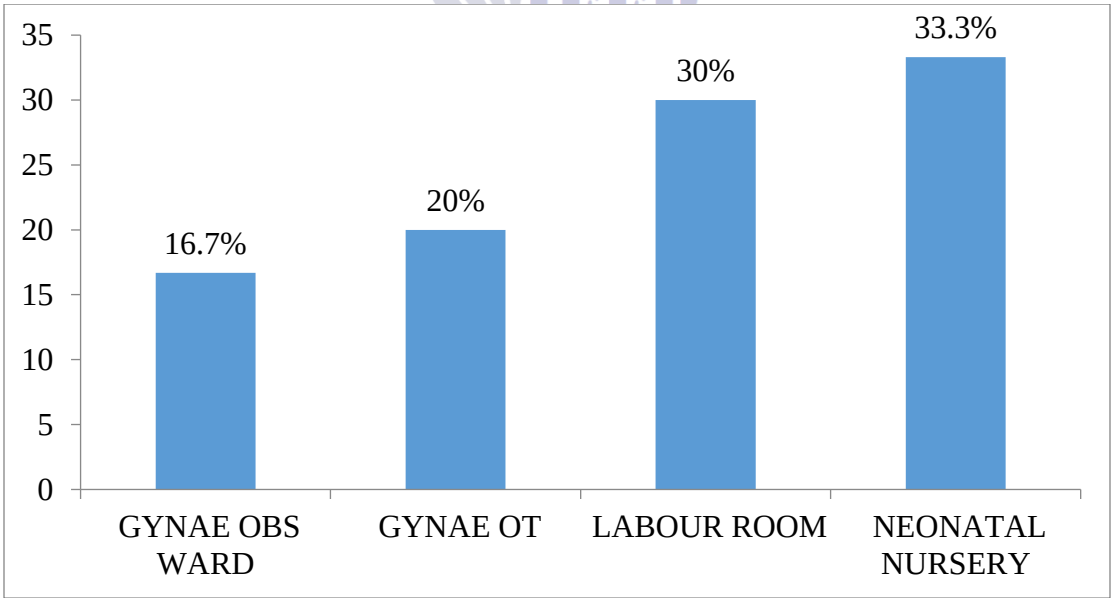


Figure 4.4 Distribution of Participants According to Wards/Units

According to selection criteria nurses who are currently working in Labor Room, Neonatal Units and Gynae Obs departments could participate in this study. Therefore, to analyze the number of participants according to their wards, it was noted that 5 out of 30 (16.7%) were from Gynae Obs wards, 6 out of 30 (20%) were from Gynae OT, 9 out of 30 (30%) were from Labor room, and 10 out of 30 (33.3%) were from Neonatal Nursery.

Section–B; Effectiveness of structured teaching program on knowledge of nurses regarding Neonatal Resuscitation (NR)

This section presents the analysis of overall effectiveness of teaching session as well as responses of each question.

Table 4.1 Overall effectiveness of teaching session

	Pre-Test		Post-Test		Mean difference		95% CI	Paired sample t-test		
	Mean	SD	Mean	SD	Mean	SD	-41.5 to -33.50	t	Df	P.value
Total	45.67	11.50	83.17	8.15	-37.50	10.73		-19.14	29	<0.001

As the primary objective of the study was to evaluate the effectiveness of structured teaching session regarding neonatal resuscitation among nurses, therefore paired t-test was used. It was observed that before teaching session the mean score of correct responses was 45.67 ± 11.50 SD and after teaching session the mean score of correct responses was turned in to 83.17± 8.15 SD. The difference between pre and post mean score was 37.50±10.73 SD. A p- value ≤0.05 was considered as significant. Significant difference was observed between pre and post mean score with p- value <0.001 showed that null hypothesis was not valid and there is strong evidence that teaching session regarding improvement of knowledge level towards neonatal resuscitation was highly effective.

Table 4.2 Responses of each question

To analyze the responses of each Question, Mc Nemar test was used

Table 4.2.1 Responses of Question one

Pre Q1.post Q1

Pre.Q1	Post.Q1		Pre total
	Incorrect	Correct	
Incorrect	1 (5.9%)	16 (94.1%)	17 (56.7%)
Correct	0 (0.0%)	13 (100.0%)	13 (43.3%)
Pre total	1 (3.3%)	29 (96.7%)	30 (100.0%)

To analyze the responses of question about percentage of newborns who will require some assistance to begin regular breathing 13 out of 30(43.3%) were correct responses before teaching session which turned in to 29 out of 30 (96.7%) correct responses after teaching session with p value 0.000. A p value ≤0.05 was considered as significant. Statistically significant difference was observed between pre and post score with p value< 0.001, which revealed strong evidence that teaching session was highly effective and substantial improvement in post knowledge score was noted.

