



# A Quasi-Experimental Study To Assess The Effectiveness Of Structured Teaching Programme On Knowledge Regarding ABG Analysis And Its Interpretation Among Nursing Officers, BLK-MAX Super Speciality Hospital, New-Delhi.

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## **Abstract:**

An arterial blood gas (ABG) is a blood test that measures the levels of many different gases in oxygen-rich blood. Some of these levels are measured directly while others are calculated from the measurements of other gases. ABG analysis is an essential investigation for Medical Surgical patients for diagnosis and managing patient's oxygen status and acid base balance. So it is necessary for all health care professionals to have adequate knowledge and skill to perform it. The aim of study was to assess the effectiveness of Structured Teaching Programme on Knowledge regarding ABG analysis and its interpretation among Nursing Officers, BLK-MAX Super Speciality Hospital, New- Delhi. Quantitative research approach was used with Quasi-experimental one group Pre-test Post-test design. Study population was nursing officers of BLK-Max Super Speciality Hospital New-Delhi. Convenience sampling technique was used to select sample. Sample size was 100 Nursing Officers. The data was collected through self-structured knowledge questionnaire. The findings of the study revealed that mean Post-test knowledge score 31.13 with Standard Deviation 2.926 was significantly higher than mean pre-test knowledge score 25.76 with Standard Deviation 3.400 as evident by paired 't' test ( $p$  value-<0.001\*) at 0.05 level of significance. It showed that structured teaching programme was effective to enhance knowledge regarding ABG Analysis and its interpretation among nursing officers. Thus, the researcher concluded that structured teaching programme was highly effective to enhance the knowledge regarding ABG analysis and its interpretation among nursing officers.

**Key words:** Assess, Effectiveness, Structured Teaching Programme, Knowledge, ABG analysis and its interpretation, Nursing Officers.

## **1.1 Introduction**

Over the last few years, there has been a tremendous increase in the knowledge, technology and skills required to treat critically ill patients. This has led to the development of intensive care units (ICUs), which are essentially areas, where severely ill patients can be concentrated and looked after and provided with the infrastructure and expertise necessary to treat critical illness. An intensive care unit (ICU) is a specially staffed and equipped area of a hospital dedicated to the management of patients with life threatening illnesses, injuries or complications. It is the most challenging work environment for the nurses because they are primary carrier at the bedside and monitors, manages and supports critically ill patient. Blood plays a vital role in the assessment of Acid base balance in body like balance of oxygen and carbon dioxide in blood shows functioning of lungs and kidneys. When there is an imbalance in body like has too much acid (acidosis) or too much base (alkalosis) regulated by lungs and kidneys. If lungs and kidneys are not functioning proper, the imbalance can be harmful and life threatening. The changes in the blood is generally diagnosed through ABG analysis test.

## **1.2 Need of the study**

Nursing officers are taking care of the patients in all the critical care departments and they monitor their conditions everytime. ABG is one of the main components to monitor the function of lungs and kidneys. Nursing officers should be able to interpret ABG analysis and implement the acquired knowledge which helps in saving the life of patients. According to American lung association, Approximately 541,000 Americans living today have been diagnosed with lung cancer at some point in their lives.<sup>4</sup>India today ranks no.4 in total number of deaths caused by lung diseases in the world and accounts for 10 percent of total deaths in India. During 2018, an estimated 234,030 new cases of lung cancer were expected to be diagnosed, representing about 13 percent of all cancer diagnoses. As per Researcher clinical experience, researcher found that Nursing officer have less knowledge regarding ABG analysis and its interpretation and found difficulty in the early detection of signs related to respiratory or metabolic diseases. Nursing officer's usually neglect the part of ABG interpretation because they think it's a part of Doctor's evaluation. Respiratory problems are the

most common problem encountered in the whole world because of the COVID-19 recently. Therefore an accurate and early identification through ABG analysis and its interpretation plays an important role in occurrence of severity of disease as well as saving the quality life of the patient. The researcher concluded that by going through all the review of literature related to knowledge regarding ABG analysis and its interpretation. The nursing officers had inadequate knowledge. further no study was found on knowledge regarding ABG analysis and its interpretation among nursing officers in BLK-MAX super speciality Hospital, New Delhi. So, the researcher wants to conduct research on it to enhance the knowledge of nursing officers to an optimal level for patient's quality of life.

### 1.3 Literature Review

- ✓ **Upreti Divya, Mishra Rakhi, 2022** conducted a Pre-experimental study to assess the effectiveness of planned teaching programme on Knowledge and Practice regarding arterial blood gas analysis and its interpretation among staff nurses working in critical care units at selected hospital of Delhi/ NCR. A Quantitative Research approach and Pre experimental research design was employed with Non –probability convenient sampling technique was used to collect the sample. The total sample was 30 Staff nurses. A Structured knowledge questionnaire was developed to identify the knowledge of staff nurses and Observational practice checklist regarding arterial blood gas analysis and its interpretation was used to assess the practice of staff nurses working in critical care units. The study results revealed that Pre-test and post-test mean knowledge scores about arterial blood gas analysis was 17.8 and post-test 26.4. Hence the study concluded that Planned teaching programme were effective in improving the knowledge and practice regarding arterial blood gas analysis and its interpretation among staff nurses working in critical care unit
- ✓ **Bayomi Ragab Rehab, Taha Mohamed Naida, 2022** conducted a Quasi experimental study aimed to evaluate the effect of self-learning package on nurses' knowledge and practices regarding arterial blood gases analysis for critically ill patients of Zagazig University Hospital. A convenient sampling was used with total number 60 sample from the selected units. Two tools were used for collecting data: Interviewing questionnaire to assess nurses knowledge and observational checklist to assess nurses practice regarding arterial blood gases analysis for critically ill patients. The study result revealed that there was a statistically significant positive correlation between total knowledge and total practice scores of the studied nurses. Preprogram (93.3%) of the studied nurses had unsatisfactory level of knowledge while in post program (91.7%), and in follow-up (86.7%) had satisfactory level, Regarding practice , pre-program (86.7%) of the studied nurses had unsatisfactory level , post-program (93.3) had satisfactory, and while follow up (86.7%) had satisfactory level. Thus , the Study concluded that implementation of self- learning package had highly statistical significance positive effect on improving nurses knowledge and practice scores regarding arterial blood gases analysis:
- ✓ **Alharbi A. Homood, Shehadeh Fadi , Awaji Yahya Nasima, 2022** conducted a Quasi experimental study on Immediate knowledge retention among nursing students in live lecture and video-recorded lecture. Total sample was of 160 nursing students randomly assigned to either of the two teaching strategies (video-recorded lecture or live lecture). Data were collected at a public university in Riyadh, Saudi Arabia. Both lectures covered the interpretation of arterial blood gases (ABG) and all students had no prior knowledge on the subject. Pretest and posttest using the same 16 questions were administered to both groups. The live lecture group's posttest mean score did not differ significantly from that of the video-recorded lecture group;  $t(156.52) = 0.47$ ,  $p = 0.64$ ,  $d = -0.08$ . The odds ratio is 1.27 and the probability is 95%. CI: .64, 2.50. This study found no difference between video-recorded lectures and live lectures in terms of providing immediate knowledge retention.
- ✓ **Mali Dilipkumar Mayuri, Menon Soumya, 2021** conducted a comparative study to assess the effectiveness of self-instructional module on knowledge regarding arterial blood gases among staff nurses from intensive care unit and wards in selected hospitals of metropolitan city. A quantitative research approach and comparative study one-group pre-test and post-test design was used which consisted a group of 60 samples (30 ICU and 30 wards) that were selected using non-probability convenient sampling technique. Knowledge of nurses was assessed using semi-structured knowledge questionnaire. The study results revealed that in pre-test of ICU, 20% , 46.7% , and 33.3% of staff nurses were categorized into poor, good, and excellent knowledge level, In pre-test of Wards, 53.3%, 43.3%, and 3.3% of staff nurses were categorized into poor, good, and excellent knowledge level but after self-instructional module, it was improved by 100% which were categorized into excellent knowledge level. Hence, the study concluded that Self-instructional module was effective in improving the knowledge regarding ABGs among staff nurses from ICU and ward

### 1.4 Problem statement

A Quasi-Experimental study to assess the effectiveness of structured teaching programme on knowledge regarding ABG analysis and its interpretation among Nursing officers, BLK-MAX Super Speciality Hospital, New-Delhi.

### 1.5 Aim of study

The aim of study was to assess the effectiveness of Structured Teaching Programme (STP) on knowledge regarding ABG analysis and its interpretation among nursing officers.

### 1.6 Objectives

- To assess the pre-existing knowledge regarding ABG analysis and its interpretation among Nursing officers of BLK-MAX Super Speciality Hospital, New Delhi.
- To develop and administer structured teaching programme regarding ABG analysis and its interpretation among nursing officers.
- To determine the effectiveness of structured teaching programme regarding ABG analysis and its interpretation among nursing officers.
- To find out the association of knowledge score regarding ABG analysis and its interpretation with demographic variables.

