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Outpatient Healthcare Utilization, Out-of-Pocket Expenditure, and Associated Factors Among Older Adults in Fars Province, Iran: A Population-Based Cross-Sectional Study

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Abstract

Background: Population aging is increasing demand for health care while raising concerns about direct household payments.

Objectives: This study examined outpatient health care utilization, out-of-pocket (OOP) expenditure, and their associated factors among older adults in Fars Province, Iran.

Methods: This population-based cross-sectional study included 700 adults aged 60 years or older selected through systematic random sampling. We collected data through structured telephone interviews using a study-specific instrument. Participants reported outpatient service use and related OOP payments during the preceding 3 months. These values were annualized by multiplying them by 4. We used negative binomial regression to examine factors associated with health care utilization and multiple linear regression to examine factors associated with OOP expenditure.

Results: Participants reported a mean annual utilization of 40.00 outpatient service uses, rounded to the nearest whole service use (standard deviation [SD], 35.00), and a mean annual OOP expenditure of 344,600,400 rials (SD: 900,876,350 rials). Medication use and general practitioner consultations were the most frequently reported services, whereas specialist dental care accounted for the highest mean OOP expenditure. In the adjusted negative binomial model, incidence rate ratios (IRRs) indicated that chronic disease (IRR = 1.683; P < 0.001), high-cost medical treatment (IRR = 1.529; P = 0.001), rural residence (IRR = 1.369; P = 0.001), and access to a family physician (IRR = 1.350; P = 0.009) were associated with higher healthcare utilization. In the multiple linear regression model, high-cost medical treatment (β = 429,000,000; P = 0.002) and chronic disease (β = 204,000,000; P = 0.027) were associated with higher OOP expenditure, whereas access to a family physician was associated with lower OOP expenditure (β = −263,000,000; P = 0.038).

Conclusions: Outpatient healthcare utilization and OOP expenditure were related but had partly different associated factors. Chronic disease and high-cost treatment were important factors associated with both healthcare utilization and direct payments. Access to a family physician was associated with greater healthcare utilization but lower OOP expenditure. These findings highlight the potential importance of strengthening family physician services and chronic disease management and evaluating the adequacy of coverage for high-cost outpatient care among older adults.

Keywords: Aged, Health Services Utilization, Health Expenditures

1. Background

Population aging is one of the major demographic changes of the twenty-first century and poses important challenges for health systems worldwide (1). According to the World Health Organization (WHO), the global population aged 60 years or older is expected to increase from approximately one billion in 2020 to 1.4 billion by

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2030 and 2.1 billion by 2050, with nearly two-thirds living in low- and middle-income countries. This demographic transition requires health systems to adapt their services and policies to meet the growing healthcare needs of older populations (1).

Older adults are disproportionately affected by chronic diseases, multimorbidity, disability, and functional limitations (2-5), resulting in greater demand for medical consultations, medications, diagnostic procedures, and rehabilitation services (6). Increased healthcare utilization may also impose a substantial financial burden on older adults and their households, particularly in health systems in which out-of-pocket (OOP) payments constitute an important source of healthcare financing (7-9). Although healthcare utilization and OOP expenditure are closely related, they represent different aspects of healthcare use and direct healthcare spending. Healthcare needs, insurance coverage, household resources, service costs, and provider type may influence this relationship. At the population level, high OOP payments have been associated with an increased risk of financial hardship and catastrophic health spending, particularly among households with limited economic resources (8, 10). However, absolute OOP expenditure alone does not directly indicate financial hardship or financial protection, as these concepts also depend on household income, resources, and the proportion of household expenditure devoted to healthcare.

Iran is experiencing rapid population aging, with the proportion of people aged 60 years or older projected to reach approximately 31% by 2050 (11). Previous studies in Iran have documented a substantial financial burden of healthcare among households with older adults. A recent comparative study of healthcare financing for older adults highlighted the need for sustainable financing mechanisms in Iran, particularly through the development of long-term care insurance (12). For example, Aliakbar et al. examined the determinants of OOP health expenditure and catastrophic health spending among households with older adults, whereas Faraji et al. investigated OOP pharmaceutical expenditure in this population (13, 14). Although these studies provide valuable evidence on the financial burden of healthcare among households with older adults, they do not jointly examine outpatient healthcare utilization and total OOP healthcare expenditure at the individual level among older adults in Iran.

Studies in Fars Province have also examined outpatient healthcare utilization and associated costs. A study using administrative data from 2,618,973 individuals insured by the Iran Health Insurance Organization in Fars Province assessed outpatient service utilization and costs by age, sex, and insurance fund (15). However, it included the general insured population rather than focusing specifically on older adults and relied on administrative insurance data. Consequently, it did not directly capture OOP expenditure reported by older adults or their households. Other studies among older adults in Iran have examined healthcare utilization, including outpatient and inpatient services, but have generally focused on utilization patterns or specific service types rather than jointly examining outpatient utilization and OOP expenditure. Thus, differences in population, data source, geographical setting, and outcome measurement indicate a need for more specific evidence on the relationship between outpatient service use and direct healthcare payments among older adults in Iran.

2. Objectives

This study examined outpatient health care utilization, OOP expenditure, and their associated demographic, socioeconomic, insurance-related, and health-related factors among adults aged 60 years or older in Fars Province, southern Iran. By examining health care utilization and OOP expenditure in the same sample of 700 older adults, this study provides updated evidence on outpatient health care use and the direct payments associated with these services. This evidence may inform efforts to improve access to outpatient care and better understand the factors associated with OOP expenditure among older adults.

3. Methods

3.1. Study Design and Sampling

In this cross-sectional study, the study population comprised adults aged 60 years or older residing in urban and rural areas covered by Shiraz University of Medical Sciences. The source population included approximately 606,950 older adults. We constructed the sampling frame using the list of older adults registered in Iran's Integrated Health System, locally known as the Integrated Health Information System (SIB). We obtained the information needed to sample and contact potential participants from the older adults' health unit of the Vice-Chancellery for Health of Shiraz University of Medical Sciences.

