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THE RELATIONSHIP BETWEEN MEDICATION USE, POLYPHARMACY, AND FRAILTY IN INDIVIDUALS AGED 65 AND OVER PRESENTING TO FAMILY HEALTH CENTERS IN YENIMAHALLE DISTRICT OF ANKARA PROVINCE

Furkan Akyüz[1], Şefik Yurdakul[2], Dilek Öztaş[1]

[1]Department of Public Health, Ankara Yıldırım Beyazıt University Faculty of Medicine, Ankara, Türkiye

[2]Nevsehir Provincial Directorate of Health, Nevsehir, Türkiye

Correspondence:
Furkan Akyüz (e-mail: furkan_akyuz32@hotmail.com)

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Ankara Yıldırım Beyazıt University Faculty of Medicine
Department of Family Medicine

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Abstract

Objectives: This study aims to investigate the relationship between medication use, polypharmacy, and frailty in individuals aged 65 and older who present to primary healthcare centers in the Yenimahalle district of Ankara, Türkiye.

Materials and Methods: This cross-sectional study was conducted in three Family Health Centers with a total of 300 elderly participants. Data were collected using a sociodemographic questionnaire, Fried's Frailty Phenotype Scale (FFS), Gait Speed Test (GST), and the Timed Up and Go Test (TUG). Medications were classified according to the Anatomical Therapeutic Chemical (ATC) system. Statistical analysis included Chi-square, Spearman correlation, and multivariate logistic regression.

Results: Among participants, 46.3% met the criteria for polypharmacy (≥5 medications). The overall frailty prevalence was 67.3%, and 63.8% of frail individuals had polypharmacy. A positive correlation was found between the total medication count and Fried frailty scores ($\rho = 0.730$; $p < 0.001$). Logistic regression analysis revealed that polypharmacy (OR: 3.63) and poor physical performance on the TUG test (OR: 3.50) were independent risk factors for frailty.

Conclusion: The study highlights a significant association between polypharmacy and frailty in older adults. Routine medication reviews and frailty screenings in primary care settings may help improve geriatric health outcomes and reduce frailty-related complications.

Keywords: Polypharmacy, frailty, medication use, primary health care, elderly.

Introduction

Globally, improvements in living conditions, increased access to healthcare services, and rapid advancements in medical technologies have contributed to an increase in average life expectancy, resulting in a significant rise in the proportion of the elderly population. Projections by the World Health Organization (WHO) estimate that by 2050, the number of individuals aged 60 and over will reach approximately 2 billion. Furthermore, in 2020, the elderly population surpassed the number of children under five years of age, compelling healthcare systems to adopt multidisciplinary and holistic approaches to address the complex needs of aging populations.[1] In Türkiye, the population aged 65 and over increased by 20.7% between 2019 and 2024, exceeding 9 million, with their share of the total population rising to 10.6%.[2]

Aging encompasses biological processes such as immunosenescence, functional decline in organ systems, and reduction in physiological reserves. These changes predispose older adults to increased prevalence of chronic morbidities and, consequently, to the concurrent use of multiple medications, known as polypharmacy.[3] Polypharmacy is commonly defined in the literature as the simultaneous use of five or more medications; however, some studies propose different thresholds.[4] Polypharmacy is associated with serious clinical outcomes, including falls, adverse drug reactions, drug–drug interactions, cognitive impairment, increased functional dependency, hospitalizations, and elevated mortality risk.[5]

The concept of frailty has gained increasing prominence in geriatric literature as a multidimensional and dynamic syndrome characterized by diminished homeostatic reserves, decreased physiological resilience to stressors, and heightened vulnerability to adverse clinical outcomes.[6] There exists a complex, bidirectional relationship between frailty and polypharmacy. Frail individuals often present with multimorbidity necessitating greater medication use, while polypharmacy itself can accelerate the progression of frailty, creating a vicious cycle.[7]

This study aims to examine the link between polypharmacy and frailty, two common conditions in older adults. Research addressing these issues together in primary healthcare settings in Türkiye is limited. Family Health Centers, as the first point of contact for elderly individuals, play a crucial role in early detection and intervention. The study will be conducted among individuals aged 65 and over attending three Family Health Centers in Yenimahalle, Ankara. Frailty will be assessed using the Fried Frailty Phenotype, and medication use will be evaluated according to the WHO's ATC classification. The relationships between polypharmacy, frailty, and the number of chronic diseases will be analyzed.[8]

The primary objectives are to determine medication use patterns in this population, assess the prevalence and influencing factors of polypharmacy, and examine the association between polypharmacy and frailty. The

findings are expected to contribute to more effective monitoring of elderly patients in primary care, encourage more cautious prescribing practices by physicians, reduce unnecessary and potentially harmful medication use, and enable early detection and intervention in frailty. Additionally, the results are anticipated to inform the development of health policies targeting the elderly population. Frailty represents a growing public health issue in primary care due to its strong association with hospitalization, disability, and mortality.

