Effectiveness of Planned Teaching Program on Knowledge and Practice Regarding Intravenous Therapy among Paediatric Nurses

ANANDHAN DIVYA[1], PALANI VIJAYASAMUNDEESWARI[2], DHANDAPANI GEETHA[3]

ABSTRACT

Introduction: Peripheral intravenous therapy is one of the most frequently used therapeutic interventions in the acute care setting. Paediatric intravenous cannulation is a fundamental part of medication and practised in almost every health care setting. Intravenous therapy is used to treat a wide variety of paediatric conditions. Although most hospitalised children receive intravenous (i.v.) therapy daily, treatment extends beyond this population to Out Patient (OP) settings, long term care and home care for the infusion of fluids, blood products, and medications.

Aim: To assess the effectiveness of planned teaching program on knowledge and practice regarding intravenous therapy among paediatric nurses.

Materials and Methods: The present pre-experimental, quantitative, non randomised, one group pre and post test design study was conducted in Paediatric Ward, Paediatric Intensive Care Unit (PICU) and Neonatal Intensive Care Unit (NICU) of 'G' block, Sri Ramachandra Hospital (SRH), Porur, Chennai, Tamil Nadu, India from 11th July 2016 to 20th August 2016. Self administered questionnaire and observational checklist was used to collect data about knowledge and practice respectively. Non probability purposive sampling technique was used to select the 30 staff nurses working in the paediatric department with less than one year of experience.

Results: The difference between the mean post-test knowledge score (M=16.20, SD=2.041) and pretest knowledge score (M=7.43, SD=2.254) of paediatric staff nurses was highly significant (p-value <0.001) and the computed t-value was t=26.7. The difference between the mean post-test practice score (M=15.13, SD=2.063) and pretest mean practice score (M=10.70, SD=2.380) was also highly significant (p-value <0.001) and the computed t-value was t=8.215.

Conclusion: The present study shows that there was a significant difference in the mean scores of knowledge and practice between pretest and post-test after the planned teaching program intervention at the level of paediatric nurses (p<0.001). So planned teaching program was effective on knowledge and practice regarding intravenous therapy among paediatric staff nurses.

INTRODUCTION

Peripheral intravenous therapy is one of the most frequently used therapeutic interventions in the acute care setting. Paediatric intravenous cannulation is a fundamental part of medication and practised in almost every health care set up. Intravenous therapy is used to treat a wide variety of paediatric conditions [1,2]. Although most hospitalised children receive i.v. therapy daily, treatment extends beyond this population to OP settings, long term care and home care for the infusion of fluids, blood products, and medications.

Children's growth and development are dynamic processes and they are prone to diseases during their developmental stages, leading to frequent admissions in hospitals [3,4]. In hospitals the treatment is different for each child and they undergo some invasive and non invasive procedures. Here, the basic invasive procedure is the i.v. therapy. The i.v. therapy is an anxiety provoking procedure for children who are hospitalised as well as their families. Adequate preparation can ease a child's fear and promote cooperation [4,5].

The i.v. cannulation is one of the most common invasive procedure in which the patient's skin is punctured with a needle to allow the insertion of a temporary plastic tube in to a vein [6,7].

The i.v. therapy for children and newborns can be both stimulating and rewarding. Significant differences exist between i.v. therapy in children and adults. Even an experienced nurse with adults may need to "re-learn" the technique [7,8]. Nurses performing i.v. procedures in children need to be skilled and knowledgeable about the basic applications of i.v. therapy and child development. The primary purpose of the therapy is to provide treatment with maximum safety and effectiveness while addressing the emotional and growth related needs of the child [9,10].

The management of paediatric patients with i.v. therapy is a major nursing responsibility. The nurse must be able to assess, monitor and evaluate the effects of i.v. therapy. The nurse needs to be aware of their level of accountability when performing intravenous cannulation. Cannulation should be incorporated into practice as a part of holistic care [11,12].

Education in evidence-based care and handling gives nurses the opportunity to improve their ability to use theoretical knowledge in clinical problems. The paediatric staff nurse placed in specialty clinical department should be trained to build competency skills in administering intravenous cannulation, fluid therapy and medication to the children [13,14]. The training would update the knowledge and raise confidence among nurses and would meet the needs of the children and parents. Therefore this study was aimed to support the practice and skills of performing i.v. cannulation more vividly so that the planned teaching program can develop and maintain the ability to carry out this task successfully.

Study Objectives

• To assess the knowledge and practice of i.v. therapy before and after the planned teaching program among paediatric staff nurses.

- To find out the relationship between the knowledge and practice of i.v. therapy among paediatric staff nurses.
- To associate the knowledge and practice of i.v. therapy with selected demographic variables of the paediatric staff nurses.

MATERIALS AND METHODS

The pre-experimental, non randomised, one group pre and post-test design was conducted from 11th July 2016 to 20th August 2016 in Paediatric ward, PICU and NICU of 'G' block, SRH, Chennai, Tamil Nadu, India. The SRH is a multispeciality tertiary care hospital with 1737 beds that caters to the healthcare needs of children from various strata of the society. The number of staff members working in these units was 110. The bed strength of paediatric ward, PICU and NICU were 120, 12 and 22, respectively. The teaching program intervention was conducted in the paediatric ward classroom, fourth floor, 'G' block at SRH in Chennai. Ethical clearance was obtained from institutional ethical committee. (Ref.No: Msc202016/IEC/24). Written informed consent was obtained from the staff nurses.

