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Effectiveness of Structured Teaching Programme on Knowledge Regarding Safe Drug Administration Among B.Sc. Nursing Students

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Abstract

Background: Any substance aside from food that is used to treat, diagnose, prevent, or lessen the symptoms of an illness or other abnormal state is considered a drug. The process of administering a medication to a patient via many routes is known as drug administration. It is just as crucial as medication computation; once the drug has been calculated, the right administration skills and expertise are required. The proper timing, route, and rights of drug administration should all be known to the administrator. Because even a small error could hurt a patient, nursing care relies heavily on calculation and administration procedures. Since nurses are essential in the administration of medication, their proficiency in this area is fundamental to drug safety.

Materials and Methods: A pre-experimental research design was adopted for the study, and 100 B.Sc. Nursing students were chosen using a non-probability Prospective sampling technique. Data was gathered to evaluate the efficacy of a structured education program on knowledge regarding safe drug administration among nursing students.

Results: The study found that before intervention, 56% of B.Sc. Nursing students demonstrated varying levels of knowledge, with 35% having average knowledge, 9% having good knowledge, and 56% having poor knowledge of safe drug administration. After the intervention, 67% had good knowledge, 24% had average knowledge, and 7% had poor knowledge. The mean post-test knowledge score was higher than the pre-test score.

Conclusion: Based on the findings of the study, it was concluded that the mean post-test knowledge score among B.Sc. Nursing students regarding safe drug administration was higher after the intervention. It was also concluded that there was no significant association between post-test level of knowledge regarding safe drug administration among B.Sc. Nursing students with their socio-demographic variables.

Keywords: Safe drug administration, Nursing students.

Introduction

Medication safety is a fundamental aspect of nursing practice due to its direct influence on patient well-being, stemming from errors in medication administration.[1,2] At the crux of nursing education lies the responsibility of nursing students in administering medications during clinical rotations, emphasizing the necessity for a thorough grasp of medication knowledge and skills.[1]

An essential part of patient care and healing is accurately performing medical orders, which is a key aspect of nursing practice. Medication errors can significantly impact patient safety, increase treatment costs, and pose risks to patients and their families. These errors may lead to higher mortality rates, longer hospital stays, and increased medical expenses. While medication errors can occur at any stage of healthcare, Medication error rates among nurses are high in both developed and developing countries.[2]

Nursing professionals are crucial in preventing medication errors, serving as the final barrier between patients and medications. However, despite this responsibility, nurses often lack proper training in handling errors, partly due to feelings of guilt, shame, limited knowledge, and fear of ethical and legal consequences.[3]

The medication administration process involves three steps: ordering, dispensing, and administration, with nurses responsible for the final step. Safe medication administration is critical in nursing and requires knowledge of dosage calculations, routes, dispensing systems, and protocols. Inadequate training and experience are closely linked to medication errors. Nursing students' competence in both the theoretical and practical aspects of medication is essential for effective clinical decision-making.[4]

RESEARCH STATEMENT

A pre-experimental study to assess the effectiveness of structured teaching program on knowledge regarding safe drug administration among the B.Sc. Nursing students of Desh Bhagat University, School of Nursing district Fatehgarh Sahib, Punjab.

OBJECTIVES OF STUDY:

1. To assess the level of knowledge regarding safe drug administration among B.Sc. Nursing students.
2. To evaluate the effectiveness of structured teaching programme on knowledge regarding safe drug administration among B.Sc. Nursing students
3. To find out the association between post-test knowledge score among B.Sc. Nursing students with their demographic variables.

Material and Methods:

For the present study quantitative research approach and pre-experimental design were used. The non-probability purposive sampling technique was used to select the 100 B.Sc. Nursing students at Desh Bhagat University, School of Nursing district Fatehgarh Sahib, Punjab. The sample was selected by a non-probability purposive sampling technique. Data was collected using a demographic data sheet and structured questionnaires were used to assess the level of knowledge regarding safe drug administration. The tool consisted of 60 questions to assess the knowledge regarding the safe drug administration, and it has domains such as Policies of drug administration, Drug administration, Drug preparation, Charting of medication, holding and discontinuation of drugs, Errors of drug administration and Drug calculation. A structured teaching programme was given to the B.Sc. Nursing students regarding safe drug administration. The data was analysed and presented in tables and figures.

