

Non-randomized Control Trial to assess the Effectiveness of Structured Teaching Program on Knowledge Regarding CPR in Pregnancy among the Staff Nurses in Selected Hospital Amritsar Punjab

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ABSTRACT

Background: Cardiopulmonary resuscitation (CPR) in pregnancy is a critical, life-saving intervention requiring specialized knowledge and skills. Many staff nurses lack adequate training in this area, which may compromise maternal and fetal outcomes.

Objective: To assess and compare the effectiveness of a Structured Teaching Program on knowledge regarding CPR in pregnancy among staff nurses.

Methods: A quantitative research approach with a non-randomized controlled trial design was adopted. The study was conducted among staff nurses in a selected hospital in Amritsar, Punjab. A structured questionnaire was administered to evaluate the baseline knowledge of both groups regarding cardiopulmonary resuscitation (CPR) during pregnancy before the intervention. Only experimental group received the Structured Teaching Program. Post-test assessment was conducted after the intervention. Data were analyzed using descriptive and inferential statistics.

Results: The findings showed a marked improvement in the knowledge scores of participants in the experimental group following the Structured Teaching Program. The mean knowledge score increased from 9.90 ± 2.38 before the intervention to 21.60 ± 3.20 after the intervention, yielding a mean gain of 11.70. This improvement was found to be highly statistically significant ($t = 17.07$, $p = 0.001$). Conversely, participants in the control group exhibited only a minimal increase in knowledge, with the mean score rising from 10.63 ± 2.79 in the pre-test to 11.16 ± 2.93 in the post-test. The observed mean difference of 0.73 was not statistically significant ($t = 1.815$, $p = 0.091$). In addition, comparison of the post-test knowledge scores between the experimental and control groups demonstrated a highly significant difference ($t = 10.76$, $p = 0.001$).

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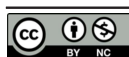
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Conclusion: The findings indicate that the Structured Teaching Program significantly enhanced the knowledge of staff nurses regarding cardiopulmonary resuscitation (CPR) during pregnancy.

KEYWORDS

• Structured Teaching Program • CPR in Pregnancy • Staff Nurses • Knowledge • Non-Randomized Controlled Trial

INTRODUCTION

Maternal cardiac arrest is a rare event, Failure to rescue patients in cardiac arrest caused by hemorrhage and hypovolemia in resource-poor areas is an urgent problem. A prompt, coordinated response by a multidisciplinary team of anesthetists, obstetricians, neonatologists and nurses are essential. (Mhyre J.M, *et al.*, 2014)¹ The prevalence of cardiac arrest in pregnant women varies from 1/20,000 to 1/50,000 pregnancies and is associated with high fetomaternal mortality. The pregnant mother is more susceptible to cardiac arrest as hypoxia is poorly tolerated. Hemorrhage, eclampsia, sepsis, and embolism are common causes of arrest. Cardiac arrest is preventable if a predisposing clinical problem is detected in time and treated immediately. Resuscitation in obstetric patient is challenging and special as it involves the lives of two patients, the mother and the fetus. (Sadhana Kulkarni, Savani S Futane., 2022)²

PROBLEM STATEMENT

Non-randomized control trial to assess the effectiveness of structured teaching program on knowledge regarding CPR in pregnancy among the staff nurses in selected hospital Amritsar Punjab.

OBJECTIVES OF STUDY

1. Assess the pretest knowledge of experimental group and control group regarding CPR in pregnancy among staff nurses
2. Assess the posttest knowledge of experimental group and control group regarding CPR in pregnancy among staff nurse
3. Compare pretest and posttest knowledge of experimental group and control group regarding CPR in pregnancy among staff nurses
4. Evaluate the effectiveness of structured teaching program on CPR in Pregnancy among staff nurses.

5. Identify association between posttest knowledge of experimental group and control group regarding CPR in pregnancy among staff nurses.

HYPOTHESIS

H₁: A statistically significant difference will be observed in the pre-test and post-test knowledge scores regarding cardiopulmonary resuscitation (CPR) in pregnancy between staff nurses in the experimental and control groups.

H₂: The pre-test knowledge scores of staff nurses regarding cardiopulmonary resuscitation (CPR) in pregnancy will show a statistically significant association with selected demographic variables in both the experimental and control groups.

