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Identifying the factors contributing to hospital readmissions in palliative care: a mixed-methods study from a Turkish palliative care unit

Serkan Budak[1*], Yasemin Karacan[2] and Veli Arslan[3]

Abstract

Background Palliative care is a comprehensive approach that aims to improve quality of life and reduce symptom burden in life-threatening illnesses. However, hospital readmissions in these patients are a significant problem for both the healthcare system and patients and caregivers. The aim of this study was to identify the factors leading to these hospital admissions and develop recommendations to inform preventive care approaches.

Methods The study utilized an explanatory sequential mixed-methods design. In the first phase, we retrospectively analyzed the clinical and demographic data of 1,256 patients receiving palliative care between 2016 and 2025 using normality tests (Kolmogorov–Smirnov, Shapiro–Wilk), group comparison tests (t-tests, ANOVA), Pearson correlation, and multiple regression analysis. In the second phase, data obtained from semi-structured interviews with 14 patients, 14 caregivers, and 17 healthcare professionals were analyzed thematically using the MAXQDA 2024 program.

Results In quantitative analyses, disease type ($p = 0.005$), number of additional chronic diseases ($p < 0.001$), and age ($p = 0.028$) were significantly associated with hospital readmissions. Hospital admission frequency was significantly higher among individuals diagnosed with Chronic Obstructive Pulmonary Disease (COPD), while the length of hospital stay was significantly higher among individuals diagnosed with stroke and Alzheimer's disease. Qualitative analysis identified three main themes: Perceptions of Care Quality, Anxieties and Fears, and Systemic Challenges.

Conclusions Preventing hospital readmissions in palliative care requires a comprehensive approach that addresses not only medical factors but also psychosocial and systemic factors. In this context, the findings point to key components that may inform the development of future nurse-led, sustainable care approaches, including early palliative care interventions, home care training, counseling services, and consistent home visits.

Keywords Palliative care, Nursing, Home care services, Hospital readmission, Hospice, Mixed methods

*Correspondence:
Serkan Budak
serkan.budak@ksbu.edu.tr
[1]Simav Vocational School of Health Services, Department of Health Care Services, Kütahya Health Sciences University, Kütahya, Turkey
[2]Faculty of Health Sciences, Nursing Department, Yalova University, Yalova, Turkey
[3]Simav Assoc. Dr. İsmail Karakuyu State Hospital, Kütahya, Türkiye

Background

Palliative care is a multidisciplinary approach aimed at improving the quality of life of individuals with progressive, life-limiting illnesses by addressing their physical, psychological, social, and spiritual needs. Globally, the demand for palliative care continues to increase due to rising rates of chronic and degenerative diseases. According to the Global Atlas of Palliative Care, approximately 56.8 million people require palliative care annually, most of whom are affected by non-communicable diseases such as cardiovascular diseases, cancer, chronic respiratory disorders, and dementia [1, 2]. In Turkey, national reports indicate that cancer is the most common diagnosis among palliative-care patients, and other frequent conditions include cardiovascular diseases, COPD, and neurodegenerative disorders [3].

Hospital readmissions remain one of the most persistent challenges in palliative care, often resulting from disease progression, uncontrolled symptoms, treatment-related complications, multimorbidity, or difficulties managing care at home. Systemic issues—such as fragmented transitions between hospital and home care, insufficient caregiver capacity, and lack of coordinated community-based support—further increase avoidable readmissions. Evidence from international studies has shown that strengthening home-based palliative care reduces symptom burden, improves patient and caregiver outcomes, and significantly lowers the likelihood of hospital readmission and healthcare costs [4, 5]. Similarly, qualitative research has demonstrated that family caregivers frequently experience uncertainty, emotional strain, and gaps in support during transitions from hospital to home, all of which contribute to service utilization patterns including readmissions [6]. Reviews also indicate that social support networks and caregiver resilience are decisive factors influencing whether patients can remain safely at home during advanced illness [7]. Moreover, home-based palliative care has been shown to substantially affect caregivers' burden, decision-making, and ability to maintain the patient at home near the end of life [8].

Palliative care delivery in Turkey is based on an integrated model that includes hospital-based palliative care units, home healthcare teams, and community-based support services. The hospital where this study was conducted is a regional public institution with a 16-bed palliative care unit operating 24/7, supported by a multidisciplinary team and linked to home healthcare services that provide follow-up after discharge. Despite national expansion of palliative care capacity, gaps persist in home care integration, caregiver education, and continuity of support, which continue to influence readmission patterns [3, 9].

Given these challenges, identifying the clinical, psychosocial, and systemic factors contributing to hospital readmissions is essential for improving the effectiveness and continuity of palliative care. This mixed-methods study aimed to examine these factors comprehensively and to strengthen integrated, preventive, nurse-led palliative care approaches.