### 1.7 Operational definition

1. **Assess:** In this study, assess refers to evaluate (or) determine knowledge regarding ABG analysis and its interpretation among Nursing officers by using structured knowledge questionnaire.
2. **Effectiveness:** In this study, effectiveness refers to the potential of Structured Teaching Programme (STP) regarding ABG analysis and its interpretation to enhance the knowledge of nursing officers regarding ABG analysis and its interpretation.
3. **Structured Teaching Programme (STP):** In this study, Structured teaching programme refers to systematically designed instructional teaching programme to enhance the knowledge regarding ABG analysis and its interpretation with the help of teaching aids (PPT, Video clips). The structured Teaching Programme was one day programme for 1hour.
4. **Knowledge:** In this study, it refers to an ability to understand and answer the question regarding ABG analysis and its interpretation. The level of knowledge score was be interpreted as Average Knowledge, Good Knowledge and very Good Knowledge.
5. **ABG Analysis and its Interpretation:** An arterial blood gas analysis is a blood test taken from an artery, that measures the blood gas values for diagnosing and managing the severity of disease where as ABG interpretation refers to the process of analyzing arterial blood gas values (ABG), monitor blood gas changes (normal, abnormal) and interpreting for diagnosing and managing the acid –base balance in critical care unit.
6. **Nursing officers:** - The nursing officers are subject in research study who works in BLK-Max Super Speciality Hospital, New Delhi.

### 1.8 Hypothesis

- H<sub>1</sub>:** There will be significant difference between mean Pre-test and Post-test knowledge score regarding ABG analysis and its interpretation among nursing officers.
- H<sub>2</sub>:** There will be significant association of knowledge score regarding ABG analysis and its interpretation among nursing officers working with demographic variables.

### 1.9 Assumptions

- Nursing officers may have some prior knowledge regarding ABG analysis and its interpretation.
- Structured Teaching Programme (STP) may help the Nursing officers to enhance the knowledge regarding ABG analysis and its interpretation.

### 1.10 Delimitations

- Nursing officers of selected department (SICU, MICU, NSICU, CTVS, ICCU), BLK-Max Super Speciality Hospital, New Delhi.
- The data collection period was delimited to a period of 10 days.

### 1.11 Conceptual framework

The present study aims to assess the effectiveness of structured teaching programme on Knowledge regarding ABG analysis and its Interpretation among Nursing Officers of BLK –MAX Super Speciality Hospital, New-Delhi. The Conceptual framework of the present study was developed by the researcher based on Imogene King's Goal Attainment Model.

### 1.12 Research approach

Quantitative Research Approach was used for this study.

### 1.13 Research design

The research design selected for the study was Quasi-Experimental (One group pre-test-post-test design).

### 1.14 Research setting

The setting was selected areas in BLK-MAX Super Speciality, New Delhi. BLK-Max Super Speciality Hospital

### 1.15 Target population

The target population of the study was nursing Officers working in BLK-MAX Super Speciality Hospital, New Delhi.

### 1.16 Accessible population

Accessible population was nursing Officers of selected departments, BLK-MAX Super Speciality Hospital who fulfills the inclusive criteria.

### 1.17 Sample size

The sample size was 100 Nursing Officers, calculated by Yamane's formula.

### 1.18 Sampling techniques

Non-probability convenience sampling technique

### 1.19 Inclusive criteria

- Nursing officers of selected departments (SICU, MICU, NSICU, CTVS, ICCU) in BLK-Max Super Speciality Hospital, New Delhi
- Nursing Officers who were present at the time of data collection.
- Nursing Officers who were willing to participate in the study.

### 1.20 Exclusive criteria

Nursing Officers who were not available and not willing at the time of data collection.

### 1.21 Development and description of tool(s):

Part I:-Demographic variables

Part II:-Self Structured knowledge questionnaire regarding ABG analysis and its interpretation. The tool consists of multiple choice questions (MCQ) regarding ABG analysis and its interpretation. Each questionnaire has four options and nursing officers have to select single correct option. For each correct answer 1 mark was given and 0 mark for incorrect answer. The score was interpreted as Average knowledge, good knowledge and Very good knowledge.

### 1.22 Data collection procedure

Researcher collected the data in 3 sections i.e., Pre-test, Intervention and Post-test. Before data collection written permission was taken from the Principal, research and ethical committee of Shimla Nursing College. After that, the written permission was taken from research and ethical committee of BLK- MAX Super Speciality Hospital, New Delhi to conduct the study. Non- Probability convenience sampling technique was used to select 100 nursing officers. Data collection was done in 2 shifts i.e., Morning and Evening shift. Fifty nursing officers were from Morning shift and fifty nursing officers were from Evening staff. Before data collection procedure, researcher made all the arrangements in Seminar Hall. All the nursing officers were requested to be in Seminar Hall. Self introduction and introduction regarding research study was given to the nursing officers. Attendance Performa was filled by the nursing officers under the supervision of researcher and Nursing tutor. After the collection of whole data researcher was thankful to the study subject or concerned authority for their full cooperation

### 1.23 Results

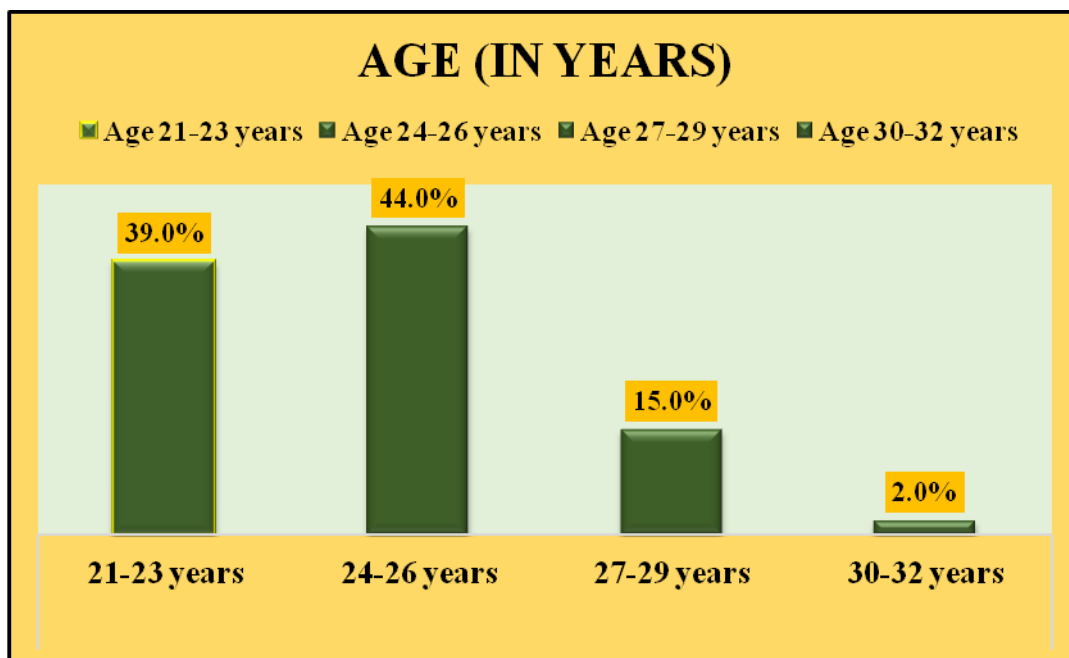
#### SECTION A: FINDINGS RELATED TO DESCRIPTION OF FREQUENCY AND PERCENTAGE OF DEMOGRAPHIC VARIABLES AMONG NURSING OFFICERS

**Table 2.1 Depicts Frequency and Percentage distribution among nursing officers based on demographic variables such as Age, Gender, Religion, Marital Status, Professional qualification.( N=100)**

S.No	Demographic Variables	Frequency(f)	Percentage (%)
<b>1.</b>	<b>Age(in years)</b>		
a)	21-23 years	39	39.0%
b)	24-26 years	44	44.0%
c)	27-29 years	15	15.0%
d)	30-32 years	2	2.0%
<b>2.</b>	<b>Gender</b>		
a)	Female	80	80.0%
b)	Male	20	20.0%
<b>3.</b>	<b>Religion</b>		
a)	Hindu	36	36.0%
b)	Muslim	11	11.0%
c)	Christian	45	45.0%

d)	Sikh	2	2.0%
e)	Others	6	6.0%
<b>4.</b>	<b>Marital status</b>		
a)	Married	14	14.0%
b)	Unmarried	86	86.0%
c)	Divorced	0	0.0%
d)	Widow	0	0.0%
e)	Separated	0	0.0%
<b>5.</b>	<b>Professional qualification</b>		
a)	G.N.M Nursing	40	40.0%
b)	Post B.Sc Nursing	2	2.0%
c)	B.Sc Nursing	57	57.0%
d)	M.Sc Nursing	1	1.0%

**Table 2.1.**According to Age (in years), majority of nursing officers i.e.,44 (44.0%) were in the Age group of 24-26years,39(39.0%) were in the Age group of 21-23years, 15(15.0%) were in the Age group of 27-29 years, least of 2(2.0%) were in the Age group of 30-32 years. With regards to Gender majority of nursing officers i.e., 80(80.0%) were female,20(20.0%) were Male. With regards to Religion majority of nursing officers i.e.,45(45.0%) were Christian,36(36.0%) were Hindu,11(11.0%) were Muslim, 6(6.0%) were others 2(2.0%) were Sikh. With regards to Marital Status majority i.e., 86 (86.0%) nursing officers were unmarried,14(14.0%) were Married & none of the nursing officers comes in other categories i.e., Divorced, Widow and Separated. With regards to Professional qualification, majority of nursing officers i.e.,57 (57.0%) were B.Sc Nursing,40(40.0%) were G.N.M Nursing, 2(2.0%) were Post B.Sc Nursing, least of 1(1.0%) was M.Sc Nursing.