Materials and Methods

Before utilizing the scale, permission was secured from the original authors through electronic correspondence. Ethical approval for the study was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University Health Sciences on 01.07.2024 with approval number 06/818. Informed consent was obtained from all participants before their inclusion in the study. The study was conducted in full accordance with the ethical standards established in the Declaration of Helsinki.

Study population and location

The study was conducted in three Family Health Centers (FHCs) located in the Yenimahalle district of Ankara, Türkiye. These centers were selected from a total of 53 FHCs in the district using a simple random sampling method. Simple random sampling was applied among eligible individuals aged 65+ presenting to the selected FHCs. The data collection process was carried out over a period of three months, between February and April 2025. The study included individuals aged 65 years and older who visited the selected Family Health Centers, were adequately informed both verbally and in writing, and voluntarily agreed to participate by signing the informed consent form.

Socio-demographic data of the participants were collected through a 30-item questionnaire administered via face-to-face interviews by the researcher. Additionally, the researcher directly applied the Fried Frailty Phenotype, GST, and TUG to assess the frailty status of the participants.

Data collection instruments

Four primary instruments were employed for data collection in this study: the socio-demographic questionnaire, Fried's Frailty Scale, GST, and TUG.

The socio-demographic questionnaire comprised 30 items covering participants' age, marital status, gender, education level, parenthood status, smoking and alcohol consumption, exercise habits, and balanced nutrition, among other lifestyle and health-related variables. Additionally, detailed information regarding health indicators such as history of falls within the past year, hospitalizations, appetite and weight loss, surgical operations, and ambulance usage was collected. Regularly used medications were recorded by both brand and active ingredient names and subsequently analyzed based on the Anatomical Therapeutic Chemical (ATC) classification system recommended by the World Health Organization.

Chronic diseases were classified using standardized ICD-10 codes recorded for each participant. Frailty status was assessed using FFS, developed by Fried et al., which evaluates five criteria: unintentional weight loss, exhaustion, physical activity level, grip strength, and walking speed. Participants were scored according to these criteria and categorized based on their total frailty score. [9]

Functional capacity was measured using the GST and TUG. In the GST, participants walked a 5-meter flat course at their normal pace, while the time was recorded with a stopwatch.[10] The TUG required participants to stand up from a chair, walk 3 meters, return, and sit down, with the duration of the task timed. These assessments are widely used to evaluate mobility, balance, and overall functional capacity in older adults.[11]

Statistical analysis

The data were analyzed using IBM SPSS Statistics, version 25.0. Descriptive statistics included calculation of means, standard deviations, medians, minimums, and maximums for continuous variables, while frequencies and percentages were reported for categorical variables. The distribution of the data was assessed through both visual methods (histograms, Q-Q plots) and analytical tests (Kolmogorov-Smirnov and Shapiro-Wilk tests).

For group comparisons, parametric (Student's t-test) or non-parametric (Mann-Whitney U test) tests were applied depending on data normality. Associations between categorical variables were examined using the Chi-square test. Relationships between frailty, polypharmacy, and various sociodemographic and clinical factors were analyzed using these methods. Correlation analyses were conducted using Spearman's correlation coefficient.

To identify factors associated with frailty, a logistic regression analysis was performed. Frailty status was defined as a score of ≥3 on the Fried Frailty Scale. Independent variables included age, gender, educational level, polypharmacy status, and TUG results.

