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Research Article

Assessing the Effectiveness of an Information Booklet on the Knowledge Regarding High Risk Medication Among Nurses Working in Intensive Care Unit in Selected Hospital in Gurugram, Haryana

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A B S T R A C T

Introduction: High alert medicines (HAMs) account for the bulk of hazardous errors and are thought to be among the drugs most closely linked to a high risk of serious injury if given incorrectly.

Objectives: The study aimed to assess the pre-test knowledge score regarding high risk Medication Among nurses working in Intensive care unit in selected hospital, To determine the effectiveness of Information Booklet regarding high risk Medication Among nurses working in Intensive care unit, To assess the post -test knowledge Score regarding high risk Medication Among nurses and to determine the association between post- test knowledge Score with selected demographic variables among Nurses working in Intensive care unit .

Methodology: The study used a non-probability purposive sampling method and a pre-experimental research design as part of a quantitative research strategy. 60 nurses who worked in the intensive care unit of a particular hospital in Gurugram, Haryana, made up the study's sample. The Structured Knowledge Questionnaire was used to gather the data. Data analysis was done using both descriptive and inferential statistics.

Results: The study results showed that the nurses working in Intensive care unit has pre-test knowledge score, 2(3.3%) had insufficient knowledge and 47(78.3%) had a moderate level of knowledge.For the posttest knowledge score, 58(96.7%) has significant increase in their adequate knowledge and, there was a substantial correlation between the nurses pre- and post-test knowledge scores and for the association it was revealed that the post-test knowledge score showed statistically no significant association with the chosen demographic variables.

Keywords: High Alert Medications, HAM, Information Booklet, Intensive Care Unit, ICU

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Introduction

Globally, there is much concern about medication safety during administration since it affects patient care quality and safety. Prescription, dispensing, storing, preparing, and administering pharmaceuticals can all result in medication errors (MEs), which are inadvertent failures in the drug treatment process. MEs were among the top concerns for nursing practitioners worldwide. High-alert medicines (HAMs) account for the bulk of hazardous errors and are thought to be among the drugs most closely linked to a high risk of serious injury if given incorrectly.[1]

The goal of pharmaceutical therapy is to achieve particular therapeutic outcomes that improve a patient's quality of life while reducing risk. There are known and unknown risks associated with the therapeutic use of prescription and over-the-counter drugs as well as drug delivery devices. High-Alert Medications (HAMs) share a number of characteristics, such as a restricted therapeutic index and the possibility of major repercussions in the event of a system failure or improper medication administration. Drugs with a narrow therapeutic index are dangerous because even slight changes in blood drug concentration or dosage can trigger Adverse Drug Events (ADEs), which are serious therapeutic failures that depend on blood concentration or dose. HAMs are drugs that, even when used as prescribed, have a high potential for serious side effects in the patient. A few classes of high-alert drugs (like insulin, opioids, sedatives, and anticoagulants) would have the biggest effect, according to the Institute for Healthcare Improvement's (IHI) America report. Because of their high frequency of usage and inherent hazards, these four kinds of HAMs are mostly to blame for injury.[2]

One of the biggest causes contributing to medicine administration errors is thought to be nurses' lack of understanding. The majority of pharmaceutical errors do not damage patients; nonetheless, improper administration of high-alert drugs frequently results in fatalities and serious injuries (such as comas or cardiac resuscitation).[3] The current study's authors verified 20 questions to gauge nurses' expertise. The study found that nurses did not know enough about high-alert drugs, as seen by the low accurate answer rate of 56.5%. The authors suggested developing educational resources and interventions to improve nurses' comprehension of this subject.[4]

According to a study, improper administration practices accounted for 6.2% of pharmaceutical mistakes. 97% of the 265 IV medication mistakes were caused by giving medications more quickly than is advised. The one study they cited indicated that giving patients concentrated electrolytes or a large dose of adrenaline might be harmful. They stated that it is necessary to evaluate nurses' levels of expertise in this area.[5]

According to a study, there are numerous preventable mistakes that can be made when high-alert pharmaceuticals are stored in easily accessible locations, look-alike and sound-alike prescriptions are kept together, warning labels are absent from medications, handwriting is difficult to read, and improper abbreviations are used.[6]

