

## Research Article

# Comparison of the frailty among older adults between the nursing home living versus own home living

Yaşlı yetişkinler arasında huzurevinde yaşayan ve kendi evinde yaşayanların kırılganlığının karşılaştırılması

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## Abstract

**Introduction:** This study aims to evaluate elder people according to their living place and gender in terms of frailty with the FRAIL Scale.

**Methods:** An observational cross sectional study was conducted between December 2019 and March 2020 with 113 patients aged  $\geq 65$  years who were admitted to a family health center in Istanbul. Patients registered at the nursing home address and patients living at their home address were assigned to the groups by the simple randomization method. A questionnaire including the demographic data and the FRAIL Scale which would evaluate the frailty was performed face-to-face. The Chi-square test was used for the statistical analysis.

**Results:** It was observed that 51.3% of 113 individuals over 65 years in the study were male ( $n = 24$ ), and the mean age was  $73.13 \pm 6.52$  years. Frailty was found to be 21.2% ( $n = 24$ ), according to the mean score of the FRAIL Scale ( $1.24 \pm 1.26$ ). The frailty rate (29.8%) of own home living elderly was found to be higher than the nursing home living elderly (12.5%) ( $p = 0.049$ ). The frailty rate of own home living men (27.6%) was higher than the nursing home living men (3.4%) ( $p = 0.038$ ). In FRAIL scale components, fatigue 19.5% ( $n = 22$ ), resistance 38.9% ( $n = 44$ ), ambulation 36.3% ( $n = 41$ ), disease 10.6% ( $n = 12$ ), weight loss 18.6% ( $n = 21$ ) of the scale component were included in the fragility measurement. In the analysis of the answers, the internal consistency of the scale was moderate level (Cronbach alpha = 0.552).

**Conclusions:** According to this study, one out of every five elderly was frail. Based on the fact that the elderly especially own home living men, are more fragile, and nursing home living women are seen at an older age, the results drew attention to the importance of nursing homes in the course of frailty in the future.

**Keywords:** Nursing home, frailty, elderly, reliability

## Öz


**Giriş:** Bu araştırmanın amacı yaşlı bireylerin yaşadıkları yer ve cinsiyetlerine göre FRAİL Ölçeği ile kırılganlık açısından değerlendirilmesidir.

**Yöntem:** Gözlemsel (vaka-kontrol) tipte olan çalışma İstanbul'da bir aile sağlığı merkezi birimine kayıtlı 65 yaş ve üzeri 113 hasta ile Aralık 2019- Mart 2020 tarihleri arasında gerçekleştirildi. Huzurevi adresine kayıtlı olanlar ve kendi ev adresinde kalanlar basit randomizasyon yöntemi ile gruplara atandı. Hastaların demografik verileri ile kırılganlık düzeyini ölçen FRAİL ölçeğini içeren anket yüz yüze uygulandı. İstatistiksel analizde Ki-kare testi grupların karşılaştırılmasında kullanıldı.

**Bulgular:** Çalışmaya katılan 65 yaş üzeri 113 bireyin %51,3'ünün erkek ( $n=24$ ) ve yaş ortalamasının  $73,13\pm6,52$  yıl olduğu gözlemlendi. FRAİL Ölçeği puan ortalamasına ( $1,24\pm1,26$ ) göre %21,2 ( $n=24$ ) düzeyinde kırılganlık saptandı. Kendi evinde yaşayan yaşlıların kırılgan olma oranları (%29,8), huzurevinde yaşayan yaşlılardan (%12,5) daha sık bulundu ( $p=0,049$ ). Özellikle kendi evinde yaşayan erkeklerin kırılganlık oranı (%27,6), huzurevinde yaşayan erkeklerden (%3,4) daha yüksek izlendi ( $p=0,038$ ). FRAİL ölçek alt başlıklarında; yorgunluk bileşeni %19,5 ( $n=22$ ), direnç bileşeni %38,9 ( $n=44$ ), ambulasyon bileşeni %36,3 ( $n=41$ ), hastalık bileşeni %10,6 ( $n=12$ ), kilo kaybı bileşeni %18,6 ( $n=21$ ) oranında kırılganlık ölçümüne dahil olmuştur. Verilen yanıtların analizinde ölçeğin iç tutarlılığı orta düzeyde (Cronbach alfa=0,552) saptanmıştır.