Methods

Study design

This study was conducted using an explanatory sequential mixed-methods design. In this design, quantitative data were collected first, followed by a qualitative phase designed to explain, expand, and contextualize the quantitative findings. The qualitative phase was planned based on the preliminary quantitative results, consistent with the explanatory nature of the design.

Study setting

The study was carried out in a 150-bed state hospital located in Kütahya, Turkey, serving a catchment population of approximately 120,000 people. The palliative care unit consists of 16 beds and provides care to an average of 500 patients annually. This hospital functions as the primary referral center for palliative care and home care patients in the region.

The hospital's home care service includes five nurses and one physician, operating on weekdays during regular working hours. The service provides symptom management, medical follow-up, caregiver education, and basic palliative care support. Outside working hours, patients and caregivers are directed to the emergency department, as no after-hours home care or consultation service is available.

Population and sample of the study

Quantitative phase

The quantitative phase initially included 1,459 patients treated in the palliative care unit between 2016 and 2025. During the data-cleaning process, 82 duplicate electronic medical records (EMRs) were removed, and 121 records were excluded because essential variables required for analysis—such as the number of hospital readmissions, length of stay, or primary diagnosis—were missing. After these exclusions, 1,256 complete and unique patient records were included in the final analysis.

A priori power analysis conducted using G*Power 3.1 (effect size $f = 0.30$, $\alpha = 0.01$, power = 0.99) indicated that at least 457 patients were required. Since the final cohort exceeded this requirement, all eligible patients with complete data were included, and no additional sampling method was applied.

All patients, including those discharged home, those who died, and those transferred, were included in the

analysis because the study outcomes (number of readmissions and length of hospital stay) reflect the entire course of palliative care follow-up. Thus, the quantitative analysis was based on the entire cohort of 1,256 patients, rather than only on the 710 patients discharged to home care (HHCU).

None of the patients had been receiving home care services prior to their first admission to the palliative care unit; home care follow-up began only after discharge. All readmissions were captured from the same hospital, which serves as the sole public center providing both palliative care and home care services in the region. Due to limitations of the EMR system, weekend versus weekday readmission patterns could not be analyzed.

Qualitative phase

The qualitative sample consisted of 14 patients, 14 caregivers, and 17 healthcare professionals (12 palliative care nurses, 3 home care nurses, 1 palliative care physician, 1 home care physician). Criterion sampling was used, focusing on patients with high readmission frequency to ensure rich information power.

In this region, palliative and home care services are predominantly nurse-led and other professional disciplines (e.g. social work, psychology, physiotherapy) are not routinely involved in decision-making about hospital readmissions. Therefore, the professional composition of the qualitative sample reflects the organizational structure of the service rather than a sampling bias.

Eligibility criteria and recruitment

Patients

- Receiving palliative care treatment,
- Having at least one chronic disease (e.g., cancer, heart failure, COPD),
- Living with a chronic illness for at least one year,
- Being 18 years or older,
- Able to communicate verbally,
- Willing to participate.

Caregivers

- Providing primary care to a palliative care patient,
- Having provided care for at least six months,
- Being 18 years or older,
- Able to communicate verbally,
- Willing to participate.

Healthcare professionals

- Actively working in palliative care or home care services for at least six months,
- Being 18 years or older,
- Willing to participate.

Exclusion criteria

- Severe speech, hearing, or cognitive impairment preventing communication,
- Diagnosed mental disability.

Recruitment

- In the quantitative phase, all eligible EMRs were screened and included.
- In the qualitative phase, recruitment continued until data saturation was reached.

Research question

- What are the demographic and clinical characteristics of patients receiving palliative care?
- What factors influence hospital readmissions among palliative care patients?
- What care and management practices can be developed—based on patients', caregivers', and professionals' experiences—to prevent hospital readmissions?
- What nursing interventions can be implemented or strengthened to reduce preventable readmissions?

Questions 1–2 were addressed quantitatively; Questions 3–4 were explored qualitatively. In the qualitative phase, Research Questions 3 and 4 were directly explored through semi-structured interview questions focusing on symptom management challenges, caregiver needs, systemic barriers, and expectations for nursing-led interventions. The answers to these research questions were derived from the thematic analysis of the qualitative data.

Data collection tools

Quantitative tool

A Personal Information Form (8 items) was used to extract:

- Age, gender,
- Primary diagnosis,
- Number of additional chronic diseases,
- Number of readmissions,
- Length of stay,
- Type of discharge,
- Admission year.

Marital status and education level were not available, as these variables are not routinely recorded in the Turkish national EMR system. Content validity was ensured

through expert review (three specialists); psychometric testing was not applicable because the tool extracted objective clinical data rather than latent constructs.