MATERIALS AND METHODS

Research Approach:

For the present study Quantitative approach-comparative survey was considered. (Raman Kalia., *et al.* 2020)³

Research Design

Quasi - experimental Research Design with Non-Randomized Control Trail- Pretest Posttest Control group design. (Suresh K Sharma 2021)⁴

Group	Pretest	Intervention	Post test
Experimental group	O1	X	O2
Control group	O1	-	O2

Setting of the Study:

The research was carried out at Guru Nanak Dev Hospital, Amritsar, Punjab.

Population:

The present study of population comprises of staff nurses working in Guru Nanak Dev Hospital Amritsar, Punjab.

Sampling Technique:

Purposive Sampling Technique (Bharat Pareek, Shivani Sharma 2011).⁵

Sample Size

The total sample selected for the present study was 60 staff nurses working in Guru Nanak Dev Hospital, Amritsar. (30 in control group and 30 in experimental group)

Description of tool:

Section A: Socio-demographic profile.

It deals with Socio-demographic variables such as age, gender, Qualification, Experience, Previous knowledge and any special training course taken.

Section B: Self-structured Knowledge Questionnaire on CPR in Pregnancy.

This section consists of 30 set of questions, with each having multiple options. Each question carries one mark for correct answer and zero for incorrect answer.

Criterion Measures:

Knowledge Level	Score	%. Percentage
Good	21-30	67-100%
Average	11-20	34-66%
Poor	0-10	0-33%

Validity of the tool:

The validity of the tool was established in Consultation with guide. The tool was modified according to suggestion and recommendations of the guide.

Data Collection Procedure:

Prior to data collection, official approval was obtained from the Medical Director of the selected hospital. The purpose and procedure of the study were explained to all eligible staff nurses, and written informed consent was obtained from those who agreed to participate. Baseline data were collected from both the experimental and control groups using a structured demographic proforma and a structured knowledge questionnaire to assess participants' existing knowledge regarding cardiopulmonary resuscitation (CPR) during pregnancy. Following the pre-test, the Structured Teaching Program on CPR in pregnancy was delivered to participants in the experimental group, and adequate time

was provided to address their questions and clarify any doubts. A post-test was conducted seven days after the educational intervention using the same structured knowledge questionnaire to measure changes in knowledge among participants in both groups. The collected data were subsequently coded, organized into tables, and analyzed using appropriate descriptive and inferential statistical methods.

RESULTS AND DISCUSSION

Major findings of the study

- According to their age, in experimental group, majority 15(50%) were in 26-30 years of age, 11(36.7%) were in 21-25 years of age and 4(13.3%) were in 31-35 years of age. In control group 11(36.7%) were in both 26-30 years of age and 21-25 years of age and 8(26.6%) were in 31-35 years of age.
- Regarding gender, in experimental group more than half 20(66.7%) were female nurses and 10(33.3%) were male nurses. In control group more than half 18(60%) were female nurses and 12(40%) were male nurses.
- As per qualification, in experimental group majority 17(56.7%) were GNM, 13(43.3%) were B.Sc. Nursing and 0 were ANM. In control group majority 16(53.3%) were GNM, 2(6.7%) were B. Sc Nursing and 12(40%) were ANM.
- According to their experience, in experimental group, majority 19(63.3%) were in 2-4 years, 8(26.7%) were in 0-2 years and 3(10%) were in > 5 years. In control group majority 10(33%) were in 2-4 years, 15(50%) were in > 5 years and 5(16.7%) were in 0-2 years.
- With regard to Previous knowledge regarding CPR in pregnancy, in experimental group, maximum 25(83.3%) had no previous knowledge and 5 (16.7%) had Previous knowledge about CPR in pregnancy. In control group, maximum 20(66.7%) had no previous knowledge and 10(33.3%) had Previous knowledge about CPR in pregnancy.
- With regard to participation in any special training course, the majority of staff nurses in the experimental group, **19 (63.3%)**, reported that they had not

attended any specialized training, while **11 (36.7%)** had undergone such training. Similarly, in the control group, **24 (80.0%)** participants had not received any special training, whereas **6 (20.0%)** reported having completed a specialized training course.