**Sonuç:** Bu çalışmaya göre her beş yaşlıdan biri kırılgandır. Kendi evinde yaşayan yaşlıların, özellikle erkeklerin daha kırılgan olması, huzurevinde yaşayan kadınların daha ileri yaşta görülmesi, gelecekte kırılganlığın seyrinde bakımevlerinin önemine dikkat çekmiştir.

**Anahtar Kelimeler:** Huzurevi, kırılganlık, yaşlılık, güvenilirlik

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## Introduction

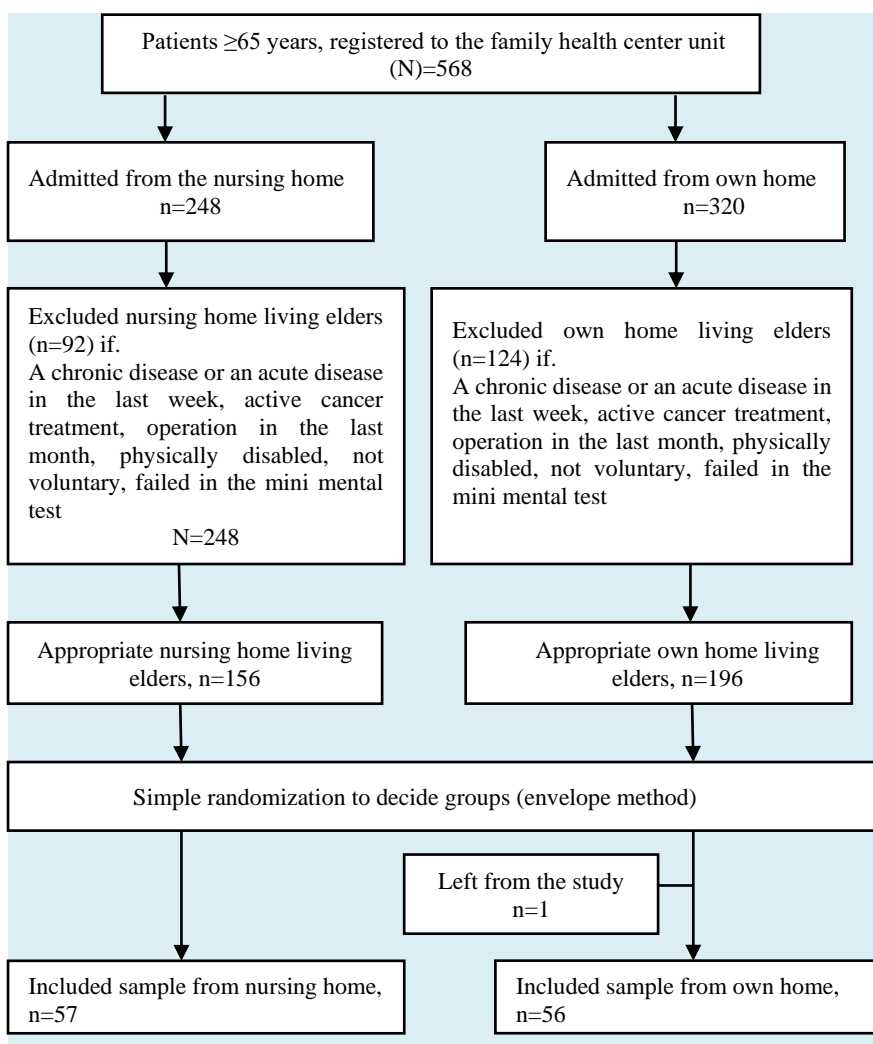
The ratio of the elderly population exceeding 10% in the total population is an indicator of the aging of the population, and the elderly population in Turkey has increased by 22.5% in the last five years. The ratio of the elderly to the general population is expected to be 25.6% in 2080 [1]. Frailty syndrome presents as the state of weakness that occurs due to reasons such as physiological aging process, malnutrition, and illness, and it occurs in the elderly in nursing institutions, who have become dependent on someone else in their daily activities [2,3]. The prevalence of frailty ranges from 4% to 10% in population-based studies and 18% to 40% in hospital-based studies [3].

Although there are many fragility scales used worldwide, in Turkey, Tilburg, Edmonton, and FRAIL Scales, of which's Turkish validity and reliability are sufficient, are frequently used [3-6]. Frailty scales provide a simple, structured evaluation opportunity especially for family physicians for elderly patients with multiple comorbidities [7]. The FRAIL Scale was preferred in this study due to being a short and rapid test developed to measure fragility.

In this study, we aimed to compare the level of vulnerability with the FRAIL Scale, regarding the age and gender among individuals over the age of 65 who live either in a nursing home or their own home.

