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Social Determinants of Out-of-Pocket Health Expenditures for the Older Adults in Turkey: An Econometric Analysis Using TURKSTAT 2023 Data

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Abstract

The rise in the older-aged population due to the demographic transition increases healthcare needs, creating a substantial Out-of-Pocket expenditure burden that is structurally determined not just by medical necessity but also by critical social and socioeconomic factors. This study aimed to analyze the social and socioeconomic determinants affecting the decision to make out-of-pocket (OOP) health expenditures and the expenditure amount among older adults individuals aged 65 and over in Turkey, utilizing the Turkish Statistical Institute 2023 Household Budget Survey data. Due to the high rate of zero expenditure observations, a two-stage econometric model strategy was adopted, employing Logistic Regression to examine the expenditure decision and Linear Regression to examine the positive expenditure amount. The analysis revealed that core disability statuses (working disability: OR=1,959) and health insurance ownership (OR=2,777) strongly increase the probability of making an expenditure. This is consistent with descriptive findings showing that expenditure tendency increases as income and education levels rise. However, a paradoxical situation was detected: while the probability of making OOP expenditure decreases for lower socioeconomic groups (low-income, low-education), the amount they spend increases once they decide to make an expenditure (low-income: B=0,092; low-education: B=0,042). The largest share of the expenditure burden stems from items where SGK/GSS coverage is insufficient, such as dental care, inpatient treatment, and pharmaceuticals, indicating that financial inequalities structurally shape OOP behavior. Consequently, it is recommended that the scope of SGK/GSS be expanded in high-burden areas and that the costs of preventive services be completely zeroed out to protect low-income older adults and prevent delayed care.

Keywords:

Out-of-Pocket Expenditure • Older Adults • Social Determinants of Health • Two-Stage Model • Turkey

Türkiye'de Yaşlı Bireylerin Cepten Sağlık Harcamalarının Sosyal Belirleyicileri: TÜİK 2023 Verileri Üzerine Ekonometrik Bir Analiz

Özet

Demografik geçişe bağlı olarak yaşlı nüfusun artması, sağlık hizmeti ihtiyaçlarını yükseltmekte ve yapısal olarak sadece tıbbi gereklilikle değil, aynı zamanda kritik sosyal ve sosyoekonomik faktörlerle de belirlenen önemli bir cepten sağlık harcaması yükü oluşturmaktadır. Bu çalışma, Türkiye'de 65 yaş ve üzeri bireylerin cepten sağlık harcaması yapma kararlarını ve harcama tutarlarını etkileyen sosyal ve sosyoekonomik belirleyicileri analiz etmeyi amaçlamaktadır. Araştırmada, Türkiye İstatistik Kurumu (TÜİK) 2023 Hanehalkı Bütçe Anketi (HBA) verileri kullanılmıştır. Verilerdeki yüksek sıfır harcama oranı nedeniyle, harcama kararını incelemek üzere Lojistik Regresyon ve pozitif harcama tutarını incelemek üzere Lineer Regresyon kullanılan iki aşamalı ekonometrik bir model stratejisi benimsenmiştir. Analiz, gelir ve eğitim düzeyi arttıkça harcama yapma eğiliminin yükseldiğini gösteren tanımlayıcı bulgularla tutarlı olarak, temel engellilik durumlarının (çalışma engeli: OR=1,959) ve sağlık sigortası (SGK/GSS) sahipliğinin (OR=2,777) harcama yapma olasılığını güçlü bir şekilde artırdığını ortaya koymuştur. Ancak, düşük sosyoekonomik grupların (düşük gelirli, düşük eğitimli) cepten harcama yapma olasılığı azalırken, harcama yapmaya karar verdiklerinde miktarın arttığı (düşük gelirli: B=0,092; düşük eğitimli: B=0,042) paradoksal bir durum tespit edilmiştir. Harcama tutarındaki en büyük yükün diş tedavisi, yatarak tedavi ve ilaçlar gibi SGK/GSS kapsamının yetersiz olduğu kalemlerden kaynaklanması, finansal eşitsizliklerin cepten harcama davranışını yapısal olarak şekillendirdiğini göstermektedir. Sonuç olarak, düşük gelirli yaşlı bireyleri korumak ve ertelenmiş bakımı önlemek amacıyla, SGK/GSS kapsamının yüksek yük oluşturan alanlarda genişletilmesi ve önleyici hizmetlerin maliyetlerinin tamamen sıfırlanması önerilmektedir.

Anahtar Kelimeler:

Cepten Sağlık Harcamaları • yaşlı bireyler • sosyal belirleyiciler • iki aşamalı model • Türkiye

Background

The onset of the 21st century marks a significant demographic transition, characterized by declining mortality rates and rising life expectancy, reshaping global economic structures and healthcare systems (Szűcs, 2024). The increase in the older population boosts this group's need for healthcare services and increases health expenditures associated with prevalent chronic diseases. This frequently translates into a considerable financial burden, largely borne through out-of-pocket (OOP) payments (Chowdhury & Goli, 2025; Rahman et al., 2025; Rezaei et al., 2024). International empirical studies consistently show that households composed solely of older adults face higher average OOP spending compared to other household types (Aregbeshola & Khan, 2024; Faraji et al., 2024; Prada & Pizarro, 2024).

