



# Investigation of the reasons and frequency of oncology patients over the age of 65 who apply to the emergency department

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## Abstract

**Purpose** This study aims to investigate frequency and causes of emergency department visits among oncology patients aged 65 and older.

**Method** In this cross-sectional, descriptive and comparative study, data were collected a questionnaire form from a single emergency department of a university hospital in İzmir, West Turkey between January 2022 and July 2022. Data were analyzed by using IBM SPSS Statistics 25 software.

**Results** A total 125 patients were included in the study. The most common causes of patients to the emergency department were infection, pain, nausea-vomiting, and dyspnea. A significant difference was found between the reason for the patient's emergency department visit and their knowledge of when to seek medical help ( $p < 0.05$ ).

**Conclusion** The recurrent visits of cancer patients to emergency departments suggest an inadequacy of comprehensive information available to both patients and their caregivers concerning the pursuit of emergency medical intervention.

**Keywords** Emergency service · Oncology · Older people · Cancer care

## Introduction

Aging is considered a physiological process that leads to various changes in organs and systems, causing physical, cognitive, and emotional transformations in individuals [1, 2]. In recent years, advancements in technology and healthcare have resulted in an increased lifespan [3]. These

positive developments have contributed to a higher proportion of the elderly within the overall demographic [4].

World Health Organization (WHO) considers individuals aged 65 and above as elderly [5, 6]. The number of this age group worldwide reached 727 million in the year 2020 [7]. Based on this information, it is projected that by the year 2050, this group will constitute approximately 16.7% of the world's population [8]. The number of individuals aged 65 and over in Turkey exceeded 5.7 million in 2012. It is estimated that this figure will reach 19.5 million in 2050 in Turkey as life expectancy increases [9, 10].

Despite all advancements in the diagnosis and treatment of cancer, this disease still leads to chronic pain and premature death. Cancer is a major cause of death in the world; in Turkey, it ranks second after cardiovascular diseases [11]. With the increasing elderly population, there has been an increase in the number of new cancer cases and the associated side effects of treatment [12].

Due to the increase in the number of chronic diseases and the decrease in physical capacity with age, there are more elderly patients applying to emergency services than younger adults. The literature shows that the emergency department (ED) admission rates of elderly patients were between 12 and 24% [13]. An examination of studies on ED applications

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for all reasons in Turkey reveals the following rates for this group: in the study by Bilgili and Öncü, the ED application rate of elderly patients is 10.1%; In the study by Unsal et al. in Eskişehir, the application rate was 13%; in the study by Kekeç et al., 14.3%; and in the study by Çığsar et al., 19.6% [5, 14–16].

The widespread adoption of early diagnosis and treatment systems and the advancement of technology has led to new treatment methods. The increasing number of cancer cases and novel treatment approaches result in a longer monitoring period, leading to more frequent ED visits [5]. The extension of follow-up periods due to increased life expectancies results in a higher incidence of local and systemic complications caused by cancer, as well as complications related to treatment. Therefore, cancer patients constitute a patient group that significantly increases Eds' workload and presents unique psychosocial challenges [17].

Although the reasons for elderly patients' admission to the ED vary, according to Hu et al., the main reasons were reported to be cerebrovascular events, oncological diseases, and cardiovascular diseases [18]. Among studies in Turkey the study by Bedel and Tomruk reveals that leading reasons are cardiovascular diseases and oncological diseases [19]. Studies show that 81% of ED visits of elderly patients are related to oncology [20, 21]. However, no study in Turkey was found that investigated the reasons and frequency of admission to the ED of oncology patients aged 65 and over.

It is crucial to determine the health status of elderly patients with advanced-stage cancer because treatment benefits are often limited, and treatment toxicity is high [22]. Consequently, elderly patients present to EDs have more complex issues, require more intensive services, and undergo a greater number of diagnostic procedures. Additionally, their hospitalization and admission rates to intensive care are higher compared to other age groups [23]. The increasing prevalence of geriatric oncology patients in EDs necessitates facilities with the appropriate physical conditions and higher levels of qualified care.

In this study, It was aimed to investigate the reasons and frequency of admission of oncology patients over the age of 65 who applied to the ED. The sub-goals of the study are as follows: to identify from these applicants the geriatric patients whose applications were recorded as malignant neoplastic diseases, to determine the clinical evaluation and reasons of oncology-related complaints, to investigate whether they received information about the number of applications, the length of stay in the ED, and the clinical complaints for which they would apply to the emergency room.

