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RESEARCH

PAIN AND FRAILTY IN ELDERLY FEMALES WITH OSTEOPOROSIS

Abstract

Introduction: Most adults who live to an advanced age become frail. Although not a disease, frailty is a combination of age-related changes and associated medical problems. This descriptive study aimed to determine the pain level and frailty status of elderly females with osteoporosis.

Materials and Method: The present study sample consisted of 105 elderly females with osteoporosis who were admitted to the geriatric outpatient units of two university hospitals. Data were collected using the questionnaire prepared by the author on the basis of a literature review, the Geriatric Pain Scale and the Edmonton Frail Scale. Data were analysed using descriptive statistics, the Mann–Whitney U test, the Kruskal–Wallis H test and correlation analysis.

Results: In total, 6.7% of the elderly females with osteoporosis reported a slight level of pain, 67.3% reported mild pain and 26% reported severe pain. Edmonton Frail Scale mean scores indicated that 16.3% of the subjects had moderate frailty and that 44.2% had severe frailty. Elderly females with osteoporosis who were sad and depressed during the past seven days due to pain were found to be more fragile ($p<0.05$). In addition, weight loss, depressive symptoms and urinary incontinence were related to frailty ($p<0.05$). A poor positive significant relationship was found between the mean scores of the Geriatric Pain Scale and the Edmonton Frail Scale.

Conclusion: Nurses and people involved in health care should assess the frailty status of elderly females with osteoporosis, particularly those reporting pain, and be aware of the characteristics, possible symptoms and affecting factors.

Key Words: Aged; Female; Frail Elderly; Geriatrics; Osteoporosis; Pain

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ARAŞTIRMA

YAŞLI OSTEOPOROZLU KADINLARDA AĞRI VE KIRILGANLIK

Öz

Giriş: Çoğu yaşlı birey ileri yaş döneminde kırılgan olacaktır. Aslında kırılganlık bir hastalık değil yaşın ilerlemesine bağlı değişimler ve hastalıkların birleşimidir. Bu tanımlayıcı çalışma, osteoporozlu yaşlı kadınlarda ağrı ve kırılganlığın incelenmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Araştırmanın örneklemini iki üniversite hastanesinin geriatri ünitesine başvuran 105 yaşlı kadın oluşturmuştur. Çalışmanın verileri araştırmacı tarafından literatür incelenerek geliştirilen tanıtıcı bilgiler formu, Geriatrik Ağrı Ölçeği ve Edmonton Kırılganlık Ölçeği kullanılarak toplanmıştır. Verilerin değerlendirilmesinde, tanımlayıcı istatistikler, Mann-Whitney U Testi, Kruskal-Wallis H Test ve korelasyon analizi kullanılmıştır.

Bulgular: Çalışmanın sonucunda araştırma kapsamına alınan osteoporozlu yaşlı kadınların %6.7'sinin hafif ağrı, %67.3'unun orta ağrı ve %26'sının şiddetli ağrı yaşadığı belirlenmiştir. Edmonton Kırılganlık ölçeği ortalama puanlarına göre %16.3'ünün orta kırılgan ve %44.1'inin şiddetli kırılgan olduğu saptanmıştır. Ağrı nedeniyle son yedi gün içerisinde üzgün ve depresif olduğunu ifade eden osteoporozlu yaşlı kadınların daha kırılgan oldukları saptanmıştır ($p<0.05$). Ayrıca kilo kaybı, depresif semptomlar ve üriner inkontinansın kırılganlık ile ilişkili olduğu belirlenmiştir ($p<0.05$). Ayrıca Geriatrik Ağrı Ölçeği ile Edmonton Kırılganlık Ölçeği puan ortalamaları arasında zayıf derecede pozitif anlamlı bir ilişki olduğu belirlenmiştir.

Sonuç: Araştırma sonuçlarına göre hemşirelerin özellikle ağrı yakınması olan osteoporozlu yaşlı kadınları kırılganlık açısından değerlendirmeleri, kırılgan yaşlı özelliklerini, görülebilecek semptomları ve risk faktörlerini bilmeleri önerilmektedir.

