Care Integration Decreases Hospitalization Costs: Retrospective Cohort Study of Palliative Care Consult Service for Hospital Patients With Metastatic Cancer

Antal Tamás Zemplenyi (✉ zemplenyi.antal@pte.hu)

  Syreon Research Institute; University of Pécs Faculty of Pharmacy   https://orcid.org/0000-0002-0177-0264

Ágnes Csikós

  Institute of Primary Health Care, University of Pécs Medical Shool

Petra Fadgyas-Freyler

  Strategic Analysis Department, National Health Insurance Fund, Budapest

Marcell Csanádi

  Syreon Research Institute

Zoltán Kaló

  Center for Health Technology Assessment, Semmelweis University; Syreon Research Institute

Éva Pozsgai

  Institute of Primary Health Care, University of Pécs Medical School

Maureen Rutten-van Mölken

  School of Health Policy and Management, Erasmus University Rotterdam

János György Pitter

  Syreon Research Institute

Research article

Abstract

Background: Palliative Care Consult Service (PCCS) programme was established in Hungary to provide palliative care to hospitalized patients with complex needs and to manage the patients' pathway when discharged from the hospital. The aim of this study was to measure the impact of PCCS on healthcare costs from the perspective of the payer.

Methods: Study population consisted of patients with metastatic cancer (identified by TNM status or ICD-10 code), who were admitted to the Clinical Center of the University of Pécs between 1 January 2014 and 31 December 2016. Patients who did not die within 180-days from enrolment were excluded. Patients receiving services from PCCS team (intervention patients) were compared to patients receiving usual care (controls). The two populations were matched using propensity scores based on age, gender, number of tumor affected organs, Charlson comorbidity index, number of hospital admissions in the year prior to enrollment, outpatient visits in 90 days prior to hospitalization, and number of days to death. Data was obtained from electronic health records linked to claims data.

Results: 197 matched pairs were identified with comparable characteristics. Mean number of hospital admissions was 2.1 and 2.5 (p =0.020); ratio of hospital deaths was 75% and 86% (p = 0.003); cost of inpatient care was 1,053 EUR and 1,300 EUR (p = 0.013); cost of home hospice care was 58 EUR and 21 EUR (p = 0.003); and total cost of care was 1,719 EUR and 1,982 EUR (p = 0.099) in the intervention and control groups, respectively.

Conclusion: This study demonstrated that palliative care consult service for end-stage cancer patients with a very limited prognosis can add value to healthcare by reducing costs associated with hospital stays and unnecessary examinations and treatments. The data suggest that early initiation of palliative care could have even greater implications.

1. Introduction

Despite the increasing recognition of palliative care throughout the world, the availability of these services is often insufficient to meet the needs of all patients requiring palliative care [1], [2].

According to a recent study [3] various barriers are associated with palliative care provision in Europe. Many patients receive palliative care at a very late stage, or are even not referred [4], there is a lack of coordination of referrals between medical specialties [4], there is a lack of knowledge about the benefits of palliative care [5], [6], and different services that provide palliative care are not integrated [5], [7]. These problems, combined with the growing ageing population, highlight the need for integrated provision of palliative care services.

In countries such as Hungary, where there are limited financial resources available for health care (healthcare expenditure as a share of GDP was 7.2% in 2017 [8]), the availability of palliative services may also be affected by the lack of adequate reimbursement. Hungary is a Central Eastern European

country with 9.8 million inhabitants [9] with increasing cancer morbidity [10] and poor cancer mortality statistics [8]. In Hungary 90% of hospice recipients are cancer patients [11].

The access to palliative care services in Hungary is reportedly limited due to the insufficient funding, as PCCS and outpatient clinics are not reimbursed by the National Health Insurance Fund. Further details on Hungarian health systems and palliative care are available elsewhere [11]–[14].

The Palliative Care Consult Service (PCCS) programme at the Clinical Centre of the University of Pécs was among the first initiatives in Hungary to provide hospital palliative care support. The PCCS team provides palliative services within the hospital mainly for terminally ill cancer patients and also takes a leading role in the Integrated Palliative Care Network in Pécs, which establishes a higher level of care coordination across different palliative care providers (consultation services, outpatient clinic, home hospice care and inpatient hospice care.) [3], [15]. PCCS programme facilitates care integration on micro and meso level. Micro level integration focuses on the individual patient; it aims to achieve a coordinated care process around the needs of the patient and family members. Components of micro level integration of PCCS programme include holistic, person-centered assessment of patients' needs and goals, coordinated patient pathways (e.g. arranging palliative care at home), shared decision making, and self management. Meso level integration of the programme focuses on the organisations and the services, and it aims to promote collaboration and continuity of care. Components of meso level integration include a strong cooperation between care providers (hospital and home hospice care), knowledge transfer enabling the spread of palliative approach among healthcare professionals, as well as professional relationships e.g. multidisciplinary teamwork.