## Material-method

### Study design

This study used a cross-sectional, a descriptive, and a comparative study design.

### Sample, setting, and ethic considerations

This cross-sectional, descriptive, and comparative study was carried out from January 2022 and July 2022 in the emergency department of a large university hospital in Izmir, West Turkey. A total of 125 patients participated in the study. The study was approved by the ethics committees of the Ethics Committee (Approval Date: 28.01.2022, Approval No: 22–1.1 T/16). Institutional permission for data collection was obtained from the Emergency Department of University Hospital (Approval Date: 20.12.2021, Reference No: E- 27344949–100–465304).

### Procedure

The purpose of the study was explained to the participants, and then all participants signed a written consent form prior to participation. A convenience sample of patients was obtained from among all patients who were visiting the emergency department. Patients were included if they met the following criteria: (a) 65 years of age or older, (b) have a history of cancer, (c) at least once received cancer treatment, (d) ability to speak, read, and write in Turkish, (e) no auditory or visual impairment, and (f) willingness to participate in the study. The data was collected face to face by researchers.

### Instruments

The data were collected by using a questionnaire form. This questionnaire form consisted of 19 questions and included socio-demographics (age, gender, marital status, educational status, economic status, and whom they live with—**six question**) and disease-related characteristics (chronic illness status, type of cancer, cancer treatment administered, number of treatments received, most recent treatment time, and information received regarding when to seek emergency department care after treatment—**seven question**), and reason for emergency department visit, actions taken to relieve symptoms before arrival, previous reasons for emergency visits, number of emergency visits in the past year, duration of observation in the emergency department, and decision made after arrival (e.g., admission, discharge) (**six question**). This form was also developed by the researcher according

to the literature and consists of 19 questions. This form was pretested on ten patients in order to check the clarity of the items, and no changes were recommended. The researcher read the questionnaire items to patients and recorded their responses.

## Data analysis

The researcher provides the descriptive statistics of the data (number, percentage, mean, standard deviation, minimum, and maximum). The first step in data analysis was to check the assumption of normality using the Shapiro–Wilk test. In cases where this assumption was not met, the Mann–Whitney *U* test was conducted to examine the difference in means between independent groups. When the assumption of sample size was not met for examining relationships between categorical variables (expected value < 5 for each group), Fisher's exact test was used. The Chi-square test was employed for investigating the relationship between multiple-choice questions. The analyses were conducted using IBM SPSS Statistics 25 software.

## Results

### Socio-demographic characteristics of participants

Examination of the demographic characteristics of the participants shows that the average age was  $70.92 \pm 3.47$  years. Of the participants, 52% were male; 92.8% were married; 55.2% had primary/middle school education; 51.2% had an income less than their expenses; and 8.8% lived alone (Table 1).

### Disease-related findings

The three most common hematologic/oncologic diagnoses of the participants presenting to the ED were lung cancer (14.4%), breast cancer (13.6%), and stomach cancer (10.4%); 82.4% of the participants (103 individuals) reported receiving chemotherapy before, and 24.8% of the participants who had received chemotherapy had undergone six to ten sessions. When questioned about the conditions under which they should visit the ED before treatment, it was found that 60.8% of participants (76 individuals) had no information (Table 2).

### Findings regarding emergency department admissions

The four most common reasons for applying to the ED are infection, pain, nausea-vomiting, and dyspnea (Table 3). It was determined that most participants presenting with infection were in the grade 2 category, those with pain complaints, in the grade 1 category, those with dyspnea complaints, in the grade 1 category, and those with nausea and vomiting, in the grade 2 category.

When questioned about any interventions before arriving at the ED, 72.8% (91 individuals) reported making no interventions to relieve their symptoms. Of the others, participants reported using antiemetic drugs (29.4%) to alleviate nausea and vomiting, analgesic drugs (44.1%) to alleviate pain complaints, and oxygen (14.7%) to alleviate dyspnea symptoms.

