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Research Article

AN EXPERIMENTAL STUDY TO ASSESS THE EFFECT OF SELF INSTRUCTIONAL MODULE ON KNOWLEDGE AND PRACTICES REGARDING HANDLING OF CYTOTOXIC DRUGS AMONG THE STAFF NURSES WORKING IN THE PEDIATRIC UNITS OF SELECTED HOSPITALS IN PUNE CITY

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ABSTRACT

Introduction: Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. Many treatment options exist for cancer and treatment with chemotherapy started in early 20th century. It involves one or more cytotoxic drugs. Nurses are the main groups that are exposed to these drugs in hospital setting. Hence an experimental study to assess the effect of self instructional module on Knowledge and Practices regarding handling of cytotoxic drugs among the staff nurses working in the Pediatric units of selected hospitals in Pune city was undertaken. The objectives of the study were to assess the Knowledge and Practices of the staff nurses regarding handling of cytotoxic drugs before and after the administration of self instructional module, to determine the effectiveness of Self Instructional Module on Knowledge and Practices among the staff nurses, to correlate the Knowledge and Practices of staff nurses and to find out the association between pre Knowledge and Practice scores with selected demographic variables. **Material and methods:** A pre experimental one group pre test post test design was used and carried out on 60 samples. The Non probability purposive sampling technique was used. Demographic Performa, structured questionnaire and observation checklist was used to collect the data. **Results:** The mean knowledge score was significantly increased from 14.3 to 17.4 (p value = 0.000) and the mean practice score was improved from 15.0 to 17.1 (p-value = 0.000) with significant positive correlation between knowledge and practice (r=0.6, t value= 6.2, p value = 0.000) depicting significant change in the knowledge and practice of the staff nurses after the administration of the self instructional module. **Conclusion:** The researcher is optimistic that the study has exposed some directions for further research that will influence a greater appreciation and awareness for safe handling awareness and practices among the staff nurses handling cytotoxic drugs.

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INTRODUCTION

Cancer is a disease process that begins when an abnormal cell is transformed by the genetic mutation of the cellular DNA. Cancer is one of the second largest killer diseases next to the heart disease. There are many treatment strategies against cancer and chemotherapy being one of them. Cytotoxic drugs are therapeutic agents mainly used in chemotherapy for their actions on killing cancerous cells. Nurses play a pivotal role in the preparation, administration of cytotoxic drugs among patients suffering with cancer. There is an increasing trend of occupational exposure to cytotoxic hazards among the health care professionals as cancer patients are usually diagnosed at earliest stages and receiving multiple chemotherapy regimens for a longer period of time. Long term occupational exposures

to cytotoxic drugs are associated with various carcinogenic, teratogenic and mutagenic effects. Nurses being the major role in the treatment, it is still a necessity and a need to continue assessing their knowledge, practices and help them with learning aids to keep them updated.

MATERIAL AND METHODS

A quantitative approach using pre experimental one group pre test post test design had been adopted for the present study. A total of 60 samples were selected by using non probability purposive sampling technique according to the inclusion criteria of the sample i.e. educational qualification (ANM, GNM, B.Sc staff nurses), staff nurses working in the Pediatric wards of selected hospitals, staff nurses who are involved in handling of cytotoxic drugs. Validity & reliability was done.

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Reliability was done by using test re-test method and inter rater method. Pilot study was conducted on 10 samples to determine the feasibility of the study and it was found feasible. Informed consent was taken prior to conduct the study. Structured questionnaire, consisting of 25 items and observation checklist, also consisting of 25 items was used to assess the pre knowledge and practices of the staff nurses. Followed with the administration of the self instructional module and similarly the post test on the 8th day. Post results were analyzed to determine the effectiveness of the self instructional module. Paired “t” test was used to calculate the significance of the intervention.