We calculated the sample size using the formula for estimating a population mean, assuming a 95% confidence level, an expected standard deviation of healthcare expenditure of 6,684,724 Iranian rials, and a precision of 500,000 rials (15). The minimum required sample size was 687 participants, which we increased to 700 to improve precision and account for potentially incomplete

responses. We selected participants using systematic random sampling from the sampling frame of 606,950 older adults registered in SIB. We calculated the sampling interval by dividing the size of the sampling frame by the required sample size. After selecting a random starting point, we selected subsequent participants at fixed intervals until we reached the target sample size of 700.

Participants were eligible if they were aged ≥ 60 years, were registered in SIB, resided in an area covered by Shiraz University of Medical Sciences, had valid contact information, and agreed to participate.

If an originally selected individual was confirmed to be deceased or unable to respond, and the required information could not be obtained from a close family member or another person sufficiently familiar with the individual's healthcare utilization and expenditures, we selected the next eligible individual on the sampling list as a replacement. The study records did not separately document the number of replacements.

3.2. Data Collection and Variables

We collected data using a study-specific form developed with reference to the World Health Organization's World Health Survey Individual Questionnaire. The form recorded information on demographic and household characteristics, socioeconomic and insurance-related characteristics, health status, outpatient healthcare utilization, medication use, and OOP expenditure. Therefore, internal consistency measures such as Cronbach's alpha were not applicable. Experts in health economics, aging, epidemiology, and health services management reviewed the form for relevance, clarity, necessity, and comprehensiveness. We revised it accordingly before data collection.

We collected data from all 700 participants through telephone interviews. For older adults who could not respond independently, we obtained the required information from a close family member or another person familiar with the participant's health status, healthcare utilization, and expenditures. This approach enabled us to include older adults who could not participate independently in the telephone interview.

Participants reported the outpatient healthcare services they had used and the corresponding OOP payments during the preceding 3 months. We used a 3-month recall period to reduce potential recall error while capturing recent healthcare utilization and expenditure. For annual comparability, we multiplied the reported 3-month utilization frequencies and expenditures by 4 to obtain annualized estimates. This annualization assumes that healthcare utilization and expenditure during the 3-month recall period reflected each participant's average experience over the year. We conducted the survey during the Iranian calendar year 1404 (21 March 2025 - 20 March 2026). We obtained responses directly from participants whenever possible. When needed, a family member or primary caregiver familiar with the participant's healthcare use helped the participant understand the questions or recall services and payments. We reviewed completed questionnaires for completeness and internal consistency before data entry and statistical analysis.

The study assessed two primary outcomes: annualized outpatient healthcare utilization and annualized outpatient OOP expenditure. We defined outpatient healthcare utilization as the number of reported uses of outpatient healthcare services during the 3-month recall period. This measure included physician visits, diagnostic laboratory tests, imaging services, medications, medical devices or equipment, rehabilitation services, and other outpatient services. We counted each use of a healthcare service as one unit. Participants reported whether they had a family physician (yes/no), whether they used family physician services, and the number of visits during the recall period. For medications, we counted the number of visits or occasions for obtaining medications rather than the number of individual medications or doses. We calculated total outpatient utilization by aggregating reported uses across these service categories. Other outpatient services included electrocardiography, echocardiography, exercise stress testing, audiometry, home nursing, and injection services. Health-related variables included self-rated health, chronic disease, limitations in activities of daily living, and receipt of high-cost medical treatment. We assessed high-cost medical treatment using a questionnaire item asking whether participants received at least one of the following services during the 3-month recall period: dialysis, chemotherapy, long-term physiotherapy, or expensive injectable treatments. We classified participants who reported receiving at least one of these services as having received high-cost medical treatment. We defined this variable based on the type of healthcare service received, not on a predefined monetary expenditure threshold. Behavioral variables included cigarette and waterpipe smoking, alcohol consumption, and physical activity.

We defined OOP expenditure as the total nominal amount paid directly by participants or their households for outpatient healthcare services. We recorded expenditures in Iranian rials without adjusting for inflation and recorded payments separately for public, private, and other providers. We summed 3-month utilization and expenditure values across service categories and annualized them by multiplying by 4. All expenditures were reported in Iranian rials. For

international context, we provided an approximate exchange rate of 1,450,000 Iranian rials per US dollar, as reported by the United Nations Development Programme for late 2025. This rate represents an approximate exchange rate for late 2025 rather than the average rate over the entire data collection period. We conducted all statistical analyses using the original expenditure values in Iranian rials.

3.3. Statistical Analysis

We summarized categorical variables as frequencies and percentages and continuous variables as means and standard deviations (SDs). In bivariate analyses, we compared mean outpatient healthcare utilization and OOP expenditure across participant characteristics using independent-samples t tests for variables with 2 categories and one-way analysis of variance for variables with 3 or more categories. Variables with a $P < 0.20$ in univariable analyses were considered candidates for inclusion in the multivariable regression models.

We analyzed healthcare utilization using multivariable negative binomial regression. We selected negative binomial rather than Poisson regression because substantial overdispersion was detected (likelihood-ratio test of alpha = 0, $P < 0.001$). We reported results as incidence rate ratios (IRRs) with 95% confidence intervals and P values. Participants with zero healthcare utilization were retained in the analysis. We used multiple linear regression to examine factors associated with annual outpatient OOP expenditure and reported regression coefficients and P values. Participants with zero OOP expenditure were retained in this analysis. We defined statistical significance as a two-sided $P < 0.05$ and performed all analyses using Stata version 17.

4. Results

We included 700 older adults in the analysis. Participants aged 60 - 64 years constituted the largest age group (43.7%), and men and women were represented almost equally. Most participants were married (71.1%) and lived in urban areas (87.4%). More than half had no formal education or only primary education; 46.0% were retired, and 69.1% were heads of household.

Almost all participants (97.7%) had basic health insurance, and 64.6% had supplementary insurance. Most participants had access to a family physician (92.1%), and 83.7% reported using family physician services. Chronic disease was reported by 82.4% of participants, whereas 6.1% received high-cost medical treatment. Most participants were completely independent in activities of daily living (81.6%), and 64.9% reported low levels of weekly physical activity. Detailed participant characteristics are presented in Table 1.