To enhance medication administration and management, identify possible medication errors before they happen, monitor, assess, and make improvements to the process's quality and safety, and uphold a high standard of nursing competence, nurses need to possess the necessary knowledge and abilities. Previous studies have highlighted varying levels of knowledge among nurses regarding high-alert medications, with common errors linked to dosage miscalculations and improper administration techniques. However, there is limited research on specific knowledge gaps among ICU nurses. This study basically aims to fill the gaps by identifying the knowledge of ICU nurses regarding high-alert medications. By understanding these levels of knowledge, targeted interventions can be developed to enhance nurse education and patient safety protocols.

Objectives

- To assess the pre-test knowledge score regarding high-risk Medication among nurses working in Intensive care unit in selected hospital in Gurugram Haryana.
- To determine the effectiveness of Information Booklet regarding high-risk Medication among nurses working in Intensive care unit in selected hospital in Gurugram Haryana.
- To assess the post -test knowledge Score regarding high-risk Medication among nurses working in Intensive care unit in selected hospital in Gurugram Haryana.
- To find a correlation between the pre-test knowledge score and post-test knowledge score regarding high-risk Medication among nurses working in Intensive care unit in selected hospital in Gurugram Haryana.
- To determine the association between post- test knowledge Score with selected demographic variables among Nurses working in Intensive care unit in selected hospital in Gurugram Haryana.

Methodology

For the study, the researcher used a quantitative research approach. With the non-probability purposive sampling technique. The study was conducted at the RJ Super Specialty Hospital in Bahadurgarh, Haryana. There were sixty nursing officers in the sample for this study. The study's instrument was divided into two parts. The nursing officers' demographic profile was presented in Section A. The Structured Knowledge Questionnaire is included in Section B. It is made up of twenty-five items that evaluate knowledge on high-alert drugs. For every correct response,

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a "1" was added, and for every incorrect response, a "0" was given. The Cronbach's alpha formula was used to determine the scale's dependability for this investigation. Reliability was determined. r=0.84. For the study, the instrument was determined to be efficient.

Ethical considerations

In this research study , an administrative approval letter was obtained from the RJ Super speciality Hospital Bahadurgarh, Haryana with reference number (SGTU/FON/21/2024/372).Each participant signed an informed consent form. Confidentiality and anonymity were made to study participants. Data was collected between 1/05/2024 and 15/5/2024.

Results of the study

The data presented in Figure 1 represents the frequency and percentage distribution of the nurses' demographic profile by age, gender, educational background, religion, years of work experience, place of employment, place of residence, monthly income, awareness of HAM, and information source. In terms of age, 22 nurses (36.7%) were in the 26–35 age group, and half of the 30 nurses (74.6%) were in the 36–40 age group. Of the nurses, only 8 (13.3%) were between the ages of 20 and 25. According to gender, there were 29 (48.3%) female nurses and 31 (51.1%) male nurses. More than half of the nurses were 38 (63.3%) GNM, 17 (28.3%) were B.Sc. Nursing, and only 5 (8.3%) nurses were Post Basic B.Sc. Nursing. In terms of religion, 53 nurses (88.3%) identified as Hindu, and 4 nurses (6.7%) identified as Muslim. Of the nurses, just three (5%) fell under the other religious category. 15 nurses (or 25%) had up to one year's experience, 37 nurses (or 61.7%) had two to four years' experience, 7 nurses (or 11.7%) had five to seven years' experience, and 1 nurse (or 1.7% of the total) had more than seven years' experience. According to working area 46, 76.7% of nurses worked in the ICU, and 7 (11.7%) worked in the PICU and NICU, respectively. Regarding where they lived, 43 nurses (71.7%) lived in an urban region, while 17 nurses (283.3%) lived in a rural one. With regard to income per month, 23 (38.3%) nurses were having below 20,000; 29 (48.3%) nurses were having 20,001-30,000; 7 (11.7%) were having 30,001-40,000; and 1 (1.7%) was having above 40,000. As per the awareness about HAM, most of the nurses (56, or 93.3%) were aware of HAM, and 4 (6.7%) were not aware of HAM. With regard to the source of information about HAM 23, 38.3% of nurses were getting information from health personnel, 51.7% of nurses were getting it from self-learning, and 10% were getting information from other sources.