Qualitative tool

A Semi-structured Interview Form was developed based on literature and quantitative findings (Supplementary Table 1). It included open-ended questions about:

- Readmission experiences,
- Symptom management,
- Caregiver burden,
- Adequacy of home care,
- System-level barriers and suggestions.

Data Collection

Quantitative data

Data were collected retrospectively from electronic medical records (EMRs) between July 30 and September 30, 2025.

Qualitative data

Interviews were conducted in patients' homes or hospital interview rooms.

- Duration: 30 min each.
- Audio-recorded and supplemented with field notes.
- Written informed consent obtained.
- Stopped when data saturation occurred.

Data Assessment

Quantitative analysis (IBM SPSS 25.0)

- Normality tests: Kolmogorov–Smirnov, Shapiro–Wilk.
- Group comparisons: Independent-samples t-test, One-way ANOVA.
- Associations: Pearson correlation.
- Multivariable analysis: Multiple linear regression.

Comorbidities were analyzed as counts; validated weighted indices (e.g., Charlson Comorbidity Index) were not used, which is acknowledged as a limitation. Readmission data were obtained exclusively from the study hospital; weekend readmissions could not be evaluated due to EMR format. A two-tailed p-value of <0.05 was considered statistically significant.

Qualitative analysis

A descriptive qualitative approach with a phenomenological orientation was applied, and data were analyzed using MAXQDA 2024. Two independent researchers conducted the initial coding of the transcripts, and codes were compared and refined through consensus meetings. To ensure credibility and confirmability, researcher triangulation, data triangulation (patients, caregivers, and healthcare professionals), reflexive notes, and an audit trail were used throughout the analysis. Codes were then organized into categories and themes through iterative comparison.

Integration of findings

This study followed an explanatory sequential mixed-methods design, and integration was achieved through the interconnected processes of connecting, building, and merging. In the connecting phase, preliminary quantitative results guided the purposeful selection of participants for the qualitative stage, ensuring inclusion of individuals with high readmission frequency and complex clinical needs. During the building phase, statistical patterns identified in the quantitative analysis—such as factors associated with higher readmission risk—guided the focus of the qualitative inquiry, through which challenges in symptom management, caregiver burden, and limitations in home care services were explored in depth and used to inform the development of the semi-structured interview questions. In the merging phase, qualitative themes were compared with, and used to explain or contextualize, the quantitative associations. To enhance transparency and methodological rigor, a joint display was planned a priori and is presented in the Results section, demonstrating how qualitative insights expanded, clarified, or deepened the interpretation of quantitative predictors. Through these integrated procedures, the two strands complemented one another, strengthening the overall explanatory power of the mixed-methods design.

Results

Patients' demographic and clinical characteristics

Table 1 illustrates the demographic and clinical characteristics of the patients. Furthermore, Fig. 1 presents a graph showing the number of hospital admissions and length of hospital stay based on patients' diagnoses.

Association between the number of hospital admissions and length of hospital stay with patients' demographic and clinical characteristics

Table 2 illustrates the findings regarding the relationship between patients' demographic and clinical characteristics, the number of hospital admissions, and the length of hospital stays. Accordingly, a statistically significant relationship was found between the type of disease and the number of hospital admissions ($p<0.05$). The number of hospital admissions for individuals diagnosed with COPD is higher than for individuals diagnosed with cancer and stroke. Furthermore, a positive correlation was found between the number of hospital admissions and the number of additional chronic diseases ($r=0.196$,

Table 1 Patients' demographic and clinical characteristics ($N = 1256$)

Variables		*n*	%
Disease	Alzheimer	129	10.3
	DM	202	16.1
	HT	127	10.1
	Cancer	280	22.3
	CKD	24	1.9
	COPD	100	8.0
	HF	127	10.1
	Stroke	206	16.4
	Others	61	4.9
Mode of discharge from palliative care	HHCU	710	56.5
	In-hospital death	509	40.5
	Transfer	37	2.9
Gender	Female	674	53.7
	Male	582	46.3
Status of recurrent hospital admissions	Yes	312	24.8
	No	944	75.2
Number of hospital admissions	Mean ± SD	1.39 ± 0.92	
	Min.-Max.	1.00–13.00	
Length of hospital stay	Mean ± SD	37.90 ± 41.07	
	Min.-Max.	1.00-279.00	
Number of additional chronic diseases	Mean ± SD	0.81 ± 0.97	
	Min.-Max.	0.00–5.00	
Age	Mean ± SD	74.95 ± 10.85	
	Min.-Max.	1.00-100.00	

DM Diabetes Mellitus, *HT* Hypertension, *CKD* Chronic Kidney Disease, *COPD* Chronic Obstructive Pulmonary Disease, *HF* Heart Failure, *HHCU* Home Health Care Unit

$p < 0.001$), and a negative correlation was found with the age variable (r=-0.064, $p < 0.05$). There was also a significant difference between disease types based on length of hospital stay ($p < 0.05$). The length of stay for individuals diagnosed with stroke was significantly higher than for those diagnosed with diabetes mellitus, hypertension, cancer, and heart failure, while the length of stay for individuals diagnosed with Alzheimer's disease was significantly higher than for those diagnosed with cancer and heart failure. In addition, a positive and statistically significant correlation was found between length of hospital stay and type of discharge from palliative care, as well as the number of additional chronic diseases ($p < 0.05$). Although patients with chronic kidney disease (CKD) showed numerically higher readmission frequencies, these differences did not reach statistical significance.

