A Descriptive Cross-Sectional Study to Assess the Knowledge and Practice of Medical Errors Among Nurses and Student Nurses

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Abstract:
INTRODUCTION:
Medical errors are a significant concern in healthcare systems worldwide, impacting patient safety and outcomes. Nurses, being at the forefront of patient care, play a crucial role in identifying, preventing, and managing these errors. Despite the critical importance of this issue, varying levels of knowledge and awareness about medical errors persist among nursing professionals. Understanding the extent of nurses' knowledge regarding medical errors is essential for improving clinical practices, and ultimately enhancing patient safety.
Each year, in the United States alone, 7000–9000 people die as a result of a Medical Error. As specified by the ***Institute of Medicine (IOM)***, *400 000 cases of preventable patient injury because of MEs occur each year in emergency clinics in the USA. Nursing is recognized as an important practice-oriented profession for improving the health of society. Society needs knowledgeable, qualified and competent personnel. In this respect, nursing education also has a mission to develop competent human resources to meet the needs of society.*
OBJECTIVES
1. To assess the level of knowledge regarding medical errors among nurses and nursing students
2. To explore the practices related to the prevention and management of medical errors among nurses and nursing students .
METHODOLOGY
The data was collected by questionnaire method which includes demographic data, Multiple Select Questions to assess the knowledge and Practice regarding Medical errors among nurses and nursing students. Descriptive and inferential statistics were used to analyze the data.
RESULTS
1. *3.3% nurses and 50% student nurses belongs to 19-21 years age group, 66.6% nurses and 50% student nurses belongs to 22-29 years age group, 23.3% nurses belongs to 30-39 years age group, 6.6% nurses belongs to 40-49 years age group.*
2. *Regard to gender 10% nurses and 50% student nurses are males and 90% of nurses and 50% of student nurses are females.*
3. *80% nurses and 100% student nurses from BSc, nursing 20% nurses from PB BSc, nursing.*
4. *Regard Area of Experience 13.3% nurses and 36.6% student nurses belongs to General ward, 26.6% nurses and 23.3% student nurses belongs to MICU, 26.6% nurses and 6.6% student nurses belongs to SICU, 33.3% nurses and 33.3% student nurses belongs to Oncology wards.*
5. *26.6% nurses and 93.3% student nurses from Nuclear family and 73.3% nurses and 6.6% student nurses from joint family.*

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I. INTRODUCTION

Medical errors are a significant concern in healthcare systems worldwide, impacting patient safety and outcomes. Nurses, being at the forefront of patient care, play a crucial role in identifying, preventing, and managing these errors[1]. Each year, in the United States alone, 7000–9000 people die as a result of a Medical Error. As specified by the **Institute of Medicine (IOM)**, 400 000 cases of preventable patient injury because of MEs occur each year in emergency clinics in the USA. Nursing is recognized as an important practice-oriented profession for improving the health of society. Society needs knowledgeable, qualified and competent personnel. In this respect, nursing education also has a mission to develop competent human resources to meet the needs of society[2,3].

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year in emergency clinics in the USA. Nursing is recognized as an important practice-oriented profession for improving the health of society. Society needs knowledgeable, qualified and competent personnel. In this respect, nursing education also has a mission to develop competent human resources to meet the needs of society[4,5].

II.   NEED FOR THE STUDY

Medical errors are a critical issue in healthcare, with far-reaching implications for patient safety, healthcare costs, and quality of care. Nurses, as key healthcare providers, play a pivotal role in the prevention, identification, and management of medical errors.   The World Health Organization (WHO) estimates that adverse events due to unsafe care is one of the top ten causes of death and disability worldwide. Approximately 134 million adverse events occur annually in hospitals in low- and middle-income countries, contributing to 2.6 million deaths each year .

Medical error is the third biggest cause of death in the United States, and it is only exceeded by heart disease and cancer (Makary & Daniel, 2016).   Medical error is an act of omission or commission in planning or execution of care that contributes or could contribute to an unintended result (Grober & Bohnen, 2005)[6].

- Errors of Omission (actions not taken)
- Errors of Commission (wrong actions taken)

STATEMENT OF THE PROBLEM

An exploratory study on knowledge and practice of medical error among nurses and student nurses at selected hospitals in A.P .

OBJECTIVES

1. To assess the level of knowledge regarding medical errors among nurses and nursing students
2. To explore the practices related to the prevention and management of medical errors among nurses and nursing students .

III.   MATERIALS AND METHODS

Descriptive exploratory research design,pre and post test was adopted for conducting this study. in this study Nurses and nursing students were seleced from General ward, MICU, SICU, Oncology Wards in selected Hospital, Nellore. The sample comprised of 30 nurses from General wards, MICU, SICU, Oncology wards and 30 nursing students from General ward, MICU, SICU, Oncology wards . In total the sample size was 60,Non probablty convenient sampling was used.