Table 4.2.2 Responses of Question two
Pre.Q2 and Post. Q2

Pre.Q2	Post.Q2		Pre total
	Incorrect	Correct	
Incorrect	6(27.3%)	16(72.7%)	22 (73.3%)
Correct	0(0.0%)	8(100%)	8 (26.7%)
Post total	6(20.0%)	24(80.0%)	30 (100.0%)

To analyze the responses of question, the correct way to position a new born's head prior to suctioning the airway, 8 out of 30(26.7%) were correct responses before teaching session which turned in to 24 out of 30(80.0%) correct responses after teaching session with p value 0.000. A p value ≤0.05was considered as significant .Significant difference was observed between pre and post score with p value < 0.001 shows strong evidence that the training session was highly effective and substantial improvement in knowledge score was observed.

Table 4.2.3 Responses of Question three
Pre.Q3 and Post. Q3

Pre.Q3	Post.Q3		Pre total
	Incorrect	Correct	
Incorrect	0	14(100%)	14 (46.7%)
Correct	0	16(100%)	16 (53.3%)
Pre total	0.0%	30(100.0%)	30(100.0%)

To analyze the responses of question about suctioning a baby's nose or mouth, 16 out of 30 (53.3%) were correct responses before teaching session which turned in to 30 out of 30 (100.0%) correct responses after teaching session with p value 0.000.A p value ≤0.05 was considered as significant .Significant difference was observed between pre and post score with p value < 0.001 indicated a strong evidence that the teaching programme was highly effective and substantial improvement in post knowledge score was noted .

Table 4.2.4 Responses of Question four
Pre.Q4 & Post. Q4

Pre.Q4	Post.Q4		Pre total
	Incorrect	Correct	
Incorrect	17(68.0%)	8(32.0%)	25(83.3%)
Correct	2(40.0%)	3(60.0%)	5(16.7%)
Pre total	19(63.3%)	11(36.7%)	30(100%)

To analyze the responses of question, effect of stimulation to stimulate breathing 5 out of 30(16.7%) were correct responses before teaching session which turned in to 11 out of 30 (36.7%) correct responses after teaching session with p value 0.109. A p value ≤0.05 was considered as significant. Insignificant difference was observed between pre and post score with p value greater than 0.05, knowledge score was improved after teaching session but it was not significant.

Table 4.2.5 Responses of Question five
Pre.Q5 and Post. Q5

	Post.Q5		
Pre.Q5	Incorrect	Correct	Pre total
Incorrect	8(42.1%)	11(57.9%)	19(63.3%)
Correct	3(27.3%)	8(72.7%)	11(36.7%)
Pre total	11(36.7%)	19(63.3%)	30(100%)

To analyze the responses of question, correct way to give free flow oxygen to baby 11 out of 30(36.7%) were correct responses before teaching session which turned in to 19 out of 30 (63.3%) correct responses after teaching session with p value 0.057.A p value ≤0.05was considered as significant. Insignificant difference was observed between pre and post score with p value greater than 0.05, knowledge score was improved after teaching session but it was not significant.

Table 4.2.6 Responses of Question six
Pre.Q6 and Post. Q6

	Post.Q6		
Pre.Q6	Incorrect	Correct	Pre total
Incorrect	9(39.1%)	14(60.9%)	23(76.7%)
Correct	3(42.9%)	4(57.1%)	7(23.3%)
Pre total	12(40.0%)	18(60.0%)	30(100.0%)

To analyze the responses of question about most important and effective step in neonatal resuscitation 7 out of 30 (23.3%) were correct responses before teaching session which turned in to 18 out of 30 (60.0%) correct responses after teaching session with p- value 0.013 .A p-value ≤0.05 was considered as significant. Significant difference was observed between pre and post knowledge score with p value < 0.05 showed considerable improvement in post knowledge score after teaching session.

Table 4.2.7 Responses of Question seven
Pre.Q7 &Post. Q7

	Post.Q7		
Pre.Q7	Incorrect	Correct	Pre total
Incorrect	6(35.3%)	11(64.7%)	17(56.7%)
Correct	3(23.1%)	10(76.9%)	13(43.3%)

Pre total	9(30.0%)	21(70.0%)	30(100.0%)

To analyze the responses of question about beginning of chest compressions 13 out of 30 (43.3%) were correct responses before teaching session which turned in to 21 out of 30 (70.0%) correct responses after teaching session with p-value 0.057. A p value ≤0.05 was considered as significant. Insignificant difference was observed between pre and post score with p value greater than >0.05, knowledge score was improved after teaching session but it was not significant.