Results

Description of Baseline profile of B.Sc. nursing students

Table-1: Baseline Profile of B.Sc. Nursing students.

N=100

S.NO	Variables	f	%
1	**Age**		
1.1	18-20	20	20
1.2	21-23	52	52
1.3	24-26	22	22
1.4	27-29	06	06
2	**Gender**		
2.1	Male	62	62
2.2	Female	38	38
3	**Current year of education**		
3.1	3rd semester	10	10
3.2	4th semester	36	36
3.3	5th semester	08	08
3.4	6th semester	29	29
3.5	4th year	17	17
4	**Source of information**		
4.1	Books/Newspapers	28	28
4.2	Social media/magazines	07	07
4.3	Health professionals	34	34
4.4	Parents/peer groups	15	15
4.5	If any other specific	16	16

Table 1 shows the majority of B.Sc. Nursing students (52%) were aged between 21 and 23 years, followed by 22% in the 24-26 age range, 20% between 18 and 20 years, and only 6% in the 27-29 age range. In terms of gender, 62% of the students were male, while 38% were female. As for their academic progression, 36% were in their 4th semester, 29% in their 6th semester, 17% in their 4th year, 10% in their 3rd semester, and 8% in their 5th semester. Regarding sources of information, 34% of students learned from health professionals, 28% from books and newspapers, 16% from specific sources, 15% from parents and peer groups, and just 7% from social media and magazines.

Table 2: Knowledge level regarding safe drug administration among B.Sc. Nursing students.
N=100

Variable	Category	Pre-test		Post test	
		f	%	f	%
Level of knowledge	Good	09	09	67	67
	Average	35	35	24	24
	Poor	56	56	07	07

Table 2 illustrates that before the intervention, most B.Sc. Nursing students (56%) had a poor level of knowledge regarding safe drug administration, followed by 35% with an average level of knowledge, and only 9% with a good level of knowledge. However, in the post-test, most students 67% demonstrated a good level of knowledge, 24% had an average level of knowledge, and only 7% showed a poor level of knowledge regarding safe drug administration. (Fig:1)