Mean annual outpatient healthcare utilization was 40.00 service uses per participant, rounded to the nearest whole service use (SD: 35.00), and mean annual OOP expenditure was 344,600,400 rials (SD: 900,876,350 rials). Among the 700 participants, 35 (5.0%) reported no outpatient healthcare utilization, and 50 (7.1%) reported no OOP expenditure during the recall period. Medication use was the most frequently reported service, with a mean of 11.23 annual service uses per participant. The corresponding means were 7.41 for general practitioner (GP) consultations, 3.90 for laboratory tests, 3.66 for physiotherapy, 3.38 for specialist consultations, 2.91 for subspecialist consultations, and 2.65 for diagnostic imaging.

Specialist dental care accounted for the highest mean OOP expenditure (120,285,710 rials), followed by medications (60,787,420 rials), medical and assistive devices (31,582,850 rials), and diagnostic imaging (28,214,850 rials). Mean annual utilization was 21.81 service uses in the private sector and 18.02 in the public sector. However, mean OOP expenditure was substantially higher for private providers (306,822,570 rials) than for public providers (43,592,110 rials). GP consultations were obtained predominantly from public providers, whereas specialist, dental, diagnostic, and medication-related services were obtained more frequently from private providers (Table 2).

Outpatient healthcare utilization differed significantly according to age, gender, residence, employment status, living arrangement, supplementary health insurance, household expenditure, access to and use of family physician services, chronic disease, self-rated health, and receipt and type of high-cost medical treatment. Higher utilization was observed particularly among women, rural residents, participants with chronic disease, and those receiving high-cost medical treatment (Table 3).

OOP expenditure differed significantly according to educational attainment, access to a family physician, receipt and type of high-cost medical treatment, type of primary caregiver, and smoking status. Participants receiving high-cost medical treatment had substantially higher OOP expenditure, whereas those with access to a family physician had lower mean OOP expenditure. The full bivariate results are presented in Table 4.

In the multivariable negative binomial regression model, several factors remained independently associated with outpatient healthcare utilization. Compared with participants aged 60 - 64 years, those aged ≥ 80 years had lower utilization (IRR = 0.784; P = 0.015), whereas the other age groups did not differ significantly. Rural residence was associated with higher utilization (IRR = 1.369; P = 0.001).

Table 2. Descriptive Statistics of Outpatient Healthcare Utilization and Out-of-Pocket Expenditures Among Older Adults by Provider Type (N = 700) [a]

Service Types	Public Sector		Private Sector		Other Providers		Total	
	Utilization	OOP Expenditure	Utilization	OOP Expenditure	Utilization	OOP Expenditure	Utilization	OOP Expenditure
General Practitioner Visits	6.98 (9.40)	3,561,310 (36, 461, 100)	0.33 (1.78)	536,000 (5, 225, 900)	0.10 (1.01)	0.00 (0.00)	7.41 (9.51)	4,097,310 (36, 843, 720)
Specialist Physician Visits	0.91 (3.60)	1,377,200 (7, 571, 620)	2.39 (5.68)	11,512,220 (51, 859, 960)	0.07 (0.75)	106,280 (1, 924, 850)	3.38 (6.41)	12,995,710 (52, 151, 490)
Subspecialist Physician Visits	0.99 (3.25)	1,869,020 (8, 628, 080)	1.87 (4.67)	13,247,140 (41, 906, 840)	0.05 (0.50)	908,000 (22, 690, 220)	2.91 (5.46)	16,024,170 (47, 901, 420)
Traditional Medicine Practitioners	0.01 (0.21)	25,710 (483, 690)	0.49 (2.64)	2,434,280 (12, 485, 870)	0.00 (0.00)	0.00 (0.00)	0.50 (2.65)	2,460,000 (12, 490, 210)
Visits to Licensed Allied Health Professionals	0.02 (0.34)	354,280 (9, 075, 750)	0.02 (0.45)	148,570 (3, 930, 830)	0.00 (0.00)	0.00 (0.00)	0.03 (0.57)	502,850 (9, 885, 100)
General Dentist Visits	0.14 (0.91)	1,825,710 (14, 950, 500)	0.68 (3.48)	23,894,280 (134, 258, 200)	0.00 (0.00)	0.00 (0.00)	0.82 (3.57)	25,720,000 (134, 764, 270)
Specialist Dentist Visits	0.09 (0.98)	4,085,710 (60, 631, 420)	0.71 (3.64)	116,200,000 (821, 025, 460)	0.00 (0.00)	0.00 (0.00)	0.80 (3.79)	120,285,710 (822, 741, 900)
Diagnostic Imaging Services	0.70 (2.36)	3,951,710 (36, 853, 830)	1.82 (3.75)	23,109,710 (75, 773, 250)	0.12 (1.07)	1,153,420 (12, 751, 400)	2.65 (4.38)	28,214,850 (84, 105, 760)
Physiotherapy Services	1.81 (11.09)	5,605,710 (37, 825, 340)	1.85 (10.05)	18,525,710 (113, 412, 800)	0.01 (0.15)	0.00 (0.00)	3.66 (16.08)	24,131,420 (120, 138, 040)
Diagnostic Laboratory Tests	1.32 (3.47)	1,592,570 (9, 808, 840)	2.54 (4.69)	12,882,050 (36, 136, 640)	0.05 (0.56)	9,140 (241, 890)	3.90 (5.38)	14,483,760 (36, 909, 140)
Medical Devices and Assistive Products	0.02 (0.30)	137,140 (2, 518, 830)	0.62 (2.31)	31,274,280 (155, 043, 940)	0.02 (0.45)	171,420 (4, 535, 570)	0.66 (2.38)	31,582,850 (155, 096, 150)
Other Outpatient Healthcare Services	0.73 (5.03)	2,951,140 (23, 813, 230)	1.49 (3.48)	22,746,000 (106, 950, 300)	0.03 (0.43)	297,140 (5, 148, 740)	2.25 (5.95)	25,994,280 (109, 005, 540)
Outpatient Surgical Procedures	0.03 (0.34)	1,045,710 (24, 320, 770)	0.07 (0.56)	7,628,570 (73, 852, 330)	0.01 (0.21)	228,570 (6, 047, 430)	0.11 (0.68)	8,902,850 (77, 860, 710)
Medications	4.27 (8.07)	15,209,140 (40, 499, 510)	6.94 (8.58)	45,578,280 (71, 607, 910)	0.01 (0.30)	0.00 (0.00)	11.23 (9.12)	60,787,420 (74, 401, 400)
Total Outpatient Healthcare Services	18.02 (23.32)	43,592,110 (110, 380, 190)	21.81 (23.08)	306,822,570 (893, 082, 330)	0.46 (2.19)	2,874,000 (28, 385, 120)	40.00 (35.00)	344,600,400 (900, 876, 350)