## Methods

This observational randomized case-control study was conducted with 113 elderly people over the age of 65 registered in Nevzat Ayaz Family Health Center in Sultangazi district of Istanbul province, between December 1, 2019, and March 1, 2020. The study sampling analysis showed there must be at least 52 cases in each group and 104 cases in total were needed for 95% power with a type 1 error of 5% (two-tailed) according to the pilot study. The study population consisted of 568 patients over 65 years of age, registered to the family healthcare unit. In order to determine the study sample, those registered at the nursing home address according to the registration date to the family healthcare unit and those registered at their home address were listed in separate groups. By the simple randomization technique, patient selection for both groups with the envelope method is shown in **Figure 1**.



**Figure 1-** Flowchart of the patient selection

Patients over 65 years of age, whose standardized mini-mental test score was above 23 and whose written informed consent was obtained to participate were included in the study. Patients under active cancer treatment, in the acute exacerbation phase of chronic disease, who had an acute infection within the last week or a history of surgery in the past 3 months and were physically disabled patients were excluded from the study. The

study was completed with a total of 113 patients, 57 in nursing homes and 56 living in their own homes. In the study, patients' demographic characteristics such as age, gender, disease, drug use, and fragility levels according to the FRAIL Scale scores were evaluated. The FRAIL Scale was developed in 2004 by Morley et al. [8]. Turkish validity and reliability study was performed by Hymabaccus et al. in 2017 [6]. The scale examines the variables of fatigue, resistance (inability to climb one floor of stairs), ambulation (difficulty in walking more than one block), illness ( $\geq 5$  comorbid diseases), and weight loss (loss of  $\geq 5\%$  of actual weight). The scores were classified as fit (0 points), pre-frail (1-2 points) and frail (3 points and above) [6].

**Ethical approval, informed consent and permissions**

This study was conducted with the approval of the Clinical Research Ethics Committee of Taksim Training and Research Hospital on date November 13, 2019/ approval no=166. All participants were informed about the study and written consent was obtained.

**Statistical analysis**

Statistical analysis was performed by IBM SPSS Statistics 22 (IBM SPSS, Turkey) software. To evaluate the study data, descriptive statistical methods (mean, standard deviation, frequency), Student t-test for comparing normally distributed parameters between two groups, and Mann Whitney U test for comparisons of non-normally distributed parameters between two groups were used. Chi-Square test, Fisher's Exact test, Fisher Freeman Halton test, and Continuity (Yates) Correction were used for comparison of qualitative data. P <0.05 levels were considered significant.

**Results**

A total of 113 older patients, 56 (49.6%) living in a nursing home and 57 (50.4%) living in their own home, with a mean age of  $73.13 \pm 6.52$  years participated in this study. The FRAIL Scale score of those living in nursing homes and their own homes were found to be similar, with a score of  $1.09 \pm 1.12$  and  $1.39 \pm 1.37$ , respectively ( $p = 0.311$ ). The total fragility score of the participants was  $1.24 \pm 1.26$ . Among the participant's, fit status was reported as 21.2% (n = 24) and pre-frailty as 38.1% (n = 43). According to the results, 29.8% (n = 17) of the elderly living in their own home and 12.5% (n = 7) of the elderly living in a nursing home were frail with a significant difference ( $p=0.049$ ). In **Table 1**, the age, gender, and frailty status of the participants are reported. The mean age of women living in nursing homes was higher than women living in their own homes ( $p = 0.001$ ).

**Table 1.** Evaluation of the age, gender, and frailty of participants

	Living in a nursing home	Living in own home	P-value
<b>Age</b> $\bar{x} \pm ss$			
Male	74.31 $\pm$ 6.88	73 $\pm$ 6.67	<sup>1</sup> 0.465
Female	76.11 $\pm$ 6.57	69.18 $\pm$ 3.61	<sup>1</sup> 0.001
<b>Gender</b> <sub>n (%)</sub>			
Male	29 (%51.8)	29 (%50.9)	<sup>2</sup> 0.923
Female	27 (%48.2)	28 (%49.1)	
<b>Frailty Status</b>			
Fit	23 (%41.1)	23 (%40.4)	<sup>2</sup> 0.049
Pre-frail	26 (%46.4)	17 (%29.8)	
Frail	7 (%12.5)	17 (%29.8)	

<sup>1</sup>Student t-test    <sup>2</sup>Chi-square test

**Table 2** represents the gender distributions of the presence of disease questioned in the FRAIL Scale according to the place of residence. Chronic disease rates did not have a different distribution regarding people living in both their own home and nursing home, and the most common diagnosis was hypertension.

