



Effectiveness Of A Nurse-Led Medication Review And Patient Education Intervention On Polypharmacy And Medication Safety Knowledge Among Elderly Outpatients In Ajmer, Rajasthan: A Quasi- Experimental Study

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ABSTRACT

Background: Polypharmacy is common among elderly individuals due to the coexistence of multiple chronic morbidities and increases the risk of adverse drug reactions, poor adherence, and hospitalization. Evidence from Indian outpatient settings on nurse-led medication review and education interventions remains limited.

Objectives:

- ✓ To assess the prevalence of polypharmacy among elderly outpatients.
- ✓ To evaluate the effectiveness of a nurse-led medication review and patient education intervention on medication safety knowledge.
- ✓ To determine the association between selected demographic variables and polypharmacy

Methods: A hospital-based quasi-experimental one-group pretest–posttest study was conducted among 100 elderly patients (≥ 60 years) attending outpatient departments of a selected tertiary care hospital in Ajmer, Rajasthan. Data were collected using a structured interview schedule. A nurse-led medication review and patient education intervention was implemented, followed by posttest assessment after four weeks. Data were analyzed using descriptive statistics, Chi-square test, and paired *t*-test with significance set at $p < 0.05$.

Results: Polypharmacy was observed in 40% of participants at baseline. Age ≥ 70 years, lower educational status, and the presence of three or more chronic morbidities showed a statistically significant association with polypharmacy ($p < 0.05$). Medication safety knowledge

improved significantly after the intervention, with good knowledge increasing from 20% to 54%. The mean knowledge score increased from 11.8 ± 3.4 to 18.2 ± 2.9 ($t = 10.92, p < 0.001$).

Conclusion: The nurse-led medication review and patient education intervention was effective in improving medication safety knowledge and addressing factors associated with polypharmacy among elderly outpatients. Integrating such nursing interventions into routine outpatient care may enhance rational medication use and patient safety.

Keywords: Elderly; Polypharmacy; Medication safety; Nurse-led intervention; Quasi-experimental study; Rajasthan

Introduction

Population ageing is a rapidly growing global and national phenomenon. In India, the increasing proportion of elderly individuals is accompanied by a rising burden of chronic non-communicable diseases such as arthritis, hypertension, diabetes mellitus, and chronic respiratory disorders. These conditions often coexist, resulting in multimorbidity and long-term use of multiple medications.

Polypharmacy, commonly defined as the concurrent use of four or more medications, has emerged as a major challenge in geriatric healthcare. Inappropriate polypharmacy increases the risk of adverse drug reactions, drug-drug interactions, non-adherence, functional decline, and hospitalization. Nurses play a pivotal role in medication monitoring, patient education, and coordination of care. Evaluating nurse-led medication review and education interventions is essential to strengthen geriatric outpatient services, particularly in resource-limited settings.

Objectives

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- ✓ .To evaluates the effectiveness of a nurse-led medication review and patient education intervention on medication safety knowledge.
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Hypotheses

H₁: Polypharmacy will be prevalent among elderly outpatients.

H₂: There will be a significant association between selected demographic variables and the presence of polypharmacy among elderly outpatients.

H₃: Elderly outpatients who receive the nurse-led medication review and patient education intervention will have significantly higher medication safety knowledge scores compared to their pre-intervention scores

Methodology

Research Approach - A quantitative research approach was adopted to systematically assess polypharmacy and medication safety knowledge among elderly outpatients and to evaluate the effectiveness of a nurse-led medication review and patient education intervention.

Research Design - A quasi-experimental one-group pretest–posttest research design was used.

Study Setting - The study was conducted in the outpatient departments (OPDs) of a selected tertiary care hospital in Ajmer, Rajasthan.

Study Population - The study population comprised elderly patients aged 60 years and above attending medical outpatient departments during the study period and receiving treatment for one or more chronic conditions.

Sample Size - a total of 100 elderly patients were included in the study.

Sampling Technique- A convenience sampling technique was adopted. Eligible elderly patients attending the OPD during the data collection period were recruited consecutively until the desired sample size was achieved.

Inclusion Criteria

- ✓ Elderly patients aged 60 years and above
- ✓ Patients attending outpatient departments
- ✓ Patients receiving one or more long-term medications
- ✓ Patients willing to participate and provide written informed consent

Exclusion Criteria

- ✓ Critically ill patients
- ✓ Patients with acute medical emergencies
- ✓ Elderly patients with severe cognitive impairment who were unable to respond and had no primary caregiver available

Variables of the Study

Independent Variable: Nurse-led medication review and patient education intervention

Dependent Variables: Polypharmacy status, Medication safety knowledge level

Demographic Variables: Age, gender, educational status, and number of chronic morbidities

Data Collection Tools- A structured interview schedule was developed after extensive literature review and expert consultation. It consisted of four sections:

Section A: Socio-demographic Variables Age, gender, educational status, and number of chronic morbidities.

