



EFFECTIVENESS OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE ON PEDIATRIC DRUGS AND IV FLUID CALCULATION AMONG B. Sc (N) 3RD YEAR STUDENTS AT SELECTED NURSING COLLEGES, HYDERABAD, TELANGANA

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Abstract

A Pre experimental study was undertaken to assess the “Effectiveness of structured teaching program on knowledge on pediatric drugs and IV Fluid calculation among B. Sc nursing 3rd year students at selected nursing colleges at Hyderabad, Telangana.” A quantitative approach and a Pre experimental one group pre- test and post- test design were used in this investigation. A non-probability convenient sampling technique to select 60 samples for the study. To guide B. Sc(N) 3rd year students' familiarity with Pediatric Drugs and IV Fluid calculation, we created a self-structured questionnaire. Prior to the commencement of the study, the B. Sc(N) 3rd year students were briefed on its objectives. A pre-test was administered to each sample, then the researcher gave the samples a structured teaching program. A week later, every single sample was given another test. Prior to doing the analysis, the data was evaluated and interpreted using descriptive and inferential statistics. According to the study's findings, the data was analyzed with the help of descriptive and inferential statistics and finding were interpreted. In pre- test, majority 54(90%) of the students scored below average and 6(10%) of the students scored average. Whereas in post- test, majority 43(72%) of students were scored above average, 15(25%) of students were scored average and 02(03%) of students were scored below average. The results have shown that over all mean percentage of pre- test of knowledge levels was 13.27 and post- test mean percentage was 23.50. The value of standard deviation of pre- test and post- test of knowledge was 1.53 and 2.25 respectively. The computed ‘t’ value of knowledge was 34.87 which was greater than the table ‘t’ value 2.00, which proved that there was a significant difference between pre- test and post- test of knowledge scores of students. Thus, research hypothesis was accepted. This indicated that structured teaching program on pediatric drugs and IV fluid calculation was effective mainly in improving the knowledge levels of the B. Sc (N) 3rd year students at selected nursing colleges, Hyderabad, Telangana.

Keywords: Pre Experimental Study, Effectiveness, Structured Teaching Program, Pediatric Drugs and IV Fluid Calculations, Nursing Students.



INTRODUCTION

The children are precious gift of world. A healthy child will be a healthy citizen. To enjoy good health is the birth right of every child. The future of our nation depends on the way in which we nurture our children today. It is the known fact that young children fall an easy-to-get infectious diseases. Administration of the medication is most important nursing responsibility. The need for accuracy in preparing and administering medication to children is greater than that of an adult. Pediatric dose is small when it compared with adult dose and a very small calculation mistake can represent a greater error.

The most essential view point for choice of a medication and foundation of the best possible pediatric dose is the affirmation that the pediatric patient isn't only a little grown-up. Infants, kids and young people have distinctive physiological, pharmacokinetic and pharmacodynamics parameters contrasted with grown-ups. The distinctions are basically identified with the progressions happening and development and require individual dosages. Thus, rules of particular measurements and valuable means for count of pediatric doses must be produced keeping in mind that the end goal is to improve the adequacy and helpful farthest point and avert genuine unfavorable impacts.

The incorrect medication administration and misunderstanding of medication for the patient can lead to poor patient outcomes that extend beyond the immediate situation. 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 face 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.

Mathematical skill is used in areas such as health to calculate drug dosage and liquid quantity, body mass and cost analysis. Mathematical calculations are of great importance in medication. Medication has beneficial effects when given in appropriate dosages, but it can be fatal in the wrong dosages. Medication process begins with inspection and prescription, and ends with the monitoring of the side effects of drugs.

Administration of medication is basic nursing function that involves knowledge and skills. The safe and accurate administration of medication is one of the most important responsibilities of a nurse. Improper administration of medication can cause harmful effects. The nurse administering medication should have the basic knowledge regarding pediatric drugs and IV fluid calculations.

This study aims to evaluate how structured teaching program enhance nursing students' understanding of Pediatric Drugs and IV Fluid Calculation principles. The present study compared the performance of nursing students who were taught through structured teaching program with that of students who were taught using conventional techniques utilizing a Pre experimental one group pre- test and post- test research design. The results of this research may be useful in understanding the potential advantages of incorporating technology-based teaching methods into nursing education, especially with respect to critical clinical skills such as Pediatric Drugs and IV Fluid calculation.