The findings indicate that 89.6% of the participants (112 individuals) sought ED care between 1 and 3 times in the last year; 56% (70 individuals) were monitored for

**Table 1** Distribution of participants according to demographic characteristics

	<i>n</i>	Min	Max	Mean	S.D
<b>Age</b>	125	64	96	70.92	6.47
<b>Gender</b>					<i>n</i>
					%
<b>Gender</b>	Female				60
	Male				65
<b>Marital status</b>	Single				9
	Married				116
<b>Educational status</b>	Primary/secondary school				69
	High school				23
	University				28
	Degree				5
<b>Income status</b>	Income less than expenses				64
	Income equals expenses				47
	Income exceeds expenses				14
<b>Person living with</b>	Alone				14
	Spouse/family				111

**Table 2** Distribution of participants according to disease-related characteristics

		<i>n</i>	%
<b>Chronic disease</b>	Yes	75	60
	No	50	40
<b>Type of cancer</b>	Lung cancer	18	14.4
	Prostate cancer	10	8.0
	Pancreatic cancer	10	8.0
	Lymphoma/leukemia	13	10.4
	Breast cancer	17	13.6
	Thyroid cancer	3	2.4
	Colorectal cancer	12	9.6
	Gastric cancer	13	10.4
	Ovarian cancer	4	3.2
	Skin cancer	2	1.6
	Sarcoma	3	2.4
	Glioma	6	4.8
	Larynx/nasopharynx cancer	3	2.4
	Endometrial cancer	2	1.6
	Cervical cancer	1	0.8
	Multiple myeloma	3	2.4
	Bladder cancer	3	2.4
	Hepatocellular cancer	2	1.6
<b>Cancer treatment administered</b>	Chemotherapy	103	82.4
	Radiotherapy	52	41.6
	Surgical	74	59.2
	Oral chemotherapy/immunotherapy	5	4.0
	Patients for whom no intervention is planned	3	2.4
<b>Number of treatments received</b>	1 time	6	4.8
	2–5 times	28	22.4
	6–10 times	31	24.8
	11–20 times	22	17.6
	21 times or more	15	12.0
<b>Information received regarding when to seek emergency department care after treatment</b>	Yes	49	39.2
	No	76	60.8

1–3 days. There was a statistically significant relationship between participants' reasons for ED visits and their level of knowledge about when to seek assistance ( $p < 0.05$ ).

It was found that information was not usually received for people with nausea-vomiting, electrolyte imbalance, general condition disorder, oral intake disorder, fatigue, pain, anemia, and diarrhea, but most people with neutropenia and neutropenic fever receive information. Multiple Chi Square test was performed to examine the relationships between hematological and oncological diagnoses and the reasons for applying to the ED, revealing a statistically significant relationship between the diagnoses received and the reasons for applying ( $p < 0.05$ ).

### Comparison of the relationships between participants' demographic characteristics and the number of ED visits

A statistically significant relationship was found between the number of ED visits and gender ( $p < 0.05$ ). It was determined that men had a greater frequency of ED visits than women. A statistically significant relationship was found between the participants' household and the number of visits to the emergency room ( $p < 0.05$ ). It was determined that most of those living alone or with their spouse/family applied to the ED 1–3 times, and most of those living with others (caregiver, in a nursing home, etc.) applied 4–9 times.

**Table 3** Distribution of participants according to the reasons for ED visits

		<i>n</i>	%
<b>Reason for emergency department visit</b>	Infection	57	45.6
	Pain	46	36.8
	Nausea-vomiting	35	28.0
	Dyspnea	34	27.2
	Tiredness	26	20.8
	Electrolyte imbalance	16	9.7
	General condition disorder/ oral intake disorder	15	12.0
	Constipation	13	10.4
	Neutropenic fever	9	7.2
	Diarrhea	8	6.4
	Anemia	8	6.4
	Neutropenia	6	4.8
	Dysuria	5	4.0
	Thrombocytopenia	5	4.0
	Hematuria	3	2.4
	Mucositis	2	1.6
	Other	2	1.6

There was no statistically significant relationship between the number of ED visits and marital status, educational level, income status, and chronic disease status ( $p > 0.05$ ). The analysis result showed no statistically significant difference in age averages based on the number of ED visits ( $p > 0.05$ ) (Table 4).

## Discussion

Regarding the causes of death worldwide, it is observed that the leading cause is non-communicable diseases. Cancer, which falls within this scope, is considered a significant public health issue due to its increasing frequency in recent years [24]. The extension of life expectancy and advancements in early diagnosis and treatment options have led to an increase in cancer patients' ED admissions. It is estimated that by the year 2030, approximately 70% of all cancers will occur in individuals aged 65 and older [25]. Studies investigating cancer patients' visits to the emergency room show that visits were more common among adults aged 65 and over, and the average age was reported to vary between 61 and 76 [21, 26–30]. In our study, the average age was calculated as  $70.92 \pm 3.47$  years.

