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Research Paper – Araştırma Makalesi

INVESTIGATION OF THE RELATIONSHIP BETWEEN FRAILTY AND DEPENDENCY IN INDIVIDUALS LIVING IN A NURSING HOME

HUZUREVİNDE YAŞAYAN BİREYLERDE KIRILGANLIK VE BAĞIMLILIK ARASINDAKİ İLİŞKİNİN İNCELENMESİ

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Özet

Yaşlanmayla birlikte ortaya çıkan kırılganlık bağımlılık riskini artırmaktadır. Bu çalışma yaşlı bireylerde kırılganlık düzeyini belirlemek amacıyla yapılmıştır. Tanımlayıcı ve kesitsel nitelikteki çalışma, 15.10.2019-30.02.2020 tarihleri arasında huzurevinde kalan 68 yaşlı ile gerçekleştirildi. Veriler araştırmacı tarafından Tanıtıcı Bilgi Formu, Edmonton Kırılganlık Ölçeği ve Barthel İndeksi kullanılarak yüz yüze görüşmeler yoluyla toplanmıştır. Katılımcıların %69,1'i kadındı ve yaş ortalaması 77±10 idi. İleri derecede kırılganlığı olan yaşlı sayısı 22 (%32,4), tamamen bağımlı olan yaşlı sayısı ise 23 (%33,8) olup aralarında istatistiksel olarak anlamlı ilişki bulunmuştur (X2=19,55, p=0,00). Huzurevinde yaşayan yaşlılarda kırılganlık görülme sıklığı yüksekti. Kırılganlığın görülme sıklığına paralel olarak bağımlılık düzeyleri de yüksek bulunmuştur. Yaşlıların bağımlılık düzeylerinin azaltılması için kırılganlık açısından değerlendirilmesi önerilmektedir.

Anahtar Kelimeler: Yaşlı, Kırılganlık Sendromu, Bağımlılık, Erken Tanı, Huzurevi

Abstract

The fragility that occurs with aging increases the risk of dependency. This study was conducted to determine the level of fragility in elderly individuals. The descriptive and cross-sectional study was conducted with 68 elderly people staying in nursing homes between 15.10.2019 and 30.02.2020. Data were collected through face-to-face interviews by the researcher using the Introductory Information Form, Edmonton Frail Scale and Barthel Index. 69.1% of the participants were female and the mean age was 77±10. The number of elderly with severe frailty was 22 (32.4%), and the number of those who were completely dependent was 23 (33.8%), and a statistically significant relationship was found between them (X^2=19.55, p=0.00). The incidence of frailty was high in the elderly living in nursing homes. In parallel with the incidence of fragility, dependency levels were also found to be high. It is recommended to evaluate the elderly in terms of fragility in order to reduce their dependency levels.

Keywords: Older Adults, Frailty Syndrome, Dependence, Early Diagnosis, Nursing Home.

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1. INTRODUCTION

Although the beginning of the old age period is accepted as 65 years by the World Health Organization, it may change depending on the living conditions, life expectancy and health insurance systems of the countries (Çilesiz and Behsdioğlu, 2023, pp.83-95). According to the latest population projections published by TURKSTAT, it is reported that the aging of the population of Turkey is accelerating and the decline in fertility and mortality rates according to OECD reports is the main determinant in this regard (TUIK, 2019; OECD, 2022). In this population experiencing the aging process, in age-related physiological reserves; Increased sensitivity to external stresses due to loss of function in the neuromuscular, metabolic, and immune systems triggers the frailty syndrome (Xue, 2011, pp.1-15).

It is a multifaceted geriatric syndrome that includes biological, physiological, cognitive, social, economic, and environmental factors that are very different from frailty, comorbidity, and disability (Rolfson, 2006, pp.526-529). In dependence, fragility is a complex condition that includes physical, mental, and social dimensions of health, such as being dependent on others, increasing the rate of dependency as we get older, deficiencies in body systems, deterioration of communication with people and the environment, the presence of multiple and chronic diseases, and the increase in symptoms that occur with aging. It is also expressed as (Cleg et al., 2019, pp.752-762).