Table 4.2.8 Responses of Question eight
Pre.Q8 and Post. Q8

Pre.Q8	Post.Q8 Incorrect	Post.Q8 Correct	Pre total
Incorrect	1(12.5%)	7(87.5%)	8(26.7%)
Correct	0(0.0%)	22(100%)	22(73.3%)
Pre total	1(3.3%)	29(96.7%)	30(100.0%)

To analyze the responses of question about correct depth of chest compressions, 22 out of 30 (73.3%) were correct responses before teaching session which turned in to 29 out of 30 (96.7%) correct responses after teaching session with p-value 0.016. A p-value ≤ 0.05 was considered as significant. Significant difference was observed between pre and post score with p-value < 0.05, showed substantial improvement in post knowledge score after teaching session.

Table 4.2.9 Responses of Question nine
Pre. Q9 and Post. Q9

Pre.Q9	Post.Q9 Incorrect	Post.Q9 Correct	Pre total
Incorrect	5(22.7%)	17(77.3%)	22(73.3%)
Correct	0(0.0%)	8(100%)	8(26.7%)
Pre total	5(16.7%)	25(83.3%)	30(100.0%)

To analyze the responses of question about time required for one cycle of compressions and breath, 8 out of 30 (26.7%) were correct responses before teaching session which turned in to 25 out of 30 (83.3%) correct responses after teaching session with p-value 0.000. A p value ≤ 0.05 was considered as significant. Significant difference was observed between pre and post score with p-value < 0.001, indicated that teaching session was highly effective and substantial improvement in post knowledge score was noted.

Table 4.2.10 Responses of Question ten
Pre.Q10 and Post. Q10

Pre.Q10	Post.Q10 Incorrect	Post.Q10 Correct	Pre total
Incorrect	0(0.0%)	13(100%)	13(43.3%)
Correct	1(5.9%)	16(94.1%)	17(56.7%)

Pre total	1(3.3%)	29(96.7%)	30(100.0%)

To analyze the responses of question about correct handling of laryngoscope 17 out of 30 (56.7%) were correct responses before teaching session which turned in to 29 out of 30 (96.7%) correct responses after teaching session with p value 0.002.A p value ≤0.05 was considered as significant .Significant difference was observed between pre and post score with p value <0.05, showed substantial improvement in post knowledge score after teaching session.

Table 4.2.11 Responses of Question eleven
Pre.Q11 &Post. Q11

Pre.Q11	Post.Q11		Pre total
	Incorrect	Correct	
Incorrect	5(29.4%)	12(70.6%)	17(56.7%)
Correct	2(15.4%)	11(84.6%)	13(43.3%)
Pre total	7(23.3%)	23(76.7%)	30(100.0%)

To analyze the responses of question about time required to complete endo trachial intubation, 13 out of 30 (43.3%) were correct responses before teaching session which turned in to 23 (76.7%) correct responses after teaching session with p value 0.013. A p value ≤0.05 was considered as significant. Significant difference was observed between pre and post score with p value < 0.05.

Table 4.2.12 Responses of Question twelve
Pre.Q12 and Post. Q12

Pre.Q12	Post.Q12		Pre total
	Incorrect	Correct	
Incorrect	0(0.0%)	14(100%)	14(46.7%)
Correct	3(18.8%)	13(81.3%)	16(53.3%)
Pre total	3(10.0%)	27(90.0%)	30(100.0%)

To analyze the responses of question about proper placement of endo trachial tube 16 out of 30 (53.3%) were correct responses before teaching session which turned in to 23 (76.7%) correct responses after teaching session with p value 0.013. A p value ≤0.05 was considered as significant. Significant difference was observed between pre and post score with p value < 0.05, showed a considerable improvement in post knowledge score after teaching session.

Table 4.2.13 Responses of Question thirteen
Pre.Q13 and Post. Q13

Pre.Q13	Post.Q13		Pre total
	Incorrect	Correct	
Incorrect	1(5.9%)	16(94.1%)	17(56.7%)
Correct	0(0.0%)	13(100%)	13(43.3%)
Pre total	1(3.3%)	29(96.7%)	30(100.0%)

To analyze the responses of question about recommended concentration of epinephrine for new-borns 13 out of 30(43.3%) were correct responses before teaching session which turned in to 29 out of 30 (96.7%) correct responses after teaching session with p value 0.000. A p value ≤0.05 was considered as significant .Significant difference was observed between pre and post score with p value<0.001, showed strong evidence that the teaching session was highly effective with significant improvement in post knowledge score.

