"A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE REGARDING HYPERBARIC OXYGEN THERAPY IN TISSUE INJURY AND INFECTION AMONG NURSING STUDENTS IN SELECTED NURSING COLLEGE AT BANGALORE."

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ABSTRAT

Hyperbaric oxygen therapy is breathing 100% oxygen while under increased atmospheric pressure. HBOT is a treatment that can be traced back to 1600s. The first well known chamber was built and run by British clergyman named Henshaw. He built a structure called domicillum that was used to treat multitude of disease. The chamber was pressurized with air or unpressurized using bellows. The aim of the study was to assess the effectiveness of structured teaching programme on knowledge regarding hyperbaric oxygen therapy among nursing students in selected nursing colleges. A quasi-experimental design with an evaluative approach by taking 60 samples through probability sampling technique in selected nursing colleges at Bangalore was undertaken. A pre-test was conducted regarding the knowledge on HBOT, then a structured teaching programme was organized and post-test was held with a gap of 7 days to assess the knowledge. The result of the study showed that in the pre-test knowledge among the sample 41 (68.3%) had inadequate, 19 (31.7%) had moderate and none had adequate level of knowledge regarding HBOT. After administration of structured teaching programme in post-test none of them had inadequate knowledge, 16 (26.7%) had moderate knowledge and 44 (73.3%) had adequate knowledge. This study also scored a mean value suggesting that the structured teaching programme was effective regarding Hyperbaric Oxygen Therapy in the majority of students among nursing students in selected nursing colleges at Bangalore. Based on the chi-square analysis the pre-test knowledge regarding HBOT was significant with age, gender and type of family at 5% levels of significance. The findings of the study revealed that nursing students have inadequate knowledge regarding HBOT, nurses who are aware of this fact can guide the newly employed graduates and the student nurses who are caring patients on HBOT.

INTRODUCTION

The respiratory system is the network of organs and tissues that helps an organism to breathe. It includes airways, lungs, blood vessels and respiratory muscle. These parts work together to move oxygen throughout the body and clean out waste gases like carbon-dioxide. Hyperbaric oxygen therapy is breathing 100% oxygen while under increased atmospheric pressure. The idea of healing patient under increased pressure was

continued by French surgeon Fontaine, who built a pressurized mobile operating room in 1879. Dr. Orville Cunningham, a professor of anesthesia what was known as "steel ball hospital". HBOT encourages the formation of new collagen and new skin cells. It does so by encouraging new blood vessel to grow. It also stimulates cells to produce certain substances like vascular endothelial growth factor. These attract and stimulates endothelial cells for healing.

NEED FOR THE STUDY

HBOT is witnessing a phase of phenomenal growth in the country. It is time that we recognize the benefits of this treatment modality so the patients are benefited by the advantages of HBOT for specific recovery.

OBJECTIVES

1.　　To assess the pre-test and post-test knowledge of nursing students on Hyperbaric oxygen therapy.

2.　　To determine the effectiveness of structured teaching program on Hyperbaric Oxygen Therapy among nursing students.

3.　　To find the association between pre-test score of students with selected demographic variables.

MATERIALS AND METHODS

Quantitative survey approach was considered as an appropriate research approach for this study. Quasi-Experimental Research Design (One group pretest post-test design) was selected. The study was conducted among 60 nursing students of II year BSc Nursing and II GNM students of T. John College of Nursing, Bangalore. The subjects were selected by using Purposive sampling technique Structured questionnaire was selected for the study. After an extensive discussion with experts, the structured questionnaire and the STP was prepared to assess the knowledge of nursing students regarding HBOT. The structured questionnaire was divided into two sections. Section A consisting of characteristics of students such as age, gender, religion, type, and year of study. Section B – Questionnaire on knowledge. The knowledge questionnaire was prepared after going through an intensive review of literature including research articles and personal discussions with experts. This consists of 24 questions to assess the knowledge regarding Hyperbaric Oxygen therapy. It is a multiple-choice questionnaire in which score 1 was awarded to correct response and 0 for wrong response. Thus, a total score of 24 was allotted for knowledge items. The structured teaching program on Hyperbaric Oxygen Therapy among nursing students was based on the literature review and suggestion by experts. It consisted of sub-topics as knowledge on basics of HBOT, knowledge on working principle of HBOT and knowledge on procedure of HBOT

METHOD OF DATA COLLECTION

• Prior permission was obtained from Principal of T John College of Nursing, Bangalore.

• The individual subjects were selected using probability sampling techniques based on inclusion and exclusion criteria.

• Before administering the tool, the purpose of study was explained to all the students with self-introduction.

• A separate classroom was selected for the data collection, privacy was maintained and subjects were made comfortable.

• The investigator took an average time of 30 minutes. The subjects completely co-operated with the investigator.

• At the end of the pre-test session, the structured teaching program was administered to the selected subjects, were encouraged to ask questions and get their doubts clarified.

• After seven days of administering the structured teaching program, post-test was done by using the same tool on the same subjects.

RESULT FINDINGS

Section 1: Description of baseline variables of nursing students

TABLE-1 Frequency and percentage distribution of nursing students according to their personal characteristics.

Characteristics	Category	Frequency	Percentage
Age (in years)	<18	0	0
	18-20	39	65
	21-22	21	35
	>22	0	0
Gender	Male	7	11.7
	Female	53	88.3
Religion	Hindu	25	41.7
	Muslim	6	10
	Christian	29	48.3
	Others	0	0
Type of family	Joint	8	13.3
	Nuclear	52	86.7
	Extended	0	0
Year of study	2ndyear BSc	49	81.7
	2ndyear GNM	11	18.3
Heard of HBOT	Yes	6	10
	No	54	90

●   Table.1 depicts that among the 60 study subjects, 65% of them belonged to the age group of 18-20 years and 35% were of age group of 21-22 years. Among them 88.3% of them were females and 11.7% of them were males. 48.3% of them were Christians and 41.7% of them belonged to Hindu religion. 86.7% of the study sample were from nuclear family. 81.7% of the subjects were from 2nd year BSc and 18.3% of them were from 2nd year GNM.

