



Assessment of Medication Storage, Self-Medication, Polypharmacy and Medication Adherence through Home Medication Review among Geriatric Population

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Abstract

Introduction: Home Medication Review (HMR) is a patient-centered service aimed at optimizing medication use and improving therapeutic outcomes, particularly in the geriatric population. Elderly patients often suffer from multiple chronic conditions, leading to polypharmacy, poor medication adherence, and increased risk of drug-related problems. Additionally, improper medication storage and self-medication practices further compromise treatment safety and effectiveness. Therefore, evaluating these factors through home-based assessment is essential to enhance rational drug use and patient care.

Objectives:• To assess the pattern and appropriateness of medication storage practices among the geriatric population.

- To evaluate the prevalence and types of self-medication practice
- To determine the extent of polypharmacy
- To assess medication adherence

Results:A total of 300 geriatric patients were included in the study. The majority (80%) had at least one chronic condition, with diabetes (42.4%) and hypertension (40.2%) being most common. About 85% of patients were on regular medication. Medication storage was mainly in cupboards (47.3%) and boxes (30.7%), while 11% never checked expiry dates. Regarding disposal, 56% returned expired medicines to pharmacies, whereas others used unsafe methods like throwing or burning. Self-medication was widely practiced, with 67% reporting occasional use, mainly due to previous experience (60.7%). Common conditions for self-medication included fever (38.7%), cough (31.5%), and acidity (28.1%). Herbal medicines (60%) and antibiotics (42.6%) were frequently used. These findings highlight gaps in safe medication practices among the elderly.

Conclusion:The study concludes that medication-related issues such as improper storage, self-medication, and potential polypharmacy are prevalent among the geriatric population. Home Medication Review serves as an effective tool to identify these problems and improve medication adherence, safety, and overall health outcomes. Implementing targeted educational interventions and pharmacist-led counseling can significantly enhance rational medication use and quality of life in elderly patients.

Keywords: Home Medicines Review, Geriatric population, Medication adherence, Polypharmacy, Self-medication, Medication storage

INTRODUCTION

Home Medicines Review (HMR) is a collaborative, patient-centred medication review conducted to optimize medicine use, identify medication-related problems and improve therapeutic outcomes. It is particularly relevant in older adults, in whom multiple chronic illnesses and complex medication regimens increase the need for careful assessment of actual medicine use at home.¹ Medication adherence is a major determinant of therapeutic outcome, while non-adherence can reduce treatment benefit and increase the burden on patients and healthcare systems.²

Polypharmacy is common in older adults and may increase the risk of adverse outcomes when multiple medicines are used concurrently.³ Self-medication is also frequently reported in geriatric populations and may be influenced by previous experience, easy access to medicines and advice from family or friends.⁴ Medication storage and disposal practices at home are therefore important components of medication safety and can be directly assessed through a home-based review.

Among the literature most closely related to the present study, Dijkstra et al. explored medication self-management among older adults living at home and identified problems involving medication organization, inappropriate storage and disposal, limited recognition of adverse effects, and unsupervised changes in medication use.⁵ Satish et al. specifically assessed the influence of Home Medication Review on medication storage, self-medication and polypharmacy and reported improvement in these practices after personalized counselling and education, supporting the role of HMR in promoting safer and more rational medicine use.⁶

Older adults frequently require long-term pharmacotherapy for multiple chronic illnesses, which may contribute to polypharmacy, medication errors and adherence-related problems. In addition, expired, unused, inadequately labelled or improperly stored medicines can compromise medication safety. HMR provides a practical approach for observing real-world medication practices, identifying drug-related problems and supporting rational medicine use.⁷ Therefore, the present home-based study was undertaken to assess medication storage, self-medication,

polypharmacy and medication adherence among community-dwelling geriatric patients and to identify areas where medication-management practices can be improved.

2. METHODOLOGY

A descriptive cross-sectional study with a home-based observational component was conducted over 3 months among community-dwelling geriatric participants. Individuals aged ≥ 60 years, taking at least one prescription medication, residing in the community, providing informed consent, and of either gender were eligible. Terminally ill patients, individuals with severe cognitive impairment, institutionalized elderly persons and mentally ill patients were excluded. Convenient sampling was used.

Study documents, including the protocol, informed consent form (ICF) and case record form (CRF), were prepared, and ethical approval was obtained from the Sarvajanic Clinical Research Ethics Committee (SCREC). After approval, eligible participants were enrolled and interviewed at home. Demographic and clinical information, chronic conditions, regular medication use, medication storage and disposal practices, self-medication and polypharmacy-related variables were recorded. Medication adherence was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8),⁸ and socioeconomic status was assessed using the Kuppuswamy socioeconomic scale used in the thesis.⁹ Data were entered into Microsoft Excel. Frequency distributions, percentages, means and standard deviations were used for descriptive analysis.