Anahtar Sözcükler: Yaşlı; Kadın; Kırılgan yaşlı; Geriatri; Osteoporoz; Ağrı

INTRODUCTION

Osteoarthritis is characterized by joint pain, stiffness and limited range of motion and has been designated an international health burden by the World Health Organization (1). Osteoporosis has become a significant health problem affecting approximately 200 million people worldwide (2) and it is an increasing problem because of the increased number of active aging adults. The most common joint sites reported were the hands and knees of women over the age of 50, estimated as high as 26.2% (3). Osteoporosis is associated with an increased risk of bone fractures and mortality among the middle-aged to older-aged individuals (2). Osteoporosis and frailty, which together greatly increase the risk of fracture, are of particular concern (4). Osteoporotic fractures, particularly those of the hip and vertebrae, can cause pain and functional disability and reduce the health-related quality of life, and they are associated with an increased mortality risk (2). Hip fractures are the most serious osteoporotic fractures, with high risk of mortality. A large proportion of patients (more than 50%) admitted to hospital with hip fracture are over 80 years old (4). Osteoporosis is clear that the risk in men is not negligible and ageing men have a greater risk of mortality and morbidity following hip fracture than do women (5).

An increase in the elderly population is accompanied by an increase in the frequency of ageing-specific problems; additionally, an increase in the very elderly population emphasises frailty as a social issue (6,7). Frailty is defined as a multi-dimensional geriatric syndrome characterised by decreased physiological reserve and loss of homeostatic capacity (8). Ageing, low educational level, insufficient nutrition, dependency, prolonged bed rest, pressure ulcers, gait disorders, general weakness, weight loss, anorexia, fear of falling, dementia, femur fractures, delirium, confusion, going out less often, multiple drug usage and depression are all related to frailty (9). Frailty is observed in 20%-30% of individuals aged 75 years or older. Despite some common risk factors and biological pathways, the relationship between frailty and osteoporosis is unclear (10). Osteoporosis is among the leading diseases that cause pain, and it is the natural course of a prolonged lifetime. It is a systematic skeletal disease characterised by bone fractures and increased fracture susceptibility due to reduced bone weight and disruption of the microarchitectural structure of the bone tissue (11). Pain has been found to negatively affect the activities of daily living (ADL) and reduce the quality of life in postmenopausal women with osteoporosis. Back pain is the most frequent complaint in patients with advanced osteoporosis. Movement, lifting loads or staying in the same posture for a long time are known factors that trigger pain (10). There are no investigations exploring the potential link between frailty and pain in older adults, but pain intensity may be an important factor in assessing the risk of frailty in this population (12). Therefore, this study aimed to determine the pain and frailty levels of elderly females diagnosed with osteoporosis.

MATERIALS AND METHOD

Study design

This study is a descriptive study.

Participants

In total, 105 participants were enrolled, and the study power [*P* (Statistical Power)] was calculated as 80%. Of 106 elderly females with osteoporosis approached, one did not agree to participate.

Inclusion criteria

- 65 years of age and older
- having a diagnosis of osteoporosis
- not having a diagnosis of dementia
- being literate
- not having severely hearing or visual impairment
- being able to verbally communicate
- agreeing to participate
- no fracture

Data collection

The following data collection tools were used:

- Data sheet
- Edmonton Frail Scale Turkish (EFS-TR)
- Geriatric Pain Scale

Data sheet

The data sheet had 19 questions on sociodemographic characteristics (age, gender, marital status, education level, profession, social security, income-expense level, household people, caregivers and need for support), the effect of disease and chronic pain on ADL and exercise habits.

Edmonton Frail Scale (EFS-TR)

The EFS was developed by Rolfson et al. (13) to define frailty in the elderly. This scale consists of 11 questions on cognitive status, general health status, functional independence, social support, medication, nutrition, mood, continence and functional performance. Cronbach's alpha coefficient of the original scale was 0.62. In Turkey, Aygor (14) found the scale to be reliable, have internal consistency for all values and Cronbach's alpha coefficient of 0.75. The total score of the scale ranges between 0 and 20. Scores between 0 and 4 reflect the state of 'not being frail', 5 and 6 reflect the state of 'being vulnerable', 7 and 8 reflect 'slight frailty', 9 and 10 reflect 'moderate frailty' and over 11 reflect 'severe frailty'.

Geriatric Pain Scale

The Geriatric Pain Scale was developed by Ferrell (15) to define patients' pain and to determine physical, emotional, cognitive and behavioural responses to pain. The scale has many components addressing the effects of pain on patients' professional, social, marital and physical lives and defining the location, severity and nature of pain. Dursun (16) found Cronbach's alpha coefficient of the scale to be 0.85 and of the subscales to be between 0.67 and 0.93.

Data collection procedure

Data were collected in an interview room in two geriatrics outpatient clinics between 1 February and 1 June 2015 by the authors. Data for the study were collected using a data collection form developed by reviewing the related literature (9,17), Geriatric Pain Scale and EFS. Females who had been diagnosed with osteoporosis and agreed to participate were included.

Ethical considerations

Ethical approval of the study was obtained from our university's Clinical Trials Ethics Committee (no. 99950669/326). The study aimed was explained to the participants, and their written and verbal consent was obtained by asking them to sign an informed consent form.

