ORIGINAL ARTICLE

FINANCING OF HEALTHCARE SERVICES IN GERIATRIC PATIENTS: ECONOMIC BURDEN AND SUSTAINABILITY IN THE FACE OF A GROWING ELDERLY POPULATION

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Abstract

Introduction: The growing proportion of the elderly population worldwide and in Türkiye has significantly affected healthcare utilization patterns and expenditure structures. This study aimed to evaluate healthcare service utilization and expenditures among individuals aged ≥65 years according to service type, service area, and age group.

Materials and Method: This descriptive, cross-sectional study utilized administrative data from the 2024 Social Security Institution (SSI) General Health Insurance system. Individuals aged ≥65 years who used at least one SSI-covered healthcare service were included. Healthcare utilization and expenditures were analyzed descriptively across hospital services, pharmacy services, medical supplies, and outpatient visits, stratified by age groups and selected chronic disease categories.

Results: Healthcare expenditures were mainly driven by hospital and pharmacy services, with hospital services accounting for approximately half of total spending. Cardiovascular diseases showed the highest healthcare utilization and expenditure among chronic disease groups. Although total expenditures were highest in the 65-69 age group, per capita expenditure increased steadily with age and reached its highest level in individuals aged ≥80 years, where it was approximately twice that of the 65-69 age group.

Conclusion: The findings indicate that healthcare utilization among the elderly population is shaped by the burden of chronic diseases and age-related care needs, while per capita healthcare expenditures increase markedly in more advanced age groups. These results provide important implications for healthcare planning and the financial sustainability of health systems in the context of population aging.

Keywords: Aged; Health Services for the Aged; Health Expenditures; Social Security.

INTRODUCTION

In recent years, one of the most prominent indicators of the global demographic transition has been the rapid growth of the elderly population (1,2). Alongside increasing life expectancy, declining fertility rates are shifting population structures toward older age groups. This transformation is reshaping the demand for healthcare services in both quantitative and qualitative terms (3). The increasing prevalence of chronic diseases and the existence of multiple comorbidities in older adults significantly elevate the demand for healthcare services. Healthcare systems face increasing demands due to these developments, which also lead to rising financial pressures (4). Data from the World Health Organization indicate that life expectancy at birth continues to increase worldwide (2), while United Nations population projections suggest that the population aged ≥65 years will expand rapidly on a global scale, with this increase being more pronounced in low- and middle-income countries (5). This demographic transition, together with the increasing demand for healthcare services, highlights the need for policies aimed at ensuring the sustainability of healthcare expenditures.

A similar demographic transition is being observed in Türkiye. Data from the Turkish Statistical Institute indicate that the proportion of individuals aged ≥65 years within the total population has increased steadily in recent years (6). Current trends suggest that this rise in the elderly population will continue in the coming decades (7). This shift is expected to be associated with a sustained increase in healthcare expenditures, particularly related to medication use, hospital admissions, and long-term care services (2). Within this broader demographic and economic context, the structure of healthcare financing systems becomes increasingly critical.

In Türkiye, healthcare services are predominantly financed through the Social Security Institution (SSI) General Health Insurance system. With its extensive population coverage, SSI plays a central role in ensuring access to healthcare services and financing healthcare expenditures. SSI establishes reimbursement and billing regulations to fund hospital services, outpatient care, medications, and medical supplies. Within this framework, healthcare services for older adults are delivered through the same healthcare system that serves the general population. Although geriatric units and specialized geriatric clinics exist in some tertiary care hospitals, most healthcare services for individuals aged ≥65 years are provided through primary care, public hospitals, university hospitals, and private healthcare institutions. Importantly, reimbursement policies within the SSI system are not age-specific; rather, healthcare services, medications, and medical supplies are reimbursed according to standardized regulations applied uniformly to all insured individuals. The growth of the elderly population has led to a marked increase in healthcare service utilization and associated expenditures within the SSI system. Studies conducted in various countries have also reported that, as the population ages, the composition of healthcare expenditures is shifting toward a structure heavily focused on hospitals and pharmaceuticals (8,9). This trend highlights the importance of closely examining healthcare expenditures among older adults in order to maintain the financial sustainability of health systems. In this context, examining healthcare utilization and expenditures among individuals aged ≥65 years according to service type, service area, and age group is essential for elucidating the economic impact of an aging population on the healthcare system. Accordingly, this study aims to analyze healthcare service utilization and expenditures among individuals aged ≥65 years based on SSI administrative records, stratified by service type, service area, and age group, and to provide up-to-date, descriptive data on the economic burden of population aging on the Turkish healthcare system.