Effects of independent variables on the number of hospital admissions and length of hospital stay

Table 3 presents the regression analysis results showing the effects of independent variables on the number of hospital admissions and length of hospital stay. Variables showing significant bivariate associations were included in the model. The explained variance ratios were 4.1% for the number of hospital admissions and 2.1% for the length of hospital stay, indicating that the quantitative model had very limited explanatory power. In addition, the correlation between the number of hospital admissions and multimorbidity was weak ($r = 0.196$), despite being statistically significant. This demonstrates that quantitative predictors alone do not sufficiently account for the complexity of hospital readmissions, suggesting that important contributing factors may lie beyond measurable clinical variables. These limitations of the quantitative model highlight the complementary value of the qualitative findings, which provided deeper insight into psychosocial, caregiving-related, and systemic mechanisms underlying hospital readmissions.

Demographic and clinical characteristics of participants in qualitative interviews

Table 4 presents the summarized demographic and clinical characteristics of the patients, caregivers, and healthcare professionals included in the qualitative phase.

Summary of qualitative findings

Qualitative analysis identified three main themes describing factors related to hospital readmissions: Perceptions of Care Quality, Anxieties and Fears, and Systemic Challenges. Within Perceptions of Care Quality, the subthemes were caregivers' lack of knowledge, perceived inadequacy of home care, and trust in healthcare professionals. The theme Anxieties and Fears comprised fear of not being able to breathe, inequitable distribution of caregiving responsibilities, and fear of dying at home. Under Systemic Challenges, the subthemes were inefficient use of resources and long waiting times for hospital admissions.

Table 5 provides a concise summary of these themes and subthemes together with brief interpretive descriptions. The full version of the theme table including illustrative quotations is provided as Supplementary Table 2.

Integration of quantitative and qualitative findings

A joint display (Table 6) was developed to integrate the quantitative predictors of hospital readmissions and length of stay with the qualitative themes. This display demonstrates how psychosocial and systemic mechanisms help to explain the statistical associations observed in the quantitative phase.

For example, the higher frequency of readmissions among patients with COPD is consistent with qualitative reports describing unmanaged dyspnea, fear of being unable to breathe at home, and difficulties accessing after-hours clinical support. The quantitative association between multimorbidity and repeated readmissions is further illuminated by narratives highlighting complex medication regimens, frequent symptom fluctuations,