The programme has been selected by SELFIE ("Sustainable intEgrated chronic care modeLs for multi-morbidity: delivery, FInancing, and performancE", Grant Agreement No. 634288), a Horizon 2020 funded EU project for in-depth evaluation as one of Hungarian multi-morbidity integrated care models. The detailed description of PCCS is available as SELFIE project deliverable report [15]. Further details on SELFIE can be found on the website (www.selfie2020.eu). The operational costs of PCCS programme were initially covered by EU funds, however the programme can only be sustained and scaled up if continuous funding is available.

There is a lack of knowledge about the impacts of consultation services on healthcare cost in Hungary to inform decision making. This study aims to assess the healthcare cost of palliative care consult service compared to usual care.

2. Methods

2.1 Population

The population of the study consists of patients with metastatic cancer, who were admitted to the Clinical Centre between January 1, 2014 and December 31, 2016. This population had advanced disease that required complex support, although not every patient was involved in palliative care. Patients mostly had

multi-morbidity. Inclusion criteria were: malignant diagnoses code (ICD C00-C97), metastatics cancer (based on TNM status), admission to the Internal Medicine Department or to the Oncology Department. Patients who were admitted for routine chemotherapy or hormone therapy and patients who did not die within 180 days of inclusion were excluded from the analysis, to limit the population to those who are at the end of their lives, and to to ensure that the population is homogeneous. It was assumed that these patients needed palliative care, even if they palliative care was not requested by the palliative physician.

2.2 Intervention

Palliative care consultation service covers symptom control, psychosocial support and patient pathway management across palliative care providers. It is available upon request of the attending physician. Despite the availability of the service, doctors still lack adequate information and knowledge about the benefits of palliative care resulting many times in late or non-referral of patients [16]. These patients receive usual care, which includes routine hospital care and a regular patient pathway across providers and patient's home.

2.3 Study design

The study had a retrospective cohort study design for the time period between 2014 January 1st and 2016 December 31st. Patients in the intervention group received palliative care from the PCCS team, while patients in the control group received usual care. However, based on the inclusion and exclusion criteria it was assumed that these patients were also in need of palliative care, but due to awareness differences between specialitsts palliative care was not requested. Patients were not recruited, informed, or contacted in any way in this study. The study protocol was reviewed and approved by the competent National Ethics Committee in Hungary (TUKEB, Decision No. 18632-4/2017/EKU).

2.5 Costs

Total healthcare cost were estimated from payer's perspective. Costs were calculated as the total expenditure of the National Health Insurance Fund (obtained from claims database) including the reimbursement of hospital care of enrolled patients; and reimbursement of all other healthcare costs post discharge (including home hospice care, pharmaceuticals, long-term care etc.). Cost of PCCS team's intervention (average cost per patient) was determined based on the accounting information provided by the University of Pécs. Utilisation of healthcare resources were also calculated including GP visits, hospital days, hospital admissions, emergency room (ER) visits and the use of expensive drugs.

2.6 Statistical analysis

Due to the nonrandomised nature of the study, patient characteristics may differ in the intervention and control group. To increase comparability of characteristics in the two groups and to reduce confounding propensity score matching method was used.

For each patient in the intervention group the hospital episode at which the patient first met the PCCS team was identified and defined as reference episode. With the matching algorithm we looked for