**Fig: 2.1:** Depicts Column diagram regarding percentage distribution of nursing officers as per Age

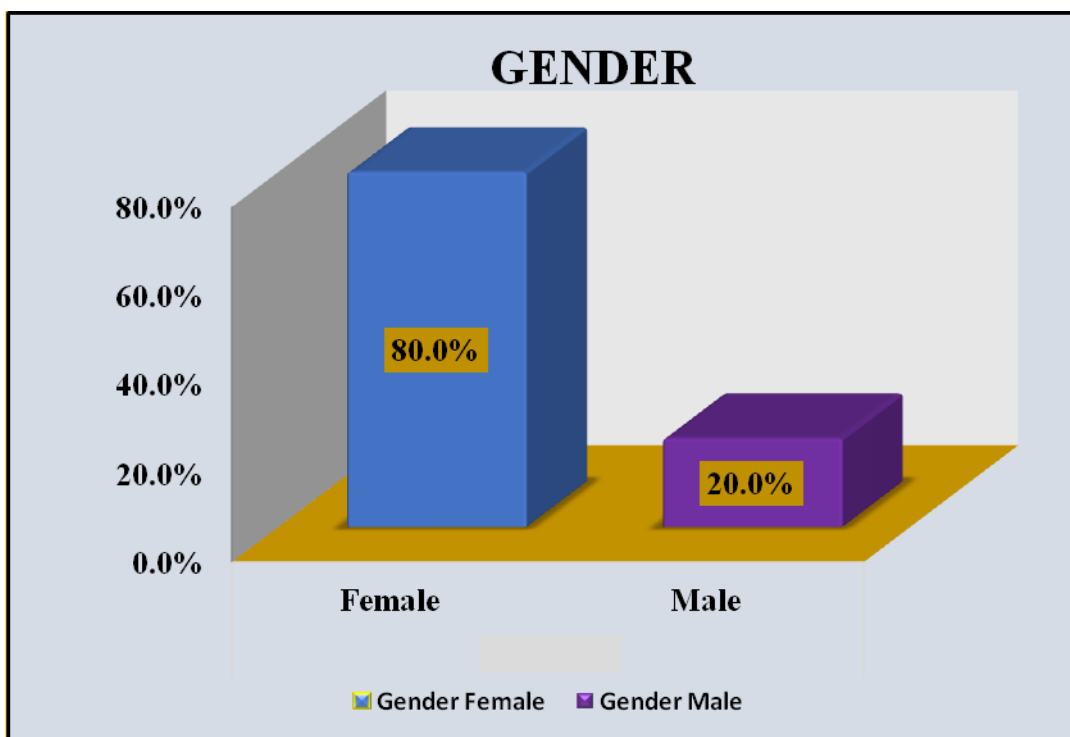


Fig: 2.2: Depicts Bar diagram regarding percentage distribution of nursing officers as per Gender.

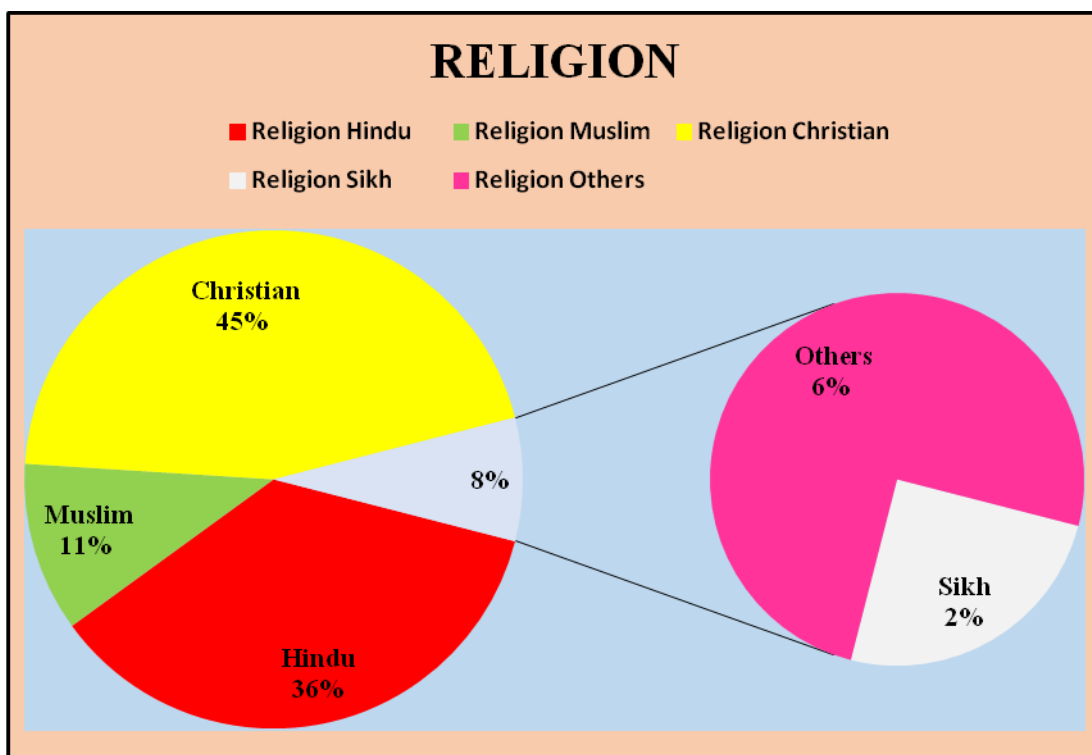


Fig: 2.3: Depicts Pie diagram regarding percentage distribution of nursing officers as per Religion.

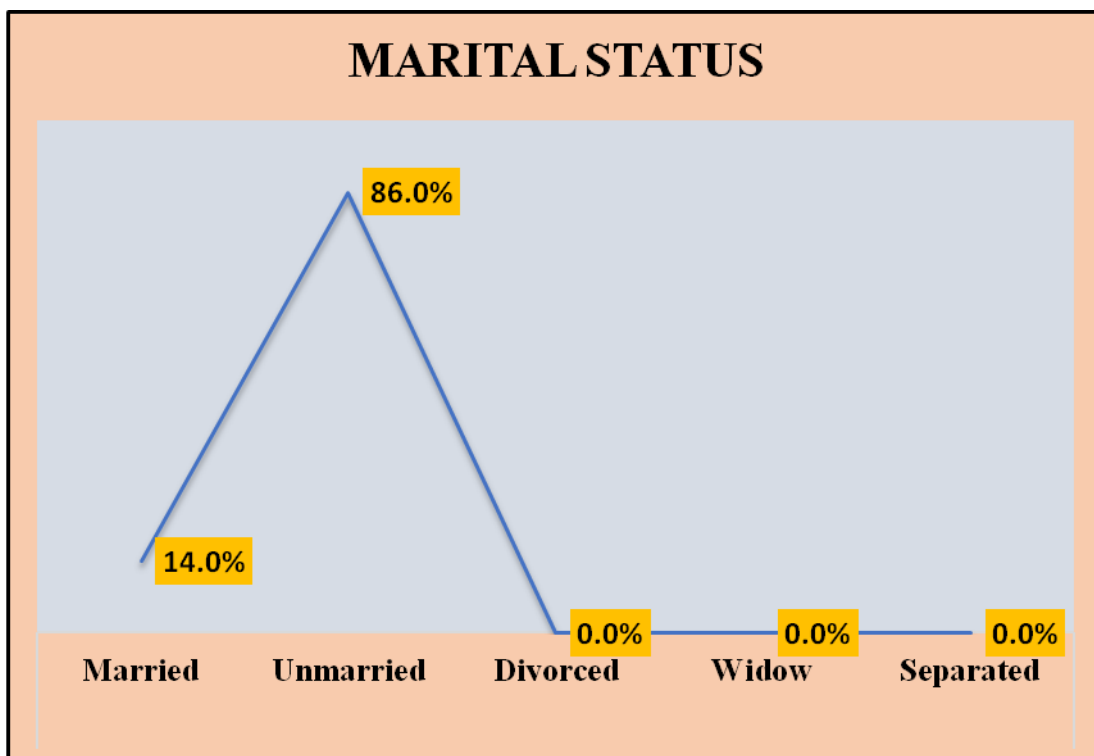


Fig: 2.4: Depicts Line diagram regarding percentage distribution of nursing officers as per the Marital Status.