3. RESULTS

3.1 Study sample and data collection summary

Data were collected from December 2025 to February 2026. A total of 300 geriatric patients meeting the inclusion and exclusion criteria were enrolled from the selected residential sites. Eligible patients were counselled regarding the study, and willing participants provided informed consent before data collection.

3.2 Distribution of patients by residential address

Residence	Frequency (N=300)	Percentage
Mehsana	93	31%
Kheralu	118	39.30%
Dela	39	13%
Gadha	50	16.70%

Kheralu contributed the largest proportion of participants (39.30%), followed by Mehsana (31%), Gadha (16.70%) and Dela (13%).

3.3 Gender-wise distribution

Gender	Frequency (N=300)	Percentage
Male	150	50%
Female	150	50%

Male and female participants were equally represented, with 150 participants (50%) in each group.

3.4 Age-wise distribution

Age group	No. of patients	Percentage
60–69 years	149	49.66%
70–79 years	116	38.66%
80–89 years	33	11%
≥ 90 years	2	0.66%

Nearly half of the participants were aged 60–69 years (49.66%), followed by 70–79 years (38.66%), 80–89 years (11%) and ≥ 90 years (0.66%).

3.5 Health & Chronic conditions

Chronic condition	Frequency	Percentage
Yes	240	80%
No	60	20%

Overall, 240 participants (80%) reported at least one chronic condition, whereas 60 (20%) reported no chronic illness.

3.6 Common chronic disease among patients

Chronic disease	Frequency	Percentage
Hypertension	106	40.20%
Diabetes	112	42.40%

Chronic disease	Frequency	Percentage
Arthritis	53	20.10%
Heart disease	20	7.60%
Asthma	8	3%
COPD	16	6.10%
GERD	11	4.20%
Dyslipidemia	3	3.80%
Hypothyroidism	8	3%
Skin infection	4	2%
CKD	2	1.80%
Cholesterol	4	2%

Diabetes (42.40%) and hypertension (40.20%) were the most commonly reported chronic conditions, followed by arthritis (20.10%). Other chronic conditions occurred at lower frequencies.

3.7 Patients under regular medication

Under regular medication	Frequency	Percentage
Yes	255	85%
No	45	15%

A total of 255 participants (85%) reported taking medications regularly, while 45 (15%) were not under regular medication.

3.8 Medication storage

Storage location	Frequency (N=300)	Percentage
Box	92	30.70%
Refrigerator	35	11.70%
Cupboard	142	47.30%
Drawer	49	16.30%
Plastic bag	8	2.60%

Cupboards were the most frequently reported medication storage location (47.30%), followed by boxes (30.70%), drawers (16.30%), refrigerators (11.70%) and plastic bags (2.60%).

Expiry-date checking	Frequency	Percentage
Always	99	33%
Sometimes	169	56%
Never	32	11%

Most participants checked expiry dates either sometimes (56%) or always (33%); 11% never checked expiry dates.

Expired medicine disposal	Frequency	Percentage
Return to pharmacy	175	56%
Throw	57	19%
Burn	30	10%
Keep	45	15%

Returning expired medicines to a pharmacy was the most frequently reported disposal practice (56%). Other participants threw them away (19%), kept them at home (15%) or burned them (10%).

3.9 Self-medication

Self-medication practice	Frequency (N=300)	Percentage
Always	23	8%
Sometimes	201	67%
Never	76	25%

Self-medication was common: 67% reported practising it sometimes and 8% always, while 25% reported never self-medicating.

Reason for self-medication	Frequency	Percentage
Previous experience	142	60.70%
Time constraints	40	17.10%
Access issues	31	13.20%
Cost	14	6%

Reason for self-medication	Frequency	Percentage
Pain	4	2%

Previous experience was the leading reported reason for self-medication (60.70%).

Common problem	Frequency	Percentage
Fever	91	38.70%
Cough	74	31.50%
Acidity	66	28.10%
Headache	59	25.10%
Body ache	52	22.10%
Runny nose	29	12.30%
Diarrhea	18	7.70%
Nausea	14	6%
Constipation	13	5.50%
Vomiting	9	3.80%
Dizziness	9	3.80%

Fever, cough, acidity, headache and body ache were the most frequently reported problems for which self-medication was used.'

Type of drug used	Frequency	Percentage
Herbal	141	60%
Antibiotics	100	42.60%
GIT drugs	45	19.10%
Vitamins	20	8.5%
Analgesics	12	5.10%
Pain relief	2	1%
UTI drugs	1	0.40%
NSAIDs	1	0.40%

Herbal medicines (60%) and antibiotics (42.60%) were the most frequently reported self-medicated products.

3.10 Polypharmacy

Total medicines used	Percentage
1	5.70%
2	10%
3	15%
4	14%
5	14.30%
6	17.30%
7	12%
8	4%
9	4.30%
10	0.30%
11	1.70%
12	1%
13	0.30%

The highest proportion of participants used six medicines (17.30%). Overall, 125 participants (42%) reported using more than five medicines daily, while 175 (58%) used five or fewer medicines.