The World Health Organization has stated that oncological diseases are more frequently observed in males from the age of 60 [26, 31]. In studies, the percentage of male participants are as follows: Koçak et al. [27], 58%; Bayrak and Kitis [21], 56.4%; Kerrouault et al. (2007) [32], 65%;

and Olt et al. (2015) [33], 55.7%. In our study, the majority of participants were found to be male, consistent with the literature. These findings highlight the importance of tailoring nursing management and patient education programs to address the specific needs of male patients, particularly in understanding disease progression, treatment processes, and the psychosocial challenges they may face.

The three most common diagnoses of participants who applied to the ED were lung cancer (14.4%), breast cancer (13.6%), and stomach cancer (10.4%). The following results have been obtained for similar studies in the literature: In Koçak et al. [27], the three most common malignancies among were reported as cancer of the lung (30%), stomach (11%), and breast (11%). In Gallaway et al. [26] which examined cancer patients who applied to the ED, the three most common hemato-oncological diagnoses were cancer of the lung (13.0%), breast (9.9%), and colon or rectum (6.8%). In a study by Lee et al. [34], which investigated epidemiological trends in ED utilization for cancer-related issues, the most common cancer types observed during ED visits were reported as lung, liver, and colorectal. In a study by Rivera et al. [35], the most commonly reported types among cancer patients presenting to the ED were breast (14.9%), prostate (11.3%), and cancer (10.3%). The literature reveals that the majority of cancer patients presenting to the ED have gastrointestinal system cancer or respiratory system cancer [36–38]. In a study comparing general emergency services and those emergency services with comprehensive cancer centers, it was stated that those patients who most frequently applied to the latter type were those with hematological, breast, and gastrointestinal system cancers [39]. According to cancer statistics published in Turkey, the most common types of cancers are lung cancer for men, and breast cancer for women [11]. Thus, the results of our study appear largely compatible with the literature. Given these findings, the role of nursing becomes crucial in managing cancer patients' educational needs. Tailored educational programs focusing on the specific needs and challenges associated with common cancer types can empower patients and their families while supporting continuity of care. It is important to provide individualized education to addressing patient concerns, and to coordinate care. In this way, nurses can help ensure that patients and their families are well-equipped to manage the complexities of cancer care, improving adherence to treatment plans and enhancing the overall patient experience.

Chemotherapy is one of the most common treatment methods for cancer-diagnosed patients. In our study, 82.4% of the participants stated that they received chemotherapy, which echoes findings in the literature [21, 40].

In our study, the most common reasons for emergency department (ED) visits among participants were infection, pain, nausea-vomiting, and dyspnea. These findings align

**Table 4** Comparison of the relationships between participants' demographic characteristics and the number of ED visits

			Number of applications			Test statistics	<i>p</i>
			1–3 times	4–9 times	10 times or more		
<b>Gender</b>	Female	<i>n</i>	58	2	0	6.201	0.02*
		%	96.7	3.3	0.0		
	Male	<i>n</i>	54	10	1		
		%	83.1	15.4	1.5		
<b>Marital status</b>	Single	<i>n</i>	6	3	0	6.099	0.11
		%	66.7	33.3	0.0		
	Married	<i>n</i>	106	9	1		
		%	91.4	7.8	0.9		
<b>Educational status</b>	Primary/secondary school	<i>n</i>	62	6	1	4.584	0.77
		%	89.9	8.7	1.4		
	High school	<i>n</i>	20	3	0		
		%	87.0	13.0	0.0		
	University	<i>n</i>	26	2	0		
		%	92.9	7.1	0.0		
	Degree	<i>n</i>	4	1	0		
		%	80.0	20.0	0.0		
<b>Income status</b>	Income is less than expenses	<i>n</i>	57	7	0	2.364	0.80
		%	89.1	10.9	0.0		
	Income equals expenses	<i>n</i>	42	4	1		
		%	89.4	8.5	2.1		
	Income exceeds expenses	<i>n</i>	13	1	0		
		%	92.9	7.1	0.0		
<b>Person living together</b>	Alone	<i>n</i>	9	2	0	11.618	0.02*
		%	81.8	18.2	0.0		
	Spouse/family	<i>n</i>	102	8	1		
		%	91.9	7.2	0.9		
	Other	<i>n</i>	1	2	0		
		%	33.3	66.7	0.0		