RESULTS

Table 1 shows the sociodemographic characteristics of the participants. Their mean age was 74.3±7.5 years; 51.4% of them had a body mass index (BMI) between 25 and 29.9 kg/m^2, 95.2% had a comorbid chronic disease and 44.8% had at least one fall in the last one year.

The Geriatric Pain Scale and EFS scores are given in Table 2. Among the participants, 67.3% reported mild pain and 26% reported severe pain. EFS indicated that 29.8% of the participants had moderate frailty and 44.2% had severe frailty. The difference between the mean scores of scales and sociodemographic characteristics (age, marital status, educational level, BMI, chronic comorbid disease and fall) was not statistically significant ($p>0.05$). The mean score of the elderly females with osteoporosis in the category having a BMI of ≥30 kg/m^2 on the Geriatric Pain Scale was higher (63.37±16.80) than that in the other BMI groups (55.22±18.76 and 57.29±15.05, respectively). Furthermore, a medium-level, positive and significant relationship was found between the EFS score, weight loss and frailty (r=0.458,

p=0.000); a poor, positive and significant relationship was found between the EFS score, urinary incontinence (r=0.301, p=0.002) and mood (r=0.256, p=0.009) (Table 3) in elderly females with osteoporosis.

Table 4 compares the Geriatric Pain Scale and EFS scores of elderly females with osteoporosis. Participants with mild and severe pain were more frail. Severe frailty was noticed in 26.9% of the participants with mild pain and 17.3% of the participants with severe pain (x^2=17.188, p=0.028). A poor, positive and significant difference was found between the two scales (r=0.271, p=0.000) (Fig. 1).

Table 1. Sociodemographic characteristics of elderly women with osteoporosis (n=105).

Sociodemographic characteristics	Number	%
Age		
70 and below	44	41.9
71–80	36	34.3
81 and over	25	23.8
Marital status		
Married	60	57.1
Single	45	42.9
Education level		
Literate	49	46.7
Primary school	24	22.8
Secondary school	17	16.2
High school	7	6.7
University	8	7.6
Body-Mass Index		
18.5–24.9	27	25.7
25–29.9	54	51.4
≥30	24	22.9
Comorbid chronic disease*		
Yes	100	95.2
No	5	4.8
Fall in the last one year		
Yes	47	44.8
No	58	55.2

*81% hypertension, 51% diabetes and cardiovascular disease

Table 2. Geriatric Pain Scale and Edmonton Frail Scale scores elderly women with osteoporosis.

Geriatric Pain Scale	**Pain Levels (n=104*)**		
		n	**%**
=57.6±17.5	Slight Pain (0–30)	7	6.7
Min=16.6	Mild Pain (30–69)	70	67.3
Max=92.8	Severe Pain (70–100)	27	26.0
	Frailty Levels (n=104*)		
		n	**%**
Edmonton Frail Scale	Not Frail (0–4)	1	1.0
9.8±2.2	Seems Vulnerable (5–6)	9	8.7
Min=4.0	Slightly Frail (7–8)	17	16.3
Max=14.0	Medium-Level Frail (9–10)	31	29.8
	Severely Frail (11 and more)	46	44.2

*one person no frail (105-1=104)

Table 3. Relationship between weight loss, mood, incontinence, and frailty scores.

	Edmonton Frail Scale
Weight loss	r=0.458 p=0.000
Mood	r=0.256 p=0.009
Incontinence	r=0.301 p=0.002

DISCUSSION

Osteoarthritis, a degenerative disease that commonly affects older people, is manifested by pain and disability (18). The general prevalence of pain is known to be between 40 and 80% (19,20). Joint pain and stiffness are generally most severe in the earlier part of the day, with improvement as the day progresses in OA (21). Among our participants, 67.3% had mild pain and 26% had severe pain, and their mean age was 74.3±7.5 years (Table 1). Clark et

al. (22) found when studying men that 85% reported pain and stiffness most of the day (measured with a modified version of WOMAC). Dursun (16) reported that 43% of patients had mild pain and 8.2% had severe pain. Yung et al. (23) reported that their study participants' average number of pain sites was 2.9 and most participants (70%) suffered moderate to severe worst pain.

Table 4. Geriatric Pain Scale and Edmonton Frail Scale Score comparison.

