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Original Research Article

DRUG UTILIZATION PATTERN IN ELDERLY POPULATION OF ANAND DISTRICT

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ABSTRACT

Background: Older adults frequently require long-term pharmacotherapy due to the rising burden of chronic diseases and multimorbidity. Evaluation of drug utilization patterns in the geriatric population is essential to promote rational prescribing and reduce medication-related risks.

Materials and Methods: A prospective observational study was conducted among 500 individuals aged 65 years and above residing in Anand district, Gujarat, from September 2017 to October 2019. Participants of either sex who were on medication were included. Data were collected through home-based interviews using a structured case record form after obtaining informed consent. Demographic details, body mass index, disease profile, number of co-morbid conditions, drug utilization pattern, number of drugs per participant, and routes of drug administration were recorded. Data analysis was performed using descriptive statistics and expressed as frequencies and percentages.

Results: Most participants belonged to the 65–74-year age group, with a slight male predominance. The majority were living with family members and had normal to increased body mass index as per Asian criteria. A total of 1,272 disease conditions were identified, with cardiovascular and endocrine disorders being the most common. Multimorbidity was prevalent, with most participants having two or more co-existing conditions. A total of 2,639 drugs were prescribed, predominantly acting on the cardiovascular, endocrine, and musculoskeletal systems. Polypharmacy was frequently observed, with many participants receiving multiple medications. Oral administration was the most commonly used route, while parenteral formulations were rarely prescribed.

Conclusion: Drug utilization among the geriatric population in Anand district is largely driven by chronic disease burden and multimorbidity, resulting in frequent polypharmacy. Emphasis on rational prescribing and periodic medication review is essential to optimize therapeutic outcomes and reduce potential medication-related complications in elderly patients.

Keywords: Geriatric population, drug utilization, polypharmacy, multimorbidity, prescribing pattern.

INTRODUCTION

The global demographic shift toward an aging population has led to an increasing proportion of older adults worldwide, with associated rises in chronic conditions and health-care needs. Elderly individuals commonly experience multiple co-existing diseases, a phenomenon termed multimorbidity, which often necessitates the use of several medications simultaneously, known as polypharmacy.[1] Multimorbidity and polypharmacy are closely interlinked and contribute significantly to the complexity of clinical management in geriatric patients, increasing the risk of adverse drug reactions, drug–drug interactions, and treatment nonadherence.[2]

In India, the prevalence of polypharmacy among older adults is particularly notable. A systematic review and meta-analysis reported a pooled polypharmacy prevalence of approximately 49%

among Indian adults aged 60 years and above, with hyperpolypharmacy and potentially inappropriate medication use also commonly observed.[3] Similarly, observational studies conducted in Indian community and hospital settings have highlighted frequent use of multiple medications and the challenges associated with prescribing for elderly patients with chronic illnesses.[4,5] These patterns not only reflect the high burden of chronic disease in the elderly but also underscore the need for ongoing evaluation of prescribing practices to ensure rational and safe medication use.

Comprehensive drug utilization studies in geriatric populations provide critical insights into medication patterns, including system-wise drug use, routes of administration, and the extent of polypharmacy. Such studies support clinicians, pharmacists, and policy-makers in identifying areas for improving prescribing quality, minimizing medication-related harm, and tailoring interventions to the specific needs of elderly patients. Against this backdrop, the present study examined drug utilization patterns in the elderly of Anand district, with an emphasis on demographic characteristics, disease burden, co-morbid conditions, medication profiles, and routes of administration for prescribed therapies.

MATERIALS AND METHODS

Study Design and Setting: A prospective observational study was conducted among the geriatric population of Anand district, Gujarat, over a period of two years (September 2017 to October 2019). The study protocol was approved by the Human Research Ethics Committee. A pilot study involving 25 participants was carried out to assess the feasibility and clarity of the Case Record Form before initiation of the main study.

Study Population and Sample Size: The study included 500 participants aged ≥65 years of either sex who were on one or more medications at the time of enrollment. There were no exclusion criteria. Written informed consent was obtained from all participants prior to data collection.

Data Collection: Participants were recruited with the assistance of the Senior Citizen Forum of Anand. Interested individuals were interviewed at their residences at a convenient time. Data were collected through direct interviews and verification of prescriptions, medication strips, and relevant medical documents, and recorded in a structured Case Record Form.

