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Determinants of Frailty and Gait Speed in People Over 65 Years of Age

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ABSTRACT

Objective: Several factors in our life process may directly contribute to frailty or are associated with diseases that can lead to frailty. In this study, we aimed to determine the factors and life events that contribute to frailty and affect gait speed using several tests.

Materials and Methods: This cross-sectional study included patients aged 65 and above. The Tilburg Frailty Indicator (TFI), the timed up and go (TUG) test, and the gait speed (GS) test were used. Independent determinants for different types of frailty and TUG and GS scores were examined using multivariate logistic and linear regression models.

Results: There were 263 individuals included in this study. The mean age of the individuals was 72.53±5.83 years old, and 46% of the individuals (n=121) were frailty. The total frailty score of the participants was 4.59±3.10, the mean TUG score was 10.28±3.11 s, and the GS score was 0.80±0.30 m/s. Female sex (adjusted odds ratio [aOR]=5.3), middle and bad health perception (aOR=6.8, aOR=58.3), poor living environment satisfaction (aOR=14.3), and TUG test score (aOR=1.6) were significantly associated with an increase in risk for frailty.

Conclusion: In this study, as we have found that factors such as sex, health perception, and gait speed affect frailty and factors such as age, polypharmacy, and frailty affect gait speed; the quality of life of the elderly can be improved with suitable intervention for these factors.

Keywords: Frailty, gait speed, elderly, quality of life, walking

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INTRODUCTION

At present, the increase in elderly population due to rapid developments in the field of medicine has been thought to lead to an increase in frail elderly population and associated problems (1). Frailty is a dynamic condition that results in the individual experiencing losses in one or more areas (physical, psychological, and social) of human body functions. Frailty manifests with aging and is affected by stressful situations (2, 3). Recently, the importance of the concept of frailty has increased in several studies related to old age and clinical care of the elderly (4). Life process factors, such as sociodemographic characteristics, lifestyle, life events, and environment-related factors, may directly contribute to and be associated with diseases that lead to frailty (2).

Geriatric assessment helps to improve the quality of life of elderly patients. These evaluations and personalized interventions have prevented many health-related adverse consequences, prolonging survival and reducing dependence on care (5).

A decrease in physical performance is inevitable in old age due to the loss of many body functions. Gait speed, used in the evaluation of physical performance, is accepted as a universal indicator of functional mobility (6). Among the current physical performance measures, the calculation of gait speed is the most appropriate method to be applied in standard clinical evaluations of the elderly because it is fast, inexpensive, and reliable (7). Certain factors are associated with slow gait speed in the literature; namely, aging, female sex, short stature, malnutrition, and cognitive impairment (8).

In this study, we aimed to determine the factors and life events that contribute to frailty and affects gait speed among older people using several tests.

MATERIALS and METHODS

This cross-sectional study was planned as a questionnaire study. The participants in the study consisted of people over 65 years of age who applied to family medicine outpatient clinics and family health training centers connected to the İzmir Katip Çelebi University faculty of medicine. The data were collected between

June and August 2018. Individuals over 65 years old who were qualified to answer the questions and who volunteered to participate in the study were included. Those who met these conditions were asked to participate in the study, and no specific selection was made. Questionnaires were administered through face-to-face interviews.

The sample size to be reached was calculated as at least 217 people with 95% power, 5% margin of error, 5% deviation, and 17% prevalence (prevalence of frailty in the elderly according to the study of Siriwardhana et al. (9). After the study was completed, the power analysis was performed using the statistical results of each item; the power analysis was above 95%. Ethics committee approval was obtained from the Izmir Katip Celebi University Non-Interventional Clinical Research Ethics Committee before starting the study (no. 163, 25.04.2018). In this study, a sociodemographic data questionnaire, the Tilburg Frailty Indicator (TFI), the timed up and go (TUG) test, and the gait speed (GS) test were used to collect data. Those who were below 65 years, who did not want to participate in the study, who gave incomplete answers to the questions, or who did not qualify to answer the questions were excluded from the study.

The sociodemographic data questionnaire consists of 16 questions about the status and amount of walking, smoking status and amount, alcohol drinking status and amount, number of people living in the house, working status, caring for someone in need of home care, constant usage of medicines, preference of applying to a health center, and quality of life. To avoid bias, an open-ended option was provided for each question.