**Table 2.** Comparison of the diseases questioned in FRAIL scale according to the place of living and gender between two groups

Diseases	Living in a nursing home				Living in own home				P
	Male n (%)	Female n (%)	Total	P	Male n (%)	Female n (%)	Total	P	
<b>Hypertension</b>	23 (%79.3)	18 (%66.7)	41 (%73.2)	<sup>1</sup> 0.444	22 (%75.9)	21 (%75.0)	43 (%75.4)	<sup>1</sup> 1.000	<sup>1</sup> 0.956
<b>Diabetes Mellitus</b>	8 (%27.6)	8 (%29.6)	16 (%28.6)	<sup>1</sup> 1.000	8 (%27.6)	14 (%50.0)	22 (%38.6)	<sup>1</sup> 0.143	<sup>1</sup> 0.353
<b>Cancer</b>	2 (%6.9)	3 (%11.1)	5 (%8.9)	<sup>2</sup> 0.664	1 (%3.4)	0 (%0)	1 (%1.8)	<sup>2</sup> 1.000	<sup>2</sup> 0.113
<b>Chronic obstructive pulmonary disease</b>	11 (%37.9)	5 (%18.5)	16 (%28.6)	<sup>1</sup> 0.190	8 (%27.6)	3 (%10.7)	11 (%19.3)	<sup>1</sup> 0.201	<sup>1</sup> 0.350
<b>Myocardial infarction</b>	1 (%3.4)	0 (%0)	1 (%1.8)	<sup>2</sup> 1.000	1 (%3.4)	1 (%3.6)	2 (%3.5)	<sup>2</sup> 1.000	<sup>2</sup> 1.000
<b>Congestive heart disease</b>	2 (%6.9)	2 (%7.4)	4 (%7.1)	<sup>2</sup> 1.000	3 (%10.3)	2 (%7.1)	5 (%8.8)	<sup>2</sup> 1.000	<sup>2</sup> 1.000
<b>Peripheral artery disease</b>	7 (%24.1)	4 (%14.8)	11 (%19.6)	<sup>1</sup> 0.589	4 (%13.8)	5 (%17.9)	9 (%15.8)	<sup>2</sup> 0.730	<sup>1</sup> 0.772
<b>Asthma</b>	2 (%6.9)	5 (%18.5)	7 (%12.5)	<sup>2</sup> 0.244	5 (%17.2)	6 (%21.4)	11 (%19.3)	<sup>1</sup> 0.948	<sup>1</sup> 0.465
<b>Rheumatoid arthritis</b>	0 (%0)	1 (%3.7)	1 (%1.8)	<sup>2</sup> 0.482	1 (%3.4)	2 (%7.1)	3 (%5.3)	<sup>2</sup> 0.611	<sup>2</sup> 0.618
<b>Cerebrovascular infarction</b>	8 (%27.6)	7 (%25.9)	15 (%26.8)	<sup>1</sup> 1.000	5 (%17.2)	3 (%10.7)	8 (%14)	<sup>2</sup> 0.706	<sup>1</sup> 0.147
<b>Chronic renal disease</b>	1 (%3.4)	1 (%3.7)	2 (%3.6)	<sup>2</sup> 1.000	0 (%0)	1 (%3.6)	1 (%1.8)	<sup>2</sup> 0.491	<sup>2</sup> 0.618

<sup>1</sup> Continuity (yates) correction    <sup>2</sup> Fisher's Exact Test    n=number of cases    %=percentage

In **Table 3**, no significant statistical difference was found when the frequency of the resistance when climbing the stairs, the strain when walking a block distance (ambulation), the presence of disease, and weight loss status. On the other hand, the rate of feeling fatigue all the time/most of the time (29.8%) of people living in their own home is statistically significantly higher than people living in nursing homes (8.9%) ( $p=0.010$ ). According to the total frail score, the frailty rate of people living in their own home (29.8%) is statistically significantly higher than those living in a nursing home (12.5%) ( $p=0.049$ ).

