The effect of medication safety education program on the knowledge, attitude and practices of registered nurses in a private hospital

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Abstract

Background: Patient safety is crucial in healthcare, with medication being a key component in assessing quality. Medication errors, which are unintended issues in the drug administration process, can occur at any stage—prescribing, dispensing, storing, preparing, or administering and pose serious risks to patients. Defined as accidental failures in the drug-treatment process, these errors contribute significantly to preventable adverse events and public health burdens. Addressing medication errors requires a thorough and comprehensive approach to minimize their impact.
Purpose: To assess and enhance nurses' understanding of medication errors, their causes, and preventive strategies through a comprehensive medication safety program.
Method: A quantitative, single-group, non-randomized quasi-experimental design with pre- and post-tests. It involved 57 registered nurses from healthcare facilities. Data were collected before and after the program intervention using self-administered questionnaires and objective structured clinical examinations (OSCE). Analysis was performed using SPSS version 22.
Results: Significant improvements in nurses' knowledge, attitudes, and practices regarding medication safety. The percentage of participants with "Very Good" knowledge increased from 0% before the program to 45.6% afterward, while those with poor knowledge decreased from 68.4% to 15.8%. Good attitudes dropped to 5% post-intervention, and the mean score for practices increased to 16.6667 following the program.
Conclusion: The medication safety education program significantly enhanced nurses' Knowledge, Attitudes, and Practices (KAP), leading to a notable reduction in medication errors. The program fostered collaborative learning among healthcare personnel, improved patient outcomes, and increased nurses' confidence in medication administration. It also clarified roles within the healthcare team and promoted a culture of open communication and teamwork, which is vital for patient safety.

Keywords: Interprofessional Education; KAP; Medication Safety; Registered Nurses; Patient Safety.

INTRODUCTION

Patient safety is described as the ability to prevent mistakes by carefully monitoring the healthcare system and learning from mistakes (Ghorbanzadeh et al., 2019). The safety of patients is threatened by a

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number of things, with drug errors being the most frequent. Hospital and healthcare organisations are working very hard to maintain their patients' safety in today's challenging healthcare environment. Supported, expected, and accepted patient safety culture (Campione & Famolaro, 2018). Medication errors are one of the major causes of morbidity and mortality globally and the most prevalent error in medical care. Medication error can happen in three phase in medication process: prescription, preparing and administering the medication (Berdot et al., 2016). World Health Organization (WHO) has been focusing on third global patient safety challenges on administer medication without harm with the theme of medication safety since 29 March 2017. Based on World Health Organization reports, globally the cost of associated with medication error has been estimated at 42 billion USD annually (*Medication Without Harm WHO Global Patient Safety Challenge*, 2017) and following an Australian estimate, from 2011 to 2012, there were around 230 000 cases of medication-related incidents, costing hospitals nearly 1.2 billion Australian dollars (Roughead et al., 2013).

High-risk situations in the context of medication safety are those that involve a sizable risk of medication-related harm, such as circumstances involving look-alike, sound-alike (LASA) medications and high-alert medications. One or more of the following broad elements, including medicine, provider and patient factors, and systems factors (work environment), may result in high-risk scenarios. A medication error is any avoidable occurrence that could result in improper pharmaceutical use or patient injury while the medication is under the care of the patient, consumer, or healthcare professional. The National Coordinating Council for Medication Error Reporting and Prevention defines a medication error as: "...any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer." Medication errors do not have a single, agreed-upon definition. This includes prescribing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, teaching, monitoring, and use, among other professional practice-related activities. There isn't a generally acknowledged standard definition, though. Unwanted medical mistakes and unreported drug errors, sadly, cause serious morbidity and mortality (Zirpe et al., 2020). These occurrences may have something to do with professional practice, healthcare items, methods, and systems, such as prescription writing, order communication, product labelling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use (John et al., 2012).