When analyzing the determinants of OOP health expenditures, it is evident that the impact stems not only from medical necessity (like chronic conditions) but also from a broad spectrum of socioeconomic and social factors (Meulman et al., 2025; Mohsin et al., 2024). For instance, studies in the Netherlands have suggested that the difference in healthcare expenditure between low- and high-income groups is driven more by the unequal distribution of social determinants than by the prevalence of chronic diseases (Meulman et al., 2025). This highlights that healthcare spending behavior is structurally determined by social and economic conditions. The literature emphasizes that demographic and socioeconomic factors such as age, gender, education level, health insurance status, and place of residence are key social determinants of OOP expenditures. For example, the typical profile of a household experiencing catastrophic health expenditure (CHE) in Portugal has been identified as poor older adults living alone (Quintal & Lopes, 2021).

Within this framework, OOP health expenditures incurred by older adults are considered not merely a consequence of the medical burden of illness, but also a reflection of the conditions in which people are born, grow, live, work, and age, as defined by the World Health Organization. These social determinants include life-enhancing resources such as socioeconomic status, education, physical environment, healthcare access, gender, and disability.

In this study, these multi-dimensional determinants are theoretically conceptualized within the framework of Andersen's Behavioral Model of Health Services Use. The model posits that healthcare utilization and associated financial behaviors result from the dynamic interaction of three factor groups: "predisposing factors" (such as age, gender, and education) representing the individual's social position; "enabling factors" (such as income, health insurance ownership, and ease of transportation) that facilitate or constrain access to services; and "need factors" (such as disability and chronic illness) representing the perceived or evaluated health status (Andersen, 1995). In the older population, OOP health expenditure behavior is recognized not merely as a medical necessity but as a structural reflection of these three factor groups on financial decisions. This model

provides a robust analytical foundation for explaining why lower socioeconomic groups delay their demand for healthcare services or encounter higher costs under constrained resources (Heider et al., 2014). Turkey presents a crucial case study for examining these determinants, owing to its rapidly aging population and unique socio-cultural structure, which combines traditional family support systems with modernizing social policies. The literature underscores the importance of econometric approaches, such as Double-Hurdle models (which simultaneously examine the older individuals' decision to incur expenditure and the expenditure amount) (Quintal & Lopes 2021, Gheshlaghi et al., 2024; Osmani & Okunade, 2021) or two-stage econometric models like logistic/probit regression (which examine the expenditure decision) (Meulman et al., 2025; Zewotir et al., 2014), for analyzing OOP expenditure behavior.

Objective

The aim of this study is to analyze the factors influencing the incidence and amount of OOP health expenditures among older adults in Turkey, not solely through basic demographic data but also through a multi-dimensional integration of social determinants. This comprehensive analysis seeks to identify the financial barriers faced by the older population in Turkey, thereby providing an evidence-based foundation for the development of targeted social and health policies.

Methods

Data Source

The data employed in this study were obtained from the micro dataset of the Household Budget Survey (HBS), which was conducted by the Turkish Statistical Institute (TURKSTAT) in 2023. The HBS constitutes a nationally representative survey series that furnishes comprehensive information regarding the socioeconomic status, living standards, consumption patterns, and income structures of individuals and households in Turkey. The HBS is designed to represent the population residing within the borders of the Republic of Turkey, and the data collection utilized a stratified two-stage cluster sampling technique.

Due to the use of anonymized secondary data from TURKSTAT's HBS, the study was deemed exempt from mandatory seeking of direct ethics committee approval. Participant consent was obtained by TURKSTAT during the initial data collection.

Study Population and Sample

The main population of the study consists of older adults aged 65 and over, included in the 2023 HBS data. The analysis focused on individuals in this age group, examining their status of making OOP health expenditures and the amount of these expenditures. The weighted total number of individuals included in the analysis is 8,570,899. Sample weights were utilized in the econometric models to ensure the ability to represent the Turkish population.

Variables and Measurement

In this study, two main dependent variables and independent variables, consisting of multi-dimensional social

determinants influencing this behavior, were used to examine the OOP health expenditure behavior of older individuals.

Dependent Variables:

1. Out-of-Pocket Health Expenditure Status: This was defined as a binary variable identifying households incurring OOP health expenditures (0: Did Not Spend, 1: Did Spend). OOP health expenditure encompasses the total healthcare costs paid directly out of pocket by individuals and households (including pharmaceuticals, dental care, inpatient/ outpatient treatment, auxiliary products, etc.).

2. Out-of-Pocket Health Expenditure Amount: This variable utilized the natural logarithm of the expenditure amount (ln(OOP)) made by individuals incurring OOP health expenditure (those with positive expenditure). The logarithmic transformation helps satisfy model assumptions by reducing the skewness in the expenditure data.

Independent Variables:

The independent variables incorporate multi-dimensional determinants such as demographic characteristics, socioeconomic status (SES), housing, and lifestyle/consumption habits.

Socio-demographic and Socioeconomic Factors: Variables included were Gender, Age, Educational attainment, Income level, Marital status, Number of older individuals within the household, Health Insurance coverage and Social Security status.

Lifestyle and Consumption Habits: This category utilized binary variables or relative shares of expenditures related to sports, culture, smoking, and alcohol consumption/expenditures within the household budget.

Structural and Health Status: Variables modeled include Housing characteristics (e.g., ownership, type, area), Ease of access to public transportation, Employment status, and Disability status (specifically, metrics for Working disability and Daily activity disability).

Statistical Analysis

Since OOP health expenditure data exhibits a high proportion of zero observations, a two-stage econometric strategy was adopted to analyze the older adults' decision to incur expenditure and the corresponding expenditure amount simultaneously. A two-stage model involving independent Logistic and Linear regressions was preferred over Heckman or Double-Hurdle approaches due to independently examine the distinct social drivers of healthcare entry versus expenditure volume. This strategy provides a more transparent decomposition of how determinants like insurance and income affect the "access decision" differently from the "spending intensity", which is crucial for public health policy interpretation.