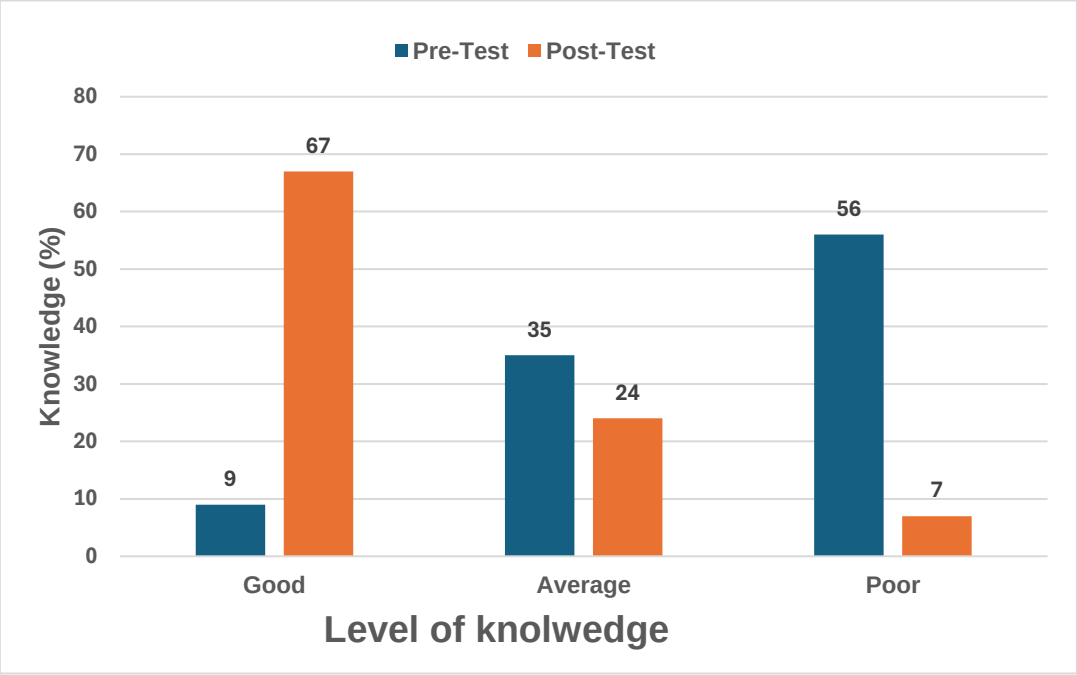

Figure 1: Knowledge regarding safe drug administration among B.Sc. Nursing students.

Table 3: Domain-specific knowledge regarding safe drug administration among B.Sc. Nursing students.
N=100

Knowledge Domain	Pre-test						Post-test					
	Good		Average		Poor		Good		Average		Poor	
	f	%	f	%	f	%	f	%	f	%	f	%
Policies of drug administration (Max. score=3)	11	11	37	37	52	52	40	40	45	45	15	15
Safe Drug administration (Max. score=20)	01	01	78	78	21	21	61	61	36	36	03	03
Drug preparation (Max. score=6)	10	10	51	51	39	39	52	52	43	43	05	05
Charting of medication	19	19	54	54	27	27	62	62	31	31	07	07

(Max. score=8)												
Withholding of medication (Max. score=4)	23	23	52	52	25	25	69	69	23	23	08	08
Medication error (Max. score=8)	15	15	35	35	50	50	56	56	37	37	07	07
Drug calculation (Max. score=11)	12	12	34	34	54	54	63	63	24	24	13	13

Table 3 depicts the domain-wise frequency and percentage distribution of level of knowledge score regarding safe drug administration among B.Sc. Nursing students of Desh Bhagat Institute of Nursing, Mandi Gobindgarh, Punjab.

In the domain of drug administration policies, the pre-test results revealed that the majority of B.Sc. Nursing students (52%) had a poor level of knowledge, followed by 37% with an average level of knowledge, and only 11% with a good level of knowledge regarding safe drug administration. However, the post-test results showed a shift, with 45% of students demonstrating an average level of knowledge, 40% showing a good level of knowledge, and only 15% with a poor level of knowledge.

Similarly, in the domain of safe drug administration, the pre-test indicated that the majority of B.Sc. Nursing students (78%) had an average level of knowledge, followed by 21% with a poor level, and only 1% with a good level of knowledge. By the post-test, there was a notable improvement, with 61% of students achieving a good level of knowledge, 36% maintaining an average level, and only 3% having a poor level of knowledge. These findings highlight a significant enhancement in the students' understanding of both drug administration policies and safe drug administration after the intervention.

In the domain of drug preparation, the pre-test results showed that the majority of B.Sc. Nursing students (51%) had an average level of knowledge, followed by 39% with a poor level, and only 10% with a good level of knowledge regarding safe drug administration. However, in the post-test, most students (52%) demonstrated a good level of knowledge, followed by 43% with an average level, and only 5% with a poor level of knowledge.

In the area of charting medication, the pre-test findings revealed that most B.Sc. Nursing students (54%) had an average understanding, 27% had a poor understanding, and 19% had a good understanding of safe drug administration. After the intervention, the post-test results showed significant progress, with 62% of students demonstrating a good level of knowledge, 31% maintaining an average level, and only 7% showing a poor level of knowledge. This highlights a substantial improvement in the students' knowledge of charting medication following the intervention.

The pre-test revealed that most B.Sc. Nursing students (52%) had an average level of knowledge in medication withholding and discontinuation, followed by 25% with a poor level and 23% with a good level. Sixty-nine percent showed strong knowledge on the post-test, twenty-three percent had moderate knowledge, and just eight percent had low knowledge.

50% of students had low knowledge, 35% had moderate knowledge, and 15% had strong knowledge in medication errors, according to the pre-test results. 56% of students demonstrated an excellent level of knowledge by the post-test, 37% an average level, and only 7% a bad one.

