A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge and Skill of Pediatric Drug and IV Fluid Calculation Among B.Sc. Nursing Students in a Selected College at Bhilai (C.G.)

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Abstract: *Background:* **Administration of the medication is most important nursing responsibility. The need for accuracy in preparing and administrating 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. Moreover, mathematical calculations have answer in decimals also which may be difficult for those nurses who are not good in Maths.** *Objectives:* **1) To assess the pre-test & post-test knowledge related to pediatric drug & IV fluid calculation among the B.Sc. Nursing students. 2) To assess the pre-test & post-test skill related to pediatric drug calculation & IV fluid calculation among B.Sc. Nursing student. 3)To find the effectiveness of structured teaching on knowledge and skill of pediatric drug & IV fluid calculation. 4) To find the correlation between pre-test knowledge & skill related to pediatric drug & IV fluid calculation among B.Sc. Nursing students. 5) To find the association of pre-test knowledge score of pediatric drug & IV fluid calculation skill with selected socio-demographic variables. 6) To find the association of pre-test skill score of drug & IV fluid calculation with selected socio-demographic variables.** *Setting and Design:* **Quasi-experimental research approach with pretest posttest research design was adopted for the study. The study focused on B.Sc. Nursing 3rd year students from selected college of nursing at Bhilai (C.G.).** *Material and Methods:* **Total 60 students from the B.Sc. Nursing 3rd year was selected from selected college Nursing Bhilai (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.** *Results:* **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 posttest 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.

Keywords: **pediatric drug calculation, pediatric IV fluid calculation, IV fluid calculation in pediatric burn.**

1. Introduction

Administration of the medication is most important nursing responsibility. The need for accuracy in preparing and administrating 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. Moreover, mathematical calculations have answer in decimals also which may be difficult for those nurses who are not good in Maths.

So mathematical calculation skill is of utmost importance for all pediatric nurses so as to facilitate accurate drug calculations with a view to avoid medication errors which may be even fatal for children including newborn.

Oral and I/V injectables medicines are in adult doses, from which pediatric amount has to be calculated for each child according to his/her weight/age. Thus, for each & every medication the pediatric nurse has to do mathematical calculation based on formula; D/H x Q = A where D stands for desired dose, H stands for dose in hand, Q stands for desired quantity and A stands for amount.

According to UNICEF (2018), the prevalence of all-cause hospitalization across age groups was estimated to be 29 per

1000 population in India (Tamil Nadu = 29–33 per 1000 population). Furthermore, 20% of hospitalizations reported at the district level were among children younger than 15 years.

2. Material and Methods

A descriptive study was conducted using quasi-experimental research design. Sample in the study were B.Sc. Nursing 3rd year students of selected college of nursing Bhilai (C.G.) fulfilling the inclusion criteria. Students who are not willing to participate and those who were absent at the time of data collection were excluded. Individual who gave informed consent were included. Data was collected by tools using self-structured questionnaire and checklist related to pediatric drug calculation, IV fluid calculation, and IV fluid calculation in pediatric burn patient. A representative sample was selected using lottery methods from the population of all B.Sc. Nursing 3rd year students of P.G. College of Nursing Bhilai (C.G.). Evaluation was done using basic evaluation questions on pediatric drug calculation, IV fluid calculation and IV fluid calculation in pediatric burn. Frequency and percentage analysis to describe the demographic characteristic of the students. t- test to analysis of effectiveness of structured teaching programme on knowledge and skill. Karl Pearson's correlation analysis to find out the correlation between knowledge & skill related to pediatric drug & IV fluid calculation. Chi-square was done to find the association of pre-test knowledge & skill score of pediatric drug & IV fluid calculation skill with selected socio-demographic variables.