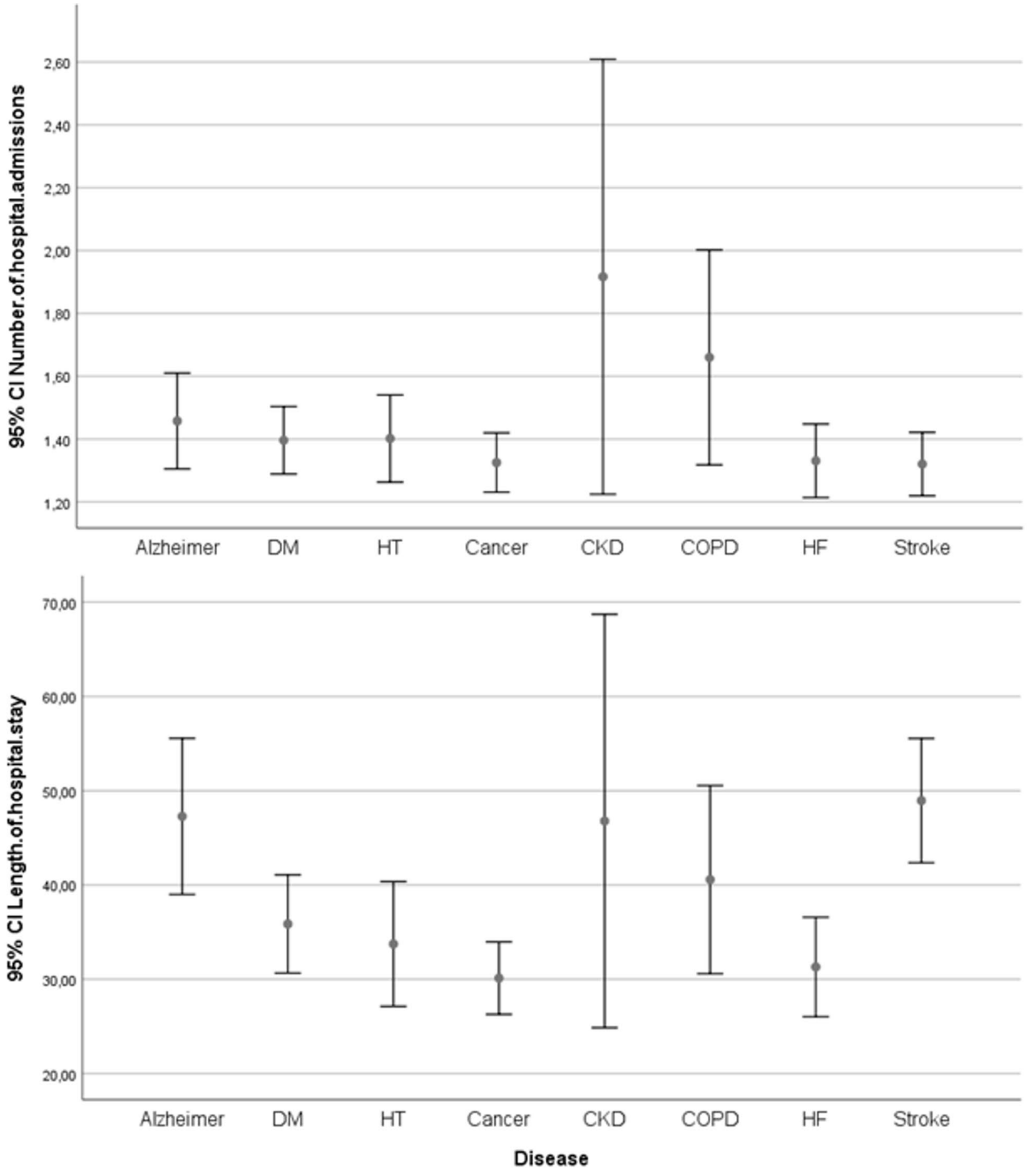

Fig. 1 Adjusted mean number of hospital admissions (95% CI) and length of hospital stay according to disease groups (95% CI). DM:Diabetes Mellitus; HT:Hypertension; CKD:Chronic Kidney Disease, COPD:Chronic Obstructive Pulmonary Disease; HF:Heart Failure

and caregiver fatigue. Similarly, the longer hospital stays observed in stroke and Alzheimer's patients correspond to qualitative accounts of high dependency in activities of daily living, difficulties in sustaining home-based care, and inequitable distribution of caregiving responsibilities within families.

In addition, the relationship between discharge type and length of hospital stay is supported by qualitative findings indicating that caregivers often feel unprepared

Table 2 Association between the number of hospital admissions and length of hospital stay with patients' demographic and clinical characteristics

Variables		Number of hospital admissions			Length of hospital stay		
		Mean ± SD	Test Value	p	Mean ± SD	Test Value	p
Disease	Alzheimer (1)	1.45 ± 0.87	F = 2.898	0.005*	47.27 ± 47.56	F = 5.626	< 0.001*
	DM (2)	1.39 ± 0.77		6 > 4	35.86 ± 37.55		1 > 4
	HT (3)	1.40 ± 0.78		6 > 8	33.74 ± 37.67		1 > 7
	Cancer (4)	1.32 ± 0.80			30.11 ± 32.69		8 > 2
	CKD (5)	1.91 ± 1.63			46.79 ± 51.94		8 > 3
	COPD (6)	1.66 ± 1.72			40.57 ± 50.29		8 > 4
	HF (7)	1.33 ± 0.66			31.29 ± 30.07		8 > 7
	Stroke (8)	1.32 ± 0.73			48.95 ± 48.04		
	Others (9)	1.33 ± 0.68			33.06 ± 28.15		
Mode of discharge from palliative care	HHCU (1)	1.37 ± 0.89	F = 1.002	0.368	35.84 ± 35.60	F = 4.950	0.007*
	In-hospital death (2)	1.44 ± 0.97			41.81 ± 47.72		2 > 1
	Transfer (3)	1.31 ± 0.71			24.40 ± 36.72		2 > 3
Gender	Female	1.35 ± 0.73	t=-1.791	0.074	36.72 ± 38.13	t=-1.072	0.284
	Male	1.45 ± 1.09			39.27 ± 44.22		
Number of additional chronic diseases	r		0.196			0.135	
	p		< 0.001*			< 0.001*	
Age	r		-0.064			0.042	
	p		0.028*			0.147	

DM Diabetes Mellitus, *HT* Hypertension, *CKD* Chronic Kidney Disease, *COPD* Chronic Obstructive Pulmonary Disease, *HF* Heart Failure, *HHCU* Home Health Care Unit