The Tilburg Frailty Indicator: TFI, which was developed by Gobbens et al. in 2010, was translated into Turkish, and its reliability and validity were verified by Arslan et al. (10, 11). TFI is divided into two parts. Part A contains 10 questions about diseases and sociodemographic factors determining frailty, while Part B consists of 15 questions about three factors, physical, psychological, and social status, which are components of frailty. Eleven items of the scale have a two-answer category of "yes" and "no," and four items have a three-answer category of "yes," "sometimes," and "no." According to the question, the score of the answers varies and 0 or 1 point is taken from each question. Scores range from 0 to 15, and individuals scoring five or higher are considered to be frail (10).

The timed up and go test: Podsiadlo et al. (12) developed the TUG test in 1991 as a modification of the "get up and go" test. On being given a command, the individual gets up from the chair in which they are seated, walks at a comfortable and safe walking speed toward a line drawn 3 m ahead, and then turns around, returns to the chair, and sits back down. A duration longer than 12 s indicates low physical performance.

The gait speed test: While performing the GS test, the timer is started five steps after the individual starts walking and stopped after they have walked a distance of 5 m. The individual is told to stop after five more steps, and the time taken is recorded. Studies show that a GS score of <0.8 m/s indicates the probability of sick aging and an increased deterioration in physical functions, whereas a higher score indicates a healthy aging process (13).

Statistical analysis: The suitability of the variables to normal distribution was examined by visual (histogram) and analytical methods (Kolmogorov–Smirnov test). The numerical data collected were mean, median, standard deviation, and value range, while the categorical data were expressed as descriptive methods such as ratio and percentage.

Frailty scores and the relationships between different parameters with TUG and GS were analyzed using the chi-square test or Fisher's test, the Spearman or Pearson correlation coefficient, the Student's t-test, and the Mann–Whitney U test. Independent determinants for different types of frailty and TUG and GS score were examined using multivariate logistic and linear regression models. When creating the regression models, the relationship between frailty, TUG, and GS scores with each factor was evaluated separately. The factors that were statistically correlated with $p \leq 0.100$ were included in this regression model. Only one of the variables with a high correlation was included in the model. In assessing the model fit, the necessary residual and compliance statistics were used, and the cases where the type-1 error level was less than 5% were interpreted as statistically significant. $P<0.05$ was considered significant in the statistical subgroup analysis. The SPSS Statistics for Windows, version 22 (IBM Corp., Armonk, NY, USA) was used for the analyses.

RESULTS

There were 263 individuals included in the study. The mean age of the individuals was 72.53±5.83 years old; 51.3% (n=135) of the participants were male. Of the individuals, 52.9% (n=139) were educated at a primary or lower education level, 43% (n=113) belonged to medium income level, 71.5% (n=188) were married or living with a partner, 46% (n=121) were frail, 50.2% (n=132) used five or more medicines (polypharmacy) daily, and 78.3% (n=206) had a TUG score of 12 s or less. The total frailty score of the participants was 4.59±3.10, the mean TUG score was 10.28±3.11 s, and the GS score was 0.80±0.30 m/s. Of the individuals, 94.3% (n=248) had a chronic disease, 92.4% (n=243) took medication regularly, 47.5% (n=125) had good health perception, 93.9% (n=247) were satisfied with their living environment, 89.7% (n=236) were defined as having a good quality of life, 72.2% (n=196) were regularly took walks, 11% (n=29) were smokers, and 15.6% (n=41) regularly consumed alcohol. The total number of medications was 4.66±2.69, and the total number of chronic diseases was 2.97±1.51. The results of the evaluation of life events according to frailty, TUG, and GS test are given in Table 1 and Table 2.

According to the results of the logistic regression analysis on frailty, the female sex (aOR=5.3, 95% confidence interval [CI]=2.533–11.223); middle health perception (aOR=6.8, 95% CI=3.263–14.238); bad health perception (aOR=58.3, 95% CI=5.088–669.285); poor living environment satisfaction (aOR=14.3, 95% CI=1.424–143.966); and TUG score (aOR=1.6, 95% CI=1.350–1.984) were associated with a significant increase in risk of frailty. It was found that frailty of the female sex significantly increased by 5 times, middle health perception by 6 times, bad health perception by 58 times, poor living environment satisfaction by 14 times, and each one-unit increase in TUG score by 1.6 times (Table 3).

