

Knowledge And Practice On The Safe Handling Of Cytotoxic Drugs Among Nurses Working In Tertiary Hospital, Nepal

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Abstract:

Background: The increasing trend of cancer embark the need for the extensive use of cytotoxic drugs (CDs) for the treatment of the disease. The nursing personnel are the one who are directly involved in handling and administration of cytotoxic drugs. So they need to have adequate knowledge and skill about handling of cytotoxic drugs. Any kind of negligence may lead to adverse consequence on patients, staff and environment. Thus, the aim of this study is to assess the knowledge and practice of safe handling of CDs among nurses.

Materials and Methods: The descriptive cross-sectional study was done among 309 nurses working in different units of Patan Hospital, Nepal. The convenience sampling technique was used to choose the sample and collect data. Data was collected by using structured self-administered questionnaire in English. The practice regarding cytotoxic drugs questionnaire was required only for those nurses who have been involved in handling of cytotoxic drugs which was clearly mentioned in tool.

Results: The result shows the mean age of nurses were 31.74±6.65 years with, the mean duration of experience in years was 9.66±6.85. The total of 55.7% had average level of knowledge with only 33% were involved in handling of cytotoxic drugs. Among the nurses involved in handling, 59.8% had average level of practice.

Conclusion: Most of the nurses possess average knowledge and practice regarding sage handling of CDs. However, study also reflect the findings that the nurses does not apply knowledge while practicing the handling of cytotoxic drugs.

Key Word: Cytotoxic drugs; Knowledge; Practice; Safe handling; Nurses.

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I. Introduction

Currently, cancer is among the leading causes of morbidity and mortality. Worldwide, an estimated 19.3 million new cancer cases and almost 10.0 million cancer deaths occurred in 2020. ¹ According to GLOBOCAN, there were an estimated 26,184 new cancer cases and 19,413 cancer deaths in Nepal in 2018. ² Chemotherapeutic agents are cytotoxic drugs (CDs) which are extensively used in health care facilities to treat cancer. Nursing personnel's play a significant role during chemotherapy preparation and administration where a little negligence may lead to adverse consequence on patients, staff and environment. ³ A study done in Iran shows that although 75% of nurses exhibit excellent knowledge score, a large number i.e. 93.7% exhibited only moderate performance on safe handling of CDs. ⁴ Another study done in India among nurses shows that all of the study population exhibit only average knowledge and average practice in handing of CDs and that none of them had good knowledge or practice. ⁵

Nursing manpower involve in handling with CDs required to be well equipped with adequate knowledge and skill. It involves patient assessment, safe administration, early identification and management of side effects of CDs. ⁶ The nurses should possess adequate knowledge and equipped with optimum skill for safe management of CDs to minimize the side effects and threat arises due to CDs. The poor nursing practice is associated with knowledge deficit which threaten personal and patient safety. ⁷ Thus the aim of this study is to assess the knowledge and practice of safe handling of CDs among nurses.

II. Material And Methods

The descriptive cross-sectional study was carried out among nurses working in Patan Hospital, Nepal. A total 309 nurse were included in the study.

Study Design: Descriptive cross-sectional study

Study Location: The study was carried out in Patan Hospital, Nepal. It is one of the tertiary care center of Nepal. The study was carried out in all units of Patan Hospital.

Study Duration: The duration of data collection was of three months from the time of ethical approval, July-September 2024.

Sample size: The sample size was calculated based on prevalence of good knowledge and was obtained as 372. However, the convenience sampling technique was used with the total of 309 nurses were included in the study.

Inclusion criteria:

1. All who were willing to participate in the study.
2. Part III i.e. practice regarding cytotoxic drugs involved only those nurses who have ever involve in handling cytotoxic drugs.

Exclusion criteria:

1. Those who were on long leave during data collection.

Procedure methodology

Data collection was done by applying all the ethical procedures that have been mentioned in ethical consideration section. The participants who meet the inclusion criteria was explained about the objectives of the study then written informed consent was taken by the researchers. Data was collected by using structured self-administered questionnaire in English. The part III i.e practice regarding cytotoxic drugs is required only for those nurses who have been involved in handling of cytotoxic drugs, clearly mentioned in tool. The questionnaire was given to participants during their break time in pantry or after completion of duty in changing room as per their convenience and was not allowed to discuss with each other while filling questionnaire. The completion of questionnaire tool about 20 minute and filled questionnaire was collected immediately by researchers on same day then the field editing was done as soon as the nurses submitted it, for avoiding any missed data. Data was collected daily from 7 am to 4 pm except Saturday till sample size was achieved.

Statistical analysis

Editing, coding and classified manually and analyzed using SPSS software version 16

Descriptive statistics: frequency, mean, percentage, and standard deviation were used to analyze socio-demographic variables.

Correlation coefficient was used to identify the relationship between knowledge and practice.

The relation was examined only for those respondents who has practice on safe handling of cytotoxic drugs.

III. Result

The analysis was done after data collection from 309 nurses regarding knowledge and practice on the safe handling of cytotoxic drugs.

The demographic profile of the participants is shown in the table no 1. The participants in result described having mean age and standard deviation of 31.74±6.65 years, also the minimum and maximum age varies as 20 to 60 years. Regarding experience of nurses, the mean duration of experience in years is 9.66±6.85.

Table no 1: Demographic profile of participants

N=309

Characteristics	Mean ± SD	Minimum-maximum
Age (in years)	31.74±6.65	20-60
Experience (in years)	9.66±6.85	1-37

Table no 2 shows the level of knowledge regarding cytotoxic drugs. There were total of 17 single response questions and score of 1 was given for each correct response, with total score range from 0- 17. The score is further converted into percentage and categorized as: > 75%: high level of knowledge; 51-75 %: average level of knowledge and ≤50 %: low level of knowledge.⁸ The analysis shows nearly half (55.7%) of the participants has average level of knowledge. Only one fourth nurses has high level of knowledge.