Section B: Clinical Profile Presence of chronic morbidities such as joint disorders, hypertension, diabetes mellitus, respiratory disorders, and sleep or depressive disorders.

Section C: Medication Profile Information on the number, type, and duration of medications. Polypharmacy was defined as the **concurrent use of four or more medications**.

Section D: Medication Safety Knowledge Questionnaire Assessed knowledge related to medication purpose, dosage and timing, adherence, awareness of side effects, and importance of follow-up. Scoring of Knowledge

- ✓ Each correct answer scored one mark ✓ Total score range: 0–25

Knowledge levels were classified as:

- ✓ Poor: $\leq 50\%$
- ✓ Average: 51–75%
- ✓ Good: $> 75\%$

Validity and Reliability of the Tool

Content validity was ensured through expert review by nursing and medical faculty. The tool was pilot tested among 10% of the sample, and these participants were excluded from the main study. Reliability was established using the split-half method ($r = 0.82$), indicating good reliability.

Description of the Intervention

- ✓ The nurse-led medication review and patient education intervention included:
- ✓ Review of prescriptions and medication lists
- ✓ Identification of duplicate, unnecessary, or potentially inappropriate medications
- ✓ Education on medication purpose, dosage, timing, and adherence
- ✓ Counseling on possible side effects and warning signs
- ✓ Lifestyle modification advice
- ✓ Coordination with treating physicians when medication optimization was indicated
- ✓ Each session lasted 20–25 minutes and was conducted individually in a private OPD

setting.

Data Collection Procedure

Baseline (pretest) data were collected through face-to-face interviews. Polypharmacy status and medication safety knowledge were assessed. The intervention was administered immediately after the pretest, and posttest assessment was conducted four weeks later using the same tool.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Written informed consent was obtained from all participants. Confidentiality, anonymity, and the right to withdraw were ensured.

Statistical Analysis.

Descriptive statistics: frequency, percentage, mean, and standard deviation

Inferential statistics: Chi-square test and paired *t*-test Statistical significance was set at $p < 0.05$.

Results

Table 1: Demographic Characteristics of Elderly Patients (n = 100)

Variable	Category	n (%)
Age	60–69 years	56 (56.0)
	≥70 years	44 (44.0)
Gender	Male	52 (52.0)
	Female	48 (48.0)
Education	≤Primary	46 (46.0)
	≥Secondary	54 (54.0)
Chronic morbidities	≤2	58 (58.0)
	≥3	42 (42.0)

Table 2: Prevalence of Polypharmacy (n = 100)

Polypharmacy Status	N (%)
≥4 medications	40 (40.0)
<4 medications	60 (60.0)

Table 3: Association between Demographic Variables and Polypharmacy (n = 100)

Variable	χ^2	df	p-value
Age	7.12	1	0.008*
Gender	0.24	1	0.62
Education	9.86	1	0.002*
Number of chronic morbidities	23.41	1	<0.001*

*Statistically significant

Table 4: Overall Medication Safety Knowledge Level (n = 100)

Knowledge Level	Pre-test n (%)	Post-test n (%)
Poor	44 (44.0)	16 (16.0)
Average	36 (36.0)	30 (30.0)
Good	20 (20.0)	54 (54.0)

Table 5: Comparison of Mean Knowledge Scores (Paired t-test)

Assessment	Mean ± SD	t-value	p-value
Pre-test	11.8 ± 3.4	10.92	<0.001*
Post-test	18.2 ± 2.9		

Discussion

The findings of the study reveal a high prevalence of polypharmacy among elderly outpatients, consistent with previous Indian studies. Age, educational status, and multimorbidity were significantly associated with polypharmacy. The nurse-led medication review and patient education intervention resulted in a significant improvement in medication safety knowledge. The increase in good knowledge levels and reduction in poor knowledge highlight the effectiveness of structured nursing interventions in geriatric outpatient care.

Limitations

- ✓ Absence of a control group
- ✓ Short follow-up period
- ✓ Medication appropriateness was not assessed using standardized tools

Conclusion

The nurse-led medication review and patient education intervention significantly improved medication safety knowledge and addressed factors associated with polypharmacy among elderly outpatients in Ajmer, Rajasthan. Integrating nurse-led interventions into routine outpatient services can enhance rational medication use and patient safety.

Recommendations

Routine nurse-led medication review and patient education programs should be implemented in outpatient settings to reduce polypharmacy and improve medication safety among elderly patients.

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