[a] Values are expressed as mean (SD). Monetary values are presented in Iranian rials. Utilization and expenditure values are annualized. The overall mean utilization of 40.00 service uses was rounded to the nearest whole service use. Abbreviations: SD, standard deviation; OOP, out-of-pocket.

Compared with 1-person households, utilization was lower among participants living in households of 2 persons (IRR = 0.776; P = 0.009), 3 persons (IRR = 0.795; P = 0.032), and 4 or more persons (IRR = 0.677; P = 0.001). Participants receiving family care or residing in a nursing home also had lower utilization (IRR = 0.675; P < 0.001).

Having a family physician was associated with higher outpatient healthcare utilization (IRR = 1.350; P = 0.009). Chronic disease (IRR = 1.683; P < 0.001) and receipt of high-cost medical treatment (IRR = 1.529; P = 0.001) were also associated with higher utilization. Compared with participants reporting low self-rated health, those reporting moderate (IRR = 0.782; P = 0.010) or high self-rated health (IRR = 0.664; P < 0.001) had lower utilization. Daily smoking was associated with lower utilization than never smoking (IRR = 0.784; P = 0.029). Supplementary health insurance, gender, employment status, previous occupation, and physical activity were not significantly associated with utilization in the adjusted negative binomial model (Table 5).

In the multiple linear regression model, fewer factors remained independently associated with OOP expenditure. Being the head of household was associated with lower OOP expenditure (coefficient = -162,000,000 rials; P = 0.033). Compared with participants with monthly household expenditure of 200 to < 250 million rials, those with monthly household expenditure in the 250 to < 300 million rial category (coefficient = 239,000,000 rials; P = 0.046) and the 300 to < 400 million rial category (coefficient = 251,000,000 rials; P = 0.039) had higher OOP expenditure.

Access to a family physician was independently associated with lower OOP expenditure (coefficient = -263,000,000 rials; P = 0.038). In contrast, chronic disease (coefficient = 204,000,000 rials; P = 0.027) and receipt of high-cost medical treatment (coefficient = 429,000,000 rials; P = 0.002) were associated with higher OOP expenditure. Occasional smoking was also associated with higher OOP expenditure than never smoking (coefficient = 847,000,000 rials; P = 0.009). Age, educational attainment,

living arrangement, and the remaining household expenditure categories were not significantly associated with OOP expenditure in the adjusted model (Table 6).

5. Discussion

This study examined outpatient healthcare utilization and OOP expenditure simultaneously among older adults in Fars Province, Iran.

Participants reported an average of approximately 40 outpatient service uses per year, rounded to the nearest whole service use, with medications and GP consultations accounting for the largest share of utilization. The frequent use of medications, laboratory tests, imaging, and physiotherapy may reflect the ongoing healthcare needs of older adults, particularly given the high prevalence of chronic disease. Previous studies have similarly shown that multimorbidity and chronic conditions are associated with greater healthcare utilization and expenditure among older populations (16-18).

Mean annual OOP expenditure was 344,600,400 rials, with substantial variation across services and provider types. Although overall utilization was relatively similar between public and private providers, OOP expenditure was markedly higher in the private sector. Across all participants, specialist dental care had the highest mean OOP expenditure, followed by medications, medical and assistive devices, and diagnostic imaging. These patterns may reflect differences in service prices, provider choice, and limitations in insurance coverage for selected outpatient services. However, because OOP expenditure was measured in absolute terms, higher payments do not necessarily indicate greater financial hardship.

Chronic disease was independently associated with both outcomes. Older adults with chronic disease had approximately 68% higher outpatient healthcare utilization and higher OOP expenditure after adjustment for other factors. This finding is consistent with previous evidence that chronic conditions and multimorbidity are associated with a greater need for repeated consultations, medications, diagnostic procedures, and other healthcare services among older adults (16-18). The simultaneous association with greater utilization and higher OOP expenditure indicates that chronic disease is associated with both greater healthcare use and higher direct healthcare payments among older adults.

High-cost medical treatment was another important factor associated with both healthcare utilization and OOP expenditure. Participants receiving high-cost treatment had approximately 53% higher outpatient healthcare utilization and substantially higher OOP expenditure than nonrecipients. Treatments such as expensive injectable medications, chemotherapy, dialysis, and long-term physiotherapy may require repeated healthcare contacts and may not be fully covered by insurance. These findings highlight the importance of evaluating the adequacy of insurance coverage for high-cost outpatient care and its potential role in limiting direct healthcare payments among older adults.

In the bivariate analysis, household expenditure was associated with healthcare utilization, whereas some household expenditure categories were associated with OOP expenditure in the adjusted linear regression model. Previous evidence indicates that socioeconomic factors are associated with healthcare utilization and direct healthcare expenditure among middle-aged and older adults (14, 19). Khoshshekan et al. also reported a positive association between household income and expenditure on medical equipment and supplies in Iran (20). Although their study focused on a specific expenditure category in the general household population, it provides complementary evidence on the relationship between economic resources and healthcare spending. Higher absolute OOP expenditure among households with higher monthly expenditures may reflect greater use of specialist, private, or partially covered services rather than greater financial hardship. Conversely, lower OOP expenditure among households with lower monthly expenditures may reflect lower utilization, greater reliance on public services, or unmet healthcare needs. These findings should be interpreted cautiously because the present study did not measure OOP expenditure relative to household resources.