partially with the literature. Koçak et al. [27] identified shortness of breath, abdominal pain, and deterioration in oral intake as the most frequent causes of ED visits, while Bayrak and Kitiş [21] reported pain, respiratory, and gastrointestinal issues. Vandyk et al. [41] highlighted neutropenic fever, infection, and nausea-vomiting as common reasons, whereas Barbara et al. [42] found pain to be the most prevalent cause. Similarly, Bozdemir et al. [36] emphasized pain, dyspnea, and nausea-vomiting as leading complaints. Other studies noted that cancer patients often visit EDs for neutropenic fever, electrolyte abnormalities, anemia, dehydration, and pneumonia [34, 35, 43, 44]. These findings underscore the multifactorial nature of ED admissions in oncology patients, particularly in managing treatment-related symptoms such as pain and nausea [45]. Given these challenges, nurse-led symptom management and patient education are critical in reducing emergency department (ED) visits. Nurses are uniquely positioned to implement proactive

symptom management strategies, empowering patients with the knowledge required to recognize early signs of complications, manage treatment-related side effects, and engage in effective self-care practices. Educational interventions, particularly those targeting the management of symptoms such as pain and nausea, can enable patients to address these issues in the home setting, thereby reducing the frequency of unnecessary ED visits, and enhancing overall quality of life. This comprehensive, nursing-led approach plays a vital role in guiding patients through the complexities of cancer treatment and ultimately optimizing patient outcomes.

The high number of applications related to nausea/vomiting symptoms was associated with the fact that most participants received chemotherapy. The literature suggests that the reasons for admission are potentially less severe ones, and thus, education from oncology nurses for symptom control could reduce ED visits and increase disease self-management. The more frequent administration of chemotherapy



and the need to control treatment-related side effects have increased the need for more accurate and more comprehensive patient and family education. The oncology nurse should comprehensively describe the potential side effects and issues caused by the use of antineoplastic agents, determine the likely timing of side effects, and assist patients in expressing their concerns [46]. The nurse should also provide symptom management to improve the individual and family's quality of life. Additionally, the nurse should offer the individual and family information about the chemotherapy protocol, create an appropriate teaching plan which covers the needs of the patient and family regarding potential side effects of treatment, necessary self-care measures, and antiemetic regimen. This plan should be carefully implemented and evaluated [47].

In our study, only 39.2% of the participants stated that they were informed about situations requiring ED visits, and the majority mentioned being informed only about the possibility of fever. In the study by Bayrak and Kitiş [21], similar findings were reported. These results suggest that patients are generally informed about infection and the possibility of fever but may lack information about other potential side effects. The oncology nurse aims to improve the quality of life for individuals and families diagnosed with cancer and to ensure that they maintain their functionality at the highest level possible. Oncology nurses, who are always present with patients and have the opportunity to observe every aspect of their lives, play a crucial role with their knowledge and skills in controlling and managing patients' symptoms. Particularly in the palliative care process, the oncology nurse should raise individuals and their families' awareness about how to control symptoms at home and ensure the effective management of pain and other symptoms [48].

In the study, 89.6% were found to have visited the ED 1–3 times in the last year, and for 56%, the follow-up period was determined as 1–3 days. In another study examining the demographic and clinical characteristics of cancer patients who visited the ED, it was reported that the length of stay in the ED was generally less than 24 h [49]. However, there is only a limited number of studies focusing on cancer patients' visits to the ED. Furthermore, it has been observed that the studies conducted did not specifically target the geriatric population but rather included all cancer patients. In this regard, our study makes a contribution to the existing literature. These results highlight the need for a specialized approach to managing oncology patients in the ED, particularly those over the age of 65. Nursing care for this population requires a comprehensive understanding of their unique challenges, such as comorbidities and potential side effects of cancer treatments. In geriatric oncology, nurses must play a key role in assessing patients' clinical needs, coordinating with multidisciplinary teams, and providing appropriate follow-up care to prevent unnecessary return visits to

the ED. Effective nursing management, including patient education and discharge planning, is critical to improving the quality of life and reducing hospital readmission rates for older cancer patients.

## Limits

The cross-sectional nature of the study, the small sample size, and the lack of variability in cancer types and drug protocols can be considered among the limitations of the study.

## Conclusion and recommendations

Advancements in the fields of medicine and technology have contributed to an increase in average life expectancy and the aging of the population, leading to an increased prevalence of non-communicable diseases, particularly cancer, along with challenges in managing treatment-related complications and symptoms. As a result, older oncology patients have experienced more frequent visits to the emergency department. In our study, we examined the reasons for and frequency of emergency department visits among oncology patients aged 65 and older, highlighting the importance of improving symptom management. Recurrent emergency department visits among cancer patients reveal insufficient knowledge about when to seek emergency care and gaps in post-treatment follow-up and palliative care. In this context, oncology nurses, particularly navigators, are expected to play a critical role in symptom management, early intervention, and care coordination. The establishment of a specialized care area for geriatric oncology patients would help address the unique needs of this population more effectively and improve the quality of healthcare services. Additionally, the development of evidence-based care guidelines for cancer patients is recommended, along with educational programs for healthcare professionals and caregivers to address these deficiencies.