Table 4.2.14 Responses of Question fourteen
Pre.Q14 and Post. Q14

	Post.Q14		
Pre.Q14	Incorrect	Correct	Pre total
Incorrect	3 (12.5%)	21 (87.5%)	24 (80.0%)
Correct	1 (16.7%)	5 (83.3%)	6 (20.0%)
Pre total	4 (13.3%)	26 (86.7%)	30 (100.0%)

To analyze the responses of question about administration of epinephrine, 6 out of 30 (20.0%) were correct responses before teaching session which turned in to 26 out of 30 (86.7%) correct responses after teaching session with p-value 0.000. A p-value ≤ 0.05 was considered as significant. Significant difference was observed between pre and post score with p-value < 0.001, showed a strong evidence that the teaching session was highly effective with considerable improvement in post knowledge score.

Table 4.2.15 Responses of Question fifteen
Pre.Q15 and Post. Q15

	Post.Q15		
Pre.Q15	Incorrect	Correct	Pre total
Incorrect	1(8.3%)	11(91.7%)	12(40.0%)
Correct	1(5.6%)	17(94.4%)	18(60.0%)
Pre total	2(6.7%)	28(93.3%)	30(100.0%)

To analyze the responses of question about breath sounds in pneumothorax or congenital diaphragmatic hernia, 18 out of 30(60.0%) were correct responses before teaching session which turned in to 28 out of 30 (93.3%) correct responses after teaching session with p value 0.006. A p value ≤ 0.05 was considered as significant. Significant difference was observed between pre and post score with p value < 0.05, showed a significant improvement in post knowledge score.

Table 4.2.16 Responses of Question sixteen
Pre.Q16 and Post. Q16

	Post.Q16		
Pre.Q16	Incorrect	Correct	Pre total
Incorrect	2(18.2%)	9(81.8%)	11(36.7%)
Correct	3(15.8%)	16(84.2%)	19(63.3%)

Pre total	5(16.7%)	25(83.3%)	30(100.0%)

To analyze the responses of question about cause of persistent bradycardia and low SPO2 during neonatal resuscitation, 19 out of 30 (63.3%) were correct responses before teaching session which turned in to 25 (83.3%) correct responses after teaching session with p value 0.146. A p value ≤ 0.05 was considered as significant. Insignificant difference was observed between pre and post score with p value > 0.05, knowledge score was improved after teaching session, but it was not significant.

Table 4.2.17 Responses of Question seventeen
Pre.Q17 and Post. Q17

	Post.Q17		
Pre.Q17	Incorrect	Correct	Pre total
Incorrect	3(10.0%)	4(13.3%)	7(23.3%)
Correct	2(6.7%)	21(70.0%)	23(76.7%)
Pre total	5(16.7%)	25(83.3%)	30(100.0%)

To analyze the responses of question about, fluid administration in babies who have been resuscitated and may have kidney damage, 23 out of 30 (76.7%) were correct responses before teaching session which turned in to 25 out of 30 (83.3%) correct responses after teaching session with p value 0.687. A p value ≤ 0.05 was considered as significant .Insignificant difference was observed between pre and post score with p value > 0.05 , knowledge score was improved after teaching session but it was not significant.

Table 4.2.18 Responses of Question eighteen
Pre.Q18 & Post. Q18

	Post.Q18		
Pre.Q18	Incorrect	Correct	Pre total
Incorrect	1(20%)	4(80%)	5(16.7%)
Correct	0(0.0%)	25(100%)	25(83.3%)
Pre total	1(3.3%)	29(96.7%)	30(100.0%)

To analyze the responses of question about Intravenous fluids given to preterm babies, 25 out of 30 (83.3%) were correct responses before teaching session which turned in to 29 out of 30 (96.7%) were correct responses after teaching session with 0.125.A p value ≤0.05 was considered as significant. Insignificant difference was observed between pre and post score with p value >0.05. Knowledge score was improved after teaching session but it was not significant.

Table 4.2.19 Responses of Question Nineteen
Pre.Q19 and Post. Q19

	Post.Q19		
Pre.Q19	Incorrect	Correct	Pre total
Incorrect	0(0.0%)	13(100%)	13(43.3%)
Correct	1(5.9%)	16(94.1%)	17(56.7%)
Pre total	1(3.3%)	29(96.7%)	30(100.0%)

To analyze the responses of question about best position to decrease the chance of brain haemorrhage,17 out of 30 (56.7%) were correct responses before teaching session which turned in to 29 out of 30 (96.7%) correct responses after teaching session with p value 0.002. A p value ≤0.05 was considered as significant .Significant difference was observed between pre and post score with p value less than 0.05 depicted in table ,indicated that substantial improvement in post knowledge score was noted.

