Impact of palliative care consult service in inpatient hospital setting: a systematic literature review

Elene Janberidze ,[1,2,3] Kristýna Poláková,[1,4] Lucie Bankovská Motlová,[1] Martin Loučka[1,4]

[1]Department of Psychiatry and Medical Psychology - Division of Medical Psychology, Charles University, Third Faculty of Medicine, Praha, Czech Republic
[2]Department of Gerontology and Palliative Medicine, Iv. Javakhishvili Tbilisi State University/Institute of Morphology, Tbilisi, Georgia
[3]Faculty of Medicine, School of Health Sciences and Public Health, University of Georgia, Tbilisi, Georgia
[4]Center for Palliative Care, Praha, Czech Republic

Correspondence to
Dr Elene Janberidze, Department of Psychiatry and Medical Psychology - Division of Medical Psychology, Charles University, Third Faculty of Medicine, Praha, Czech Republic; elene.janberidze@gmail.com

Received 6 March 2020
Revised 8 August 2020
Accepted 14 August 2020

To cite: Janberidze E, Poláková K, Bankovská Motlová L, *et al*. *BMJ Supportive & Palliative Care* Epub ahead of print: [please include Day Month Year]. doi:10.1136/bmjspcare-2020-002291

ABSTRACT

Objectives Despite a number of studies on effectiveness of palliative care, there is a lack of complex updated review of the impact of in-hospital palliative care consult service. The objective is to update information on the impact of palliative care consult service in inpatient hospital setting.

Methods This study was a systematic literature review, following the standard protocols (Preferred Reporting Items for Systematic Reviews and Meta-Analyses, Joanna Briggs Institute tools) to ensure the transparent and robust review procedure. The effect of palliative care consult service was classified as being associated with improvement, no difference, deterioration or mixed results in specific outcomes. PubMed, Scopus, Academic Search Ultimate and SocINDEX were systematically searched up to February 2020. Studies were included if they focused on the impact of palliative care consult service caring for adult palliative care patients and their families in inpatient hospital setting.

Results After removing duplicates, 959 citations were screened of which 49 full-text articles were retained. A total of 28 different outcome variables were extracted. 18 of them showed positive effects within patient, family, staff and healthcare system domains. No difference was observed in patient survival and depression. Inconclusive results represented patient social support and staff satisfaction with care.

Conclusions Palliative care consult service has a number of positive effects for patients, families, staff and healthcare system. More research is needed on factors such as patient spiritual well-being, social support, performance, family understanding of patient diagnosis or staff stress.

INTRODUCTION

Palliative care patients experience multiple problems including distressing symptoms, emotional, social and spiritual needs.[1 2] Providing palliative care showed an improvement in quality of life, quality of care and satisfaction with care of those terminally ill patients and their families.[3 4]

Hospitals nowadays provide inpatient palliative care service by specialised teams for the patients.[5 6] According to 2000–2016 report of Centre to Advanced Palliative Care and National Palliative Care Research Centre, the percentage of annual hospital admissions seen by the palliative care team increased by 75% in USA.[5] In 2015, on average, 4.8% of all hospital admissions received a palliative care consultation.[7] Those multi professional teams initiate conventional hospice and palliative care consultation service, offer formal and informal education, and liaise with other services in and out of the hospital.[8]

Available studies showed improvement in a number of outcomes in hospitalised patients who had support from palliative care consult teams.[9 10] Involvement of specialised palliative care consult service led to improvement in the management of distressing symptoms such as pain, nausea, fatigue, depression, anxiety and vomiting.[9 11–15] Studies also show that satisfaction with care had also improved[16 17] as well as that introducing palliative care early during hospital admission was associated with lower cost of hospital stay[18] and patients had higher 6-month net cost savings.[3] Although most studies suggest that palliative care patients benefit from those services, there are studies reporting no differences between usual care and palliative care consult service in inpatient hospital setting.[3 19 20]