Structured questionnaire to assess the knowledge scores on medical error among nurses and nursing students. Observational Rating Scale to assess the Practice of Medication Process among Nurses and student nurses

IV.   RESULTS AND DISCUSSIONS

The test is conducted by using questionnaire method. The mean score of the test knowledge was 19.3 for nurses and 17 for student nurses. The test findings reveal that the nurses have adequate knowledge and student nurses have moderate knowledge.

The findings shows that there was no significant difference found between knowledge score and age ($p \geq 0.22$), gender ($p \geq 0.80$), professional qualification ($p \geq 0.84$). years of experience ($p \geq 0.63$) at a level of significance ($p \leq 0.05$).

The mean score of the test Practice was 21 for nurses and 18 for student nurses. The test findings reveal that the nurses and student nurses have adequate knowledge.

Major Findings of the study were as Follows
- ❖ Majority of the participants 35 (58.33%) were in the age group of 20 to 29 years
- ❖ Majority of the participants 42 (70%) were females
- ❖ Majority of the participants 20 (33.33%) were Experienced in Oncology Ward
- ❖ Majority of the participants 54 (90%) were B.Sc. Nurses & Nursing students
- ❖ Majority of participants 36 (60%) were from Nuclear Family
- ❖ Majority of participants 50 (50%) had adequate knowledge and 50 (50%) had moderate knowledge regarding Medical Errors among Nurses Nursing Students.
- ❖ There was a Non significant association between the level of knowledge and practice regarding Medical Errors among Nurses and Nursing Students with their selected socio demographic variables such as Age . As evidenced by p value greater than 0.05 ($P > 0.05$)

ANALYSIS AND INTERPRETATION

Statistical analysis helps the researchers make sense of quantitative information without statistics; quantitative data would be a chaotic mass of numbers.

Statistical procedure enable researcher to summarize, organize, evaluate, interpret and communicate, numerical information (Polit and Beck, 2004**).**

The purpose of analysis is to reduce data into an interpretable and meaning so that the results can compare and significance can be identified.

Presentation of Data and Analysis

The data was organized and presented in the following sections:-

Section 1:-Description of Demographic variables of Nurses and Student Nurses.

Section 2:-Mean and standard deviation of knowledge scores regarding Medical Errors among Nurses and Student Nurses in selected Hospital, Nellore.

Section 3:-Frequency and percentage distribution of knowledge scores regarding Medical Errors among Nurses and Student Nurses in selected Hospital, Nellore.

Section 4:- Mean and standard deviation of Practice scores regarding Medical Errors among Nurses and Student Nurses in selected Hospital, Nellore.

Section 5:- Frequency and percentage distribution of Practice scores regarding Medical Errors among Nurses and Student Nurses in selected Hospital, Nellore.

Section 6:- Association between the level of knowledge scores regarding Medical Errors among Nurses and Student Nurses with their selected socio-demographic variables.

SECTION I:- DESCRIPTION OF DEMOGRAPHIC VARIABLES OF NURSES AND STUDENT NURSES.

In this section the Demographic variables of the sample such as Age, Gender, Educational status, Area of Experience, Type of Family are described in terms of frequency and percentage.

Table No-1: Frequency and Percentage distribution of Demographic variables of Nurses and Student Nurses

S. NO	DEMOGRAPHIC VARIABLES	FREQUENCY		PERCENTAGE (%)	
		NURSES	STUDENT NURSES	NURSES	STUDENT NURSES
1	**Age in years** 1. 19-21 years 2. 22-29 years 3. 30-39 years 4. 40-49 years	1 20 7 2	15 15 _ _	3.33% 66.66% 23.33% 6.66%	50% 50% _ _
2	**Gender** 1. Male 2. Female	3 27	15 15	10% 90%	50% 50%
3	**Educational Status** 1. GNM 2. B.Sc. Nursing 3. P.B. B.Sc. Nursing 4. M.Sc. Nursing	_ 24 6 _	_ 30 _	_ 80% 20% _	_ 100% _
4	**Area of Experience** 1. General ward 2. MICU 3. SICU 4. Oncology Wards	4 8 8 10	11 7 2 10	13.33% 26.66% 26.66% 33.33%	36.66% 23.33% 6.66% 33.33%
5	**Type of Family** 1. Nuclear 2. Joint	8 22	28 2	26.66% 73.33%	93.33% 6.66%

