



## KNOWLEDGE AND PRACTICE OF NURSES ON CANCER CHEMOTHERAPY EXTRAVASATION PREVENTION AND MANAGEMENT

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### ABSTRACT

Extravasation is the anticipated adverse problem of chemotherapy drug administration.

The study dealt with assessing the knowledge and practice of nurses on prevention and management of cancer chemotherapeutic drugs extravasation.

**METHOD:** A quantitative, descriptive study with 39 Nursing professionals working in a tertiary care hospital in Tamilnadu, India. The practice was evaluated using an observation checklist. Self-administered questionnaire was used to assess the knowledge on prevention and management of extravasation.

**RESULTS:** It was found that 64.1% of the subjects have adequate knowledge about the prevention and management of cancer chemotherapy drug extravasation. The overall practice scores were found to be higher than the knowledge scores. There was statistically significant correlation between knowledge and practice. There was no significant association with knowledge and practice score with selected demographic variables except age at 0.05 level.

**CONCLUSION:** Thus, the study reveals that majority of the staff had adequate practice ensuring high standard care for children with cancer.

**KEYWORDS :** Extravasation, Chemotherapy, Knowledge, Practice

### INTRODUCTION

Extravasation means infiltration or leakage of an intravenous chemotherapeutic agent into the surrounding tissue which results in local damage (Kassner, 2000). Drugs that can cause blisters, ulceration, severe tissue destruction and necrosis is called vesicant. Extravasation of vesicant agents can result in significant tissue damage, alteration in limb function. It may require fasciotomy and amputation of the affected extremity, leading to sepsis, disability and prolong the treatment process & hospitalization. Rates of occurrence range from 0.5–6% ( Tomlinson. D-2010). Since children are the high-risk group to suffer extravasation, due to various factors, such as their limited ability to communicate pain or changes in sensation during vesicant administration, difficult access and maintenance of peripheral veins. The risk factors for extravasation with the use of Central Venous Access Devices (CVADs) include Needle dislodgement, incorrect needle length, and incomplete or improper needle access technique (Schulmeister , 2010), increased activity or sleeping on the side of the port-a-catheter, rupture or tear in the catheter or port septum (Kassner, 2000), migration of the catheter tip. Complying with the preventive strategies such as check blood return from the cannula & flush with normal saline to check for infiltration before vesicants are administered, hourly monitoring of the IV site to ensure patency (Wengström, Y.,&Margulies, A.2008). The choice of IV site is paramount when attempting cannulation for chemotherapy. Cannulating over joints, the antecubital fossa or dorsum of the hand should be avoided as tissue damage due to extravasation may have serious consequences as there is little soft tissue for the protection of underlying nerves and tissues. (Allwood &Stanley 2002). Early detection and appropriate intervention based on the mechanism of action of the extravasated drug are paramount to halt tissue damage and reduce the chance of permanent disability or disfigurement (Albanell and Baselga, 2000, Sauerland, *et al.*2006). Accurate documentation of the event is vital to facilitate patient care and in case of litigation (Ettinger *et al.* 2007).

Nurses play an important role in the administration of these drugs, monitoring and maintaining the venous access, thus in preventing, identifying and appropriately managing extravasation.

The objectives of the study are

- To assess the Knowledge and Practice of nurses on Cancer chemotherapy drug extravasation prevention and management
- To find the relationship between the Knowledge of nurses with their Practice on Cancer chemotherapy drug extravasation prevention and management.
- To find the association between selected demographic variables with the Knowledge and Practice of nurses on Cancer chemotherapy drug extravasation prevention and management

### Hypothesis

There will be adequate practice compared to knowledge on Cancer chemotherapy drug extravasation prevention and management among staff nurses. There will be significant relationship between knowledge and practice.

### METHODS

A descriptive design was adopted for the study. A total of 39 nurses working in the Pediatric department clinical areas where cancer chemotherapy drugs are administered to children. Nurses with minimum of one-year experience in the field and undergone the standard in service education programme on extravasation were selected for the study. Nursing staff who were pregnant and staff not willing to take part in the study were excluded. Informed consent was obtained from each subject prior to participation in this study. Demographic details were filled by the staff. First week of data collection the clinical scenario on extravasation was displayed as a printed form to the staff to read and practice related to the management of extravasation was observed on a mannikin using the observation check list. 8-9 staff were observed per day. Every day the scenario was changed to avoid contamination. Second and third week of data collection practice of nurses related to the measures followed to prevent or promptly identify extravasation was observed at the bed side while the staff were administering the chemotherapy to the child. The observations were done using an observation checklist at the following point of time. At the time of starting the chemotherapy, followed by one hour and 2 hour to check on hourly monitoring of IV line patency and documentation of the same. Then Knowledge was assessed using self-administered questionnaire in two sessions one in the morning and one in the evening. Observation of practice for each nursing personnel took about 30-40 minutes and 25-30 minutes spent by the subjects to complete the demographic data and the knowledge questionnaire. The data was analyzed using descriptive and inferential statistics. Confidentiality of the subjects were maintained. .