Graphical representation of baseline variables

Figure.1: Percentage distribution of the sample according to their age groups.

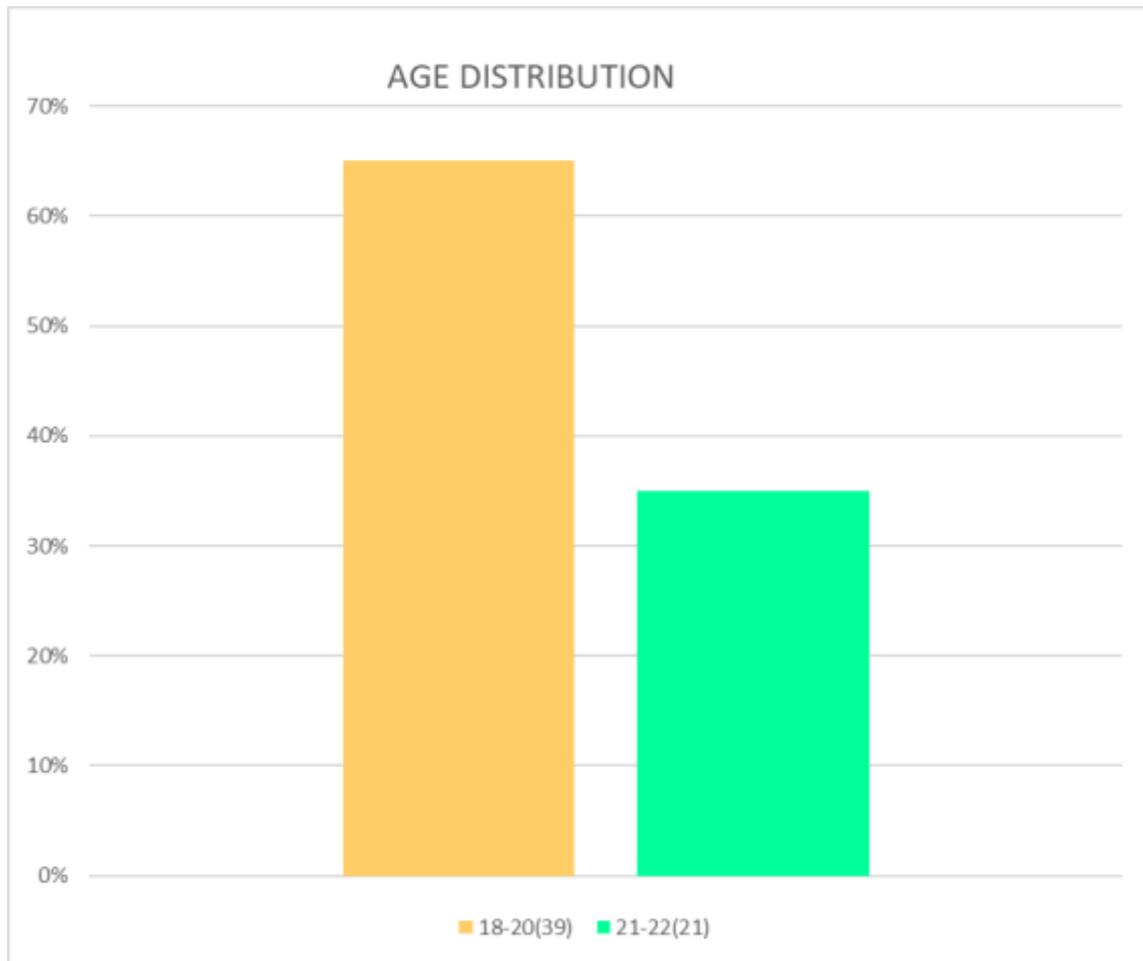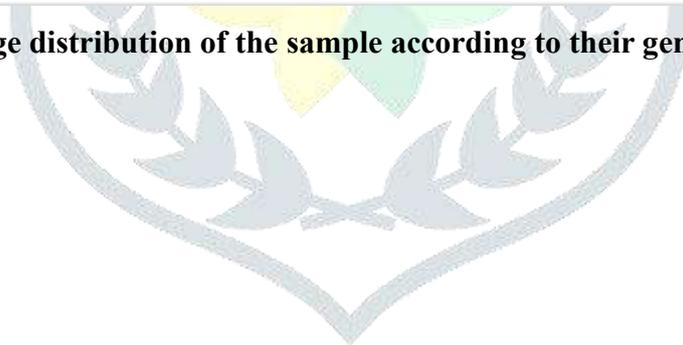AGE DISTRIBUTION

■ 18-20(39) ■ 21-22(21)