Frailty is a syndrome that can be prevented if diagnosed at an early stage or at least delayed by intervening in the signs of frailty. Therefore, early diagnosis and treatment of frailty gain importance (Rolfson et al., 2006, pp.526-529; StrandbergandPitkala, 2007, pp.1328-1329). The incidence of fragility varies depending on the various definitions of fragility. Studies have shown prevalence figures ranging from 7% to 32% in community-dwelling individuals (LalyandCrome, 2007, pp. 16-20; Shamliyan et al., 2013, pp.719-736). Although there are few studies on the prevalence of frailty in the elderly in Turkey, there is not enough conclusive data on the frail elderly yet (Aras et al., 2011, pp.130-137). Studies indicate that living space can be associated with fragility (Rockwood et al., 2006, pp.975-979). However, no study has been found in the literature in which the relationship between the frailty prevalence of the elderly living in nursing homes and the level of dependence has been found. This study aims to determine the relationship between the prevalence of fragility and the dependence level of individuals living in nursing homes and to draw attention to this issue.

2. METHODS

This cross-sectional study was planned to evaluate the frailty levels of elderly individuals living in a public nursing home in Adana. The bed capacity of the nursing home where the research was conducted was 150, and at the time the research was conducted, a total of 138 individuals aged 60 and over were living in the nursing home, 50 of whom were in the dementia department. Before starting the study, Non-Interventional Clinical Research Ethics Committee approval (decision number: 64, date: 01.02.2019) and written permission from the Provincial Directorate of Family, Labor and Social Services (decision number: 605.01-6, date:

26.09.2019) was obtained. Although patient selection in the study was voluntary, verbal and written consent was obtained from the participants; They were informed about the protection of elements such as confidentiality and confidentiality and that they could leave the study at any time. The population of the research consisted of individuals living in a nursing home at the time the research was conducted. People who were over 65 years of age, stayed in the institution for at least one year, were not in the terminal period, did not have cognitive impairment, dementia, or mental illness (major depression, schizophrenia, psychosis, etc.), could be contacted and volunteered to participate in the study were included in the study. The study aimed to reach all 88 people, except the patients hospitalized in the dementia ward. 3 of the 88 elderly people were in the terminal period, and 17 patients did not agree to participate in the study. As a result, the sample of the study consisted of 68 elderly people who met the inclusion criteria.

Data collection was carried out by two researchers between 15.10.2019 and 30.02.2020. Individual interviews were conducted in a private room and lasted an average of 25 minutes. An introductory information form was prepared by the researcher by examining the literature on the subject; It consists of a total of 11 questions questioning the socio-demographic characteristics of the individual (age, gender, marital status, educational status, etc.) and disease-related characteristics. Information about diseases and drugs was confirmed from the medical records of each elderly person after they were obtained from him. In addition, information was collected on frailty profiles with the Edmonton Frail Scale and daily living activities with the Barthel Index.

The Edmonton Frail Scale: The Turkish validity and reliability study of the scale, which was developed to assess fragility in the elderly, was conducted. The Cronbach's alpha value of the original scale was 0.62 and it was found to be a valid and reliable tool (Rolfson et al., 2006, pp.526-529; Aygör 2013, pp.1-283). The scale consists of 11 questions and is evaluated in the range of 0-20 points. If the score from the scale is in the range of 0-4, the elderly individual is not fragile; It is evaluated as vulnerable in the range of 5-6, slightly fragile in the range of 7-8, moderately fragile in the range of 9-10, and severely fragile in the range of 11 points and above. The Cronbach alpha value of the scale is 0.75 (Aygör, 2013, pp.1-283). In this study, the Cronbach's alpha value of the scale was calculated as 0.66.