RESULTS

Analysis of Demographic Data: Table No.1

n=60

s.n	Demographic variable	Freq	%
	Age		
1.1	21-30 years	55	91.6%
	31-40 years	4	6.7%
	Above 40 years	1	1.7%
	Gender		
1.2.	Female	58	96.7%
	Male	2	3.3%
	Educational Qualification		
1.3.	ANM	1	1.7%
	B.Sc.	44	73.3%
	GNM	15	25.0%
	Years of experience as a Registered nurse		
1.4.	1-3 years	16	26.7%
	3-6 years	13	21.7%
	Upto 1 year	31	51.6%
1.5.	Have you ever worked in the oncology unit? or (Have you ever handled Cytotoxic Drugs?)		
	Yes	60	100.0%
	Any source of information regarding handling of cytotoxic drugs		
1.6.	Chemo-protocol book	9	15.0%
	Hospital experience	12	20.0%
	No	16	26.7%
	Oncology classes	6	10.0%
	Others	17	28.3%

Table No. 1 shows that majority (91.7%) of the staff Nurses were under the age group 21-30 years, majority (96.7%) of the Staff Nurses were female staff nurses, majority (73.3%) of the Nurses were B.Sc. staff Nurses, majority (51.6%) of the Staff Nurses were having at least up to 1 year of experience, all the Staff Nurses had worked in the oncology unit and majority (28.3%) of the staff Nurses were having information regarding handling of cytotoxic drugs from other sources.

Table no. 2 Analysis of knowledge of the staff nurses regarding handling of cytotoxic drugs before the administration of self instructional module
n=60

S.No	Level of Knowledge	Pretest	
		Freq	%
1.	Poor (Score 0-8)	0	0.0%
2.	Average (Score 9-16)	52	86.7%
3.	Good (Score 17-25)	08	13.3%

Table No. 2 shows that 86.7% staff nurses had average knowledge (Score 9-16) and 13.3% of them had good knowledge (score 17-25) regarding handling of cytotoxic

drugs. Knowledge regarding handling of cytotoxic drugs was aimed in terms of introduction, preparation, administration, after care and adverse effects of cytotoxic drugs. Among that following are the areas where the staff nurses didn't have adequate knowledge- types of PPE, adverse effects and after care of cytotoxic drugs. However they had adequate knowledge in areas regarding introduction, exposure of cytotoxic drugs, use of PPE, preparation of cytotoxic drugs.

Table no.3 Analysis of practices of the staff nurses regarding handling of cytotoxic drugs before the administration of self instructional module

n=60

S.No	Practices	Pretest	
		Freq	%
1.	Poor (Score 0-8)	0	0.0%
2.	Average (Score 9-16)	50	83.3%
3.	Good (Score 17-25)	10	16.7%

Table No. 3 shows that 83.3% of the staff nurses had average practice (Score 9-16) and 16.7% of them had good practice (Score 17-25) regarding the standard protocol of handling cytotoxic drugs. Practices regarding cytotoxic drugs were aimed in terms of prior to administration, administration and post administration. Among that, following were the areas where the staff nurses didn't follow all the guidelines- practices of locating spill kit, use of spill kit, selection of PPE, assessment of adverse effects. However they followed all the guidelines in areas of were calculating the weight prior to administration, gathering equipments, use of PPE and documentation.

Table no. 4 Analysis of Knowledge of the staff nurses regarding handling of cytotoxic drugs after the administration of self instructional module

n=60

S.No	Level of Knowledge	Posttest	
		Freq	%
1.	Poor (Score 0-8)	0	0.0%
2.	Average (Score 9-16)	34	56.7%
3.	Good (Score 17-25)	26	43.3%

Table No. 4 shows that in posttest, 56.7% of the staff nurses had average knowledge (Score 9-16) and 43.3% of them had good knowledge (Score 17-25) regarding handling of cytotoxic drugs. The knowledge level was found to be increased in the areas of routes of occupational hazard, selection of PPE, contents of spill kit, administration and adverse effects of cytotoxic drugs.

Table no.5 Analysis of Practices of the staff nurses regarding handling of cytotoxic drugs after the administration of self instructional module

n=60

S.No	Practices	Posttest	
		Freq	%
1.	Poor (Score 0-8)	0	0.0%
2.	Average (Score 9-16)	28	46.7%
3.	Good (Score 17-25)	32	53.3%

Table No.5 shows that 46.7% staff nurses had average practices (Score 9-16) and 53.3% of them had good practices (Score 17-25) regarding handling of cytotoxic drugs. The practices were

found to be improved in areas of selection of PPE, use of spill kit for spill management, administration of cytotoxic drugs.