3. Results and Discussion

A. Distribution of subjects according to socio-demographic variables

As per socio-demographic variables with respect to age of the students (in years) represents that all 60(100%) were in the age group of 20-22 year. According to gender of the students represents that all 60(100%) students were female. With regard to residential area of students maximum 35(58.33%) students resides in urban area and 25(41.67%) resides in rural area. According to posting in pediatric ward depicts that all 60(100%) students are posted in pediatric ward. A finding with regarding experience in pediatric ward reveals that maximum 48(80%) of students are having 1 week, 9(15%) are having 2 week and only 3(3.33%) students are having 3-week experience in pediatric ward. In relation to the interest of students in maths shows that majority of students i.e., 31(57.67%) have interest in maths while only 29(48.33%) had no interest in maths. A finding regarding basic mathematical knowledge of students indicates that maximum 43(71.67%) had good basic mathematical knowledge while only 17(28.33%) students were poor basic mathematical knowledge.

With regard to distribution of subject according to trust in drug preparation knowledge depicts those 39(65%) students trusted in their drug preparation knowledge and 21(35%) students had no trust in their drug preparation knowledge. According to attended of any seminar/ training programme on drug preparation shows that 41 (68.33%) students never attended any seminar/ training programme on drug calculation while 19(31.67%) were attended seminar/ training programme on drug calculation. A findings on subjects according to source of information on drug calculation depicts that most of the students i.e. 58(96.67%) received information from their teachers and only 2(3.33%) students received information from media.

B. Area wise analysis of knowledge regarding pediatric drug & IV fluid calculation

In pretest maximum knowledge was in the area of IV fluid calculation in pediatric burn (Mean-3.43, Mean%-68.6) which is increased in posttest (Mean-3.83, Mean%-76.6).

Followed by knowledge on pediatric drug calculation in pretest (Mean-6.07, Mean %-60.7) which increased in posttest (Mean-7.25, Mean %-72.5).

The minimum knowledge in pretest was in the area of pediatric IV fluid calculation (Mean-7.18, Mean%--55.23) which increased in posttest (Mean-9.58, Mean%--73.69).

Overall analysis of knowledge based on scoring criteria indicates that pretest & posttest knowledge criteria of students

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 posttest refers to teaching 49(81.66%) had average knowledge & 11(18.33%) had average knowledge & none had poor knowledge related to pediatric drug, IV fluid & IV fluid calculation in pediatric burn.

C. Overall analysis to assess pretest & posttest skill score

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.

D. Analysis of effectiveness of structured teaching programme on knowledge

The statistical paired "t" implies that the difference in the pretest & posttest values are found statistically significant at (p<0.001) with a paired "t" value of 3.44 (pediatric drug calculation), 6.69 (pediatric IV fluid calculation), 3.92(IV fluid calculation in pediatric burn) which is greater than the table value (2.66, 3.46, 3.46) there exists a statistical significance in the enhancement of knowledge score indicates positive impact of teaching programme.

Analysis of effectiveness of structured teaching programme on Skill

The posttest mean skill scores of pediatric drug calculation skill (6.88), pediatric IV fluid calculation skill (2.58), skill in IV fluid calculation in pediatric burn (2.47), mathematical/ calculation skill (9.43) was found higher when compared with pretest mean knowledge score (4.83, 1.92, 1.38, 4.5).

The statistical paired "t" implies that the difference in the pretest & posttest values are found statistically significant at (p<0.001) with a paired "t" value of 7.15 (pediatric drug calculation skill), 3.53 (pediatric IV fluid calculation skill), 7.34

Table 1

AREA OF KNOWLEDGE	PRETEST		POSTTEST		DF/T VALUE	CRITICAL VALUE/P VALUE
	MAX SCORE	MEAN	SD	MEAN	SD	
Pediatric drug calculation	10	6.07	2.04	7.25	1.35	3.44	2.66/P<0.01 HS
Pediatric IV fluids calculation	13	7.18	1.84	9.58	1.66	6.69	3.46/P<0.001 HS
IV fluid calculation in pediatric burn	5	3.43	1.09	3.83	1.01	3.92	3.46/P<0.001 HS
Overall	28	16.68	4.04	20.67	2.57	5.73	3.46/P<0.001 HS

(Skill in IV fluid calculation in pediatric burn), 16.05(mathematical/calculation skill) which is greater than the table value (3.46, 3.46, 3.46, 3.46) there exists a statistical significance in the enhancement of skill score indicates positive impact of teaching programme.