1. Probability of Making OOP Expenditure (First Stage): Logistic Regression analysis was employed to model the binary outcome of the individual's decision to either incur or not incur OOP health expenditure. The model results are reported in terms of Odds Ratios (OR).

2. OOP Expenditure Amount (Second Stage): Linear Regression analysis was

used to model the expenditure amount exclusively for older individuals who incurred expenditure (i.e., those with a positive expenditure amount). This model utilized the natural logarithm of the expenditure amount (ln(OOP)) as the dependent variable. The model results, illustrating the impact of the independent variables on the expenditure amount, are reported in terms of B coefficients.

All statistical analysis and econometric modeling were conducted using IBM SPSS Statistics software (Version 26.0; IBM Corp., Armonk, New York, USA). Statistical significance for the results was accepted at the $p<0.05$ level.

Results

The analysis of demographic and socioeconomic characteristics (Table 1) reveals that the largest group is the 65–74 age cohort (66.1%) and women (55.6%). A positive correlation with socioeconomic status was observed: the highest income quintile and university graduates recorded the highest OOP expenditure incidence (62.1% and 56.4, respectively) and the highest average amounts (2,622.87 TRY and 1,895.87 TRY). Conversely, the lowest income quintile showed the lowest incidence (40.4%). Incidence was highest among the ≥ 85 age group (56.8%) and those reporting a working disability (60.9%). Household structure significantly impacts incidence, with households containing three or more older adults showing the highest rate (69.80%), while single-person households had the lowest incidence (35.9%) and the lowest average expenditure (508.36 TRY).

Table 2 highlights a significant disparity regarding health insurance: while 49.1% of the insured population (SGK/GSS) incur OOP expenses, uninsured individuals, despite a low incidence (16.5%), report a demonstrably higher average OOP amount (2,825.24 TRY) compared to the insured (1,101.29 TRY). Examining financial status, individuals without retirement income pay a higher average amount (1,211.47 TRY) when they do incur costs. Regarding living conditions, those not paying rent (59.1%) and those owning two or more vehicles (60.7% incidence, 2,130.86 TRY average) show the highest expenditure propensity. Conversely, detached house residents show a lower incidence (43.0%). Finally, the presence of an alcohol habit (62.1%) or a sports habit (67.8%) significantly correlates with a higher incidence of OOP health expenditure.

Tables 3a and 3b detail consumption expenditures, highlighting that food consumption (4,892.08 TRY) and energy consumption (1,009.80 TRY) are the highest mandatory expenses, while discretionary items like sports (14.51 TRY) and cultural (57.02 TRY) consumption remain notably low. The analysis of relative share (Table 3b) indicates a strong correlation between discretionary spending capacity and the propensity for OOP health expenditures. Specifically, individuals allocating a medium share to sports expenditure registered the highest OOP incidence at an extraordinary 83.2%. Similarly, a medium share of cultural expenditure resulted in a 62.0% incidence. In contrast, those with the highest proportional share of the mandatory

energy expenditure showed a 57.1% OOP incidence.

Table 4 details the distribution of OOP health expenditures in 2023. The overall mean amount of total OOP health expenditure is 541.78 TRY, representing an average of 2.4% of the total household budget, or 3.44% when excluding food. For individuals who actually incurred these costs (conditional spending), the mean expenditure amount rises to 1,117.56 TRY. The three largest components of the total OOP expenditure are, in descending order: Other outpatient oral and dental treatment services (mean 134.96TRY), Inpatient curative and rehabilitative services (mean 98.02 TRY), and pharmaceuticals, vaccines, and other medical preparations (mean 82.72 TRY).

In Table 5, the Advanced Logistic Regression Model (Model 2, Nagelkerke R2: 17.10%) identifies factors influencing the probability of older individuals making OOP health expenditures. The strongest factors increasing this probability are Health Insurance (SGK/GSS) (OR=2.777), followed by having a Working disability (OR=1.959) and a low share of Energy expenditure (OR=1.697). Other factors increasing the probability include smaller housing areas, being employed, and having easy access to public transport. Conversely, the strongest factors reducing the probability of OOP expenditure are no sports expenditure (OR=0.460), no old age allowance (OR=0.674), no cultural expenditure (OR=0.679), and living in a nuclear household (OR=0.711). Other reducing factors include no car ownership, living in a detached house, and being a homeowner.

In Table 6, the Linear Regression analysis (Adjusted R2 of 34.6%) examines factors influencing the amount of OOP health expenditure for older individuals who reported positive spending. The strongest factors increasing the expenditure amount are Nuclear household type (B=0.115), Low Income (B=0.092), being a household with only 1 older person (B=0.092), and having a Working disability (B=0.091). Other positive determinants include having no car ownership and being covered by health insurance (SGK, GSS). Conversely, the strongest factors reducing the expenditure amount are the presence of a Daily activity limitation/disability (B=-0.142), a low share of Energy expenditure (B=-0.123), and having No retirement pension (B=-0.100). Easier access to health services and smaller housing areas also reduce the amount spent.