The study proposal was presented and approved by the Research Ethics Committee, College of Nursing, CMC, Vellore.

### Description of the instrument

The instrument was developed by the investigator and it was validated by the medical and nursing experts in the field. It consists of three parts. Part I includes demographic details of study participants such as age, professional qualification, years of experience in CMC, and years of experience in the present area of work in the Pediatric nursing department.

Part II includes knowledge questionnaire on Cancer chemotherapy

drug extravasation prevention and management. The questionnaire has 25 items. Each item has 4 options with one correct answer and score of 1 was given for the correct answer. The maximum score was 25. The results were interpreted in percentage as adequate knowledge (> 80%), moderately adequate knowledge (60-79%), and inadequate knowledge (less than 60%)

Part III includes a Practice evaluation using observation checklist. This has two aspects.

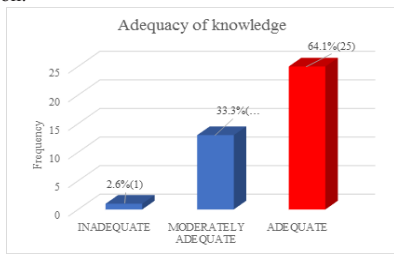
**Part III A:** Practice of nurses related to prevention of extravasation while administering the chemotherapy to the child at the bedside. This part contains 10 items with performed, not performed and not applicable options. score of 1 was given if the step was performed, score of 0 was given if the step was not performed and not applicable has no score. Maximum score was 10.

**Part III B:** Simulated practice of the management of extravasation was observed on a mannikin. An extravasation scenario was displayed to the staff and the management steps performed were observed using the observation checklist. This part contains 10 steps with performed, and not performed options.

Score of 1 was given if the step was performed, score of 0 will be given if the step was not performed. Maximum score was 10. The results were interpreted as adequate Practice (> 80%), moderately adequate Practice (60–79%), and Inadequate Practice (less than 60%).

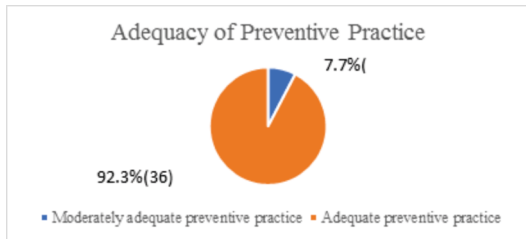
**Results**

**Diagram 1:** Distribution of samples according to their knowledge regarding prevention and management of cancer chemotherapy drug extravasation.



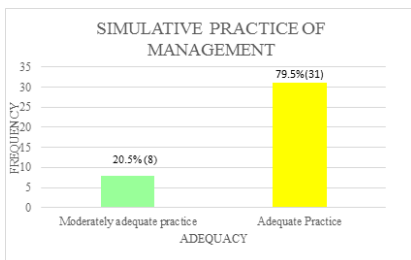
The above diagram reveals that majority (64.1%) of the nurses have adequate knowledge regarding prevention and management of cancer chemotherapy drug extravasation

**Diagram 2:** Distribution of samples according to their practice regarding prevention of extravasation



The above diagram reveals that 7.7% of the samples have moderately adequate preventive practice.

**Diagram 3:** Distribution of samples according to their practice regarding management of extravasation



The above diagram reveals that 79.5% of the samples have adequate practice in managing extravasation.

**Table 1: DEMOGRAPHIC VARIABLES**

DEMOGRAPHIC VARIABLES	CATEGORY	N	%
Age	<25 Years	8	20.51
	25.1-35 Years	16	41.03
	> 35 Years	15	38.46
Qualification	BSc N	5	12.82
	GNM	34	87.18
Total years of experience	1-5 Years	13	33.33
	5.1-10 Years	3	7.69
	> 10 Years	23	58.97
Present area of work	Paed Oncology ward	18	46.15
	Paed Private ward	12	30.77
	Paed OPD	9	23.08
Experience in present area	1-5 Years	14	35.9
	5.1-10 Years	11	28.21
	> 10 Years	14	35.9

The above table shows that majority (41.03%) of the nurses were between the age of 25-35 years, and majority (87.18%) of the nurses are with the GNM qualification. About 58.9% of nurses have more than 10 years of experience in the nursing field and 35.9% of the nurses' work for more than 10 years in the oncology nursing field.