Results

Of the 300 participants, 149 (49.7%) were female, and 151 (50.3%) were male, with a mean age of 72.86±5.15 years. Of the participants, 66.3% were in the 65–74 age range. Regarding educational level, 33.0% had completed primary school, 24.3% were high school graduates, and only 4.7% had attained a university degree or higher. Descriptive statistical data regarding the number of chronic diseases, the number of regularly used medications, the walking speed test and timed up-and-go test durations, as well as the frequency of health check-ups within the past year of the participants, are presented in Table 1. The average number of chronic diseases was determined to be 2.78 ± 1.75, with participants reporting up to 10 different chronic conditions. The average number of regularly used medications was 3.72 ± 2.29. Regarding healthcare utilization, participants reported attending health check-ups an average of 4.14 ± 2.12 times in the past year. TUG duration was measured with an average of 10.26 seconds among participants, and durations exceeding 10 seconds are generally associated in the literature with decreased functional capacity and an increased risk of frailty.[12] Participants' average walking speed was 0.64 ± 0.12 m/s (median 0.63 m/s). GST reliably indicates functional capacity and frailty risk: below 0.6 m/s signals high risk, 0.6–0.8 m/s moderate risk, and above 0.8 m/s low risk (Table 1).[13]

Table 1. Descriptive Statistics of Number of Chronic Diseases, Medication Use, TUG, GST, and BMI

Variable	Mean	Median	Std. Deviation	Min	Max
Number of Chronic Diseases	2.78	2.00	1.75	0	10.00
Number of Regularly Used Medications	3.72	3.00	2.29	0	10.00
Number of Health Check-ups in the Last Year	4.14	3.00	2.12	1.00	15.00
Body Mass Index (BMI) (kg/m²)	25.3	25.86	2.63	19.05	33.73
Timed Up and Go Test (TUG)(seconds)	10.26	10.00	1.95	7.00	17.00
Gait Speed Test (GST) (m/s)	0.64	0.63	0.12	0.33	1.10

Std. Dev.: Standard Deviation, Min: Minimum, Max: Maximum, BMI: Body Mass Index, GST : Gait Speed Test, TUG : Timed Up and Go Test

The relationship between the frailty status of individuals in the study and some basic sociodemographic variables (gender, presence of children, age category, marital status, and education level) is presented in Table 2. The table shows both the number (n) and percentage (%) of "frail" and "not frail" responses for each category, along with the results of the Chi-square test (χ^2 and p) indicating the level of statistical significance. According to the analysis results, age category (χ^2=65.194; p<0.001) and education level (χ^2=7.739; p=0.005) have a statistically significant relationship with frailty. Frailty frequency increases markedly, especially in the advanced and very advanced age groups, while individuals with primary school education or below show higher rates of frailty (Table 2).

Table 2. Relationship Between Frailty and Sociodemographic Variables

Variable	Category	Not Frail n (%)	Frail n (%)	χ^2	p
Gender	-Male	50 (33.1)	101 (66.9)	0.027	0.868
	-Female	48 (32.2)	101 (67.8)		
Presence of Children	-No	6 (28.6)	15 (71.4)	0.172	0.678
	-Yes	92 (33.0)	187 (67.0)		
Age Groups	-Young-old (65–74 years)	96 (48.2)	103 (51.8)	65.194	**<0.001***
	-Old-old (75–84 years)	2 (2.1)	94 (97.9)		
	-Very old (≥85 years)	0 (0.0)	5 (100.0)		
Marital Status	-Married	91 (34.2)	175 (65.8)	2.543	0.111
	-Others	7 (20.6)	27 (79.4)		
Education Level	-Primary school or below	40 (25.5)	117 (74.5)	7.739	**0.005***
	-Secondary school or above	58 (40.6)	85 (59.4)		

n: Number of participants %: Percentage χ^2: Chi-square test statistic p: Significance level

p-value ≤ 0.05 is considered statistically significant.

The relationships between frailty status and various clinical characteristics in older adults were evaluated using the Chi-square test. Among individuals with chronic diseases, the prevalence of frailty was 70.2%,

whereas it was 39.3% among those without chronic diseases; this difference was found to be statistically significant (p<0.001). Among individuals meeting the definition of polypharmacy, 92.8% were classified as frail, compared to 45.3% among those without polypharmacy (χ^2 = 76.404; p<0.001). According to the results of the Gait Speed Test (GST), 95.7% of participants with poor performance (<0.6 m/s) were frail, whereas this rate was 72.2% among those with good performance (>0.8 m/s), and the difference was statistically significant (χ^2 = 16.822; p<0.001). A similar association was observed in the TUG; the prevalence of frailty was 48.6% among participants with good performance (≤10 s), while it was 94.3% among those with poor performance (>10 s) (p<0.001) (Table 3).