MATERIALS AND METHOD

This study was designed as a descriptive, cross-sectional analysis based on administrative records from the SSI. Healthcare service utilization and expenditure data pertaining to individuals aged

≥65 years were evaluated, and the analyses were conducted through a retrospective review of existing SSI records.

Ethics Approval

This study was approved by the Ankara Etlik City Hospital Scientific Research Evaluation and Ethics Committee No. 1 (Approval No: AEŞH-BADEK1-2025-762, 17 December 2025). The study was conducted in accordance with the principles of the Declaration of Helsinki. Due to the retrospective design of the study, the requirement for individual informed consent was waived.

Data Source

The data were derived from administrative records within the SSI General Health Insurance system, including billed healthcare services from SSI-contracted providers, pharmacy prescription records, and medical supply expenditure items obtained from SSI's central healthcare expenditure databases. Analyses were conducted at the individual level using fully anonymized records.

Study Population and Inclusion Criteria

The study population comprised individuals aged ≥65 years who utilized at least one healthcare service covered by the SSI General Health Insurance system during the study period and had available billed service records in the dataset.

Although comprehensive diagnostic data were available in the dataset, the analyses focusing on chronic disease groups were deliberately restricted to selected high-burden conditions with the highest patient volumes and healthcare expenditures, in order to enhance analytical clarity and interpretability.

Definition of the Comparison Group

In this study, the primary analyses were conducted on individuals aged 65 years and older. However, to better elucidate age-related differences in

Table 1. Distribution of Healthcare Expenditures by Type of Service Among the Study Population (High-Cost Expenditure Categories)

	Age Group	Number of Individuals	Number of Follow-ups/Visits	Total Expenditure*	Expenditure per Capita (TRY)
Hospital Services	<65	8,336,569 (100.0%)	106,848,902 (100.0%)	125.24 (100.0%)	15,023
	65-69	2,960,930 (35.5%)	36,801,390 (34.4%)	38.46 (30.7%)	12,987
	70-74	2,242,812 (26.9%)	29,569,153 (27.7%)	33.47 (26.7%)	14,922
	75-79	1,524,893 (18.3%)	20,390,535 (19.1%)	24.86 (19.8%)	16,300
	≥80	1,607,934 (19.3%)	20,087,824 (18.8%)	28.46 (22.7%)	17,700
Pharmacy Expenditures	<65	8,716,333 (100.0%)	114,157,468 (100.0%)	102.91 (100.0%)	11,807
	65-69	3,093,970 (35.5%)	37,919,456 (33.2%)	32.58 (31.7%)	10,528
	70-74	2,345,864 (26.9%)	31,507,730 (27.6%)	28.16 (27.4%)	12,003
	75-79	1,593,542 (18.3%)	22,341,902 (19.6%)	20.74 (20.2%)	13,016
	≥80	1,682,957 (19.3%)	22,388,380 (19.6%)	21.44 (20.8%)	12,737
Outpatient Medical Supplies (Adult incontinence products, optical devices, medical supplies, orthoses, prostheses, hearing aids, etc.)	<65	1,663,286 (23%)	1,827,604 (24%)	6.88 (49%)	2,006
	65-69	529,805 (31.9%)	576,124 (31.5%)	0.58 (17.3%)	1,089
	70-74	417,875 (25.1%)	461,252 (25.2%)	0.65 (19.4%)	1,548
	75-79	302,354 (18.2%)	336,294 (18.4%)	0.67 (20.1%)	2,222
	≥80	413,252 (24.8%)	453,934 (24.8%)	1.44 (43.2%)	3,484

*Expenditures are presented in billion Turkish Lira (TRY). Percentages indicate the share within each service category. Expenditure per capita represents the average expenditure per individual within each age group. Approximate equivalents in US Dollars were calculated using the average annual exchange rate for 2024 based on data from the Central Bank of the Republic of Türkiye (1 USD ≈ 32.5 TRY).

