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Assessment of Fall Risk in Cancer Patients Receiving Palliative Care

Palyatif Bakım Alan Kanser Hastalarında Düşme Riski'nin Değerlendirilmesi

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ASSESSMENT OF FALL RISK IN CANCER PATIENTS RECEIVING PALLIATIVE CARE

ABSTRACT

Aim: This study aims to evaluate fall risk factors in cancer patients receiving palliative care units.

Method: This cross-sectional descriptive study was performed on 122 cancer patients served the palliative care unit between 01 October and 20 November 2020. The patient's functional status was evaluated with the Katz Index of Independence in Activities of Daily Living. The data were collected using the Itaki Fall Risk Scale.

Results: The mean age of patients was 57.32±12.10 years. The fall risk score of the patients was found to be 17.25±6.20. The risk of falling was higher in the elderly, those with chronic disease, diagnosed with lung cancer, and a history of falling variables. The most common minor risk factor was the presence of chronic disease, and the most common major risk factor was dizziness.

Conclusions and Suggestions: Fall risk is high in cancer patients receiving palliative care. Cancer patients receiving palliative care treatment should be evaluated in terms of fall risk.

Keywords: Palliative Care, Risk Factors, Cancer, Accidental Falls.

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PALYATİF BAKIM ALAN KANSER HASTALARINDA DÜŞME RİSKİ'NİN DEĞERLENDİRİLMESİ

ÖZ

Amaç: Bu çalışmada palyatif bakım ünitesinde tedavi gören kanser hastalarında düşme risk faktörlerinin değerlendirilmesi amaçlanmıştır.

Yöntem: Bu kesitsel tanımlayıcı çalışma, 01 Ekim-20 Kasım 2020 tarihleri arasında palyatif bakım ünitesinden hizmet alan 122 kanser hastasında gerçekleştirildi. Hastanın fonksiyonel durumu Katz'ın Günlük Yaşam Aktiviteleri İndeksi ile değerlendirildi. Veriler İtaki Düşme Riski Ölçeği kullanılarak toplandı.

Bulgular: Hastaların yaş ortalaması 57.32±12.10 yıl idi. Hastaların düşme riski skoru 17.25±6.20 olarak bulundu. Yaşlılarda, kronik hastalığı olanlarda, akciğer

kanseri teşhisi konanlarda ve düşme öyküsü olanlarda düşme riski daha yüksekti. En yaygın minör risk faktörü kronik hastalık varlığı, en yaygın majör risk faktörü baş dönmesi idi.

Sonuç ve Öneriler: Palyatif bakım alan kanser hastalarında düşme riski yüksektir. Palyatif bakım tedavisi alan kanser hastaları düşme riski açısından değerlendirilmelidir.

Anahtar Kelimeler: Palyatif Bakım, Risk Faktörleri, Kanser, Kaza ile Düşme.

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INTRODUCTION

Falling is a common incident and a major health problem among elderly persons. Furthermore, the World Health Organization (WHO) defines falling as a person falling to the ground or another lower level (World Health Organization, 2021). Falls are a common problem among the elderly population. Older people need medical attention and suffer serious injuries, including fractures and head injuries. Meanwhile, cancer is increasingly a disease of older people, with more than half of cancer diagnoses arising in people over the age of 65 years (Ho et al., 2023; Tomczak et al., 2021).

The etiology of falls is often multifactorial, including age-related physiological changes, pathological conditions, behavioral problems, and environmental factors (Richardson, 2017). The majority of falls do not result in serious injury. Approximately 37%–56% of falls cause minor injuries, whereas only 10%–15% cause major injuries (Zhang et al., 2018). Yet, hip fracture, subdural hematoma, and traumatic brain injury are all known complications associated with falling (O'Sullivan & Kaelin, 2020). Falls represent the leading cause of injury-related hospitalization in people aged 65 and over, accounting for 14% of emergency admissions and 4% of all hospital admissions in that age group (Zhang et al., 2018). Moreover, accidents are the fifth leading cause of death among the elderly and, falls account for two-thirds of all accident-related deaths. As a condition, falls can have a significantly negative impact on the health and independence of elderly people, sometimes resulting in injury, disability, and even premature death (Khow et al., 2018). Furthermore, even if a fall does not cause any physical injury, it can cause psychological problems such as anxiety and depression and the avoidance of physical activity on the part of the patient. In addition, falls are often associated with activity limitation, an increase in drug use, a decrease in quality of life, and an increase in costs (Huang et al., 2017).