Objective 1: Assess the pretest knowledge of experimental group and control group

regarding CPR in pregnancy among staff nurses

Pre-test findings showed that in the experimental group, 63.3% of nurses had poor knowledge and 36.7% had average knowledge. In the control group, 60% had poor knowledge while 40% showed average knowledge. No participant in either group achieved a good knowledge score. (Figure 1)

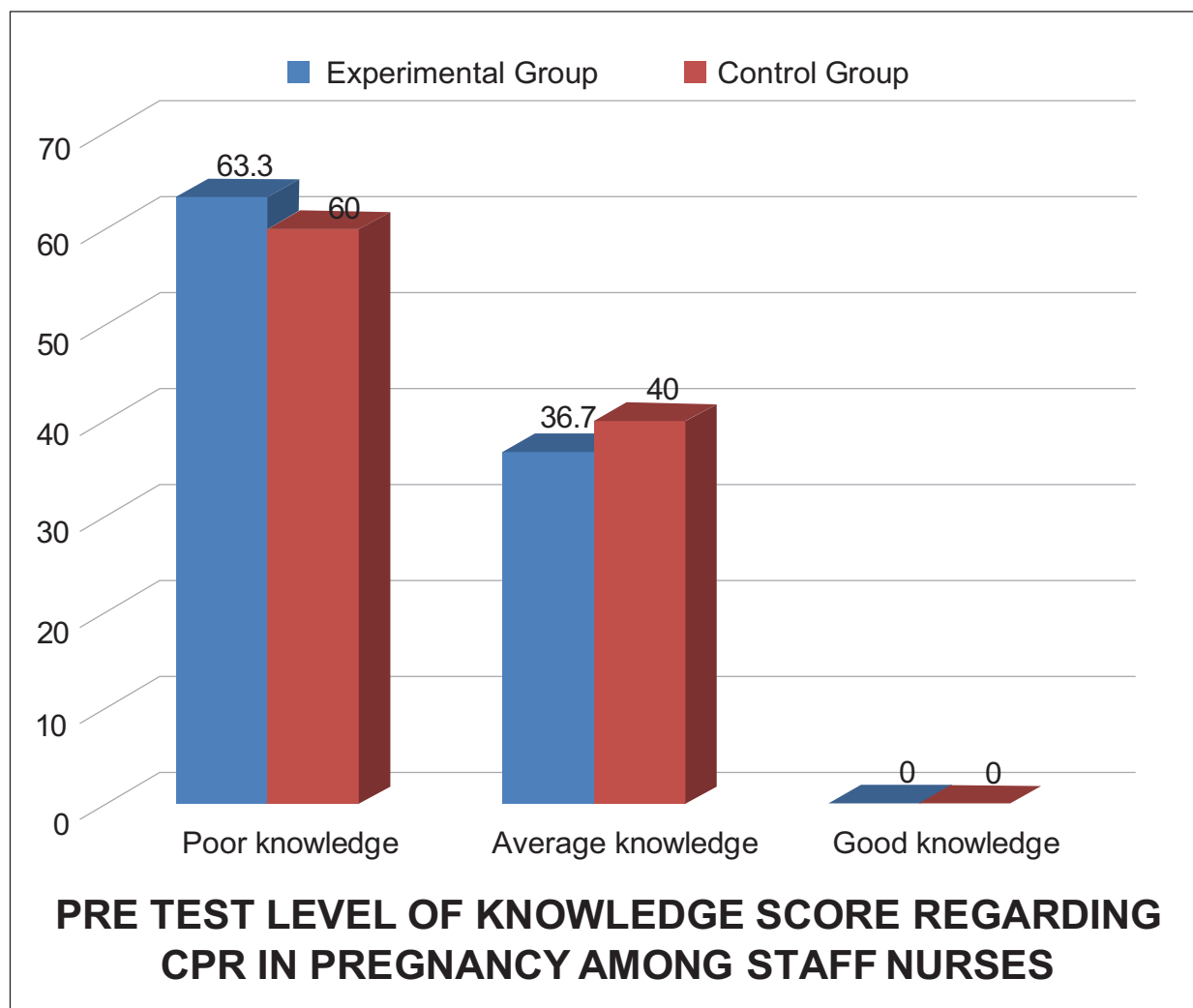


Figure 1: Distribution of pre-test level of knowledge regarding CPR in pregnancy among staff nurses in experimental and control group

Objective 2: Assess the posttest knowledge of experimental group and control group regarding CPR in pregnancy among staff nurse

The post-intervention assessment revealed a marked improvement in the knowledge levels of the experimental group. A total of **83.3%** of the staff nurses demonstrated good knowledge, while **16.7%** attained an average level of

knowledge. Notably, none of the participants were categorized as having poor knowledge following the Structured Teaching Program.