Table No 1: Indicates the description of frequency and percentage of demographic variables of Age, Gender, Educational status, Area of Experience, Type of Family.
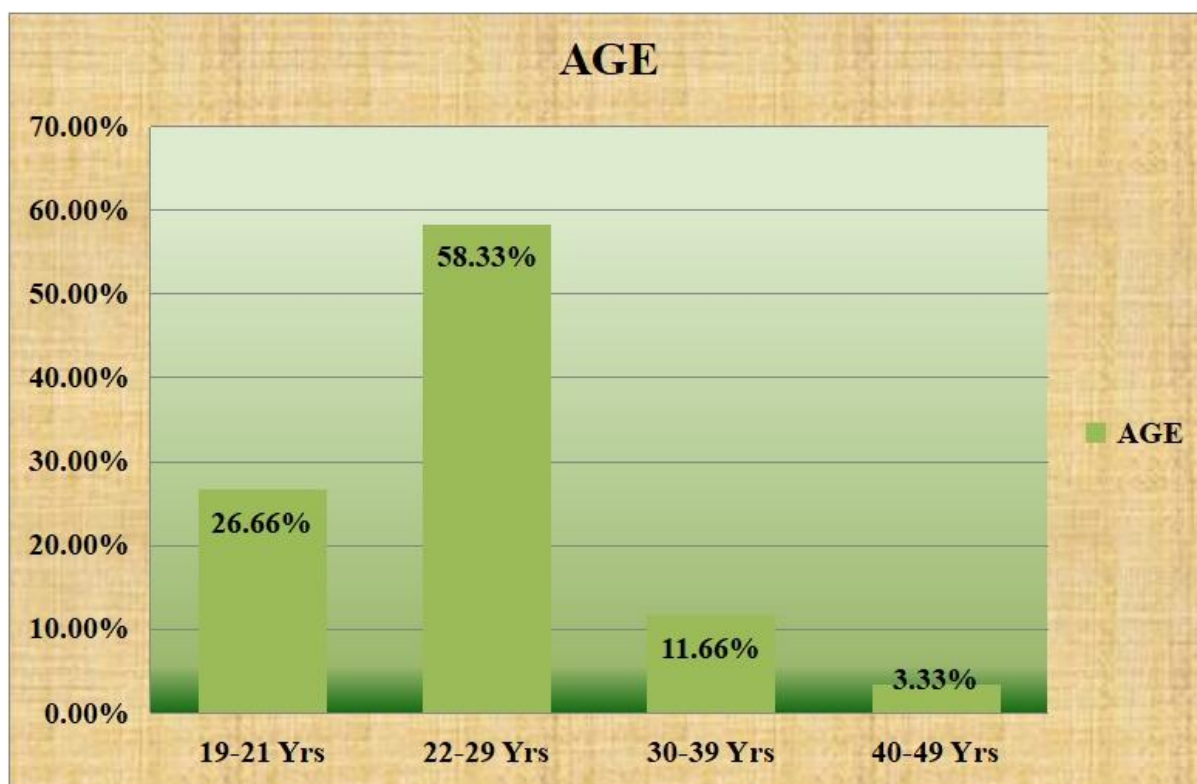