Access to a family physician showed a noteworthy pattern. Having a family physician was associated with higher outpatient healthcare utilization but lower OOP expenditure. This pattern may reflect differences in healthcare-seeking behavior, continuity of primary care, referral pathways, or the types of services used by older adults with access to a family physician. Previous studies have highlighted the role of primary and integrated care in healthcare utilization among older adults with multimorbidity (16, 21). However, an alternative explanation is that individuals with better underlying health or less complex conditions may be more likely to rely on primary care and less likely to require costly specialist or private services, resulting in lower OOP expenditure. Therefore, the observed association should not be interpreted as evidence that access to a family physician reduces OOP expenditure. Given the cross-sectional design, we cannot rule out reverse causation or residual confounding by underlying health status and healthcare needs.

After adjustment, several demographic and household characteristics were associated with outpatient healthcare utilization. Rural residents had higher utilization, whereas utilization was lower among adults aged ≥ 80 years, those living in larger households, those receiving care from family members, and those residing in nursing homes. Lower utilization among the oldest adults does not necessarily reflect lower healthcare need, as mobility limitations, dependence on caregivers, or barriers to accessing outpatient care may contribute to this pattern. Similarly, lower utilization among those living in larger households or receiving care from family members may reflect differences in healthcare-seeking behavior, caregiving arrangements, or access to outpatient services. Rural residence was associated with higher healthcare utilization but not with higher OOP expenditure. This pattern may reflect differences in the types and costs of services used; however, because the present study did not directly assess reasons for provider choice or financial protection, these findings should be interpreted cautiously.

Smoking showed different associations across the two outcomes. Daily smoking was associated with lower outpatient healthcare utilization, whereas occasional smoking was associated with higher OOP expenditure. These findings should be interpreted cautiously because the number of participants in some smoking categories was small and the observed associations may reflect differences in underlying health status, healthcare-seeking behavior, or other unmeasured factors. Further studies are needed to clarify these relationships.

5.1. Strengths and Limitations

The relatively large, population-based sample and the inclusion of detailed demographic, socioeconomic, insurance-related, health, and behavioral characteristics allowed a comprehensive assessment of factors associated with both outcomes. Moreover, we assessed utilization and OOP expenditure across a broad range of outpatient services and separately for public, private, and other providers. Several limitations should be considered. First, the cross-sectional design precludes causal inference. Second, healthcare utilization and OOP expenditure were self-reported and may be subject to recall or reporting bias. Although a 3-month recall period was used to reduce recall error, annualizing these values by multiplying them by 4 assumes that the recall period was representative of the entire year and does not fully account for seasonal variation or infrequent high-cost events. This may have contributed to the substantial variability observed in OOP expenditure. Third, data were collected through telephone interviews. Although proxy respondents were used when older adults could not respond independently, proxy reporting may have introduced information bias, particularly for healthcare utilization and OOP expenditure. Fourth, substitution bias cannot be completely excluded because deceased individuals were replaced with other eligible individuals, and information on the characteristics of the individuals who were replaced was unavailable for comparison. Finally, information on disease severity, cognitive status, health literacy, caregiving, distance to healthcare facilities, and detailed insurance benefits was unavailable. OOP expenditure was measured in absolute terms, and catastrophic health expenditure was not assessed; therefore, higher OOP expenditure does not necessarily indicate greater financial hardship. The study was conducted in Fars Province, which may limit the generalizability of the findings to other regions of Iran.

5.2. Conclusions

This study identified demographic, socioeconomic, and health-related factors associated with outpatient healthcare utilization and OOP expenditure among older adults in Fars Province. The findings underscore the importance of aligning health policies with older adults' healthcare needs and economic circumstances. Policy priorities should include strengthening primary care and continuity of care for older adults with chronic conditions, improving the effective use of family physician services, and evaluating the adequacy of insurance coverage for high-cost outpatient care. Particular attention should also be given to older adults with greater healthcare needs and higher direct payments. These findings may support more targeted policies to improve access to appropriate outpatient care and reduce reliance on OOP payments among older populations.

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Footnotes

AI Use Disclosure: ChatGPT was used for text editing in the introduction section at a Moderate level.

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Analysis and Interpretation: F. Z., Z. K., and M. B.; Manuscript Drafting: F. Z., F. L., and Z. K.; Critical Revision for Important Intellectual Content: Z. K., Z. G., and M. B.; Statistical Analysis: F. Z. and M. B.; Administrative, Technical, and Material Support: Z. K., Z. G., and M. B.; Study Supervision: F. L. and M. B.

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Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

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Informed Consent: Before each interview, participants were informed about the study objectives, the voluntary nature of participation, the confidentiality of their information, and their right to withdraw at any time. Informed consent was obtained before data collection. Personal identifiers were used only for sampling and data collection and were removed from the analytical dataset. Study data were stored securely and were accessible only to the research team.

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Table 1. Sociodemographic, Health, Behavioral, and Economic Characteristics of the Study Participants (N = 700)

Variables	Frequency	Percentage
Demographic characteristics		
Age (y)		
60 - 64	306	43.71
65 - 69	39	5.57
70 - 74	120	17.14
75 - 79	99	14.14
≥ 80	136	19.43
Gender		
Male	356	50.86
Female	344	49.14
Marital Status		
Single	14	2.00
Married	498	71.14
Widowed	188	26.86
Place of Residence		
Urban	612	87.43
Rural	88	12.57
Education Level		
Illiterate	163	23.29
Primary Education	223	31.86
Below High School Diploma	74	10.57
High School Diploma	145	20.71
University Education	95	13.57
Employment Status		
Retired	322	46.00
Unemployed	310	44.29
Employed	68	9.71
Previous Occupation		
Government Employee	176	25.14
Private-sector Employee/Worker	83	11.86
Self-employed	147	21.00
Others	294	42.00
Household Size (person)		
1	90	12.86
2	280	40.00
3	178	25.43
≥ 4	152	21.71
Head of Household		
Yes	484	69.14
No	216	30.86
Living Arrangement (Living under family care or residing in a nursing home)		
Yes	85	12.14
No	615	87.86
Economic characteristics		
Health Insurance Coverage		
Yes	684	97.71
No	16	2.29
Supplementary Health Insurance		
Yes	452	64.57