E. Analysis to find out the correlation between knowledge & skill related to pediatric drug & IV fluid calculation
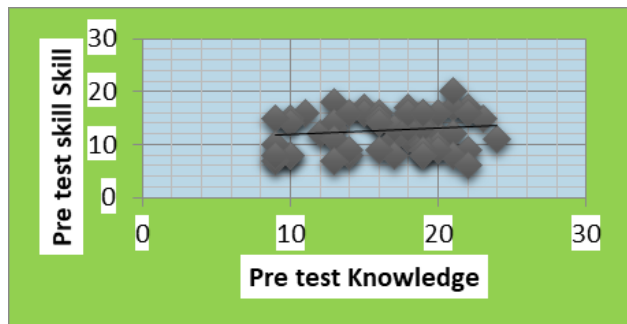

Fig. 1. Karl Pearson's correlation

Scatter diagram shows that Karl Pearson's correlation "r"=0.14 (low positive correlation) fig. 1, shows that there is low positive correlation between pretest and posttest knowledge related to pediatric drug, IV fluid calculation and IV fluid calculation pediatric burn as the calculated r=0.14 which is (r>0.4)

F. Association of pre-test knowledge score of pediatric drug & IV fluid calculation skill with selected socio-demographic variables

There is a significant association between pretest knowledge & attending of seminar/ training program as the calculated Chi-Square value 6.12 is greater than table value 5.99 at df=2. (Hence H2 is accepted in accordance seminar/ training attended for drug calculation)

There is no significant association between pretest knowledge and socio-demographic variables like place of residence, experience in pediatric ward, interest in Maths, basic mathematical knowledge, drug preparation knowledge and source of information as the calculated Chi-Square value (0.51, 1.25, 0.006, 2.92, 1.55, 0.17) was less than the table value (5.99 at df=2). (Hence H2 is rejected in accordance to place of residence, experience in pediatric ward, interest in Maths, basic mathematical knowledge, drug preparation knowledge and source of information)

Association of pre-test skill score of drug & iv fluid calculation with selected socio-demographic variables

There is a significant association between pretest knowledge &basic mathematical knowledge as the calculated Chi-Square value 5.04 is less than table value 3.84 at df=1. (Hence H1 is accepted in accordance to basic mathematical knowledge) Shows that there is no significant association between pretest

knowledge and socio-demographic variables like place of residence, experience in pediatric ward, interest in Maths, basic mathematical knowledge, drug preparation knowledge and source of information as the calculated Chi-Square value(2.49, 0.16, 1.02, 5.04, 2.16, 0.34, 0.75) was more than the table value (3.84 & 5.99 at df=1 &2) (Hence H1 is rejected in accordance to place of residence, experience in pediatric ward, interest in Maths, drug preparation knowledge and source of information.

4. Discussion

In the present study the objective of the study was to assess the knowledge and skill of B.Sc. Nursing 3rd year students regarding pediatric drug calculation, IV fluid calculation and IV fluid calculation in pediatric burn. This study concluded that students' nurses have good knowledge and skill regarding pediatric drug calculation, IV fluid calculation, and IV fluid calculation in pediatric burn. It shows that structured teaching programme helped subjects to gain in knowledge.

This study was supported by Nikhil DT& Priyanka PP (2020) who assessed the knowledge of selected pediatric medication among nursing students in selected Nursing Colleges of Kolhapur city. Quantitative approach was considered to carry out with non-probability convenient sampling technique on 100 Nursing students studying in Kolhapur City. The findings revealed that majority of Nursing students 66% had an average knowledge, 7%were having poor knowledge, 26% were having good knowledge and only 1% Nursing student had excellent knowledge regarding selected pediatric medications. The mean knowledge score of Nursing students regarding selected pediatric medications was found to be Average with score of 9.08 out of 20 which means there is need to enhance knowledge regarding selected pediatric medications.

5. Conclusion

Most of the nursing students have average knowledge regarding pediatric drug calculation, IV fluid calculation, and IV fluid calculation in pediatric burn. All the variables are significantly associated with the selected variables.

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