Table 3. Relationship Between Frailty and Clinical Characteristics

Variable	Category	Not Frail n (%)	Frail n (%)	χ^2	p
Chronic Disease					
	Yes	81 (29.8)	191 (70.2)	11.045	**<0.001***
	No	17 (60.7)	11 (39.3)		
Polypharmacy (≥5 drugs)					
	Yes	10 (7.2)	129 (92.8)	76.404	**<0.001***
	No	88 (54.7)	73 (45.3)		
Gait Speed Test (GST) (m/s)	-Good (>0.8 m/s)	10 (27.8)	26 (72.2)	78.274	**<0.001***
	-Moderate (0.6–0.8 m/s)	83 (55.7)	66 (44.3)		
	-Poor (<0.6 m/s)	5 (4.3)	110 (95.7)		
Timed Up and Go Test (TUG) (seconds)	-Good (≤10 seconds)	91 (51.4)	86 (48.6)	68.970	**<0.001***
	-Poor (>10 seconds)	7 (5.7)	116 (94.3)		

n: Number of participants, %: Percentage χ^2: Chi-square test statistic p: Significance level, GST: Gait Speed Test, TUG: Timed Up and Go Test, p-value ≤ 0.05 is considered statistically significant.

In the analysis examining polypharmacy, the dependent variable "Polypharmacy" (Present/No) was evaluated in relation to various sociodemographic variables using chi-square test results (χ^2 and p values). Each cell presents both the number (n) and the percentage (%). No significant differences were identified regarding gender, having children, or marital status (p > 0.05). In contrast, significant differences emerged across age groups (χ^2 = 151.324; p < 0.001) and educational status (χ^2 = 5.653; p < 0.05). The prevalence of polypharmacy was highest among the elderly and very elderly groups, reaching 95.8%–100.0%, while it was only 21.1% in the young-old group. Regarding education, the prevalence of polypharmacy was 52.9% among those with

primary school education or below, compared to 39.2% among those with secondary school education or higher (Table 4).

Table 4. Relationship Between Polypharmacy and Sociodemographic Variables

Variable	Category	No Polypharmacy n (%)	Polypharmacy n (%)	χ^2	p
Gender	-Male	87 (58.4)	62 (41.6)	2.655	0.103
	-Female	74 (49.0)	77 (51.0)		
Presence of Children	-No	12 (57.1)	9 (42.9)	0.110	0.740
	-Yes	149 (53.4)	130 (46.6)		
Age Groups	-Young-old (65–74 years)	157 (78.9)	42 (21.1)	151.324	**<0.001***
	-Old-old (75–84 years)	4 (4.2)	92 (95.8)		
	-Very old (≥85 years)	0 (0.0)	5 (100.0)		
Marital Status	-Married	148 (55.6)	118 (44.4)	3.672	0.055
	-Others	13 (38.2)	21 (61.8)		
Education Level	-Primary school or below	74 (47.1)	83 (52.9)	5.653	**0.017**
	-Secondary school or above	87 (60.8)	56 (39.2)		

n: Number of participants %: Percentage χ^2: Chi-square test statistic p: Significance level, p-value ≤ 0.05 is considered statistically significant

Individuals with chronic diseases were significantly more likely to experience polypharmacy (≥5 medications), with 51.1% of them falling into the polypharmacy group, whereas none of the participants without chronic conditions used five or more medications ($\chi^2 = 26.662$; $p < 0.001$). Similarly, frail individuals demonstrated a strong association with polypharmacy, as 63.9% were classified in the polypharmacy group, compared to only 10.2% of non-frail individuals ($\chi^2 = 76.404$; $p < 0.001$). Furthermore, the gait speed test was found to be a significant predictor of polypharmacy: while only 2.8% of those with good walking performance used multiple medications, this rate rose to 90.4% among those with poor performance ($\chi^2 = 150.550$; $p < 0.001$). In contrast, TUG showed no significant relationship with polypharmacy status ($\chi^2 = 1.018$; $p = 0.313$) (Table 5).

Table 5. Relationship Between Polypharmacy and Clinical Characteristics

Variable	Category	No Polypharmacy n (%)	Polypharmacy n (%)	χ^2	p
Chronic Disease	Yes	133 (48.9)	139 (51.1)	26.662	**<0.001***
	No	28 (100.0)	0 (0.0)		
Fraility	Yes	73 (36.1)	129 (63.9)	76.404	**<0.001***
	No	88 (89.8)	10 (10.2)		
Gait Speed Test (GST) (m/s)	-Good (>0.8 m/s)	35 (97.2)	1 (2.8)	150.550	**0.001***
	-Moderate (0.6–0.8 m/s)	115 (77.2)	34 (22.8)		
	-Poor (<0.6 m/s)	11 (9.6)	104 (90.4)		
Timed Up and Go Test (TUG) (seconds)	-Good (≤10 seconds)	147 (83.1)	30 (16.9)	149.900	**<0.001***
	-Poor (>10 seconds)	14 (11.4)	109 (88.6)		

n: Number of participants %: Percentage χ^2: Chi-square test statistic p: Significance level

p-value ≤ 0.05 is considered statistically significant. GST: Gait Speed Test, TUG: Timed Up and Go Test