Table 4.2.20 Responses of Question twenty
Pre.Q20 and Post. Q20

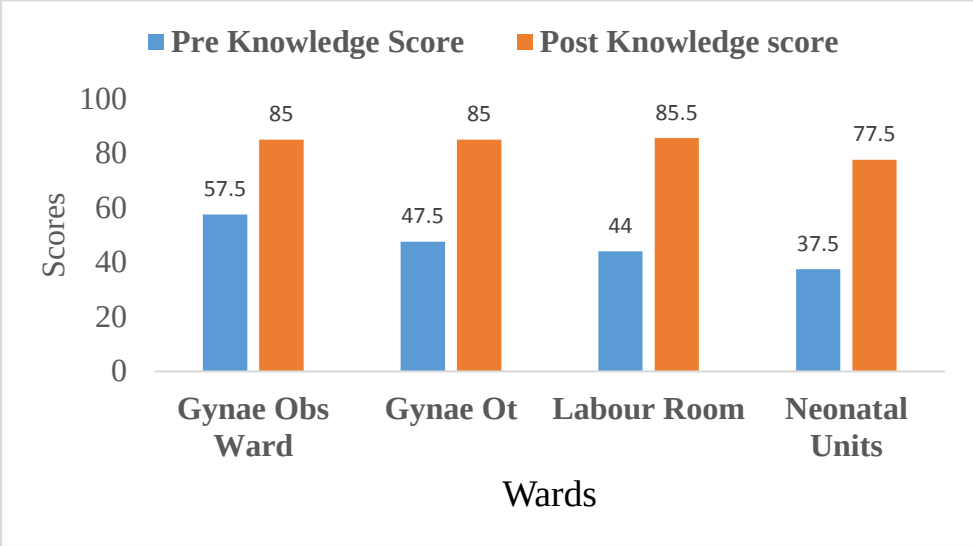
	Post.Q20		
Pre.Q20	Incorrect	Correct	Pre total
Incorrect	7(26.9%)	19(73.1%)	26(86.7%)
Correct	0(0.0%)	4(100%)	4(13.3%)
Pre total	7(23.3%)	23(76.7%)	30(100.0%)

To analyze the responses of question about, development of acute respiratory deterioration in meconium stained baby, 4 out of 30 (13.3%) were correct responses before teaching session which turned in to 23 out of 30 (76.7%) correct responses after teaching session with p value 0.000 .A p value ≤0.05 was considered as significant .Significant difference was observed between pre and post score with p value < 0.001, indicated there was strong evidence that the substantial improvement in post knowledge score was noted.

Section -C
Table 4.3 Comparison of Experience with pre and post knowledge score

	EXPERIENCE	MEAN	Std, Deviation	Std, Error	P-Value
Pre Knowledge Score	1-5	42.14	13.80	5.22	.643
	6-10	46.39	11.73	2.77	
	11-15	48.00	7.58	3.39	
Post Knowledge score	1-5	84.29	6.07	2.30	.867
	6-10	82.50	9.28	2.19	
	11-15	84.00	7.42	3.32	

After applying one-way ANOVA, it was examined that there was no significant difference in the mean pre and post knowledge score based on working experience of nurses. The mean pre and post knowledge score calculated against their experience category and found p value 0.643 and 0.867 respectively. A p value ≤0.05 was considered as significant and it shows that there is no significant association between experience and pre and post knowledge score of participants.



After applying one-way ANOVA, it was examined that there was significant difference in mean scores of pre- knowledge of nurses working in different wards/units. The mean score of Pre Knowledge of nurses of Gynae Obs Ward (Mean=57.50, SD=9.35) was more than mean score of Pre Knowledge Score of nurses of Neonatal Units (Mean=37.50, SD=9.64). There was no significant difference among nurses working in different units after post knowledge test. The mean pre and post knowledge score calculated against nurses of wards/units and found p value .148. A p value ≤0.05 was considered as significant.

