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A STUDY TO ASSESS THE EXISTING PRACTICES AND FACTORS RELATED TO PEDIATRIC INTRAVENOUS MEDICATION ADMINISTRATION AMONG STAFF NURSES IN SELECTED HOSPITAL OF KOLKATA, WEST BENGAL

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Abstract:

The main purpose of the study was assessing existing practices of pediatric medication administration & recognizing factors which are barrier of safe practices which helps in developing strategy to maintained standard practices**.** The main objectives of the study were: To find the existing practices of intravenous medication administration & to identify the factors affecting practices of pediatric administration. The study was conducted using survey approach & descriptive design. Total 80 staff nurses were selected from pediatric unit of two private hospitals of Kolkata, using convenience sampling technique & data collected by the researcher through observation & interview, using three valid tools: I Demographic Performa, II Observation checklist for assessing practice, III Interview schedule to identify factors that barrier of safe practices. Reliability was established for the tool II & tool III using inter rater method & r value found 0.80 for both tool. Study findings revealed that out of 80 staff nurses 50 (62.5%) were within the age group of less than 25 years, only 13 (16.25%) were more than 30 years & rest 17(21.25%) were within the age group of 26 to 30 years .Data also reveals that out of 80 staff nurses majority 73.75% of staff nurses had professional qualification of GNM. Data also revealed that out of 80 staff nurses majority of 80% staff nurses had total working experience within 1 to 5 years, majority of staff nurses 70% had total years of working experience in pediatric unit less than 1 year. There was no significant association with the practice of staff nurses with the selected variables at‹ 0.005 level of significance.

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Background of the Study:

Medication administration is a continuous process that goes beyond the task of simply giving medication to a client. A numbers of tasks involves during medication administration that includes assessing, preparing medications, administering drug, terminating the procedure, observing child's response& recording. Each step involves some risk of error for which nurses are responsible directly or indirectly as it is a depended action of nurses. They should follow each step carefully otherwise risk of doing error increases & clients are endangered with the effects of medicine error.

Unsafe intravenous medication administration may result number of various complications such as circulatory overload, infiltration, extra vacation of blood, thrombo phlebitis, air embolism, pyogenic reaction, infection, allergic reaction, serum hepatitis, nerve damage, osmotic dieresis etc.

There are numbers of factors which need to be considering before administration of drug to a pediatric client. Factors are in general, children's body weight, body surface area, health & nutritional status, kidney & liver function, route, drug allergy etc. Children require smaller doses than adults & doses also varying among different age group of children. The drug concentration at site of action is based on the ration between the amount of drug administered & size of the body. The dose calculations for abnormally thin or obese patients are required on the basis of body weight. Health & nutrition status is the another important factor which is need to consider during drug administration because debilitated & anemic patients are in general more sensitive to the toxic effects of the drug & hence they are given smaller doses.

Need of the study:

Nurses need to consider the pathological state of an ill child if the organs through which biotransformation or excretion takes place are diseased. Many drugs are consciously administered for the children who are suffering with renal insufficiency or liver diseases. In general, the rapidity of abortion of a drug decreases with route of administration in the following order; intravenous › intramuscular › subcutaneous › oral. Thus intravenous (intravenous) dose of a drug is smaller than it's intramuscular (intramuscular) or subcutaneous or oral dose. Time &

frequency of drug administration also need to be justified because biological half- life of a drug is varying among the drugs. Drug allergy is the another important area need to consider because range of allergic reaction affecting the health of the children.[6]

Objectives of the study:

- To assess the existing practices of intravenous pediatric medication administration.
- To identify the factors affecting practices of pediatric medication administration.
- To find the association of existing practices of intravenous pediatric medication administration with selected variables.

Variables of the study:

Research variables

- Practices of intravenous medication administration.
- Factors related to intravenous pediatric medication administration.

Selected variables – age, professional qualification, total years of working experiences in pediatric unit, total working experience in years and participation in any educational programme on medication administration.

Conceptual framework: Conceptual framework based on modified J.W. Kenny General System model (Source J.W. Kenny system model, WHO SEAROS technical publication 1985).

Delimitation:

The study delimited to staff nurses---

- Who provide care to children
- Working in pediatric unit of two private hospitals of Kolkata.

Methodology:

Research approach - Survey approach was considered appropriate to the present study as it was concerned with the collection of the data from the staff nurses regarding practice of intravenous medication administration & factors related pediatric intravenous medication administration.

Research design - A descriptive survey design was chosen for the present study as the researcher was intended to describe the practices of staff nurses on intravenous (I.V) medication administration & the related factors as reported by them.