Figure No.3: Percentage Distribution of Nurses and Student Nurses according to Age
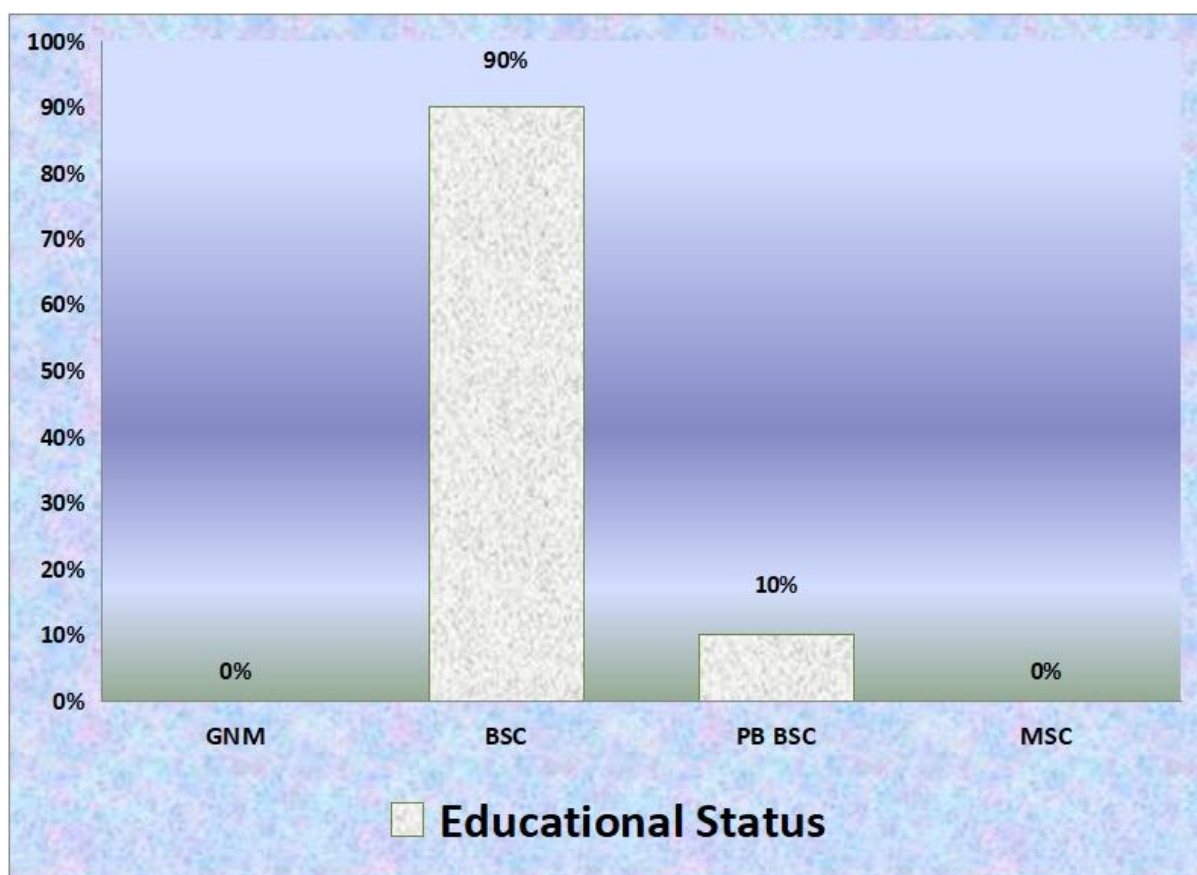