The purpose of this study is to contribute to the ongoing advancement of nursing education by assessing how structured teaching program learning affects student performance, engagement, and retention of information. This research will also examine how such technological interventions can aid in the development of nursing students as competent, confident, and capable healthcare professionals, ultimately enhancing patient care outcomes.

NEED FOR STUDY

Worldwide prevalence rate (National Institute of Health-NIH):

In the pediatric field, the administration of drugs involves a great responsibility, as it directly affects the safety and health of the assisted children. Despite medication errors in children are frequently reported, their epidemiology is difficult to completely understand. It has been estimated that 7.5 million preventable medication errors could occur with pediatric patients in the United States each year. Other studies estimated that 14–31% of pediatric medication errors could result in harm or death. The US Pharmacopeia (USP) Medication Errors Reporting Program reported higher rates of medication errors in pediatric patients (31%) than in adults (13%). According to some authors, an error in the overall spectrum of the delivery process involving prescribing, dispensing, and administering was observed in 5–27% of medication orders for children. Takata et al. observed a 22% of preventable medication error in the inpatient pediatric setting, which could have been identified earlier (17.8%) or mitigated more effectively (16.8%).

In India, 444 million children which is one of the world's largest child & adolescent population. It is over ardent duty to keep the children safe, offered them opportunities that faster physical, social & mental well- being and ensuring that the health care personnel give the best quality care without any errors. India's population is growing faster i.e. 15.5 million babies are born every year or one every two seconds.



LITREATURE REVIEW

Abhilekha Biswal & Daisy Abraham (2023) Conducted a study on Quasi-experimental research approach with pre- test post- test research design was adopted for the study. The study focused on B.Sc. Nursing 3rd year students from selected college of nursing at Bhilal (C.G.). Material and Methods: Total 60 students from the B.Sc. Nursing 3rd year are selected from selected college Nursing Bhilal (C.G.) after obtaining informed consent. Data was collected by tool self-structured questionnaire, and checklist related to pediatric drug calculation, IV fluid calculation, and IV fluid calculation in pediatric burn patient. Score analysis indicates that among 60 students under study in knowledge of pediatric drug calculation, IV fluid calculation and IV fluid calculation in pediatric burn indicates that in pretest 33(55%) had average knowledge 25(41.67%) had poor knowledge and 2(3.33%) had good knowledge related to pediatric drug calculation, IV fluid calculation & IV fluid calculation in pediatric burn. However, in post- test refers to teaching 49(81.66%) had good knowledge & 11(18.33%) had average knowledge & none had poor knowledge related to pediatric drug, IV fluid & IV fluid calculation in pediatric burn. Score analysis indicates that among 60 students under study in skill of pediatric drug calculation, IV fluid calculation and IV fluid calculation in pediatric burn indicates that in pretest maximum 44(73.33%) students are have average skill and 16(26.67%) have poor skill. However, in post- test 45(75%) had good skill and 15 (25%) had average skill related to pediatric drug, IV fluid & IV fluid calculation in pediatric burn.

Indre Brasaitte-Abrome (2021) conducted a cross-sectional study the aim of this study is to evaluate the medication calculation skills of graduating nursing students in six European countries and analyze the associated factors. The students performed two calculations (tablet and fluid) testing medication calculation skills requiring different levels of conceptual understanding and arithmetic. The managers and patients answered one question about the students' medication kills. In total, 1,796 students, 538 managers and 1,327 patients participated the study. The data were analysed statistically. The STROBE guideline for cross-sectional studies was applied. Almost all (99%) of the students performed the tablet calculation correctly, and the majority (71%) answered the fluid calculation correctly. Older age, a previous degree in health care and satisfaction with their current degree program was positively associated with correct fluid calculations. The patients evaluated the students' medication skills higher than the nurse managers did and the evaluations were not systematically aligned with the calculation skills tested.

Jyothi, A. Biswal (2023) Conducted a study to assess the effectiveness of structured teaching program on knowledge and skill of pediatric drug and IV fluid calculation among B. Sc (N) students in selected college Bhilal. A sample of 60 students were taken for the study and data was collected by self-structured questionnaire and check list related to pediatric drug calculation and IV fluid calculation in pediatric burns indicates that in pretest 33 (55%) had average, knowledge 25 (41.67%) had poor knowledge and 2 (3.33%) had good knowledge related to pediatric burn. However in post-test 45 (75%) had good knowledge, 15 (25%) average knowledge had average skill related to pediatric drug and IV fluid calculation in pediatric burn. It was concluded that students gained knowledge on pediatric drugs and IV fluid calculation.