Inclusion criteria: Staff nurses with less than one year of experience after graduation, who were available and willing to participate in the study during the period of data collection were included.

Exclusion criteria: Staff nurses who were not available or unwilling to participate in the study were excluded.

Sample size calculation: The total size of the sample was 30 nurses posted in paediatric wards, PICU and NICU. The formula used for sample size calculation is:

$$n = \frac{2(Z_\alpha + Z_{1-\beta})^2\ \sigma^2}{\Delta^2}$$

There were 110 nurses working in the paediatric unit, out of them there were 32 staff nurses with less than one year of experience after graduation. Out of these, 30 nurses fulfilled the inclusion criteria and were selected.

Phase I-Selection of Samples (Pretest)

The sample selection was done using purposive sampling technique. The nurses were given a self administered questionnaire in the respective wards. Pre test on knowledge (15 min) and practice (20-30 min) was conducted for six groups with five members in each.

Phase II-Planned Teaching Program Intervention for the Study Group

The intervention was given to each of the six groups on separate days after a pre test. a planned teaching program was conducted in paediatric ward classroom the investigator asked the staff nurses to assemble all the eligible nurses in the classroom after their morning shifts were over and the investigator also got permission from their supervisor incharge for nurses having the afternoon shifts. the following day, lecture on intravenous therapy was given using lecture cum discussion method (20 min) by using a power point presentation and for practice demonstration method (20 min) by using an i.v. stimulator, which lasted for 40 mintues. after the demonstration the participants were asked to redemonstrate under the investigator's supervision and doubts were clarified. Redemonstraion was done by the staff nurses for 10 minutes. The intervention was conducted for all 30 participants over a period of six days, with demonstrations being conducted for a group of five participants everyday.

Phase III (Post-test)

On the 7th day of intravenous therapy intervention, the Post-test was conducted with the same group by using the same tool for knowledge and practice of Intravenous therapy.

Description of the Instruments

Section I consisted of background variables of staff nurses. It includes age, gender, education qualification, marital status, years of experience of the staff nurses, and their area of working.

Section II-A: Consisted of 34 self administered multiple choice questions for knowledge. It includes six components of intravenous therapy. The areas of i.v. therapy and number of items were; knowledge on venous system (3) selection of vein and cannula (7), precannulation procedure (4), i.v. cannula insertion (10), postcannulation procedure (5) and complications (5)

Section II-B: Consisted of 20 self administered multiple choice questions for practice of intravenous therapy; preprocedure care: (6) selection of vein (5), i.v. cannula insertion (5) and postprocedure care: (4)

Scoring and Interpretation

Part I-Knowledge

Regarding the questionnaire on knowledge on i.v. therapy, the highest possible score was 34. One mark was given for every correct answer and a score of zero was given for every wrong answer, the resulting scores were ranged as follows.

Adequate Knowledge: 76 to 100% (a score from Q 23 to 34)

Moderate Knowledge: 50 to 75% (a score from Q 12 to 22)

Inadequate Knowledge: 0 to 49% (a score from Q 1 to 11)

Part II-Practice

Regarding the practice of i.v. therapy, the highest possible score was 20. One mark was given for every correct practice (Yes option) and a score of zero was given for every wrong practice (No option). The resulting scores were ranged as follows:

Satisfactory practice: 76 to100% (a score from Q 13 to 20)

Moderate practice: 50 to75% (a score from Q 7 to 12)

Inadequate practice: 0 to 49% (a score from Q 1 to 6)

STATISTICAL ANALYSIS

The collected data were grouped and analysed by descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics, paired' test was used to determine the difference between pretest and post-test in the group. Correlation coefficient was used to determine the association between knowledge and practice. Analysis of variance (ANOVA) was used to determine the relationship between knowledge and practice with the selected demographical variables/characteristics.

RESULTS

Background variables show that 17 (56.7%) of the novice nurses were in the age group of 20-22 years and 13 (43.3%) were between 23-25 years. All of them 30 (100%) were females. With regard to qualification, 10 (33.3%) had completed basic B.Sc Nursing and 20 (66.7%) had completed Diploma in Nursing. Majority of them 28 (93.3%) were unmarried. Regarding months of experience, 16 (53.3%) had 7 to 12 months of experience and 14 (46.7%) had 0 to 6 months of experience. With regard to area of work, 12 (40%) were in paediatric ward, 11 (36.7%) were in NICU and 7 (23.3%) in PICU [Table/Fig-1].

