

Knowledge of Medication Management and Therapeutic Care Practices Among Nurses Caring for Older Adults: A Cross-Sectional Study

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Abstract

Background: Older people often have several chronic diseases, and they need to take multiple medications and undergo ongoing therapy. The purposes of this study were to determine the knowledge of medication management and therapeutic care practices among caregivers (nurses) of older adults and to explore factors associated with the level of knowledge. **Methods:** A cross-sectional study design (n=120) via convenience sampling technique used a structured self-administered questionnaire to evaluate knowledge about medication administration, drug interactions, adverse drug reactions, managing polypharmacy, therapeutic monitoring and educating patients. Data were analyzed using SPSS version 26.0 with p-value < 0.05 as statistically significant. **Results:** The overall mean score of their knowledge was 78.4 ± 10.6 out of 100. It was observed that the majority of the nurses (61.7%) had good knowledge, 28.3 % had moderate knowledge, and 10.0% had poor knowledge. A significant correlation was found between knowledge and some factors, such as higher scores with increasing clinical experience and higher scores with those who had recently completed professional training ($p < 0.05$). There were positive relationships between knowledge and years of experience ($r = 0.49$, $p < 0.001$) as well as between knowledge and attendance in continuing education activities ($r = 0.52$, $p < 0.001$). Multiple regression analysis showed that continuing professional education ($\beta = 0.38$, $p < 0.001$) and clinical experience ($\beta = 0.31$, $p = 0.002$) were significant factors related to knowledge about medication management and therapeutic care practices. **Conclusion:** The majority of nurses showed evidence of good knowledge of medication management and therapeutic practices for older people. There was a significant contribution to higher knowledge level from professional training and clinical experience.

Keywords: Medication Management, Therapeutic Care, Nurses, Polypharmacy, Patient Safety, Geriatric Nursing

Introduction

Among older adults, chronic diseases often co-occur and are treated with chronic medications, and monitoring therapy is needed on an ongoing basis ¹. In older adults, multimorbidity is associated with polypharmacy, which is associated with complex medication regimens and increased risk of medication-related problems, making safe medication management an essential part of geriatric nursing care and patient safety ². Age-related pharmacokinetic and pharmacodynamics changes, such as altered absorption, distribution, metabolism, elimination and drug sensitivity, make older adults more vulnerable to adverse drug reactions and medication-related problems ^{3,4}. Prescribing medications in elderly people can be difficult since they may take several medications from multiple providers ⁵. Nurses are directly involved in administration of medicines, monitoring patients' responses, detecting adverse effects of medicines, educating patients and communicating concerns relating to medicines to physicians and pharmacists ^{6,7}, which means that nurses need to have adequate knowledge to reduce the harm caused by medicines to older adults. Therapeutic care activities in geriatric nursing do not just involve giving medicines according to schedule ⁸.

These practices contribute to patient-centered therapeutic management and contribute to treatment safety, medication adherence, continuity of care and educating older adults and their caregivers regarding medication schedules, side effects, warning signs, and follow-up care ⁹. Higher educational qualification, clinical experience and continuing professional education are important factors that can enhance nurses' knowledge and competency in medication management ¹⁰. While in the majority of healthcare environments, nurses receive regular training, there may be a lack of knowledge regarding therapeutic monitoring, adverse drug reaction reporting, polypharmacy and drug interactions in older adult patients ^{11,12}.

The present study, therefore, aimed to evaluate nurses' knowledge regarding the management of medicines and therapeutic practices for older adults. The study also sought to determine amongst the nurses who were studied, significant demographic and professional characteristics such as clinical experience, educational attainment, continuing professional education and age that were correlated with their levels of knowledge.

Methodology

A descriptive cross-sectional study was conducted to evaluate the knowledge of medication management and therapeutic care practices of older adults by nurses. This study was conducted in authors affiliated hospitals and healthcare setup where geriatric patients are treated at in/out patient. Institutional permissions were obtained prior to data collection, and all data collection was considered ethical. This was an optional participation, informed consent was obtained from all participants. The confidentiality, anonymity and privacy of the study participants were observed. The sample was made up of registered nurses (RNs) who were directly caring for older adult patients. There were 120 nurses in all involved in the study. Because of the nature of the study, a convenience sampling technique was used to recruit participants during the study. The study included nurses having at least 6 months experience in acute care of older adults who wished to participate. Nurses on leave during the data collection period and nursing students, interns and those with incomplete data in the questionnaire were excluded.