The pre-test results for drug calculation revealed that the majority of B.Sc. Nursing students (54%) had a poor level of knowledge, followed by 34% with an average level and only 12% with a good level of understanding on safe drug administration. However, in the post-test, 63% of students had a high level of knowledge, 24% had a medium level, and just 13% had a low level of understanding regarding safe medication administration.

Table 4: Effectiveness of structured teaching programme on knowledge level regarding safe drug administration among B.Sc. Nursing students.

N=100

Variable	Pre-test	Post-test	t-value	p-value
	Mean ± SD	Mean ± SD		
Level of knowledge	25.18 ± 7.97	42.5 ± 8.42	14.73	< 0.001

Max score-60, Min score-0 **t = 1.66,df= 99 ,p<0.05significant**

There was a marked increase in mean scores from pre-test to post-test from 25.18 to 42.5, p< 0.001. The paired t-test revealed a highly significant improvement (t=14.73, p< 0.001) after the intervention**. (Table 4, Fig. 2)**

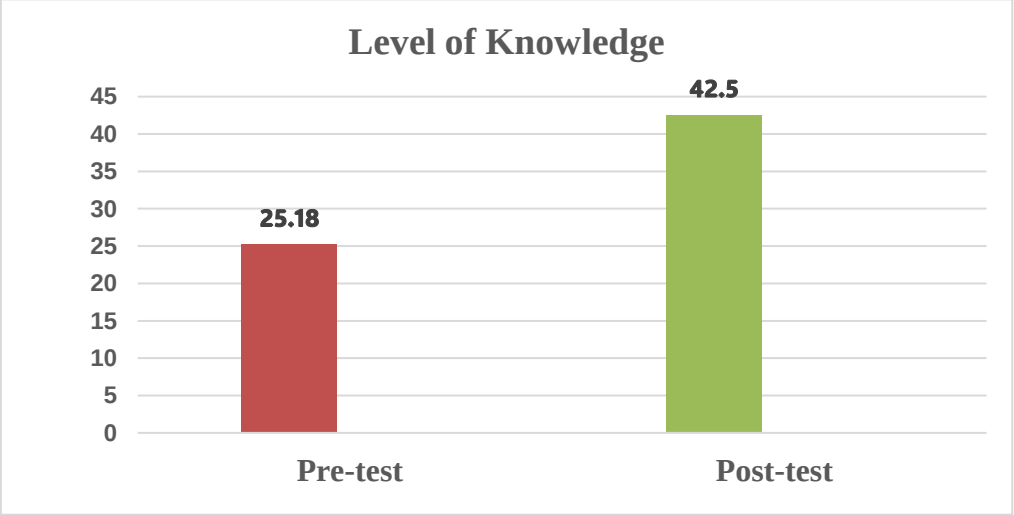

Fig:2 Comparison of knowledge regarding safe drug administration among B.Sc. Nursing students.

Table 5: Association between post-test level of knowledge regarding safe drug administration among B.Sc. Nursing students with their demographic variables.

N=100

S.no	Variables	Level of Knowledge			df	X^2	Table value
		Good	Average	Poor			
1	**Age**						
1.1	18-20	01	06	10	06	1.8	12.59
1.2	21-23	09	19	33			
1.3	24-26	02	08	11			
1.4	27-29	01	02	02			
2	**Gender**						
2.1	Male	06	21	34	02	0.13	5.99
2.2	Female	03	14	22			
3	**Current year of education**						

3.1	3rd semester	00	04	06	08	8.21	15.21
3.2	4th semester	03	13	20			
3.3	5th semester	01	02	05			
3.4	6th semester	03	09	17			
3.5	4th year	02	07	08			
4	**Source of information**						
4.1	Books/Newspapers	03	09	16	08	6.23	15.51
4.2	Social Media/Magazines	00	04	04			
4.3	Health Professionals	01	13	18			
4.4	Parents/Peer Groups	03	03	08			
4.5	Any other specific	02	06	10			

*Significant $p<0.05$

Table 5 showed that the chi-square values of age (1.8), gender (0.13), current year of education (8.21), and source of information (6.23) were found non-significant.

