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Research Article

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Effectiveness of structured education on safe handling and disposal of chemotherapeutic drugs among nursing students

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ABSTRACT

Aim

To evaluate the effectiveness of structured education on safe handling and disposal of chemotherapeutic drugs among nursing students

Participants and setting

A pre-experimental one group pre-test – post-test design was adopted for this study. The study was conducted in Vandhana school of Nursing, Kodhad, telugana, India. The investigator selected 40 nursing students who fulfilled the inclusion criteria were selected by using simple random sampling technique.

Intervention

Data was collected regarding demographic variable, knowledge and attitude of the diploma in nursing students on safe handling and disposal of chemotherapeutic drugs. The investigator assessed the level of knowledge and attitude of the diploma in nursing students by using structured questionnaire and modified three point Likert Scale and by using checklist through one to one teaching by lecture, demonstration, video clippings and verbalization. Structured teaching programme was conducted on the same day on group wise each group consists of 17 members. Data collection was done in English the questionnaire was distributed to each nursing students. At the end of the teaching the doubts were cleared. Then 10 minutes was allotted for discussion.

Measurement and findings

The analysis finding indicates clearly that 36% of students had inadequate knowledge and 46% of them had negative attitude regarding safe handling and disposal of chemotherapeutic drugs. A well planned structured teaching programme given to the same group. The effectiveness of programme showed high level of significant at $p < 0.001$ level. It showed that structured teaching programme was an effective method to improve the knowledge and attitude.

Conclusion

The pharmacist-based interventions improved the knowledge of nursing students in cytotoxic drug handling. Further assessment may help to confirm the sustainability of the improved practices.

Keywords: Knowledge, Attitude, Effectiveness, Chemotherapeutic Drugs, Nursing students

INTRODUCTION

Cancer therapy is broadly based upon the use of chemotherapeutic drugs with strong anti-cancer cytotoxic effects. Their widespread use has led to concerns about the hazards that they can cause among hospital personnel involved in their use, as besides cancer cells these agents can also affect normal cells causing them important damages. In order to minimize occupational exposure to chemotherapeutic cytotoxic drugs, special department design and equipment are necessary as well as personal protective measures and safety practices during all procedures involving the use of these agents, such as transportation and storage, preparation and reconstitution, administration and care of patients and finally disposal. [1] The toxic effects of anticancer chemotherapy are well known to oncology specialists and to primary care clinicians. Awareness of these effects typically influences treatment plans for patients undergoing cancer therapy to prevent or mitigate adverse outcomes. However, beyond the patient safety concerns arising from the necessary therapeutic use of these drugs, occupational risks to health care workers handling these drugs in the course of their duties still need to be fully addressed. [2] Worldwide, more than 11 million new cases of cancer are diagnosed each year, and that number is expected to rise to 16 million by 2020. In the United States, the American Cancer Society (ACS) predicts that almost 1.4 million new cancer cases will be diagnosed in 2006. The National Cancer Institute predicts that this figure will double by the year 2050 because the US population is growing and aging. This increased patient load, along with the use of high-dose chemotherapy, combinations of several drugs, and the use of antineoplastic drugs for diseases other than cancer, will increase the potential for exposure of the health care worker to these drugs. [3] For the past 3 decades, treatment for many of these cancer cases has relied principally on anticancer chemotherapy. The first such agent, sulphur mustard gas, was observed to cause changes in bone marrow of World War I veterans who were hospitalized many years later. This led to its evaluation as an anticancer agent, and the related, but less toxic, nitrogen mustards were later demonstrated to produce tumour regression in lymphoma patients. With approximately 100 different antineoplastic drugs now in use and many more under development, drugs used to treat cancer have opened new avenues, from improving the quality of life of patients with cancer to a complete cure. Addressing these drugs' formidable toxicity profile, however, has been an ongoing campaign for clinicians

and, more recently, for the occupational health community. [4] Nurses must be aware of the safe handling of the chemotherapeutics, its classification, its action on cells and the safe handling and disposal to prevent the hazards. They must be conscious about their own health. [5] In response to reports of measurable air levels of antineoplastic agents in hospitals and preliminary evidence of exposure to personnel handling these agents, a survey was designed and conducted to document the current handling practices of injectable antineoplastic drugs by hospital and health care workers at two major teaching hospitals and three affiliated community hospitals. The survey included assessment of drug preparation, administration, and disposal. A sample of nurses, pharmacists, physicians, and other staff who routinely come in contact with these drugs was interviewed for validation of the observed results. Drug preparation facilities and methods were not uniform even within a single institution, including local preparation in the pharmacy under controlled or uncontrolled conditions, as well as individual drug preparation and administration on the hospital floors. Handling practices for drug preparation were not consistent from practitioner to practitioner. In some cases, where laboratory coats and disposable gloves were provided, it was not a routine practice to wear them. Based on such analysis of risk factors, recommendations for improved practices are given.⁷

MATERIALS AND METHODS

The study investigated 40 adolescent nursing students in the City of Kodhad, Telugana. Their understanding of the English language used in the questionnaire. A twenty-five statements questionnaire on their knowledge of safe handling and disposal of chemotherapeutic drugs was administered for their responses. Permission to administer the questionnaire was sought from the Senior Management of the institution. Following their consent, the questionnaire was administered after briefing participants that the questionnaire was to find out how much they knew about safe handling and disposal of chemotherapeutic drugs and their participation was subject to their agreeing to participate. Frequency and percentage distribution was used to analyze the demographic data of school students. Mean and standard deviation was used to complete the knowledge and attitude of safe handling and disposal of chemotherapeutic drugs of school students. Paired test was used to analyze the effectiveness between the pre and posttest. Chi-square

test was used to associate the demographic variables with knowledge and attitude of safe handling and disposal of chemotherapeutic drugs among nursing students. Correlation co-efficient was to analyze the correlation between knowledge and attitude of safe handling and disposal of chemotherapeutic drugs among nursing students.