Variables	Frequency	Percentage
No	248	35.43
Total Monthly Household Expenditure (million rials)		
< 100	79	11.29
100 to < 150	76	10.86
150 to < 200	118	16.86
200 to < 250	144	20.57
250 to < 300	105	15.00
300 to < 400	102	14.57
400 to < 500	54	7.71
≥500	22	3.14
Health characteristics		
Having a Family Physician		
Yes	645	92.14
No	55	7.86
Use of Family Physician Services		
Yes	586	83.71
No	114	16.29
Presence of Chronic Disease		
Yes	577	82.43
No	123	17.57
Self-rated General Health (0 = Worst, 10 = Best)		
Low, score 1 - 3	87	12.43
Moderate, score 4 - 7	407	58.14
High, score 8 - 10	206	29.43
Independence in Activities of Daily Living		
Completely Independent	571	81.57
Needs Partial Assistance	76	10.86
Needs Complete Assistance	53	7.57
Receiving High-Cost Medical Treatment		
Yes	43	6.14
No	657	93.86
Type of High-Cost Medical Treatment (among participants receiving high-cost treatment, n = 43)		
Dialysis	4	9.30
Chemotherapy	7	16.27
Long-term Physiotherapy	11	25.60
High-Cost Injectable Medications	21	48.83
Social characteristics		
Coverage by Social Support Organizations		
Yes	111	15.86
No	589	84.14
Having a Primary Caregiver		
Yes	159	22.70
No	541	77.30
Primary Caregiver (among participants with a caregiver, n = 159)		
Family Member	146	91.82
Professional Caregiver (Nurse)	13	8.18
Behavioral characteristics		
Smoking Status		
Daily User	60	8.57
Occasional User	22	3.14
Former User	12	1.71
Never Used	606	86.57

Variables	Frequency	Percentage
Waterpipe Smoking Status		
Daily User	23	3.29
Occasional User	37	5.29
Former User	5	0.71
Never Used	635	90.71
Alcohol Consumption Status		
Daily Drinker	2	0.29
Occasional Drinker	4	0.57
Former Drinker	2	0.29
Never Drank	692	98.86
Weekly Physical Activity Level		
Low	454	64.86
Moderate	133	19.00
High	113	16.14

Table 3. Association Between Participant Characteristics and Total Outpatient Healthcare Utilization Among Older Adults (N = 700) [a]

Characteristics	Mean Utilization (annual service uses)	SD (annual service uses)	P value
Age (y)			0.0291
60 - 64	37.37	30.92	
65 - 69	47.59	29.58	
70 - 74	46.80	43.13	
75 - 79	41.01	31.17	
≥ 80	35.09	38.81	
Gender			0.0070
Male	36.12	34.53	
Female	43.26	35.24	
Marital Status			0.6734
Single	33.71	26.24	
Married	39.09	35.13	
Widowed	41.49	35.41	
Place of Residence			0.0010
Urban	37.98	31.84	
Rural	51.09	50.89	
Education Level			0.3415
Illiterate	42.65	37.32	
Primary Education	36.79	35.81	
Below High School Diploma	44.81	38.14	
High School Diploma	38.37	29.11	
University Education	38.99	34.83	
Employment Status			0.0423
Retired	40.09	38.15	
Unemployed	41.34	33.56	
Employed	29.65	22.91	
Previous Occupation			0.1006
Government Employee	42.73	41.58	
Private-sector Employee/Worker	38.27	31.20	
Self-employed	33.66	31.18	
Others	41.14	33.36	
Household Size (person)			0.0652
1	45.38	44.81	
2	38.90	29.60	
3	42.42	42.76	
≥ 4	34.29	26.05	
Head of Household			0.7373
Yes	39.93	35.78	
No	38.96	33.39	
Living Arrangement (Living under family care or residing in a nursing home)			0.0012
Yes	28.14	20.51	
No	41.22	36.32	
Health Insurance Coverage			0.4617
Yes	39.78	35.04	
No	33.25	35.38	
Supplementary Health Insurance			0.0120
Yes	42.09	37.41	
No	35.15	29.78	
Total Monthly Household Expenditure (million rials)			0.0037

Characteristics	Mean Utilization (annual service uses)	SD (annual service uses)	P value
< 100	25.42	22.44	
100 to < 150	31.79	25.31	
150 to < 200	40.27	47.14	
200 to < 250	43.47	34.88	
250 to < 300	46.21	35.03	
300 to < 400	43.37	33.03	
400 to < 500	37.85	29.77	
≥ 500	44.73	32.67	
Having a Family Physician			0.0386
Yes	40.43	35.43	
No	30.25	28.70	
Use of Family Physician Services			0.0012
Yes	41.52	35.80	
No	29.89	29.07	
Presence of Chronic Disease			P < 0.001
Yes	43.68	36.49	
No	20.61	17.52	
Self-rated General Health (0 = Worst, 10 = Best)			P < 0.001
Low, score 1 - 3	53.24	54.17	
Moderate, score 4 - 7	42.39	33.47	
High, score 8 - 10	28.43	22.71	
Independence in Activities of Daily Living			0.1857
Completely Independent	38.79	32.46	
Needs Partial Assistance	40.11	35.77	
Needs Complete Assistance	48.00	55.01	
Receiving High-Cost Medical Treatment			P < 0.001
Yes	68.37	62.03	
No	37.75	31.69	
Type of High-Cost Medical Treatment			P < 0.001
Dialysis	32.00	6.93	
Chemotherapy	70.00	51.58	
Long-term Physiotherapy	101.82	100.48	
High-Cost Injectable Medications	60.76	34.21	
Having a Primary Caregiver			0.0903
Yes	43.87	41.72	
No	38.44	32.87	
Primary Caregiver			0.9089
Family Member	44.42	43.75	
Professional Caregiver (Nurse)	45.85	30.75	
Smoking Status			0.0557
Daily User	29.00	27.81	
Occasional User	49.27	35.76	
Former User	36.67	28.79	
Never Used	40.39	35.61	
Waterpipe Smoking Status			0.8364
Daily User	33.04	23.33	
Occasional User	39.35	33.09	
Former User	38.40	2.84	
Never Used	39.89	35.63	
Alcohol Consumption Status			0.4732
Daily Drinker	64	33.94	
Occasional Drinker	18	5.16	