**Table 3** Evaluation of the parameters regarding the FRAIL scale components and frailty level between two groups

Feature	Living in a nursing home			P	Living in own home			P	P	
	Male n (%)	Female n (%)	Total n (%)		Male n (%)	Female n (%)	Total n (%)			
Fatigue	Sometimes/ Very rare/ Never	27 (%93.1)	24 (%88.9)	51 (%91.1)	<sup>1</sup> 0.664	22 (%75.9)	18 (%64.3)	40 (%70.2)	<sup>2</sup> 0.506	<sup>3</sup> 0.010
	Always / often	2 (%6.9)	3 (%11.1)	5 (%8.9)		7 (%24.1)	10 (%35.7)	17 (%29.8)		
Resistance while climbing stairs	No	22 (%75.9)	16 (%59.3)	38 (%67.9)	<sup>2</sup> 0.297	16 (%55.2)	15 (%53.6)	31 (%54.4)	<sup>1</sup> 1.000	<sup>3</sup> 0.202
	Yes	7 (%24.1)	11 (%40.7)	18 (%32.1)		13 (%44.8)	13 (%46.4)	26 (%45.6)		
Ambulation	No	22 (%75.9)	15 (%55.6)	37 (%66.1)	<sup>2</sup> 0.186	15 (%51.7)	20 (%71.4)	35 (%61.4)	<sup>2</sup> 0.209	<sup>3</sup> 0.749
	Yes	7 (%24.1)	12 (%44.4)	19 (%33.9)		14 (%48.3)	8 (%28.6)	22 (%38.6)		
Presence of disease	0-4	26 (%89.7)	23 (%85.2)	49 (%87.5)	<sup>1</sup> 0.700	27 (%93.1)	25 (%89.3)	52 (%91.2)	<sup>1</sup> 0.670	<sup>1</sup> 0.736
	≥5	3 (%10.3)	4 (%14.8)	7 (%12.5)		2 (%6.9)	3 (%10.7)	5 (%8.8)		
Weight Loss	<%5	22 (%75.9)	22 (%81.5)	44 (%78.6)	<sup>1</sup> 0.852	24(%82.8)	24(%85.7)	48 (%84.2)	<sup>1</sup> 1.000	<sup>1</sup> 0.597
	>%5	7 (%24.1)	5 (%18.5)	12 (%21.4)		5 (%17.2)	4 (%14.3)	9 (%15.8)		
Frailty status	Fit	13 (%44.8)	10 (%37)	23 (%41.1)	<sup>3</sup> 0.123	11(%37.9)	12(%42.9)	23 (%40.4)	<sup>4</sup> 0.736	<sup>4</sup> 0.049
	Pre-frail	15 (%51.7)	11 (%40.7)	26 (%46.4)		10(%34.5)	7 (%25)	17 (%29.8)		
	Frail	1 (%3.4)	6 (%22.2)	7 (%12.5)		8 (%27.6)	9 (%32.1)	17 (%29.8)		

<sup>1</sup> Fisher's Exact Test <sup>2</sup> Continuity (yates) correction <sup>3</sup>Fisher Freeman Halton Test <sup>4</sup>Chi-Square Test X: mean. SS: Standard deviation n=number of cases %=percentage

In the study, fatigue component 19.5% (n = 22), resistance component 38.9% (n = 44), ambulation component 36.3% (n = 41), disease component 10.6% (n = 12), and weight loss component was included in the frailty score with a rate of 18.6% (n = 21).

In **Table 4**, the internal consistency reliability of the FRAIL Scale components was evaluated according to the answers of the participants. The total Cronbach's alpha value of the FRAIL Scale items was found to be 0.552 which was moderately reliable. While the internal consistency coefficients of the scale items for fatigue, resistance, and ambulation were above 0.50 and at a moderate level of internal reliability. The internal consistency of the disease and weight loss items were found to be below 0.50.

**Table 4.** Evaluation of the internal consistency reliability of the test and FRAIL Scale components according to the answers of the participants

FRAIL Scale Component Items	Cronbach alfa
Fatigue	0.362
Resistance	0.656
Ambulation	0.515
Presence of disease	0.010
Weight loss	0.056
<b>Total score</b>	<b>0.552</b>

## Discussion

In this present study, one out of every five patients over the age of 65 years were found to be frail. The fact that elders living in their own homes were frailer than those living in the nursing home draw attention to the need for care units or caregivers for older adults. To be a man living own home that was related to the significantly high frailty was thought since men had increased self-care needs more than women.