Geriatric Pain Scale	Edmonton Frail Scale					Total
	Not Frail	Seems Vulnerable	Slightly Frail	Medium-Level Frail	Severely Frail	
Slight pain %	- (0-0%)	2 (1.9%)	3 (2.9%)	2 (1.9%)	- (0-0%)	7 (6.7%)
Mild pain %	1 (1.0%)	7 (6.7%)	12 (11.5%)	22 (21.2%)	28 (26.9%)	70 (67.3%)
Severe pain %	- (0-0%)	- (0-0%)	2 (1.9%)	7 (6.7%)	18 (17.3%)	27 (26.0%)
Total **%**	1 (1.0%)	9 (8.7%)	17 (16.3%)	31 (29.8%)	46 (44.2%)	104 (100.0%)

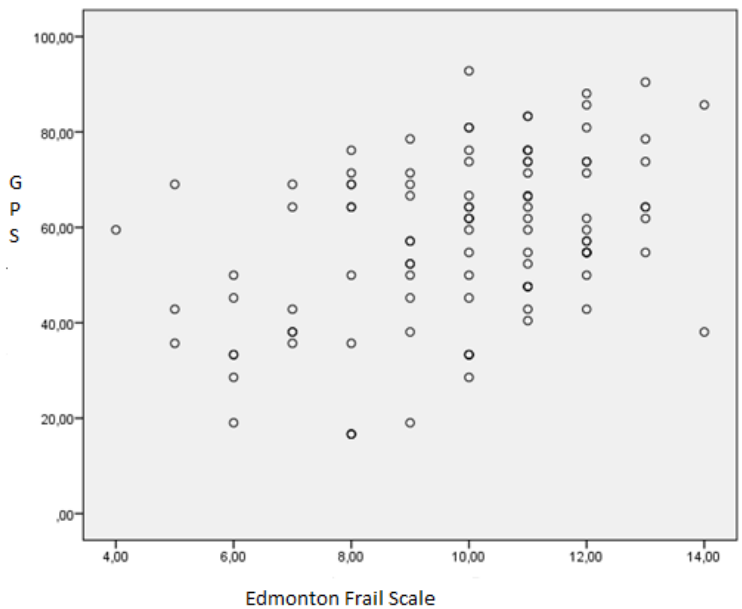

Figure 1. Correlation of Geriatric Pain Scale and Edmonton Frail Scale scores.

In our study, 29.8% of the participants had moderate frailty and 44.2% had severe frailty. The present study analysed the relationship between geriatric pain and frailty in elderly females with osteoporosis and found that almost half of the participants had severe frailty. Furthermore, the participants having mild and severe pain were found to be more frail. A poor positive relationship was found between pain and frailty (r=0.271, p=0.000) (Fig. 1). One in 10 people aged over 65 years and between one-fourth and a half of those aged over 85 years are frail (24). In his study, Aygor (14) found that among patients aged 65 years and older, 13.1% had mild frailty, 10% had moderate frailty and 13.1% had severe frailty. In studies in Canada, approximately 16% of non-frail participants, 34% of pre-frail participants and 50% of frail participants reported moderate or high pain (25,26). In the CHAMP study, approximately 17% of non-frail participants reported intrusive pain compared to over 40% of frail participants with intrusive pain (27,28). Overall, the frailty status was significantly associated with pain.

Our study shows that weight loss, incontinence problems and worse mood associate with increased frailty. In their study, Theou et al. (28) found that 10% of patients without any disability or chronic disease were still frail. Chen et al. (29) determined that frailty was related to chronic disease, depressive symptoms and other geriatric syndromes. Tse et al. (30) suggested that apart from improving mobility and reducing pain, loneliness was a target of psychosocial interventions to reduce frailty and improve the quality of life. The frailty rate in their population was higher than that in other studies. Shega et al. (25) showed that in elderly people with depression, the adjusted odds of being frail to not being frail were higher by a factor of 4.13. Lin et al. (31) showed that there are significantly more participants with depression in frail and pre-frail elderly groups than in the non-frail groups. Mood can impact pain, and elderly people with frailty experience more anxiety and depression than non-frail people. Anxiety may contribute to pain in frail people, and it is associated with a subjective feeling of apprehension about impending or anticipated harm, increased heart rate and avoidance behaviour. The relationship between depression and pain is complex. Pain is an antecedent and a consequence of depression.

There were no previous studies that analysed geriatric pain and frailty in elderly females with osteoporosis (32). Considering the negative effects of pain due to osteoporosis and other chronic diseases on ADL, quality of life and functional independence in the elderly, pain is likely to negatively affect frailty.

In conclusion, a significant relationship was found between pain and frailty in elderly females with osteoporosis. It should be noted that elderly females with osteoporosis are at a high risk of developing frailty; so, nursing care plan should be included precautions for frailty. In addition, weight loss, depressive symptoms and urinary incontinence were found to be possibly related to frailty. Nurses should know the characteristics of elderly frail patients, possible symptoms and risk factors (for example, weight loss, incontinence and deterioration of mood). Evidence-based nursing practices specific to nursing care should be studied and applied.

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