A structured self-administered questionnaire, based on literature and guidelines, was used to collect data. There were two sections to the questionnaire. Demographic and professional data, such as age, gender, educational qualification, years of clinical experience and attendance of continuing professional education were obtained in the first section. The second part evaluated the older adults' knowledge regarding medication management and therapeutic care practices. Medication administration, drug-drug interactions, adverse drug reaction monitoring, polypharmacy management, therapeutic monitoring and patient education were the domains covered.

The scores for knowledge were obtained by giving 1 point for each correct answer and 0 point for each wrong answer. The overall score was then rated as poor (less than 60%), moderate (60-79%) or good (80 and above) levels of knowledge. Once administrative approval was received eligible nurses were approached during their working hours and told about the purpose of the study. Informed consent was written and obtained before taking part. Questionnaire was given and received anonymously for confidentiality. The statistical package for the social sciences (SPSS) version 24.0 was used for analysis of data. Participant characteristics and scores for knowledge were summarized using descriptive statistics such as frequencies, percentages, means and standard deviations. The knowledge scores were compared between the demographic groups by independent t-tests and one-way analysis of variance (ANOVA). Pearson correlation analyses were used to investigate the relationships between the knowledge scores and selected variables. Multiple linear regression analysis was used to determine independent factors which influence knowledge. A p value of < 0.05 was considered to be statistically significant.

Results

A total of 120 nurses participated in the study. The findings describe participants' demographic characteristics, knowledge of medication management and therapeutic care practices, and factors associated with knowledge levels. Inferential analyses were performed to identify significant predictors of knowledge among nurses caring for older adults.

Table 1: Demographic Characteristics of Participants (n = 120)

Variable	Category	N (%)
Gender	Male	38 (31.7)
	Female	82 (68.3)
Age (years)	21–30	42 (35.0)
	31–40	51 (42.5)
	>40	27 (22.5)
Education	Diploma	36 (30.0)
	BS Nursing	65 (54.2)
	Master's	19 (15.8)
Clinical Experience	<5 years	39 (32.5)
	5–10 years	48 (40.0)
	>10 years	33 (27.5)
Recent Training	Yes	71 (59.2)
	No	49 (40.8)

Female nurses constituted the majority of participants. Most nurses held a bachelor's degree and had 5–10 years of clinical experience. More than half reported attending recent professional training programs.

Table 2: Knowledge Scores by Domain and levels

Domain	Mean ± SD
Medication Administration	16.8 ± 2.4
Drug Interactions	14.2 ± 3.1
Adverse Drug Reactions	15.7 ± 2.7
Polypharmacy Management	13.9 ± 3.3
Therapeutic Monitoring	9.1 ± 1.8
Patient Education	8.7 ± 1.6
Total Knowledge Score	78.4 ± 10.6

Knowledge level	N (%)
Poor (<60%)	12 (10.0)
Moderate (60–79%)	34 (28.3)
Good (≥80%)	74 (61.7)

Nurses achieved the highest scores in medication administration and adverse drug reaction management, while comparatively lower scores were observed for polypharmacy management and therapeutic monitoring. Most nurses demonstrated good knowledge levels, while only a small proportion showed poor knowledge regarding medication management and therapeutic care practices.

Table 3: Extensive Statistical Analysis

Comparison of Knowledge Scores by Participant Characteristics		
Variable	Mean Score ± SD	p-value
Male	75.6 ± 11.3	0.032
Female	79.7 ± 10.1	
<5 years' Experience	72.9 ± 10.8	<0.001
5–10 years' Experience	79.5 ± 8.9	
>10 years' Experience	84.1 ± 9.4	
Training Attended	82.8 ± 8.5	<0.001
No Training	72.1 ± 10.7	
Correlation between Knowledge Score and Selected Variables		
Variable	r	p-value
Age	0.32	<0.001
Clinical Experience	0.49	<0.001
Continuing Education Participation	0.52	<0.001
Educational Qualification	0.41	<0.001
Multiple Linear Regression Analysis Predicting Knowledge Scores		
Predictor	β	p-value
Continuing Education	0.38	<0.001
Clinical Experience	0.31	0.002
Educational Qualification	0.24	0.009
Age	0.17	0.041

Knowledge scores were significantly higher among nurses with greater clinical experience and those who had attended recent training programs. Positive correlations were observed between knowledge scores and age, professional experience, continuing education, and educational qualification. Multiple linear regression analysis revealed that continuing professional education was the strongest positive predictor of knowledge regarding medication management and therapeutic care practices among nurses ($\beta = 0.38$, $p < 0.001$). Clinical experience ($\beta = 0.31$, $p = 0.002$), educational qualification ($\beta = 0.24$, $p = 0.009$), and age ($\beta = 0.17$, $p = 0.041$) were also significant independent predictors. The regression model was statistically significant ($F = 29.4$, $p < 0.001$) and explained 51% of the variance in knowledge scores ($R^2 = 0.51$), indicating that professional training and experience play important roles in enhancing nurses' competencies in medication management and therapeutic care for older adults.