Table 1. Demographic and Socioeconomic Characteristics of Older Adults

			Out-of-Pocket (OOP) Health Expenditure Status		Out-of-Pocket (OOP) Health Expenditure Amount (TRY)*	
	Frequency	Percent	Frequency	Percent	Mean	SD
Gender						
Male	3.805.799	44,4	1.850.698	48,6%	1.133,31	3.077,57
Female	4.765.100	55,6	2.304.397	48,4%	1.104,92	3.376,34
Age Group						
65–74 years	5.664.702	66,1	2.759.810	48,7%	970,51	2.640,45
75–84 years	2.358.467	27,5	1.084.302	46,0%	1.448,30	4.363,48
≥85 years	547.730	6,4	310.983	56,8%	1.269,38	3.461,93
Marital Status						
Not currently married (No partner)	3.418.303	39,9	1.527.540	44,7%	1.009,80	3.046,44
Currently married (Has partner)	5.152.596	60,1	2.627.556	51,0%	1.180,21	3.356,04
Educational Attainment						
No schooling completed	3.173.710	37,0	1.383.749	43,6%	987,72	2.957,66
Primary school	3.807.469	44,4	1.967.566	51,7%	1.104,43	2.984,37
Middle school	515.476	6,0	209.412	40,6%	1.512,70	4.992,98
High school	534.430	6,2	289.990	54,3%	723,99	2.141,88
University / Higher education	539.814	6,3	304.379	56,4%	1.895,87	4.908,53
Income Quintile						
Lowest Quintile (20%)	3.391.803	39,6	1.369.754	40,4%	701,01	2.470,75
Second Quintile (20%)	1.587.741	18,5	761.542	48,0%	714,08	1.368,34
Third Quintile (20%)	1.462.664	17,1	767.635	52,5%	700,67	2.048,79
Fourth Quintile (20%)	1.164.342	13,6	657.248	56,4%	1.568,41	4.006,78
Highest Quintile (20%)	964.349	11,3	598.918	62,1%	2.622,87	5.520,38
Employment Status						
Employed (Worked)	901.288	10,5	473.331	52,5%	1.417,93	3.589,29
Not employed (Did not work)	7.669.611	89,5	3.681.764	48,0%	1.078,95	3.197,95
Reason for Not Working						
Retired	3.456.443	40,3	1.661.934	48,1%	944,73	2.512,70
Disabled/Sick	183.014	2,1	103.546	56,6%	1.414,24	4.823,91
Elderly (Too old to work)	2.024.026	23,6	982.803	48,6%	1.069,81	3.061,16
Other	2.006.128	23,4	933.481	46,5%	1.290,34	4.069,29
Working Physical/Mental Disability						
Yes	1.383.934	16,1	842.176	60,9%	1.047,06	3.038,62
No	7.186.965	83,9	3.312.919	46,1%	1.135,49	3.297,26
Daily Physical/Mental Disability						
Yes	1.235.675	14,4	720.223	58,3%	1.379,98	3.505,66
No	7.335.224	85,6	3.434.872	46,8%	1.062,54	3.186,99
Relationship to Household Head						
Self	5.527.164	64,5	2.464.129	44,6%	1.035,77	2.936,53
Spouse	1.855.024	21,6	958.251	51,7%	1.218,27	3.595,59
Grandparent	1.040.430	12,1	654.948	62,9%	1.331,26	3.905,03
Other	148.281	1,7	77.767	52,4%	668,57	1.148,30
Number of Individuals Aged 65+						
1	4.623.616	53,9	2.073.605	44,80%	1.001,39	2.930,75
2	3.844.086	44,9	2.009.422	52,30%	1.248,08	3.588,00
3+	103.197	1,2	72.069	69,80%	821,06	839,87
Household Size						
1 person	1.723.199	20,1	617.871	35,9%	508,36	1.024,68
2–3 people	4.710.096	55,0	2.371.356	50,3%	1.120,93	3.489,92
4–5 people	1.190.614	13,9	670.901	56,3%	1.155,62	2.584,52
6 or more	946.990	11,0	494.968	52,3%	1.810,36	4.339,06
Household Type						
Single-person Household	1.723.199	20,1	617.871	35,9%	508,36	1.024,68
Nuclear Family	4.645.035	54,2	2.331.470	50,2%	1.136,37	3.538,59
Extended Family	2.085.368	24,3	1.150.227	55,2%	1.411,19	3.410,30
Other	117.297	1,4	55.527	47,3%	1.024,46	2.119,53

*The closing exchange rate for 1 USD as of December 29, 2023, was 29.78 Turkish Lira (TRY).

Table 2. Life Circumstances, Financial Security, and Lifestyle Factors of Older Adults