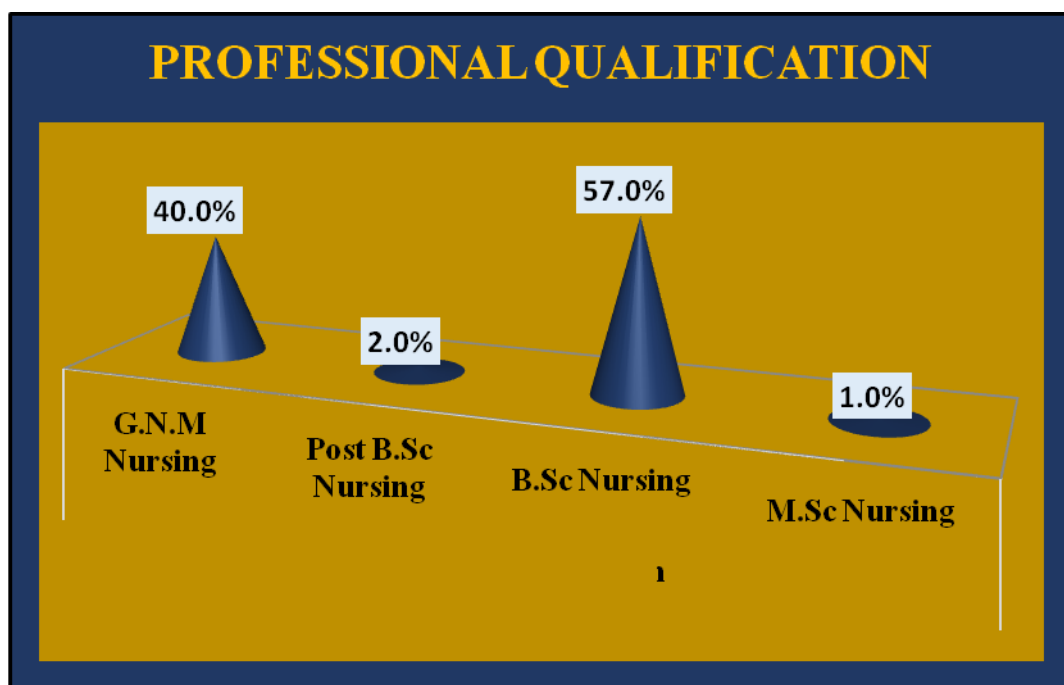


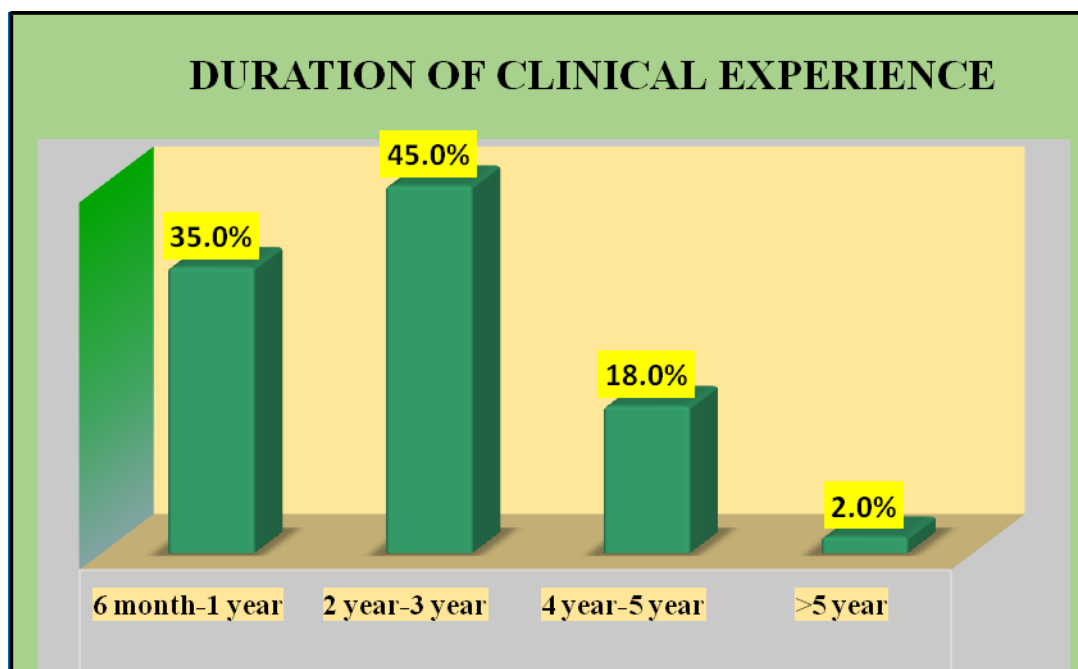
Fig: 2.5: Depicts Conical diagram regarding percentage distribution of nursing officers as per Professional Qualification.

Table 2.2 Depicts Frequency and Percentage distribution of nursing officers based on demographic variables such as Duration of Experience, Area of working, Any Previous Knowledge, If Yes, Source of Information. (N=100)

S.No	Demographic Variables	Frequency(f)	Percentage(%)
6.	Duration of clinical experience		
a)	6 month-1 year	35	35.0%
b)	2 year-3 year	45	45.0%
c)	4 year-5 year	18	18.0%
d)	>5 year	2	2.0%

<b>7.</b>	<b>Area of working</b>		
a)	Surgical ICU(SICU)	20	20.0%
b)	Medical ICU(MICU)	20	20.0%
c)	Neuro-Surgical ICU(NSICU)	20	20.0%
d)	Cardiothoracic and Vascular Surgery(CTVS)	20	20.0%
e)	Intensive Coronary Care Unit(ICCUC)	20	20.0%
<b>8.</b>	<b>Any previous knowledge</b>		
a)	Yes	100	100%
b)	No	0	0.0%
<b>9.</b>	<b>If yes, source of information</b>		
a)	Mass Media (Television, Internet)	0	0.0%
b)	Education/Training	100	100%
c)	Books(Journal/Magazine)	0	0.0%
d)	Others	0	0.0%

**Table 2.3** According to duration of clinical Experience, majority of nursing officers i.e.,45(45.0%) had 2-3 years of clinical experience, 35(35.0%) had 6 month-1year of clinical experience, 18(18.0%) had 4-5 years of clinical experience and least of 2(2.0%) had >5 years of clinical experience. With regard to Area of working, equal number of nursing officers i.e., 20(20.0%) were in Surgical ICU, Medical ICU, Neuro-Surgical ICU, Cardiothoracic and Vascular Surgery and in Intensive Coronary care unit. With respect to any previous knowledge regarding ABG Analysis and its Interpretation the majority of nursing officers i.e., 100 (100%) had previous knowledge regarding ABG Analysis and its Interpretation .With respect to if Yes, Source of information, majority of nursing officers i.e.,100 (100.0%) had source of information from Education/Training and none of nursing officers i.e.,0(0.0%) got information from Mass Media (Television, Internet),Books (Journal /Magazine) and others.



**Fig: 2.6:** Depicts Column diagram regarding percentage distribution of nursing officers as per Duration of Clinical Experience.



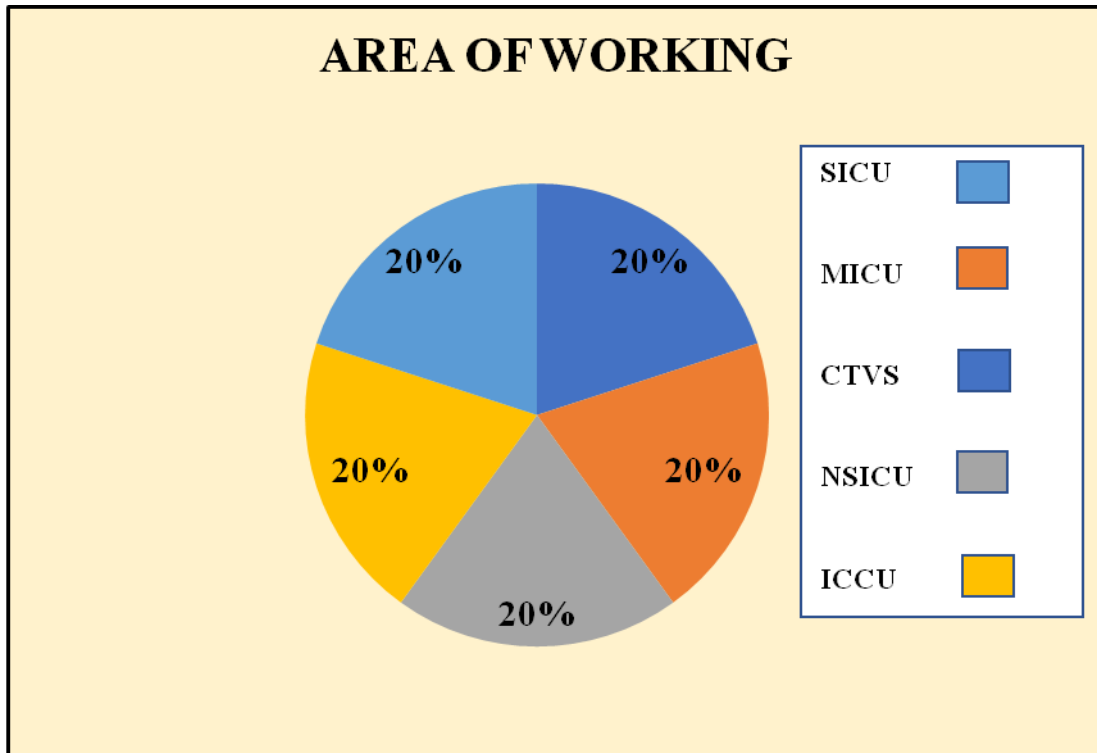


Fig: 2.7: Depicts Pie diagram regarding percentage distribution of nursing officers as per Area of working.