Table 4.4 Comparison of Experience in different units with pre and post knowledge score

	Wards	MEAN	SD	SE	P-value
Pre Knowledge Score	Gynae Obs Ward	57.50	9.35	3.82	.007
	Gynae Ot	47.50	8.22	3.35	
	Labor Room	44.00	10.49	3.32	
	Neonatal Units	37.50	9.64	3.41	
Post Knowledge score	Gynae Obs Ward	85.00	9.49	3.87	.148
	Gynae Ot	85.00	3.16	1.29	
	Labour Room	85.50	7.62	2.41	
	Neonatal Units	77.50	8.86	3.13	

Table 4.5 Pearson coefficient of correlation among age, Pre Knowledge Score and Post Knowledge Score

Variables	1	2	3
1.Age			
2. Pre Knowledge Score	.013		
3.Post Knowledge Score	-.123	.446*	

There was no significant correlation between age and Pre Knowledge Score (r=.013, p>.05) and there was no significant correlation between age and Post Knowledge Score (r= -.123, p>.05). There was significant correlation between Pre Knowledge Score and Post Knowledge Score of nurses (r=.446, p<.05).

Section –D; Refers to assess the knowledge level about neonatal resuscitation before teaching session

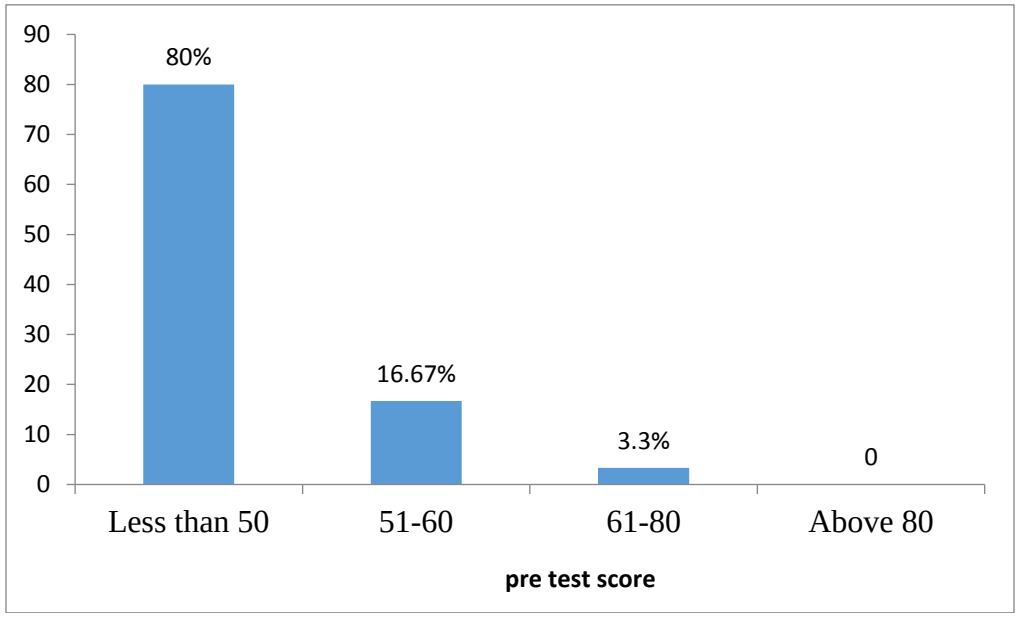


Figure 4.6 Knowledge Levels of Nurses Before teaching Session

As the second objective of the study was to assess the knowledge level regarding neonatal resuscitation among nurses before teaching session therefore, according to preselected criteria of knowledge level indicators as mentioned in chapter 3, it was noted that 24 out of 30 (80%) participants having poor knowledge as they responded less than 50 % questions correctly ,5 out of 30 (16.67%) participants having average knowledge as they responded 51-60% questions correctly, 1 out of 30 (3.3%) having good knowledge as they responded 61-80% questions correctly and no one has knowledge above 80%.