Falling is recognized as an important problem among elderly patients with cancer (Magnuson et al., 2019). Oncology patients face several risk factors for falling

due to both the cancer itself and the side effects of its treatment (Yesilbakan & Ustundag, 2019). Common risk factors for falls are accentuated by the effects of cancer and its treatment. Especially cancer and its treatments potentiate important risk factors for falls, including muscle weakness, proprioception, poor balance, functional disability, and cognitive impairment (Morris and Lewis, 2020). Cognitive impairment is a potent risk factor for falling and is frequently associated with gait abnormalities (Chantanachai et al., 2021). Sarcopenia develops more rapidly in patients receiving chemotherapy and corticosteroid treatment. Moreover, patients with sarcopenia are more prone to adverse clinical conditions that may develop after falling (Beaudart et al., 2017). In a limited number of studies involving individuals with cancer, falls were detected with a frequency of 15%–53% in oncology and palliative care units. Falls are common in palliative care patients. Patients are more likely to fall if they have a history of falls; if they take multiple medicines if they are older; if their functional status is not stable and if they have delirium or cognitive impairments (Forrow et al., 2022).

This study aimed to was to determine the risk of falls in cancer patients in the palliative care unit of a hospital in the Black Sea Region of Turkey and to evaluate the factors causing falls.

METHOD

Study Design*:* The study was then carried out in the palliative care unit of the Samsun University Samsun Trainig and Research Hospital in Samsun, Turkey, between October 1,2020 and November 20, 2020. In patients with more than one hospitalization, only their first hospitalization was considered and informed consent was obtained from all individual participants for the study. Patients under the age of 18, patients without a diagnosis of cancer, and patients with cognitive impairment due to dementia or Alzheimer's disease were not included in this study. Our palliative service has sixteen beds.

Study Population*:* The margin of error was 5% and the confidence interval was 95% and the sample size was calculated as 120. Therefore, 8 of the 130 patients initially included in the study were excluded. Eight of the 130 cancer patients were also diagnosed with major cognitive impairment (i.e., Alzheimer's disease, dementia) and communication problems, which meant they had to be excluded from the study. A total of 122 patients who were diagnosed with cancer and attended the palliative care unit were included in the study.

Data Collections*:* The bed dependency status of the patients was evaluated using the Katz Index Independence in Activities of Daily Living (Katz ADL). The Katz ADL was developed in 1963 and consists of six questions designed to elicit

information about bathing, dressing, toileting, transferring, continence, and feeding activities (Pehlivanoglu et al., 2018). The Turkish version of the Katz ADL was evaluated by Pehlivanoglu et al in 2018. The Katz ADL is scored by awarding three points if a person performs the activities of daily living independently, two points if they do so with assistance, and one point if they cannot perform the activities at all. In terms of the Katz ADL score, 0–6 points indicate that a person is "dependent," 7–12 points indicate that a person is "semi-dependent," and 13–18 points indicate that a person is "independent" (Wallace and Shelkey, 2007).

The other data required for the study were collected using the socio-demographic data form prepared by the researchers and the Itaki Fall Risk Scale. The gathered socio-demographic data included each patient's age, gender, marital status, educational status, occupation, presence of chronic disease, number of drugs, cancer type, cohabitation status, history of falling, and number of falls. The Itaki Fall Risk Scale has been developed by the Accreditation Quality and Employee Rights Department of the Ministry of Health of the Republic of Turkey (Ministry of Health, General Directorate of Health Services, 2023).

The risk factors are categorized as either major or minor, with the minor risk factors being awarded one point and the major risk factors being awarded five points. The minor risk factors comprise being over five years old, unconsciousness, poor vision, a history of falling in the last month, the presence of chronic disease, the need for physical support, urinary or fecal incontinence status, the use of more than four drugs, using less than three pieces of equipment for care, the absence of bed railings, and the presence of physical barriers on the walking path. The major risk factors comprise unconsciousness, uncooperativeness, balance problems while standing or walking, the presence of dizziness, orthostatic hypotension, visual and physical disability, risky drug use in the last week, and the use of three or more pieces of equipment to care for the patient. The scale score is calculated using the scores for all of the items. A total score of 0¬–4 is considered to indicate a low risk, whereas a score of 5+ is considered to indicate a high risk (Ministry of Health, General Directorate of Health Services, 2023) .