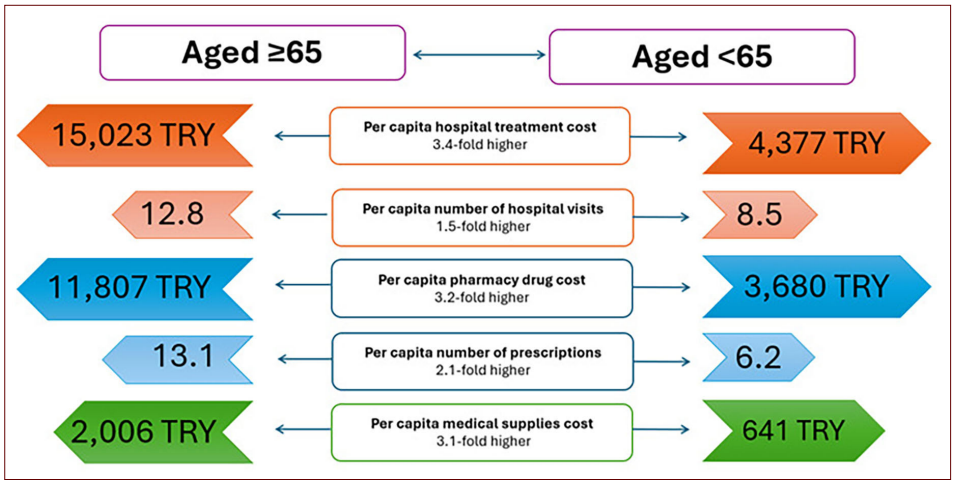


Figure 1. Comparison of Per Capita Healthcare Utilization and Costs Between Individuals Aged ≥65 Years and <65 Years
Expenditures are presented in Turkish Lira (TRY) on a per capita basis. Approximate equivalents in US Dollars were calculated using the average annual exchange rate for 2024 based on data from the Central Bank of the Republic of Türkiye (1 USD ≈ 32.5 TRY).

healthcare utilization and expenditure levels, data from individuals younger than 65 years were included as a comparison group, particularly for the analyses presented in Table 1 and Figure 1.

Variables Assessed and Classification of Expenditures

Healthcare service utilization and expenditures were evaluated using the following variables: number of individuals, number of follow-ups or visits, prescriptions, and total expenditure amounts. Analyses were conducted according to expenditure categories (hospital services, pharmacy services, and outpatient medical supplies and assistive products) and age groups (65-69, 70-74, 75-79, and ≥80 years).

Hospital services were evaluated under the categories of examinations, laboratory tests, radiology, admission and discharge procedures, and in-hospital medication services. Pharmacy expenditures included medications dispensed through pharmacies, while outpatient medical supplies comprised adult incontinence products, optical devices, medical supplies, orthoses, prostheses, and hearing aids.

Outpatient healthcare services were analyzed by clinical specialty within the scope of outpatient clinic visits. For each specialty, the number of individuals, number of visits, mean visits per individual, and total expenditure amounts were calculated for individuals aged ≥65 years.

Analyses of medication use were performed in two stages. In the first stage, medication use and expenditure amounts were evaluated according to selected chronic disease groups and stratified by age. In the second stage, medication use among individuals without formal medical reports was analyzed using prescription-based data and classified at ATC Level 1 according to the Anatomical Therapeutic Chemical (ATC) classification system.

All expenditure amounts are expressed in Turkish Lira (TRY) and presented as whole numbers, with commas used as thousand separators.

Definition of High-Burden Chronic Disease Groups

High-burden chronic disease groups were identified based on their contribution to healthcare utilization and expenditures within the Social Security Institution (SSI) General Health Insurance administrative database for the year 2024. Disease groups were selected because they are commonly associated with substantial healthcare use and economic burden among older adults. Diagnoses were classified using the International Classification of Diseases, 10th Revision (ICD-10) codes recorded in the administrative database. Accordingly, the

following chronic disease categories were included in the analysis: cardiovascular diseases (ICD-10: I00-I99), diabetes mellitus (ICD-10: E10-E14), chronic respiratory diseases (ICD-10: J40-J47), malignant neoplasms (ICD-10: C00-C97), chronic kidney disease (ICD-10: N18), and neurodegenerative disorders including Alzheimer's disease (ICD-10: G30) and Parkinson's disease (ICD-10: G20) and eye diseases (ICD-10: H00-H59). These ICD-10 code groups were used to identify diagnoses within the SSI administrative dataset and to evaluate healthcare utilization and expenditure patterns related to these conditions.