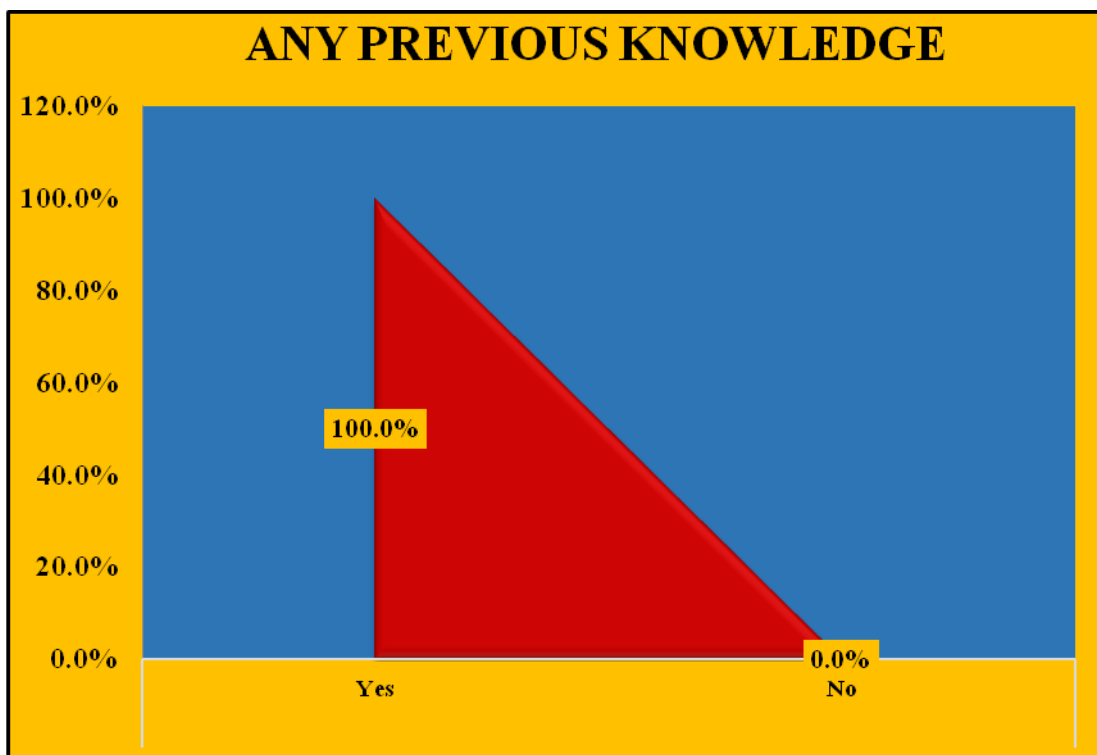


Fig: 2.8: Depicts Area diagram regarding percentage distribution of nursing officers as per Any previous knowledge.

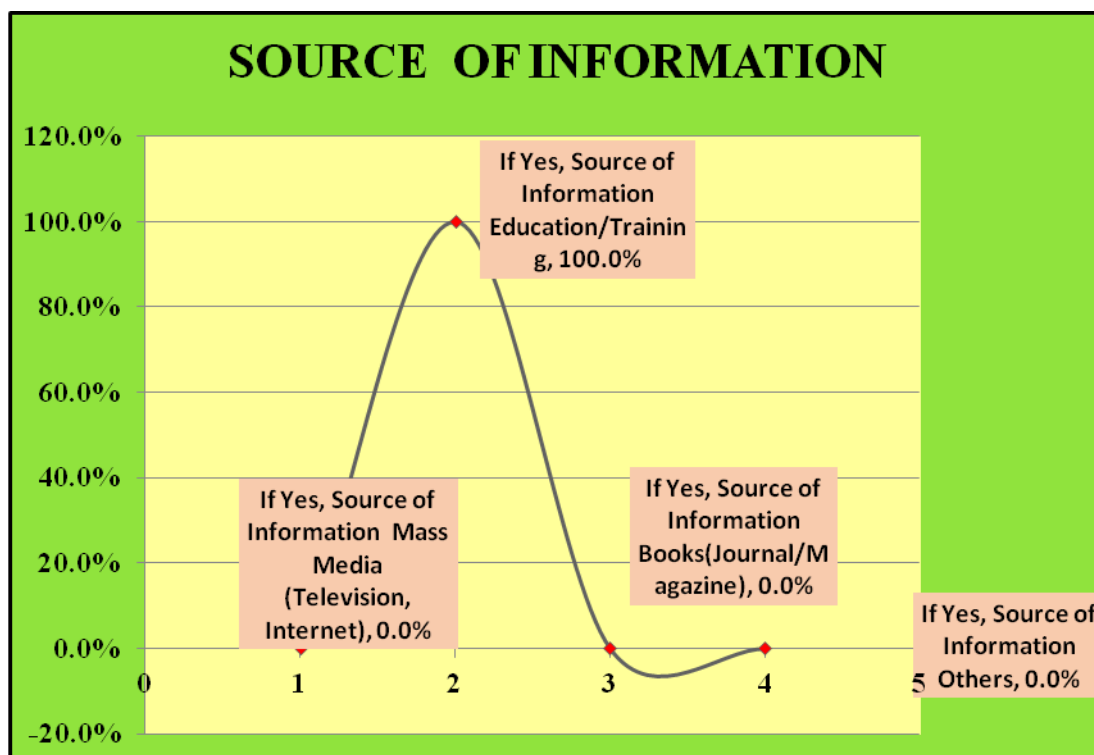


Fig: 2.9: Depicts Scatter diagram regarding percentage distribution of nursing officers as per Source of information

**SECTION B: FINDINGS RELATED TO ASSESSMENT OF THE PRE-TEST AND POST-TEST KNOWLEDGE SCORES REGARDING ABG ANALYSIS AND ITS INTERPRETATION.**

**Table 2.3: Depicts Frequency & Percentage distribution of pre-test knowledge scores among nursing officers N=100**

S.No	Level of Knowledge scores	Range of Knowledge scores	Frequency (f)	Percentage (%)
1.	Average Knowledge	0-13	0	0%
2.	Good Knowledge	14-26	45	45%
3.	Very good Knowledge	27-40	55	55%

Maximum Marks=40

Minimum Marks=0

**Table 4.4** Revealed that ,In Pre-test ,Majority of nursing officers i.e.,55(55%) had Very good Knowledge,45(45%)had Good Knowledge and none of nursing officers comes in the category of Average Knowledge regarding ABG analysis and its Interpretation.

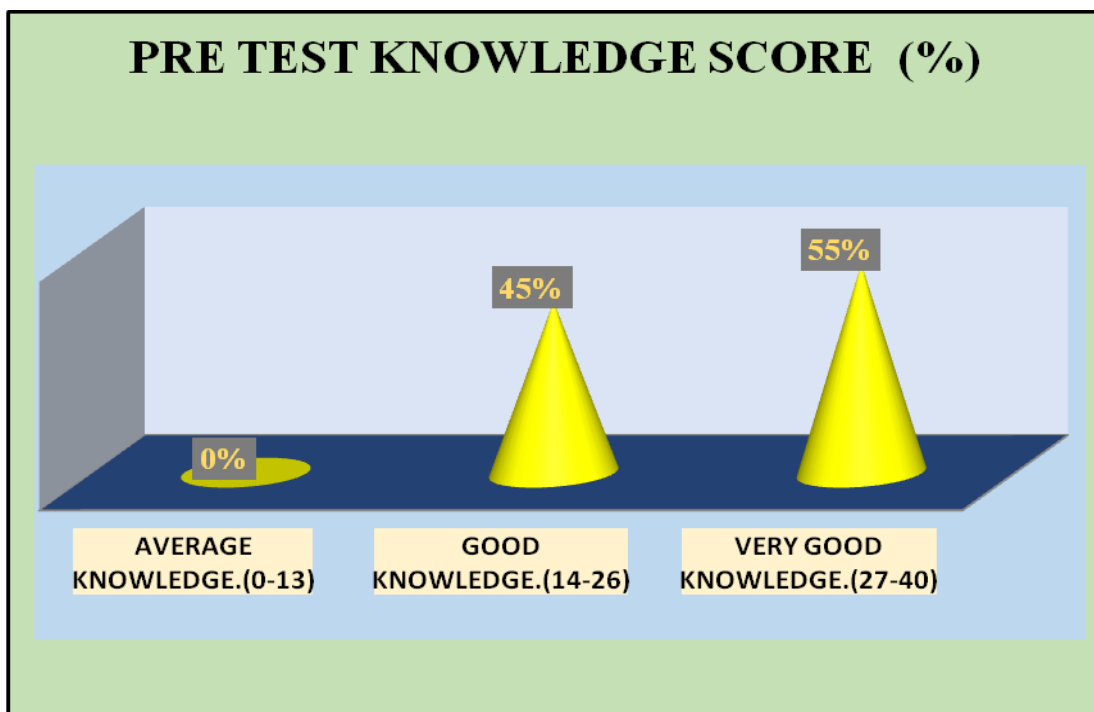


Fig: 2.10: Depicts Conical diagram regarding percentage distribution of Pre-test Knowledge scores regarding ABG Analysis and its interpretation.

Table 2.4: Depicts Frequency and Percentage distribution of post-test knowledge score among nursing officers. N=100

S.No	Level of Knowledge scores	Range of Knowledge scores	Frequency (f)	Percentage (%)
1.	Average Knowledge	0-13	0	0%
2.	Good Knowledge	14-26	5	5%
3.	Very good Knowledge	27-40	95	95%

Maximum Marks=40 Minimum Marks=0

Table 2.4 Revealed that, In Post-test, Majority of nursing officers 95(95%) had Very good Knowledge, 5(5%)had Good Knowledge and none of nursing officers comes in the category of Average Knowledge regarding ABG analysis and its Interpretation.