Figure.2: Percentage distribution of the sample according to their gender.
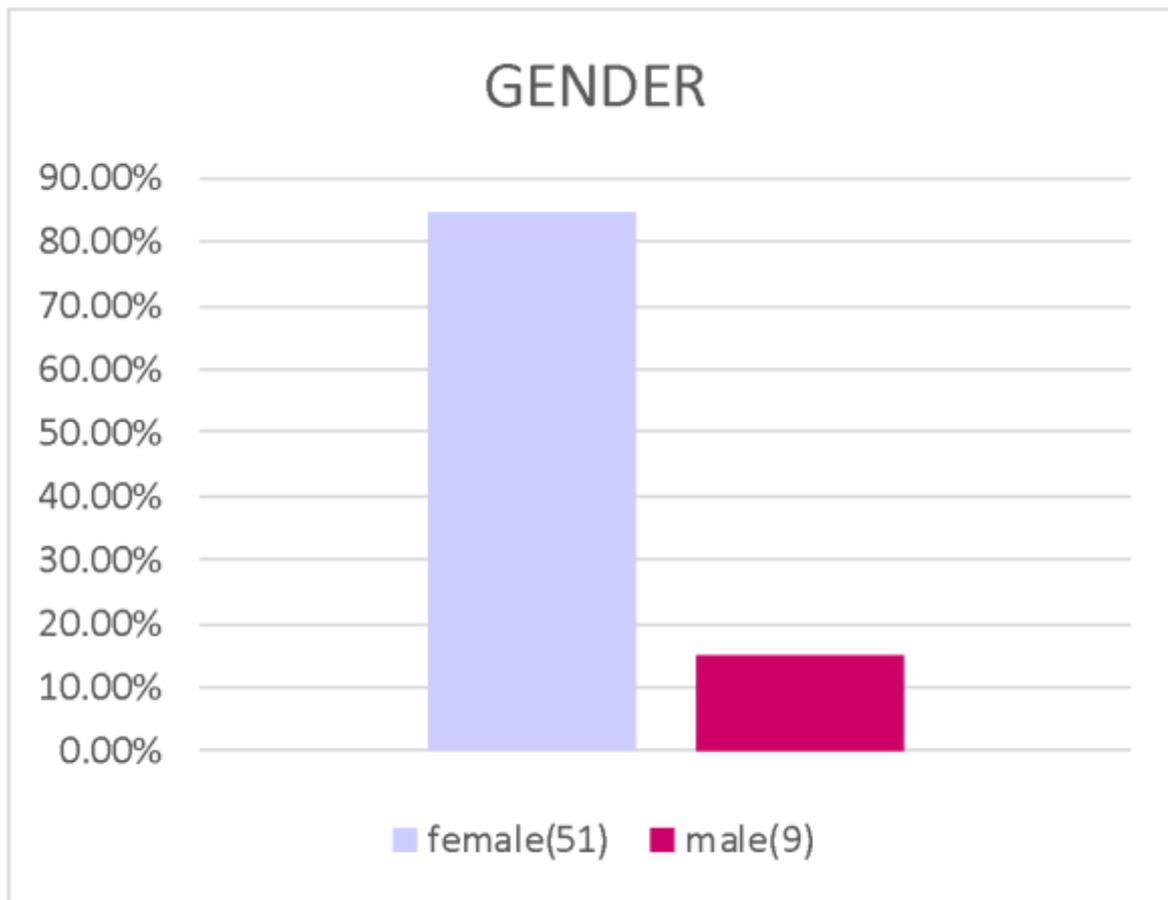
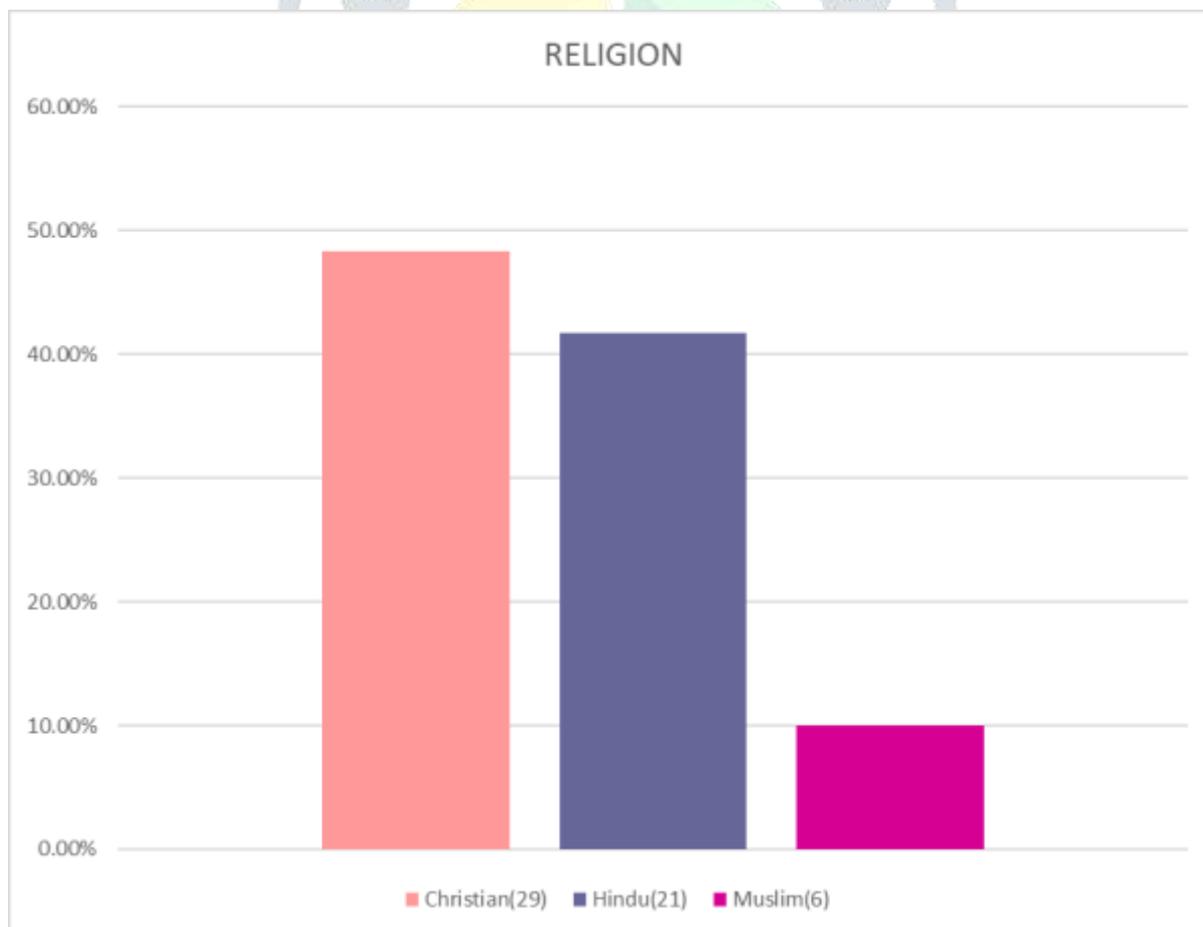**Figure.3: Percentage distribution of the sample according to religion.**