Description of research tool

It consists of three sections.

Section A

It consists of demographic variables which include age of the individual, religion, education, type of family, previous exposure to knowledge.

Section B

Multiple choice questions to assess the knowledge of safe handling and disposal of chemotherapeutic drugs

Part I: Questions related to safe handling and disposal of chemotherapeutic drugs.

Section C

Modified three point Likert scale to assess the attitude regarding safe handling and disposal of chemotherapeutic drugs. This section includes 10 items with choices as agree, uncertain and disagree.

RESULTS

Table 1: Mean and standard deviation of knowledge and attitude on of safe handling and disposal of chemotherapeutic drugs nursing students

N=40

Domain	Pre test		Post test		‘t’ value
	Mean	S.D	Mean	S.D	
Knowledge	6.78	1.241	19.11	1.23	44.63*** (S)
Attitude	11.48	1.29	11.48	1.29	3.523*** (S)

*p<0.05, **p<0.01, ***p<0.001, S – Significant

Table 1 denotes the mean and standard deviation of knowledge and attitude of nursing students on safe handling and disposal of chemotherapeutic drugs. Observing the pre-test level of mean knowledge score was 6.78 with S.D 1.241 and post-test level of mean knowledge score was 19.11 with S.D 1.23 and the ‘t’

value of 44.63 showed high level of significance. With respect to the pre-test mean attitude score was 11.48 with S.D 1.29 and post-test mean attitude score was 11.48 with S.D 1.29 and the ‘t’ value of 3.523 showed high level of significance.

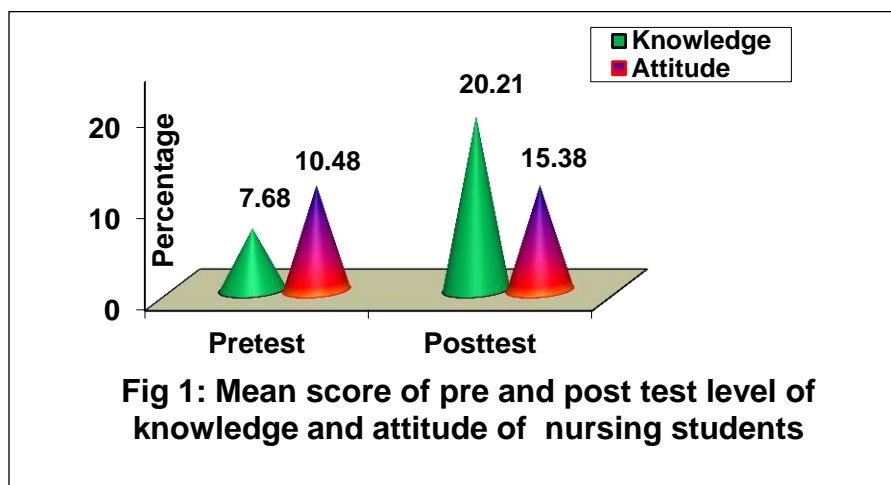


Table 2: Correlation of pre and post-test level of knowledge and attitude on safe handling and disposal of chemotherapeutic drugs of nursing students

N=40

Domain	Knowledge		Attitude		'r' value
	Mean	S.D	Mean	S.D	
Pre test	6.78	1.241	11.48	1.29	0.66*
Post test	19.11	1.23	11.48	1.29	0.57***

*p<0.05, ***p<0.001

Table 2 shows the correlation of pre and post-test level of knowledge and attitude on safe handling and disposal of chemotherapeutic drugs of nursing students mean score was 6.78 with S.D 1.241, the attitude mean 11.48 with S.D 1.29 and overall 'r' value was 0.66 which significant The analysis reveals that the pre-test level of knowledge at p<0.05 level. The post-test level of knowledge mean score was 19.11 with S.D 1.23 the attitude mean 11.48 with S.D 1.29 clearly indicates a positive correlation between knowledge and attitude (r = 0.57) which is significant at p<0.001 level.

DISSCUSION

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CONCLUSION

The results of this study indicate a significant improvement of knowledge among nursing students handling cytotoxic anticancer drugs after a series of interventions. Pharmacists, with the knowledge on the nature and potential hazards of cytotoxic drugs, play an important role to improve the nurses' capability to handle these drugs safely. The centralization of cytotoxic drug reconstitution (CDR) activities is a crucial strategy to minimize the improper drug handling in wards. On top of that, sufficient education and training as well as hospital policy are effective tools to improve the safety climate in a hospital catering chemotherapy actively.

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