patients in the control group who had very similar characteristics at their hospital care. As control patients in the sample had several hospital epizodes, it had to be ensured that we select the most similar hospital admission (episode with the least distance in the propensity score). Patients in the intervention group were put in order based on a random function. The reference episode of the first patient in the intervention group was matched to a hospital episode of a control patient (who met the inclusion criteria) using nearest neighbour matching (1:1). Then this pair of patients was removed from the sample and the matching was performed for the second patient and so on, until all reference episode of patients in the treatment group were matched to hospital episodes of control patients. This process was repeated 100 times, resulting in 100 different samples of paired hospital epizodes. The matching process with the least sum of differences was selected as the best performing matching. As it was not common practice during the study period to record information about patients' general health status (e.g. Karnofsky score) or symptoms (e.g. pain, fatigue) in a structured format, we considered other parameters that might indicate the need for palliative care in the metastatic cancer patient group. These parameters have been suggested by an expert panel of palliative physicians. Propensity scores were determined in logistic regression models including age at the day of admission (in days), sex, number of organs affected by cancer, Charlson comorbidity index, days left until death, number of hospital admissions and emergency care 90 days prior to the reference episode. Differences in total costs per patient from the start of the reference date until death were analysed by using Independent Samples T Test. Patient level data was retrieved from the electronic medical records of the Clinical Centre with the Medsol Analyzer software and linked with the database of the National Health Insurance Fund. The dates of patients' death were obtained from the Ministry of Internal Affaires. All cost are in Euros (EUR) converted from Hungarian Forint (HUF): 1 EUR = 320 HUF. Conversion rate was based on average currency exchange rate in study period. Purchasing power parity was not used. Statistical analyses were performed using Rstudio Version 1.1.453 (running R 3.4.4) and IBM SPSS Statistics (version 25).

3. Results

3.1 Population

A subsample of 1,516 patients was identified for which there were adequate data for matching and analysis (palliative care, n = 197; usual care, n = 1,319). This group had no missing data on any propensity score variable. After matching, 197 pairs of patients and 197 pairs of hospital epizodes (the reference epizodes of each patients) were identified. For the analysis, the costs of all healthcare utilizations after the reference date (admission date of the reference hospital episode) were retrieved from the National Health Insurance Fund and linked to each patient. No data was missing on costs.

The patients' characteristics before and after nearest neighbour matching are listed in Table 1.

Table 1
Baseline characteristics of retrospective study sample before and after propensity score matching

Patient characteristics	PCCS (N = 197)	Usual care	
		Before matching (N = 1319)	After matching (N = 197)
Age, years, mean (SD)	64.63 (11.5)	64.67 (9.62)	64.37 (9.68)
Female	52%	43%	60%
Number of organs affected by tumour, mean (SD)	2.12 (0.65)	1.88 (0.55)	2.11 (0.6)
Charlson weighted comorbidity index, mean (SD)	6.4 (1.99)	6.12 (2.08)	6.48 (1.9)
Number of hospital admission in the previous 90 days, mean (SD)	2.48 (2.32)	2.85 (2.75)	2.37 (2.1)
Number of emergency admission in the previous 90 days, mean (SD)	0.37 (0.64)	0.32 (0.7)	0.36 (0.69)
Number of emergency outpatient care in the previous 90 days, mean (SD)	0.98 (1.29)	0.67 (1.18)	0.84 (1.19)
Days to death (number of patients)			
0−60	138	NA	135
61−120	43	NA	44
121−180	16	NA	18
Number of days to death, mean (SD)	48.02 (39.71)	69.8 (51.74)	49.27 (43.42)
Propensity score, mean (SD)	0.06042 (0.0447)	NA	0.060389 (0.0440)
SD: standard deviation			

3.3 Costs

The impact of PCCS on total direct costs is shown in Table 2. The results show a clear pattern. The inpatient costs of patients involved in PCCS was lower, -246.7 EUR (95% CI, -441.3, -52.1), while the cost of medical devices and home hospice care are higher compared to patients in the usual care, 28,3 EUR (95%CI, 5.3, 51.3) and 36.9 EUR (95% CI, 13.0, 60.7) repsectively. The costs for the PCCS team only occurred in patients involved in hospital palliative care. When considering the total cost of care (including the cost of PCCS service), there was no statistically significant difference between the two matched patient groups.

