ISSN 2458-8865 E-ISSN 2459-1505
www.fppc.com.tr
Family Practice & Palliative Care

Research Article

Factors related to cost-effective use of palliative care services in Türkiye

Türkiye'de palyatif bakım hizmetlerinin maliyet etkin kullanımına ilişkin faktörler

Ali Erol[a], Eyyüp Taşdemir[a], Feridun Gürlek[b], Fatih Coşkun[a], Ebubekir Demir[a], Hakan Demirci[c]

[a] Department of Internal Medicine, Bursa Yüksek İhtisas Training and Research Hospital, University of Health Science, Bursa, Türkiye

[b] Department of Allergy and Immunology, Bursa Yüksek İhtisas Training and Research Hospital, University of Health Science, Bursa, Türkiye

[c] Department of Family Medicine, Bursa Yüksek İhtisas Training and Research Hospital, University of Health Science, Bursa, Türkiye

Abstract

Introduction: The aim of this study was to determine the components affecting the cost in palliative care (PC) and to determine how much they affect this cost separately and to evaluate the relationship between PC components and PC cost in order to determine the cost table of both the patient and the hospital in a more planned way and for a more cost-effective management.

Methods: This was a retrospective cohort study. Data on patients, demographic characteristics, chronic disease profiles, duration of antibiotic use, antibiotic costs, length of stay, presence and number of hospital infections, feeding methods, opioid use, mortality rate, presence of decubitus ulcer, central venous catheter and tracheostomy were evaluated to determine their effects on cost.

Results: No significant relationship was found between cost of palliative care and mortality, age, gender, opioid use and chronic diseases. The cost of palliative care for the cancer group was statistically lower, with an average daily cost of $177. Length of stay, decubitus ulcers, duration of antibiotic use, number of nosocomial infections, presence of central venous catheter and tracheostomy, and nutritional status showed a positive correlation with cost of palliative care.

Conclusions: It was observed that some components of PC were associated with high costs, but mortality was independent of costs. While calculating the cost-effectiveness in PC, mortality should also be taken into consideration along with other components, and PC efficiency should not be ignored while targeting cost-effectiveness.

Keywords: Cost, cost effectiveness, palliative care

Öz

Giriş: Bu çalışmada palyatif bakımda (PB) maliyeti etkileyen bileşenlerin belirlenmesi ve bunların ayrı ayrı bu maliyeti ne kadar etkiledikleri ve hem hastanın hem de hastanenin maliyet tablosunu daha planlı bir şekilde belirlemek ve daha maliyet etkin bir yönetim amacıyla PB bileşenleri ile PB maliyeti arasındaki ilişkinin değerlendirilmesi amaçlandı

Yöntem: Bu retrospektif bir kohort çalışmasıdır. Hastaların demografik özellikleri, kronik hastalık profilleri, antibiyotik kullanım süreleri, antibiyotik maliyetleri, kalış süreleri, hastane enfeksiyonu varlığı ve sayısı, beslenme yöntemleri, opioid kullanımı, mortalite oranı, bası yarası varlığı, santral venöz kateter ve trakeostomiye ilişkin veriler incelendi. Maliyet üzerindeki etkileri değerlendirildi.

Bulgular: Palyatif bakımın maliyeti ile mortalite, yaş, cinsiyet, opioid kullanımı ve kronik hastalıklar arasında anlamlı bir ilişki bulunamadı. Kanser grubu için palyatif bakımın maliyeti istatistiksel olarak anlamlıydı(p=0.025) ve ortalama günlük maliyet 177,5 $ idi. Hastanede kalış süresi, dekübit ülseri, antibiyotik kullanım süresi, hastane enfeksiyonu sayısı, santral venöz kateter ve trakeostomi varlığı ve beslenme durumu palyatif bakımın maliyeti ile pozitif korelasyon gösterdi.