Findings related to the pre-test knowledge score

According to the data in Table 1, the possible range of score was 0-25 and range of obtained score was 12–22, with a mean of 13.07, a median of 12, and a standard deviation of 4.023. The scores are within the normal distribution, as indicated by the proximity of the mean and median (13.07), which was roughly in the middle of the score range (0–25). The standard deviation (4.023) illustrates the range of scores.

The frequency and percentage distribution of nurses according to their pre-test knowledge score for high alert drugs are displayed in Table 2 and Figure 2. According to the data, the majority of nurses 47, or 78.3%—had a moderate level of knowledge, followed by 11 (18.3%), who had an appropriate level, and 2 (3.3%), who had an inadequate level

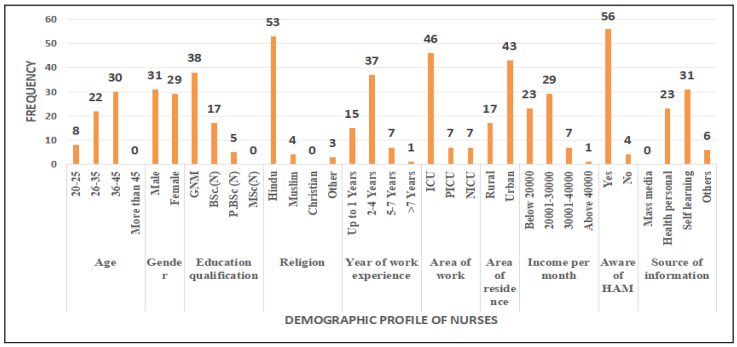


Figure 1.Multiple bar diagram depicting frequency distribution of nurses by their demographic profile

Table 1.Findings related to Possible range of score, Range of the obtained score, Mean, Median, and Standard Deviation of nurses by their pre test knowledge score

n=60

Possible range of score	Range of obtained score	Mean	Median	Standard deviation
0-25	12-22	13.07	12	4.023

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Table 2.Frequency and percentage distribution of nurses by their pre test knowledge score

n=60

Range of scores	Level of knowledge	Frequency (f)	Percentage (%)
0-8	Inadequate knowledge	2	3.3
9-16	Moderate knowledge	47	78.3
17-25	Adequate knowledge	11	18.3

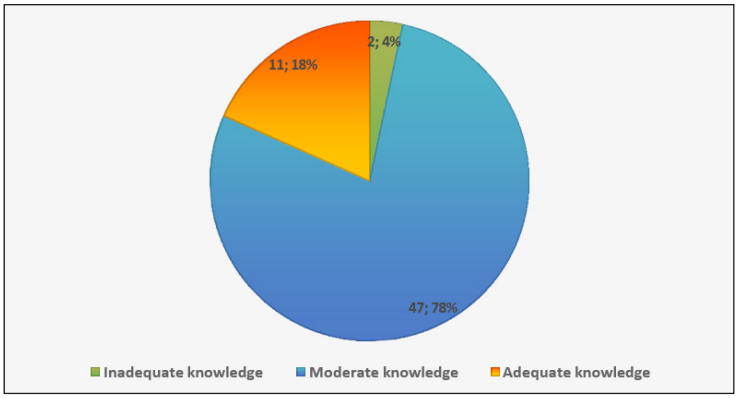


Figure 2.Pie chart displaying the frequency and percentage distribution of nurses based on their knowledge score from the pre-test

Findings related to the post-test knowledge score

Table 3 presents the collected scores, with a mean of 23, a median of 23.5, and a standard deviation of 1.953. The possible range of scores, i.e., 0-25, is shown by the data. The proximity of the mean and median indicates that the scores are in the normal distribution, and the mean score of 23.02 was about in the middle of the score range of 0 to 25. Variability in the scores is shown by the standard deviation (1.953)

The frequency and percentage distribution of nurses according to their post-test knowledge score for high alert drugs are displayed in Table 4 and Figure 3. According to the results, 58 nurses, or 96.7 percent, have significantly increased their knowledge, indicating that they have acquired knowledge successfully. and none of the nurses received a low or inadequate knowledge score, indicating that the intervention had a good effect. Therefore, H1 was approved since it shows a 0.05 level of significance increase in the post-test knowledge score of ICU nurses regarding high-risk drugs.