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**Data availability** No datasets were generated or analysed during the current study.

## Declarations

**Ethical approval** This study was performed in line with the principles of the Declaration of Helsinki.

**Consent to participate** Informed consent was obtained from all individual participants included in the study prior to the interview.

**Conflict of interest** The authors declare no competing interests.

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## References

- Doner NH, Yıldırım Y (2021) Adding life to the years: old age from Meleis' perspective. *Journal of Turkish Nurses Association* 2(2):78–87
- Baz U, Satar S, Kozacı N et al (2014) Geriatric patient admissions to the emergency service. *Eurasian Journal of Emergency Medicine* 13(2):53–57
- Akbuga Ozel B, Mamak Ekinci EB, Kayıpmaz AE et al (2016) Analysis of the use of resources and features of presentations and the trends in geriatric patients presenting to the emergency department: 2011–2015. *Turkish Journal of Geriatrics* 19(3):154–161
- Sarıtaş A, Kandış H, Baltacı D (2013) Approach to geriatric patients in emergency services. *Academic Journal of Emergency Medicine* 12(2):93–97
- Bilgili MA, Öncü MR (2021) Evaluation of geriatric patients applying to the emergency department. *Van Medical Journal* 28(1):77–83
- Zubaroglu Yanardağ M, Say Şahin D (2019) An examination on trait anxiety and trait depression in the elderly individuals. *Journal of Society & Social Work* 30(1):37–55. <https://doi.org/10.33417/tsh.516681>
- Oyetunde MO, Ojo OO, Ojewale LY (2013) Nurses' attitude towards the care of the elderly: implications for gerontological nursing training. *J Nurs Educ Pract* 3(7):150–158. <https://doi.org/10.5430/jnep.v3n7p150>
- Mwakilasa MT, Foley C, O'Carroll T, Flynn R, Rohde D (2021) Care experiences of older people in the emergency department: a concurrent mixed-methods study. *J Patient Exp* 8:23743735211065267. Published 2021 Dec 10. <https://doi.org/10.1177/23743735211065267>
- Cantay H, Sahin S, Sutlu S (2022) Evaluation of healthcare use among patients aged 65 and over applying to the general surgery outpatient clinic. *The Anatolian Journal of Family Medicine* 5(1):32–37. <https://doi.org/10.5505/anatoljfm.2022.41961>
- Turkish Statistical Institute Seniors with Statistics, 2022. Access Address: <https://data.tuik.gov.tr/Bulten/Index?p=Istatistik-lerle-Yasli-lar-2021-45636#:~:text=T%C3%9C%C4%B0K%20Kurumsal&text=Ya%C5%9Fl%C4%B1%20n%C3%BCfus%20olarak%20kabul%20edilen,9%C7%27ye%20y%C3%BCKse> Published on March 18, 2022. Access Date: 05.11.2023.
- Republic of Türkiye Ministry of Health Turkey Cancer Statistics 2018. Access Address: [https://hsgm.saglik.gov.tr/depo/birimler/kanser-db/Dokumanlar/Istatistikler/Kanser\\_Rapor\\_2018.pdf](https://hsgm.saglik.gov.tr/depo/birimler/kanser-db/Dokumanlar/Istatistikler/Kanser_Rapor_2018.pdf) Published on 2022. Access Date: 20.11.2023.