**Table 2: Mean, SD of knowledge and practice of staff nurses**

Variable	N	Mean	SD
Knowledge	39	16.03	2.55
Practice of Management	39	8.15	0.84
Practice of Prevention	39	9.1	0.82

The above table shows that the mean of knowledge score is 16.03 compared to the higher mean score for practice with 8.15 and 9.1. Hypothesis 1 is accepted by this result. The above finding matches with a similar study (Devi C.B, 2016) finding that the overall mean knowledge score was 13.43 and mean practice score was 30.85 and it was positively correlated.

**Table:3 Correlation between knowledge and practice of staff nurses**

Variable	Knowledge		Inference
	R	p value	
Practice of Management	.9321	.0141	Significant

P<.05 denote the significance

There was significant correlation between knowledge and practice of management of extravasation i.e. calculated by Pearson's correlation coefficient value r = .9321 at p<0.05 level of significance. Hence it was concluded that there is a positive linear correlation, when the knowledge increases Practice also increases. Hypothesis 2 is also accepted by this result.

**Table 4: Association between knowledge with selected demographic variables of staff nurses**

Level of knowledge	Age (years)						Pearson $\chi^2$ value	p value
	<25		25.1-35		>35			
	No	%	No	%	No	%		
Inadequate	0	0	1	6.25	0	0	9.798*	0.044
Mod. Adequate	4	50	3	18.75	6	40		
Adequate	4	50	12	75	9	60		
Total	8	100	16	100	15	100		

\* Significant at 0.05 level

There was a significant association of knowledge with Nurses Age i.e. ( $\chi^2$  – value = 9.798) were significantly associated with knowledge at 0.05 level i.e. P<0.05. The above results evidence that as the age increases knowledge of staff nurses on prevention and management of extravasation has increased. The chi- square analysis also revealed that

there is no significant association between knowledge and practices of nurses with the other selected demographic variables.

## DISCUSSION

Similar study done by Devi C.B,( 2016)and her findings revealed that majority 40 (66.7%) of the staff nurses have moderate knowledge regarding extravasation, 58 (96.7%) of staff nurses had good practice. Study done by Gozzo *et al* (2017) revealed that 75%of the study subjects are unaware of the use of the hot compress for certain chemotherapeutic agents but in the present study it is found that 84% of the subjects were aware of this aspect. Study done by Kapucu.S(2017) found that 75.7% nurses had correct information on management of extravasation. In this study 79.59% of staff had adequate knowledge regarding the management of extravasation.

In the current study it is rewarding to see that Majority (92.3%) of the nurses had good preventive practices at the bedside and 79.5% of the nurses had adequate simulative practice related to management of extravasation. This study was done to know where the nurses stand in terms of caring for children undergoing chemotherapy. These results have shown that ongoing staff education, constant feedback given to the staff on their performance, and master's level prepared specialized faculty contribution to maintain the quality of patient care are useful. Most of the staff (90%) were aware that 10ml syringe is recommended to use with central lines because it generates less pressure to prevent damage to the venous catheter & blood vessel and it was observed that 97.4% of the nurses used 10ml syringe only with central lines such as PICC or Port- a- cath.

The findings about practice of management revealed to us that all the subjects (100%) were able to perform the initial steps of managing the extravasation such as stopping the infusion, leaving the cannula in place and aspirating the cannula to withdraw the residual drug. Though only 38.4% of the subjects were knowledgeable about the mechanism (DNA binding & Non-DNA binding) by which the extravasated drug cause tissue damage, majority (84.6%) of the subjects were able to perform the appropriate local application (dry warm pack for vincristine and dry cold pack for doxorubicin) depending on the name of the drug. About 38.4% of the samples did not realize that documentation is to be done following the intervention for extravasation. In contrary majority (97.4%) of the staff were knowledgeable on what content to be recorded followed by extravasation. The nursing practice aspects such as educating and counselling the family members regarding the follow up care after extravasation was found to be moderately adequate (70%) which needs to improve to adequate practice by reiterating to the staff about the importance of communication.

## CONCLUSION

Nurses play an important role in the administration of cancer chemotherapeutic agents, maintaining the IV access, monitoring the patients closely, identifying adverse events such as extravasation, initiating the appropriate intervention and assisting the physician in the ongoing care to ensure the best care possible to our patients. It is evident through the above study that a greater proportion of nurses have adequate practice than knowledge. Though this discrepancy between knowledge and practice has to be explored further, these results are an eye opener that the nurses need a greater number of innovative educational sessions to improve their knowledge aspect.

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