Table 5 displays the coefficient correlation between the nurses working in the intensive care unit of selected hospital in Gurugram, Haryana, and their pre- and post-test knowledge scores about high-risk medication. At a 0.05 significance level the computed r value is (1), at 0.005 level of significance. This suggests that there was a positive correlation between the nurses' pre- and post-test knowledge scores on high-risk medications. It offers compelling proof that the nurses' knowledge increased as a result of the information booklet. Because there was a significant correlation between the Intensive Care Unit Nurses' pre- and post-test knowledge scores on high-risk drugs at the 0.05 level of significance, hence, H2 was accepted.

The Chi square results showed that in Table 6 , Regarding age, educational background, year of experience, working region, awareness of HAM, and information source, the results shows that the acquired p- value, as indicated in table-4, was significant at the more than 0.05 level. Therefore, this suggests that the post-test knowledge score and a subset of demographic characteristics do not statistically significantly correlate. Therefore, at the 0.05 level of significance, H3 was discarded since it shows no meaningful relationship between the post-test knowledge score and the chosen demographic variables.

Table 3.Findings related to Possible range of score, Range of the obtained score, Mean, Median, and Standard Deviation of nurses by their post-test knowledge score

n=60

Possible range of score	Range of obtained score	Mean	Median	Standard deviation
0-25	12-24	23	23.5	1.953

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Table 4.Frequency and percentage distribution of nurses based on their post-test knowledge score

n=60

Range of score	Level of knowledge score	Frequency (f)	Percentage (%)
0-8	Inadequate knowledge	0	0
9-16	Moderate knowledge	2	3.3
17-25	Adequate knowledge	58	96.7

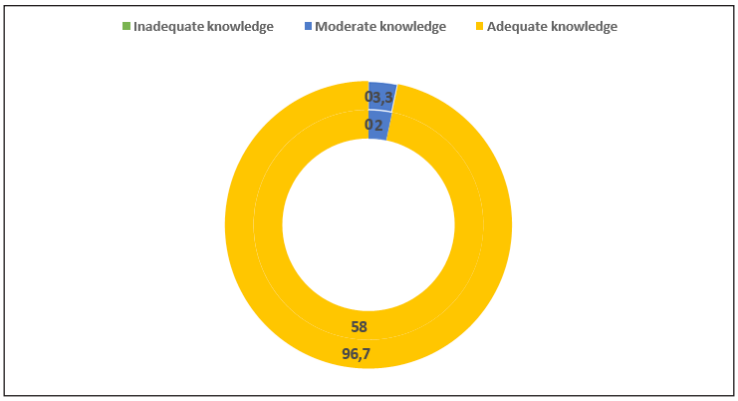


Figure 3.Doughnut-diagram showing the percentage distribution of nurses by their post- test knowledge score

Table 5.Mean, Standard Deviation, and r value for coefficient correlation [AK2.1][PS2.2][AK2.3]of the Pre-test knowledge score and post-test knowledge score regarding high-risk Medication among nurses

n=60

Variable	Mean	Standard Deviation	r value	p value
Pre-test knowledge	13.47	4.023	+1	<0.005
Post-test knowledge	23.04	1.953		

*r=1<0.005

Table 6.Chi-square test used for association between between post- test knowledge Score with selected demographic variables (age, educational qualification, year of experience, working area, aware about HAM, Source of information)