Table 2
Healthcare costs per patient in the study period

Cost category		PCCS (N = 197)	Usual care N=(197)	Estimated Difference	p-value
		EUR, mean (SD)	EUR, mean (SD)	EUR, mean (95% CI)	
Inpatient acute care	Hospital care*	1053 (818)	1299 (1123)	-246.69 (-441.3 ; -52.08)	*0.013*
Outpatient	Outpatient clinic	91 (98)	110 (141)	-19.42 (-43.51 ; 4.67)	*0.114*
	Imaging (CT, MRI diagnostics)	106 (120)	127 (177)	-21.18 (-51.1 ; 8.74)	*0.165*
Home care	Medicines	242 (414)	300 (552)	-58.66 (-155.27 ; 37.95)	*0.233*
	Medical devices*	50 (140)	22 (86)	28.29 (5.29 ; 51.28)	*0.016*
	Home social care	3 (27)	0 (6)	2.3 (-1.64 ; 6.23)	*0.252*
	Home hospice care*	58 (132)	21 (107)	36.86 (13.02 ; 60.7)	*0.003*
	Transportation of patients	7 (15)	8 (29)	-1.31 (-5.95 ; 3.32)	*0.577*
Inpatient hospice care	Hospice institution	98 (307)	71 (365)	27.13 (-39.6 ; 93.86)	*0.425*
Total healthcare cost (NHIF reimbursement)		**1719 (1340)**	**1982 (1777)**	**-262.45 (-574.21 ; 49.31)**	0.099
Cost of PCCS (for the hopital)		130 (152)	0 (0)	129.77 (108.44 ; 151.11)	*0.000*
*Difference statistically significant at p < 0.05 level. CI: confidence interval, SD: standard deviation					
(Medical devices refer to equipment for home care such as wheelchair, bed, pumps etc.)					

Utilization of healthcare resources and the proportion of patients who died at the hospital are presented in Table 3. Patients who participated in the PCCS program were less likely to be hospitalized, reflecting the reduced cost of inpatient hospital care. The proportion of patients who died in the hospital was also lower. There was no statistically significant difference between the groups in GP visits, inpatient care, emergency admissions and number of high value drug therapies initiated for patients. Interestingly, patients in both groups spent more days in acute care hospitals than in long-term care facilities (including the institutional hospice).

Table 3
Utilization of healthcare resources

Resource utilization	PCCS (N = 197)	Usual care (N = 197)	Estimated Difference
	Mean (SD)	Mean (SD)	Mean (95% CI)
General practitioner visits	5.13 (5.43)	5.21 (5.99)	-0.08 (-1.21 ; 1.05)
Inpatient acute hospital days	16.55 (14.94)	16.69 (14.8)	-0.13 (-3.08 ; 2.81)
Inpatient long term care days	4.77 (12.67)	4.91 (15.62)	-0.14 (-2.95 ; 2.68)
Number of hospital admissions*	2.1 (1.46)	2.5 (1.92)	-0.4 (-0.74 ; -0.06)
Number of emergency admissions	0.4 (0.71)	0.33 (0.77)	0.07 (-0.08 ; 0.22)
Number of high value drug therapies	0.08 (0.66)	0.12 (0.51)	-0.04 (-0.15 ; 0.08)
Proportion of patients who died at the hospital*	0.75 (0.44)	0.86 (0.34)	-0.12 (-0.19 ; -0.04)
*Difference statistically significant at $p < 0.05$ level. CI: confidence interval, SD: standard deviation			

As the number of days until death was assumed to be associated with the total cost of care, the anyalysis was stratified by 60 day survival intervals to estimate the difference in healthcare costs, PCCS costs and the total costs (including PCCS) in the three strate. The result is presented in Table 4, which shows a clear association between the number of days until death and the magnitude of cost saving.

Table 4
Healthcare cost broken down by 60 days interval

Number of days until death	PCCS	Usual care	Estimated difference	p-value
Number of patients in each group				
0–60	138	135		
61–120	43	44		
121–180	16	18		
Mean healthcare cost (NHIF reimbursement), in EUR				
0–60	1112	1139	-27	*0.776*
61–120	2899	3246	-347	*0.245*
121–180	3785	5210	-1425	*0.028*
Mean cost of PCCS, in EUR				
0–60	96	0	96	*0.000*
61–120	179	0	179	*0.000*
121–180	290	0	290	*0.000*
NHIF: National Health Insurance Fund; EUR: euro; NR: not relevant				

4. Discussion

Our study has some key findings:

1. Our study shows that patients involved in palliative care are less frequently readmitted and are more likely to use home palliative care. The impact of PCCS on the level of care integration was clearly demonstrated by the reallocation of the costs between the different froms of care. Our analysis shows that the provision of hospital palliative care support lowers the cost of inpatient care and increases the cost of home hospice care. This association suggests that patients involved in PCCS tend to use home care rather than inpatient care in acute care hospitals. Homecare medical equipment are used to a greater extent in the PCCS group, which may be explained by the prescriptions made by palliative physicians, to support the home-base palliative care of patients [15]. The cost of home hospice care is very low compared to other cost elements. This is due to the low value of the NHIF reimbursement of the consultation fee. The analysis shows no statistically siginificant difference in total cost when comparing PCCS with usual care, which might be explained by the relatively small smaple size and great variation in costs (high SD).