Sonuç: PB'ın bazı bileşenlerinin yüksek maliyetlerle ilişkili olduğu ancak mortalitenin maliyetlerden bağımsız olduğu görüldü. PB'da maliyet etkinliği hesaplanırken diğer bileşenlerle birlikte mortalite de dikkate alınmalı, maliyet etkinliği hedeflenirken PB verimliliği de göz ardı edilmemelidir.

Anahtar Kelimeler: Maliyet, maliyet etkinlilik, palyatif bakım

Received	Accepted	Published Online	Corresponding Author	E-mail
June 14, 2024	December 6, 2024	December 31, 2024	Ali Erol	alierol625@gmail.com
Correspondence	Ali Erol. Mimarsinan Mah.Emniyet Cad. 16310 Yıldırım/Bursa, Türkiye			
	https://doi.org/10.22391/fppc.1501116			

Key Points

1. Chronic diseases, age and opioid use do not affect the cost of palliative services.
2. In patients with tracheostomy, the presence of infection, the number of infections, the presence of pressure sores, the use of central venous catheters, the use of antibiotics, the length of hospital stay and nutritional status affect the cost of palliative services..

Introduction

Palliative care (PC) services involve a wide range of services delivered by professionals, including physicians, nursing, support workers, paramedics, pharmacists, physiotherapists and volunteers, to support terminally ill patients and their families [1]. PC improves the quality of life of patients and their families having difficulties associated with life-threatening illnesses, with a holistic approach [2]. Effective use of PC services reduces unnecessary hospital admissions and the use of health services including primary care and intensive care units [3].

It is known that PC components determine quality in care management. These components include age, aetiology, pain control, physical therapy and rehabilitation, nutritional support, decubitus ulcers, presence of tracheostomy and catheters, social financial support, susceptibility to infections/other diseases, psychological and spiritual support to patients and/or relatives and caregivers, and home care units. Studies have shown that the higher the number of components in PC, the higher the cost of the care. In one study, age, sex, daily habits, activities and number of chronic conditions were found to increase both public and private expenditures. A study evaluating the predictors of end-of-life costs revealed three variables, time of death, functional status and living arrangements, as important indicators of cost [4].

The range for PC cost is wide, not only between countries but also in the same country. For example, the average expenditure of primary health insurances in expert PC ranged from £186 to £6213 ($239 to $7981) in 2010 and 2011 per death in the United Kingdom [5]. The cost of PC for palliative inpatients in Romania is $96 per day whereas Bickel gave the daily cost of PC as $452 [6][7]. These differences in cost calculations may be due to the consideration of the results obtained from the package invoices of reimbursement systems. Adequate national policies are needed to minimize the variability in cost of PC and maximize the service obtained.

For PC service to be provided more cost-effectively, it is necessary to know the pay items in the current application. In this study, it was aimed to identify costly components in PC and to evaluate the relationship between PC components and the cost of PC.

Methods

Data on patients' demographic characteristics, chronic disease profiles, duration of antibiotic use, antibiotic costs, length of stay, presence and number of hospital infections, feeding methods (E: enteral; P: parenteral; and EP: enteral & parenteral), opioid use, mortality rate, presence of decubitus ulcer, central venous catheter and tracheostomy were evaluated to determine their effects on cost. Cost refers to the total care expenses incurred during a single stay in the PC unit. Cost data were obtained from the hospital information management system. Daily monitoring, laboratory results, drugs, consumable materials, bed fees and other treatment fees of the patients were recorded.

The Number Cruncher Statistical System (NCSS) 2007 program (Kaysville, Utah, USA) was used for statistical analysis. Mann-Whitney U test was used to compare descriptive statistical measures (mean, standard deviation, median, frequency, ratio, minimum and maximum) as well as two groups of variables that did not show normal distribution in comparison to the quantitative data. Kruskal-Wallis test was used to compare groups of three or more that did not show normal distribution. Statistical significance was determined at $p < 0.05$ level.

Ethical Approval

This study was carried out between May 2018 and May 2020 in the PC unit at the hospital. The study protocol was approved by the Ethics Committee of the Hospital (2011-KAEK-25 2018/ 03-10). A total of 133 patients were screened retrospectively.