Figure No.5: Percentage Distribution of Nurses and Student Nurses according to Educational Status
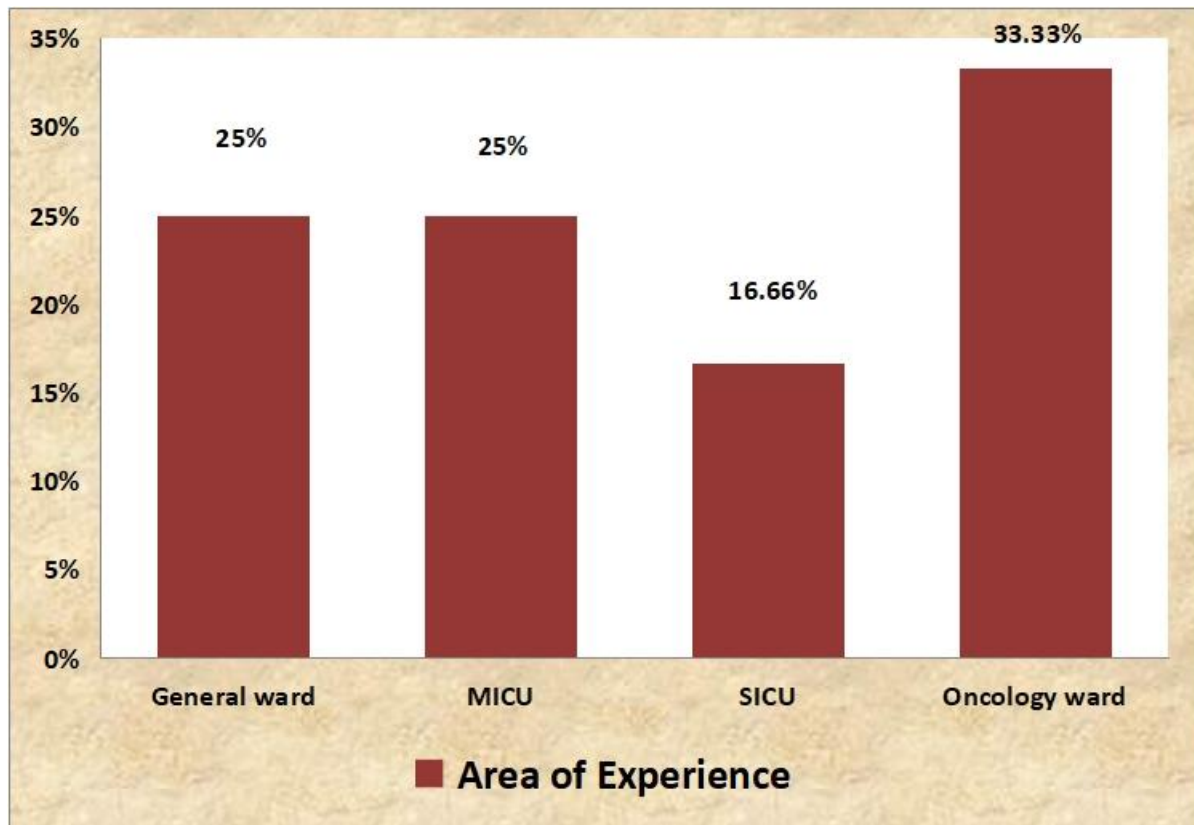
Figure No.6: Percentage Distribution of Nurses and Student Nurses according to Area of Experience
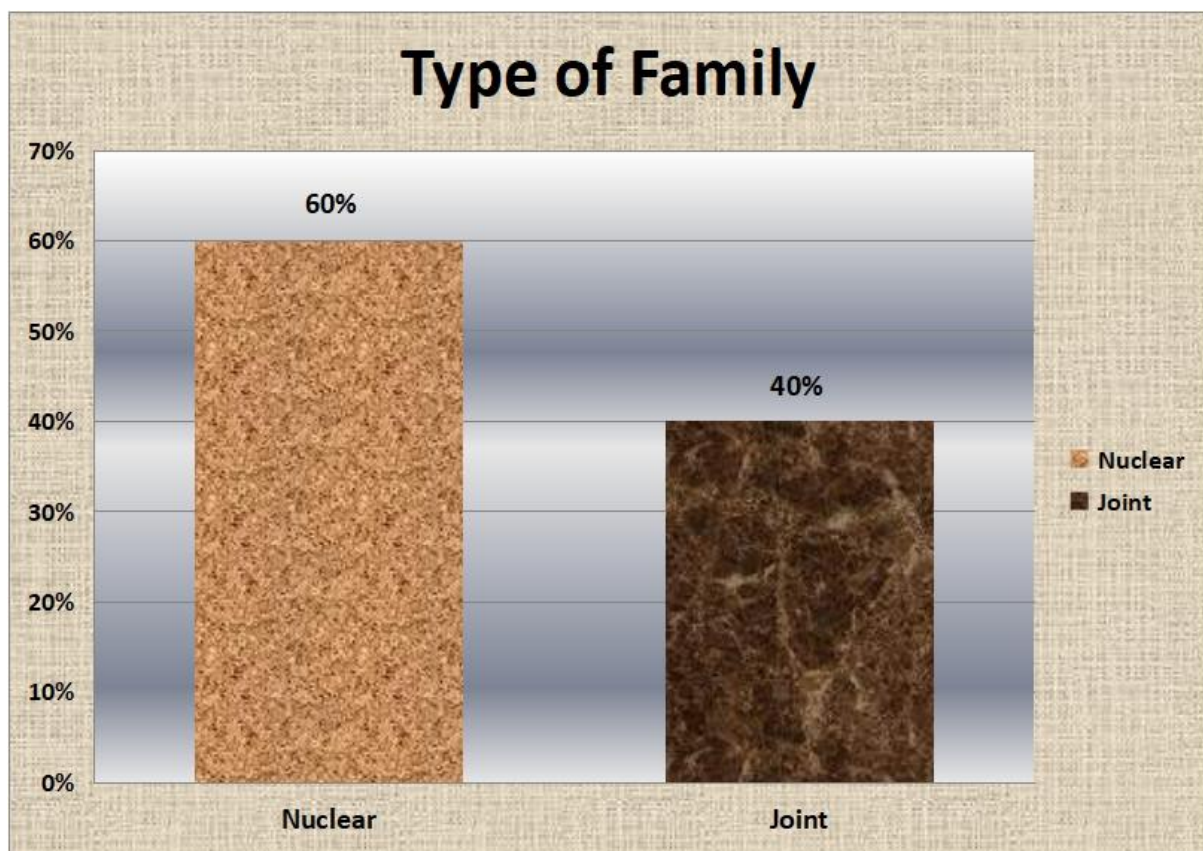

Figure No.7: Percentage Distribution of Nurses and Student Nurses according to Type of Family.

Section II- Mean and Standard Deviation of knowledge scores of Nurses and Student Nurses.
In this section data on level of knowledge regarding Medical Errors among Nurses and Student Nurses in selected Hospital in Nellore, is analyzed in terms of mean and standard deviation.

Table No 2: Mean and standard deviation level of knowledge scores
N=60

Knowledge score	Mean		Median		Mode		SD	
	Nurses	Student Nurses	Nurses	Student Nurses	Nurses	Student Nurses	Nurses	Student Nurses
Nurses and Student Nurses	19.3	17	20	17	20	16	2.14	2.1

The table No:2; Depict the data on level of knowledge scores regarding Medical Errors among Nurses and Student Nurses in selected Hospital, Nellore.