The Barthel Index: The Barthel Index, which was developed by Mahoney and Barthel in 1965 and is one of the most frequently used indexes in the evaluation of daily life functions in our country, evaluates the individual's daily functions (eating, walking, going to work, going to the toilet, bathing, going somewhere inside or outside the building) was evaluated as the ability to perform without assistance. The Cronbach's alpha value of the original scale was 0.93 and it was found to be a valid and reliable tool (Mahoney and Barthel, 1965, pp. 61-65). The total score of the index, whose reliability study was conducted in Turkey, is "100". According to the scores obtained from the relevant departments; It was evaluated as 0-20 points: Completely dependent, 21-61 points: Severely dependent, 62-90 points: Moderately dependent, 91-99 points: Mildly dependent, 100 points: Completely independent. Cronbach's alpha coefficient, which shows the internal consistency of the scale, was 0.94 for the first measurement; For the second measurement, a very high reliability of 0.94 was found. (Küçükdeveci et al., 2000, pp. 87-92). In this study, the Cronbach's alpha value of the scale was calculated as 0.93.

The data obtained were evaluated using the SPSS (Statistical Package of Social Science version 21) package program. While evaluating the findings obtained in the study, Pearson Chi-

Square analysis was used to compare quantitative data as well as descriptive statistical methods (Mean, Standard deviation). The results were evaluated at the 95% confidence interval and the significance level of $p<0.05$.

3. RESULTS

It was found that 39.7% of the participants were between the ages of 65-74, 32.4% were severely frail, and 33.8% were completely dependent (Table 1).

Table 1: Examination of the Demographic Characteristics of the Participants

Variable (n=68)	n (number)	% (percentel)
Gender		
Female	47	69.1
Male	21	30.9
Marital Status		
Single	43	63.2
Married	25	36.8
Age Groups (Age mean=77±10)		
Young Old Age (65-74 years)	27	39.7
Middle Old Age (75-84 years)	24	35.3
Late Old Age (85 and above)	17	25
Educational Status		
Illiterate	31	45.6
Literate	3	22.1
Primary School	24	35.3
High School	6	8,8
Licence	4	5.9
Presence of Chronic Disease		
Yes	45	85.3
No	23	14.7
Regular Exercise Status		
Yes	15	22.1
No	53	77.9
Drug Use Status (Number of drugs mean=4±4)		
Yes	58	85.3
No	10	24.7
Edmonton Frail Scale		
Not Fragile (0-4 points)	6	8.8
Fragile in Visible (5-6 points)	13	19.1
Slightly Fragile (7-8 points)	10	14.7
Moderate Fragile (9-10 points)	17	25
Severe Fragile (11 points and above)	22	32.4
Barthel Index		
Fully Dependent (0-20 points)	23	33.8
Highly Dependent (21-61 points)	15	22.1
Moderately Dependent (62-90 points)	16	23.5
Mildly Dependent (91-99 points)	4	5.9
Fully Independent (100 points)	10	14.7

*Data are expressed as numbers (n) and frequency (%).

When the personal characteristics of the participants and their fragility levels were compared, a significant relationship was found only between gender and fragility level (p=0.01). The level of severe fragility of women (28.4%) was higher than that of men (Table 2).

Table 2: Examination of the Relationship Between the Characteristics of the Participants and the Frailty Levels

Variable (n=68)	Edmonton Frail Scale										Statistical Probability Value
	Not Fragile		Vulnerable in Visible		Slightly Fragile		Medium Fragile		Severely Fragile		
Gender	N	%	N	%	N	%	N	%	N	%	
Female	2	3	6	9	7	10.4	13	19.4	19	28.4	**X^2=11.9 p=0.01***
Male	4	6	7	10.4	3	4.5	4	5.1	2	3	
Marital Status											
Single	3	4.5	6	9	3	4.5	7	10.4	5	7.5	X^2=2.80 p=0.59
Married	3	4.5	7	10.4	7	10.4	10	14.9	16	23.9	
Age Groups											
Young Old Age	2	3	8	11.9	5	7.5	5	7.5	5	37.3	X^2=7.21 p=0.51
Middle Old Age	3	4.5	3	4.5	2	3	7	14.9	10	37.3	
Late Old Age	1	1.5	2	3	3	4.5	5	9	6	25.4	
Educational Status											
Illiterate	2	3	6	1.5	2	1.5	8	1.5	13	19.4	
Literate	0	0	1	9	1	3	1	11.9	0	0	
Primary School	3	4.5	2	3	6	9	5	7.5	4	6	X^2=22.1 p=0.33
High School	1	1.5	4	6	1	0	2	3	1	1.5	
License	0	0	0	0	1.5	0	1	1.5	3	4.5	
Presence of Chronic Disease											
Yes	4	5.9	5	7.4	6	8.8	11	24.4	19	27.9	**X^2=8.94 p=0.03***
No	2	2.9	8	11,8	4	5.9	6	26.1	3	4.4	
Regular Exercise Status											
Yes	2	2.9	3	4.4	2	2.9	4	5.9	4	5.9	X^2=0.69 p=0.95
No	4	5.9	10	14.7	8	11.8	13	19.1	18	26.5	
Drug Use Status											
Yes	4	5.9	10	14.7	10	14.7	13	19.1	21	36.2	X^2=6.97 p=0.13
No	2	2.9	3	4.4	0	0	4	5.9	30.9	1.5	