In the studies conducted in Turkey, the presence of the frailty was found to be 39.2%. In the validity and reliability studies of the FRAIL Scale in countries such as China, Korea, Mexico, frailty rates were found 17.2%, 17.5%, and 10.4%, respectively [9-11]. In our study, the presence of frailty was 21.2%, which was similar to the literature. In a study by Ozdemir et al., the rate of frailty in patients hospitalized in a geriatrics clinic which was evaluated with different scales was found between 63.1% and 91.2% [12]. This result confirmed that hospitalized patients would be frailer. In our study, the result that the frailty (12.5%) among those living in a nursing home was lower than the frailty among those living in their own home (29.8%) was unexpected.

In a study conducted on women in Australia, it was observed that frailty has increased with age and the presence of female frailty increased from 5.6% aged 73-78 years to 16.2% aged 85-90 years [13]. Considering the distribution of the elderly population in our country in 2019, it was observed that the population of women over 65 years was higher, with a distribution of 44.2% male population and 55.8% female population [1]. In our study, the rate of women was observed close to men's, with a participation rate of 48.7%. When the genders were compared, women living in nursing homes were significantly older than women living in their own homes, while there was no difference in men. It may comment that women might be applying to nursing homes at an older age than men, as their self-care may be better. In the literature, the female gender is the second (12.8%) risk factor for frailty, following the age factor [3]. However, being a woman did not have a significant difference in terms of gender in our study.

Frail individuals face higher rates of negative consequences; therefore, it is important to evaluate frailty in the early stages [14]. The presence of pre-frailty in Turkey is 43.3%. In the study, the pre-frailty rate (38.1%) was determined more than the fragility rate (21.2%). Although it was not statistically significant, half of the elderly men (51.7%) living in the nursing home, and one-third (34.5%) of the men living in their home were pre-frail. It has been concluded that the need for nursing homes may be more important for especially elderly men, compared to women in terms of preventing frailty.

In the Korean version of the FRAIL Scale, it was observed that the components of frailty contributed at a rate as follows: fatigue 36.9%, endurance 38.8%, ambulation 26.2%, disease 2.9%, and weight loss 35.9% [10]. In our country, in the study by Soyuer et al., the frailty components contributed to the frailty with the rates of fatigue component 64.9%, endurance component 35.1%, ambulation component 48.6%, disease component 8.3%, and weight loss component 16.7% [16]. When compared with the fatigue component of 19.5% in our study, this high difference was thought to be secondary to the effect of pain and restriction of movement in the knee pain group of the study population of Soyuer et al.. However, the resistance component of 35.1% and the ambulation component of 48.6% in the study of Soyuer et al. were close to the 38.9% resistance and 36.3% ambulation component in our study. It was suggested that components such as depression, anxiety, sleep quality might be effective in addition to pain components.

Depending on cultural behaviors, Turkish family members are heavily burdened with elderly people in their family and may not tolerate leaving an elder parent in a long-term care unit [17]. In the Turkish family model, caregiver burden is mild to moderate and correlates with the frailty [17]. This cultural structure and the lack of services for the elderly cause great difficulties in older ages [17]. In our study, the reason of higher rate on frailty at own home living than the nursing home living was thought to be due to the cultural reasons that elderly parents did not prefer nursing home care.

In the evaluation of the frailty with the FRAIL Scale, the total internal reliability of the test was observed to be moderate (Cronbach's alpha = 0.552), according to the answers in the study sample. The reliability finding in our study was lower than the original (Cronbach alpha = 0.787) validation study of the FRAIL scale conducted by Hymabaccu et al. [6]. It seems that patients' responses to the last two components for illness and weight loss may cause this finding. It may be commented that the amount of weight loss and the number of additional diseases may be subjective depending on the verbal patient measure as a confounding factor while responding.

## Limitations

The absence of measurements of the participants regarding self-care management or caregiving need was a limitation of the study.

## Conclusion

In our comparison of the frailty among older adults between the nursing home living versus own home living, it was demonstrated living own home was a stronger reason than nursing home living for frailty especially among old men. Nevertheless, it should be supported by larger and longitudinal studies for generalizing the results of our single-centered observational search. Our findings drew attention to the need for elderly care units. The fact that the elderly people's perception of weight loss and disease awareness was not clear, revealed the importance of elderly health screenings in family medicine practice by family physicians.

## Conflict of Interest

The authors reported no conflict of interest.

Author Contributions		Author Initials
SCD	Study Conception and Design	SSA, MMB, OB
AD	Acquisition of Data	SSA, MMB, OB
AID	Analysis and Interpretation of Data	SSA
DM	Drafting of Manuscript	SSA, MMB, OB
CR	Critical Revision	MMB

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**Prior publication:** The study has not been presented as an abstract or has not been totally or partly published before.

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