OBJECTIVES OF THE STUDY

- To assess the level of knowledge regarding pediatric drugs and IV fluid calculation among B. Sc (N) 3rd year students by pre- test.
- To evaluate the effectiveness of structured teaching program on knowledge on pediatric drugs and IV fluid calculation among B. Sc (N) 3rd year students by post- test.
- To find out the association between the post-test level of knowledge scores among B. Sc (N) 3rd year students along with their selected demographic variables.

METHODOLOGY

The present pre-experimental one group pre- test and post- test Design study was undertaken to assess the impact of structured teaching program on Pediatric Drugs and IV Fluid Calculation among B. Sc nursing 3rd year students at selected nursing colleges in Hyderabad, Telangana. The study had as its focus the assessment of knowledge and practical competence of nursing students prior and post-intervention. A systematic approach was followed to ascertain the reliability and validity of the results.

Research Design

This Pre experimental one group pre- test and post- test Design study included a control group before and after the test. The researcher adopted the Pre-Experimental one group pre-test and post-test research design in this study.

Study area

The research was carried out in two chosen nursing colleges in Hyderabad, Telangana. The institutions were selected through convenience sampling and their willingness to engage in the research.

Population and Sample

The study population consisted of B. Sc (N) 3rd year students enrolled in the undergraduate



nursing program. The total number of participants was 60. This selection was made using a non-probability convenient sampling method.

Inclusion and Exclusion

Inclusion Criteria:

Students in their third year of nursing college, who were willing to participate in the research, and who were present for both the pre- and post-test assessments were all considered for inclusion in the study. The criteria allowed for the involvement of participants with a high level of academic understanding and accessibility for the full study process.

Exclusion Criteria:

The exclusion criteria were nursing students who had earlier experience with structured teaching program aimed at Pediatric Drugs and IV Fluid Calculation, since it might have led to biased responses and study results. To ensure consistency and precision of the data collected, students who missed any portion of the study—such as the pre-test, intervention, or post-test—were also kicked out.

HYPOTHESIS:

- H1: There will be a significant difference between the pre-test and post- test knowledge regarding pediatric drugs and IV fluid calculation among B. Sc (N) 3rd year Students.
- H2: There will be a significant association between the post-test level of knowledge regarding pediatric drugs and IV fluid calculation among B. Sc (N) 3rd year Students with selected demographic variables.

Variables of the Study

Independent Variable: In this independent variable is Structured teaching program on pediatric drugs and IV fluid calculation among B. Sc (N) 3rd year students.

Dependent Variable: In this study dependent variable is knowledge of B. Sc (N) 3rd year students on pediatric drugs and IV fluid calculations.

Development of the Tool

The tool is divided into two halves.

SECTION-A: Demographic variables of B. Sc(N) 3rd year students: -

It includes two demographic factors about B. Sc (N) 3rd students, like age and where they learnt about Pediatric drugs and IV Fluid Calculation.

SECTION-B:

A self-structured questionnaire is utilized to assess the B. Sc (N)3rd year students' understanding of important Pediatric drugs and IV Fluid Calculation during a structured teaching program. Thirty multiple-choice questions covering

general information on important Pediatric drugs and IV Fluid Calculation.

Interpretation Of Score

The frequency and proportion of structured teaching program on important Pediatric drugs and IV Fluid Calculation based on the pre- and post-test knowledge levels are interpreted as

Description of the Intervention:

The intervention was a structured teaching program, which took about 15 minutes, on the Pediatric drugs and IV Fluid Calculation which includes 10 medication administration rights, 3 checks, routes of medication administration and parenteral route of administration and IV Fluid calculations. The structured teaching was created with AV aids such as flash cards, charts, pamphlets and voice-over narration for enhanced understanding.

Data Collection Procedure

Data collection spanned two weeks. On day one, there was a pre-test for the students aimed at measuring initial knowledge levels.

Thereafter: Students were given the structured teaching program had their usual routine classroom lecture about Pediatric drugs and IV Fluid Calculation. After 7 days, a post-test was administered using the same tools.

Validity:

The tool's content validity was established by submitting it to Child Health nursing specialists. Every expert concurred with the statement and added a few insightful recommendations.