Results

A total of 133 patients, 44.4% female (n=59) and 55.6% male (n=74), were screened retrospectively. The participants' ages ranged from 18 to 97 years, with an average of 67.9 ± 19.4 years. The hospitalization period ranged from 3 to 114 days, with an average of 28.8 ± 22.1 days. The duration of antibiotic use ranged from 0 to 84 days, with an average of 20.5 ± 17.8 days. The cost of antibiotics ranged from 0 to $3035 (median=$ 335),with an average of $570±661. The cost of PC (Table 1) ranged from 468,1 to 19,891$ (median=$ 3919), and the average cost was 5392±4382$. The results revealed that the chronic disease profiles, age (r: -0.140, p=0.107), mortality (p=0.462), opioid use (p=0.730) (Table 2) and gender (p=0.449) did not significantly affect the cost. On the other hand, the presence of infection (r: 0.698, p=0.001), number of infections (p=0.001), presence of decubitus ulcers (p=0.016), use of central venous catheters (p=0.003) in patients who underwent tracheostomy (p=0.001), antibiotic usage (r: 0.850 p=0.001), length of stay(r: 0.953, p=0.001) (Table 3) and nutritional status (p=0.001) had significant effects on the cost. The cost was higher in the EP group than the E group (p=0.001) and the P group (p=0.010). There was no statistically significant difference between the E and P groups in terms of cost (p=0,190). The presence of malignancy resulted in a statistically significant difference (p=0.025) in the cost of PC. Lower costs of care were observed in cases with malignancy.

Table 1. General characteristics of the participants

Age (years)	*Min-Max (Median)*	18-97 (74)
	Average ± Standard Deviation	67.90±19.42
Gender	Female (%)	59 (44.4)
	Male (%)	74 (55.6)
Length of hospital stay (days)	*Min-Max (Median)*	3-114 (22)
	Average ± Standard Deviation	28.89±22.10
Antibiotic duration (days)	*Min-Max (Median)*	0-84 (15)
	Average± Standard Deviation	20.59±17.86
Antibiotic cost ($)	*Min-Max (Median)*	0-3035 (335,3)
	Average ± Standard Deviation	570 ± 661
Total cost of palliative care ($)	*Min-Max (Median)*	468.1-19,891 (3919)
	Average ± Standard Deviation	5392 ± 4382

Table 2. Total costs of palliative care according to chronic diseases and other components