*Statistically significant results ($p < 0.05$)

Table 3 Effects of independent variables on the number of hospital admissions and length of hospital stay: results of regression analysis

Dependent Variable / Model		Independent Variable	Un Std. Coeff.		Std. Coeff.	t	F	Model (p)
			B	Std. Error	Beta			
Number of hospital admissions	$R^2 = 0.044$	Constant	1.685	0.188	-	8.98	18.18	< 0.001*
	Adj. $R^2 = 0.041$	Disease	0.005	0.011	0.013	0.46		
		Number of additional chronic diseases	0.190	0.027	0.201	7.01		
		Age	-0.006	0.002	-0.073	-2.56		
Length of hospital stay	$R^2 = 0.023$	Constant	24.145	4.160	-	5.80	9.55	< 0.001*
	Adj. $R^2 = 0.021$	Disease	1.074	0.500	0.062	2.14		
		Mode of discharge from palliative care	2.755	2.124	0.037	1.29		
		Number of additional chronic diseases	6.103	1.220	0.145	5.00		

*Statistically significant results ($p < 0.05$)

Table 4 Demographic and clinical characteristics of participants in qualitative interviews

Participant Group	*n*	Summary of Key Characteristics
Patients	14	Mostly older adults (≥ 65 years). majority with ≥ 2 chronic diseases; common diagnoses included COPD. cancer. stroke. and Alzheimer's; all had ≥ 1 hospital readmission.
Caregivers	14	Predominantly middle-aged family members; most were primary caregivers providing ≥ 6 months of care; high caregiving burden reported.
Healthcare Professionals	17	Includes 12 palliative-care nurses. 3 home-care nurses. 1 palliative-care physician. 1 home-care physician; clinical experience ranged from 1–15 years; directly involved in symptom management and patient follow-up.

and insecure about managing care at home, leading to repeated requests for rehospitalization when symptoms worsen or support is perceived as insufficient.

Overall, the integrated findings show that clinical predictors such as disease type, multimorbidity, and discharge status are closely intertwined with caregivers' knowledge and confidence, emotional responses (particularly anxiety and fear), and structural limitations in home care services. This confirms that reducing preventable hospital readmissions in palliative care requires not only medical optimization but also strengthening caregiver education, improving continuity and accessibility of home-based palliative services, and addressing systemic barriers in care delivery.

Table 5 Summary of themes And subthemes across narratives of Patients. Caregivers. And health professionals ($N=45$)

Theme	Subtheme	Summary
Perceptions of Care Quality	Caregivers' lack of knowledge	Caregivers have significant gaps in symptom management and technical skills. contributing to avoidable readmissions.
	Perceived inadequacy of home care	Many patients and caregivers view the home as insufficient to manage complex symptoms. leading to a preference for hospital-based care.
	Trust in healthcare professionals	Hospitals are perceived as safer due to continuous monitoring and professional expertise.
Anxieties and Fears	Fear of not being able to breathe	Dyspnea triggers panic. leading patients and caregivers to seek urgent hospital admission.
	Inequitable distribution of caregiving responsibilities	Concentration of caregiving burden on a single family member increases exhaustion and drives readmission decisions.
	Fear of dying at home	Cultural norms and lack of preparedness for end-of-life care at home prompt families to seek hospitalization.
Systemic Challenges	Inefficient use of resources	Home-care services have limited capacity. leading to unmet care needs and preventable hospital visits.
	Long waiting times for hospital admissions	High demand and limited bed capacity cause delays. increasing caregiver stress and emergency admissions.

Table 6 Joint display integrating quantitative predictors with qualitative explanatory themes

Quantitative Findings	Qualitative Explanations (Themes/Subthemes)	Integrated Interpretation
COPD patients had the highest number of readmissions	Anxieties and Fears → Fear of not being able to breathe	Patients frequently report panic during dyspnea episodes and seek hospital care immediately due to fear of respiratory distress.
	Perceptions of Care Quality→ Perceived inadequacy of home care	Caregivers feel unable to manage COPD symptoms such as breathlessness. leading to frequent readmissions.
Stroke and Alzheimer's patients had longer hospital stays	Anxieties and Fears → Unequal distribution of caregiving responsibilities	Families struggle with the heavy physical and emotional burden of caring for dependent patients.
	Perceptions of Care Quality→ Caregivers' lack of knowledge	Caregivers report limited skills in managing complex daily care needs (feeding. mobility. pressure ulcers).
Positive correlation between multimorbidity and number of readmissions ($r=0.196$)	Systemic Challenges → Inefficient use of resources	Multiple chronic conditions overwhelm home-care capacity. increasing reliance on hospital services.
	Perceptions of Care Quality→ Caregivers' lack of knowledge	Caregivers report difficulty managing multiple symptoms and medications at home.
Negative correlation between age and readmissions ($r=-0.064$)	Anxieties and Fears → Fear of dying at home	Families may avoid repeated hospital readmissions among older patients nearing end of life.
Length of stay differed by disease type and was associated with discharge status	Systemic Challenges → Long waiting times for hospital admissions	High demand for palliative beds creates delays and prolongs stays.
	Perceptions of Care Quality→ Trust in healthcare professionals	Families prefer to keep patients hospitalized until symptoms stabilize.