- Sadik M, Ozlem K, Huseyin M, AliAyberk B, Ahmet S, Ozgur O (2014) Attributes of cancer patients admitted to the emergency department in one year. *World J Emerg Med* 5(2):85–90. <https://doi.org/10.5847/wjem.j.issn.1920-8642.2014.02.001>
- Keskinoglu P, Inan F (2014) Analysis of emergency department visits by elderly patients in an urban public hospital in Turkey. *Journal of Clinical Gerontology & Geriatrics* 5(4):127–131. <https://doi.org/10.1016/j.jcgg.2014.07.001>
- Unsal A, Cevik AA (2003) Metintas S, et.al. Emergency department visits by elder patients. *Turk j Geriatr* 6(3):83–8.
- Kekec Z, Koc F, Buyuk S (2009) Review of geriatric patients hospitalization in emergency department. *JAEM* 8(3):21–24. <https://doi.org/10.4170/JAEM.2009.58070>
- Cırsar G, Akkus Y, Elnare G, Erdemir-Ozturk E, Palas MB (2016) Reasons for elderly people consulting the emergency department: a retrospective study in Kars. *Turk J Geriatrics* 19(1):19–26
- Can N, Yolcu S, Beceren NGC, Tomruk O (2013) Determining the relationship between sociodemographic characteristics of cancer patients who admit to our emergency department and their emergency applications. *Bozok Medical Journal* 3(2):6–11
- Hu SC, Yen D, Yu YC, Kao WF, Wang LM (1999) Elderly use of the ED in an Asian metropolis. *Am J Emerg Med* 17(1):95–99
- Bedel C, Tomruk O (2018) Characteristics of geriatric patients presenting to a university emergency department. *Medical Journal of Suleyman Demirel University* 25(4):393–399. <https://doi.org/10.17343/sdutfd.370472>
- Yaylacı S, Topuzoglu A, Karcıoglu O (2009) Clinical characteristics and one-year survival of cancer patients presenting to emergency department. *Int J Hematol* 4:213–222
- Bayrak E, Kitis Y (2018) The main reasons for emergency department visits in cancer patients. *Med Bull Haseki* 56:6–13. <https://doi.org/10.4274/haseki.83997>
- Alan O, Gursel O, Unsal M et al (2013) Oncologic approach in geriatric patients. *Okmeydani Medical Journal* 29(2):94–98. <https://doi.org/10.5222/otd.sup2.2013.094>
- Akpınar O, Turkdogan KA, Kapcı M et al (2015) Use of emergency department by elderly patients. *J Clin Anal Med* 6(suppl 3):310–314
- Mete B, Soyiler V, Buzgan B (2020) Cancer incidence and survival analysis among elderly people in Bingol province. *Cukurova Med J* 45(1):290–297. <https://doi.org/10.17826/cumj.654044>
- Nene RV, Brennan JJ, Castillo EM, Tran P, Hsia RY, Coyne CJ (2021) Cancer-related emergency department visits: comparing characteristics and outcomes. *West J Emerg Med* 22(5):1117–1123. <https://doi.org/10.5811/westjem.2021.5.51118>
- Gallaway MS, Idaikkadar N, Tai E et al (2021) Emergency department visits among people with cancer: frequency, symptoms, and characteristics. *J Am Coll Emerg Physicians Open* 2(3):e12438. <https://doi.org/10.1002/emp2.12438>
- Kocak S, Ertekin B, Polat M et al (2012) Reasons for oncology patients in the emergency department application. *Sakarya Medical Journal* 2:16–20. <https://doi.org/10.5505/sakaryamj.2012.96268>
- Haydaroglu A, Bolukbasi Y, Ozsaran Z (2007) Cancer registry analysis at Ege University: evaluation of 34134 cases. *Turkish Journal of Oncology* 22(1):22–28