			Out-of-Pocket (OOP) Health Expenditure Status		Out-of-Pocket (OOP) Health Expenditure Amount (TRY)*	
	Frequency	Percent	Frequency	Percent	Mean	SD
Retirement Pension						
No	4.556.077	53,2	2.171.906	47,7%	1.211,47	3.661,07
Yes	4.014.822	46,8	1.983.190	49,4%	1.014,72	2.717,72
Old-age Pension						
No	7.572.339	88,3	3.663.790	48,4%	1.205,60	3.420,33
Yes	998.560	11,7	491.305	49,2%	461,03	1.191,51
Health Insurance Status						
SGK/GSS (Social Security Institution/General Health Insurance)	8.287.125	96,7	4.072.520	49,1%	1.101,28	3.256,54
Other	70.941	0,8	47.509	67,0%	1.252,68	956,56
None	212.834	2,5	35.067	16,5%	2.825,23	3.629,45
Housing Tenure						
Owner / Homeowner	6.894.819	80,4	3.306.384	48,0%	1.161,20	3.456,56
Tenant / Renter	993.384	11,6	445.906	44,9%	1.163,70	2.894,55
Official Housing / Quarters	1.183	0,0	0	0,0%		
Does not pay rent / Living Rent-Free	681.513	8,0	402.805	59,1%	708,31	1.096,47
Housing Type						
Detached house / Single-family house	3.373.014	39,4	1.450.018	43,0%	715,62	2.288,15
Apartment / Row house	5.197.885	60,6	2.705.078	52,0%	1.333,02	3.640,32
Number of Rooms						
Small	708.214	8,3	380.159	53,7%	594,66	1.175,14
Standard	3.264.257	38,1	1.505.592	46,1%	1.172,50	3.395,44
Large	4.598.428	53,7	2.269.345	49,4%	1.168,71	3.371,89
Housing Area						
Small	2.992.863	34,9	1.490.844	49,8%	1.089,52	3.075,09
Standard	4.532.628	52,9	2.126.040	46,9%	1.174,49	3.350,00
Large	1.045.408	12,2	538.212	51,5%	970,40	3.288,99
Heating System						
None	1.523	0,0	0	0,0%		
Central Heating	4.441.278	51,8	2.291.682	51,6%	1.241,21	3.231,26
Stove	3.880.922	45,3	1.725.181	44,5%	819,08	2.645,36
Air Conditioning / HVAC	247.176	2,9	138.233	55,9%	2.792,91	7.228,08
Fuel Type						
Solid fuel	3.779.775	44,1	1.684.222	44,6%	796,72	2.380,83
Liquid fossil fuel	4.315.344	50,3	2.211.824	51,3%	1.304,37	3.604,41
Modern (e.g., natural gas, electricity)	475.780	5,6	259.049	54,4%	1.608,54	4.481,96
Ease of Access to Public Transportation						
Very easy	1.256.439	14,7	669.345	53,3%	857,21	2.543,23
Easy	4.839.220	56,5	2.430.086	50,2%	1.305,23	3.736,35
Difficult	1.803.841	21,0	719.378	39,9%	1012,93	2.559,76
Very difficult	671.398	7,8	336.286	50,1%	503,53	1.297,01
Vehicle Ownership						
None	5.172.539	60,4	2.272.871	43,9%	1.002,28	3.123,71
1 vehicle	3.081.447	36,0	1.689.785	54,8%	1.157,23	3.349,41
2 or more vehicles	316.913	3,7	192.439	60,7%	2.130,86	3.556,31
Ease of Access to Healthcare Services						
Very easy	1.211.838	14,1	602.370	49,7%	1.040,25	3.280,49
Easy	4.772.358	55,7	2.411.528	50,5%	1.278,45	3.621,99
Difficult	1.901.774	22,2	792.528	41,7%	949,48	2.474,61
Very difficult	684.929	8,0	348.669	50,9%	520,44	1.327,31
Smoking Habit						
Yes	3.189.915	37,2	1.600.998	50,2%	1.274,51	3.303,52
No	5.380.984	62,8	2.554.097	47,5%	1.019,19	3.206,65
Alcohol Habit						
Yes	396.812	4,6	246.332	62,1%	1.966,53	4.753,15
No	8.174.087	95,4	3.908.763	47,8%	1.064,06	3.119,82
Cinema Habit						
Yes	134.258	1,6	76.671	57,1%	3.609,23	6.761,07
No	8.436.641	98,4	4.078.425	48,3%	1.070,72	3.124,25
Sports Habit						
Yes	198.388	2,3	134.593	67,8%	1.786,64	4.888,99
No	8.372.511	97,7	4.020.503	48,0%	1.095,17	3.174,63

Table 3a. Absolute Amounts (TRY) of Selected Consumption Expenditures of Older Adults

	Mean	SD
Fruit consumption	500,67	506,26
Vegetable consumption	878,88	829,85
Food consumption	4892,08	4413,04
Energy consumption	1009,79	2158,71
Long term care consumption	1,14	65,35
Alcohol consumption	35,99	284,38
Cigarette consumption	405,25	785,96
Sports consumption	14,50	141,86
Cultural consumption	57,01	603,38

Table 3b. Relative Share of Selected Consumption Expenditures of Older Adults

			Out-of-Pocket (OOP) Health Expenditure Status		Out-of-Pocket (OOP) Health Expenditure Amount (TRY)*	
Fruit Consumption in Food Expenditure	**Frequency**	**Percent**	**Frequency**	**Percent**	**Mean**	**SD**
Low	1876014	21,9	797073	42,5%	855,21	2743,82
Medium / Moderate	5273872	61,5	2612280	49,5%	1179,20	3303,53
High	1421013	16,6	745742	52,5%	1182,08	3516,52
Vegetable Consumption in Food Expenditure						
Low	1233671	14,4	623202	50,5%	1067,48	2634,19
Medium / Moderate	6205271	72,4	2972605	47,9%	1173,68	3550,71
High	1131957	13,2	559288	49,4%	875,14	1868,91
Energy Expenditure in Total Expenditure						
Low	4152221	48,4	2369378	57,1%	1507,59	4121,88
Medium / Moderate	2989071	34,9	1181997	39,5%	639,86	1243,24
High	1429606	16,7	603720	42,2%	522,14	1202,06
Cultural Expenditure in Total Expenditure						
Low	7209299	84,1	3317593	46,0%	997,92	2938,77
Medium / Moderate	1080403	12,6	669747	62,0%	1821,37	4620,19
High	281197	3,3	167755	59,7%	673,80	1616,11
Sports Expenditure in Total Expenditure						
Low	8353407	97,5	3991219	47,8%	1112,46	3270,61
Medium / Moderate	109921	1,3	91448	83,2%	831,02	1472,13
High	107571	1,3	72428	67,3%	1760,80	3464,80
Alcohol and Tobacco Expenditure in Total Expenditure						
Low	5330346	62,2	2529387	47,5%	939,65	3034,92
Medium / Moderate	2513125	29,3	1330902	53,0%	1591,53	3846,19
High	727429	8,5	4155096	48,5%	504,28	1047,26