Statistical Analyses

Statistical analyses were performed using descriptive statistical methods. Categorical variables were presented as numbers and percentages, while continuous variables were summarized as total values and distributions. Analyses were conducted across chronic disease categories, expenditure types, age groups, outpatient clinic visits, hospital services, and indicators of medication use. All results were reported in tabular format, and no statistical comparisons or hypothesis testing were performed. Because the analysis was based on nationwide administrative data covering the entire insured population rather than a sample, inferential statistical analyses (e.g., confidence intervals or significance testing) were not conducted.

RESULTS

This study analyzed healthcare service utilization and expenditures among individuals aged ≥65 years covered by the SSI General Health Insurance system in 2024. Utilization patterns and expenditures by selected high-burden chronic disease groups are summarized in Table 2. Cardiovascular diseases constituted the largest diagnostic group in terms of both medication use and hospital service utilization and accounted for the highest proportion of total healthcare expenditures. In contrast, although cancer patients represented a relatively small proportion of the study population, they were associated with a disproportionately high combined medication and hospital service cost burden (Table 2).

Table 2. Distribution of selected high-burden chronic diseases, medication use, hospital services, and healthcare expenditures among the study population aged ≥65 years

Diagnostic Group	Medication Users* n (%)	Medication Expenditure n (% of total)	Hospital Services Users** n (%)	Hospital Services Expenditure n (% of total)	Total Expenditure *** n (%)
Overall Total	7,172,282 (100%)	73.43 (100%)	4,057,555 (100%)	30.91 (100%)	104.35 (100%)
Cardiovascular Diseases	5,846,292 (82%)	19.06 (26%)	2,855,941 (70%)	12.93 (42%)	31.99 (31%)
Diabetes Mellitus	2,380,506 (33%)	11.09 (15%)	184,701 (5%)	1.36 (4%)	12.45 (12%)
Cancer	207,226 (3%)	8.70 (12%)	273,562 (7%)	9.57 (31%)	18.27 (18%)
Respiratory System Diseases	1,039,590 (14%)	6.48 (9%)	151,439 (4%)	1.02 (3%)	7.50 (7%)
Dementia-Parkinson's Disease	458,487 (6%)	3.73 (5%)	201,977 (5%)	1.95 (6%)	5.67 (5%)
Chronic Kidney Disease	128,108 (2%)	2.14 (3%)	139,381 (3%)	2.01 (7%)	4.15 (4%)
Psychiatric Disorders	1,139,770 (16%)	1.89 (3%)	339,393 (8%)	0.53 (2%)	2.42 (2%)
Eye Diseases	813,615 (11%)	1.45 (2%)	1,089,775 (27%)	0.71 (2%)	2.16 (2%)

*Medication users include individuals who received reimbursed prescription drugs covered by the Social Security Institution (SSI) within the study period.
**Hospital service users include individuals who utilized both inpatient and outpatient healthcare services.
***Expenditure values represent the combined cost of medications and hospital services. Expenditures are presented in billion Turkish Lira (TRY). Percentages indicate the share of each diagnostic group within total expenditures. Approximate equivalents in US Dollars were calculated using the average annual exchange rate for 2024 based on data from the Central Bank of the Republic of Türkiye (1 USD ≈ 32.5 TRY).

Across selected chronic disease groups, the proportions of individuals aged ≥65 years and their corresponding medication expenditure shares within the overall population aged ≥65 years varied considerably (Table 2). In the cardiovascular disease group, the share of medication expenditures exceeded the proportion of individuals in the general population. Similarly, in respiratory and eye disease groups, medication expenditure shares were higher than their corresponding population proportions, indicating a relatively higher per capita medication cost burden among older individuals (Table 2).