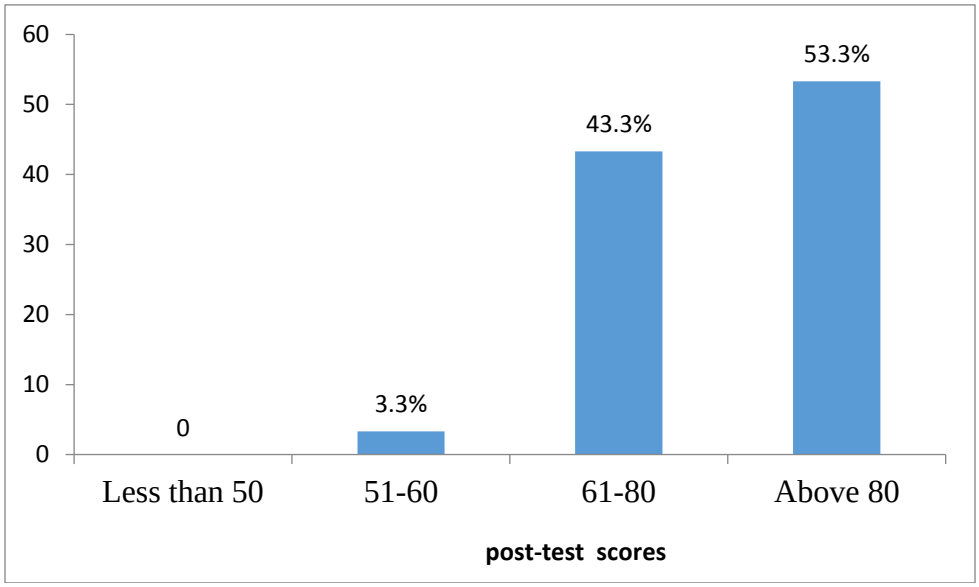


Figure 4.7 Knowledge Level of Nurses After teaching Session

After teaching session it was noted that knowledge score was improved, 16 out of 30 (53.3%) participants having very good knowledge as they responded above 80% questions correctly, 13 out of 30 (43.3%) participants having good knowledge as they responded 61-80% questions correctly, 1 out of 30 (3.3%) having average knowledge as she responded 51-60% questions correctly and no one has poor knowledge less than 50%.

DISCUSSION

Nursing is a profession that is directly related with health and life; therefore, it requires the knowledge that must be highly effective. Birth asphyxia is a leading cause of neonatal mortality and morbidity in developing countries (Ezenduka et al., 2016). Accurate evaluation and timely initiation is very important for successful resuscitation of the newborns with birth asphyxia (Koonwar et al., 2016).

The purpose of this study was to assess effectiveness of structured teaching programme on knowledge of nurses regarding neonatal resuscitation; therefore the focus of present study was to determine the current knowledge level of nurses working in DHQ and THQ hospitals of Punjab and their knowledge improvement after teaching session. Appropriate knowledge towards NR is essential for proper practices according to standard guidelines. If nurses have sufficient knowledge of resuscitation skills, it would enable the nurses to properly manage the asphyxiated newborn and the outcomes are expected to improve. To best of knowledge of researcher, this study is basically for the assessment and improvement of neonatal resuscitation knowledge and skills among nurses of DHQ and THQ hospitals of Punjab.

Teaching session was of four hours which was divided in to lecture, demonstrations followed by hands on training by using mannequin and question answer session .Overall teaching session was interactive in nature. The findings of teaching session revealed that program was highly effective and significantly contributed to the improvement of nurse's knowledge and skills towards neonatal resuscitation (Table 4.1). This significant difference in knowledge was resulted from the information provided in the teaching session and is abundantly evident by the improvement in scores (Table 4.1). The findings of the study are consistent with the outcome of a previous study in which training session regarding neonatal resuscitation among birth attendants was conducted in Nigeria and significant knowledge and skill improvement was noted. Neonatal resuscitation trainings has the potential to reduce the high neonatal mortality rate (Uwakah and Smee, 2017).

As sound knowledge is definitely a key factor to manage and control any disease, this teaching session appeared to be effective in providing baseline education about neonatal resuscitation for the improvement of knowledge and skills among nurses. Quite similar results were also found in a study that was conducted on nurses in tertiary care hospital, lucknow india and significant knowledge improvement was noted through educational session (Koonwar et al., 2016). Same educational intervention was also adopted by (Subbiah et al., 2012) for the purpose of improvement of knowledge and skills among nurses and found substantial improvement in knowledge after training session. The results of this study are also supported by a previous study that indicated the beneficial effects of educational based training session and showed substantial improvement in knowledge and skills among birth attendants and significantly helps to decrease neonatal mortality ,caused by neonatal birth asphyxia, which helps to improve the overall health status of rural communities in Eastern Nigeria (Uwakah and Smee, 2017).

Proper awareness and an organized knowledge towards resuscitation plays an important role in early diagnosis and adequate management (Gauro et al.). In this study same questionnaire tool was used before and after teaching session which was composed of 20 questions encompassing various aspects of neonatal resuscitation queries related to different resuscitation steps like initial steps, ppv, chest compressions, medications and i/v fluids. All these queries were addressed through comprehensive educational teaching session and

it was found that the outcome of this education based intervention revealed significant improvement in knowledge table (4.1) and training intervention significantly enhance the knowledge of skills. The overall improvement in knowledge and skills is also supported by a previous study conducted by (Koonwar et al., 2016) in which effectiveness of teaching programme on neonatal resuscitation in relation to knowledge and skills of nursing personnel was conducted and significant knowledge and skills improvement was noted.