Figure.4: Percentage distribution of the sample according to type of family.
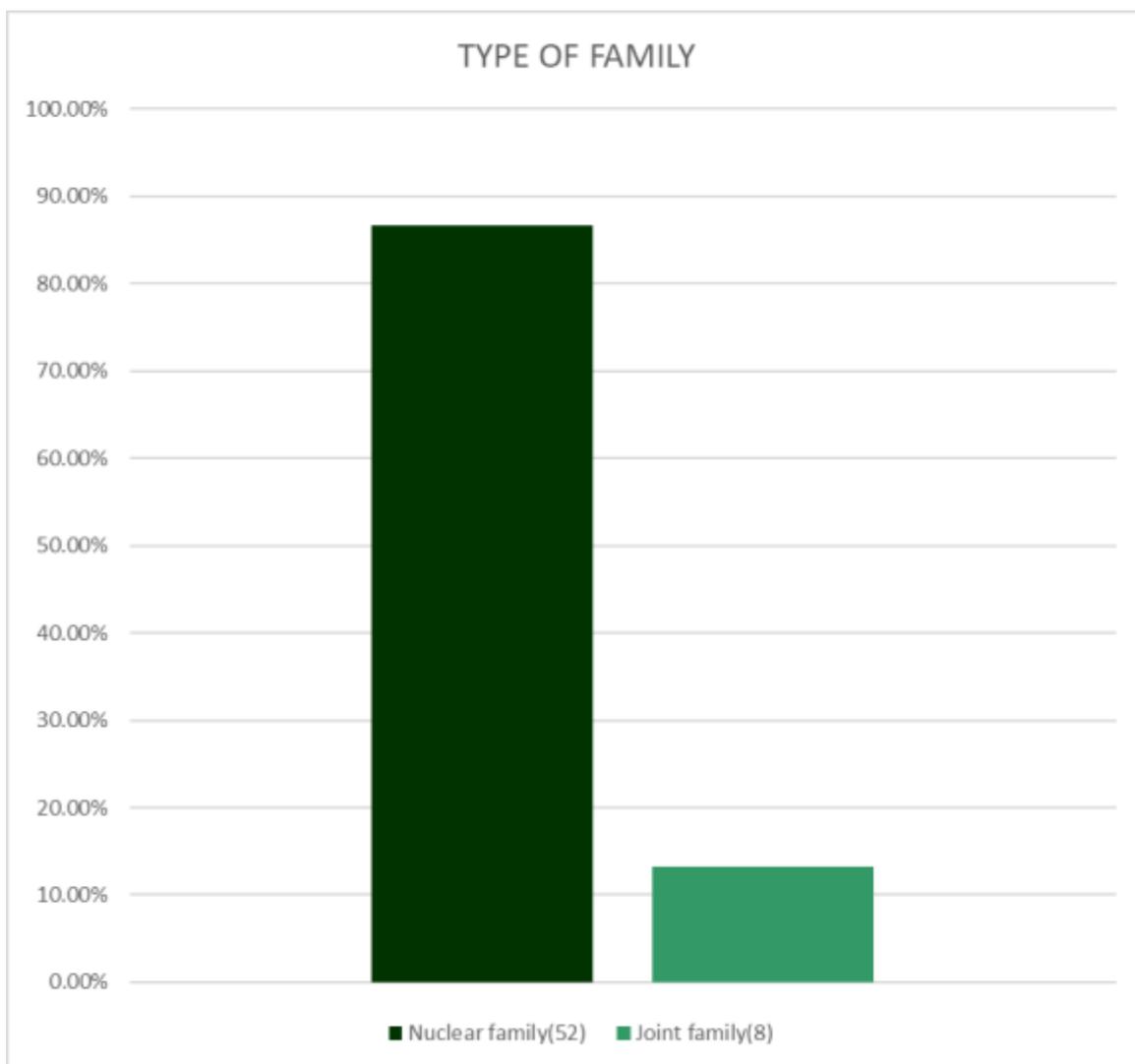