Table 4. Out-of-Pocket Health Expenditures of Older Adults (TRY)

	Mean	SD
Pharmaceuticals, vaccines, and other pharmaceutical preparations	82,72	246,19
Herbal medicines and homeopathic products	12,67	309,63
Medical diagnostic products	2,64	39,03
Preventive and protective devices and products	0,89	21,87
Treatment devices and products for personal use	3,23	25,47
Vision assistance products	44,35	682,37
Hearing and communication assistance products	31,74	722,18
Mobility and daily living assistance products	25,84	190,64
Repair, rental, and maintenance of medical and assistance products	3,55	103,98
Immunization services	0,11	6,38
Preventive oral and dental treatment services	1,63	36,83
Other outpatient oral and dental treatment services	134,96	1472,79
Outpatient curative and rehabilitative services	78,82	628,45
Long-term outpatient care services	2,68	95,03
Inpatient curative and rehabilitative services	98,02	1061,88
Long-term inpatient care services	0,00	0,00
Diagnostic imaging services and medical laboratory services	17,86	209,70
Emergency patient transfer services and emergency rescue services	0,00	0,00
Total Health Expenditure	541,78	2328,55
Share in total expenditure	0,024	0,07
Ratio to total expenditure excluding food	0,0344	0,09
Health expenditure amount of those making out-of-pocket health expenditure	1117,56	3246,70

Table 5. Factors Affecting the Likelihood of Out-of-Pocket Health Expenditure among Older Adults

Variables	**Model 1: Basic Model**				**Model 2: Advanced Model**			
Nagelkerke R^2	%6,2				%17,1			
Correct classification	%62,1				%66,1			
	OR	**%95 Lower**	**%95 Upper**	**p**	**OR**	**%95 Lower**	**%95 Upper**	**p**
Constant	1,606			,000	2,143			,000
Gender (Male)	1,055	1,052	1,059	,000	,899	,895	,903	,000
Age (65-74 years)	,985	,982	,988	,000	1,075	1,072	1,079	,000
Education (Primary school and below)	,951	,947	,954	,000	,960	,956	,964	,000
Income (Low)	,661	,659	,663	,000	,915	,911	,918	,000
Marital Status (No partner)	1,009	1,005	1,013	,000	1,065	1,060	1,070	,000
Relationship to Household Head (Self)	,738	,735	,740	,000	,827	,823	,830	,000
Household Size (≤3 members)	,992	,989	,996	,000	,870	,867	,874	,000
Household Type (Nuclear)	,699	,696	,702	,000	,711	,707	,715	,000
Number of elderly in household (1)					,769	,766	,772	,000
Health Insurance (SGK, GSS)					2,777	2,751	2,802	,000
Housing Tenure (Owner)					,816	,812	,819	,000
Retirement pension (none)					,891	,887	,895	,000
Old age pension (none)					,674	,671	,677	,000
Housing Type (Detached)					,728	,725	,731	,000
Housing Area (≤100 square meters)					1,419	1,414	1,425	,000
Fuel Type (Solid)					1,046	1,042	1,051	,000
Energy Expenditure (Low share)					1,697	1,692	1,703	,000
Access to Public Transport (Easy)					1,093	1,087	1,099	,000
Access to Health Services (Easy)					,990	,984	,995	,000
Car Ownership (None)					,714	,711	,716	,000
Employment Status (Yes)					1,366	1,359	1,373	,000
Daily Activity Limitation/Disability (Present)					1,031	1,025	1,038	,000
Working Disability (Present)					1,959	1,947	1,970	,000
Fruit Expenditure in Household (Low share)					,899	,897	,902	,000
Vegetable Expenditure in Household (Low share)					1,071	1,068	1,074	,000
Sports Expenditure in Household (None)					,460	,455	,465	,000
Cultural Expenditure in Household (None)					,679	,676	,681	,000
Alcohol-Cigarette Expenditure in Household (None)					1,052	1,046	1,058	,000

Table 6. Factors Affecting the Amount of Out-of-Pocket Health Expenditure for Older Adults

Variables	Model 1: Basic				Model 2: Advanced			
Adjusted R^2	%23,7				%34,6			
	B	%95 Lower	%95 Upper	p	B	%95 Lower	%95 Upper	p
Constant	3,098	3,083	3,113	,000		5,594	5,695	,000
Gender (Male)	,019	,058	,067	,000	-,042	-,146	-,135	,000
Age (65-74 years)	,069	,241	,247	,000	,063	,219	,226	,000
Education (Primary school and below)	,043	,177	,186	,000	,042	,175	,184	,000
Income (Low)	,158	,527	,534	,000	,092	,306	,314	,000
Marital Status (No partner)	,011	,033	,042	,000	-,047	-,170	-,159	,000
Relationship to Household Head (Self)	-,018	-,066	-,058	,000	-,040	-,141	-,132	,000
Household Size (≤3 members)	,007	,023	,031	,000	,030	,106	,115	,000
Household Type (Nuclear)	,113	,526	,537	,000	,115	,534	,546	,000
Number of elderly in household (1)					,092	,304	,313	,000
Health Insurance (SGK, GSS)					,042	,497	,520	,000
Housing Tenure (Owner)					-,010	-,048	-,040	,000
Retirement pension (none)					-,100	-,339	-,329	,000
Old age pension (none)					-,030	-,163	-,152	,000
Housing Type (Detached)					,055	,189	,198	,000
Housing Area (≤100 square meters)					-,076	-,264	-,255	,000
Fuel Type (Solid)					,028	,089	,099	,000
Energy Expenditure (Low share)					-,123	-,471	-,464	,000
Access to Public Transport (Easy)					,045	,166	,180	,000
Access to Health Services (Easy)					-,083	-,317	-,304	,000
Car Ownership (None)					,063	,209	,216	,000
Employment Status (Yes)					-,015	-,082	-,072	,000
Daily Activity Limitation/Disability (Present)					-,142	-,636	-,623	,000
Working Disability (Present)					,091	,372	,384	,000
Fruit Expenditure in Household (Low share)					,046	,153	,159	,000
Vegetable Expenditure in Household (Low share)					,004	,011	,017	,000
Sports Expenditure in Household (None)					,010	,081	,099	,000
Cultural Expenditure in Household (None)					-,004	-,022	-,013	,000
Alcohol-Cigarette Expenditure in Household (None)					,012	,033	,046	,000

