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Knowledge of nursing students regarding drug calculation and safe drug administration in pediatric ward

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Abstract
The objectives of the study were: to assess Knowledge of nursing students regarding drug calculation and safe drug administration in Pediatric ward, to find out the association of level of Knowledge of nursing students regarding drug calculation and safe drug administration with the selected variables.
A non-experimental approach was adopted for the study. The research design adopted for the study was descriptive design.The sample size of the study comprised of 110 nursing students of M.M. College of Nursing Bachelor of Science of Nursing – 85 students Post Basic Bachelor of Science of Nursing – 25 students. The tool used for data collection was structured knowledge questionnaire.
The data presented also showed that the calculated chi-square values of knowledge of nursing students with age, gender, class, religion, frequency of drug administration and educational program attended were significant and chi square value of practice was significant with age.
The conclusion are drawn from the study that most of the nursing students had average knowledge regarding drug calculation and safe drug administration and most of them had very good practice regarding drug calculation and safe drug administration.

Keywords: Knowledge, nursing students, drug calculation, safe drug administration and pediatric ward

Introduction
Safety is one of the main objectives for all health care systems and it is a key step in ensuring a good quality of life. Right dosage calculation and safe drug administration are the two main components for effective treatment of patient. Drugs are prepared and administered in the amount ordered by the physician. Medication errors occur when medications are ordered, transcribed, dispensed, administered and monitored. Nurses and student nurses need to be proficient enough, drug calculation and safe drug administration [1].
As incorrect medication administration and misunderstanding of medication for the patient can lead to poor patient outcomes that extend beyond the immediate situation [2].
Patient safety and quality care are issues of major concern worldwide and are significant challenges facing healthcare systems, clinical practice and nursing education. Patient safety is especially faces many challenges that ensuring students have the knowledge and abilities to safely administer medications to patients. Safety in drug calculation and drug administration by nursing students is an area that has been explored by nurse researchers. Drug calculation and drug administration is a common and necessary core competency in nursing care [3].
For adults, the reported incidence of errors in treatment with medication ranges from 1%-30% of all hospital admissions, or 5% of orders written. In paediatrics, however, this number has been reported to be as high as one in 6.4 orders. A study by the US Pharmacopeia Medication Error Reporting Program demonstrated a significantly increased rate of medication error resulting in harm or death in paediatric patients (31%), compared with adults (13%).In a more recent study, adverse drug event occurred as a similar rate between paediatric (5.7%) and adult patients (5.3%) [4].
A review of current literature suggests there are three key factors which influence the student's ability to perform accurate medication calculations. These factors are mathematical ability. Understanding the medication formula and being able to link patient to the medication [2].

Materials and methods

A "Non Experimental, Descriptive study was conducted on 110 nursing students selected with convenient sampling technique. Out of 110 students 85 were from Bachelor of Science of Nursing or 25 were from Post Basic Bachelor of Science of Nursing. The students who are present at time of data collection and those are posted in paediatric wards were included in the study. Structured knowledge questionnaire was used to obtain necessary data. Structured knowledge questionnaire comprised of 30 knowledge items regarding drug calculations and safe drug administration. The reliability of Knowledge questionnaire was calculated by KR20 (0.68). Ethical approval was obtained from the principle of the M.M. Institute of Nursing for conducting the research study.

Data collection was done on 27 Feb. 2016 - 04 March 2016 on Bachelor of nursing 3rd year students and Post Basic Bachelor of Science of nursing 1st year students of M.M. College of Nursing posted in pediatric ward. There was no interference on the routine academic activities while collecting data from the student. Self introduction and establishing rapport with subject was done. Purpose of the study was explained to the samples, the confidentiality of their responses was assured and professional norms were maintained. Data was collected by the researchers using paper pencil for checking knowledge. 45 minutes to fill knowledge questionnaire was taken by nursing students. No problem faced during data collection.

In the study, descriptive and inferential analysis using frequency, range, mean, median, standard deviation and chi square test were used.

Result

Frequency and percentage distribution of nursing students in terms of sample characteristics shows that majority (90%) of the sample were aged 19-22 years, majority (82.7%) were females. Majority (72.7%) belonged to Hindu religion and (96.4%) were posted in paediatric medical ward. Less than half of the nursing students (37.3%) were administering drug two times to the patient per day and majority (86.4%) of sample were not attended any educational programs.