			Total cost of palliative care (Dollar)		
		n	Min-Max (Median)	*Average ± Standard Deviation*	p-value
Gender	Female	59	468 -16691 (3853)	4927±3844	[A]*0.449*
	Male	74	517-19891 (4128)	5762±4760	
Alzheimer's disease	No	108	468-19891 (3886)	5247±4418	[A]*0.339*
	Yes	25	985-14849 (4989)	6017±4251	
Parkinson's disease	No	126	468-19891 (3963)	5292±4244	[A]*0.559*
	Yes	7	2177-18370 (3467)	7190,6±6572	
Malignancy	No	101	468-19891(4200)	5862,9±4599	[A]*0.025**
	Yes	32	768-14239 (2955)	3906,6±3242	
Chronic thyroid disease	No	107	517-19891 (3687)	5074,5±4164	[A]*0.117*
	Yes	26	468-18370 (5887)	6699,7±5065	
Heart failure	No	105	468-19891 (3919)	5455,1±4402	[A]*0.643*
	Yes	28	517-17344 (4041)	5156,4±4374	
COPD	No	117	468-19891 (3853)	5360,3±4415	[A]*0.668*
	Yes	16	1099-17344 (5036)	5625,3±4258	
Diabetes	No	86	675-19891 (4232)	5770,9±4821	[A]*0.421*
	Yes	47	468-13369 (3639)	4699,2±3374	
Cerebrovascular diseases	No	66	468-19891 (3741)	5447,8±4699	[A]*0.743*
	Yes	67	517-18387 (4008)	5337,5±4080	
Hypertension	No	76	675-19891 (3886)	5282,7±4146	[A]*0.892*
	Yes	57	468-18387 (4008)	5538,2±4712	
Coronary artery disease	No	111	468-19891 (4200)	5588±4393	[A]*0.109*
	Yes	22	517-18370 (3503)	4404,4±4284	
Chronic renal failure	No	101	517-19891 (4008)	5471,2±4419	[A]*0.670*
	Yes	32	468-17344 (3790)	5142,8±4320	
Chronic liver disease	No	122	468-19891 (4066)	5520,3±4387	[A]*0.099*
	Yes	11	873-14239 (1781)	3971,8±4263	
Hyperlipidemia	No	107	468-19891 (3639)	5209,7±4308	[A]*0.170*
	Yes	26	944-17344 (4943)	6143,4±4685	
Opioid use	No	111	468-19891 (3919)	5439,7±4412	[A]*0.730*
	Yes	22	768-16691 (3717)	5152,7±4320	
Nutritional status	E	70	468-19891 (3169)	4576,9±4465	[A]*0.190*
	P	7	873-4608 (2440)	2522,3±1477	
	E/P	56	1247-17344(5561)	6770±4124	
Number of Nosocomial infections	No	37	517-9102 (1762)	2123,8±1554	[B]*0.001***
	1 infection	36	468-9449 (3768)	4160,8±2233	
	2 infections	36	1184-1989 (5500)	6849,2±4526	
	≥ 3 infections	24	2701-18387 (9553)	10092,8±4659	
Mortality	No	92	468-19891 (4199)	5618,4±4562	[A]*0.462*
	Yes	41	768-17344 (3612)	4884,5±3954	
Decubitus ulcer	No	47	468-19891 (3160)	4300±3878	[A]*0.016**
	Yes	86	517-18387 (496)	5989,1±4545	
Central catheter	No	99	517-18387 (3572)	4728,9±3884	[A]*0.003***
	Yes	34	468-19891 (5560)	7323,5±5181	
Tracheostomy	No	77	768-14849 (3467)	4195,3±3264	[A]*0.001***
	Yes	56	468-19891 (5788)	7038±5157	

*[a]Mann Whitney U Test, [b]Kruskal Wallis Test , *p<0.05, **p<0.01, COPD: Chronic Obstructive Pulmonary Disease*

Table 3. Factors affecting the total cost of palliative care

	Total cost of palliative care ($)	
	r	p
Age (years)	-0.140	*0.107*
Number of Nosocomial infections	0.698	*0.001***
Length of hospital stay (days)	0.953	*0.001***
Antibiotic duration (day)	0.850	*0.001***
Antibiotic cost ($)	0.778	*0.001***

*r: Spearman's correlation coefficient. **p<0.01*

Discussion

The cost of palliative care per patient was between 468.1-19,891,8$ and the average cost was 5392,2±4382$. No significant relationship was found between cost of palliative care and mortality, age, gender, opioid use and chronic diseases. The cost of palliative care for the cancer group was statistically lower, with an average daily cost of $177. Length of stay, decubitus ulcers, duration of antibiotic use, number of nosocomial infections, presence of central venous catheter and tracheostomy, and nutritional status showed a positive correlation with cost of palliative care.

There are studies in the literature suggesting that the population at the end-of-life increases health expenditures [8]. In a palliative care study conducted in 2017, Bynum et al. reported that the probability of costs remaining high decreased as age increased [9]. In our study, no relationship was found between age, gender and cost.

The literature has reported an increase in healthcare costs and the use of resources in cases where additional chronic diseases were present. Increased healthcare costs are linked to primary and specialist health services, drug use, emergency department admissions and increased length of stay [10]. Patel et al. reported an average cost of $48,550 per hospitalization for terminally ill liver disease patients receiving palliative care. In our study, there was no correlation between chronic disease profile and cost [11].