>5 medicines used daily	Frequency	Percentage
Yes	125	42%
No	175	58%

Same medicine for multiple illnesses	Frequency	Percentage
Yes	34	11%
No	266	89%

Duplicate/unused medicines stored	Frequency	Percentage
Yes	73	24%
No	227	76%

Use of the same medicine for multiple illnesses was reported by 11% of participants, and 24% stored duplicate or unused medicines at home.

3.11 Morisky Medication Adherence Scale-8 (MMAS-8)

MMAS-8 item	Yes	No
1. Sometimes forget medication	51 (17%)	249 (83%)
2. Missed medication in past two weeks	14 (5%)	286 (95%)
3. Cut back/stopped because felt worse	11 (4%)	288 (96%)
4. Forgot medication when travelling	72 (24%)	228 (76%)
5. Took medication last time due*	287 (96%)	13 (4%)
6. Stop when symptoms controlled	30 (10%)	270 (90%)
7. Feel hassled by treatment plan	16 (5%)	284 (95%)

Item 8: difficulty remembering all medicines	Frequency	Percentage
All the time	2	0.70%
Usually	12	4%
Sometimes	51	17%
Once in a while	141	47%
Never/rarely	94	31.3%

Adherence category	Percentage
High adherence	56%
Medium adherence	35%
Low adherence	9%

The mean MMAS-8 total score was 8.436 ± 1.583 . The thesis reports that most participants were in the high-adherence category (56%), followed by medium adherence (35%) and low adherence (9%).

4. DISCUSSION

The study included 300 geriatric participants from four residential sites, with the largest proportion from Kheralu. Men and women were equally represented. Nearly half of the participants were aged 60–69 years, whereas only a small proportion were aged ≥ 90 years. A previous HMR study in the geriatric population of Gandhinagar reported a near-balanced gender distribution, with 52.95% males and 47.05% females.¹⁰

Chronic morbidity was common, with 80% of participants reporting at least one chronic condition. Diabetes (42.4%) and hypertension (40.2%) were the leading conditions, and 85% of participants were under regular medication. The thesis compares these findings with earlier Indian studies in which diabetes and hypertension were also prominent chronic conditions among older adults.^{10,11}

Medication storage practices showed that cupboards (47.3%) and boxes (30.7%) were the principal storage locations. Although 89% of participants checked expiry dates always or sometimes, 11% never checked them. More than half returned expired medicines to pharmacies, while others threw, burned or retained expired medicines. The thesis discussion compares these findings with an Indian household survey that reported box storage as a major location and substantial differences in expiry-date checking and disposal practices.¹¹

Self-medication was reported sometimes by 67% and always by 8% of participants. Previous experience was the most common reason (60.7%), while fever, cough, acidity, headache and body ache were common problems managed through self-medication. Herbal medicines and antibiotics were the most frequently reported products. The thesis compares these findings with Sharma et al., who also documented frequent self-medication practices in an Indian population, although the distribution of reasons differed.¹²

Polypharmacy-related findings showed that 42% of participants used more than five medicines daily, 11% used the same medicine for multiple illnesses, and 24% stored duplicate or unused medicines. The thesis discussion compares these practices with earlier work reporting higher proportions of use of more than five medicines and duplicate/unused medicine storage.^{11,13}

Medication adherence was generally favourable. The thesis reports 56% high adherence, 35% medium adherence and 9% low adherence, with a mean MMAS-8 score of 8.436 ± 1.583 . Nevertheless, specific adherence barriers remained: 17% sometimes forgot medication, 24% forgot medication while travelling, and 10% sometimes stopped medication when symptoms were controlled. These findings indicate that overall adherence can coexist with specific behavioural gaps requiring targeted counselling. The thesis contrasts its adherence findings with Vatcharavongvan et al., who reported a higher proportion of poor medication adherence in older adults with polypharmacy.¹³

5. CONCLUSION

About 50% of the patients belonged to the 60–69 years age group, while the remaining were aged above 70 years. Approximately 56% of the participants were classified as overweight to obese based on BMI. Half of the participants were male, and the other half were female. Nearly 50% of them belonged to the upper-lower socioeconomic class. The most prominent chronic conditions observed were hypertension and diabetes.

Almost 85% were regular medication for respective disease conditions. 48% were storing medication in Cupboard followed by Box (30.7%) and Drawer (16.3%).

89% were checking expiry dates. 56% of them were returning expired medicines to pharmacy. 75% were taking

self-medications by their previous experience.

38% for fever, 32% for cough, 28% for acidity, 25% for headache and 22% for bodyache doing self medication.

Patients were taking herbal (60%), antibiotics (43%), GIT (19%), vitamins (8.5%), analgesics (5.1%), pain killer (1%), 0.4% for UTI and NSAIDS.

67% suggested friends & family as source of information. 55.2% patients were taking more than 5 medicines.

11% answered that they were using same medicines for multiple illness.

Out of the total participants, 58% were found to have high adherence, 35% had medium adherence and 9% of them were found to have low adherence.

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