Statistical Analysis: Differences between independent binary groups were assessed by the Mann-Whitney U test. Pearson's chi-square test was performed to evaluate the data. The data average and percentages are presented with standard deviation. The data were evaluated using the Statistical Package for the Social Sciences (SPSS) version 22.0 software (IBM Corp., Armonk, NY, USA). Statistical significance was accepted at $p < 0.05$.

Ethical Considerations: Samsun University Samsun Training and Research Hospital Clinical Research Ethical Committee approval was granted for the study (decision number GOKA/2020/14/3).

RESULTS

The mean age of the 122 cancer patients receiving palliative care was 57.32 ± 12.10 years. Some 54.15% (n=66) of the patients were women, and 60.25% (n=29) of the women were housewives. From a demographic perspective, some 61.37% (n=75) of the patients were married, and 34.09% (n=42) of them graduated from primary school. Lung cancer was the most common diagnosis among the patients (29.55%, n =36). According to the Katz ADL, 70.25% (n =86) of the patients were semi-dependent on the bed. Additionally, it was determined that 70.25% (n=86) of the cancer patients lived with their families. Moreover 54.15% (n=66) of the patients were found to require more than four drugs (Table 1).

The fall risk score of the female patients was found to be 15.26±7.92 while the fall risk score of the male patients was determined to be 19.97±8.80. A statistically significant difference was observed between the mean fall risk scores according to age groups, presence of chronic disease, cancer status, and history of falling. The risk of falling was higher in the elderly, those with chronic disease, diagnosis of lung cancer and a history of falling variables (respectively, p=0.023, p=0.042, p=0.003, and p=0.001). No statistically significant difference was observed between the mean fall risk scores and the gender, marital status, educational status, occupation, number of drugs, place of fall, cohabitation status, and addiction status variables (p>0.05) (Table 1).

Tablo 1. Evaluations of patients' sociodemographic characteristics and fall risk factors

Patient characteristics		Total n (%)	Itaki Fall Risk Scale (X±SS)	p value
Age (years)	18-41	28 (22.72)	18.58±8.23	***0.023****
	42-65	50 (40.91)	20.25±9.34	
	66-89	31 (25.00)	21.34±9.97	
	≥90	13 (11.37)	23.76±10.75	
Gender	Female	66 (54.15)	15.26±7.92	0.547*
	Male	56 (45.85)	19.97±8.80	
Marital status	Married	75 (61.37)	22.44±10.01	0.341*
	Single	28 (22.72)	17.67±9.20	
	Widowed/Divorced	19 (15.91)	25.35±10.48	
Educational status	Illiterate	5 (4.56)	20.33±9.77	0.268*
	Primary school	42 (34.09)	19.40±8.25	
	Secondary school	28 (22.72)	13.43±6.98	
	High school	25 (20.45)	11.56±6.57	
	University	22 (18.18)	10.41±6.34	

Occupation	Housewife Officer/worker Self-employment	29 (15.91) 65 (61.37) 28 (22.72)	14.53±8.32 13.22±8.56 18.76±9.63	0.698*
Chronic disease	Yes No	92 (75.00) 30 (25.00)	19.80±7.45 18.15±8.91	***0.042****
Cancer diagnosis	Lung cancer Breast cancer Colon cancer Brain cancer Other	36 (29.55) 25 (20.45) 22 (18.18) 22 (18.18) 17 (13.64)	20.59±10.04 18.38±9.44 15.77±7.31 16.15±7.24 17.20±8.39	***0.003****
Number of falls	0 1 ≥2	44 (36.16) 42 (34.09) 36 (29.75)	15.48±7.43 18.35±8.68 20.37±9.90	***0.001****
Number of drugs	<4 ≥4	56 (45.85) 66(54.15)	21.78±9.53 23.67±10.11	0.054**
Cohabitation status	Family Caregiver	86 (70.25) 36 (29.75)	19.46±9.93 18.39±7.76	0.123**
Where the falling took place?	Home Street Business Vehicle Other	76 (62.43) 32 (26.15) 5 (4.20) 1 (0.69) 8 (6.53)	17.16±7.53 21.35±9.34 19.69±8.02 18.50±8.98 23.44±9.17	0.458**
Activities of Daily Living	Semi- dependent Independent	86 (70.25) 36 (29.75)	22.57±10.04 20.78±10.61	0.654**