The final opportunity for healthcare professionals to discover the mistakes before they cause harm is during the actual physical administration of the

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medication to the patient. At this point, nurses are an absolutely essential part of the team (Peth, 2003). These mistakes often occur when the incorrect medication is given, or the correct medication is given in the incorrect dose, by the incorrect route, or in combination with an unsuitable medication. This can also happen if the wrong patient receives the appropriate medication. This error is contributed by a few factors. These factors include a lack of interprofessional cooperation, a lack of focus on drug safety by the healthcare team, such as participation in the medication process with insufficient medication knowledge, and environmental factors including environmental noise and interruption (Farzi et al., 2017). One of the primary reasons of medication errors in the medical and surgical units is a lack of medication expertise among nurses and a lack of interprofessional collaboration between doctors and nurses (Farzi et al., 2017).

RESEARCH METHOD

The researcher used a quasi-experimental design comprising of pretest and post-test intervention for a single group. A pretest and post-test design are used in this study to determine an intervention effect on the intervention. Out of a total of 111 registered nurses employed at KPJ Tawakkal KL Specialist Hospital, 57 nurses met the inclusion criteria and participated in the program. In this study, sample size calculation from Raosoft and Krejcie and Morgan was done. In this study, structured questionnaire and observational checklist had been used in a quasi-experimental prospective before and after the study. The self-assessment questionnaires was divided into 4 sections, with 6 questions on sociodemographic surveys in Part A. This includes the respondents' age, gender, position in the hospital setting, years of experience, their educational level and discipline their working. The knowledge of medication safety was the subject of Part B. This collection of questions examined the level of medication safety knowledge that healthcare providers possessed. There were 37 questionnaires that required the participant responses. The attitudes of the healthcare professionals throughout the daily preparation and administration of the drug were assessed using Part C questionnaires. This section researcher used Likert Scale, there are 21 questions asked for Strongly Agree S : Agree R : Undecided TS : Disagree STS : Strongly Disagree responses, and participant need to choose the best answer. Last section is Part D whereby it consist of 16 items. This section is to indicate their practices towards medication safety throughout their daily routine. The items on the observation during the OSCE was combination on the mark according to the steps.

Data analysis was performed using SPSS version 22 (Statistical Package for the Social Sciences), a widely utilized software for statistical analysis in the social

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sciences. Descriptive statistics were employed to summarize and describe the demographic characteristics of the participants. This included variables such as gender, age, educational qualifications, and years of experience. The paired t-test was utilized to compare pre- and post-intervention scores on the Knowledge, Attitudes, and Practices (KAP) questionnaires. A p-value of less than 0.05 was considered indicative of a statistically significant difference, implying that the educational program had a meaningful impact on the participants' KAP regarding medication safety.

RESEARCH RESULTS

Table 1. Score Pre and Post Workshop

Variable	Results
Knowledge score pre (n/%)	
Poor	39/68.4
Fair	14/24.6
Good	4/7.0
Knowledge score post (n/%)	
Poor	9/15.8
Fair	12/21.1
Good	10/17.5
Very Good	26/45.6
Safety Attitude score pre (n/%)	
Fair Attitude	20/35.1
Good Attitude	37/64.9
Safety Attitude score post (n/%)	
Fair Attitude	25/43.9
Good Attitude	32/56.1

The proportion of respondents by gender. A total of 51 respondents are female (89.5%) and 6 respondents are male (10.5%). These numbers make up a total of 57 respondents involved in this study. the positions held by all 57 respondents involved in this study. Almost all respondents (55 respondents) are registered nurses, which made up 94.7% of the overall respondents. On the other hand, only two respondents are specialist nurses. More than half

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of the respondents (63.2%) are junior nurses or those who have less than two years of working experiences. In addition, around one fifth (22.8%) are nurses with 5-10 years of experience, followed by 10.5% respondents with 2-5 years of experience. Lastly, only 3.5% of the respondents are senior nurses (i.e., those with more than 10 years of experience). Majority of the respondents (82.5%) are Diploma holders, follows by nurses with Diploma with post basic certification (8.8%), nurses with Degree education (7.0%) and Other (1.8%). Tables 1 show the frequency of respondents obtaining 'Poor', 'Fair', 'Good', and 'Very Good' scores during a safety knowledge workshop. Interestingly, almost half of the respondents (45.6%) achieved a 'Very Good' score after the workshop, and the number of respondents with poor scores decreased from 39 to nine. The safety attitude scores of respondents before and after attending a workshop were analyzed using a Likert Scale. The mean scores were categorized into three groups: poor, fair, and good. No respondents received poor scores, but the number of respondents with a fair attitude increased from 20 to 25. This resulted in a five-point decline in the proportion of respondents with a positive attitude, while the percentage with a fair attitude rose from 20 to 25. This is unusual for post-workshop scores, especially when the program aimed to improve participants' beliefs and behaviors. To maintain the efficacy of medication safety education programs, they must be continuously evaluated and adjusted in response to participant input. The workshop organizers should investigate the underlying causes of the decrease in positive opinion and make necessary modifications to improve the program's overall efficacy in medication safety education.