Section III-Frequency and Percentage Distribution of level of knowledge scores
In this section the data on level of knowledge regarding Medical Errors among Nurses and Student is analyzed in terms of frequency and percentage.

Table No3: Frequency and percentage distribution of knowledge scores
N=60

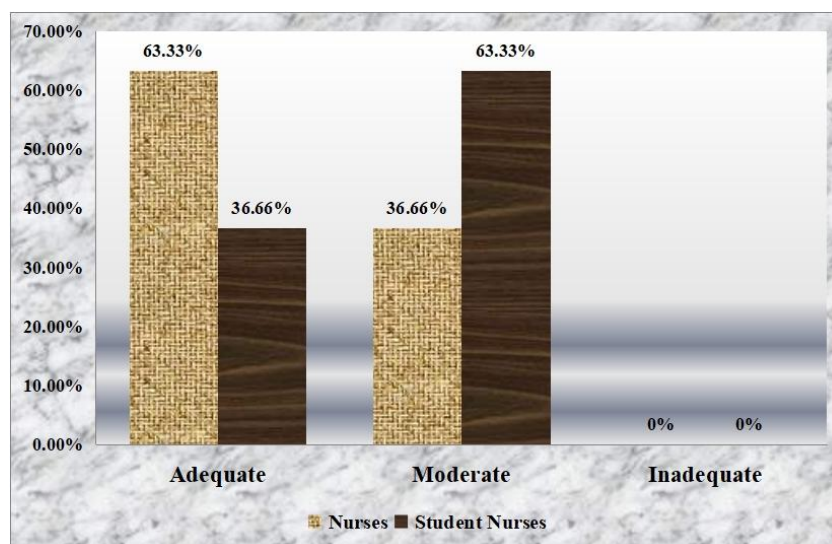| Knowledge score	Score Interpretation	Frequency		Percentage	
		Nurses	Student Nurses	Nurses	Student Nurses
Adequate knowledge	>75 %	19	11	63.33%	36.66%
Moderate knowledge	50-75 %	11	19	36.66%	63.33%
Inadequate knowledge	<50%	–	–	–	–

Figure no: 8: Percentage Distribution of Nurses & Nursing Students according to Knowledge scores

Section IV- Mean and Standard Deviation of practice scores of Nurses and Student Nurses.
In this section data on level of practice regarding Medical Errors among Nurses and Student Nurses in selected Hospital in Nellore, is analyzed in terms of mean and standard deviation.

Knowledge score	Mean		Median		Mode		SD	
	Nurses	Student Nurses	Nurses	Student Nurses	Nurses	Student Nurses	Nurses	Student Nurses
Nurses and Student Nurses	21	18	21	18	21	18	0.9	1.5

The table No:4 ; Depict the data on level of practice scores regarding Medical Errors among Nurses and Student Nurses in selected Hospital, Nellore.   **Section V -Frequency and Percentage Distribution of level of practice scores**
In this section the data on level of practice regarding Medical Errors among Nurses and Student is analyzed in terms of frequency and percentage.

Table No 5: Frequency and percentage distribution of practice scores
N=60

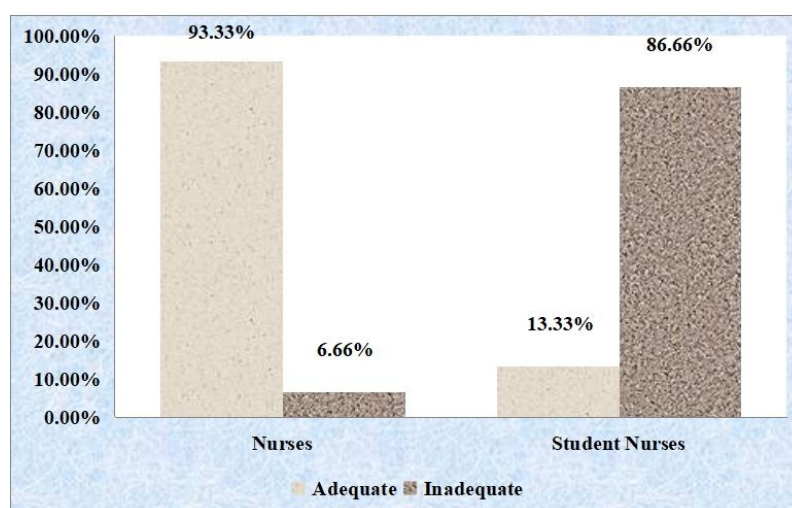| Practice score	Score Interpretation	Frequency		Percentage	
		Nurses	Student Nurses	Nurses	Student Nurses
Adequate knowledge	>80 %	28	4	93.33%	13.33%
Inadequate knowledge	<80%	2	26	6.66%	86.66%

Figure no: 9: Percentage Distribution of Nurses & Nursing Students according to Practice scores

Section VI; Association between the level of knowledge scores with selected socio demographic variables
In this section the data on knowledge scores with their selected socio demographic variables such as Age, Gender, Educational status, Area of Experience, Type of family.