Discussion

This explanatory sequential mixed-methods study identified clinical, psychosocial, and structural factors influencing hospital readmissions among palliative care patients. Quantitative findings highlighted disease type, multimorbidity, and age as significant predictors of readmission frequency and hospital stay duration, while qualitative findings provided deeper insights into the lived experiences, perceptions, and systemic barriers that shape admission decisions. Integrating both strands allowed not only the identification of statistical associations but also the exploration of the mechanisms driving these patterns.

Quantitative interpretation

Consistent with previous research, patients with COPD demonstrated the highest frequency of readmissions, underscoring the clinical complexity and recurrent exacerbations characteristic of advanced respiratory disease. Studies have shown that COPD patients experience high 30-day readmission rates and often require repeated acute care due to symptom instability, inadequate home monitoring, and the unpredictable course of the illness [10, 11]. Similarly, prolonged hospital stays among individuals with stroke and Alzheimer's disease align with evidence showing that neurological deficits and cognitive impairment increase care dependency and recovery time [12, 13].

Multimorbidity also emerged as a significant factor in hospital readmissions, consistent with studies showing that the accumulation of chronic conditions substantially increases symptom burden and acute care utilization [14]. Interestingly, older age in this study was associated with fewer readmissions, a finding that contrasts with several reports indicating that advanced age is generally

linked to higher readmission risk in palliative and chronic disease populations [15, 16]. Recent work suggests that older adults may experience fewer readmissions due to differences in care trajectories, less aggressive intervention patterns, and care preferences that prioritize comfort over hospitalization [17]. These contextual differences may partly explain why age showed an inverse association with readmission in our sample.

Qualitative findings in this study also offered important contextual explanations. Caregivers of older patients frequently described a preference to avoid rehospitalization unless absolutely necessary, emphasizing comfort, familiar surroundings, and reduced distress for the older adult [17]. Participants also expressed concerns about the physical and emotional burden of hospital transfers for elderly relatives, which may contribute to fewer hospital visits [18]. Together, these qualitative insights illustrate how cultural norms, caregiver decision-making, and end-of-life expectations can shape hospitalization patterns beyond what is observable in quantitative data alone [6].

An additional noteworthy finding concerns patients with CKD. Although CKD did not emerge as a top predictor in regression analyses, descriptive data showed higher readmission frequencies within this subgroup [19]. This pattern may reflect the hemodynamic instability, metabolic complications, and symptom fluctuations common in advanced renal disease—issues that warrant greater emphasis in both clinical monitoring and future research [20]. However, the correlation between multimorbidity and readmissions was weak (r = 0.196), and the regression models explained only a small proportion of the variance (4.1% for the number of readmissions and 2.1% for the length of stay), indicating that routinely collected clinical variables have limited predictive value on their own [14].

Qualitative interpretation

The qualitative findings revealed three interrelated thematic domains—perceptions of care quality, anxieties and fears, and systemic challenges—that shape admission decisions in nuanced ways.

The theme of Perceptions of Care Quality showed that gaps in caregivers' knowledge, particularly regarding symptom management and basic nursing care, generated insecurity in the home environment. This perception, combined with limited home-care support, contributed to viewing the hospital as a safer and more competent setting. Previous research similarly reports that insufficient caregiver training and inadequate home-care resources increase families' reliance on hospital-based services [21, 22]. Trust in healthcare professionals—especially those available around the clock—further influenced families' reliance on acute care services.

Under Anxieties and Fears, patients and caregivers emphasized the emotional drivers of readmission. The fear of dyspnea emerged as a powerful trigger, whereby even mild respiratory discomfort was perceived as life-threatening, leading directly to emergency admissions. The inequitable distribution of caregiving responsibilities intensified caregiver strain; when caregiving roles fall disproportionately on one individual, exhaustion and psychological burden make hospital admission a perceived relief [23]. Additionally, cultural and emotional concerns surrounding death at home reinforced families' preference for hospital environments during periods of decline [24].

The third theme, Systemic Challenges, highlighted structural barriers. Inefficient allocation of home care resources, insufficient staffing, limited access to equipment, and overly long waiting times for hospital admission created conditions in which avoidable readmissions became almost inevitable. These findings align with existing literature documenting the need for coordinated, well-resourced community-based palliative care systems [6, 7].