Settings – Settings for the study was Calcutta Medical Research Institute (CMRI) & Peerless Hospital, Kolkata. Total number of pediatric bed in CMRI was 70, out of general bed & PICU bed was 30. Total number of pediatric bed in Peerless hospital was 40, out of general bed & PICU bed was 20 each.

Population – In this study the population was staff nurses working in pediatric unit, & private hospital of Kolkata.

Sample & Sampling technique – For this study sample were the staff nurse who provides care to the children. In this study the sampling technique that the researcher has considered was non probability convenience sampling technique as staff nurses were convenient at the time of the study.

Sample selection criteria

Inclusion criteria – Staff nurses were involved those who ----

- Registered from West Bengal Nursing Council.
- Provides direct care to the pediatric client.
- Were willing to participate in the study.
- Has professional qualification of GNM, B.Sc & Post Basic B.Sc Nursing.

Exclusion criteria – Staff nurses who were not available at the time of data collection.

Development & description of the tool - As per the purpose & objectives three tools were developed through extensive review of research & non research literature , consultation with experts in the field & related fields, establishing content validity, reliability, administering the tool for pilot study.

Tool I: Demographic Performa – The structured demographic performa was used to measure the background data that includes five items in relation to age, professional qualification, total years of working experiences in pediatric unit, total working experience in years and participation in any educational programme on medication administration.

Tool II: Observational checklist on pediatric medication administration – It was consisted with 32 items. The items were organized in the area of Self preparation, unit & article preparation, child preparation, drug preparation, administration & termination. All items had 2 options "yes" or 'no". Observing each correct step 1 marks will be allotted by the researchers & no negative marking was there. Maximum possible score was 32 & minimum possible score was 0.

Tool III: Semi structured interview schedule on factors related to pediatric medication administration – This tool consisted with 14 items & each had 5 options. The options were the parts of nurses related factors, environment related factors, & management related factors.

Reliability- The reliability was calculated using inter rater method. The r value obtained was 0.80 for tool II & tool III which indicated that the tool had internal consistency.

Ethical consideration – Ethical permission was obtained from

- The chief of nursing of Calcutta Medical Research Institute (CMRI)
- The chief of nursing superintendent of Peerless Hospital.
- Informed consent from the participants.

Steps for data collection – The researcher had collect the data from 80 staff nurses working in the pediatric unit using convenience sampling technique depending on inclusion & exclusion criteria. Formal administrative permission was obtained from the chief of nursing of Calcutta Medical Research Institute (CMRI) & chief of nursing superintendent of Peerless Hospital, Kolkata. An informed consent has obtained from each participant. The confidentiality of the participants was maintained during the study. The practice regarding I.V medication administration was observed from each staff nurses while administering medication to pediatric

client. After completion of the procedure each nurses has interviewed by the researcher to find the factors related to their practice.

Organization of the study findings - The data were presented under the following section:

Section 1: Description of sample characteristics

Table 1: Frequency and Percentage distribution of sample characteristics n=80

S.No	Sample characteristics	Frequency (f)	Percentage (%)
1	Age in Years		
	a. ‹ 25	50	**62.5%**
	b. 26-30	17	21.25%
	c. › 30	13	16.25%
2	Professional qualification		
	a. GNM	59	**73.75%**
	b. B.Sc nursing	18	22.5%
	c. Others	03	3.75%
3	Total years of working experience		
	a. 1-5	64	**80%**
	b. 6-10	8	10%
	c. › 10	8	10%
4	Working experience in pediatric unit		
	a. ‹ 1	56	**70%**
	b. 1 – 5	17	21.25%
	c. › 5	7	8.75%
5	Educational programme in medication administration		
	a. Not at all	35	**43.75%**
	b. Once	27	33.75%
	c. Twice or more	18	22.5%

Section – II: Practiced of staff nurses on intravenous medication administration

Table 2 Range, mean, median, and standard deviation of practice score n= 80

Variables	Range	Mean	Median	Standard deviation (SD)
Practice score	8 (20-28)	24.25	24.62	4.58

The mean & median are very close to each other so it inferred that data were normally distributed. The score was ranged from 20-28 & standard deviation was 4.58 which indicate less depression of the scores.