Table 1. Evaluation of life events according to frailty and timed up and go test

Life events	Frailty						TUG (s)					
	No		Yes		Statistical analysis		<12		≥12		Statistical analysis	
	n	%	n	%	x^2	p	n	%	n	%	x^2	p
Sex												
Women	45	31.7	83	68.6	35.61	<0.001***	94	45.6	34	59.6	3.51	0.073
Men	97	68.3	38	31.4			112	54.4	23	40.4		
Education Level												
Primary or lower (Low)	53	37.3	86	71.1	33.49	<0.001***	99	48.1	40	70.2	8.79	0.012*
High school and equivalent schools (intermediate)	45	31.7	25	20.7			60	29.1	10	17.5		
College/faculty or more (advanced)	44	31.0	10	8.3			47	22.8	7	12.3		
Income level												
1500 TL or less (low)	33	23.2	66	54.5	34.80	<0.001***	68	33.0	31	54.4	10.28	0.006**
1501TL–3500TL (medium)	67	47.2	46	38.0			92	44.7	21	36.8		
3501TL or more (high)	42	29.6	9	7.4			46	22.0	5	8.8		
Having chronic diseases	130	91.5	118	97.5	4.33	0.059	191	92.7	57	100	4.40	0.047*
Medication use	126	88.7	117	96.7	5.89	0.019*	186	90.3	57	100	5.98	0.009**
Health perception												
Good	102	71.8	23	19.0	79.83	<0.001***	116	56.3	9	15.8	37.07	<0.001***
Middle	39	27.5	76	62.8			80	38.8	35	61.4		
Bad	1	0.7	22	18.2			10	4.9	13	22.8		
A serious illness in yourself	28	19.7	41	33.9	6.77	0.011*	43	20.9	26	45.6	14.12	<0.001***
Serious illness in a loved one	34	23.9	43	35.5	4.24	0.042*	56	27.2	21	36.8	2.01	0.188
Living environment satisfaction	141	99.3	106	87.6	15.63	<0.001***	196	95.1	51	89.5	2.51	0.123
Good life quality	140	98.6	96	79.3	26.28	<0.001***	194	94.2	42	73.7	20.34	<0.001***
Being married or living with a partner	119	83.8	69	57.0	22.98	<0.001***	158	76.7	30	52.6	12.68	0.001**
Walking	117	82.4	73	60.3	15.86	<0.001***	156	75.7	34	59.6	5.75	0.020*
Polypharmacy	59	41.5	73	60.3	9.21	0.003**	90	43.7	42	73.7	16.06	<0.001***
Consuming alcohol	34	23.9	7	5.8	16.37	<0.001***	37	18.0	4	7.0	4.06	0.061
Smoking	17	12.0	12	9.9	0.28	0.694	26	12.6	3	5.3	2.46	0.152
	Mean±SD		Mean±SD		p		Mean±SD		Mean±SD		p	
Age	72.21±5.75		72.90±5.93		0.335		71.70±5.44		75.50±6.26		<0.001***	
Number of medications	4.25±2.80		5.14±2.48		0.008**		4.39±2.80		5.61±2.01		<0.001***	
Number of chronic diseases	2.74±1.59		3.24±1.36		0.007**		2.84±1.54		3.45±1.29		0.007**	
GS (m/sn)	0.94±0.31		0.64±0.20		<0.001***		0.89±0.27		0.46±0.09		<0.001***	

*: P<0.05; **: P<0.01; ***: P<0.001; TUG: Timed up and go; SD: Standard deviation; GS: Gait speed