Sample characteristics	Options	Adequate knowledge	Moderate knowledge	Inadequate knowledge	Chi square value	P value	df
Age	36-40 years	30	0	0	3.221	0.200	2
	25-35 years	21	1	0			
	20-25 years	7	1	0			
Education qualification	GNM	36	2	0	1.198	0.549	2
	BSc.(N)	17	0	0			
	P.BSc (N)	5	0	0			
	MSc(N)	0	0	0			
Year of work experience	Up to 1 Yrs	15	0	0	3.203	0.361	3
	2-4 Yrs	36	1	0			
	5-7 Yrs	6	1	0			
	>7 Yrs	1	0	0			
Area of work	ICU	45	1	0	3.039	0.219	2
	PICU	7	0	0			
	NICU	6	1	0			

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Aware of HAM	Yes	54	2	0	0.148	0.701	1
	No	4	0	0			
Source of information	Mass media	0	0	0	1.935	0.380	2
	Health personal	23	0	0			
	Self-learning	29	2	0			
	Others	6	0	0			

p≥0.05, NS

Discussion

The bulk of hazardous errors are caused by high-alert medications (HAMs), which are thought to be among the drugs most frequently associated with a high risk of serious injury if administered incorrectly. One of the biggest contributing factors to medicine administration errors is thought to be nurses' inadequate expertise. The majority of pharmaceutical errors do not damage patients; nonetheless, improper administration of high-alert drugs frequently results in fatalities and serious injuries (such as comas or cardiac resuscitation). The current study's goals were to evaluate nurses' pre- and post-test knowledge scores regarding high-risk medication, as well as the usefulness of an information booklet on the subject. It also sought to establish a relationship between nurses' pre- and post-test knowledge scores regarding high-risk medication and certain demographic variables related to nurses working in intensive care units in a particular hospital in Gurugram, Haryana.

The current study found that the average knowledge score was 13.07 and, after the post-test, 23. The pre-test and post-test knowledge scores of nurses had standard deviations of 4.023 and 1.953, respectively. This suggests that the intervention had a favorable impact on the post-test knowledge score and that the mean variability of the pre-test knowledge score was higher. The results of this investigation are in line with Zehra F. et al., who found that student nurses' mean knowledge score on high-alert drugs was 30.23 on the pretest and 44.03 on the post-test. Student nurses' pretest scores had a standard deviation of 9.71 and their post-test scores of 7.42, indicating that the pretest had higher variability.

At a 0.05 level of significance, the computed r value is 1. At a 0.005 level of significance, this suggests that there is a positive correlation between the nurses' pre- and post-test knowledge scores on high-risk medications. It offers compelling proof that the nurses' knowledge increased as a result of the information booklet.

The results of this study are consistent with Yousef et al. They indicate that there was a statistically significant difference in the study respondents' overall knowledge scores regarding high-alert drugs in both the pre- and post-tests (t=19.717.9, p=0.000), respectively. It demonstrates the strong correlation between the nurses' pre- and post-test knowledge scores. [8]

The current study's findings indicate that, at the 0.05 level of significance, there was no statistically significant correlation between the post-test knowledge score and the selected demographic among nurses regarding high-alert medications, age (p=0.200), educational background (p=0.549), years of work experience (p=0.361), area of work (p=0.219), awareness of HAM (p=0.701), and source of information (p=0.380).

The results of this investigation are in line with Zehra F et al., who found no significant correlation at the 0.05 level of significance between the knowledge of student nurses about high-alert medications and certain demographic variables, such as age (p=0.678), education (p=0.302), percentage of class attendance (p=0.615), percentage of previous exams (p=0.930), and area of residence (p=0.891). Thus, the H_2 was turned down. At the 0.05 level of significance, there is no discernible correlation between the awareness of high-alert drugs and certain demographic variables. [7]

Nursing implications :Nurses should participate in educational programs in hospital addressing the proper management of high alert drugs. It is recommended that nurses adopt the practice of preparing, storing, transferring, and administering drugs with high alertness along with Incorporating guidelines for administering high alert drugs in the nursing curriculum

Conclusion

Medication on high alert is one of the key ideas for enhancing patient safety. It is important to design and review appropriate workplace policies and procedures for the safe handling of high alert drugs. In order to minimize the exertion and pressure on nurses to reduce HAM errors, nurse administrators should rework work plans and do early assessment and intervention.

Limitations

The small sample size used in the study restricts how far the results may be applied.

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