Original Research

To Compare Pre and Post Interventional Knowledge Regarding Safe Handling Practices of antineoplastic drugs among nurses

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ABSTRACT:
Aim: To compare pre and post interventional knowledge regarding safe handling practices of antineoplastic drugs among nurses. **Material and methods:** 252 nurses working in medical oncology, semiprivate and the special wards were included in this study. Data was collected on planed dates and the data collection technique used was paper and pencil test. On day 1, the purpose of the study was explained to all the nurses and they will be assured of the confidentiality. Written consent was obtained from the samples. Pre-test was conducted. A self structured information module on safe handling practices of antineoplastic drugs was administered to the samples to gain knowledge about the safe handling of antineoplastic drugs.Post test was conducted on day 7. **Results:** The comparison of pre test knowledge and post test knowledge. The pre test knowledge of the nurses mean value (75.27±8.99) and the post test knowledge of the nurses was (82.28±9.4). There a significances relation was observed in the comparison of pre test knowledge of nurses and post test knowledge of nurses. **Conclusion:** We concluded that the majority of the nurses had moderately adequate knowledge and skills and after the structured teaching more than half of the nurses gained adequate knowledge and skills. The study found that structured teaching program on knowledge regarding safe handling practices of antineoplastic drugs among nurses has helped to develop additional knowledge and skills about the same.
Knowledge: safe handling practices, antineoplastic drugs, nurses

INTRODUCTION

According to Global Cancer Incidence Mortality and Prevalence (GLOBOCAN) estimates, about 14.1 million new cancer cases, and 8.2 million deaths occurred in 2012 worldwide.[1] However, there are an estimated 18.1 million new cases and 9.6 million deaths in 2018[2] new cases are expected to rise to 16 million by 2020.[3]

Cancer is expected to rank as the leading cause of death and the single most important barrier to increasing life expectancy in every country of the world in the 21st century.[2] Cancer constitutes an enormous burden worldwide that is expected to increase due to different factors known to cause cancer.[1] Cancer is an emerging public health problem in Africa and about 715,000 new cancer cases and 542,000 deaths occurred in 2008, with these numbers expected to double in the next 20 years.[4] In Ethiopia, annual incidence and mortality of all cancer were reported 51,700 and 41,600 respectively.[5] Besides, cancer is responsible for 5.8% of total national deaths.[6,7] According to GLOBOCAN 2012 estimates, about 40% of cancers are preventable.[1]

Antineoplastic drugs are cytotoxic agents which are widely used in healthcare centers to treat patients with cancer. Researchers have confirmed that the adverse drug reactions (ADRs) associated with antineoplastic agents may occur in both patients and individuals involved in the treatment chain. The US National Institute of Occupational Safety and Health (NIOSH) classified these drugs as high risk since they are mutagenic, teratogenic, and carcinogenic.[8]

The toxic effects of antineoplastic drugs used in the treatment of cancer have been well-known since their introduction in the 1940's. Cancer treatment with chemotherapy or antineoplastic drugs began in the early 20th century. Since then, these drugs have begun

to be used to treat many types of cancer. However, in addition to patient safety concerns arising from the necessary therapeutic use of these drugs, occupational hazards for health care workers who administer these drugs while performing their duties still need to be fully addressed.[9]

Chemotherapy is based on the use of antineoplastic drugs with strong anti- cytotoxic effects. In order to reduce the exposure of antineoplastic cytotoxic drugs, special door and equipment structures, protective and safety measures are required performing all procedures involving the use of these agents, such as transporting, maintaining, preparing, rehabilitating law, managing and caring for patients.Total numbers of questions were 30 each question carries one mark, total mark was 30.

MATERIAL AND METHODS

The study conducted in the department of nursing, mayur hospital and research centre. Patients were admitted on different wards like medical oncology, semiprivate and special ward. 252 nurses working in medical oncology, semiprivate and the special wards were included in this study.

INCLUSION CRITERIA

- Nurses who are administering antineoplastic drugs selected hospitals Indore.
- Nurses who are willing to participate in the study.
- Nurses who are available at the time of data collection.
- Nurses who have more than one year of experience.
- Nurses who can understand, read and write English.