According to Spearman correlation analysis results, there is a strong negative correlation between GST and TUG ($\rho = -0.964$; $p < 0.001$). A positive correlation was observed between the number of regularly used medications and the total score of FFS ($\rho = 0.730$; $p < 0.001$). The number of chronic diseases showed a high correlation with both the number of regularly used medications ($\rho = 0.862$; $p < 0.001$) and the total FFS score ($\rho = 0.747$; $p < 0.001$). All correlations were statistically significant ($p < 0.001$) (Table 6).

Table 6. Correlation Analysis Between Functional Tests, Clinical Indicators, and Frailty

Variables	Gait Speed Test (GST)	Timed Up and Go Test (TUG)	Number of Regular Medications	Age	Number of Chronic Diseases	Frailty Score (FFS)
Gait Speed Test (GST)	1.000	–0.964*	–0.697*	–0.664*	–0.681*	–0.783*
Timed Up and Go Test (TUG)	–0.964*	1.000	0.696*	0.672*	0.697*	0.799*
Number of Regular Medications	–0.697*	0.696*	1.000	0.689*	0.862*	0.730*
Age	–0.664*	0.672*	0.689*	1.000	0.703*	0.691*
Number of Chronic Diseases	–0.681*	0.697*	0.862*	0.703*	1.000	0.747*
Frailty Score (FFS)	–0.783*	0.799*	0.730*	0.691*	0.747*	1.000

*ρ: Spearman correlation coefficient; all correlations are statistically significant at $p < 0.001$. GST: Gait Speed Test, TUG: Timed Up and Go Test, FFS: Frailty Score

In the logistic regression analysis, frailty status was examined as the dependent variable, and the model demonstrated good fit to the data (Hosmer–Lemeshow p = 0.059; Nagelkerke $R^2 = 0.436$). The results indicated that polypharmacy (≥5 medications), age, and performance on TUG were significant predictors of frailty. Individuals with polypharmacy had a 3.63 times higher likelihood of being frail, each one-year increase in age raised the risk of frailty by 17%, and poor Timed Up and Go Test performance increased the odds of frailty by 3.50 times. Gender and education level were not significantly associated with frailty. The model identifies polypharmacy, advanced age, and low physical performance as independent determinants of frailty in older adults (Table 7).

Table 7. Logistic Regression Analysis Results of Factors Affecting Frailty

Variable	Categories	B	S.E.	OR	p-value	95% CI (Lower – Upper)
Polypharmacy	Reference = No Yes (≥ 5 drugs)	1,288	0,454	**3,63**	**0,005***	1,49 – 8,84
Age	(per year increase)	0,153	0,052	**1,17**	**0,003***	1,05 – 1,29
Gender	Reference = Female Male	0,505	0,326	1,66	0,121	0,88 – 3,14
Timed Up and Go Test (TUG)	Reference = Good Poor (>10 sec)	1,254	0,516	**3,50**	**0,015***	1,28 – 9,62
Education Level	Reference => Primary Primary and below	0,407	0,309	1,50	0,189	0,82 – 2,75

Note: OR = Odds Ratio, B = Coefficient, SE = Standard Error, CI = Confidence Interval, TUG = Timed Up and Go Test, *p-value ≤ 0.05 is considered statistically significant. Nagelkerke R^2 = 0.436.

Discussion

This study comprehensively evaluated the association between polypharmacy and frailty in the elderly population. Results indicated that the prevalence of frailty was significantly elevated in participants who were taking five or more medications. Similarly, the literature emphasizes that polypharmacy increases the risk of frailty, and frail individuals often use multiple medications due to multimorbidity.[14]

In our study, elderly individuals were found to have an average of 2.78 chronic diseases and to use an average of 3.72 medications. The average GST was 0.64 m/s, and the average TUG test duration was 10.26 seconds. These findings support the association between frailty and polypharmacy reported in the literature. A TUG duration exceeding 10 seconds is associated with reduced physical capacity.[12] Similarly, low gait speed is considered a strong indicator of frailty.[15] Furthermore, the relationship between increased burden of chronic disease and the prevalence of polypharmacy is consistent with previous studies.[16]