*Pearson Chi-square test **Mann-Whitney U test

When the results of the Itaki Fall Risk Scale were examined, the most common minor risk factor was the presence of chronic disease (75%) and the most common major risk factor was dizziness (90.91%). Interestingly, the least minor risk factor was determined to be unconsciousness (100%), the least major risk factor was shown to be physical disability (88.64%) (Table 2).

Table 2. Distribution of falls risk factors

Major Risk Factors	**Yes** **n (%)**	**No** **n (%)**
Unconscious or uncooperative	25 (20.45)	97 (79.55)
Balance problem while walking	86 (70.25)	36 (29.75)
Dizziness	111 (90.91)	11 (9.09)
Orthostatic hypotension	64 (52.27)	58 (47.43)
Visually impaired	19 (15.91)	103 (84.09)
Physical disability	14 (11.36)	108 (88.64)
≥ 3 care equipments connected to the patient	22 (18.18)	100 (81.82)
Risky drug use in the last week	42 (34.09)	80 (65.91)
Minor Risk Factors		
>65 years	53 (43.18)	69 (56.82)
Unconsciousness	0	122 (100)
History of falling in the last one month	39 (31.82)	83 (68.18)
Chronic disease history	92 (75.00)	30 (25.00)
Needing physical support	80 (65.91)	42 (34.09)
Urinary/fecal incontinence	6 (4.55)	116 (95.45)
Poor vision	78 (63.64)	44 (36.36)
>4 drug use	55 (45.45)	67 (54.55)
<3 maintenance equipment	72 (59.09)	50 (40.91)
Absence of bed rails	42 (34.09)	80 (65.91)
Physical obsticals in walking path	39 (31.82)	83 (68.18)

In addition, the findings indicated that the frequency of falling increased with an increasing age and increasing number of drugs being required to treat the cancer ($p = 0.034$, $p=0.021$) (Table 3).

In line with the results of the study, it was determined that there was no statistically significant difference between the frequency of falls and gender, marital status, education status, occupation, cohabitation, and fall-place variables (Table 3).

Table 3. Comparison of the frequency of falls with socio-demographic data

Patient characteristics		No Fall	1 time Fall	≥2 Falls	p value
Age (years)	18-41	20	7	1	***0.034****
	42-65	13	15	22	
	66-89	11	10	10	
	≥90	0	10	3	
Gender	Female	27	21	18	0.146*
	Male	17	21	18	
Marital Status	Married	30	24	21	0.381*
	Single	10	9	9	
	Widowed/Divorced	4	9	6	
Educational status	Illiterate	0	3	2	0.429*
	Primary school	21	15	6	
	Secondary school	6	12	10	
	High school	9	10	6	
	University	12	2	12	
Occupation	Housewife	10	12	7	0.155*
	Officer/worker	26	14	25	
	Self-employment	18	16	4	
Chronic disease	Yes	20	21	26	0.268*
	No	24	21	10	
Number of drugs	<4	10	16	15	***0.021****
	≥4	34	26	21	
Cohabitation Status	Family	37	30	20	0.342**
	Caregiver	7	12	16	
Where the falling took place?	Home	32	20	24	0.439**
	Street	10	12	10	
	Business	2	3	0	
	Vehicle	0	6	0	
	Other	0	1	2	
Total		**44**	**42**	**36**	

*Pearson chi-square test **Mann-Whitney U test

DISCUSSION

Falls and injuries due to falling in cancer patients can result in limitations in terms of the activities of daily living, a decrease in quality of life, and increase in both morbidity and mortality (Magnuson et al., 2019). The risk of falling cancer patients receiving palliative care has been evaluated and found that the frequency of falls increased with increasing age (Forrow et al., 2022).

According to cancer statistics from Turkey, lung cancer is the most common type of cancer nationally, with a prevalence rate of 17.6% in 2020 (Ferlay et al., 2021). In the present study, 29.55% of the cancer patients being treated by the palliative care unit were diagnosed with lung cancer similar to our study.