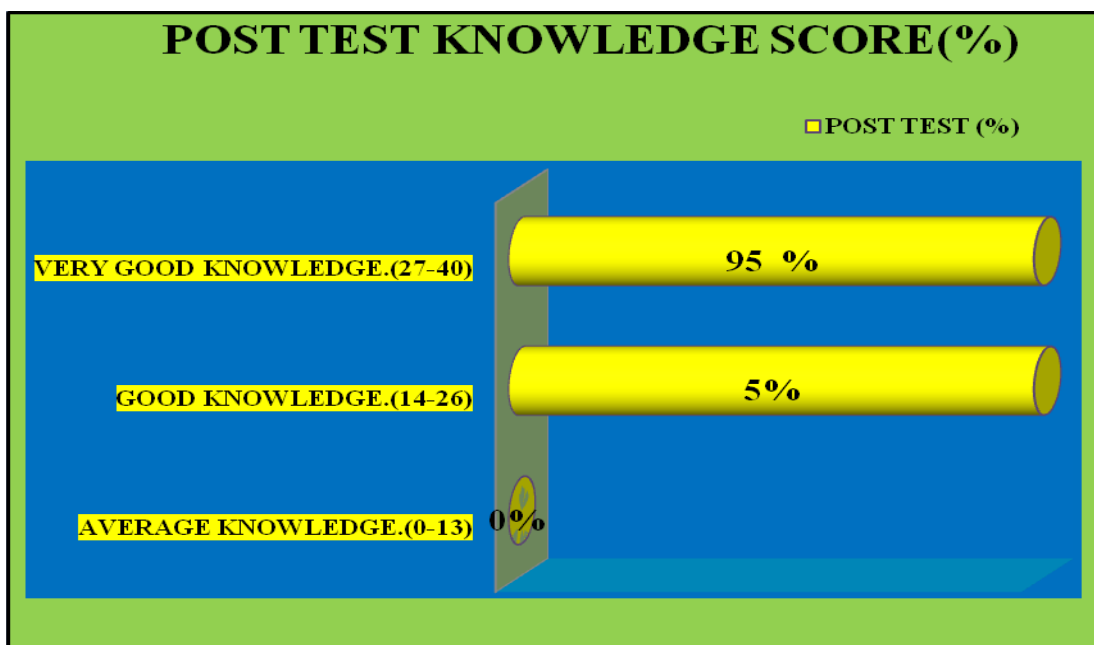


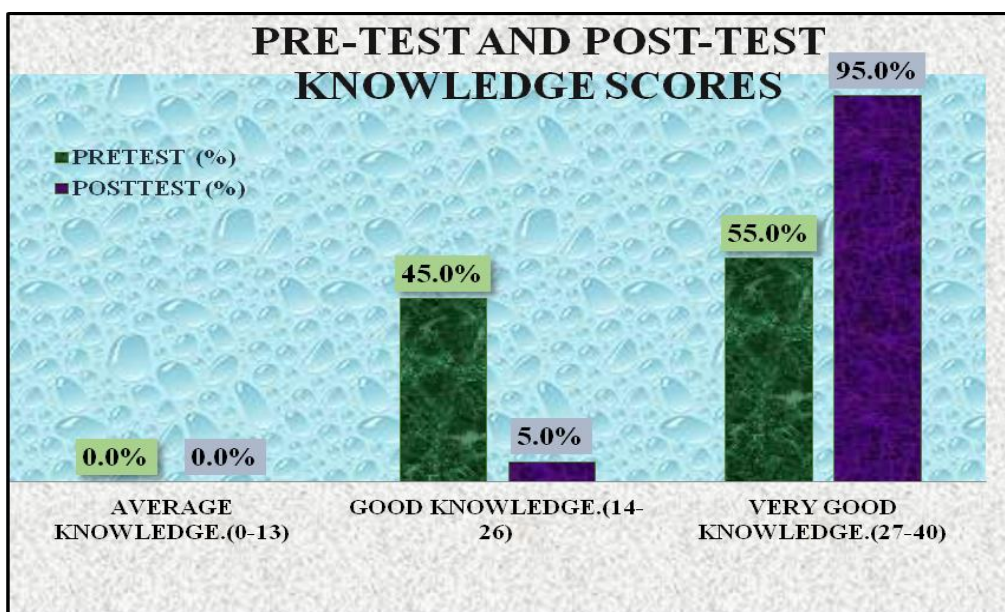
Fig: 2.11: Depicts Cylindrical diagram regarding percentage distribution of Post-test Knowledge score regarding ABG Analysis and its interpretation.

**Table-2.5: Depicts Frequency and Percentage distribution of assessment of Pre-test and Post-test Knowledge scores. N=100**

S. No	Level of Knowledge	Range of Knowledge	Pre-test Knowledge score		Post-test Knowledge score	
			Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1.	Average Knowledge	0-13	0	0%	0	0%
2.	Good knowledge	14-26	45	45%	5	5%
3.	Very good Knowledge	27-40	55	55%	95	95%

**Maximum Marks=40** **Minimum Marks=0**

**Table 2.5** Revealed that, in Pre-test ,Majority of nursing officers i.e.,55(55%) had Very good Knowledge,45(45%)had Good Knowledge and none of nursing officers comes in the category of Average Knowledge regarding ABG analysis and its Interpretation, where as in Post-test ,Majority of nursing officers 95(95%) had Very good Knowledge,5(5%)had Good Knowledge and none of nursing officers comes in the category of Average Knowledge regarding ABG analysis and its Interpretation.



**Fig 2.12: Depicts Bar diagram regarding percentage distribution of Pre-test and Post-test Knowledge scores regarding ABG Analysis and its Interpretation.**

**Table 2.6: Depicts Descriptive Statistics of Pre-test and Post-test Knowledge Score regarding ABG Analysis and its Interpretation among Nursing Officers N=100**

Knowledge Score	Mean	Standard Deviation	Median	Maximum Score	Minimum Score	Range	Mean (%)
Pre-test Knowledge Score	25.76	3.400	27	32	15	17	64.40
Post-test Knowledge Score	31.13	2.926	31	38	23	15	77.80

**Maximum Marks=40** **Minimum Marks=0**

**Table 2.6** Revealed that, in Pre-test, Mean score was 25.76, Standard Deviation was 3.400, Median score was 27, Maximum score was 32, Minimum score was 15, Range was 17 and Mean (%) was 64.40, Where as in Post-test, Mean score was 31.13, Standard Deviation was 2.926, Median score was 31, Maximum score was 38, Minimum score was 23, Range was 15 and Mean (%) was 77.80.

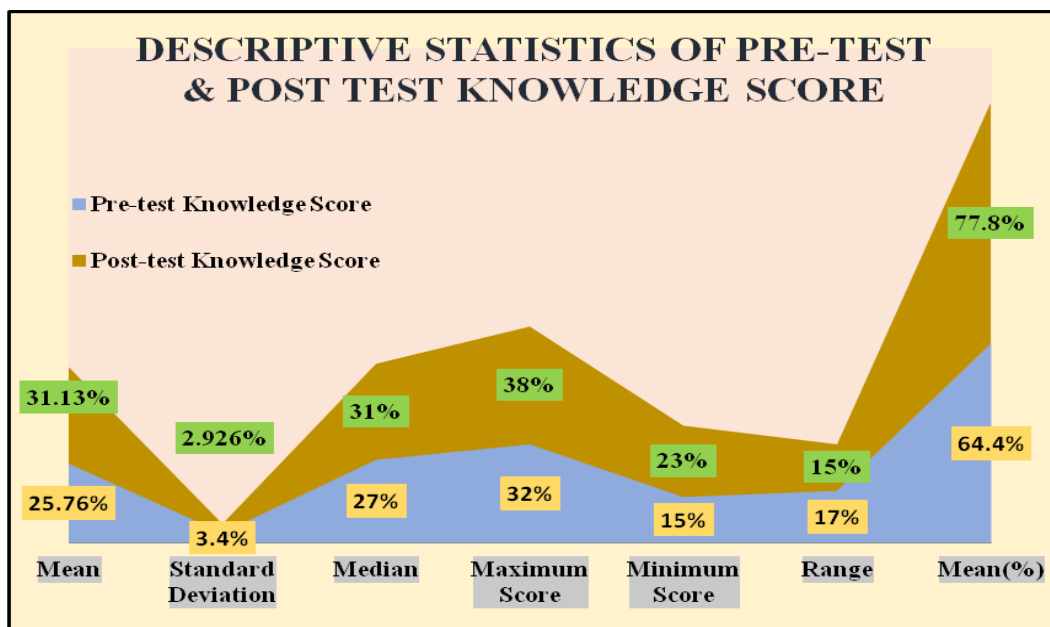


Fig .13: Depicts Area diagram regarding percentage distribution of descriptive statistics of Pre-test and Post-test knowledge score in terms of Mean, Mean%, Standard deviation, Median, Minimum and Maximum Knowledge scores and range

**SECTION C: FINDINGS RELATED TO COMPARISON OF PRE-TEST AND POST-TEST KNOWLEDGE SCORE AMONG NURSING OFFICERS TO DETERMINE THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME.**

**Table 4.7: Depicts comparison of Pre-test and Post-test knowledge score among nursing officers to determine the effectiveness of structured teaching programme. N=100**

Group	Pre-test Knowledge Scores		Post-test Knowledge Scores		Mean Difference	Df	Paired 't' test		
	Mean	S.D	Mean	S.D			't' test	T value	p-value
Research group	25.76	3.400	31.13	2.926	5.370	99	22.633	1.98	<0.001*

\*Significant, NS Non-Significant

\*Significant at 0.05 level

Table 4.7 Showed the Comparison of Pre-test and Post-test Knowledge score regarding ABG Analysis and its Interpretation among nursing officers by using Paired 't' test.