Characteristics	Mean Utilization (annual service uses)	SD (annual service uses)	P value
Former Drinker	36	16.97	
Never Drank	39.69	35.14	
Weekly Physical Activity Level			0.1120
Low	41.08	37.18	
Moderate	33.92	28.97	
High	40.50	32.13	

[a] Abbreviation: SD, standard deviation.

Table 4. Association Between Participant Characteristics and Total Out-of-Pocket Expenditures for Outpatient Healthcare Among Older Adults (N = 700) [a]

Variables	Mean OOP Expenditure	SD	P value
Age (y)			0.1350
60 - 64	445,761,701.9	1,250,425,068.8	
65 - 69	275,183,591.0	287,238,474.9	
70 - 74	281,988,334.6	362,345,638.9	
75 - 79	235,862,223.6	252,408,783.6	
≥ 80	271,294,677.6	665,066,907.9	
Gender			0.4295
Male	318,132,473.3	851,426,050.5	
Female	371,991,618.5	949,814,813.1	
Marital Status			0.6442
Single	99,400,000.7	104,405,410.7	
Married	352,422,170.2	973,734,381.8	
Widowed	342,140,619.6	712,918,521.3	
Place of Residence			0.4944
Urban	353,430,583.6	953,658,126.8	
Rural	283,190,456.0	359,296,605.1	
Education Level			0.0341
Illiterate	253,169,081.2	314,767,003.6	
Primary Education	258,351,375.2	555,936,687.9	
Below High School Diploma	377,552,434.2	712,505,227.8	
High School Diploma	532,304,828.7	1,615,591,216.1	
University Education	391,771,369.3	807,471,854.2	
Employment Status			0.5380
Retired	365,764,100.7	1,127,510,084.5	
Unemployed	305,834,312.1	550,070,461.8	
Employed	421,111,766.3	982,746,583.4	
Previous Occupation			0.5074
Government Employee	431,255,228.5	1,286,732,602.4	
Private-sector Employee/Worker	308,628,435.2	593,076,386.7	
Self-employed	378,135,239.9	1,166,714,026.7	
Others	286,113,322.0	402,076,576.3	
Household Size (person)			0.4944
1	496,084,004.1	1,411,680,194.3	
2	354,554,558.6	1,000,526,481.8	
3	288,424,496.0	526,951,443.2	
≥ 4	302,354,475.1	622,755,513.6	
Head of Household			0.0615
Yes	302,076,613.6	641,307,977.7	
No	439,885,167.9	1,304,394,330.4	
Living Arrangement (Living under family care or residing in a nursing home)			0.1120
Yes	199,031,530.0	295,294,622.0	
No	364,719,670.3	953,237,526.7	
Health Insurance Coverage			0.4547
Yes	348,496,779.6	910,389,679.0	
No	178,030,001.3	225,395,562.9	
Supplementary Health Insurance			0.9410
Yes	342,732,824.9	887,705,323.9	
No	348,004,195.2	926,207,181.6	

Variables	Mean OOP Expenditure	SD	P value
Total Monthly Household Expenditure (million rials)			0.1270
< 100	197,821,776.8	359,817,578.1	
100 to < 150	278,643,685.4	658,218,968.9	
150 to < 200	232,153,899.2	310,488,391.1	
200 to < 250	275,440,557.6	369,898,563.6	
250 to < 300	498,734,858.7	1,366,723,120.8	
300 to < 400	523,579,177.9	1,565,596,047.9	
400 to < 500	362,522,222.8	669,961,819.0	
≥ 500	545,881,820.9	909,146,066.7	
Having a Family Physician			0.0082
Yes	318,366,197.1	765,565,558.8	
No	652,256,002.5	1846,924,519.5	
Use of Family Physician Services			0.1275
Yes	321,706,001.7	788,841,090.1	
No	462,285,616.4	1,334,958,895.3	
Presence of Chronic Disease			0.0897
Yes	371,283,392.0	955,530,315.1	
No	219,428,944.0	565,723,119.6	
Self-rated General Health (0 = Worst, 10 = Best)			0.3469
Low, score 1 - 3	458,077,197.0	1,578,725,772.7	
Moderate, score 4 - 7	346,171,107.7	805,042,573.9	
High, score 8 - 10	293,572,428.6	655,800,498.5	
Independence in Activities of Daily Living			0.7434
Completely Independent	344,725,395.8	937,666,071.0	
Needs Partial Assistance	395,110,002.5	884,681,845.1	
Needs Complete Assistance	270,824,831.5	365,773,023.1	
Receiving High-Cost Medical Treatment			0.0016
Yes	764,713,498.6	2,220,696,258.0	
No	317,104,409.2	732,607,797.6	
Type of High-Cost Medical Treatment			0.0007
Dialysis	165,066,666.7	105,852,979.8	
Chemotherapy	179,866,726.7	253,122,763.3	
Long-term Physiotherapy	629,854,547.3	553,243,562.6	
High-Cost Injectable Medications	1,155,232,383.8	3,131,972,236.5	
Coverage by Social Support Organizations			0.2200
Yes	248,336,220.2	358,813,234.4	
No	362,741,862.2	968,824,008.9	
Having a Primary Caregiver			0.9120
Yes	337,476,838.0	675,031,129.2	
No	346,592,908.7	957,715,007.1	
Primary Caregiver			0.0051
Family Member	303,003,071.9	425,773,296.5	
Professional Caregiver (Nurse)	852,209,230.8	1,885,244,695.6	
Smoking Status			0.0006
Daily User	239,684,001.5	607,309,113.4	
Occasional User	442,872,728.2	932,296,304.2	
Former User	1,386,410,001.7	4,172,324,183.6	
Never Used	330,790,622.3	729,287,834.8	
Waterpipe Smoking Status			0.7470
Daily User	169,956,523.0	306,936,948.8	
Occasional User	299,242,170.8	454,101,510.7	
Former User	170,640,010.0	86,980,728.4	