In the pretest, majority 20 (66.6%) of the staff nurses had inadequate knowledge regarding i.v. therapy, nearly 8 (26.7%)had moderate level of knowledge and 2 (6.7%) had adequate knowledge, whereas in the post-test, 16 (53.3%) had moderate level of knowledge and 14 (46.7%) had adequate level of knowledge. In the pretest, majority 15 (50%) of the staff nurses had moderate practice regarding i.v. therapy, nearly 7 (23.3%) had adequate level of practice and 8 (26.7) had inadequate practice, whereas in the post-test 17 (56.7%) had moderate level of practice, 12 (40%) had adequate level of practice and only 1 (3.3%) had inadequate practice. [Table/Fig-2] shows that there was a statistically significant difference (p<0.001) in the mean scores of knowledge and practice between the pretest and post-test.

Demographic variables	N	%
Age		
20-22 years	17	56.7
23-25 years	13	43.3
Gender		
Male	-	-
Female	30	100
Qualification		
Basic B.Sc (Nursing)	10	33.3
Diploma in Nursing	20	66.7
Marital status		
Married	2	6.7
Unmarried	28	93.3
Months of experience		
0-6	14	46.7
7-12	16	53.3
Area of work		
Paediatric ward	12	40.0
PICU	7	23.3
NICU	11	36.7

[Table/Fig-1]: Distribution of paediatric staff nurses according to their demographic variables (N=30).

Variables (group)	Pretest		Post-test		Difference (Post test- Pretest)		Paired t-value and p-value
	Mean	SD	Mean	SD	Mean	SD	
Knowledge	7.43	2.254	16.20	2.041	8.767	1.794	26.7* 0.001
Practice	10.70	2.380	15.13	2.063	4.433	2.956	8.215* 0.001

[Table/Fig-2]: Comparison of mean scores of knowledge and practice on intravenous therapy before and after the planned teaching program (N=30).

There was no significant correlation between knowledge and practice of paediatric staff nurses of i.v. therapy in both the pretest and Post-test [Table/Fig-3].

Variables	Correlation co-efficient between knowledge and practice	
	r-value	p-value
Pretest	0.044	0.816
Post-test	0.255	0.173

[Table/Fig-3]: Correlation co-efficient between knowledge and practice scores on intravenous therapy in the pretest and post-test (N=30).

There was a siginificant association between mean scores of the knowledge and the area of work of paediatric staff nurses in pre test (p<0.01), in post test, siginificant association between the practice mean scores and the area of work of paediatric staff nurses (p<0.05), was analysed by using ANOVA test.

DISCUSSION

In the present study (pre test), majority {20 (66.6%)} of the staff nurses had inadequate knowledge regarding i.v. therapy, nearly 8 (26.7%) had moderate level of knowledge and 2 (6.7%) had adequate knowledge, whereas in the post-test, 16 (53.3%) had moderate level of knowledge and 14 (46.7%) had adequate level of knowledge.

A study by Hossain AM, et al., on assessment of the level of knowledge on i.v. cannulisation among staff nurses in a tertiary care hospital in Dhaka city found that 49.7% had good knowledge level followed by 25.5% who had average knowledge, 21.7% had excellent knowledge and 3.1% had poor knowledge [15].

Similarly, an exploratory study (Saji V 2016) to assess the knowledge regarding peripheral intravenous cannulation among nursing staff in a selected hospital of Indore city found that majority 60% of the nursing staff had good knowledge, 34% had excellent knowledge, 6% of nursing staff had average knowledge regarding peripheral i.v. cannulation and no subject had poor knowledge regarding peripheral i.v. cannulation [16-18].

The hypothesis was supported by the study findings, there was a highly significant difference in the mean scores of practice on i.v. therapy between pretest (M=10.70) and post-test (M=15.13) with the mean difference of 4.433 (t-value=8.215; p<0.001). The planned teaching was effective in increasing the practice scores of subjects regarding i.v. therapy.

A study conducted by Saji V (2016) assessed the impact of structured education on knowledge and practice regarding venous access device among nurses at Karad, India found that in experiment group, the mean scores of practice regarding venous access device care increased from 15.4 to 19.6 (p<0.001) in the post-test after structured education when compared to control group where mean score of practice increased to 15.5 from 15.4 (p<0.01) [18].

Limitation(s)

The instruments used to test knowledge and practice were developed and applied for the first time. Also, the assessment of knowledge and practice of i.v. therapy after the planned teaching intervention was done within seven days. Hence, it was not possible to measure the long term effect on knowledge and practice.

CONCLUSION(S)

It is concluded that the majority of the staff nurses have inadequate knowledge and most of them have moderately satisfactory level of practice. Planned teaching program intervention is effective in increasing the level of knowledge and practice of i.v. therapy among paediatric staff nurses.

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PARTICULARS OF CONTRIBUTORS:
1. Postgraduate Student, Department of Paediatric Nursing, Sri Ramachandra Faculty of Nursing, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India.
2. Lecturer, Department of Paediatric Nursing, Sri Ramachandra Faculty of Nursing, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India.
3. Lecturer, Department of Paediatric Nursing, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Palani vijayasamundeeswari,
Lecturer, Department of Paediatric Nursing, Sri Ramachandra Faculty of Nursing,
Sri Ramachandra Institute of Higher Education and Research,
Chennai, Tamil Nadu, India.
E-mail: vijisamun15@gmail.com

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