2. The stratification of the patient population according to the number of days until death shows that the earlier the patient is involved into the palliative care, the higher the cost savings potential for the

healthcare system. If the hospital spent 290 euros for involving a patient in palliative care in the last 120 to 180 days, it would save 1425 euros for the healthcare system. In Hungary, the majority of patients die in hospitals (Csikós 2018). Two recent national studies showed that Hungarian adults prefer to receive end-of-life care in their own homes instead of hospital [17]. This study shows that patients managed by the PCCS team are less likely to die at the hospital compared to patients in the usual care. This suggests that patients in PCCS are better prepared for death and accept that it is useless to try new treatments or go to hospital. The lower number of patients dying in the hospital explaines the higher savings towards the end of life.

3. Access to palliative care is still limited. In the study sample, only 13% of hospitalized metastatic cancer patients have received palliative care in their last 180 days of life. This shows a serious deficit in the awareness of the availability of the PCCS team and the lack of knowledge of referring physicians about the benefits of palliative care. Data also show that two-thirds of PCCS patients were not included in palliative care until the last 60 days of their life, suggesting a relatively late referral practice. The cost of PCCS is currently not reimbursed by the National Health Insurance Fund, but is financed from the hospital's budget, which represents a serious barrier to the access to care.

Our study has several limitations. A retrospective approach was used to determine the prognosis by estimating the number of days to death. This was the same for the matched patient pairs. Some studies suggest that palliative care could lead to longer survival. However, the potential impact of palliative care on survival and costs during the prolonged survival period were excluded from the current study.

We did not use performance status scores (such as ECOG or Karnofsky score) to match patients because this information was not available from the hospital information system. However, using the inclusion criteria, we selected patients with a high probability of palliative care need, as they were in the final stage of their metastatic cancer.

We also considered relevant covariates such as the number of organs affected by the tumour and a weighted comorbidity index to make to populations comparable. The number of days until death was also considered as a matching parameter as it was assumed that the prognosis of survival was not affected by palliative care services. Although propensity score matching minimized observed confounding due to selection bias, there is likely to be unobserved heterogeneity between intervention and control patients.

The data were collected in a hospital with a well-established palliative care program in Hungary and a close professional relationship with other palliative care providers in the region. The transfer of the outcomes of the current study to other regions is only feasible if these conditions are appropriately established.

This study focused only on metastatic cancer patients. If we take into account patients with other diseases (such as organ failures) and the aging population, we could assume that the impact of PCCS on cost savings is even greater.

5. Conclusion

This study demonstrated that palliative care for end-stage cancer patients with a very limited prognosis can add value to healthcare by reducing unnecessary costs associated with hospital stays and useless examinations and treatments. If the health system can provide enough resources to manage patients at home, it will most probably save money at the system level. The data suggest that early initiation of palliative care has even greater implications. In order to increase service availability at hospitals proper funding of PCCS needs to be established. Sharing best practices and estimating the costs of palliative care is an essential part of planning for wider implementation in other locations. Policymakers in Hungary and other countries with restricted financial resources and limited specialized palliative services should consider implementing or further developing integrated palliative care models for the benefit of patients and the healthcare system.

Abbreviations

PCCS - Palliative Care Consulting Service

SELFIE - Sustainable Integrated Chronic Care Models For Multi-Morbidity: Delivery, Financing, And Performance

NHIF: National Health Insurance Fund

Declarations

Ethics approval and consent to participate

This study involved retrospective patient data. The protocol of the study has been reviewed and approved by the competent National Ethics Committee in Hungary (TUKEB, Decision No. 18632-4/2017/EKU) before the start of the data collection.

Consent for publication

Not applicable

Availability of data and materials

The data that support the findings of this study are available from the University of Pécs but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the University of Pécs and Syreon Reserch Institute.

Competing interests

The authors declare that they have no competing interests.

Funding

Authors' contributions

AZ and JP were responsible for research design and assessment, and analysis and interpretation of data. MCs, PFF and AZ analysed the data at the NHIF. JP wrote the script in R for the statistical analyses. AZ wrote the first draft of this study, with all authors commenting on and contributing to successive drafts of the manuscript. MVR, ZK and EP critically revised the manuscript. ACs helped interpreting the results and framing the policy implications. All authors have approved this manuscript for publication.

Acknowledgements

References

[1] K. Woitha, E. Garralda, J. M. Martin-Moreno, D. Clark, and C. Centeno, "Ranking of Palliative Care Development in the Countries of the European Union.," *J. Pain Symptom Manage.*, vol. 52, no. 3, pp. 370–377, Sep. 2016.