Conversely, the control group showed no substantial improvement, with 53.3% still demonstrating poor knowledge and 46.7% achieving average knowledge. None attained a good score. (Figure 2)

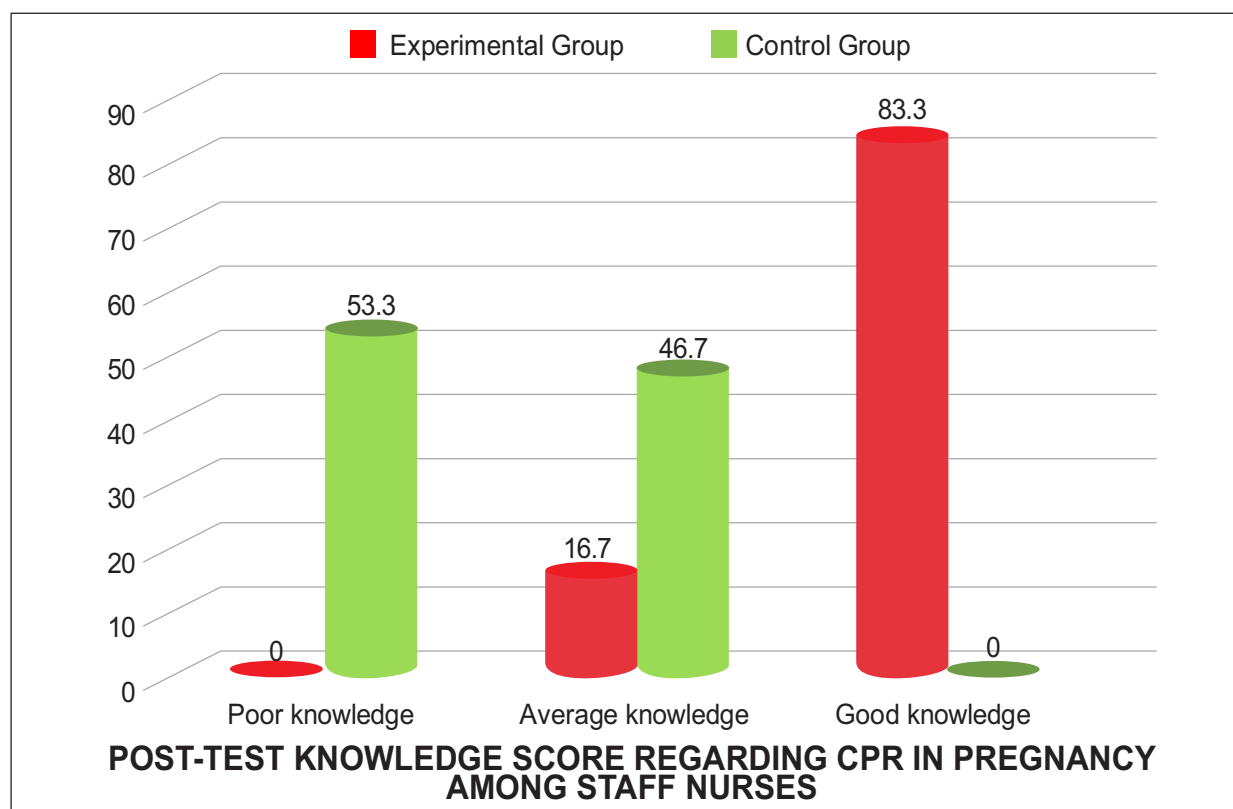


Figure 2: Distribution of post-test level of knowledge regarding CPR in pregnancy among staff nurses in experimental and control group

Objective 3: To compare pre-test and post-test knowledge scores of the experimental and control groups.