Variables	Mean OOP Expenditure	SD	P value
Never Used	354,938,766.7	937,115,820.5	
Alcohol Consumption Status			0.9157
Daily Drinker	549,120,000.0	250,485,506.2	
Occasional Drinker	93,000,005.0	57,719,790.6	
Former Drinker	144,000,000.0	186,676,190.2	
Never Drank	346,043,406.4	905,655,798.4	
Weekly Physical Activity Level			0.4532
Low	319,616,557.1	755,224,473.8	
Moderate	349,979,550.3	717,662,519.0	
High	438,646,727.1	1,462,771,249.0	

[a] Monetary values are presented in Iranian rials. Abbreviations: SD, standard deviation; OOP, out-of-pocket.

Table 5. Multivariable Negative Binomial Regression Analysis of Factors Associated with Outpatient Healthcare Utilization Among Older Adults [a]

Variables	Coefficient	IRR	95% CI	P value
Age (y)				
60 - 64	Ref.			
65 - 69	0.003	1.003	(0.760, 1.324)	0.981
70 - 74	0.032	1.032	(0.861, 1.236)	0.732
75 - 79	-0.080	0.923	(0.765, 1.113)	0.403
≥ 80	-0.242	0.784	(0.646, 0.953)	0.015
Gender				
Male	Ref.			
Female	0.105	1.110	(0.919, 1.341)	0.278
Place of Residence				
Urban	Ref.			
Rural	0.314	1.369	(1.135, 1.651)	0.001
Employment Status				
Retired	Ref.			
Unemployed	0.082	1.084	(0.833, 1.413)	0.545
Employed	-0.119	0.887	(0.705, 1.118)	0.312
Previous Occupation				
Others	Ref.			
Government Employee	0.152	1.164	(0.897,1.512)	0.253
Private-sector Employee/Worker	0.207	1.230	(0.925, 1.636)	0.154
Self-employed	0.126	1.134	(0.874, 1.473)	0.343
Household Size (person)				
1	Ref.			
2	-0.252	0.776	(0.642, 0.940)	0.009
3	-0.229	0.795	(0.645, 0.980)	0.032
≥ 4	-0.389	0.677	(0.541, 0.849)	0.001
Living Arrangement (Living under family care or residing in a nursing home)				
No	Ref.			
Yes	-0.392	0.675	(0.553, 0.826)	P < 0.001
Supplementary Health Insurance				
No	Ref.			
Yes	-0.017	0.983	(0.852, 1.135)	0.820
Having a Family Physician				
No	Ref.			
Yes	0.300	1.350	(1.076, 1.694)	0.009
Presence of Chronic Disease				
No	Ref.			
Yes	0.521	1.683	(1.405, 2.017)	P < 0.001
Self-rated General Health (0 = Worst, 10 = Best)				
Low, score 1 - 3	Ref.			
Moderate, score 4 - 7	-0.246	0.782	(0.649, 0.943)	0.010
High, score 8 - 10	-0.409	0.664	(0.531, 0.832)	P < 0.001
Receiving High-Cost Medical Treatment				
No	Ref.			
Yes	0.425	1.529	(1.191, 1.964)	0.001
Smoking Status				
Never Used	Ref.			
Daily User	-0.242	0.784	(0.631, 0.976)	0.029
Occasional User	0.253	1.288	(0.912, 1.819)	0.150

Variables	Coefficient	IRR	95% CI	P value
Former User	-0.365	0.693	(0.439, 1.097)	0.118
Weekly Physical Activity Level				
Low	Ref.			
Moderate	-0.041	0.960	(0.816, 1.130)	0.625
High	0.030	1.030	(0.864, 1.228)	0.741

[a] Abbreviations: IRR, incidence rate ratio; CI, confidence interval; Ref., reference category.

Table 6. Multivariable Linear Regression Analysis of Factors Associated with Out-of-Pocket Expenditure for Outpatient Healthcare Among Older Adults (N = 700) [a]

Variables	Coefficient (Iranian rials)	P value
Age (y)		
60 - 64	Ref.	
65 - 69	-176,000,000	0.252
70 - 74	-94,534,730	0.350
75 - 79	-192,000,000	0.076
≥ 80	-108,000,000	0.321
Education Level		
Illiterate	Ref.	
Primary Education	-51,151,130	0.590
Below High School Diploma	-8,126,979	0.952
High School Diploma	173,000,000	0.129
University Education	15,444,990	0.905
Head of Household		
No	Ref.	
Yes	-162,000,000	0.033
Living Arrangement (Living under family care or residing in a nursing home)		
No	Ref.	
Yes	-162,000,000	0.168
Total Monthly Household Expenditure (million rials)		
200 to < 250	Ref.	
< 100	-47,594,920	0.716
100 to < 150	122,000,000	0.353
150 to < 200	18,485,850	0.867
250 to < 300	239,000,000	0.046
300 to < 400	251,000,000	0.039
400 to < 500	61,436,110	0.679
≥ 500	169,000,000	0.431
Having a Family Physician		
No	Ref.	
Yes	-263,000,000	0.038
Presence of Chronic Disease		
No	Ref.	
Yes	204,000,000	0.027
Receiving High-Cost Medical Treatment		
No	Ref.	
Yes	429,000,000	0.002
Smoking Status		
Never Used	Ref.	
Daily User	-192,000,000	0.387
Occasional User	847,000,000	0.009
Former User	141,000,000	0.468

[a] Abbreviation: Ref., reference category.