Table 3: Frequency and Percentage distribution of practice score n= 80

Class interval of practice score	Frequency (f)	Percentage (%)
0-2	0	0
3-5	0	0
6-8	0	0
9-11	0	0
12-14	0	0
15-17	0	0
18-20	4	5
21-23	28	35
24-26	32	40
27-29	16	20
30-32	0	0

Minimum possible score 0

Maximum possible score 32

Section – III: Factors related to intravenous medication administration

Table 4: Factors that barriers of correct practices n= 80

S.No	Practice on medication administration	Incorrect practice n (%)	Factors related to barrier of correct practice	n (%)
1	**Fails to assemble articles**	78 (97.50 %)	Forgot to take Unaware Not willing Not available Others	20 (25 %) 4 (5%) 5 (6.25 %) 45(56%) 4(5%)
2	**Fails to explain the procedure**	6 (7.50 %)	Lack of time Others	4 (5%) 2 (2.50%)
3	**Fails to observe & touch the child's I.V channel site**	18 (22.50 %)	Unaware Unwilling No time No existing standard Others	6 (7.50%) 1(1.25%) 8(10%) 1(1.25%) 2(2.50%)
4	**Fail to cross check the medicine**	3 (3.75 %)	Unaware Absence of supervisor Others	1(1.25%) 1(1.25%) 1(1.25%)
5	**Fail to collect the drug after cleaning with spirit swab**	36 (45%)	No time Unwilling Unaware No provision of resources Others	12(15%) 2(2.50%) 12(15%) 1(1.25%) 9(11.25%)
6	**Fail to clean the port of channel**	43 (53.75 %)	Unaware Unwilling No provision of resources	23(28.75%) 7(8.75%) 4(5%)
7	**Fail to take correct dose of medicine**	2 (2.50 %)	No clear direction	2(2.50%)
8	**Fail to keep record of skin condition**	77 (96.25 %)	No exiting standard	77(96.25%)
9	**Fail to keep record of patency of channel**	78 (97.50 %)	No existing culture	78(97.50%)
10	**Fail to keep record of patient's response**	80 (1000 %)	No existing standard	80(100%)

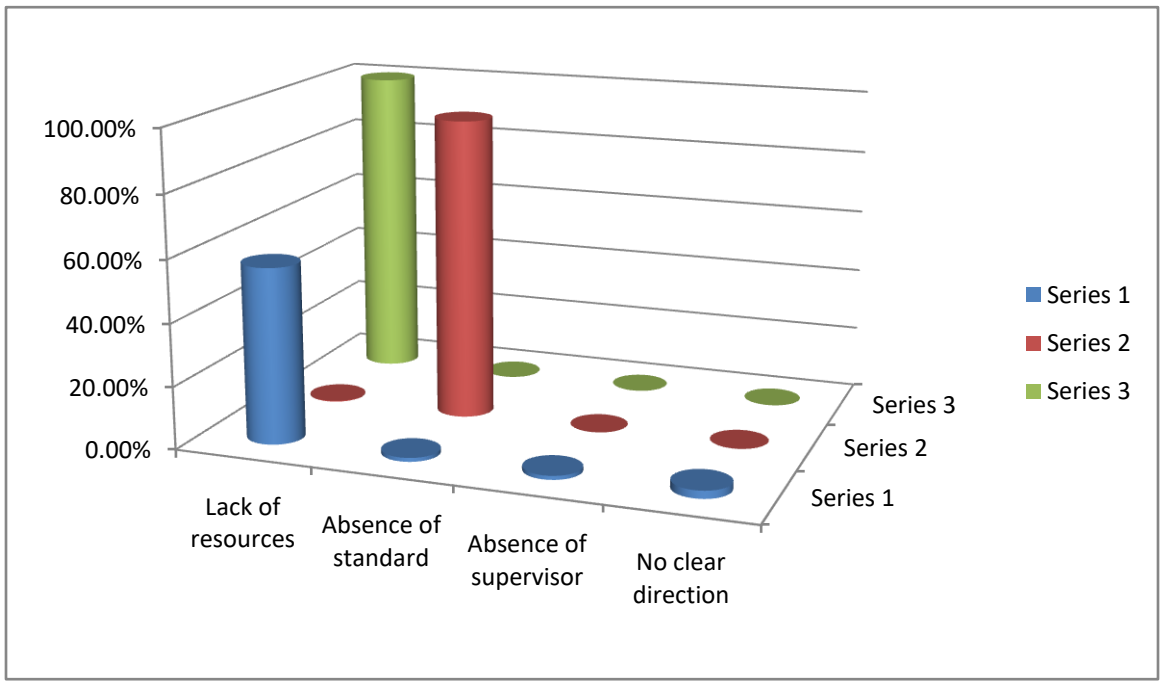

Fig 1: Bar diagram shows barrier of incorrect practice as hospital management related factors reported in number of occasion

Section IV: Association of practices of intravenous medication administration and selected variables.