Figure.5: Percentage distribution of the sample according to year of study.
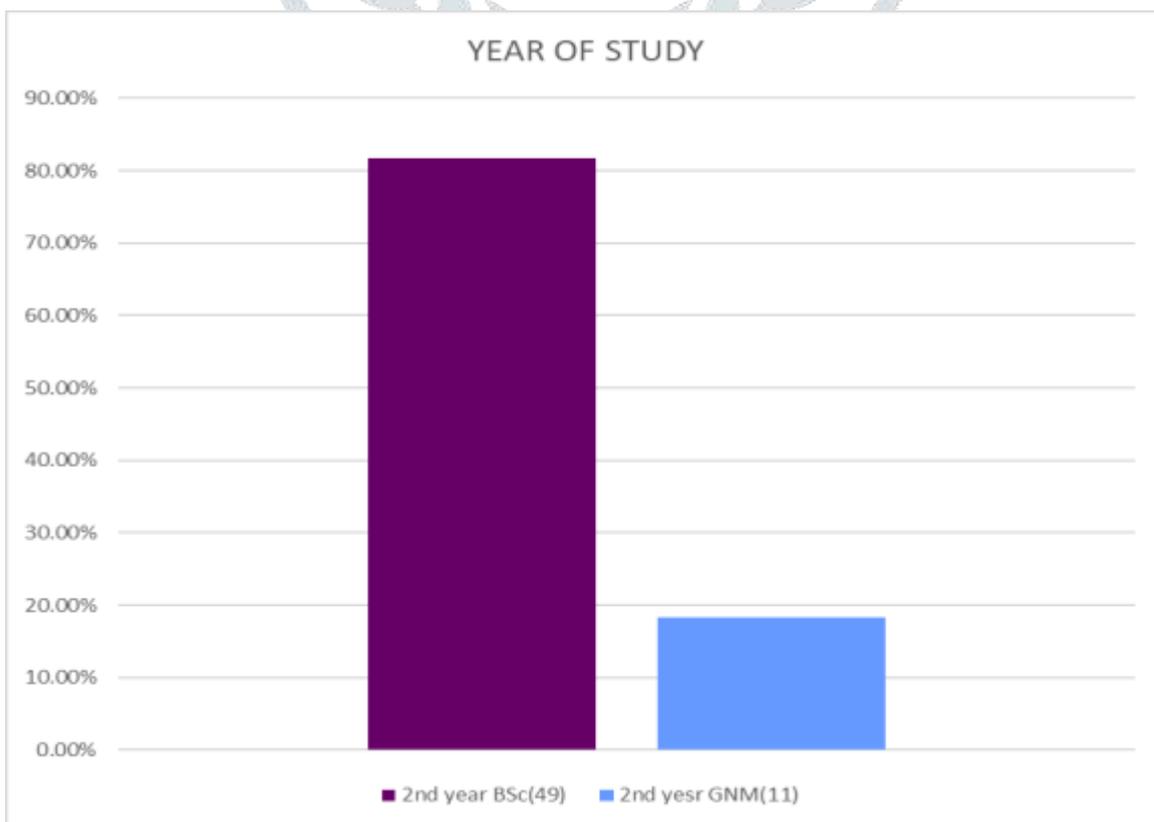
Figure.6: Percentage distribution of the sample according to information on HBOT
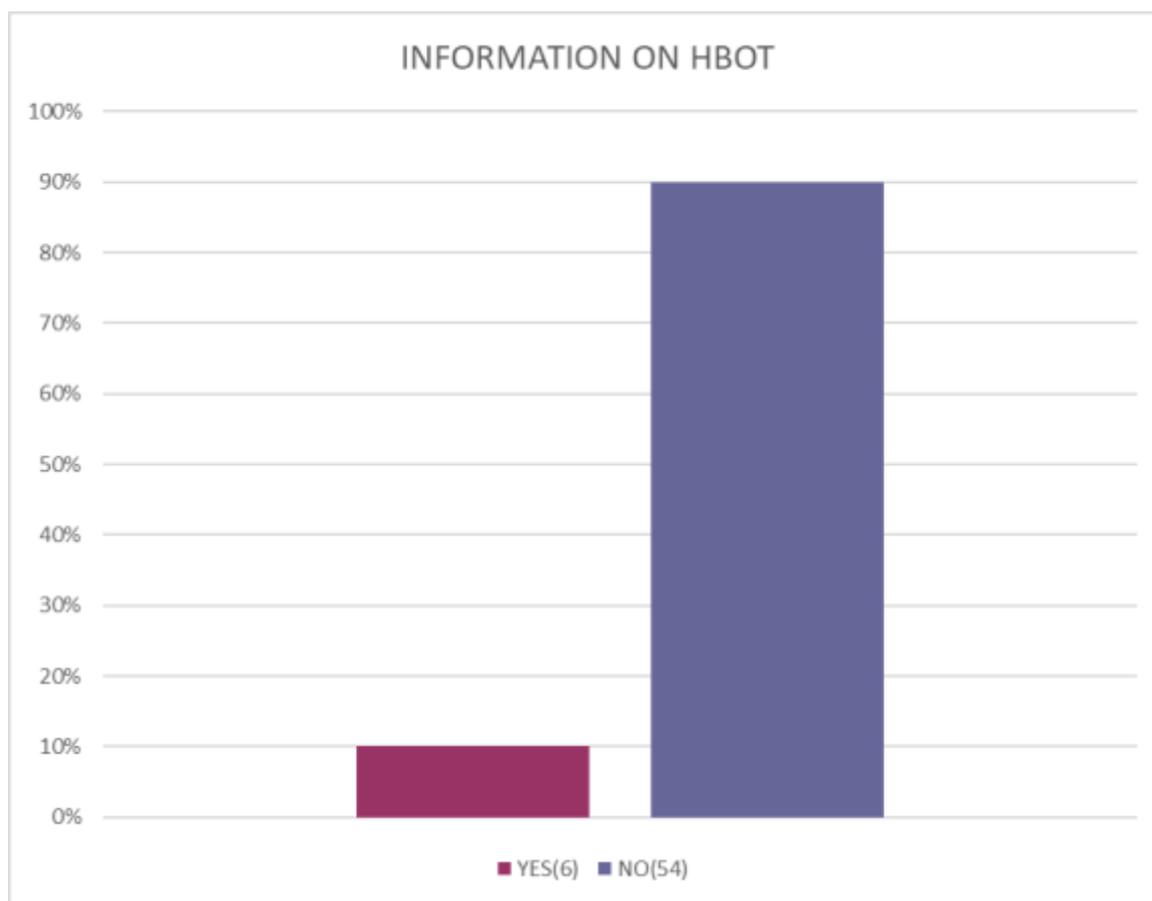

Figure.7: -Percentage distribution of the sample according to source of information on HBOT

Section-2: Description of knowledge score before and after STP.