In a study they conducted, Zhang et al determined the rate of falling at least once during the previous six months in patients diagnosed with cancer to be 35.8% (Zhang et al., 2018). In the present study, the rate of falling during the previous six months among the cancer patients hospitalized in the palliative care service was observed to be 34.09%. These results suggest that the risk of falling should be evaluated and recorded in adult patients who are receiving cancer treatment. Importantly, individuals with a previous history of falling are more likely to fall again due to having developed a fear of falling.

In the study of Morgan et al., it was reported that patients hospitalized in the palliative care unit had a higher risk of falling in patients with complaints of dizziness. Also, the frequency of falls increased in patients followed in palliative care units (Morgan et al., 2015). Similarly, the most common major risk factor in this study was dizziness.

In the study of Irmak et al., the risk of falling was found to be higher in those with a low level of education. Moreover, they found the presence of chronic disease to be associated with an increased risk of falling in elderly individuals (Irmak et al., 2019). In the present study, the patient's education level was found to not effect on their risk of falling. There are several possible reasons for this finding, including the fact that the majority of participating patients had a lower education level, while those with a higher education level had not opted to engage, in mental activities to maintain their intellectual level over the years. However, more detailed studies on this subject are required to allow for more accurate interpretations of the data.

In the study conducted by Zhao et al., 11 risk factors for falling in cancer patients were identified. These factors were age, history of falling, use of opiates, benzodiazepines, steroids, antipsychotics, sedatives, radiation therapy, chemotherapy, use of assistive devices, and length of hospital stay. In the present study, unlike other studies, it was observed that the most common minor risk factor for falling

was seen to be the presence of chronic disease, while the most common major risk factor was identified as dizziness. By contrast, the least common minor risk factor for falling was unconsciousness, while the least common major risk factor was physical disability (Zhao et al., 2022).

Zhao et al., also found elderly people are more prone to falls as they age, especially patients over 65 years old. Furthermore, they reported physiological changes that are part of the normal aging process can alter a person's ability to tolerate anti-tumor treatments and put the patient at risk of toxicity, which can lead to falls (Zhao et al., 2022). However, in this study, the risk of falling was not found to increase with increasing age in the participating cancer patients.

In a study conducted by Solmaz and Altay, they reported that cognitive and functional changes, chronic disease status and related multidrug use increase the risk of falling in elderly individuals. In addition, they emphasized the importance of closely monitoring the drugs used by elderly individuals in terms of their side effects, and in this case, the health team also has important duties (Solmaz & Altay, 2019).

It must be acknowledged that the present study had several limitations. First, the research was conducted in a single center. Second, the number of the patients is limited. Third, the fact that cancer patients both with and without a prior history of falling were included in the study. Improved generalizations would be possible if only individuals without a history of falling were included in future studies in this field. The fourth limitation stemmed from the home environment being evaluated solely on the based on patient's statements in this study. It would likely prove useful if the characteristics of participants' home environments were evaluated using researcher observations in future studies.

The key strength of the present study concerned the fact that it was one of only a limited number of studies to have investigated the factors associated with falls in cancer patients being treated by palliative care units. The detection of the risk factors for falling and the regulation of those risk factors could serve to decrease fall rates.

CONCLUSION

Fall risk is higher in cancer patients receiving palliative care. The most common major risk factor is dizziness, and the most common minor risk factor is the presence of chronic disease. In this study, the frequency of falling was found to increase with increasing age and number of drugs. Prevention and management of falls in cancer patients is an important issue that needs to be emphasized. Patients receiving palliative care treatment should be evaluated in terms of fall risk,

and those with high risk should be informed in detail. In the patient group experiencing signs and symptoms related to cancer and its treatment, fall prevention interventions will make a significant contribution to increasing the quality of life of individuals.

Conflict of İnterest Statement

The authors declare that they have no conflicts of interest

Authors' Contributions

Design of the study: MC (%100)

Data collection: MC (%50), NSY (%25), SM (%25)

Data analysis: MC (%70), NSY (%15), SM (%15)

Article writing: MC (%60), NSY (%20), SM (%20)

Article revision: MC (%50), NSY (%25), SM (%25)

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