Between 2007 and 2011, May et al. reported that the average cost of palliative care for 256 cancer patients was $11,150 [12]. Oliver et al. calculated the costs of all hospitalizations and costs from diagnosis to death and reported a cost of £11,556 per patient in 109 malignant cases [13]. In our study, only spot hospitalization costs of the patients were calculated, and the cost of care for patients with malignant tumours was $3906 per person on average. This value is significantly lower due to the short length of stay of patients suffering from malignant tumours compared to other patients.

In another study carried out in 2011, Kart determined that the invoicing costs for terminally-ill cancer patients followed up in the intensive care unit were $279 per day and $3716 in total [14]. These were doubled when incidental expenditures such as palliative care, nutrition and antibiotic expenses were added. However, the cost calculation was based on intensive care unit bills subsidised by the SSI in the intensive care units. The average daily cost for cancer patients with malignant tumours in our palliative care centre was $177 and the cost for patients with malignant tumours was also significantly lower in a previous study [15]. Since the life expectancy of cancer patients is low, the length of stay is short; this consequently lowers the cost. However, the daily costs of care for cancer patients were similar in our assessment. Most of the studies on the cost of palliative care in the literature are directed towards cancer patients, whereas this study included all patients in need of palliative care.

In addition, the authors found correlations between nosocomial infections, antibiotic use and length of stay. It was concluded that prolonged survival or prolonged hospitalization leads to increased risk of infection [16]. Dagli et al. published a study indicating the presence of a vicious cycle between the cost of antibiotics and palliative care [17]. In our study, we observed that the use of antibiotics positively correlated with the cost of care in the palliative care unit. However, the cost of antibiotics ($570) is a small part of the cost ($5392). This should be taken into account when discussing antibiotic usage in palliative care units. In 2006, the average cost of care per patient with decubitus in the United States was reported to be $48,000. The cost of a decubitus treatment per case is between $20,900 and $151,700 , and the annual cost is around $11 billion [18]. In Türkiye, there are a few studies onthe cost of decubitus ulcers, including a cost analysis of decubitus ulcers by some private health institutions [19]. According to the 2014 data of these health institutions, the cost per case of decubitus ulcers in stage I was calculated as $265, in stage II as $1200 and in stage III as $308. In our study, we examined the relationship between cost and decubitus ulcers. The cost of care for cases without decubitus ulcer was $4300. Although we did not calculate the cost of decubitus treatments separately, the cost for cases with decubitus ulcers increased to $5989. The factors that affected the cost included skin and soft tissue infections from decubitus ulcers.

In our palliative care unit, a tracheostomy cannula was present in 42.1% (n=56) of our patients. The cost was significantly higher for patients with a tracheostomy cannula. Tracheostomy is the fifth most common cause of re-hospitalization after the procedure [20]. Increased costs may therefore be associated with hospitalization.

In our study, the rate of insertion of central venous catheters in our palliative care unit was 25.6%. Numerous complications are associated with the placement of central venous catheters. The most common complication is bleeding in the early period and infection in the long-term. In our study, the cost of care for patients with central venous catheters was significantly higher than for those without, suggesting a link between cost and long-term catheter-associated infections.

The number of publications investigating the relationship between nutrition and cost has increased over the last decade. Naberhuis et al. reviewed 5646 publications and reported that malnutrition can increase care costs and length of stay . Malnourished individuals are more likely to experience complications (delayed wound healing, pressure ulcers and infections), longer length of stay and a higher risk of death [21]. In our study, the cost of care for EP-fed patients was significantly higher than the cost of care for E or P-fed patients. The cost increased as nutritional intervention increased.

In our study, the rate of narcotic use was 16.5% (n=22). In a study on opioid cost, the relative cost of opioids to income was higher in developing countries [22]. We did not calculate the cost of opioids in our study; however, we found that the use of opioids did not lead to an increase in costs in the palliative care unit. Although there were no problems in accessing opioid-derivative drugs in our palliative care unit, the rate of opioid use was low. This is because patients and their relatives avoid opioid use for fear of addiction.