Table 2 presents the numbers of individuals, follow-ups, prescriptions, visits, and expenditure amounts by type. Hospital and pharmacy expenditures constituted the largest share of total healthcare spending. By age group, total hospital and pharmacy expenditures were highest in the 65–69 age group, whereas per capita expenditures increased with age, reaching the highest hospital costs among individuals aged ≥80 years. Although outpatient medical supply expenditures represented a relatively small proportion of total spending, both the number of individuals and total expenditure in this category were higher in those aged ≥80 years (Table 2).

Comparative analyses of per capita hospital visit frequency, hospital treatment costs, pharmacy medication costs, and medical supply costs between individuals aged ≥65 and <65 years are shown in Figure 1. Per capita hospital treatment, pharmacy medication expenditures, and medical supply expenditures were higher in the ≥65-year group than in the <65-year population (Figure 1). The differences presented in Figure 1 represent descriptive comparisons and were not evaluated using formal statistical significance testing; therefore, these findings should be interpreted with caution.

The distribution of outpatient visits by clinical specialty is shown in Table 3. Among individuals aged ≥65 years, emergency medicine was the most frequently visited specialty in terms of both the number of individuals and visits. In terms of expenditures, internal medicine, orthopedics and traumatology, and cardiology accounted for the highest total outpatient healthcare costs (Table 3).

Table 3. Distribution of Outpatient Healthcare Services by Clinical Specialty Among Individuals Aged ≥65 Years

Follow-up Specialty	Number of Individuals n (% of total)	Number of Visits n (%)	Mean Visits per Individual	Total Expenditure* n (%)
Emergency Medicine	5,387,461 (65%)	25,500,873 (24%)	4.73	7.08 (5.7%)
Internal Medicine	4,495,334 (54%)	12,070,107 (11%)	2.69	10.95 (8.7%)
Ophthalmology	2,825,386 (34%)	7,972,833 (7%)	2.82	3.67 (2.9%)
Cardiology	2,799,967 (34%)	7,248,210 (7%)	2.59	7.08 (5.7%)
Orthopedics and Traumatology	2,091,672 (25%)	4,860,241 (5%)	2.32	8.04 (6.4%)
Neurology	1,730,772 (21%)	4,138,066 (4%)	2.39	3.90 (3.1%)
Urology	1,680,309 (20%)	4,622,117 (4%)	2.75	3.58 (2.9%)
Otorhinolaryngology	1,666,626 (20%)	3,105,230 (3%)	1.86	0.81(0.6%)
Dentistry	1,520,771 (18%)	3,855,326 (4%)	2.54	2.96 (2.4%)
Pulmonology	1,494,443 (18%)	3,389,671 (3%)	2.27	3.52 (2.8%)

*Expenditures are presented in billion Turkish Lira (TRY). Percentages indicate the share within total outpatient healthcare expenditures. Approximate equivalents in US Dollars were calculated using the average annual exchange rate for 2024 based on data from the Central Bank of the Republic of Türkiye (1 USD ≈ 32.5 TRY).

Table 4. Distribution of Non-Report-Based Medication Use and Expenditure Shares by ATC Level 1 Drug Groups Among Individuals Aged ≥65 Years Compared with the Overall Population

ATC Level 1 Drug Group	Number of Individuals (% of Overall Population)	Expenditure* (% of total expenditure)	Ratio of Per Capita Expenditure in ≥65 Years to Overall Population
Alimentary Tract and Metabolism	7,548,272 (15%)	6.95 (30%)	2.05
Blood and Blood-Forming Organs	3,601,553 (20%)	1.35 (27%)	1.36
Cardiovascular System	3,559,991 (33%)	2.02 (44%)	1.33
Dermatologicals	4,489,013 (15%)	2.02 (21%)	1.36
Systemic Anti-infectives	6,207,760 (12%)	3.09 (17%)	1.43
Musculoskeletal System	6,995,855 (13%)	4.93 (25%)	1.88
Nervous System	5,798,006 (15%)	2.03 (27%)	1.84
Respiratory System	5,880,733 (12%)	2.66 (16%)	1.36
Sensory Organs	2,762,929 (17%)	0.83 (27%)	1.63

*Expenditures are presented in billion Turkish Lira (TRY). Percentages indicate the share within total medication expenditures. Approximate equivalents in US Dollars were calculated using the average annual exchange rate for 2024 based on data from the Central Bank of the Republic of Türkiye (1 USD ≈ 32.5 TRY).