Table no. 6 Comparison of Pre & Post Knowledge scores (Mean, SD & “t” Values)

S.no	Knowledge	Pretest		Posttest	
		Freq	%	Freq	%
1.	Poor (Score 0-8)	0	0.0%	0	0.0%
	Average (Score 9-16)	52	86.7%	34	56.7%
	Good (Score 17-25)	8	13.3%	26	43.3%
2.	Mean	14.3		17.4	
3.	SD	1.9		2.6	
4.	t	15.8			
5.	Df	59			
6.	p-value	0.000			

Table No.6 shows that during the pretest, 86.7% staff nurses had average knowledge (Score 9-16) and 13.3% of them had good knowledge (score 17-25) regarding handling of cytotoxic drugs. In posttest, 56.7% of the staff nurses had average knowledge (Score 9-16) and 43.3% of them had good knowledge (Score 17-25) regarding handling of cytotoxic drugs. The researcher applied paired t-test for comparison of pretest and posttest knowledge scores. Mean pretest knowledge was 14.3 which was increased to 17.4 in posttest. t-value for this comparison was 15.8 with 59 degrees of freedom. Corresponding p-value was 0.000, which was smaller than 0.05. Hence the null hypothesis was rejected. The self-instructional module was proved to be significantly effective in improving the knowledge of the staff nurses regarding handling of cytotoxic drugs

Table No.7 Comparison of Pre & Post Practice scores (Mean, SD & “t” Values)

S.no	Practices	Pretest		Posttest	
		Freq	%	Freq	%
1.	Poor (Score 0-8)	0	0.0%	0	0.0%
	Average (Score 9-16)	50	83.3%	28	46.7%
	Good (Score 17-25)	10	16.7%	32	53.3%
2.	Mean	15.0		17.1	
3.	SD	1.4		1.9	
4.	T	16.4			
5.	Df	59			
6.	p-value	0.000			

Table No.7 shows that during the pretest, 83.3% of the staff nurses had average practices (Score 9-16) and 16.7% of them had good practices (Score 17-25) regarding handling cytotoxic drugs. In posttest, 46.7% staff nurses had average practices (Score 9-16) and 53.3% of them had good practices (Score 17-25) regarding handling of cytotoxic drugs. The researcher applied paired t-test for comparison of pretest and posttest practice scores. Mean pretest practice was 15 which was increased to 17.1 in posttest. t-value for this comparison was 16.4 with 59 degrees of freedom. (Table value- 2.00) Corresponding p-value was of order of 0.000, which was smaller than 0.05. Hence the null hypothesis was rejected. The self-instructional module was proved to be significantly effective in improving the practice of the staff nurses regarding handling of cytotoxic drugs

Table no.8 Correlation between the Knowledge and Practices of staff nurses regarding handling of cytotoxic drugs

s.no	Mean pretest knowledge score	Mean pretest practice score	r value	t value	p-value
1.	14.3	15.0	0.6	6.2	0.000

Table No. 8 shows that correlation coefficient between knowledge and practices were 0.6, which indicates that there is positive correlation between knowledge and practices of staff nurses. The significance of this positive correlation was tested using t-test for significance of correlation coefficient. t- value for this t-test was found to be 6.2 with 58 degrees of freedom. Corresponding p-value was 0.000, which was smaller than 0.05. Hence there was a significant positive correlation between knowledge and practices of staff nurses.