EXCLUSION CRITERIA

- Nurses who have less than one year of experience
- Nurses who are not willing to participate
- Nurses who cannot understand read and write English.

METHODOLOGY

Data collection was done from mayur hospital and research centre. The samples were selected from medical oncology, semiprivate and special ward in mayur hospital and research centre. Data was collected using structured questionnaire and check list.Formal written permission was obtained from the authorities of the hospitals. Data was collected on planed dates and the data collection technique used was paper and pencil test. On day 1, the purpose of the study was explained to all the nurses and they will be assured of the confidentiality. Written consent was obtained from the samples. Pre-test was conducted. A self structured information module on safe handling practices of antineoplastic drugs was administered to the samples to gain knowledge about the safe handling of antineoplastic drugs.Post test was conducted on day 7.

The research design selected for this study was one group pre and post ±test design; it is a type of quasi experimental design. This design was selected to explain the relationship between chemotherapy knowledge and skill of the nurses.

$$O_1 Í \quad x\ Í\ O_2$$

- O_1- Pre-test
- X ±Intervention
- O_2- Post-test

Pre-test (O_1) refers to pre assessment of the staff nurses knowledge and skill regarding safe handling practices of antineoplastic drugs among nurses. Intervention (X) refers to the structured teaching program on safe handling practices of antineoplastic drugs among nurses about 30 to 45 mts. Post-test (O_2) refers to re-assessment of the same after one week using structured questionnaire and check list respectively.

LEVEL OF KNOWLEDGE

Excellent	24-30
Very good	19-24
Good	13-18
Average	7-12
Poor	0-6

DATA ANALYSIS

The data analysis was include descriptive and inferential statistics. The plan of analysis will made with opinion of experts. The analysis will be done based on the objectives and hypothesis to be tested. Items related to background variables will be analyzed in terms of frequency and percentages. Mean, median, standard deviation and mean percentage of pre and post test score will be computed. "T" test would be applied to determine the significance of mean difference between mean pre-test score and post-test score.

RESULTS

Table 1 shows that the 252 nurses were selected for the study, among them 167(66.%) members were between the age 19-23 years, 79(31.6%) of them were 24-29 years of age and 6(2.4%) of them were more than 29 years of age. Among 252, 188(74.6%) of them were female nurses and 64(25.4%) were male. Among them 146(57.9%) nurses have a degree in B.Sc Nursing and 98(38.8%) have a diploma in GNM and remaining have MSc.(N).73(28.9%) staff nurses have less than2 years of experience, 132(52.1%) of them having 2-3 years and the remaining 47(19.4%) members have above 3years of experience. 90(35.7%) nurses have not attended any training program regarding regarding safe handling practices of antineoplastic drugs and the remaining 162(64.3%) have Additional qualification.

Table: 1 Demographic data of the nurses

Demographic Profile	Number	%
Age (yrs)		
19-23	167	66.0

24-29	79	31.6
Above 29	6	2.4
Gender		
Female	188	74.6
Male	64	25.4
Educational status		
B.Sc.(N)	146	57.9
GNM	98	38.8
M.Sc.(N)	8	3.3
Years of experience		
Less than 2 years	73	28.9
2-3 years	132	52.1
Above 3 years	47	19.0
Additional qualification		
Yes	162	64.3
No	90	35.7

Table: 2 Knowledge level of pre test and post test in nurse

Knowledge	Mean±Sd
Mean of knowledge Pre test	75.27±8.99
Mean of knowledge Post test	82.28±9.4

Comparison of pre test knowledge and post test knowledge regarding safe handling practices of antineoplastic drugs. Table2 show that the comparison of pre test knowledge and post test knowledge. The pre test knowledge of the nurses mean value (75.27±8.99) and the post test knowledge of the nurses was (82.28±9.4). There a significances relation was observed in the comparison of pre test knowledge of nurses and post test knowledge of nurses.

Table 3 show that the distribution of nurses according to their level of knowledge on regarding safe handling practices of antineoplastic drugs shows that in pre-test had Excellent knowledge 51(20.2), Very good (26.5), Good 88 (34.9) knowledge and Poor 32(12.8) knowledge and very poor 14(5.6) knowledge.