Study Variables and Outcome Measures: Following variables were analyzed:

1. **Demographic and Anthropometric Details:** Age, sex, education status, living status, height, and weight were recorded. Body mass index (BMI) was calculated and categorized using Asian BMI criteria. Age was grouped into 65–74, 75–84, and ≥85 years (Table 1).
2. **Disease Profile:** All diagnosed diseases were recorded and classified system-wise (e.g., cardiovascular, endocrine, musculoskeletal). Each disease was counted separately, and the total disease burden was expressed as frequency and percentage (Table 2).
3. **Co-morbid Conditions:** The number of co-existing diseases per participant was documented, and participants were categorized based on the frequency of co-morbid conditions (Table 3).
4. **Drug Utilization Pattern:** Prescribed drugs were classified system-wise according to the WHO Essential Medicines List. Each formulation was considered as one drug, and the distribution was expressed as number and percentage (Table 4).
5. **Number of Drugs per Participant:** The total number of drugs consumed by each participant was recorded to assess the extent of polypharmacy. The average number of drugs per participant was calculated by dividing the total number of drugs by the total number of participants (Table 5).
6. **Route of Administration:** Drugs were categorized based on the route of administration (oral, inhalational, topical, subcutaneous, intramuscular/intravenous), and their distribution was expressed as frequency and percentage (Table 6).

Statistical Analysis: Data from 500 participants were analyzed using descriptive statistics. Results were expressed as frequencies and percentages and presented in tabular form. No inferential statistical tests were applied.

RESULTS

The study population largely consisted of younger elderly individuals, with a predominance of males and relatively good educational status. Most participants were living with family support, which may facilitate medication adherence and continuity of care. [Table 1]

The morbidity profile was dominated by chronic non-communicable diseases, particularly cardiovascular and endocrine disorders, reflecting the growing burden of lifestyle-related illnesses in the elderly. The presence of multiple system involvement indicates complex healthcare needs in this age group. [Table 2]

Multimorbidity was common, with most participants having two or more co-existing conditions, highlighting increased therapeutic complexity and the potential risk of drug–drug interactions. [Table 3]

Drug utilization patterns corresponded closely with the disease profile, with cardiovascular and endocrine medications being most frequently prescribed. The use of supplements and system-specific drugs suggests attempts to address both chronic disease management and age-related physiological changes. Table 4]

Polypharmacy was prevalent, driven by multimorbidity, raising concerns regarding

medication burden and the need for regular prescription review in geriatric patients. [Table 5]

Oral administration was the preferred route, indicating management in stable, outpatient settings and an effort to minimize invasive therapies in the elderly. [Table 6]

Table 1: Demographic Characteristics of Participants (n = 500)

Parameter	Category	Number of Participants (%)
Age group (years)	65–74	368 (73.60)
	75–84	116 (23.20)
	≥85	16 (3.20)
Gender	Male	276 (55.20)
	Female	224 (44.80)
Education status	Illiterate	39 (7.80)
	Up to 12th standard	233 (46.60)
	Graduate	177 (35.40)
	Postgraduate and above	51 (10.20)
Family status	Living alone	40 (8.00)
	Living with spouse/family	460 (92.00)
BMI category (Asian criteria)	<18.5 (Underweight)	11 (2.20)
	18.5–22.9 (Normal)	190 (38.00)
	23.0–24.9 (Overweight)	116 (23.20)
	25.0–29.9 (Pre-obese)	165 (33.00)
	30.0–40.0 (Type I obese)	18 (3.60)
	40.1–50.0 (Type II obese)	0 (0.00)

Table 2: Disease prevalent in geriatric population

Disease Pattern	No. of diseases Out of 1272 (%)
Cardiovascular disease	551 (43.31)
Endocrine disorder	283 (22.24)
Musculoskeletal disease	126 (9.90)
Respiratory disease	084 (6.60)
Genitourinary disease	062 (4.87)
Central Nervous System disease	060 (4.71)
Hematological disease	037 (2.90)
Gastrointestinal disease	032 (2.51)
Dermatological disease	019 (1.49)
Ocular/ ENT disease	018 (1.41)
Total	1272 (100%)