Table no. 9 Application of Fisher’s exact test for association between Knowledge regarding handling of cytotoxic drugs and selected demographic variables of staff nurses

s.no	Demographic variable	Knowledge		p-value	
		Average	Good		
1.	Age	21-30 years	47	8	0.657
		31-40 years	4	0	
		Above 40 years	1	0	
2.	Gender	Female	50	8	0.572
		Male	2	0	
		ANM	1	0	
3.	Educational qualification	B.Sc.	37	7	0.612
		GNM	14	1	
		Years of experience as a Registered nurse	2-3 years	12	
More than 3 years	13	0			
Upto 1 year	27	4			
4.	Any source of information regarding handling of cytotoxic drugs	Chemo-protocol book	7	2	0.257
		Hospital experience	10	2	
		No	16	0	
		Oncology classes	4	2	
		Other	15	2	

Table no.10 Application of Fisher’s exact test for association between practices regarding handling of cytotoxic drugs and selected demographic variables of staff nurses

s.no	Demographic variable	Practices		p-value	
		Average	Good		
1.	Age	21-30 years	45	10	1.000
		31-40 years	4	0	
		Above 40 years	1	0	
2.	Gender	Female	48	10	1.000
		Male	2	0	
		ANM	1	0	
3.	Educational qualification	B.Sc.	36	8	1.000
		GNM	13	2	
		Years of experience as a Registered nurse	2-3 years	13	
More than 3 years	13	0			
Upto 1 year	24	7			
5.	Any source of information regarding handling of cytotoxic drugs	Chemo-protocol book	7	2	0.069
		Hospital experience	9	3	
		No	15	1	
		Oncology classes	3	3	
		Other	16	1	

Table No.9 shows that since all the p-values are large (greater than 0.05), none of the demographic variables was found to have significant association with knowledge of the staff nurses regarding handling of cytotoxic drugs.

Table No. 10 shows that since all the p-values are large (greater than 0.05), none of the demographic variables was found to have significant association with practices of the staff nurses regarding handling of cytotoxic drugs.

DISCUSSION

The present study was set up to assess the effect of self instructional module on knowledge and practices of the staff nurses regarding handling of cytotoxic drugs. In this present study it was found that during the pre test, 86.7% of the staff nurses had average knowledge and 13.3% had good knowledge. However during post test, 56.7% had average knowledge and 43.3% had good knowledge. Similarly, for the practices during pre test 83.3% of them had average practice and 16.7% of them had good practice. Likewise during post test, 46.7% had average practices and 53.3% of them had good practices.

Somayah Hanaf *et al* conducted an observational cross-sectional survey study on Safe Handling of Cytotoxic Drugs and Risks of Occupational Exposure to Nursing Staffs in three tertiary care teaching hospitals in Tehran, Iran in 2012. Totally 270 adverse reactions were reported. The most frequently reported adverse effects included headache and vertigo (40 cases), hair loss (36 cases), skin rashes and itching (31 cases), and burning sensation in eyes (31 cases). The researchers concluded that monitoring the personnel who are directly involved in handling of cytotoxic drugs is of great importance. Furthermore, educating the personnel in the field of standards of cytotoxic drugs handling could increase the nursing staff's knowledge regarding these drugs' adverse reactions.

Keeping in view the findings of the present study, the researcher identified some areas where the staff nurses were lacking in both their knowledge and practice regarding handling of the cytotoxic drugs. The areas which the researcher felt the need to be taken care of were identified as: exposure routes, adverse effects of handling cytotoxic drugs, following the standard operating procedure while administering the drug, appropriate selection and use of personnel protective equipments right from the receiving till the after care of the drug.

These results further states that reinforcement and reeducation on new and current practice is still an important aspect to knowledge dissemination and retention among the staff nurses. It is also evident that self learning in the form of written material that is self instructional module serves as a ready reference as it is easier and convenient for the learners.

It can be concluded that SIM remains the preferred and accepted method of instruction, as it is handy and help clarify and further enquire into the areas of weakness and gaps in knowledge as well as practices by the nurses.

CONCLUSION

This study helps to maintain an awareness and up to date knowledge and skill regarding safe handling of cytotoxic drugs and also ensuring that staff nurses are adequately prepared to protect themselves in their workplace from unnecessary exposure. It also aimed in improving the knowledge and practices of the staff nurses handling the cytotoxic drugs. The findings of the present study indicates that participants when administered the self instructional module showed improved knowledge and practice score as compared to the knowledge and practices before the administration of the self instructional module. Learning aid i.e self instructional module was found to be effective in improving the knowledge and practices of the staff nurses regarding handling of cytotoxic drugs.

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