A study conducted in Canada highlighted the highest cost of palliative care in inpatient wards, with the public health system playing the biggest role in meeting the cost [23]. In our study, there was a close relationship between length of stay and cost. The medical expenses of the patients hospitalized in our palliative care unit were covered by the SSI on a large scale; however, this did not include the fees of a professional caregiver or support for the patient's relatives. Hoover et al. found that the average annual medical expenditure for people aged 65 years and over ($1996) was $37,581 in the last year of life, whereas Yu et al. estimated that the total social cost of end-of-life care was $34,197 per patient over the entire palliative period(an average of 4 months) [24]. In our study, the average monthly cost of hospitalization in the palliative care unit was 5392 ± 4382$. Vogl et al. reported the cost of palliative care as £5763 . In this study, the length of stay in palliative care was reported as an important cost factor [25].

In our study, common components of palliative care (tracheostomy, catheter or feeding tube requirement, antibiotic dependence with decubitus ulcers and immobilization) were associated with high costs; however, mortality was not statistically related to cost. This is an indication that economic limitations do not interfere with life expectancy. In this way, it is understood that there is no contradiction with the palliative care philosophy of "not prolonging life but also not shortening". It can be said that a palliative care model that does not conflict with palliative care targets is acceptable. It is also important to note that a combination of low costs and high death rates can be considered a violation of the right to

life, and a high cost-high mortality rate can be an indication of resource mismanagement. Therefore, determining the effectiveness of palliative care after a mortality-cost comparison will be the best approach.

Gardiner et al. suggested that the cost in palliative care should be overestimated rather than assessed by the individual component elements that affect the cost of palliative care [26]. At the end of this study, it was emphasized that components of the cost should be taken into consideration. However, the decrease in cost calculation is immediately noticeable. Numerous studies in the literature use estimated figures obtained from social security institutions or insurance companies when calculating costs of interrupted programme packages. In our study, the cost analysis was carried out without taking into account the patient-based programme package and without considering the invoiced or paid amounts. Individual expenses were calculated manually one by one. All amounts corresponding to laboratory, consumables, examination, imaging, medicine and services were retrieved from patient records.

One expenditure item that we could not provide and was thus excluded from this study is the care fees paid by the state to caregivers. Household income is calculated as disability salaries paid to patients in need; however, these costs are also paid for by the state while the patient is still in the hospital. Gardiner et al. emphasized that insensitive care costs account for a large percentage of costs and therefore place a heavy financial burden on informal caregivers. This situation, which can be described as insensible loss, constitutes the limitation of our study [26].

If we compare it with palliative care costs in Türkiye, in a study conducted by Dişli Z. et al. in the palliative service of Malatya Education and Research Hospital, the average cost per patient was calculated as $631, while in our study the median value was $3919. They determined the daily bed cost as $560, non-antibiotic drugs as $560 and the nutrition fee as $89 [27].

In addition, in our hospital, no material is purchased by the patient's relatives and all expenses are covered by our hospital. No material or medication such as catheters, cloths, antibiotics are paid for by the patient, so there is no impact on the cost figures. On the other hand, in choosing antibiotics for patients, empirical treatment was started first and then the drugs were revised according to the culture results.

In conclusion, it was observed that some components of PC were associated with high costs, but mortality was independent of costs. While calculating the cost-effectiveness in PC, mortality should also be taken into consideration along with other components, and PC efficiency should not be ignored while targeting cost-effectiveness. PC services should target a better end-of-life accompanied by the lowest cost and best fit for the PC description.

Limitations

Cost variability due to the difference in antibiotic and treatment protocol application of each center will affect the results of the study. In addition, in practice, doctors' willingness to discharge their patients is a subjective issue and will directly affect the cost when the hospital stay is prolonged. Due to such features, the fact that the study is not multicentered is a limitation of the study.

Conclusion

It was observed that some components of PC were associated with high costs, but mortality was independent of costs. While calculating the cost-effectiveness in PC, mortality should also be taken into consideration along with other components, and PC efficiency should not be ignored while targeting cost-effectiveness.