Table no 2: Level of knowledge

N=309

Level of knowledge	Frequency (n)	Percentage (%)
Low (> 75%)	53	17.2

Average (51-75 %)	172	55.7
High (≤50 %)	84	27.2

Further nurses were asked if they were involved in handling of cytotoxic drugs. Among 309 nurses, the total of 102 (33%) nurses were involved in handling of cytotoxic drug. The table no 3 shows the nurses who practiced handling of cytotoxic drugs.

Table no 3: Frequency of nurses involved in cytotoxic drugs

N=306

Involved in cytotoxic drugs	Frequency (n)	Percentage (%)
Yes	102	33
No	207	67

The nurses who were involved in handling of cytotoxic drugs were further asked for their practice regarding handling of cytotoxic drugs. The practice questionnaire consists of 20 dichotomous, Yes and No, response. The score of 1 is obtained for appropriate practice with total of 20 score. The score is further converted into percentage and categorized as: > 75%: high level of practice; 51-75 %: average level of practice and ≤50 %: low level of practice. The level of practice of 102 nurses is shown in table no 4. The finding shows that only 59.8% has average level of practice and nearly one third has low level of practice.

Table no 4: Level of practice

N=102

Level of practice	Frequency (n)	Percentage (%)
Low	34	33.3
Average	61	59.8
High	7	6.9

Further the analysis was done to find out the relationship between level of knowledge and level of practice. The table no 5 shows the relationship which shows that there is strong negative relationship between knowledge and practice of handling cytotoxic drugs. This implies that even the nurses have good knowledge they have poor practice.

Table no 5: Relationship between knowledge and practice

	Level of knowledge	Level of practice
Level of knowledge	1	-0.261
Level of practice	-0.261	1
	.008	

IV. Discussion

The current study shows that nearly 55.7% of the participants has average level of knowledge and only 27.2 % of nurses possess high level of knowledge. Furthermore 59.8% has average level of practice and 33.3% responded as low level of practice.

A supporting study was done in Euthopia among 412 health professional shows that knowledge toward CD handling is good among 52.7% and bad among 47.3% of respondents. Also, practice was good among 37.6 % and bad among 62.4% of respondents.⁹

Another inline study was done in Iran among 54 nurses showed that 20.5% and 79.5% of nurses had the medium and high level of knowledge, respectively. Regarding practice, 25%, 50%, and 25% of nurses had the low, medium, and high level of performance.¹⁰

Some similar result was also seen in study of Bangladesh among 96 nurses shows that 91.66% had good level of knowledge. Regarding practice, 66.7% of respondents prepared chemotherapy agents in the biological safety cabinet while 33.3% did not use any equipment.¹¹

The study done among 86 oncology nurses of Iran, showed the mean practice score was 21.1 ± 3.76 with total score of 50.¹² Another study of Turkey among 121 nurses shows the information score was 7.82 ± 0.38 of a total of 14 points, and that of self-protection was 7.94 ± 0.24 of a total of 11 points.¹³

The contrast study finding was seen in the study done among 32 oncology nurses in Iran shows that 75% possessed excellent knowledge and 93.7% exhibited moderate performance and no one performed well. The study concluded that standard guidelines education helps to improve the nurses' knowledge and performance on the safe handling of antineoplastic drugs.⁴

Another contrast finding was seen in study of Srilanka among 203 participants shows 94% had adequate knowledge; with 25.62% received training on safe handling of anticancer drugs. However, 86% were poor on preparation practices and 98% performed poor for cleaning practices.¹⁴

Another study done among 60 nurses in India shows that 55% had poor knowledge and 45% have average knowledge regarding safe handling of chemotherapeutic drugs. The study suggested that lack of advance knowledge should be consider unsafe for providing such drugs.⁸

Another study done in Egypt among 30 nurses show that there was overall poor knowledge. Also, 93.3% nurses practice is poor related to safe handling, and disposal of cytotoxic drugs.¹⁵

Similarly study done in Egypt among 55 oncology nurses shows that 67.3% of them had a satisfactory level of knowledge and 36.4% of them had an adequate practice.¹⁶

The analysis of relationship between level of knowledge and level of practice in present study shows that there is strong negative relationship between knowledge and practice of handling cytotoxic drugs ($r = -0.261$, $p = 0.008$). This implies that even the nurses have good knowledge they have poor practice. This may be possibly due to reasons that nurses may not have correct knowledge but they were handling it correctly either because they were asked to do like that or just following institutional policy.

Only similar findings regarding relationship was seen in the study done in Iraq where result showed that there was significant negative association between knowledge and practices ($r = -0.469$, $p = 0.014$).⁷

The contrast finding was seen in study done in Srilanka where there was no significant association between knowledge and practices. Furthermore, there was no significant correlation between participants' knowledge and practices regarding the safe handling of anticancer drugs.¹⁴

Another contrast study of Euthopia among 412 health professionals shows that good practice (AOR = 3.24, 95% CI (1.95–5.37)) were significantly associated with knowledge towards cytotoxic drugs. The findings were due to fact that knowledge improves practice.⁹

Another study in Egypt shows statistical positive significant correlations between nurses' overall knowledge and practice regarding safe handling of cytotoxic drugs ($r = 0.481^*$, $p = 0.007^*$).¹⁵

V. Conclusion

The present study concluded that there is average level of knowledge and practice among nurses regarding handling of cytotoxic drugs. Also, the knowledge and practice are not in line for individual nurses. These findings strongly suggested that nurses should be consciousness enough to acquire information and implement as well. The study also emphasize the need of monitoring system, training programe and safety facilities.

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