The study investigated the impact of sociodemographic factors on frailty, revealing significant associations with both age and educational attainment. As age increased, the prevalence of frailty also rose, with all

individuals aged 85 and above identified as frail. Frailty was more common among individuals with lower levels of education. Similarly, the literature indicates that older age and low educational attainment increase the risk of frailty, and the combined effect of these two factors is even stronger. A 13-year study conducted in the Netherlands found that low education level significantly increased the risk of frailty, especially when combined with advanced age (OR=2.94).[17] Similarly, another study conducted in 2023 with 911 elderly participants showed that low education level and increasing age both raise the risk of frailty. These findings suggest that age and education are important variables to consider when assessing frailty.[18]

In our study, 70.2% of individuals with chronic diseases were found to be frail, compared to 39.3% of those without chronic conditions. Additionally, low gait speed emerged as a strong indicator of frailty. The literature also highlights gait speed, particularly ≤0.6 m/s, as an important predictor of mortality and functional decline. Therefore, GST plays a critical role in the early identification and intervention of frail individuals.[19]

In our study, a significant association was identified between age and educational level with polypharmacy, demonstrating a marked increase in the prevalence of polypharmacy, particularly among the advanced elderly population. The presence of chronic comorbidities and functional impairments was also found to be closely correlated with polypharmacy. Furthermore, elderly individuals exhibiting poor physical performance showed higher rates of polypharmacy, with an increased burden of chronic disease observed within the polypharmacy group. Consistent with these findings, a cross-sectional study conducted by Midao et al. across 17 European countries highlighted a robust association between polypharmacy and clinical factors such as the number of chronic conditions, decreased gait speed, anorexia, and depression.[20]

In our study, significant positive correlations were found between GST, TUG, regular medication use, number of chronic diseases, and frailty score in older adults. A strong negative correlation was observed between gait speed and TUG, which, due to differences in their measurement units, indicates that gait speed (m/s) and TUG support each other's results. Moreover, both the number of medications and the number of chronic diseases were positively associated with frailty. The literature also highlights that reduced gait speed is linked to frailty and increased health risks. The systematic review by Gutiérrez Valencia et al. demonstrated that polypharmacy and frailty interact reciprocally and may jointly contribute to adverse health outcomes.[21]

In the logistic regression analysis of our study, the primary factors determining frailty status in older adults were found to be polypharmacy, advanced age, and poor performance on TUG (>10 seconds). The risk of frailty was 3.6 times higher among those taking five or more medications, and 3.5 times higher among those with poor TUG performance. In contrast, Arslan et al. demonstrated that a higher number of chronic diseases was significantly linked to increased overall medication use and served as a strong predictor of polypharmacy (aOR

= 6.83). Furthermore, their findings indicated that being female increased the risk of polypharmacy by 3.4 times, and higher frailty scores were correlated with an increased likelihood of polypharmacy.[22]

In the study conducted by Hung et al., frailty in older adults was assessed using the Fried Frailty Phenotype and the FRAIL Index, reporting a frailty prevalence of 45.85%. Multivariable logistic regression analysis revealed that polypharmacy increased the risk of frailty by 8.81 times, the presence of three or more chronic diseases by 3.28 times, and low educational level by approximately 2.2 times. These findings highlight the strong association between polypharmacy and frailty, supporting the results of our study, while the lack of a significant association for low educational level and chronic disease presence in our findings stands out as a difference from the literature. In primary care practice, systematic frailty screening using simple tools such as GST and TUG may enable earlier identification of high-risk patients. Additionally, reviewing medication lists at each visit could reduce inappropriate polypharmacy. [23] Family physicians should routinely implement frailty screening and conduct structured polypharmacy reviews to reduce medication burden and improve outcomes in elderly patients.

Limitations

This study has several limitations. First, its cross-sectional design restricts the ability to infer causality. Second, the study population was limited to three FHCs in a single district, which may limit generalizability. Third, clinical information was based on available coded diagnoses, which may influence classification accuracy.

Strengths

Strengths of this study include the use of validated frailty measures (FFP, GST, TUG), face-to-face data collection, and evaluation within primary care settings, where frailty screening is highly relevant.

Ethical Considerations: Ethical approval for the study was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University Health Sciences (Date: 01.07.2024; No: 06/818).

Conflict of Interest: The authors declare no conflict of interest.

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