Table 2. Evaluation of life events according to gait speed test

Life events	Gait speed (m/s)		
	Yes	No	Statistical analysis
	Mean±SD	Mean±SD	p
Sex (women)	0.70±0.23	0.89±0.33	<0.001***
Having chronic disease	0.79±0.30	1.03±0.29	0.003**
Medication use	0.78±0.30	1.02±0.31	0.001**
A serious illness in yourself	0.68±0.28	0.84±0.30	<0.001***
Serious illness in a loved one	0.75±0.25	0.82±0.32	0.046*
Living environment satisfaction	0.81±0.31	0.63±0.24	0.025*
Good life quality	0.82±0.30	0.58±0.26	<0.001***
Being married/living with a partner	0.85±0.30	0.67±0.27	<0.001***
Smoking	0.79±0.30	0.90±0.35	0.061
Frailty	0.64±0.20	0.94±0.31	<0.001***
Walking	0.84±0.31	0.70±0.25	0.001**
Polypharmacy	0.73±0.30	0.87±0.30	<0.001***
Consuming alcohol	0.96±0.29	0.77±0.30	<0.001***
	Gait speed (m/sec)		
Educational level			
Primary or lower (low) (I)	0.70±0.26		<0.001***
High school and equivalent schools (intermediate) (II)	0.87±0.32[a]		
College/faculty or more (advanced) (III)	0.95±0.30[b]		
Income level			
1500 TL or less (low) (IV)	0.69±0.27		<0.001***
1501TL–3500 TL (medium) (V)	0.83±0.30[c]		
3501 TL or more (high) (VI)	0.95±0.30[d]		
Health perception			
Good (VII)	0.93±0.31[e]		<0.001***
Middle (VIII)	0.70±0.24		
Bad (IX)	0.60±0.29		

*: P<0.05; **: P<0.01; ***: P<0.001; a: Significantly higher in Group II than Group I; b: Significantly higher in Group III than Group I; c: Significantly higher in Group V than Group IV; d: Significantly higher in Group VI than Group IV and Group V; e: Significantly higher in Group VII than Group VIII and Group IX; SD: Standard deviation

According to the results of the logistic regression analysis on TUG, the age (aOR=1.1, 95% CI=1.060–1.200), bad health perception (aOR=5.1, 95% CI=1.416–18.905), polypharmacy (aOR=2.2, 95% CI=1.059–4.846), and frailty (aOR=4.6, 95% CI=1.873–11.628) were associated with a significant increase in risk of slowed walking speed. It was found that low physical performance risk in terms of walking speed of each one-unit increase in age significantly increased by 1.1 times, bad health perception by five times, polypharmacy by two times, and the frailty by four times (Table 4).

In the multivariate linear regression analysis model on GS, age (β=–0.017), female sex (β=–0.112), educational level (β=0.043), having chronic disease (β=–0.132), absence of serious illness in yourself (β=–0.088), and frailty (β=–0.173) were found to be effective on GS (Table 5).

DISCUSSION

In this study, sociodemographic determinants and life events that influence frailty and gait speed were investigated. The results indicated that middle and the bad health perception, poor living environment satisfaction, and TUG score significantly increased frailty for the female sex. Meanwhile, bad health perception, polypharmacy, and frailty significantly increased the low physical performance risk of the age. Advanced age, female sex, having a chronic disease, absence of serious illness in yourself, and frailty were found to have a significant negative effect on walking, while the higher educational level had a positive effect.

In this study, the female sex increased the frailty score by five times. In the literature, several studies report that frailty is more common

Table 3. Results of logistic regression analysis on frailty

	Unadjusted OR (95% CI)	p	Adjusted OR (aOR) (95% CI)	p
Sex (women)	4.708 (2.794–7.934)	<0.001***	5.332 (2.533–11.223)	<0.001***
Health perception				
Middle	8.642 (4.768–15.665)	<0.001***	6.817 (3.263–14.238)	<0.001***
Bad	97.565 (12.504–761.255)	<0.001***	58.354 (5.088–669.285)	0.001**
Poor living environment satisfaction	19.953 (2.595–153.428)	0.004**	14.317 (1.424–143.966)	0.024*
Poor quality of life	18.229 (4.219–78.770)	<0.001***	5.706 (0.932–34.949)	0.060
Polypharmacy	2.139 (1.305–3.506)	0.003**	1.977 (0.743–5.265)	0.172
TUG score	1.752 (1.491–2.059)	<0.001***	1.636 (1,350–1.984)	<0.001***
Number of chronic diseases	1.253 (1.061–1.479)	0.008**	0.779 (0.556–1.092)	0.147

*: P<0.05; **: P<0.01; ***: P<0.001. OR: Odds ratio; CI: Confidence interval; TUG: Timed up and go test

Table 4. Results of logistic regression analysis on Timed Up and Go test

	Unadjusted OR (95% CI)	p	Adjusted OR (aOR) (95% CI)	p
Age	1.113 (1.059–1.171)	<0.001***	1.128 (1.060–1.200)	<0.001***
Health perception				
Middle	5.639 (2.570–12.375)	<0.001***	2.357 (0.930–5.971)	0.071
Bad	16.756 (5.762–48.728)	<0.001***	5.173 (1.416–18.905)	0.013*
Absence of serious illness in yourself	3.179 (1.710–5.911)	<0.001***	1.916 (0.898–4.086)	0.093
Single marital status	2.962 (1.606–5.464)	0.001**	1.858 (0.886–3.895)	0.101
Polypharmacy	3.609 (1.883–6.918)	<0.001***	2.265 (1.059–4.846)	0.035*
Frailty	9.717 (4.512–20.924)	<0.001***	4.666 (1.873–11.628)	0.001**