Conflict of interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author Contributions		**Author Initials**
SCD	Study Conception and Design	AE,ET
AD	Acquisition of Data	AE,ET,FG,ED
AID	Analysis and Interpretation of Data	AE,ET,FG,HD,FC,ED
DM	Drafting of Manuscript	AE,,FG,HD,FC,ED
CR	Critical Revision	AE,HD,FC

Financial Support: No financial support was received for this paper.

Acknowledgments: We would like to thank all the authors and palliative service staff who contributed to the creation of this publication.

Prior publication: The research article has not been presented at any congress before and has not been published in any journal.

References

1. World Health Organization (WHO). Palliative care overview. Avaliable at :https://www.who.int/teams/integrated-health-services/clinical-services-and-systems/palliative-care (Access Date: 8 June 2024)
2. Radbruch L, De Lıma L, Knaul F., Wenk R., Alı Z., Bhatnaghar S., et al. (2020). Redefining palliative care—a new consensus-based definition. J Pain Symptom Manage, 60(4), 754-64. https://doi.org/10.1016/j.jpainsymman.2020.04.027
3. Bajwah S, Oluyase AO, Yı D, Gao W, Evans CJ, Grande G, et al. The effectiveness and cost-effectiveness of hospital-based specialist palliative care for adults with advanced illness and their caregivers. Cochrane Database of Systematic Reviews, 2020;(9).https://doi.org/10.1002/14651858.CD012780.pub2
4. Guerrıere DN, Zagorskı B, Fassbender K, Masuccı L, Lıbrach L, Coyte PC. Cost variations in ambulatory and home-based palliative care. Palliat Med 2010;24:523-32. https://pubmed.ncbi.nlm.nih.gov/20348270/
5. Hughes Hallett T, Craft A, Davıes C, Mackay I, Nıelsson T. Funding the right care and support for everyone: creating a fair and transparent funding system. J Pain Palliative Care Pharmacother 2011;25:362-64 . https://doi.org/10.3109/15360288.2011.621020
6. Mosoıu D, Dumıtrescu M, Connor SR. Developing a costing framework for palliative care services. J Pain Symptom Manag 2014;48:719-29. https://doi.org/10.1016/j.jpainsymman.2013.11.017
7. Bıckel K, Ozanne E. Importance of Costs and Cost Effectiveness of Palliative Care. J Oncol Pharm Pract 2017;13:287. https://pubmed.ncbi.nlm.nih.gov/28437151/
8. Hogan C, Lunney J, Gabel J, Lynn J. Medicare beneficiaries' costs of care in the last year of life. Health Affair 2001;20:188-95. https://doi.org/10.1377/hlthaff.20.4.188