Association of knowledge scores with selected Socio demographic variables

S.No	Variables	Adequate		Moderate		Inadequate		Chi-square	
		Nurses	Students	Nurses	Students	Nurses	Students	Nurses	Students
1	**Age** 1.15-19 yrs 2.20-29 yrs 3.30-39 yrs 4.40-49 yrs	1 10 6 2	5 6 0 0	0 10 1 0	10 9 0 0	0 0 0 0	0 0 0 0	P = 0.188805 X^2=0.999869 DF = 6	P = 0.704786 X^2= 0.994387 DF = 6
2	**Gender** 1.Male 2.Female	1 18	4 7	2 9	11 8	0 0	0 0	P = 0.255704 X^2=0.879983 DF = 2	P = 0.255704 X^2= 0.879983 DF = 2

3	**Educational Status** 1.GNM 2.B.Sc 3.M.Sc 4.P.B.B.SC	0 15 4 0	0 11 0 0	0 9 2 0	0 1 9 0	0 0 0 0	0 0 0 0	P = 0.849753 X^2=0.990673 DF = 6	P = 1 X^2= 0.985612 DF = 6
4	**Area of Experience** 1.General ward 2.MICU 3.SICU 4.Oncology	2 4 6 7	6 2 1 2	2 4 2 3	5 5 1 8	0 0 0 0	0 0 0 0	P = 0.664173 X^2=0.995232 DF = 6	P = 0.382322 X^2= 0.998991 DF = 6
5	**Type of Family** 1.Nuclear 2.Joint	3 16	11 0	5 6	17 2	0 0	0 0	P = 0.076626 X^2=0.962412 DF = 2	P = 0.265355 X^2= 0.875747 DF = 2

NOTE: - DF=DEGREE OF FREEDOM, S=SIGNIFICANT, NS=NON-SIGNIFICANT

Table No 6: Depict the data on level of knowledge scores with their selected socio demographic variables such as Age, Gender, Educational Status, Area of Experience, Type of Family.
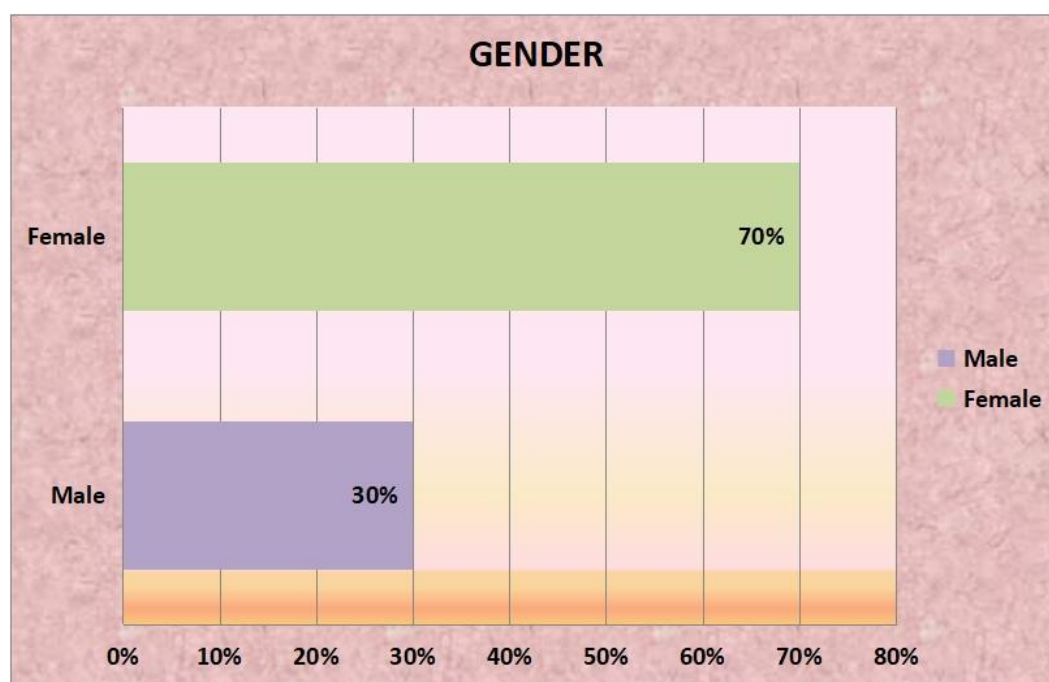