Table 3: Frequency of co-morbid conditions

Frequency	Number of participants (%)
1	099 (7.78)
2	189 (29.71)
3	116 (27.35)
4	057 (17.92)
5	026 (10.22)
>6	013 (6.99)
Total	500 (100%)

Table 4: Category wise distribution of drugs

Category of drugs	No. of drugs prescribed (%)
Drugs acting on Cardiovascular system	1073 (40.65)
Drugs acting on Endocrine system	417 (15.80)
Drugs acting on Musculoskeletal system	275 (10.42)
Vitamins, minerals & dietary supplements	200 (7.57)
Drugs acting on Respiratory system	199 (7.54)
Drugs acting on Gastrointestinal system	178 (6.74)
Drugs acting on central nervous system	134 (5.07)
Dermatological agents	052 (1.97)
Drugs used for Genitourinary system	042 (1.59)
Drugs acting on Hematological system	028 (1.06)
Antimicrobial agents	012 (0.45)
Anticancer drugs	004 (0.15)
Total	2639 (100%)

Table 5: Number of drugs consumed per participant

No. of drugs taken by participant	No. of participants	Total formulations
1	23	023
2	39	078
3	70	210

4	84	336
5	67	335
6	68	408
7	58	406
8	34	272
9	28	252
10	16	160
>10	13	159
Total	500	2639

Table 6: Formulation given by different route

ROA	Number of formulations (%)
Oral	2467 (93.45)
Subcutaneous	0027 (1.06)
Inhalation	0068 (2.58)
Topical	0074 (2.80)
Intramuscular/Intravenous	0003 (00.11)
Total	2639 (100%)

DISCUSSION

This study reveals that drug utilization among elderly individuals in the community is strongly shaped by the high prevalence of chronic non-communicable diseases and multimorbidity. Comparable observational studies in rural and tertiary care settings in India have also reported a substantial burden of comorbid conditions among older adults, with a large proportion of patients presenting with diabetes, cardiovascular disorders, and other chronic illnesses requiring ongoing pharmacotherapy.[6,7] These conditions inherently contribute to the increased number of medications prescribed per individual and explain the polypharmacy trends observed in the present study.

The prevalence of polypharmacy in our cohort aligns with findings from both community and hospital-based research, where a considerable percentage of older adults were prescribed multiple medications concurrently, often exceeding five drugs per person.[6,8] Such extensive medication use reflects the complexity of managing chronic diseases in elderly populations and underscores the importance of regular prescription review to mitigate the risks of drug–drug interactions and inappropriate prescribing.

System-wise analysis showed that drugs for cardiovascular and endocrine systems were most frequently prescribed, which is consistent with reports from other drug utilization studies indicating these classes as commonly used in older adults due to high rates of hypertension and diabetes in this age group.[8,9] The prominence of musculoskeletal and respiratory medications further supports the multifaceted nature of geriatric care, where age-related degenerative changes and chronic obstructive airway conditions are prevalent.

Polypharmacy has been associated with adverse outcomes, such as increased healthcare utilization, falls, and mortality in elderly cohorts. Recent evidence suggests that specific combinations of high-risk medications contribute to these outcomes independent of overall drug count.[10-13] Though this study did not systematically evaluate clinical adverse outcomes, the high degree of polypharmacy observed warrants concerted efforts in comprehensive medication reviews, including the application of criteria like Beers or STOPP/START, to optimize therapeutic regimens and minimize medication-related harm.

CONCLUSION

The present study demonstrates that drug utilization in the geriatric population of Anand district is predominantly influenced by a high burden of chronic non-communicable diseases and widespread multimorbidity. Cardiovascular and endocrine disorders emerged as the leading contributors to morbidity, which was reflected in the prescribing pattern dominated by drugs acting on these systems. Polypharmacy was common among elderly participants, largely driven by the presence of multiple co-existing conditions. Oral formulations were overwhelmingly preferred, indicating long-term outpatient management of chronic illnesses. These findings highlight the need for rational prescribing practices, regular medication review, and geriatric-specific therapeutic strategies to minimize medication-related risks and optimize treatment outcomes in the elderly population.

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