*: P<0.05; **: P<0.01; ***: P<0.001. OR: Odds ratio; CI: Confidence interval

in women than in men (14, 15). Here, frailty was detected in 68% of women and 31% of men, a significant difference. The reasons for this difference between the sexes remain unknown (5). Therefore, when analyzing frailty, the concept of sex should be explained not only by determining people's genetic, anatomical, and physiological characteristics but also by considering cultural characteristics such as social roles expressing psychological identity, access to resources, and role restrictions between sexes (15). Therefore, we should be more sensitive about frailty in older women. Although there was a significant relationship between frailty and medication use, educational and income levels, quality of life, marital status, walking, and chronic disease in univariate analyses, this significance was lost in multivariate regression analyses. Medication use was more frequent (p=0.028), educational and income levels were lower (p<0.001 and <0.001, respectively), quality of life was worse (p=0.048), and the frequency of married or living with a partner was lower (p<0.001), the frequency of walking was lower (p=0.009), and the frequency of chronic disease was higher (p=0.004) for women. The significance of these items on frailty in the regression model was lost. This can give us an idea about the reasons for the high prevalence of frailty among women in our country.

Contrary to our results, many studies in the literature argue that advanced age increases the risk of frailty (2, 16–18). Here, no effect on frailty due to age was detected. Several recently used

Table 5. Results of linear regression analysis on gait speed test

	β	%95 CI	p
Age	-0.017	-0.022; -0.012	<0.001***
Sex (women)	-0.112	-0.178; -0.047	0.001**
Educational level	0.043	0.003; 0.084	0.036*
Health perception	-0.046	-0.101; 0.009	0.104
Having chronic disease	-0.132	-0.259; -0.005	0.041*
Absence of serious illness in yourself	-0.088	-0.156; -0.020	0.011*
Frailty	-0.173	-0.247; -0.099	<0.001***
ΔR2 (%; p-value)		42.5***	

*: P<0.05; **: P<0.01; ***: P<0.001. β: Regression coefficient; CI: Confidence interval; ΔR2= Coefficient of determination

frailty scales focus on the physical component of frailty. Age is associated with the more physical components of frailty (14). Frailty increases due to factors such as decrease in physical performance, increase in the number of diseases, and increase in social isolation due to advanced age; however, it is believed that frailty reflects biological aging rather than chronological aging (19). Therefore,

rather than focusing on age, we believe that the concept of frailty, in which physical, psychological, and social dimensions are evaluated, would be more accurate.

Our study found that poor living environment satisfaction increased frailty by 14 times. When the life satisfaction of the older adult decreases, the tendency toward isolation and depression increases, and mobility problems are seen with a decrease in physical function. Therefore, older adults who are not satisfied with their living environment can be expected to have a high level of frailty. Our results indicated that having middle and bad health perceptions increased frailty by 6 times and 58 times, respectively. Living environment satisfaction and general health perception can directly affect a person's physical and mental health. Physical deficiencies, chronic diseases, cognitive disorders, and social isolation have negative effects on the quality of life, living environment satisfaction, and general health perception of the elderly (20). One of the essential goals in detecting frailty in the elderly through geriatric assessment is to improve their quality of life (20). The risk of frailty increases if the individual thinks that their quality of life is poor, if they are physically and mentally ill, and if they are not satisfied with their physical performance and cognitive and social status. As living environment satisfaction was worse ($p<0.001$) and bad health perception was more frequent ($p<0.001$) for individuals with a poor quality of life, the significance between the quality of life and frailty in the regression model was lost. From this sentence, it should not be understood that the quality of life has lost its importance for frailty. Quality of life, living environment satisfaction, and perception of health is statistically very related concepts. When the regression model is created for frailty, the model chooses those that will create much more significance. Therefore, the quality of life lost its significance in the regression model. Thus, quality of life, living environment satisfaction, and health perception are factors that directly affect and intersect with each other. All these factors should be taken into account when evaluating the elderly.