Taken together, these findings emphasize that strengthening nurse-led education, counseling, and home-based follow-up is essential for addressing the emotional and practical challenges that frequently trigger preventable readmissions.

Integration of findings

The mixed-methods integration demonstrated that many quantitative associations—such as the high readmission rates among COPD patients or prolonged stays among neurological patients—are rooted in caregiver limitations, heightened anxiety, and inadequacies in home care infrastructure. Qualitative themes thus explained why certain clinical groups disproportionately rely on hospital-based care and why routine clinical variables alone insufficiently predict readmissions [7, 22].

Moreover, the qualitative strand illuminated factors not captured in the quantitative data, including social norms, caregiver fatigue, and perceptions of safety, suggesting that comprehensive strategies must address psychosocial and structural determinants alongside medical factors. The integration process also demonstrated that many of the mechanisms underlying readmissions—such as caregiver insecurity, inadequate symptom management, and limited continuity of care—can be mitigated through targeted, nurse-led interventions.

Implications for practice and further research

The findings highlight the need for strengthened home-based palliative care services, particularly for patients with complex symptoms such as dyspnea. Enhancing caregiver competence through structured training

programs, symptom management protocols, and clear guidance for emergency decision-making may reduce preventable readmissions. Improving communication between home care teams and hospital services, implementing rapid-response consultation lines, and expanding access to equipment and professional support are also promising strategies.

Findings from the qualitative and quantitative phases highlight that nurse-led interventions are central to preventing avoidable readmissions. Core strategies include structured caregiver education, regular home visits, proactive symptom monitoring—especially for dyspnea and other distressing symptoms—clear guidance for emergency decision-making, and strengthened communication during transitions from hospital to home. These nurse-driven practices can enhance caregivers' competence and confidence, reduce anxiety-driven admissions, and improve continuity of home-based palliative care.

Future research should investigate disease-specific pathways of readmission—particularly in CKD and multimorbid populations—and evaluate community-based interventions aimed at supporting caregivers. Expanding the qualitative lens to include social workers, psychologists, and rehabilitation specialists would enrich understanding of care needs. Longitudinal studies and multi-site research could further clarify contextual variations in readmission patterns.

Conclusion

This study demonstrates that hospital readmissions in palliative care are shaped by a combination of clinical characteristics, caregiver-related factors, emotional dynamics, and systemic limitations. Quantitative analyses identified COPD, multimorbidity, and neurological conditions as significant predictors of readmission, while qualitative findings provided a deeper understanding of the fears, perceptions, and structural gaps that drive care-seeking behaviors.

Rather than proposing a definitive care model, the study offers evidence-based suggestions for enhancing continuity and safety in home-based palliative care. Strategies such as caregiver education, timely professional support, coordinated discharge planning, and improved system-wide resource allocation may collectively reduce avoidable readmissions. Ultimately, an integrated approach that addresses medical, psychosocial, and structural determinants is essential for improving the quality and outcomes of palliative care.

Strengths and limitations

A major strength of this study is the use of an explanatory sequential mixed-methods design, which enabled a comprehensive exploration of readmission factors from both statistical and experiential perspectives. Inclusion of patients, caregivers, and healthcare professionals enriched the data and strengthened the credibility of the findings.

However, several limitations should be acknowledged. First, the study was conducted in a single institution, limiting generalizability to other regions and healthcare systems. Second, although multimorbidity was included quantitatively, the Charlson Comorbidity Index—an established measure of disease burden—was not used, which may have constrained the comparability of findings. Third, reasons for readmission could not be analyzed by disease type due to limitations in patient records. Fourth, the qualitative sample included only one physician, potentially restricting the diversity of professional perspectives. Fifth, although efforts were made to ensure trustworthiness, the use of a small coding team and the absence of a structured reflexivity framework may have influenced the analysis. Finally, long-term outcomes of home-based care were not monitored, preventing assessment of temporal patterns in readmissions.

Despite these limitations, the study provides valuable insights into the multifactorial nature of hospital readmissions in palliative care and offers actionable recommendations for practice and future inquiry.

Abbreviations

COPD Chronic Obstructive Pulmonary Disease
CKD Chronic Kidney Disease

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12904-025-01979-w.

Supplementary Material 1

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Authors' contributions

Serkan Budak: conceptualization, methodology, project administration, investigation, validation, analysis, writing – original draft, writing – review and editing. Yasemin Karacan: conceptualization, methodology, resources, writing – review and editing, supervision. Veli Arslan: conceptualization, methodology, resources, writing – review and editing, supervision.

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Data availability

The datasets generated and/or analyzed during the current study are not publicly available due to ethical restrictions but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Kütahya Health Sciences University Non-Interventional Clinical Research Ethics Committee (Approval No: 2025/09 – 02) and the participating hospital prior to the study. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Written informed consent was obtained from all individual participants included in the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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