TABLE-2 Frequency and distribution of respondents on pre and post-test knowledge level on HBOT.

Knowledge Level	Category	Pre-test		Post-test	
		Frequency	Percent	Frequency	Percent
Inadequate	≤ 50 % Score	41	68.3	0	0
Moderate	51-75% Score	19	31.7	16	26.7
Adequate	> 75 % Score	0	0	44	73.3

Total		60	100	60	100

Table-2 and Fig.9 shows that the pre-test knowledge among the sample 41 (68.3%) had inadequate, 19 (31.7%) had moderate and none had adequate level of knowledge regarding HBOT. The above data is depicted in fig.9

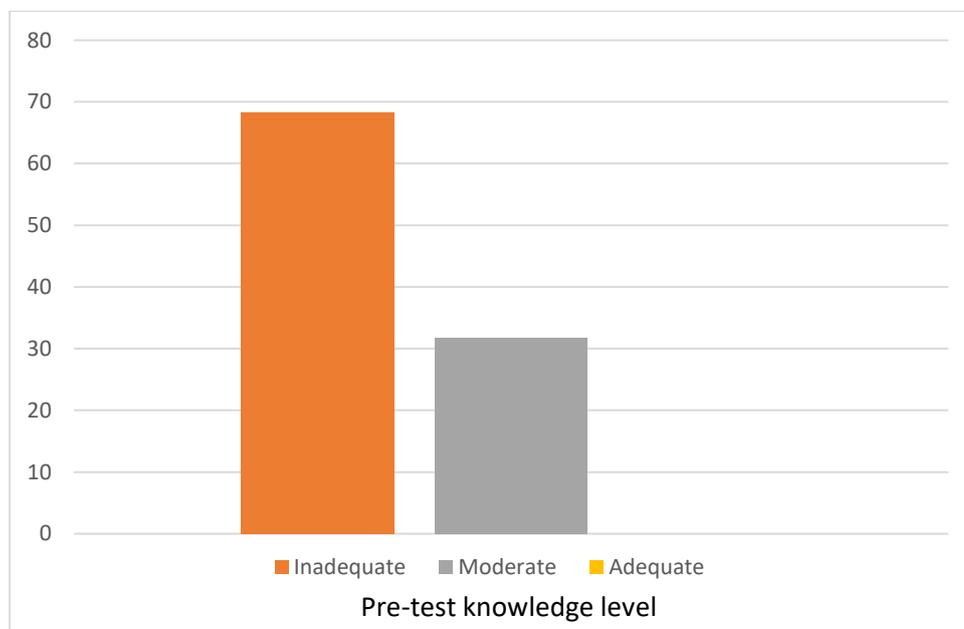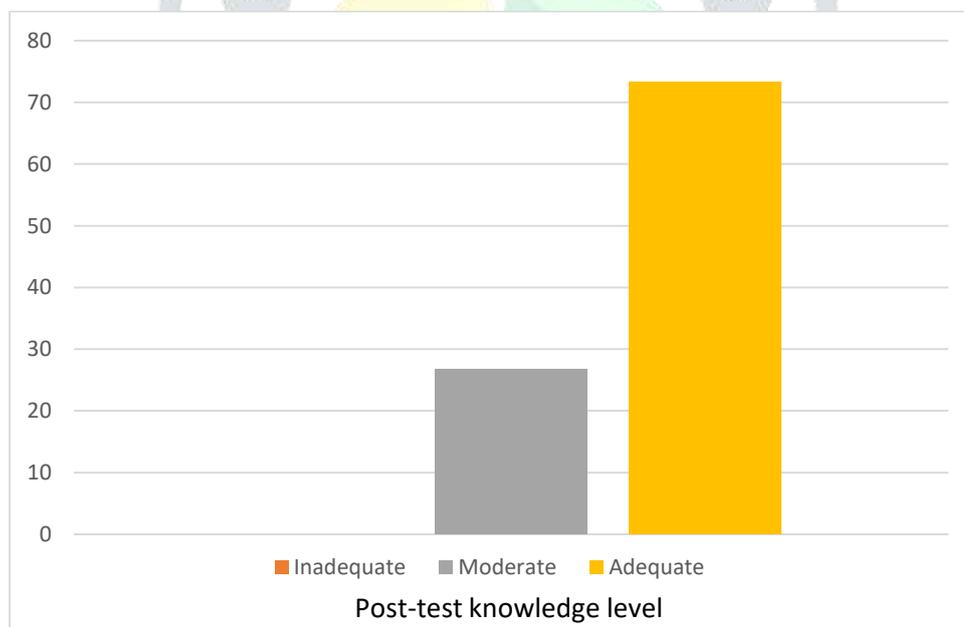**Figure.8: Pre-test knowledge level on HBOT among nursing students**

Figure.9: Post-test knowledge level on HBOT among nursing students

Section 3: Determine the effectiveness of structured teaching programme regarding HBOT on knowledge level.

Table - 3 Classification of respondents on pre-test and post-test knowledge level on HBOT.