Our study found that each point increase in the TUG score increased the risk of frailty by 1.6 times. Gait speed was found to be –0.17 m/s slower in frail elderly. In addition, the risk of low physical performance (>12 sec) in terms of TUG was found to be four times higher in frail elderly. In their systematic review, Binotto et al. (21) stated that there is a relationship between slow gait speed and physical frailty and that gait speed should be measured when performing geriatric evaluations. In a cohort study of 126 patients with a mean age of 64 years, Soto et al. (22) found that gait speed was significantly lower in the frailty group. In the cohort study by Mance et al., (23) gait speed was found to be 30% slower in the frailty group. In a retrospective study conducted by Lee et al. (24) in primary care, frailty could be detected in more than 60% of individuals by looking at gait speed alone. In the studies of O'Donoghue et al. and Arjunan et al., a significant negative correlation was found between frailty and gait speed (25, 26). The slow walking speed we found in our study and the increase in frailty seem to be compatible with these results. Slow gait speed is a strong predictor of frailty (27). As walking difficulty is one of the physical components of frailty, the relationship between gait speed and frailty can be predicted.

Our study found that walking speed slows with increased age. In a review by Bohannon, it was reported that advanced age adversely affected gait speed and TUG (28). Causes that are correlated to age, such as the decreasing physical performance of individuals and the increasing number of chronic diseases and body pains, may affect walking speed (8). In the cohort study by Mance et al., (23) increase in age, female sex, low educational level, and poor health status were found to be associated with slow gait speed. In Bohannon's study, age, height, and waist circumference were found to be highly correlated with gait speed (8). In the cohort study by Sialino et al. (29) that included 2407 participants, female sex, lower educational level, and having more chronic diseases were found to be associated with slower gait speed. In our study, we found that a high educational level positively affected gait speed and shape. In the studies of Busch et al., (6) high educational status was found to be associated with an increase in walking speed. Similar to frailty, a low educational level is associated with factors such as low income, low self-confidence, and low cognitive status, which may adversely affect walking speed.

Our study concluded that polypharmacy increased the risk of low physical performance in terms of TUG by two times. In addition, gait speed was found to be –0.13 m/s slower in people who have chronic disease and –0.08 m/s slower in people who have a serious illness in themselves. de Groot et al. (30) found that gait speed decreased as the number of drugs used increased. Polypharmacy is known to be associated with disability, mortality, and a decrease in gait speed and power (31). Each additional disease increases the number of drugs used, and the symptoms and adverse effects of the medication may affect the patient's physical function by reducing their gait speed.

This study is one of the first steps in Türkiye toward determining the factors and life events contributing to frailty and gait speed using several tests. In our study, the factors affecting frailty and the appropriate walking tests to be conducted for people over 65 years of age were determined. In addition, regression models were created and the effects of these factors and their relationship with each other were discussed.

Limitations

The assessment of the quality of life, health perception, and satisfaction with the living environment was conducted through Likert-type questions rather than a scale. People were asked about their current perceptions on the subjects. The results may not be clear unless the perceptions are measured with a scale. This is a scale format bias. Likert-type questions were formed in a five-point format, and we attempted to reduce the effect of this limitation. In this way, an attempt was made to prevent end adversion bias. Since the data used in this study were collected from people who applied to health centers, this study cannot be generalized for the general public. The cognitive functions of the participants were not evaluated through a scale. In the power analysis, only the total sample size of the "having chronic disease" factor was 382. Since its power analysis was 0.84, it was accepted as an acceptable statistical error rate.

CONCLUSION

Many factors affect gait speed and frailty in the elderly. Identifying and correctly analyzing these factors is very important. By detecting a decrease in gait speed and an increase in frailty, early intervention can protect older adults from many adverse life events, including hospitalization and death. In our study, we have found that factors such as age, health perception, polypharmacy, and frailty

have effects on gait speed and that factors such as sex, health perception, living environment satisfaction, and gait speed have effects on frailty; the quality of life and the life expectancy of the elderly can be improved with the suitable intervention for these factors. Furthermore, suitable interventions can be applied for the older population, and future studies in this subject can further improve their quality of life and life expectancy.

Ethics Committee Approval: The Izmir Katip Celebi University Non-Interventional Clinical Research Ethics Committee granted approval for this study (date: 25.04.2018, number: 163).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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