9. Bynum JP, Austın A, Carmıchael D, Meara E. High-cost dual eligibles' service use demonstrates the need for supportive and palliative models of care. Health Affair 2017;36:1309-17. https://doi.org/10.1377/hlthaff.2017.0157
10. McPhaıl SM. Multimorbidity in chronic disease: impact on health care resources and costs. Risk Manage Healthc Policy 2016;9:143. https://doi.org/10.2147/RMHP.S97248
11. Patel AA, Wallıng AM, Rıcks-Oddıe J, May FP, Saab S, Wenger N. Palliative care and health care utilization for patients with end-stage liver disease at the end of life. Clin Gastroenterol H 2017;15:1612-9. https://doi.org/10.1016/j.cgh.2017.01.030
12. May P, Normand C, Cassel JB, FabbroED, FıneRL , MenzR, et al. Economics of palliative care for hospitalized adults with serious illness: a meta-analysis. JAMA Intern Med 2018;178:820-9. https://doi.org/10.1001/jamainternmed.2018.0750
13. Olıver E, Kıllen J, Kıebert G, J Hutton, R Hall, B Hıggıns, et al. Treatment pathways, resource use and costs in the management of small cell lung cancer. Thorax. 2001;56:785-90. https://doi.org/10.1136/thorax.56.10.785
14. Kart L. Evaluation of end stage patient in intensive care unit. Selcuk Med J 2011;27:146-48. https://www.selcukmedj.org/en-us/evaluation-of-end-stage-patient-in-intensive-care-unit-en-4190/ (Access Date: 8 June 2024)
15. Bajwah S, Oluyase AO, Yi D, Gao W, Evans CJ, Grande G, et all.The effectiveness and cost-effectiveness of hospital-based specialist palliative care for adults with advanced illness and their caregivers. Cochrane Database Syst Rev. 2020 30;9(9).doi: 10.1002/14651858.CD012780.
16. Albrecht JS, McGregor JC, Fromme EK, Bearden DT, Furuno JP. A nationwide analysis of antibiotic use in hospice care in the final week of life. J Pain and Symptom Manag 2013;46:483-90. https://doi.org/10.1016/j.jpainsymman.2012.09.010
17. Daglı O, Tasdemir E, Ulutasdemır N. Palliative care infections and antibiotic cost: a vicious circle. Aging Male 2020;23:98-05. https://doi.org/10.1080/13685538.2019.1575353
18. Russo CA, Steiner C, Spector W. Hospitalizations Related to Pressure Ulcers Among Adults 18 Years and Older.In: Healthcare Cost and Utilization Project (HCUP) Statistical Brief.Agency for Healthcare Research and Quality(US) 2006.Available at: http://www.ncbi.nlm.nih.gov/books/NBK54557/ (Accessed Date:30 July 2024)
19. Koc S, Bakoglu N, Bardak A. Cost analysis of pressure ulcers cases in Acibadem healthcare group.Asian J Pharm Med Sci 2014;2(6). Available at: https://ajouronline.com/index.php/AJPNMS/article/view/1993.(Access Date: 8 June 2024)
20. Spataro E, Durakovıc N, Kallogjerı D, Nussenbaum B. Complications and 30 day hospital readmission rates of patients undergoing tracheostomy: A prospective analysis. Laryngoscope 2017;127:2746-53. https://doi.org/10.1002/lary.26668
21. Naberhuıs JK, Hunt VN, Bell JD, Partrıdge JS, Goates S, Nuıjten MJC.Health care costs matter: a review of nutrition economics–is there a role for nutritional support to reduce the cost of medical health care? Nutr Diet Sup 2017;9:55-62. https://doi.org/10.2147/NDS.S126232
22. De Lıma L, Sweeney C, Palmer JL, Bruera E. Potent analgesics are more expensive for patients in developing countries: a comparative study. J Pain Palliat Care Pharmacother 2004;18:59-70. https://doi.org/10.1080/J354v18n01_05
23. Dumont S, Jacobs P, Turcotte V, Turcotte S, Johnston G. Distribution and sharing of palliative care costs in rural areas of Canada. J Palliat Care 2014;30:90-98. https://doi.org/10.1177/082585971403000204
24. Yu M, Guerrıere DN, Coyte PC. Societal costs of home and hospital end of life care for palliative care patients in Ontario, Canada. Health Soc Care Community 2015;23:605-18. https://doi.org/10.1111/hsc.12170
25. Vogl M, Schıldmann E, Leıdl R, Hodıamont F, KalıesH , Maıer BO, et al. Redefining diagnosis-related groups (DRGs) for palliative care–a cross-sectional study in two German centres. BMC Palliat Care 2018;17:1-11. https://doi.org/10.1186/s12904-018-0307-3
26. Gardıner C. Ryan T. Gott M. What is the cost of palliative care in the UK? A systematic review. BMJ Support Palliat Care, 2017,8(3). https://doi.org/10.1136/bmjspcare-2018-001519
27. Disli ZK, Oterkus M, Delen AL, Erce C. An evaluation of cost analysis of palliative care centers. Med Sci,2022;11(2):745-9.doi: 10.5455/medscience.2021.12.391