Knowledge Level	Category	Classification of Respondents				χ^2 Value
		Pre test		Post test		
		N	%	N	%	
Inadequate	≤ 50 % Score	41	68.3	0	0.0	85.26*
Moderate	51-75 % Score	19	31.7	16	26.7	
Adequate	> 75 % Score	0	0.0	44	73.3	
Total		60	100.0	60	100.0	

-      * Significant at 5% level, $\chi^2(0.05,2df) = 5.991$

-          The comparison of the pre-test and post-test knowledge level is shown in table-6. Chi square was used to measure different aspects of knowledge level. In pre-test 68.3% of the samples had inadequate knowledge but in post-test none of them had inadequate knowledge. Considering the moderate level of knowledge pre-test had 31.7% and post-test had 26.7%. In case of adequate knowledge in pre-test none had adequate knowledge whereas in post-test majority of sample (73.3%) had adequate knowledge. The above data is depicted in fig.10

Figure.10: Pre-test and Post-test knowledge level on HBOT among nursing students
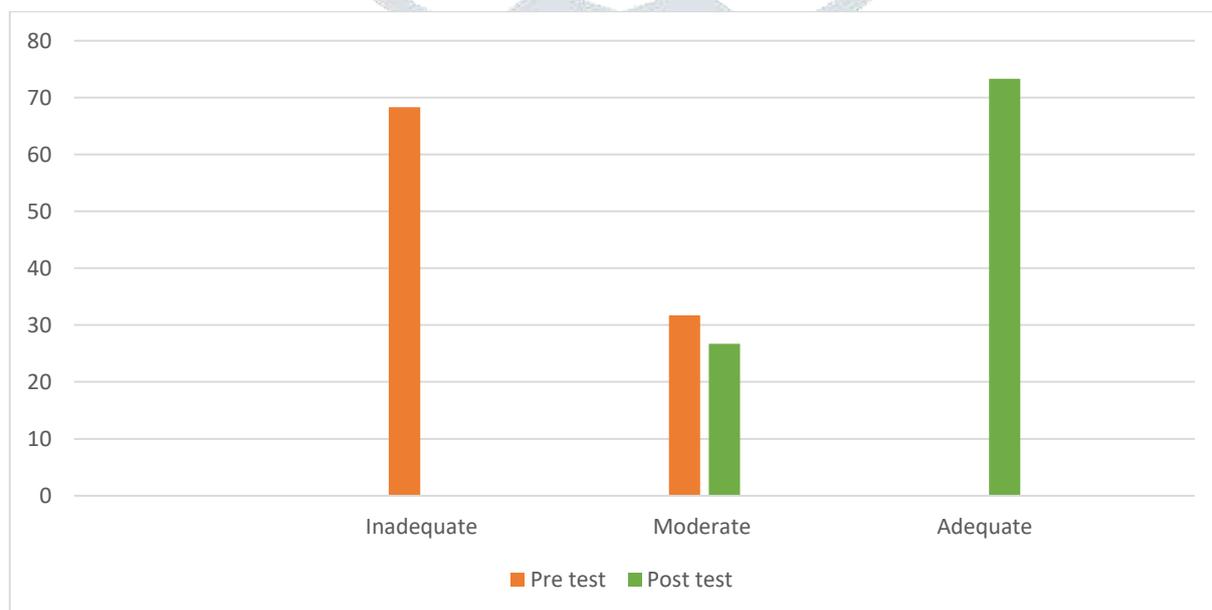
Table-4 Overall pre-test and post-test mean knowledge on HBOT.

Aspects	Max. Score	Knowledge Scores				Paired 't' Test
		Mean	SD	Mean (%)	SD (%)	
Pre test	24	10.17	2.91	42.4	12.1	23.18*
Post test	24	19.72	1.75	82.2	7.3	

-          * Significant at 5% level,   t (0.05,59df) = 1.96

Table-4 indicates the overall knowledge score of HBOT in pre-test and post-test. It was found that post-test mean knowledge score (82.2% and SD 7.3%) was higher when compared with pre-test knowledge score (42.4% and SD 12.1%). The statistical paired 't' test implies that the difference in the pre-test knowledge and post-test knowledge found statistically significant at 5% level. The paired 't' test worked out (23.18) reveals that there exists a statistical significance in the enhancement scores indicating the impact of structured teaching programme among nursing students. Hence the null hypothesis was rejected research hypothesis was accepted (fig.12)

Figure.11: Overall pre-test and post-test mean knowledge score on HBOT among nursing students.
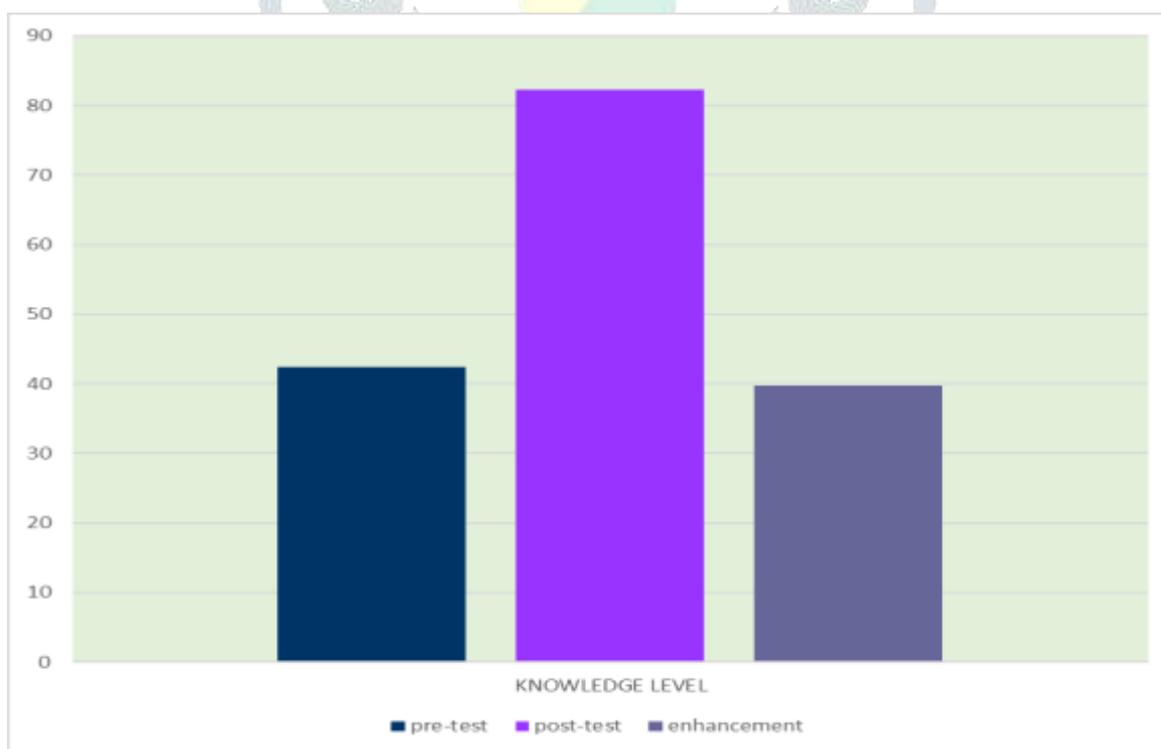
SECTION 4- Association of pre-test knowledge with the selected socio-demographic variables.