Mean Post-test knowledge score i.e., 31.13 was significantly higher than the mean Pre-test knowledge score 25.76 as evident by paired t-test value i.e., 22.633 at 0.05 level of significance among nursing officers.

Hence, Hypothesis H<sub>1</sub> i.e., there will be significant difference between mean pre-test and post-test knowledge scores regarding ABG Analysis and its Interpretation among nursing officers was **accepted**.

Therefore, Researcher concluded that structured teaching programme was found effective to enhance knowledge regarding ABG Analysis and its Interpretation among nursing officers.

**SECTION D: FINDING RELATED TO ASSOCIATION OF KNOWLEDGE SCORES REGARDING ABG ANALYSIS AND ITS INTERPRETATION AMONG NURSING OFFICERS WITH DEMOGRAPHIC VARIABLES.**

**Table 4.8: Depicts Association of Pre-test scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables N=100**

S.No	Demographic Variables	good Knowledge			df	χ <sup>2</sup>	't' Value	P value
		Very Knowledge	Good Knowledge	Average Knowledge				
1.	Age							
a)	21-23 years	15	24	0	3	12.083	7.815	0.00*

A Quasi-Experimental Study To Assess The Effectiveness Of Structured Teaching Programme On Knowledge Regarding ABG Analysis And Its Interpretation Among Nursing Officers, BLK-MAX Super Speciality Hospital, New Delhi.

b)	24-26 years	25	19	0				
c)	27-29 years	13	2	0				
d)	30-32 years	2	0	0				
<b>2. Gender</b>								
a)	Female	41	39	0	1	2.273	3.841	0.132 <sup>NS</sup>
b)	Male	14	6	0				
<b>3. Religion</b>								
a)	Hindu	17	19	0				
b)	Muslim	8	3	0				
c)	Christian	27	18	0	4	3.889	9.488	0.421 <sup>NS</sup>
d)	Sikh	1	1	0				
e)	Others	2	4	0				
<b>4. Marital Status</b>								
a)	Married	10	4	0				
b)	Unmarried	45	41	0				
c)	Divorced	0	0	0	1	1.775	3.841	0.183 <sup>NS</sup>
d)	Widow	0	0	0				
e)	Separated	0	0	0				

**Table 4.8: Depicts Association of Pre-test scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables N=100**

S.No	Demographic Variables	Very good Knowledge	Good Knowledge	Average Knowledge	Df	$\chi^2$	T value	P value
<b>5. Professional qualification</b>								
a)	G.N.M Nursing	21	19	0				
b)	Post B.Sc Nursing	0	2	0	3	4.265	7.815	0.234 <sup>NS</sup>
c)	B.Sc Nursing	34	23	0				
d)	M.Sc Nursing	0	1	0				
<b>6. Duration of Clinical Experience</b>								
a)	6 month-1 year	14	21	0				
b)	2 year-3 year	22	23	0	3	16.813	7.815	0001*
c)	4 year-5 year	17	1	0				
d)	>5 year	2	0	0				
<b>7. Area of Working</b>								
a)	Surgical ICU(SICU)	10	10	0				
b)	Medical ICU(MICU)	18	2	0				
c)	Neuro-Surgical ICU(NSICU)	13	7	0	4	21.010	9.488	0.000*
d)	Cardiothoracic and Vascular Surgery(CTVS)	10	10	0				
e)	Intensive Coronary Care Unit(ICCUC)	4	16	0				

**Table 4.8: Depicts Association of Pre-test scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables. N=100**

S.No	Demographic Variables	Very good Knowledge	Good Knowledge	Average Knowledge	df	$\chi^2$	T value	P value
<b>8.</b>	<b>Any Previous Knowledge</b>							
a)	Yes	55	45	0			NA	NA
b)	No	0	0	0				
<b>9.</b>	<b>If Yes, Source of Information</b>						NA	NA
a)	Mass Media (Television, Internet)	0	0	0				
b)	Education/Training	55	45	0				
c)	Books(Journal/Magazine)	0	0	0				
d)	Others	0	0	0				
e)	Education/Training	0	0	0				

\*SIGNIFICANT, <sup>NS</sup>-NON SIGNIFICANT \*SIGNIFICANT AT 0.05 LEVEL

**Table 4.8:** Showed the Association of Pre-test Knowledge scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables by using chi square test.

Pre-test knowledge scores among nursing officers was significantly associated with demographic variable such as Age( $\chi^2=12.083, df=3$ ), Duration of clinical Experience( $\chi^2=16.813, df=3$ ), Area of Working( $\chi^2 =21.010, df=4$ ) at p value <0.05 level of significance.

There was no significant association found in Pre-test Knowledge scores among nursing officers with any of other demographic variables such as Gender, Religion, Marital Status, Professional qualification, Any previous Knowledge and if Yes, Source of information. The calculated chi-square values were more than the table value at the 0.05 level of significance.

Hence, **Hypothesis H<sub>2</sub>** i.e., there will be significant association of knowledge score regarding ABG Analysis and its Interpretation among nursing officers with demographic variables, was **rejected**.

**Table 4.9: Depicts Association of Post-test scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables N=100**

S.No	Demographic Variables	Very good Knowledge	Good Knowledge	Average Knowledge	df	$\chi^2$	't' Value	P value
<b>1.</b>	<b>Age(in years)</b>							
a)	21-23 years	35	4	0				
b)	24-26 years	43	1	0				
c)	27-29 years	15	0	0	3	3.852	7.815	0.278 <sup>NS</sup>
d)	30-32 years	2	0	0				
<b>2.</b>	<b>Gender</b>							
a)	Female	76	4	0				
b)	Male	19	1	0	1	0.000	3.841	1.000 <sup>NS</sup>
<b>3.</b>	<b>Religion</b>							
a)	Hindu	34	2	0				
b)	Muslim	10	1	0				
c)	Christian	44	1	0	4	2.967	9.488	0.563 <sup>NS</sup>
d)	Sikh	2	0	0				
e)	Others	5	1	0				
<b>4.</b>	<b>Marital Status</b>							
a)	Married	13	1	0				
b)	Unmarried	82	4	0	1	0.157	3.841	0.692 <sup>NS</sup>

c)	Divorced	0	0	0
d)	Widow	0	0	0
e)	Separated	0	0	0

**Table 4.9: Depicts Association of Post-test scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables. N=100**

S.No	Demographic Variables	Very good Knowledge	Good Knowledge	Average knowledge	Df	$\chi^2$	't' value	P value
<b>5.</b>	<b>Professional qualification</b>							
a)	G.N.M Nursing	36	4	0	3	3.527	7.815	0.317 <sup>NS</sup>
b)	Post B.Sc Nursing	2	0	0				
c)	B.Sc Nursing	56	1	0				
d)	M.Sc Nursing	1	0	0				
<b>6.</b>	<b>Duration of Experience</b>							
a)	6 month-1 year	31	4	0	3	4.829	7.815	0.185 <sup>NS</sup>
b)	2 year-3 year	44	1	0				
c)	4 year-5 year	18	0	0				
d)	>5 year	2	0	0				
<b>7.</b>	<b>Area of Working</b>							
a)	Surgical ICU(SICU)	17	3	0	4	8.421	9.488	0.077 <sup>NS</sup>
b)	Medical ICU(MICU)	20	0	0				
c)	Neuro-Surgical ICU(NSICU)	20	0	0				
d)	Cardiothoracic and Vascular Surgery(CTVS)	20	0	0				
e)	Intensive Coronary Care Unit(ICCU)	18	2	0				

**Table 4.9: Depicts Association of Post-test scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables. N=100**

S.No	Demographic Variables	Very good Knowledge	Good Knowledge	Average Knowledge	df	$\chi^2$	't' value	P value
<b>8.</b>	<b>Any Previous Knowledge</b>							
a)	Yes	95	5	0			NA	NA
b)	No	0	0	0				
<b>9.</b>	<b>If Yes, Source of Information</b>							
a)	Mass Media (Television, Internet)	0	0	0			NA	NA
b)	Education/Training	95	5	0				
c)	Books(Journal/Magazine)	0	0	0				
d)	Others	0	0	0				
e)	Education/Training	0	0	0				



\*SIGNIFICANT, <sup>NS</sup>-NON SIGNIFICANT \*SIGNIFICANT AT 0.05 LEVEL

**Table 4.9:** Showed the Association of Post-test Knowledge scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables by using chi square test.

There was no significant association was found in Post-test Knowledge scores among nursing officers with any of demographic variables such as Age, Gender, Religion, Marital Status, Professional qualification, Duration of Experience, Area of Working, Any previous Knowledge and if Yes, Source of information. The calculated chi-square values were more than the table value at the 0.05 level of significance.

Hence, **Hypothesis H<sub>2</sub>** i.e., there will be significant association of knowledge scores regarding ABG Analysis and its Interpretation among nursing officers with demographic variables, was **rejected**.

#### 1.24. Discussion

##### 1. The First objective was to assess the pre-existing knowledge regarding ABG analysis and its interpretation among nursing officers.