29. Hintistan S, Cilingir D, Nural N, Akkas Gursoy A (2012) Practices regarding symptoms experienced by patients with hematological cancer due to chemotherapy. *Gümüşhane University Journal of Health Sciences* 1(3):153–164
30. Hamid M, Hannan M, Myo Oo N, et al (2022) Chemotherapy toxicity in older adults optimized by geriatric assessment and intervention: a non-comparative analysis. *Curr Oncol*. 29(9):6167–6176. Published 2022 Aug 26. <https://doi.org/10.3390/curroncol29090484>
31. World Health Organization, Cancer. Access Address: [https://www.who.int/health-topics/cancer#tab=tab\\_3](https://www.who.int/health-topics/cancer#tab=tab_3) Date of Access: 29.12.2023
32. Kerrouault E, Denis N, Le Conte P, Dabouis G (2007) Une meilleure organisation des soins pourrait diminuer le nombre des patients atteints de cancer adressés aux urgences. Analyse prospective de 123 patients [Improving organization of care could reduce referrals of cancer patients to the emergency department. Prospective analysis of 123 patients]. *Presse Med*. 36(11 Pt 1):1557–1562. <https://doi.org/10.1016/j.lpm.2007.04.015>
33. Olt S, Ergenç H, Baykara M, Arpacı E, Yaylacı S, Demirci H, Tamer A (2015) Retrospective analysis of the patients we followed in the oncology clinic. *Sakarya Medical Journal* 5(2):77–81. <https://doi.org/10.5505/sakaryamj.2015.72687>
34. Lee SY, Ro YS, Shin SD, Moon S (2021) Epidemiologic trends in cancer-related emergency department utilization in Korea from 2015 to 2019. *Sci Rep*. 11(1):21981. Published 2021 Nov 9. <https://doi.org/10.1038/s41598-021-01571-1>
35. Rivera DR, Gallicchio L, Brown J, Liu B, Kyriacou DN, Shelburne N (2017) Trends in adult cancer-related emergency department utilization: an analysis of data from the nationwide emergency department sample. *JAMA Oncol* 3(10):e172450. <https://doi.org/10.1001/jamaoncol.2017.2450>
36. Bozdemir N, Eray O, Eken C et al (2009) Demographics, clinical presentations and outcomes of cancer patients admitted to the emergency department. *Turkish Journal of Medical Sciences* 39:235–240
37. Yildirim B, Tanriverdi O (2014) Evaluation of cancer patients admitted to the emergency department within one month before death in Turkey: what are the problems needing attention? *Asian Pac J Cancer Prev* 15(1):349–353. <https://doi.org/10.7314/apjcp.2014.15.1.349>
38. Tanriverdi O, Beydilli H, Yildirim B, Karagoz U (2014) Single center experience on causes of cancer patients visiting the emergency department in southwest Turkey. *Asian Pac J Cancer Prev* 15(2):687–690. <https://doi.org/10.7314/apjcp.2014.15.2.687>
39. Yang Z, Yang R, Kwak MJ, et al (2018) Oncologic emergencies in a cancer center emergency department and in general emergency departments countywide and nationwide. *PLoS One* 13(2):e0191658. Published 2018 Feb 20. <https://doi.org/10.1371/journal.pone.0191658>
40. Ahn S, Lee YS, Lim KS, Lee JL (2012) Emergency department cancer unit and management of oncologic emergencies: experience in Asan Medical Center. *Support Care Cancer* 20(9):2205–2210. <https://doi.org/10.1007/s00520-012-1478-8>
41. Vandyk AD, Harrison MB, Macartney G, Ross-White A, Stacey D (2012) Emergency department visits for symptoms experienced by oncology patients: a systematic review. *Support Care Cancer* 20(8):1589–1599. <https://doi.org/10.1007/s00520-012-1459-y>
42. Barbera L, Atzema C, Sutradhar R et al (2013) Do patient-reported symptoms predict emergency department visits in cancer patients? A population-based analysis *Ann Emerg Med* 61(4):427–437.e5. <https://doi.org/10.1016/j.annemergmed.2012.10.010>
43. Workina A, Habtamu A, Zewdie W (2022) Reasons for emergency department visit, outcomes, and associated factors of oncologic patients at Emergency Department of Jimma University Medical Centre. *Open Access Emerg Med*. 14:581–590. Published 2022 Oct 28. <https://doi.org/10.2147/OAEM.S381816>
44. Lee Stirling S, Etland C, Connelly CD, Calero P, Ecoff L (2022) Oncology nurse navigator effect on emergency department visits and hospital admissions of adults with cancer post-outpatient chemotherapy. *Oncol Nurs Forum* 49(6):595–612. <https://doi.org/10.1188/22.ONF.595-612>
45. Celik B, Guler I, Karaca B, Cetin M, Emem MK (2022) Cancer patients presenting to the emergency department in northwest Syria. *Medicine Science [Internet]* 11(4):1697–701. Available from: <https://search.ebscohost.com/login.aspx?direct=true&db=e5h&AN=161703687&site=eds-live>
46. Rieger PT, Yarbrow CH (2003) Role of the Oncology Nurse. In: Kufe DW, Pollock RE, Weichselbaum RR, et al., editors. *Holland-Frei Cancer Medicine*. 6th edition. Hamilton (ON): BC Decker; 2003. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK13570> Available date: 20.11.2023
47. Republic of Turkey Ministry of Health Nursing Regulation. Available from: <https://www.resmigazete.gov.tr/eskiler/2011/04/20110419-5.htm> Available date: 02.01.2024
48. Tarakcioğlu Celik GH (2016) Symptom management in oncology nursing. *Gümüşhane University Journal of Health Sciences* 5(4):93–100
49. Ayrancı E, Yılmaz B (2023) Demographic and clinical characteristics of cancer patients presenting to the emergency department: a single-center experience. *J Exp Clin Med* 40(3):431–436. <https://doi.org/10.52142/omujecm.40.3.2>

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