Discussion

The study utilized a two-stage econometric approach (Logistic and Linear Regression) on TURKSTAT 2023 HBS data to analyze the determinants of OOP health expenditure among older Turkish individuals.

Descriptive findings confirmed a strong positive relationship between high socioeconomic status (income and education) and both expenditure participation (highest income 62.1%) and the average amount (2,622.87 TRY), supporting international evidence that economic status is a significant determinant of OOP spending (Ali, 2025; Kaiser et al., 2025; Muhammad Malik & Azam Syed, 2012;

Khoshshekan et al., 2025). However, the econometric analysis revealed a critical "financial access barrier" paradox: low-income (OR=0.915) and low-education (OR=0.960) groups have a reduced probability of making any OOP expenditure (Xu, 2008; Thomson et al., 2024; Khan et al., 2025; Pinchoff et al., 2023), but when they overcome this barrier and spend, the expenditure amount significantly increases (B=0.092 and B=0.042 respectively). This paradoxical increase suggests they are confronting delayed and more severe health issues requiring higher-cost treatments (Pinchoff et al., 2023; Sangar et al., 2025; Alrashed & Mohamed, 2024; Azubuike & Alawode, 2024). From the perspective of Andersen's model, this can be interpreted as the conversion of delayed healthcare demand due to a lack of enabling factors such as sufficient income or transportation into high-cost expenditures under the pressure of need factors.

The econometric analysis reveals a significant gender differential, showing that older men have a lower probability of making OOP expenditures (OR=0.899) and spend lower average amounts when they do (B=−0.042) compared to women. This difference, suggesting higher utilization and costs for women, is broadly supported by international literature from Saudi Arabia, Thailand, and Pakistan which link greater OOP spending to female-headed households or find that male heads restrict spending more aggressively (Osmani & Okunade, 2021; Ali, 2025; Khoshshekan et al., 2025). The study's findings reveal that a staggering 53.7% of older women have no completed schooling and 41.8% fall into the lowest income quintile. This lack of enabling factors (both education and income) deeply intersects with gender, creating a layered within group vulnerability. Consequently, uneducated older women with limited income represent a high risk group forced to navigate essential health needs with the most restricted financial buffers (Srivastava et al., 2022; Ozer, 2023).

The analysis of household structures in this study indicates that household type significantly impacts both the incidence and the amount of OOP health expenditures. In the specific context of Turkey, health expenditures for older individuals are shaped not only by their individual income but also by traditional family support systems (Arun, 2013). This finding is consistent with the literature on Turkey, which emphasizes that household

structure and extended family support often serve as a buffer in managing out-of-pocket health expenses (Ipek, 2019; Boz & Ozsarı, 2020).

The study demonstrates that easy access to health services (spatial/geographic accessibility) plays a significant regulatory role on both the expenditure decision and the expenditure amount of older individuals. Logistic regression shows that "Easy access to health services" reduces the probability of making an out-of-pocket expenditure (OR=0.990), and Linear regression shows that it reduces the expenditure amount (B=−0.083). This finding indicates that easy access to services tends to reduce the total cost by lowering indirect costs (transportation, time) or enabling early intervention. This result is consistent with international findings demonstrating that geographical barriers significantly increase OOP expenditure, as seen in Saudi Arabia (Ali, 2025), Cambodia (Kaiser et al., 2025), and India (Kumar et al., 2015).

Health insurance ownership (SGK/GSS) stands out as the strongest factor increasing the probability of making an OOP expenditure (OR=2.777). Within the framework of Andersen's model, health insurance serves as a primary enabling factor that facilitates an individual's entry into the healthcare system. However, our findings suggest that being insured in Turkey paradoxically encourages individuals to make co-payments or utilize services that are not fully covered by the scheme, such as dental care and specific pharmaceuticals. This situation indicates that while insurance lowers the initial barrier to access, it simultaneously triggers OOP spending due to the structural limitations of the coverage. This parallels studies examining OOP pharmaceutical expenditures in Iran and studies in Saudi Arabia, which determined that insurance membership did not significantly reduce OOP expenditures (Ali, 2025). In Turkey context, this induced expenditure reflects a system where the GSS acts as a gateway to care but requires significant private financial contributions for comprehensive treatment.

Disability statuses, such as working disability (present) (OR=1.959) and daily activity limitation/disability (present) (OR=1.031), strongly increase the probability of making a health expenditure. This finding aligns with international empirical studies confirming that chronic and complex medical conditions among older adults necessitate OOP payments (Kaiser et al., 2025; Nguyen et al., 2021; Zhang et al., 2023; Fout et al., 2024; Paul et al., 2025).