In present study mean score of knowledge was very low table (4.1), the findings of the study are in line with the (Koonwar et al., 2016) which shows the overall knowledge and skills of nursing personnel was inadequate. It could be because of many reasons like lack of motivation of training, lack of awareness and knowledge about bad developmental outcome of birth asphyxia, lack of curriculum revision, absence of planning and preparation, in sufficient and mismanagement of resources, unstable health policies, un awareness about priorities, personnel interest and many more reasons. All participants of this study were qualified registered nurses.

Effect of the structured teaching session on knowledge was tested using a pretest, administered just before the session commenced and at the end of four hours session, post test was administered. Knowledge was assessed by 20 questions and substantial improvement in knowledge was found after structured teaching session. Pre and post type of strategy was used in current study as this type of strategy can be immediate, important and cost effective source of information dissemination among health care workers and communities throughout the developing countries like Pakistan where problems and issues are more than resources. In future, strategy of present study may contribute to prepare nurses to assist in preventing and controlling neonatal mortality, however significant limitation of this teaching session may be the retention of knowledge among nurses may not always be over time, and need periodic sessions regarding neonatal resuscitation. These findings are in line with (Shikuku et al., 2017) who concluded that healthcare providers need regular refresher NR training and clinical mentorship with a focus on skills retention at least every year.

Neonatal resuscitation must be a part of continuous education programs and should be incorporated in curricula in all categories of health care providers, although a brief educational intervention was proven to be effective and has long term effect on nurses' knowledge. Teaching on the basic neonatal care including the neonatal resuscitation knowledge and skills should be stressed during the nursing education itself to ensure acceptable neonatal outcome(Suresh et al.).

According to findings of the study only few nurses were aware about neonatal resuscitation,(80%) participants were having poor knowledge (16.67%) participants having average knowledge and only 1 (3.3%) was having good knowledge and no one has knowledge above 80% figure (4.4). In our study 20 knowledge questions regarding neonatal resuscitation were asked, pre knowledge score was very poor , In pre teaching session only one question regarding fluid given to preterm baby was correctly responded by more than 80%, table (4.2.18) and only three questions regarding ,correct depth of chest compressions ,table (4.2.8) cause of Persistent bradycardia and low SPO2 during neonatal resuscitation, table (4.2.16), babies fluid requirement who have been resuscitated and may have kidney damage after the resuscitation table (4.2.17) were correctly responded between 60-80% . For other 16 questions in pre teaching session knowledge level was average and very poor. There are several reasons such as limited opportunities of continues education program and awareness seminars, insufficient resources workload and rotation of duties, lack of motivation related to learning of health issues contributing to poor level of knowledge regarding neonatal resuscitation in developing countries like Pakistan.

Findings of the study revealed that there was no significant association between experience and age with pre &post knowledge score of

participants, similar findings was supported by(Gauro et al.) .

In present study poor knowledge of nurses actually demonstrates the snap shot of preparation level of nurses of THQ and DHQ hospitals and it could be the big reason of loss in cases of birth asphyxia. This might be due to absence of standardized teaching during undergraduate and post graduate courses. So, training in neonatal resuscitation for health care providers should be emphasized (Gebreegziabher et al., 2014).

Training programs are the key strategy in promotion of health care services so, there must be regular in service trainings of all health care providers especially nurses regarding neonatal resuscitation at all levels of health care facilities in Pakistan. Regular in-service training of nurses may have positive effect in decreasing neonatal mortality rate in low income and under resourced settings (Subbiah et al., 2012).

Conclusion:

- Majority of nurses working in DHQ and THQ hospitals of Punjab have poor knowledge as evident by scores in pretest. Before teaching session inadequate knowledge represents a strong need to conduct advanced teaching session regarding neonatal resuscitation among all levels of health care facilities in Pakistan. Lack of knowledge was noted in this study that can be offset through structured teaching programs.
- In the light of findings of the present study, it is concluded that teaching session regarding neonatal resuscitation based on standard neonatal resuscitation guidelines among nurses was highly effective for the improvement of knowledge and skills. Sustained continuous training programs are necessary for knowledge and skill retention because both decline with time. According to international recommendations, validity of training program is 2 years. Neonatal resuscitation programme should be repeated after every 2 years. Increased quality and quantity of teaching programs can lead to improved knowledge and skills.

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