This section deals with the findings of the selected socio-demographic variables like age, gender, religion, type of family, year of studying of nursing students and heard of HBOT. The chi-square test was used to find out the association of pre-test knowledge score with the selected demographic variables.

The following null hypothesis was stated

H0- There is a significant effectiveness of STP regarding hyperbaric oxygen therapy among nursing students.

TABLE-5 Association between demographic variables and pre-test knowledge level of respondents on HBOT.   n=60

Demographic Variables	Category	Sample	Knowledge Level				χ^2 Value	P Value
			Inadequate		Moderate			
			N	%	N	%		
Age group (years)	18-20	39	23	59.0	16	41.0	4.51*	P<0.05 (3.841)
	21-22	21	18	85.7	3	14.3		
Gender	Male	7	7	100.0	0	0.0	3.97*	P<0.05 (3.841)
	Female	53	34	64.2	19	35.8		
Religion	Hindu	25	15	60.0	10	40.0	1.57 NS	P>0.05 (5.991)
	Muslim	6	4	66.7	2	33.3		
	Christian	29	22	75.9	7	24.1		
Type of family	Joint	8	8	100.0	0	0.0	4.28*	P<0.05 (3.841)
	Nuclear	52	33	63.5	19	36.5		
Year of studying	2nd year BSc	49	32	65.3	17	34.7	1.13 NS	P>0.05 (3.841)
	2nd year GNM	11	9	81.8	2	18.2		
Heard of HBOT	Yes	6	4	66.7	2	33.3	0.01 NS	P>0.05 (3.841)
	No	54	37	68.5	17	31.5		
Combined		60	41	68.3	19	31.7		

- * Significant at 5% Lel,   NS : Non-significant

- Note: Figures in the parenthesis indicate Table value

- Association between pre-test knowledge score and demographic variables was found out using χ^2 formula. The data presented in the table shows that there were significant association between pre-test knowledge score and selected variables like age, gender and type of family. The calculated chi square value

(age- 4.51, gender-3.97 and type of family-4.28) were more than the table value (3.84) at 0.05 level of significance so the null hypothesis was rejected and research hypothesis was accepted for these variables.

●   The other variables like religion (1.57), year of studying (1.13) and heard of HBOT (0.01) did not show any association with the pre-test knowledge score as their chi square values were less than table value at 5% level of significance. So the null hypothesis was accepted and research hypothesis was rejected for these variables.

Implications

Hyperbaric oxygen therapy (HBOT) is breathing 100% oxygen while under increased atmospheric pressure. HBOT is a treatment that can be traced back to the 1600's. As nurses have a crucial role in administration of HBOT. This study helps nursing students, the near future nurses to improve their knowledge regarding HBOT. The findings of the study have implications in the field of nursing practice, nursing education, nursing research and nursing administration.

Nursing practice

The findings of the study revealed that nursing students have inadequate knowledge regarding HBOT, nurses who are aware of this fact can guide the newly employed nursing officers and the student nurses who are caring patients on HBOT. Nurses also can use the structured teaching programme used in the study to widen and update their knowledge regarding HBOT.

Nursing Education

As the literature proves HBOT is one of the significant treatment used in tissue injury and infection, the nursing students should be adequately instructed about it. The student nurses should have an adequate knowledge in HBOT. So based on the findings of the study the nursing education can take steps to educate them regarding HBOT.

Nursing Administration

Nurse administrator has a key role in planning, organizing and conducting the in-service. Based on the findings of the study nurse administrator can organize and conduct in-service programmes on the topic of HBOT for the nurse working in critical care unit. Nurse administrators can also include this topic in their orientation programmes for newly employed staff nurses.

Nursing research

The study gives an opening to the nursing student's knowledge regarding HBOT. Based on the findings further research studies can be conducted among nurse and nursing students on different aspects of knowledge and practice in caring for patients on HBOT.

Limitations of the study

The limitations of the present study include:

1.   Small sample size (60) limits the generalization of the study.
2.   Use of structured questionnaire in data collection restricts the amount of information that could be obtained from nursing students
3.   As the study was limited to 60 samples studying in selected nursing college, the researcher was not able to collect the data from other students who are excluded during random selection and from those who are studying in other nursing colleges
4.   No attempt was made to measure the retention of knowledge after post test

CONCLUSION

The findings of the study revealed that nursing students have inadequate knowledge regarding HBOT, nurses who are aware of this fact can guide the newly employed graduates and the student nurses who are caring patients on HBOT. Nurses also can use the structured teaching programme used in the study to widen and update their knowledge regarding HBOT. The study gives an opening to the nursing student's knowledge

regarding HBOT. Based on the findings further research studies can be conducted among nurse and nursing students on different aspects of knowledge and practice in caring for patients on HBOT

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