



AN OBSERVATIONAL STUDY FOR ANALYSIS OF OUTCOME OF PERIPHERAL INTRAVENOUS LINE CANNULA WITH SPLINT & WITHOUT SPLINT APPLICATION AMONG UNDER FIVE CHILDREN ADMITTED IN SELECTED HOSPITAL, AGARTALA, WEST TRIPURA.

Nursing

Mrs. Rumpa Das* Nursing Tutor, Tripura Institute of Paramedical Sciences, Tripura. *Corresponding Author

Mrs. Sangita Das Associate Professor, Tripura College of Nursing,

ABSTRACT

Peripheral intravenous (IV) lines are commonly used in the medical setting to provide access for the administration of fluids, medications, and blood products. In pediatric patients, the insertion of an IV line can be challenging due to their small size and limited tolerance for discomfort. In order to prevent dislodgement and complications, some healthcare providers choose to apply a splint to the IV line site. However, the use of splints for IV lines in children is not widely studied. **Aim:** This paper aims to present an observational study that analyzes the outcomes of peripheral IV line cannula with and without splint application among under five children admitted in a selected hospital in Agartala. **Material and method:** he study employs a descriptive comparative research design, conducted at Tripura Medical College & Dr. Bram Teaching Hospital, with a sample size of 60 under-five children, evenly distributed between the splint and without splint groups. Two tools were developed for data collection: Tool I captured demographic data and clinical characteristics, while Tool II, the Modified Jackson Visual Infusion Scale, assessed the status of cannula. **Results:** In both groups, almost half of the children (46.6%) had the IV line on their wrist, and about two-thirds (66.6%) were admitted for 3-5 days. Both groups mostly had intermittent infusion (53.4% and 66.6%). The splint group received medication twice a day (46.6%), while the group without splint received it once a day (66.6%). Most had a 24-gauge cannula (86.6%), with no junction area involvement (73.4% and 100%). 66.6% in the splint group scored healthy (0-2), while 60% without splint scored unhealthy (3-5). The study showed the splint was effective, with a mean score difference of 1.65 and a longer functional duration of the cannula. **Conclusion:** The study examined peripheral intravenous cannulation with and without a splint. Results showed the splint group initially had poorer conditions, improving after splint application. All hypotheses were accepted, indicating the effectiveness of splint use.

KEYWORDS

Peripheral intravenous line, Cannula, Splint, Pediatric, Under-five children.

INTRODUCTION:

The insertion of an IV line is a common procedure in pediatric patients and is necessary for the delivery of essential fluids and medications. However, the success rate of IV line insertion in children is lower compared to adults due to their small and fragile veins (Fernandez et al., 2016). In addition, children tend to move and fidget, making it difficult to maintain the stability of the IV line. This can result in dislodgement, causing interruption in therapy and discomfort for the child.

To minimize the risk of dislodgement, healthcare providers sometimes choose to apply a splint to the IV line site. A splint is a device that helps to stabilize and protect the IV line, preventing it from being pulled out or kinked. However, the use of splints for IV lines in children is not supported by strong evidence.

Need Of Study:

The absence of proper practices and insufficient storage supply in numerous hospitals leads to the underutilization of splints during cannulation. Conducting a study becomes crucial to enhance child safety, as they are the future citizens shaping our nation. The researcher aims to observe the impact of peripheral intravenous line cannulation with and without splint application among under-five children, with the goal of improving cannulation functionality.

OBJECTIVES OF THE STUDY

1. To find out the effectiveness of peripheral Intravenous line cannula functional duration with splint & without splint among under five children.
2. To compare the functional duration of peripheral Intravenous line with splint & without splint among under five children.

METHODOLOGY

Research Design:

The study employs a descriptive comparative research design to analyze the outcomes of peripheral intravenous line cannulation with and without splint among under-five children.

Dependent Variable: Effectiveness of peripheral intravenous line.

Independent Variable: Splint.

Research Setting:

The study is conducted in the Pediatric Ward at 'TMC & DR. BRAM Teaching Hospital' in Agartala, Tripura West

Sample and Size:

A sample of 60 under-five children, with 30 in the splint group and 30 in the group without splint, is selected from the general pediatric ward.

Sampling Technique: The sample is drawn using purposive sampling.

Criteria for Sample Selection:

Inclusion Criteria

1. Under-five children with IV cannula.
2. Admitted in the pediatric ward.

Exclusion Criteria

1. IV cannula removed immediately after the procedure.
2. Critically ill children.

Selection and Development of Tools:

Tool I: Background information with demographic and clinical characteristics.

Tool II: Modified Jackson Visual Analog Scale to assess the status of cannula.

Description of Tools:

the Modified Jackson Visual Analog Scale, consists of 15 statements categorized from 'No difficulty' to 'Severe difficulty.'

Validity of Tool:

Content validity is established through expert opinions. Tools are modified based on recommendations from experts.

Reliability of Tool:

Karl Pearson's method calculates the reliability of the structured questionnaire and Modified Jackson Visual Analog Scale, yielding a highly reliable result of 0.86.

Ethical Consideration:

Ethical clearance is obtained from the Research Committee and Institutional Ethical Committee. Written permissions are secured from relevant authorities, and informed consent is obtained from participants.

Pilot Study:

A pilot study involving 40 under-five children is conducted to refine the methodology and assess feasibility. The pilot study shows no issues, ensuring a smooth process for the main study.