The knowledge levels regarding cardiopulmonary resuscitation (CPR) during pregnancy were compared between the experimental and control groups. During the pre-test, the experimental group obtained a mean knowledge score of 9.90 ± 2.38 , while the control group recorded a mean score of 10.63 ± 2.79 . The observed mean difference of 0.73 was not statistically significant ($t = 1.815$, $df = 58$, $p = 0.091$), indicating that the two groups were comparable before the intervention.

Following the Structured Teaching Program, the post-test findings demonstrated a marked increase in the knowledge scores of the experimental group. The experimental group achieved a mean score of 21.60 ± 3.20 , whereas the control group had a mean score of 11.16 ± 2.93 . The mean difference of 10.44 was found to be highly statistically significant ($t = 10.76$, $df = 58$, $p = 0.001$). Hence, the research hypothesis (H_1) was accepted, and the null hypothesis (H_2) was rejected, confirming the effectiveness of the Structured Teaching Program in enhancing staff nurses' knowledge regarding cardiopulmonary resuscitation (CPR) during pregnancy. (Table 1)

Table 1: Compare the level of knowledge regarding CPR in pregnancy among the staff nurses in experimental and control group
n1=30; n2=30

Variables	Comparison	Mean	SD	Mean D	t value	df	p value
Pre-test	Experimental	9.90	2.38	0.73	1.815	58	0.091NS
	Control	10.63	2.79				
Post-test	Experimental	21.60	3.20	10.44	10.76	58	0.001*
	Control	11.16	2.93				

*P<0.05 level of significance

NS-Non significance

Objective 4: Evaluate the effectiveness of structured teaching program on CPR in Pregnancy among staff nurses.

The findings of the study demonstrated that the structured teaching program was highly effective in improving the knowledge of staff nurses regarding CPR in pregnancy. The

paired t-test analysis in the experimental group showed a highly significant improvement in post-test scores compared to pre-test scores ($t = 17.07$, $p = 0.001$). The mean gain score of 11.70 points further confirmed the strong impact of the intervention. Therefore, the research hypothesis (H_1) was accepted and the null hypothesis (H_2) was rejected. (Table 2)

Table 2: Effectiveness of structured teaching program on knowledge regarding CPR in pregnancy among the staff nurses between experimental group N=30

Variables	Comparison	Mean	SD	Mean D	t value	df	p value
Experimental group	Pre-test	9.90	2.38	11.70	17.07	29	0.001*
	Post-test	21.60	3.20				

*P<0.05 level of significance NS-Non significance

Objective 5: Identify association between posttest knowledge of experimental group and control group regarding CPR in pregnancy among staff nurses.

Chi-square tests revealed no significant association between pre-test knowledge levels and any demographic variable in both the

experimental and control groups ($p > 0.05$).

This implies that baseline knowledge of CPR in pregnancy does not depend on professional qualification, past experience, or training exposure. Instead, it emphasizes the importance of targeted and updated educational interventions. (Table 3)

Table 3: Association between pre-test knowledge regarding CPR in pregnancy among the staff nurses with selected demographic variables in experimental group N=30

Demographic variables	Knowledge		χ^2 value	df	P value
	Poor	Average			
Age					
21-25 years	8	3	1.298	2	0.522 ^{NS}
26-30 years	8	7			
31-35 years	3	1			
Gender					
Male	7	3	0.287	1	0.592 ^{NS}
Female	12	8			
Qualification					
ANM	--	--	0.889	1	0.346 ^{NS}
GNM	12	5			
B.SC Nursing	7	6			
Experience					
0-2 years	5	3	0.017	2	0.992 ^{NS}
2-4 years	12	7			
> 5 years	2	1			
Previous knowledge regarding CPR in pregnancy					
Yes	5	0	3.474	1	0.062 ^{NS}
No	14	11			
Any special training course taken					
Yes	7	4	0.001	1	0.979 ^{NS}
No	12	7			

*p<0.05 level of significance

NS - Non significant

DISCUSSION

The findings of the present study are supported by several previous studies. A study conducted by Reena Rose Tigga *et al.* (2023)⁶ on staff nurses regarding high-risk obstetric emergencies reported a significant increase in mean knowledge scores from 50.93 ± 11.87 in the pre-test to 82.45 ± 1.87 in the post-test, with a highly significant paired t-value of 20.01. The researchers concluded that the implementation of a structured teaching program resulted in a significant improvement in nurses' knowledge related to the management of obstetric emergencies.