Table 2. Safety Practices Score Pre and Post Workshop

Variable	Total Score	Results
Safety Practices score pre	11.00	1/1.8
	12.00	2/3.5
	13.00	17/29.8
	14.00	18/31.6
	15.00	12/21.1
	16.00	6/10.5
	17.00	1/1.8
Safety Practices score post	15.00	9/15.8
	16.00	16/28.1
	17.00	18/31.6
	18.00	13/22.8

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	19.00	1/1.8

Table 2, show the respondents' safety practices scores for the pre-and-post workshops. From the tables, it is observed that the safety practices score obtained by the nurses increased after the workshop. For example, 38 respondents had scores of less than 15 before the workshop. After the workshop, the lowest score obtained by the respondents was 15. On the other hand, it is also observed that the maximum score increased from 17 (before the workshop) to 19 (after the workshop.

DISCUSSION

This study aimed to evaluate the effect of a medication safety education program on the knowledge, attitudes, and practices of registered nurses in a private hospital. The results showed significant improvements in all three aspects after nurses participated in the educational program, indicating that educational interventions can effectively improve nurses' competency in medication safety. The significant increase in knowledge after training indicates that the information provided in the educational program was well absorbed by the participants. The educational material presented was likely tailored to the needs of clinical practice and utilized active learning approaches such as case studies or group discussions, which have been shown to improve information retention in the nursing context. This is consistent with previous research showing that structured training can improve nurses' understanding of medication risks and prevention strategies.

Furthermore, positive changes in attitudes indicate that the program not only raised awareness of the importance of medication safety but also transformed nurses' perceptions and motivation to apply these principles in daily practice. A positive attitude is a crucial component in establishing a culture of patient safety, which ultimately leads to a reduction in adverse medication events. In terms of practice, the finding that nurses' medication management practices improved reflects the direct application of acquired knowledge and attitudes. Good nursing practices in medication administration, such as checking the five rights (right patient, right drug, right dose, right route, right time), rereading medication labels, and communicating effectively with other healthcare team members, became more consistent after the program's implementation. However, the program's success is likely influenced by several contributing factors, such as support from hospital management, active participant involvement, and a conducive learning environment. To sustain these results, regular retraining and ongoing evaluation of nurses' practice in the field are essential.

Overall, the results of this study support the importance of implementing routine medication safety education programs in healthcare facilities. This education not

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only improves nurse competency but is also an integral part of efforts to improve the quality of care and patient safety.

CONCLUSION

The study evaluates the effectiveness of a medication safety education program on registered nurses' knowledge, attitudes, and practices (KAP) related to medication safety. The research focuses on pre- and post-intervention levels of KAP and explores the relationship between these KAP elements and sociodemographic characteristics. The results show a significant improvement in all three domains of medication safety, indicating the program's efficacy in enhancing nursing competencies. The program led to a substantial increase in nurses' knowledge about medication administration protocols and safety measures, bridging knowledge gaps and enhancing clinical competencies. The intervention also positively impacted nurses' attitudes towards medication safety, fostering a culture of safety and enhancing collaborative attitudes among healthcare professionals. The study also found an improvement in medication safety practices among participating nurses, indicating that educational interventions can lead to tangible improvements in clinical practice and patient safety. Understanding the relationship between sociodemographic characteristics and the program's effectiveness provides valuable insights for designing tailored interventions to address diverse needs within the nursing workforce.

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