[2] C. Centeno, T. Lynch, E. Garralda, J. M. Carrasco, F. Guillen-Grima, and D. Clark, "Coverage and development of specialist palliative care services across the World Health Organization European Region (2005-2012): Results from a European Association for Palliative Care Task Force survey of 53 Countries.," *Palliat. Med.*, vol. 30, no. 4, pp. 351–362, Apr. 2016.

[3] M. den Herder-van der Eerden, *Integrated Palliative Care a European Investigation into the Perspectives of Patients, Family Caregivers and Healthcare Professionals*. 2019.

[4] K. Beernaert, J. Cohen, L. Deliens, D. Devroey, K. Vanthomme, K. Pardon, and L. Van den Block, "Referral to palliative care in COPD and other chronic diseases: a population-based study.," *Respir. Med.*,

vol. 107, no. 11, pp. 1731–1739, Nov. 2013.

[5] B. Mason, E. Epiphaniou, V. Nanton, A. Donaldson, C. Shipman, B. A. Daveson, R. Harding, I. Higginson, D. Munday, S. Barclay, K. Boyd, J. Dale, M. Kendall, A. Worth, and S. A. Murray, "Coordination of care for individuals with advanced progressive conditions: a multi-site ethnographic and serial interview study.," *Br. J. Gen. Pract.*, vol. 63, no. 613, pp. e580-8, Aug. 2013.

[6] G. Albers, K. Froggatt, L. Van Den Block, G. Gambassi, P. Vanden Berghe, and S. Pautex, "A qualitative exploration of the collaborative working between palliative care and geriatric medicine : Barriers and facilitators from a European perspective," *BMC Palliat. Care*, pp. 1–10, 2016.

[7] N. Davies, L. Maio, J. Van Riet, E. Mariani, B. Jaspers, and R. Sommerbakk, "Quality palliative care for cancer and dementia in five European countries : some common challenges," *Aging Ment. Health*, vol. 18, no. 4, pp. 400–410, 2014.

[8] OECD/EU (2018), *Health at a Glance: Europe 2018: State of Health in the EU Cycle*. Paris: OECD Publishing, 2018.

[9] Hungarian Central Statistical Office, "Population, vital statistics (1900-).," *Hungarian Central Statistical Office*, 2019. [Online]. Available: http://www.ksh.hu/docs/eng/xstadat/xstadat_long/h_wdsd001a.html.

[10] Hungarian Central Statistical Office, "Main diseases of adults," *Hungarian Central Statistical Office*, 2019. [Online]. Available: http://statinfo.ksh.hu/Statinfo/index.jsp?lang=en. .

[11] A. Csikos, C. Busa, and K. Muszbek, "Hospice Palliative Care Development in Hungary.," *J. Pain Symptom Manage.*, vol. 55, no. 2S, pp. S30–S35, Feb. 2018.

[12] J. Hasselaar and S. Payne, Eds., *Integrated palliative Integrated palliative care*. 2016.

[13] K. Hegedus, M. Lukacs, J. Schaffer, and A. Csikos, "The current state, the possibilities and difficulties of palliative and hospice care in Hungary," *Orv. Hetil.*, vol. 155, no. 38, pp. 1504–1509, Sep. 2014.

[14] G. Benyo, M. Lukacs, C. Busa, L. Mangel, and A. Csikos, "[Current situation of palliative care in Hungary. Integrated palliative care model as a breakout possibility].," *Magy. Onkol.*, vol. 61, no. 3, pp. 292–299, Sep. 2017.

[15] A. Zemplényi, M. Csanádi, K. Csetneki, Z. Kaló, Á. Csikós, and J. G. Pitter, "Thick Description of Palliative Care Consult Service," *SELFIE Deliv. Rep.*, 2016.

[16] A. Csikos, J. 3rd Mastrojohn, T. Albanese, J. R. Moeller, S. Radwany, and C. Busa, "Physicians' beliefs and attitudes about end-of-life care: a comparison of selected regions in Hungary and the United States.," *J. Pain Symptom Manage.*, vol. 39, no. 1, pp. 76–87, Jan. 2010.

[17] A. Csikos, T. Albanese, C. Busa, L. Nagy, and S. Radwany, "Hungarians' perspectives on end-of-life care.," *J. Palliat. Med.*, vol. 11, no. 8, pp. 1083–1087, Oct. 2008.