A comparable study conducted by Ranimol P.V., Priyanka Chaudhary, and Ramanpreet Kaur (2021)⁷ at Sacred Heart Hospital, Jalandhar, evaluated the effect of a structured teaching program on staff nurses' knowledge of cardiopulmonary resuscitation (CPR). The results showed a substantial increase in the mean knowledge score from 11.58 ± 2.149 before the intervention to 24.03 ± 2.400 after the intervention, reflecting a mean improvement of **12.45**. Statistical analysis demonstrated that this gain was highly significant ($t = 27.744$, $p < 0.001$). Based on these findings, the researchers reported that the structured teaching program was effective in strengthening nurses' knowledge of CPR.

Another investigation carried out by Najrana, Asif Khan, and Nazneen Shaikh (2018)⁸ among nursing students assessed the impact of a structured teaching program on knowledge related to cardiopulmonary resuscitation (CPR). The findings revealed that the participants' knowledge scores improved considerably following the educational intervention, with the median score increasing from **12.4** in the pre-test to **27.2** in the post-test. The effectiveness of the intervention was confirmed by a highly significant paired t-test result ($t = 27.44$, $p < 0.001$), indicating that the structured teaching program substantially enhanced CPR knowledge among the nursing students.

CONCLUSION

The present study concluded that the structured teaching program was effective in improving the knowledge of staff nurses regarding CPR in pregnancy. The post-test knowledge scores of the experimental group

showed significant improvement compared to the pre-test scores, indicating that educational interventions play an important role in enhancing nurses' understanding of maternal resuscitation procedures.

The study also highlights the necessity of regular training and continuing education programs for staff nurses to ensure preparedness in managing obstetric emergencies effectively. Adequate knowledge and timely implementation of CPR in pregnancy can contribute to better maternal and fetal outcomes, reduce complications, and improve the quality of emergency nursing care. Therefore, periodic educational programs, simulation training, and skill-based workshops should be encouraged in healthcare institutions to strengthen nurses' competency in maternal resuscitation.

Implications for Nursing

Nursing Practice

The findings of the study emphasize the importance of improving staff nurses' knowledge and skills regarding CPR in pregnancy to ensure prompt and effective maternal resuscitation during obstetric emergencies. Enhanced competency among nurses can contribute to improved maternal and fetal outcomes, reduction in mortality and morbidity, and better emergency response in clinical settings. Nurses should be encouraged to follow updated evidence-based guidelines for maternal CPR, including left uterine displacement, airway management, and modified chest compression techniques during pregnancy.

Nursing Education

The study highlights the need to incorporate CPR in pregnancy as an essential component of nursing education and in-service training programs. Nursing curricula should include simulation-based learning, emergency drills, and competency assessments related to maternal resuscitation. Continuing Nursing Education (CNE) programs, workshops, and seminars can help staff nurses remain updated with current recommendations and improve their confidence in handling obstetric emergencies.

NURSING ADMINISTRATION

Nursing administrators should organize regular training sessions, mock drills, and certification programs on CPR in pregnancy for all nursing personnel. Adequate availability of emergency equipment, resuscitation protocols, and multidisciplinary coordination should be ensured in hospitals. Hospital policies should support periodic evaluation of nurses' knowledge and practical skills related to maternal CPR.

Nursing Research

The study provides a basis for further research on maternal resuscitation practices among healthcare professionals. Future studies can explore long-term retention of knowledge, effectiveness of simulation-based interventions, comparison of different teaching methods, and assessment of practical skills in CPR during pregnancy. Research can also be conducted in larger populations and different healthcare settings to improve generalizability of findings.

Limitations

- This study assessed only the staff knowledge and attitude of the staff nurses was not assessed.
- The size of the sample was 60.

Recommendations

- A study can be conducted with a large sample size to confirm the results of this study.
- The comparative study can be conducted with in nursing staff of different hospitals.
- Study can be conducted with different educational level of nursing staff.
- Study can be conducted with different educational intervention aimed at improving the knowledge of nurse.

Acknowledgement

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and responses. Appreciation is also extended to everyone who contributed, either directly or indirectly, throughout the course of this study.

Conflict of Interest

The researcher declares that this investigation was conducted without any external financial support. As the study was entirely self-funded, no conflict of interest exists.

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