*Note. Bold values indicate statistical significance ($p < 0.05$).
Data are expressed as mean, percentile and Pearson Chi-Square test

When the relationship between the descriptive characteristics of the participants and the level of dependence was examined, a statistically significant relationship was found between gender, marital status, smoking status, presence of chronic diseases, and regular exercise status and the level of dependence of the patients. (respectively: p=0.00, p=0.02, p=0.01, p=0.02, p=0.02). The total dependency levels of men (11.8%) were higher than women (2.9%). Single participants had higher rates of total dependency (14.7%) than married participants (8.8%). The total dependency level of smokers (8.8%) was higher than non-smokers (%5.9). The total dependency level of participants with chronic disease (11.8%) was higher than participants without (% 2.9). The rate of total dependency of the participants who did sports regularly (4.4%) was lower than the participants who did not (%10.3) (Table 3).

Tablo 3: Investigation of the Relationship Between the Characteristics of the Participants and their Dependence Level

Variable (n=68)	Barthel Index										Statistical Probability Value
	Totally Dependent		Highly Dependent		Moderately Dependent		Mildly Dependent		Completely Independent		
Gender	n	%	n	%	n	%	n	%	n	%	
Female	21	15.9	9	19.1	14	29.8	1	2.1	2	4.3	X^2=23.3 **p=0.00***
Male	4	6	7	10.4	3	4.5	4	5.1	2	3	
Marital Status											
Single	20	46.5	9	20.9	9	20.9	1	2.3	4	6.3	X^2=10.8 **p=0.02***
Married	3	12	6	24	7	28	3	12	6	24	
Age Groups											
Young Old Age	7	26,9	5	19,2	5	19,2	2	7,7	7	26,9	X^2=5,86 p=0,66
Middle Old Age	10	40	6	24	6	24	1	4	2	8	
Late Old Age	6	35.3	4	23.5	5	29.4	1	5.9	1	5.9	
Educational Status											
Illiterate	11	35.5	8	25.8	10	32.3	1	3.2	1	3.2	
Literate	2	66.7	1	33.3	0	0	0	0	0	0	X^2=27.5 p=0.12
Primary School	6	30	4	20	4	20	2	10	4	20	
High School	1	16.7	0	0	2	33.3	0	0	3	50	
Licence	3	75	1	25	0	0	0	0	0	0	
Presence of Chronic Disease											
Yes	16	35.6	8	17.8	13	28.9	0	0	8	17.8	X^2=11.5 **p=0.02***
No	7	30.4	7	30.4	3	13	4	17.4	2	8.7	
Regular Exercise Status											
Yes	3	20	1	6.7	3	20	1	6.7	7	46.7	X^2=16.6 **p=0.00***
No	4	5.9	10	14.7	8	11.8	13	19.1	18	26.5	
Drug Use Status											
Yes	19	32.8	14	24.1	15	25.9	2	3.4	8	13.8	X^2=6.01 p=0.19
No	4	40	1	10	1	10	2	20	2	20	

*Note. Bold values indicate statistical significance ($p < 0.05$).
Data are expressed as mean, percentile and Pearson Chi-Square test

A statistically significant relationship was found between the frailty level of the participants and the level of dependency (p=0,00). Among the participants, 47.8% of those who were completely addicted were severely frail, 40% of those who were severely addicted were severely frail, and 18.8% of those who were moderately dependent were severely frail. Among the mildly dependent participants, there were no severely fragile participants. 20% of completely independent respondents were severely fragile (Table 4).