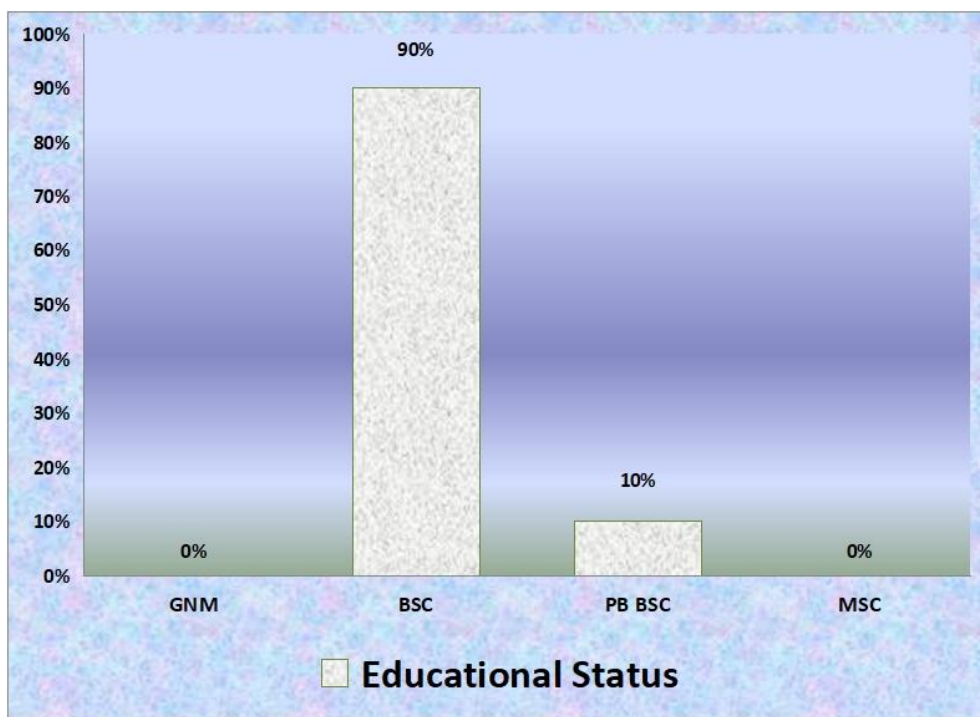**Figure No.4: Percentage Distribution of Nurses and Student Nurses according to Gende**

Figure No.5: Percentage Distribution of Nurses and Student Nurses according to Educational Sta

V. SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATIONS

SUMMARY:
The study to "Assess the level of knowledge and practice of medical error among nurses and student nurses at selected hospitals in A.P".

The data was collected by questionnaire method which includes demography data, Multiple Select Questions to assess the knowledge and Practice regarding Medical among nurses and nursing students. Descriptive and inferential statistics were used to analyze the data[11].

The following Objectives were set for the study
1. To assess the level of knowledge regarding medical errors among nurses and nursing students
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Major Findings of the study were as Follows
 ❖ Majority of the participants 35 (58.33%) were in the age group of 20 to 29 years
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IMPLICATIONS
Some of the implications from the present study in various areas of nursing are as follows.
Nursing Practice
 • The nurse and nursing students should be equipped with up to date knowledge and practices of medical errors.
Nursing Education
 ❖ The findings of the study indicate that all nurses and nursing students should be made aware of medical errors.

❖ Efforts should be made to improve and expand nursing curriculum to provide more content concerning awareness of medical error.
❖ Nurse and Student nurse can be provided with in-service education to update their knowledge regarding medical errors[13].

Nursing Administration

► Periodic seminars and symposium can be arranged regarding medical errors.

► Nursing administration should take initiative to conduct the periodic health education programme to improve the awareness of medical errors[14,15].

Nursing Research

► Adequate allocution of funds, nursing personnel to conducting the research.

Limitations

► The limited sample size places limitation on the generalization of the study findings.

RECOMMENDATIONS

► A study can be conducted with a larger sample size to confirm the results of the study.

► A similar study can be conducted by using experimental and control group.

► Study can be conducted using random sampling technique.

VI. CONCLUSION

Medication error was perceived as the most common medical errors (MEs; 76%). Negligence was perceived as the most common cause of MEs (80.5%); nurses and doctors (84.5%-89.5%) were considered as staff who make most MEs. Respondents perceived that students commit MEs due to less knowledge about procedures (79%) and inadequate supervision (77%) in the clinical setting. Taking measures in addressing this can reduce MEs in health facilities. Enhanced supervision and effective ways of teaching drug administration are recommended.

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