Discussion

It was found that the level of knowledge regarding safe drug administration among B.Sc. Nursing students performed good in the post-test as compared to the pre-test. In the pre-test, a significant portion of students, 56%, demonstrated a poor level of knowledge. Conversely, in the post-test, most students, 69%, exhibited a good level of understanding regarding safe drug administration. Study findings revealed that most nurses had average knowledge scores, followed by poor scores, and a few had good scores.[5] Similar results were found from other studies that found that the post-test knowledge and practice scores of the staff nurses on the safe administration of drugs were statistically higher.[6] Medication calculation courses positively impacted students' skills, with those receiving traditional face-to-face lectures showing significantly greater improvement than those taking the e-learning course.[7] Nursing students often struggle with mathematical and drug dose calculation skills, highlighting the need for changes in educational strategies within nursing curricula.[8]

Conclusion

The findings of the study showed that the mean score of post-test knowledge was higher than the mean score of pre-test knowledge. So, due to insufficient data researcher rejects the null hypothesis and accepts the research hypothesis. There would be no significant association between the post-test level of knowledge regarding safe drug administration among B.Sc. Nursing students with their socio-demographic variables.

RECOMMENDATIONS

Based on findings of the study, the following recommendations had been made for the further study.

1. Replication of the same study on large samples may help to draw conclusions that are more definite and generalize to a larger population.
2. A comparative study can be conducted regarding safe drug administration between student nurses and staff nurses.
3. A quasi-experimental study can be conducted regarding the drug calculation.

4. The findings can be used for planning, implementation and evaluation to assess the problems of nursing students regarding safe drug administration.

Nursing Implication:

1. Nurses are the key persons of the health team, who play a major role in health promotion and maintenance. Nursing care is an art and science in providing quality care.
2. The study implies a basis for developing new skills and enhancing knowledge in nursing students.
3. Nursing personnel working in different areas should be given in-service education which helps them to update with recent knowledge.
4. As a nurse educator, there are abundant opportunities for nursing professionals to educate students regarding safe drug administration

References

1. Osuchukwu EC, Agba M, Osuchukwu NC. Medication safety knowledge and practice among nursing students: A parallel-group randomized controlled trial at the University of Calabar Teaching Hospital. J Educ Health Promot. 2024;13:400. Published 2024 Oct 28. doi:10.4103/jehp.jehp_1615_23 Stedman's medical dictionary 2014.https://www.cancer.gov/def/drug.
2. Raghavendran M, Bhattarcharjee T, Revathi R. A Descriptive Study to Assess Knowledge Level Regarding Prevention of Medication Error among Students in Selected Nursing College, Kanpur. Int. J. Pharm. Investigation. 2021;11(3):324-6.
3. Cancino KD, Arias M, Caballero E, Escudero E. Development of a safe drug administration assessment instrument for nursing students. Revista Latino-Americana De Enfermagem 2020;28. doi.org/10.1590/1518-8345.2989.3246.
4. Mtuankure JM, Kyalo AM, Githemo G. Knowledge of the administration of medications among undergraduate nursing students in selected clinical sites in Kenya. African Journal of Health Sciences 2023;35(6):757–67. doi.org/10.4314/ajhs.v35i6.10.
5. Kaur A, Charan GS. A study to assess the knowledge regarding medication error among staff nurses at SGRD Hospital, Amritsar, Punjab. Int J Health Sci Res. 2018; 8(8):213-218.
6. Raghavan S, Bhardwaj U, Rani S. To study the effectiveness of the training program on safe administration of drugs to reduce the medication error. Indian J Holist Nurse. 2020;11(3):12-9.
7. Van Lancker A, Baldewijns K, Verhaeghe R, Robays H, Buyle F, Colman R, et al. The effectiveness of an e-learning course on medication calculation in nursing students: a clustered quasi-experimental study. Journal of Advanced Nursing 2016;72(9):2054–64. doi.org/10.1111/jan.12967.
8. Guneş UY, Baran L, Yilmaz DK. Mathematical and drug calculation skills of nursing students in Turkey. International Journal of Caring Sciences. 2016 Jan 1;9(1):220.