Table 4: Examination of the Relationship between the Frailty Level of the Participants and the Level of Dependent

Variable (n=68)	**Edmonton Frail Scale**										**Statistical Probability Value**
	Not Fragile (0-4 points)		**Fragile in Visible (5-6 points)**		**Slightly Fragile (7-8 points)**		**Medium Fragile (9-10 points)**		**Severely Fragile (11 and above)**		
Barthel Index	N	%	N	%	N	%	N	%	N	%	
Totally Dependent (0-20 points)	1	4.3	3	13	5	21.7	3	13	11	47.8	
Severely Dependent (21-61 points)	0	0	1	6.7	1	6.7	7	46.7	6	40	
Moderately Dependent (62-90 points)	2	12.5	3	18.8	3	18.6	5	31.3	3	18.8	**X^2=19.5 p=0.00***
Slightly Dependent (91-99 points)	1	25	2	50	0	0	1	25	0	0	
Completely Independent (100 points	2	20	4	40	1	10	1	10	2	20	

*Note. Bold values indicate statistical significance (p <0.05).
Data are expressed as mean, percentile and Chi-Square test

4. DISCUSSION

Frailty is a syndrome characterized by decreased physical and cognitive reserves that make the elderly more vulnerable to adverse events, hospitalizations, falls, dependency and death (Mello et al., 2018, pp.735-739; Schoon et al., 2914, pp.693-701). The average prevalence of frailty among the elderly aged 65 and over living in the community is ~10%, and it varies widely between 4.0% and 59.1%, depending on the frailty criteria used (Collard et al., 2012, pp.1487-1492). Outcomes are also quite heterogeneous in the elderly living in a nursing home setting, with the mean prevalence of frailty in a wide range between 19.0% and 75.6% (Kojima, 2015, pp.940-945). Early diagnosis of frailty is important, it brings many health problems, especially in advanced ages, chronic diseases, and accordingly dependency and disability rates increase (Pınar and Sert, 2009, pp.46-55). This increase in the dependency rate causes physical, mental, and the functional loss, and thus an increase in the need for help and care (Porcel-Gálvez et al., 2020, pp.8511). There is evidence of an association between the level of dependency and increased mortality (Bahrmann et al., 2019, pp.1233-1242).

In the study, the prevalence of frailty and dependency among the elderly living in nursing homes was high, and it was found that 32.4% were severely frail and 33.8% were completely dependent (Table 1). In addition, when the dependency level of the participants and the characteristics of the elderly were compared, it was found that having a female gender, being married, smoking, having a chronic disease, and not doing sports were found to increase the risk of dependency ($p<0,05$). In the studies that examined the relationship between gender and dependency level in the literature, in parallel with our study, the dependency rate of women was found to be higher than that of men. In parallel with the results of our study, the dependency rates of women were reported to be higher than men (Yazıcı and Kalaycı, 2015, pp.385-390; Somrongthong et al., 2017, pp.49-55; Mortazavi et al., 2020, pp.88-95). It is thought that the higher dependency of women than men may be related to physiological processes such as fertility and menopause, and the longer life expectancy of women than men.

In the study, the dependency rates of single participants were higher than those of single participants. When we look at the literature, studies are reporting that the dependency rate is higher in single people in parallel with our results (Mortazavi et al., 2020, pp.88-95; Göçer and Günay, 2018, pp.116-124; Gökçe et al., 2020, pp.168-183). It is thought that it may be related to the fact that married individuals are advantageous in terms of healthy life and nutrition, as well as the fact that spouses support each other both physically and psychologically.