Table:3 Knowledge level of pre test in nurse

Level of knowledge	Pre-test	
	Frequency	%
Excellent(25-30)	51	20.2
Very good(19-24)	67	26.5
Good(13-18)	88	34.9
Average (7-12)	32	12.8
Poor(0-6)	14	5.6

Table 4 show that in post-test had Excellent knowledge 71(28.1), Very good 86(34.1), Good 64(25.3) knowledge and Average 23(9.1) knowledge and poor 8(3.4) knowledge.

Table 4 knowledge level of post test in nurses

Level of knowledge	Post-test	
	frequency	%
Excellent(25-30)	71	28.1
Very good(19-24)	86	34.1
Good(13-18)	64	25.3
Average (7-12)	23	9.1
Poor(0-6)	8	3.4

By using chi square test, data analysis was done to find out the association between pre-test knowledge of nurses regarding safe handling practices of antineoplastic drugs and their selected demographic variables viz. age in years, educational status, years of experience and additional qualifications. The results show that there is a significant association between the educational statuses and there is no significant association between age in years, year of experience and additional Qualifications, among nurses who regarding safe handling practices of antineoplastic drugs.

Table 2 show that the comparison of pre test knowledge and post test knowledge. The pre test knowledge of the nurses mean value (75.27±8.99) and the post test knowledge of the nurses was (82.28±9.4). Table 3 shows there is a average knowledge of staff nurses in pre test. There a significances relation was observed in the comparison of pre test knowledge of nurses and post test knowledge of nurses.

Table 4 shows Excellent level of knowledge in post test. There a significances relation was observed in the comparison of pre test knowledge of nurses and post test knowledge of nurses.

DISCUSSION

In this study total 252 nurses were selected for the study, among them 167(66.26%) members were between the age 19-24 years, 79(31.34%) of them were 24-29 years of age and 6(2.36%) of them were more than 29 years of age.Among 252, 188(74.6%) of them were female nurses and 64(25.3%) were male. Among them 146(57.9%) nurses have a degree in B.Sc Nursing and 98(38.8%) have a diploma in GNM and remaining have MSc.(N). 73(28.9%) staff nurses have less than2 years of experience, 132(52.3%) of them having 2-3 years and the remaining 47(19.4%) members have above 3years of experience. 90(35.7%) nurses have not attended any training program regarding regarding safe handling practices of antineoplastic drugs and the remaining 162(64.3%) have Additional qualification.

Similar study were done by RavongunuoNakhro and Suresh Ray(2017)[10] 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 found similar demographic parameter. they were found 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 to1year of experience, all the Staff Nurses had worked in the oncology unit.

In another study conducted by Hosen MS et al (2019)[11] on Evaluation of knowledge and practice of handling chemotherapy agents by nurses. There were 96 respondents who participated in the survey and

majority of them were 89 (92.7%) female rest of were male. The age of respondents did vary. Some 40 (41.7%) of nurses were in between 18-25 years age, 33 (34.4%) were in 26-32 years and 23 (24%) of them were above 33 years of age. Most respondents 88 (91.7%) had a minimum qualification i.e. diploma and remaining 8 (8.3%) had bachelor degree in nursing from different nursing schools. Majority 70 (72.9%) of respondents did not obtain any training regarding chemotherapy agents handling, however, 26 (27.1%) were reported to have enough skill to handle chemotherapy agents. Researcher found that the nurses significantly differed in having any special training on chemotherapy agents handling even they did not attain any seminar, symposium and workshop. Working experience in chemotherapy units of respondents' shown that majority of them 63 (65.6%) had between 0.6-4 years, 22 (22.9%) between 4-8 years and while 11 (11.5%) had more than 8 years. Among the respondents 15 have worked in other unit before starting to chemotherapy unit. It also showed that the most of the respondents 84 (87.5%) had worked at private hospitals and the remaining 12 (12.5%) worked at public hospitals chemotherapy unit.