Procedure for Data Collection:

Data collection is conducted with formal administrative permission, informed consent, and confidentiality assurance. A structured questionnaire and Modified Jackson Visual Analog Scale are administered, and data are collected over a period of two weeks.

Data Analysis:

Descriptive statistics, including frequency, percentage distribution, mean, mean difference, and standard deviation, are employed for data analysis. Inferential statistics, such as 't' value, are used to assess the effectiveness.

RESULTS OF THE STUDY**Regarding Demographic findings of the study**

Description	Key Findings
Age Distribution	Highest frequency (60% & 40%) in age group 0-1 year. Lowest frequency in splint group (40%) for age group 2-3 years and without splint group (23.40%) for age group 4-5 years.
Gender Distribution	Highest frequency (53.40% & 60%) in female gender. Lowest frequency (46.60% & 40%) in male gender for both groups.
Weight Distribution	Highest frequency (60% & 40%) in weight range 8-10kg. Lowest frequency in both groups for weight <8kg (23.40% & 6.60%).
Duration of Hospitalization	Splint group: Highest frequency (60%) for 4-9 days. Without splint group: Highest frequency (53.40%) for 10-15 days. Lowest frequency for both groups (46.60% & 40%) for 4-9 days and 10-15 days, respectively.

The key findings from the age distribution reveal the highest frequency (60% & 40%) in the 0-1 year age group, with the lowest frequencies observed in the splint group (40%) for the 2-3 year age group and in the without splint group (23.40%) for the 4-5 year age group. In terms of gender distribution, the highest frequencies (53.40% & 60%) were in the female gender, while the lowest frequencies (46.60% & 40%) were in the male gender for both groups. Regarding weight distribution, the highest frequency (60% & 40%) occurred in the 8-10kg weight range, with the lowest frequencies in both groups observed for weight <8kg (23.40% & 6.60%). For the duration of hospitalization, the splint group had the highest frequency (60%) for 4-9 days, while the without splint group had the highest frequency (53.40%) for 10-15 days. The lowest frequencies for both groups (46.60% & 40%) were found for 4-9 days and 10-15 days, respectively.

Table 1: Frequency & percentage of score regarding clinical characteristics among under five children.

Clinical characteristics	Category	Splint		Without splint	
		F	%	F	%
Site of cannula insertion-	Wrist	14	46.60%	14	46.60%
	Forearm	6	20%	8	13.40%
	Elbow	6	20%	6	20%
	Dorsal of foot	4	13.40%	6	20%
Duration of cannulation-	< 3 days	6	20%	4	13.40%
	3-5 days	20	66.60%	20	66.60%
	6-10 days	4	13.40%	6	20%
Type of infusion	Continuous	14	46.60%	10	33.40%
	Intermittent	16	53.40%	20	66.60%
Type of injection	Antibiotics	14	46.60%	12	40%
	Analgesic	4	13.40%	12	40%
	PPI	6	20%	6	20%
	Steroid	3	10%	0	0%
Frequency of giving medication	OD	10	33.40%	20	66.60%
	BD	14	46.60%	10	33.40%
	TDS	3	10%	0	0%
	Continuous IV	3	10%	0	0%
Number of injection	<2	6	20%	20	66.60%
	4-Feb	10	33.40%	10	33.40%
	6-Apr	14	46.60%	0	0%
Size of cannula	24	26	86.60%	26	86.60%
	26	4	13.40%	4	13.40%
Any junction area	Yes	8	26.60%	0	0%
	No	22	73.40%	30	100%

Table 2 Frequency & Percentage distribution on Jackson visual analog scale regarding Peripheral intravenous cannulation among under five children

Category	Score	Splint		Without splint	
		F	%	F	%
Healthy	0-2	20	66.6%	12	40%
Unhealthy	3-5	10	33.4%	18	60%

Table 2 data reveals that 66.6% under-five children in the splint group are healthy, while 40% in the without splint group are healthy. In the splint group, 33.4% are unhealthy, and in the without splint group, 60% are unhealthy. Notably, 66.6% of the splint group achieved a healthy score (0-2), while 60% of the without splint group received an unhealthy score (3-5), suggesting the effectiveness of the splint intervention.

Table 3 "t" value for the scores on the Jackson Visual Analog Scale regarding peripheral intravenous cannulation is calculated for both the splint group and the group without splint.

S.N.	Mean	SD	Mean difference	't' Value
Splint	3.81	2.19	1.65	3.43*
Without splint	2.16	1.72		

The findings revealed that the mean score in the splint group was 3.81, while the mean score in the group without splint was 2.16. The mean difference between the two groups was 1.65, and the standard deviation was 2.19 for the splint group and 1.72 for the group without splint. The calculated "t" value was 3.43, exceeding the tabulated value of 3.18 at a 0.05 significance level with 58 degrees of freedom. This indicates a significant difference between the two groups, supporting the acceptance of the research hypothesis (H2) that suggests the effectiveness of splint application during peripheral intravenous cannulation.

CONCLUSION:

The present study observe the outcome of peripheral Intravenous cannulation with splint & without splint application. The study findings indicated that splint group condition is poor than the without splint group. It also clear that splint group is poor, that's why after applying the splint improving their condition. All the hypothesis accepted. All the respondents were very much cooperative and administrative cooperation met the final study smooth and successful. The findings of the study revealed that using splint during cannulation was effective. There is significant differences between the mean score of with splint group & the mean score of without splint group among under five children. From the findings of the present study it can be concluded that when using splint during cannulation it increase functional duration of cannula.

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