Reliability:

Karl Pearson's method of calculating correlation coefficients was used to verify the tool's reliability. The tool's reliability was indicated by the computed "r" value of 0.9.

Data Analysis:

The data obtained were coded and put into SPSS software. Descriptive statistics (percentage, standard deviation, and mean) were utilized in summarizing test scores and demographic data. To check the impact of the intervention, inferential statistics such as independent and paired t- tests were used, with p 0.05 serving as the significant level.

RESULT AND DISCUSSION:

The above table shows that maximum 41(68%) of students belonged to the age group between 18 to 20 yrs, 19(32%) of students belonged to the age group between 21- 23 years and none of the students belonged to the age group between 15 to 17 yrs.



Table 1: Demographic Variables of B. Sc (N) 3rd year Students Frequency and percentage distribution of B. Sc (N) 3rd year students according to the Age n=60

Age	Frequency	Percentage
15 to 17 yrs	0	0%
18 to 20 yrs	41	68%
21 to 23 yrs	19	32%

Table 2: Frequency and percentage distribution of B. Sc (N) 3rd year students according to the source of information n=60

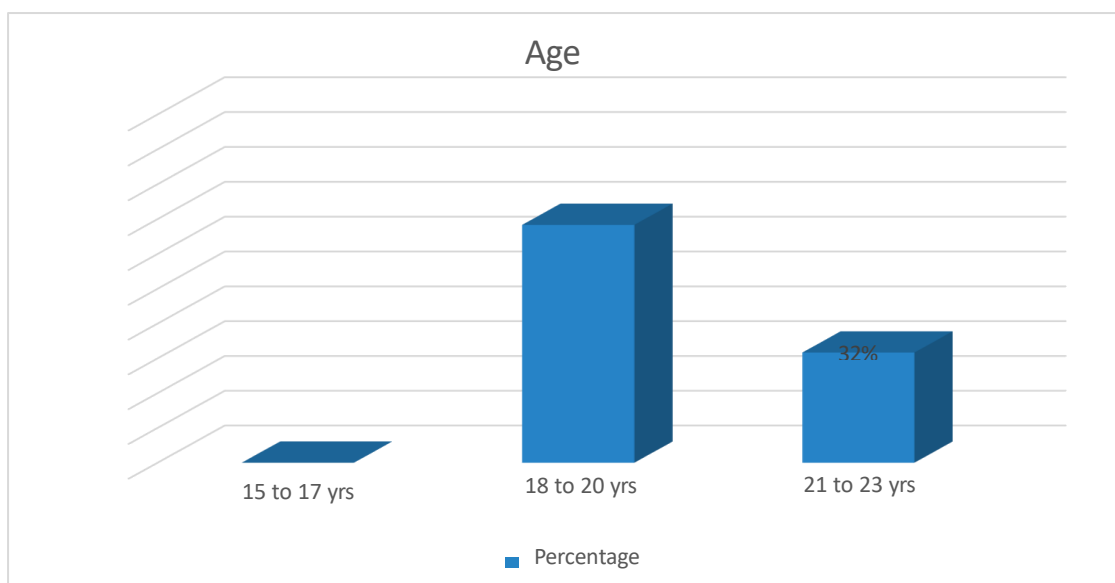
Source of Information	Frequency	Percentage
No	3	5%
Health workers	12	20%
Teachers	39	65%
Others	6	10%

Table 3: Comparing pre- test and post- test level of knowledge on pediatric drugs and IV fluid calculation among B. Sc [N] 3rd year students with mean and standard deviation.

Knowledge levels	Pre test		Post test	
	F	%	F	%
Below average	54	90%	2	3%
Average	6	10%	15	25%
Above average	0	0%	43	72%

Table 4: Cumulative scores of knowledge on pediatric drugs and IV fluid calculation of the B. Sc (N) 3rd year students in pre- test and post- test n=60.