Table 4 presents the number of individuals and expenditure amounts for non-medical report-based medications across ATC Level 1 drug groups, along with the ratio of per capita expenditure in individuals aged ≥65 years compared with the overall population. Expenditures on alimentary tract and metabolism drugs were disproportionately higher relative to the proportion of individuals aged ≥65 years in the overall population. In contrast, although cardiovascular system drugs did not demonstrate a comparable increase in per capita expenditure, they accounted for a substantial share of total non–report–based medication expenditures (Table 4).

DISCUSSION

In this study, healthcare service utilization and healthcare expenditures among individuals aged ≥65 years were evaluated according to type of service, service area, and age group using administrative records from the SSI. The findings are broadly consistent with trends reported in the international literature regarding the impact of population aging on healthcare systems while also highlighting several features specific to the service delivery and financing structure of the Turkish healthcare system. In this respect, the present study represents one of the first comprehensive analyses in Türkiye to examine healthcare utilization and expenditure patterns among the elderly population covered by SSI in a detailed, age-stratified manner. The results indicate that with advancing age, healthcare utilization not only increases quantitatively but is also accompanied by a marked rise in per capita healthcare expenditures. Notably, the highest per capita healthcare costs were observed among individuals aged ≥80 years. This finding reflects the economic implications of an increasing burden of chronic diseases, greater care needs, and more complex patterns of healthcare utilization at advanced ages. The increasing prominence of care-oriented expenditures in the oldest age groups also suggests that healthcare utilization in advanced age is increasingly shaped not only by treatment-related services but also by care and support needs. From a health policy perspective, this finding highlights the growing importance of strengthening long-term care structures, integrating home healthcare services, and developing sustainable strategies to

address the care needs of an aging population in Türkiye. Therefore, the impact of population aging on healthcare systems should be assessed not only in terms of overall expenditure growth but also within the framework of planning age-sensitive care and support services.

When chronic disease groups were examined, cardiovascular diseases emerged as the leading category in terms of both healthcare service utilization and total expenditure. Cardiovascular diseases are among the conditions whose prevalence increases with advancing age, and they constitute a substantial proportion of the morbidity burden in the elderly population. Age-related vascular structural changes, an increased atherosclerotic burden, metabolic disturbances, and the presence of multiple comorbidities contribute to greater clinical monitoring and treatment needs for these conditions (10). Long-term and often lifelong hospital-based care, regular outpatient follow-up, and intensive medication use help explain the dominant role of cardiovascular diseases in overall healthcare expenditures. In the present study, total expenditures related to this disease group remained high across all age groups, while per capita expenditure increased with advancing age and became particularly pronounced among individuals aged 80 years and older.

Similarly, chronic conditions such as diabetes mellitus and cancer were observed to make substantial contributions to overall healthcare expenditures. Age-related metabolic changes and the frequent coexistence of cardiovascular risk factors contribute to the increasing prevalence of diabetes in older age groups. Microvascular and macrovascular complications associated with diabetes lead to increased healthcare utilization through the need for regular monitoring and intensive pharmacological treatment (11, 12). The literature indicates that the rising cancer burden with advancing age is associated with a broad spectrum of healthcare services, ranging from diagnostic and staging procedures to systemic therapies and long-term follow-up requirements (13-15). In the present study, although individuals with cancer constituted a relatively small proportion of the overall patient population, they accounted for a disproportionately high share of medication-related and overall healthcare expenditures. This finding reflects the substantial impact of targeted therapies, immunotherapies, and other high-cost oncologic medications on healthcare spending among the elderly population.

Age-stratified analyses indicate that healthcare utilization and related expenditures escalate with increasing age, a trend that is especially evident in per capita costs. In the present study, the relatively higher total expenditure observed in the 65-69 age group appears to be related to the numerical predominance of this group within the elderly population and the continuation of active diagnostic and treatment processes. In contrast, per capita expenditures increased progressively with age and reached the highest levels among individuals aged ≥80 years. In older age groups, the increasing burden of multimorbidity, functional limitations, and elevated levels of dependency leads to more intensive and expensive healthcare utilization. Indeed, the literature suggests that while the use of acute treatment-oriented services may decline in very old age, the need for care, support, and long-term follow-up becomes more prominent (16,17). Within this framework, the increasing prominence of care-oriented expenditure items in our study, such as adult incontinence products among individuals aged ≥80 years, indicates a shift in healthcare spending toward care- and support-focused services in this age group. This finding suggests that care needs may become more prominent in this age group and highlights the potential importance of strengthening long-term care services as well as home-based care and support services in healthcare system planning.