Discussion

The current cross-sectional study aimed to evaluate nurses' knowledge about medication administration and therapeutic care practices in relation to older adults' care. The results indicated that most of the nurses had satisfactory knowledge, with a mean score of knowledge overall of 78.4 ± 10.6 out of the 100 marks. Most of the nurses exhibited fair knowledge, and a few had moderate or poor knowledge. The results of the domain-wise analysis revealed that the highest scoring domain was the medication administration, while adverse drug reaction management and therapeutic monitoring were found to be low-scoring domains. The relatively low scores in the domains of polypharmacy management and therapeutic monitoring are consistent with previous studies which reported that the knowledge about polypharmacy management and therapeutic monitoring among nurses might be inadequate^{13,14}. Polypharmacy can be challenging in older adults, due to the changes that occur in their natural body mechanisms, comorbidities and heightened risk of drug interactions. As a result, lack of information in these areas could affect medication safety and effectiveness in the elderly population¹⁵.

These results suggest that while nurses generally have acceptable to moderate competencies in routine medication administration, more advanced knowledge and skills in polypharmacy management, therapeutic evaluation, and geriatric pharmacology may need further training^{16,17}. The provision of targeted educational interventions focusing on geriatric pharmacotherapy may thus be useful to reinforce the capacities of nurses in the care of complex medication use and management regarding older adults¹⁸. Continuing professional education (CPE) and Medication Safety training are known to be significant factors in enhancing nurses' medication safety knowledge, clinical decision making, and safe medication administration practices^{19, 20}. The present results also concurred with the observation of nurses that those who had received recent training scores significantly higher than those who did not have recent training exposure²¹. Nurses who receive training are more likely to be up to date on medication policies and procedures, high-risk medications, reporting adverse drug reactions, and patient medication education. On the other hand, the results of this study revealed that clinical experience and knowledge score were positively correlated, as previous studies reported that medication safety competence was correlated with clinical reasoning, nursing practice readiness and safe nursing care competence gained from repeated clinical learning and practice exposure^{22, 23}.

The clinical experience may improve nurses' awareness of medication-related problems, track of therapeutic responses, and evidence-based decision making in routine care of patients²⁴. Educational qualification was also found to be related positively with knowledge, suggesting that those nurses who have more academic preparation would have more knowledge regarding the principles of patient safety, therapeutic care, and pharmacology. These results were similar to those found by previous studies where age was found to be positively associated with knowledge, and that this was possibly due to the interaction between professional maturity and experience gained, and to the exposure to clinical practice^{25,26}. Increased knowledge of pharmacology and the adoption of lifelong learning habits could also be explained by higher education levels and help to foster better medication management habits²⁷.

There are some limitations of this study. First, due to its cross-sectional design, causal relationships cannot be determined between the various professional and knowledge factors. Second, the study was conducted in some hospitals and health facilities and convenience sampling was used so that the generalizability of the study results may be limited. Third, a self-administered questionnaire was used to measure knowledge, and this may not have accurately captured current clinical practices or medication administration practices. Hospitals need to establish geriatric medication safety measures and promote interprofessional working between the nursing team, doctors and pharmacists. Larger multicenter samples of patients and nurses, as well as an observational study of nursing practice and patient outcomes associated with medication safety, should be included in future studies. The effectiveness of practical competency can be enhanced through simulation-based training, case-based learning, medication review workshops and clinical audits.

Conclusion

In conclusion, the majority of nurses had good knowledge about the management of medications and therapeutic care for older people. Recent professional training, increased experience and education level, and age were associated with increased knowledge scores. CPE was the most powerful predictor of knowledge. The findings highlight the importance of frequent education sessions, medication management for seniors, and education on polypharmacy management and therapeutic monitoring. It is recommended that healthcare institutions arrange regular competency-based training and medication safety workshops to improve nurses' practical skills in geriatric medication management.

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Conflict of Interest

None

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Use of Artificial Intelligence

The corresponding author declared that no artificial intelligence or AI-assisted tools were used in this manuscript.

Authors' Contribution

NA, SM and NR contributed significantly and equally as per ICMJE. All authors gave their final approvals to publish this article.

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