The top three items constituting the largest share of older adults' out-of-pocket expenditures point to areas where the basic social security system is inadequate: Other outpatient oral and dental treatment services (mean 134.96 TRY), inpatient curative and rehabilitative services (mean 98.02 TRY), and pharmaceuticals, vaccines, and other pharmaceutical preparations (mean 82.72 TRY). The high burden posed by dental and inpatient treatment services suggests that SGK/GSS fails to provide full financial protection in these areas. This is consistent with findings in Spain, where dental care is largely uninsured and was

identified as the highest dimension of deprivation, with 9% of the population lacking access to this service due to financial reasons (Clemente-Marcuello et al., 2024). Pharmaceutical costs are a major component of the OOP burden globally, reported as the main contributor to out-of-pocket health expenditure in Bangladesh, China, and Vietnam (Du et al., 2019), and determined to account for over 20% of catastrophic health expenditure (CHE) for households in Portugal (Quintal & Lopes, 2021). In the framework of Andersen's model, these high-cost items represent a shift where need factors overwhelm the system's enabling capacity, indicating that the GSS serves as an entry point but not a comprehensive financial shield.

This study utilized discretionary consumption expenditures (sports, culture) as indirect indicators of financial capacity. Indicators such as no sports expenditure in the household (OR=0.460) and no cultural expenditure in the household (OR=0.679) most strongly reduce the probability of making an OOP expenditure, highlighting the decisive role of the absence of a financial buffer. Conversely, it was determined that those who are able to allocate budget to sports and cultural items have a higher probability of making health expenditures (67.8% and 62.0%, respectively). These discretionary items function as enabling factors that signal financial elasticity; their absence reflects a structural budget constraint where mandatory costs for food and energy (Table 3a) leave no room for healthcare participation. Although the common consensus in the literature suggests that engaging in sports activities will reduce household health expenditure in the long run by lowering treatment and drug costs, this finding can be explained in this study by concluding that those who can budget for discretionary consumption items also possess a higher financial capacity for health expenditures.

On the other hand, factors indicating restricted living conditions, such as low energy expenditure (B=−0.123) and small housing area (B=−0.076), reduce the expenditure amount in the linear regression model. This presents a paradox, as these factors increase the probability of expenditure in thelogistic regression (OR>1). This paradox suggests that when acute need factors force socioeconomically disadvantaged older adults into the healthcare system, they are compelled to utilize cheaper alternatives or restrict spending to balance their limited budgets. This constraint aligns with the "financial access barrier" literature, where low-income individuals may delay or forego needed care due to costs until a medical crisis occurs.

Turkey is characterized by a rapidly aging population within the demographic transition process and a General Health Insurance system that significantly expanded following the 2003 Health Transformation Program. However, our empirical findings demonstrate that the GSS does not serve as an absolute shield in protecting the older population from financial risks; particularly low-income older adults remain vulnerable to transportation costs and additional out-of-pocket items such as dental care and pharmaceutical co-payments. Turkey's high

inflationary environment and the mounting pressure of food expenditures reflected in the 2023 data transform healthcare spending into a severe budget constraint issue for the older adults. This economic climate weakens the enabling factors within Andersen's model, leading to the postponement of necessary healthcare demand.

Study Limitations

When interpreting the results of this study, the following limitations should be considered: First, the study relies solely on out-of-pocket health expenditure data from the TURKSTAT HBS. Since the HBS's primary purpose is to determine household consumption patterns, it does not include detailed clinical and health status information, such as the frequency of health service utilization, the type and severity of chronic diseases, or unmet need (care needed but not received). This limits the ability to deeply analyze the medical determinants of health expenditure behavior. Second, the study utilized lifestyle and consumption habits (such as sports/culture expenditures) as indirect indicators (proxy variables) of financial capacity. Although these proxy variables demonstrate expenditure capacity, they are not direct measures of individuals' true health status or health-related behaviors, and caution must be exercised when interpreting the results. Third, a methodological limitation arises from the assumptions of the Two-Stage Model employed in this study. The analysis employed a two-stage approach (Logistic and Linear Regression) which separately examined the expenditure decision and the expenditure amount. This approach, despite tackling the issue of zero expenditures, assumes that the two decisions are independent. However, these decisions may be interdependent in some cases, which could affect the results due to the strong assumptions inherent in the model. Fourth, the study is based on cross-sectional data drawn from the 2023 HBS. Although cross-sectional analyses demonstrate the relationship between variables, they cannot definitively determine the direction of causality between out-of-pocket expenditures and socioeconomic status (for example, whether low income reduces expenditure, or whether high expenditure leads to impoverishment). Finally, the out-of-pocket health expenditure data in the HBS are collected through self-reporting by household members. In such self-reported data, there is a risk of recall bias occurring, especially for small and frequently incurred expenditures (such as pharmaceuticals and over-the-counter products).

Conclusion

This study utilized 2023 TURKSTAT data to analyze the two-stage OOP health expenditure behavior (decision and amount) of older adults individuals in Turkey, confirming that these expenditures are significantly shaped by structural effects, including Financial Capacity and Access Inequality. The findings show that higher socioeconomic status increases the incidence of OOP spending, while a critical disparity exists where the uninsured and those without retirement income pay significantly higher average amounts when they do spend. Based on these results, the

primary recommendation is the Strategic Expansion of SGK/GSS Coverage for high-burden areas like dental care and long-term rehabilitation to alleviate financial barriers. Furthermore, targeted financial protection mechanisms are necessary for vulnerable groups (e.g., those living alone or low-income) against high-cost health shocks. Lastly, the study recommends long-term investment in social participation and education for the older adults and, crucially, completely eliminating the costs for preventive and early diagnosis services for low-income groups, as financial barriers in these areas lead to delayed, severe treatment and disproportionately high expenditure amounts.

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