It was determined that while smoking and having a chronic disease the participants increased the level of dependency, and doing regular sports decreased the level of dependency. Studies are reporting that having a chronic disease increases the level of dependency in the elderly (Yönt, 2023, pp.575-578; Elbi and Özyurt, 2021, pp.9-17). Although there is no study on the effect of smoking on the level of dependency in the elderly, it is thought that the negative effects of smoking on the cardiovascular and respiratory systems and its carcinogenicity may cause chronic diseases. It is thought that the level of dependency of the participants is high due to the use of multiple drugs in chronic diseases, the development of complications related to the diseases, and the physical and mental health problems of the participants. Regular physical activity can increase the independence of the elderly by increasing muscle strength and preventing or delaying the emergence of chronic diseases in the elderly. In the study, it is

thought that the increase in the level of independence of the elderly who do sports may be due to the positive effects of sports on the preservation of muscle mass and active aging. (Table 2).

Frailty levels should be evaluated routinely considering their negative impact on mortality and morbidity rates, and the chance of an early diagnosis of the elderly should be increased. For this, close follow-up of the elderly at risk in terms of frailty is important. When the characteristics of the participants were compared with the fragility level, only having a female gender was found to be a factor that increased the risk of frailty ($p<0,05$) (Table 3). When we look at the literature, the female gender is reported as the most obvious risk of fragility (Tavassoli et al., 2014, pp.457-464; Bandeen-Roche et al., 2015, pp.1427-1434; Özdemir et al., 2017, pp.1-5).

Frailty is associated with a variety of adverse health outcomes in the elderly, including higher hospitalization, depression, falls, disability, and mortality (Mutlay and Seydi, 2021, pp.78-83). While 11 (47.8%) of the dependent participants in the study were severely frail, only 2 (20%) of the independent participants were found to be severely fragile. At the same time, there were no severely vulnerable participants among the mildly dependent participants. In parallel with the results of the study, a study conducted in Canada showed that there is a strong relationship between vulnerability and dependency in activities of daily living. It has also been reported that hospitalization increases this risk 4-fold (Basic and Shanley, 2015, pp.670-685). Again, many studies report that frailty causes a decrease in activities of daily living (Uchmanowicz et al., 2015, pp.521-529; Van Kan et al., 2008, pp.29-37).

5. CONCLUSIONS

It is reported that frailty is a dynamic process that can be changed with appropriate intervention rather than an inevitable result of old age, and early diagnosis and treatment are important (Morley et al., 2013, pp.392-397). In particular, it is estimated that three-quarters of the elderly (>85 years) have frailty. In the frail elderly, falls significantly increase the risk of disability, long-term care, and death. Therefore, ensuring that the aging population remains independent is a global priority (Clegg et al., 2013, pp.752-762). For the success of the management of frailty syndrome in society, it is recommended to focus on the struggle through the cooperation of all relevant health professionals and other social institutions, including the elderly and their families (Turnet and Clegg, 2014, pp.744-747). To solve health problems, the level of vulnerability must first be measured exactly. Frailty has a complex structure and multidimensional measurement tools are ideal measurement tools at the diagnostic stage, as they evaluate vulnerability in more detail (Chen et al., 2018, pp.240-245). Considering the results of the study and the literature, it is recommended that the elderly living in care centers be regularly evaluated with valid scales in terms of frailty. In this way, early diagnosis of frailty, determination of its stage, and planning of the treatment process can be achieved. By keeping the fragility process under control, elderly individuals will be able to maintain their independence and their quality of life will increase.

Limitations

This study has limitations. This is a cross-sectional study conducted in a single nursing home with a small sample size and data may be biased. The scope of respondents had some limitations. The scope of the survey may be expanded for further research in the future.

Ethical approval and consent of participation

Each object was willing to register, and also informed consent before the study began. All participants gave informed consent for the research and said that their anonymity was preserved. During this study, the Declaration of Helsinki was adhered to. Before starting the application, the approval of the Non-Interventional Clinical Research Ethics Committee (decision no: 64, date: 01.02.2019) and written permission from the Directorate of Family, Labor and Social Services (decision no: 605.01-6, date: 26.09.2019) were obtained.

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Declaration of Competing Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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