When outpatient healthcare utilization was evaluated, visits were found to be concentrated

particularly in emergency medicine and internal medicine specialties. Emergency medicine was the most frequently utilized specialty in terms of both the number of individuals and the total number of visits. Internal medicine was among the specialties with the highest number of visits and the greatest expenditure. This pattern suggests that the coexistence of chronic disease management and acute health problems in the elderly population substantially shapes healthcare utilization behaviors. The literature similarly reports that a significant proportion of healthcare visits among older adults occur due to acute symptoms, exacerbations of chronic conditions, and sudden clinical deterioration, leading to increased utilization of emergency departments and internal medicine services (18). Previous studies have also emphasized that the growing burden of multimorbidity, polypharmacy, and functional vulnerability in advanced age groups contributes to the concentration of outpatient healthcare utilization within these specialties (19). These results highlight the necessity of enhancing primary healthcare services and chronic disease management strategies to alleviate the strain on the healthcare system within the elderly demographic.

Findings related to medication use indicate that polypharmacy is common among the elderly population and that pharmaceutical expenditures constitute a substantial share of total healthcare spending. Studies based on national health insurance data have reported that advanced age, the presence of multiple comorbidities, and increased healthcare utilization significantly contribute to the high prevalence of medication use in older adults (20,21). In the present study, both medications prescribed for chronic diseases requiring medical reports and non-report medications were found to contribute substantially to the overall expenditure burden. In particular, the prominence of drugs related to the alimentary tract and metabolism is noteworthy. This finding likely reflects the widespread use of medications aimed at symptom control and supportive treatments in older individuals and highlights the importance of medication safety, appropriate prescribing practices, and rational drug use. Furthermore, certain geriatric syndromes that are common in older adults, such as constipation, malnutrition, and other gastrointestinal symptoms, may contribute to the increased use of medications related to the alimentary tract. In addition, polypharmacy in older age groups may lead to potentially inappropriate medication use, which represents an important issue requiring careful consideration from a geriatric pharmacology perspective (22,23). Consequently, the formulation of rational prescribing methodologies and suitable medication management strategies for the elderly demographic is crucial for both patient safety and the sustainability of healthcare costs.

This study has several limitations. First, the analyses were restricted to healthcare services billed under the SSI, excluding out-of-pocket expenditures, private health insurance payments, and services outside SSI coverage. Therefore, we may partially underestimate the overall economic burden of healthcare expenditures among the elderly population. However, according to OECD health expenditure statistics, out-of-pocket payments account for approximately 16% of total health expenditure in Türkiye, which is lower than the OECD average. This suggests that public reimbursement mechanisms play a dominant role in healthcare financing in Türkiye and that analyses based on SSI data still reflect a substantial proportion of overall healthcare spending. Second, medication data were based on prescription records and did not reflect actual drug consumption or treatment adherence. Third, although comprehensive diagnostic data were available, disease-specific analyses were limited to selected high-burden chronic conditions with the highest patient volumes and healthcare expenditures to enhance analytical clarity. Nevertheless, the use of nationwide administrative data covering a large elderly

population enables a comprehensive assessment of healthcare utilization and age-related increases in per capita expenditures in Türkiye, thereby contributing to a clearer characterization of the growing healthcare cost burden associated with population aging.

CONCLUSION

This study demonstrates that healthcare utilization and expenditures increase progressively with advancing age among individuals aged ≥65 years in Türkiye. In particular, per capita healthcare expenditures rise substantially in older age groups, while care- and support-oriented services account for a growing proportion of total healthcare spending. These findings underscore the increasing impact of population aging on the healthcare system and highlight the importance of developing policies that consider age-related variations in healthcare needs and expenditures. In this context, strengthening primary healthcare services, improving chronic disease management, and implementing sustainable financing and resource allocation strategies tailored to the needs of older adults may contribute to improving the efficiency and sustainability of the healthcare system.

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