Table 5: Association between practice level and selected demographic variables n=80

S.No	Sample characteristics	Level of practice Above median 24.62	Level of practice Below median 24.62	Chi square	df	P value 0.05 level	Significance
1	Age in Years a. ‹ 25 b. 26-30 **c.** › 30	 27 8 4	 26 8 7	0.78	2	5.99	NS
2	Professional qualification a. GNM b. B.Sc nursing c. Others	 30 8 1	 29 10 2	1.1074	2	5.99	NS

3	Total years of working experience a. 1-5 b. 6-10 **c.** › 10	 33 2 4	 31 6 4	2.004	2	5.99	NS
4	Working experience in pediatric unit a. ‹ 1 b. 1 – 5 **c.** › 5	 25 10 4	 30 8 3	0.7694	2	5.99	NS
5	Educational programme in medication administration a. Not at all b. Once **c.** Twice or more	 16 13 10	 18 15 8	0.430	2	5.99	NS

Major findings of the study:

Findings of the study were organized in relation to objectives. The major findings of the study were organized under the following headings:

Section 1: Description of sample characteristics

- Out of 80 staff nurses 50 (62.5%) belongs to age group of ‹ 25 years.
- More than half of the participants 59 (73.75%) were GNM.
- Majority of nurses 64(80%) HAD 1-5 Years of working experience.
- Most 56 (70%) of them ‹ 1 years of working experience in pediatric unit.
- 35 (43.75%) of them had not participate in any educational programe in medication administration.

Section 2: Practice on I.V medication administration

- The range, mean, median & standard deviation of practice score was 24.25, 24.62 & 4.58 respectively. The mean & median was very close to each other that indicates normal distribution of score. The obtained standard deviation indicates that practice score was less dispersed.
- All 80 staff nurses were practiced hand washing before giving to pediatric medication administration, identifies the right client, dissolve medicine correctly & discard the vial/ ampule to the appropriate color coded bag.

Section 3: Frequency & percentage distribution of factors related to pediatric medication administration

The factors barrier of pediatric medication was categorized into nurse related , hospital environment , & hospital management related factors.

- Among 80 staff nurses 78 (97.50%) were forgot to take one or more articles & rest 2 (2.50%) were able to assemble all require articles. The factors related to barrier of correct practice in the area of assembling articles was reported mostly forgot to take 20 (25%), Unaware 4 (5%), not willing 5 (6.25%), not available 45 (56.25%).
- Among 80 staff nurses only 4(5%) did not explain to mother before doing the procedure & reported reasons was lack of time & 2 (2.50%) specified other reasons.
- Among 80 staff nurses 18 (22.50%) did not observe the channel site & reported reasons were unawareness 6 (7.50%), unwilling 1(1.25%) , no time 8(10%) , no existing standard 1 (1.25%), others 2 (2.50%).
- Among 80 staff nurses only 3(3.75%) were not cross check the medicine with another nurse & reasons were reported unaware 1(1.25%), absence of supervisor 1(1.25%), & others 1(1.25%).
- Among 80 staff nurses 36(45%) were not collect the drug after cleaning the vial with spirit swab the reasons were no time to clean the vial 2(15%), unwilling to clean the vial 2 (2.50%) , & unaware 12(15%) about the cleaning the vial with spirit swab, no provision for resources 1(1.25%), & others 9(11.25%).
- Among 80 staff nurses only 2(2.5%) did not took the correct dose of medicine the reason were reported no clear direction 2(2.50%) had given to take the correct dose of medicine.

- Among 80 staff nurses 43 (53.7%) did not clean the port with spirit swab, & the reasons were unwilling 7(8.75%), unawareness 23 (28.75%), & no provision for resources 4 (5%).
- Among 80 staff nurses 77 (96.25%) were not kept record of skin condition, the reason was no existing culture to keep record of skin condition 77 (96.25%).
- Among 80 staff nurses 78 (97.5%) did not keep record of patency of channel & the reason was reported no existing culture to keep record of patency of channel 78(97.5%).
- 80 staff nurses did not kept record of patient response during & after medication administration. The reason was no existing standard to keep record of child's response 80(100%).

Section 4: Association of practices score with selected demographic variables.

To find the association of practice level with selected demographic variables chi square test was done & the value (0.78), (1.1074), (2.00), (0.769), (0.430) were lesser than the table value. Hence, the researcher fails to reject the null hypothesis & conclude that there was no significant association of practice score with selected variables.

Limitations:

- The study was conducted only at pediatric unit of two private hospitals. Thus, it might not be representative of the population of all pediatric staff nurses of Kolkata.
- The nurse reported factors was considered as barrier of correct practice.
- Convenience sampling technique was used to select simple.

Recommendations:

- A similar study can be undertaken on a larger scale for making a more valid generalization.
- A comparative study can be done to find the difference of pediatric I.V medication practices between private & government setting.
- An experimental study can be done to assess the effect of plan teaching programme on improvement of knowledge & practice of staff nurses on pediatric intravenous medication administration.

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