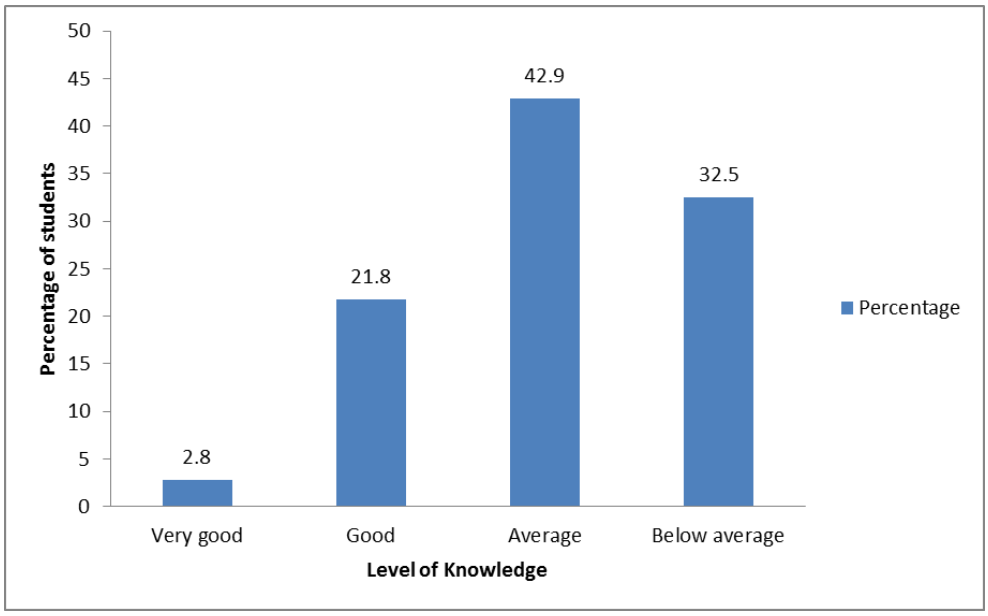

Fig 1: The bar diagram showing frequency and percentage distribution of nursing students based on level of knowledge regarding drug calculation and safe drug administration.

Table 1: Range, Mean, Standard Deviation & Median of Knowledge Score of Nursing Students Regarding Drug Calculation and Safe Drug Administration, N=110

	Range	Median	Mean ± SD
Knowledge score	5-23	17	16.02 ± 3.625

Maximum score=30, Minimum score=0

Table 1:- depicts that mean knowledge score of nursing students regarding drug calculation and safe drug administration was 16.02±3.625 and median was 17. Table 2 depicts that area wise mean knowledge score of nursing students regarding drug calculation and safe drug administration. The highest mean percentage was found in the area of routes of drug administration (60.66%) and the lowest mean percentage was found in the area of drug calculation (41.90+%).

Table 2: Area Wise Mean, Mean Percentage and Range of Knowledge Score of Nursing Students Regarding Drug Calculation and Safe Drug Administration, N=110

Area	Maximum score	Range	Mean	Mean %	Rank
Drug calculation	11	1-8	4.61	41.90	3rd
Routes of drug administration	6	0-6	3.64	60.66	1st
Medication practices	13	1-11	7.77	59.76	2nd

Maximum score=30, Minimum score=0

Table 3: Chi Square Value Showing Association between Levels of Knowledge with Sample Characteristics, N=110

S. No.	Sample characteristics	Knowledge Level				DF	χ^2
		Below Average	Average	Good	Very Good		
1	**Age(in years)**						
1.1	19-22	33	44	20	2	3	3.79*
1.2	23-26	3	3	4	1		
2	**Gender**						
2.1	Male	9	10	0	0	3	7.66*
2.2	Female	27	37	24	3		
3	**Class**						
3.1	B.Sc. Nursing	31	34	19	1	3	5.59*
3.2	Post Basic B.Sc. Nursing	5	13	5	2		
4	**Religion**						
4.1	Hindu	28	33	16	3	9	4.24*
4.2	Muslim	1	1	0	0		
4.3	Sikh	7	11	7	0		
4.4	Christian	0	2	1	0		
5	**Posted in Pediatric area**						
5.1	Medicine	35	46	22	3	3	2.00^{NS}
5.2	Surgery	1	1	2	0		
6	**Frequency of drug administration**						
6.1	One	3	10	4	1	9	8.71*
6.2	Two	12	19	8	2		
6.3	Three	15	11	6	0		
6.4	Four	6	7	6	0		
7	**Educational Program attended**						
7.1	Yes	2	8	5	0	3	3.98*
7.2	No	34	39	19	3		

χ^2 (3) = 3.18, χ^2 (9) = 2.26, *Significant ^{NS} Non Significant

Table 3:- depicts that the association between level of knowledge of nursing students with age, gender, class, religion, frequency of drug administration and educational program attended i.e. 3.79, 7.66, 5.59, 4.24, 8.71, 3.98 were significant at 0.05 level and posted in i.e. 2.00 was non significant at 0.05 level.

Discussion

In the present study the objective of the study was to assess the knowledge and practice of nursing students regarding drug calculation and safe drug administration. This study concluded that the student nurses have average knowledge regarding drug calculation and safe drug administration. Consistent results showed a similar study conducted by Ahmad fuadsham suddin and Sarah diyanashafie in 2011 which revealed that the head nurses and staff nurses have average knowledge in preparation and administration of intravenous medication [5].

- Also in consistence with the study of Ghi-Yin Hsaio, I-Ju Chen, Shu Yu, Only 3·6% of nurses considered themselves to have sufficient knowledge about high-alert medications, 84·6% hoped to gain more training, and the leading obstacle reported was insufficient knowledge (75·4%) [6].

Conclusion

Most of the nursing students have average knowledge regarding drug calculation and safe drug administration. All the variables was significantly associated with selected variables except the posting in pediatric ward.

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