T-test: Paired two sample			
Parameters	Pre- test knowledge scores		Post- test knowledge scores
Mean	13.27		23.50
Standard deviation	1.53		2.25
Standard error	0.20		0.29
T- test	34.87		

NS – Not Significant at $p > 0.05$ **Figure 1: Frequency and Percentage Distribution of B. Sc (N) 3rd year students according to the age**

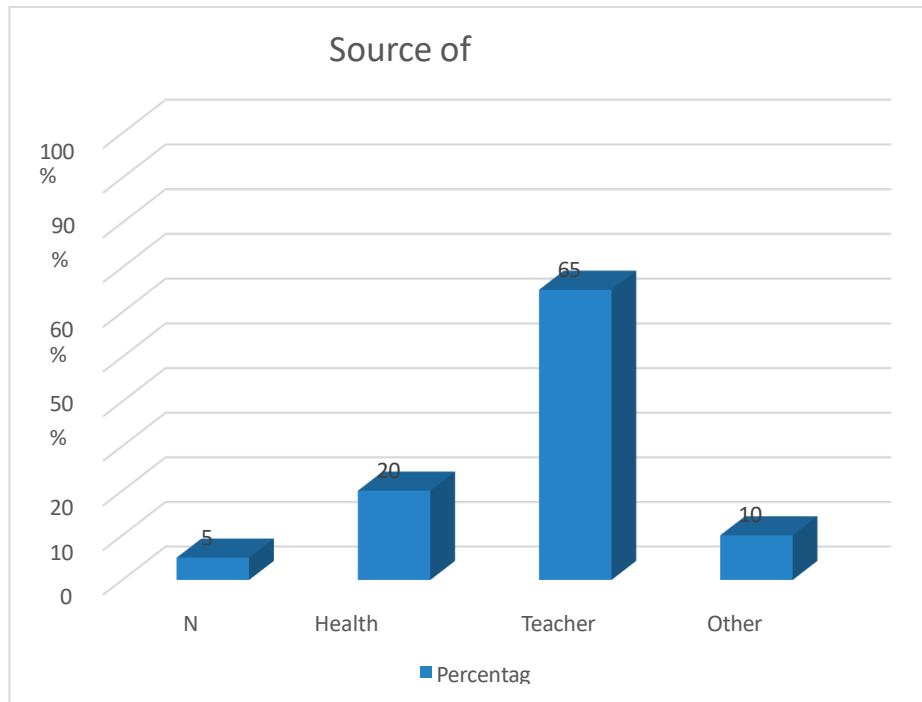


Figure 2: Frequency and Distribution of the B. Sc (N) 3rd year students according to Source of information.

The above Table shows that majority 39(65%) were from teacher, 12(20%) were from health workers, 6(10%) were from others and 3(5%) has no source of knowledge.

The above table shows that in pre- test majority 54(90%) of the students scored Below average and 6(10%) of the students scored average. Whereas in post- test majority 43(72%) of students were scored above average, 15(25%) of students were scored average and 02(03%) of students were scored below average.

The above table shows that in knowledge levels the mean value of pre- test is 13.27 and post- test is 23.50. In knowledge levels the value of standard deviation of pre- test and post- test are 1.53 and 2.25 respectively. The knowledge levels the calculated 't' value at 59 df at 0.05 level of significance is 34.87. since in knowledge levels the calculated 't' value is more than the table value [2.00] at 0.05 level, the null hypothesis is rejected. This shows that there is a difference in the knowledge levels of pre- test and post- test among students. Hence it is concluded that post- test knowledge scores increased than the pre- test knowledge scores. Which shows that structured teaching program is effective.

DISCUSSION:

It is clear from findings of the study that the post- test means score (23.50) was higher than the pre- test mean (13.27) of the students regarding pediatric drugs and IV fluid calculations. The computed 't' value of knowledge on pediatric drugs

and IV fluid calculations was 34.87 was more than the table value (2.00) at 0.05 level of significance. There was a significant difference between pre-test and post-test knowledge scores regarding pediatric drugs and IV fluid calculations showed that structured teaching was effective.

CONCLUSION:

The following conclusion were drawn on the basis of the findings of the study. After structured teaching on knowledge on pediatric drugs and IV fluid calculation among students, there was a significant difference in the mean scores of the students in pre- test and post- test. The post- test mean scores (23.50) was higher than the pre- test mean (13.27) of the students regarding pediatric drugs and IV fluid calculations. The obtained 't' value of knowledge on pediatric drugs and IV fluid calculations was 34.87 was more than the table value (2.00) at 0.05 level of significance in the pre and post test scores of the students.

Limitations:

The study was limited to

- The investigator could not conduct the study on large sample.
- The investigator could not extend the study beyond the selected regarding pediatric drugs and IV fluid calculations among B. Sc(N) 3rd year students.

Recommendations:

- A similar study can be conducted in the college setting with larger sample.



- A comparative study can be done to find out the effectiveness of different student groups. undertaken with control group for effective comparison.
- A true experimental study can be

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