The overall Pre-test Knowledge score among Nursing officers revealed that , majority of nursing officers i.e.,55(55%) had Very good Knowledge,45(45%)had Good Knowledge and none of nursing officers had Average Knowledge regarding ABG analysis and its Interpretation.

The present study findings was supported by **Upreti Divya, Mishra Rakhi (2022)**, conducted a Pre-experimental study to assess the effectiveness of planned teaching programme on Knowledge and Practice regarding arterial blood gas analysis and its interpretation among staff nurses working in critical care units at Jaypee Hospital, Noida, Delhi/ NCR. The study results revealed that in Pre- test i.e., 13 (43.4%) of staff nurses were having average knowledge, 11(36.6%) had good, 2 (6.6%) had excellent and 4(13.4%) had poor knowledge. Hence, the researcher concluded that majority of staff nurses were having average knowledge in pre-test regarding arterial blood gas analysis and its interpretation.

##### 2. Second objective was to develop and administer structured teaching programme regarding ABG analysis and its interpretation among nursing officers.

After conducting Pre-test, it was found that least of nursing officers comes in the category of very good knowledge score. Researcher administered “Structured teaching programme” among nursing officers.

After administration of “Structured teaching programme” on ABG Analysis and its Interpretation the Knowledge score was enhanced with high percentage of very good Knowledge from good knowledge.

The overall Post-test knowledge score among nursing officers revealed that, the majority of nursing officers i.e.,95(95%) had Very good Knowledge,5(5%)had Good Knowledge and none of nursing officers had Average Knowledge regarding ABG analysis and its Interpretation.

The present study finding was supported by **Sachan Priya Das Swastika (2021)**, conducted a pre-experimental study to assess the effectiveness of structured teaching program on knowledge about arterial blood gas analysis among the staff nurses working in critical care unit of Integral hospital, Lucknow. The study results revealed that 20 (66.67%) nurses had inadequate knowledge, 10 (33.33%) had moderately adequate knowledge and one had adequate knowledge in pre test, Where as in post test, 11 (36.67%) had moderately adequate knowledge, 19 (63.33%) had adequate knowledge and no one had inadequate knowledge .Hence the researcher concluded that there was a significant improvement in knowledge of staff nurses in post-test score afteradministration of structured teaching programme.<sup>84</sup>

##### 3. The Third objective was to determine the effectiveness of structured teaching programme regarding ABG analysis and its interpretation among nursing officers.

Based on the objective, the effectiveness of “Structured teaching programme” was assessed by comparing pre-test and post-test knowledge score by using paired-‘t’ test.

Overall pre-test mean knowledge score was 25.76, Standard Deviation was 3.400, where as post-test mean score was 31.13, Standard Deviation was 2.926 as evidenced by paired ‘t’ test value 22.633 with p value <0.001\*. This result has shown that there was statistical difference in improving the knowledge score at p <0.005 level of significance. Based on the paired ‘t’ test result , the calculated value (22.633) was more than the table value (1.98).

The present study finding was supported by **M. Karpukkarasi1, N. Arasuman (2020)**, conducted a pre experimental study to assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Arterial Blood Gas Analysis and its Interpretation among Intensive Care Unit Staff Nurses of Manjunath Hospital in Bengaluru . The study results revealed that (70.0%) had inadequate knowledge, 15 (30%) had moderate knowledge, none of them had adequate knowledge in pre-test and 40 (80%) had adequate knowledge, 10 (20%) had moderate knowledge and none of them had inadequate knowledge in post-test. The pre-test mean score was 26.72 and standard deviation was 5.3. The post-test mean score was 43.3 and standard deviation was 3.8. The calculated t-value was 17.5 which was significant at 0.05 level. This result has shown that there was statistical difference in improving the knowledge score. Hence the study concluded that STP was effective in improving the knowledge of staff nurses regarding ABG analysis.<sup>85</sup>

##### 4. The Fourth objective was to find out the association of knowledge score regarding ABG analysis and its interpretation with demographic variables.

The data analysis revealed that in pre-test knowledge score, Significant association was seen with demographic variable

such as Age, ( $\chi^2=12.083$ ,  $df=3$ ), Duration of clinical Experience ( $\chi^2=16.813$ ,  $df=3$ ), Area of Working ( $\chi^2=21.010$ ,  $df=4$ ) at p value  $<0.05$ . There was no significant association found in Pre-test Knowledge scores among nursing officers with any of other demographic variables such as Gender, Religion, Marital Status, Professional qualification, Any previous Knowledge and if Yes, Source of information. Where as in Post-test, There was no significant association was found in Post-test Knowledge scores among nursing officers with any of other demographic variables such as Age, Gender, Religion, Marital Status, Professional qualification, Duration of Experience, area of working, Any previous Knowledge and if Yes, Source of information.

The study finding was supported by **Begum Reshma, Rani Ranju Das and Saikia Borgohain Unmona (2019)**, conducted a Pre-experimental study to assess the effectiveness of structured teaching programme on knowledge of ABG analysis among staff nurses of ICU of 2 private hospitals of Guwahati, Assam. The study results revealed that there was significant association of pre-test knowledge score with professional qualification, ( $\chi^2=9.47$ ,  $df=2$ ), total working experience, ( $\chi^2=5.05$ ,  $df=2$ ), In-service education, ( $\chi^2=9.72$ ,  $df=1$ ), on ABG analysis. The remaining demographic variables such as age, gender, type of ICU have no significant association with knowledge level of the nurses.<sup>86</sup>

### 1.25. Conclusion

The present study was to assess the effectiveness of the structured teaching programme on knowledge regarding ABG Analysis and its Interpretation among nursing officers working in BLK-MAX Super Speciality Hospital, New-Delhi. Knowledge was enhanced after administration of structured teaching programme. Hence, the structured teaching programme was found effective in improving the knowledge of nursing officers.

Ethical approval: Informed consent was obtained from all individuals participants included in the study.

### ACKNOWLEDGMENT

**“The only way to discover the limits of the possible is to go beyond them into the impossible”**

In the present world of competition there is race of existence in which those who will come forward to succeed. Research is like a bridge between theoretical and practical working. Thus, I choose to be part of it and learn something new.

Words are often too less to reveal one's deep regards. An understanding of the word like this is never the outcome of the efforts to single person. I the researcher of the study take this opportunity to express my profound sense of gratitude and respect to all those who helped me to complete this thesis successfully.

The depth of gratitude I have towards God Almighty, the Holy Spirit for his abundant grace and blessings during the course of study and completion of this work, cannot be comprehend.

I express my heartfelt thanks to my loving family **Mr. Ram Lal Kulvi (Father), Mrs. Saraswati Kulvi (Mother), Ms. Nitika Kulvi (Sister), and Ivesh Kulvi (Brother)** the back bone of my life. They are the one who brought up me with their constant motivation and encouragement that has led me to work out on this study successfully. It would not have been possible for me to complete this project without the love and support of my family who initiated me to take up this noble profession and also for their support, prayers and encouragement throughout my carrier. I am very much fortunate to be surrounded by such wonderful family.

I express my humble regards, immense pleasure to **My Guide/Advisor Dr. Pallavi Pathania (Professor, Medical Surgical Nursing)** for her ongoing mentorship and never-ending supply of fascinating tasks. Her humble approach to research and science is an inspiration. This approach is evident in her simple but obvious writing style, which I aspire to emulate throughout my career. I learned so many remarkable qualities from observing you. My success is due to all of your guidance and constant support. A million thanks for her encouragement, useful and excellent advice, but mostly for challenging me to be the best version of myself and always pushing me to my limit.

My heartfelt gratitude to **Co-Guide/Advisor Ms. Ritika Soni (Associate Professor, Mental Health Nursing)** for her constant supervision, constructive, criticism and enormous encouragement throughout the course. Her critical comments helped me in improving the content of Dissertation. I sincerely lack the word to express the gratitude towards her. Thank you for being so understanding, caring and being for constant support.

I am deeply indebted to **Members of Research and Ethical Committee** of Shimla Nursing College, Shurala, for their approval and for giving me the opportunity to conduct the research project valuable.

I wish to acknowledge the entire **Teaching and Non Teaching Staff**, who willingly gave their valueable time and constructive throughout the project.

I express my thanks to all **Experts (Medical Surgical Nursing Field)** for their valuable judgements, constructive recommendations and enlightening suggestions while validating the tool.

I am deeply indebted to **Members of Research and Ethical Committee** of The Ganga Ram Institute for Post Graduate Medical Education and Research (GRIPMER) for their approval and for giving me the opportunity to conduct the research project valuable.

I extend my thanks to the respected **Chief Nursing Officer Ms. Josephine Cyrill** of Sir Ganga Ram Hospital, New-Delhi for granting me permission to conduct the pilot study.

I am deeply indebted to **Members of Research and Ethical Committee** of BLK-MAX Super Speciality Hospital for their approval and for giving me the opportunity to conduct the research project valuable.

I extend my thanks to the respected **Sr. Director of Academic Affairs, Research & Continuing Education (AARCE) Dr. Anil Handoo** of BLK-MAX Super- Speciality Hospital, New-Delhi for granting me permission to conduct the final study.

I am also grateful to all the **Nursing Officers** as a study sample for their immense co-ordination, response and participation in research project. Thank you for answering the questions and co-operation during the data collection process and intervention.

Last but not the least, I consider it as my privilege to carry out M.Sc. in Nursing under Shimla Nursing College, Shimla, H.P.

Finally, Thanks to all of my well-wishers and many others who helped me directly or indirectly during my study.

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