In another study conducted by Darshana Kumari et al (2016)[12] on the study of practice regarding safety measures used by nurses while handling Chemotherapy drugs and they were also found similar demographic profile in their study. They foundDistribution of nurses according to their age in years shows that 64% of the nurses belonging to 21-30 years,33% of nurses belonging to 31-40 years, 1% belonging to 41-50 years and 2% nurses belonging to above 51 years respectively. Distribution of nurses according to their gender shows that 15% were belonging to male gender and 85 % were belonging to female gender respectively. Distribution of nurses according to their marital status shows that 34% of nurses were single, 66% of nurses were married and no widowed respectively.Distribution of nurses according to their number of living children shows that 24% of nurse were one living child,31% of nurses were two living children, 6% of nurses were more than two children and 39% of nurses were no child respectively. Distribution of nurses according to their number of abortion shows that 21% of nurses were one abortion, 4% of nurses were two abortions, 1% of nurses were more than two abortion and 74% of nurses were no abortion respectively. Distribution of nurses according to their previous training shows that 8% of nurses were having previous training and 92% of nurses were having no previous training respectively. Distribution of nurses according to their education qualification shows that 66% of nurses were belonging to RGNM, 28% of nurses were belonging to Basic. B.Sc/Post Basic. BSc nursing, 2% of nurses belonging to M.Sc nursing respectively. Distribution of nurses according to their working experience shows that 70% of nurses were belonging to 1-5 years

experience, 28% of nurses were belonging to 6-10 years experience, 2% of nurses belonging to above 16 years working experience respectively. Distribution of nurses according to their regular medical checkup shows that 31% of nurses were belonging to no regular checkup, 68% of nurses were belonging to every 2-5 years regular checkup and 1% of nurses belonging to more than 5 years regular checkup respectively.

According to their level of knowledge on regarding safe handling practices of antineoplastic drugs in pre-test had Excellent knowledge 51(20.2), Very good (26.5), Good 88 (34.9) knowledge and Average 32(12.6) knowledge and Poor 14(5.5) knowledge and in post-test had Excellent knowledge 71(28.12), Very good 86(34.1), Good 64(25.3) knowledge and Average 23(9.1) knowledge and Poor 8(3.1) knowledge. The result of this study showed an increase in level of knowledge of the nurses after implementation of structured teaching program on intravenous administration of chemotherapy. These findings are similar to an another study.

RavongunuoNakhro and Suresh Ray (2017)[10] were observed 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. They were found 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 and they found 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.

Similar results were found by Rupali P. Pethe (2017)[13] identify the effect of antineplastic drugs on nurses handling chemotherapeutic agents. Sample size was 59 nurses who handled antineplastic drugs and 64 community health nurses. they were found in this study that in pre-test scores, 1.67% has Average knowledge, 26.67% have Poor knowledge, 13.33% of samples had good knowledge, 58.83% had average knowledge and 15% had very good knowledge, whether in post-test scores 45% the study participants have good and excellent knowledge, 8.33% have average knowledge and only 1.67% has poor knowledge.

In another study conducted by Darshana. Kumari et al (2016)[12] on the study of practice regarding safety measures used by nurses while handling Chemotherapy drugs and they were also found similar results. they were found that the majority of samples 56 (56%) were having poor practice while handling chemotherapy drugs and 44% of nurses were having good practice while handling chemotherapy drugs, Maximum score was 6 and minimum score was 1.

In another study conducted by Hosen MS et al (2019)[11] on Evaluation of knowledge and practice of handling chemotherapy agents by nurses. They were examined the knowledge of the respondents regarding chemotherapy agents handling and safety measures have been taken while working in chemotherapy unit. The minimum and maximum knowledge score on chemotherapy agents handling was 8 and 15 respectively. Most of the respondents 88 (91.66%) had good level of knowledge their score was 11-15, and the minority i.e., 8 (8.34%) nurses' scored range 5-10. Therefore, it is established that their knowledge score was in satisfactory level.

CONCLUSION

We concluded that most of the nurses had moderately adequate knowledge and skills and after the structured teaching more than half of the nurses gained adequate knowledge and skills. The study found that structured teaching program on knowledge regarding safe handling practices of antineoplastic drugs among nurses has helped to develop additional knowledge and skills about the same. Hence, structured teaching helps the nurses to be aware of the hazardous effects of antineoplastic drugs so they may protect themselves as well as the patients.

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