Multiple systematic literature reviews on the effectiveness of palliative care have been conducted in the last decade.[4 21–26] Those reviews mostly addressed palliative care patients in different settings such as

hospital, hospice and home.[4 21 23–26] Two systematic literature reviews of randomised controlled trails examined the evidence for effectiveness of specialised palliative care consult services in improving symptom control, quality of life, family satisfaction with care and economical costs in inpatient and outpatient settings.[24 25] Results suggest effectiveness of specialised palliative care in improvement of family satisfaction with care,[24] pronounced effect for patients with cancer who received such care early and small effect on quality of life.[25] Thus, methodological limitations of included studies reduced the strength of the evidence.[24 25] Other reviews addressed patients with cancer in different care settings.[4 22] The limited generalisability of the studies is due to diverse patient population studied, different settings used, heterogeneity of palliative care teams, validity of measured outcomes in the studies and methodological weaknesses due recruitment, attrition and adherence.[27–30]

A systematic literature review conducted by Higginson *et al* in 2002 dealt with the matter whether hospital-based palliative teams improve care for palliative care patients or their families at the end of life.[27] This study suggested that hospital-based palliative care teams offered some benefits to palliative care patients in the hospital setting. The second systematic review of randomised controlled trials published in 2008 addressed effectiveness of specialised palliative care in inpatient and outpatient setting.[24] According to the results, improvement was observed in patient quality of life, symptom control, family satisfaction with care and hospital cost savings of specialised palliative care. During the last 12 years, many interesting original studies have been published on the topic where the evidence summary could give more conclusive results. In the present review, in order to describe the effect of inpatient palliative care consultation services, the term 'palliative care consult service' is used throughout the paper.[31] The overall aim of the present study is to systematically update our knowledge on the impact of palliative care consult service on palliative care patients in inpatient hospital setting.

The following research question was addressed in the present systematic literature review:

- What is the impact of the palliative care consult service in inpatient hospital setting?

METHODS

Potentially relevant records were identified from the databases PubMed, Scopus (through Elsevier), Academic Search Ultimate and SocINDEX with Full Text (through EBSCO host). The search strings were designed for each database using both free-text and controlled vocabulary (eg, Medical Subject Heading, American Psychological Association Thesaurus), and consisted of combinations of terms representing "palliative care", "hospital", and "team AND effect OR evaluat, benefit, impact" (online supplemental appendix 1. Search Strategy PubMed). The searches covered the years from their inception through 2020 with the last search date being 20 February 2020. Search details and the specific search strings for all bibliographical databases will be provided on request by the corresponding author.

Titles, abstracts and keywords of the 1482 identified citations were independently screened by two authors (EJ and KP) to judge their potential relevance. The following inclusion criteria were applied: (1) a study which considered the use of palliative care services caring for adult (≥18 years) palliative care patients and their families, (2) inpatient hospital setting (inpatient consultation services) and (3). palliative care teams or palliative care physicians and/or nurses involved in the study. The exclusion criteria were: non-English publications, reviews, commentaries, case reports, publications addressing tool development (eg, validation studies), studies with >50% of the sample being non-palliative patients and studies where impact of palliative care team or service was not measured.

The term 'palliative care patients' was defined with the following terminology: 'palliative', 'end of life care patients', 'terminally ill', 'supportive care patients', and 'patients with advanced cancer' or simply by the involvement of palliative care consult service in the care of the patients in the sample. In the present systematic literature review, we defined palliative care team as using the following words in the papers: 'palliative care consultation team', 'palliative care team', 'hospital based palliative care team', 'supportive team' and/or palliative care intervention was provided by at least two palliative care specialists (eg, physician and nurse). Palliative care intervention which was provided by palliative care team was defined as multidisciplinary care for the patients including but not limiting to consultations, pain and symptom management, education, assessment of quality of life, end-of-life care decisions, illness and prognostic understanding, referral and care coordination.

References deemed eligible for inclusion in the screening process were then independently examined in full text by two of the authors (EJ and KP). Any discrepancies between the reviewers' selections were discussed to obtain consensus, or a third author (ML) was consulted.

The reference list of all included papers were examined by researcher (EJ) for identification of additional relevant studies. The quality of included studies was graded according to hierarchies of evidence by Joanna Briggs Institute Critical Appraisal Tools.[32] The studies were not excluded from this systematic literature review based on poor methodological quality.

Data from all included full-text papers were selected for extraction. A predefined checklist for data extraction was created where the following information was extracted: author, year, country, study design,[33] quality grading of the study, site of care, disease, number of participants, interventions used, palliative care team composition, main outcome measures and the endpoint. The effect

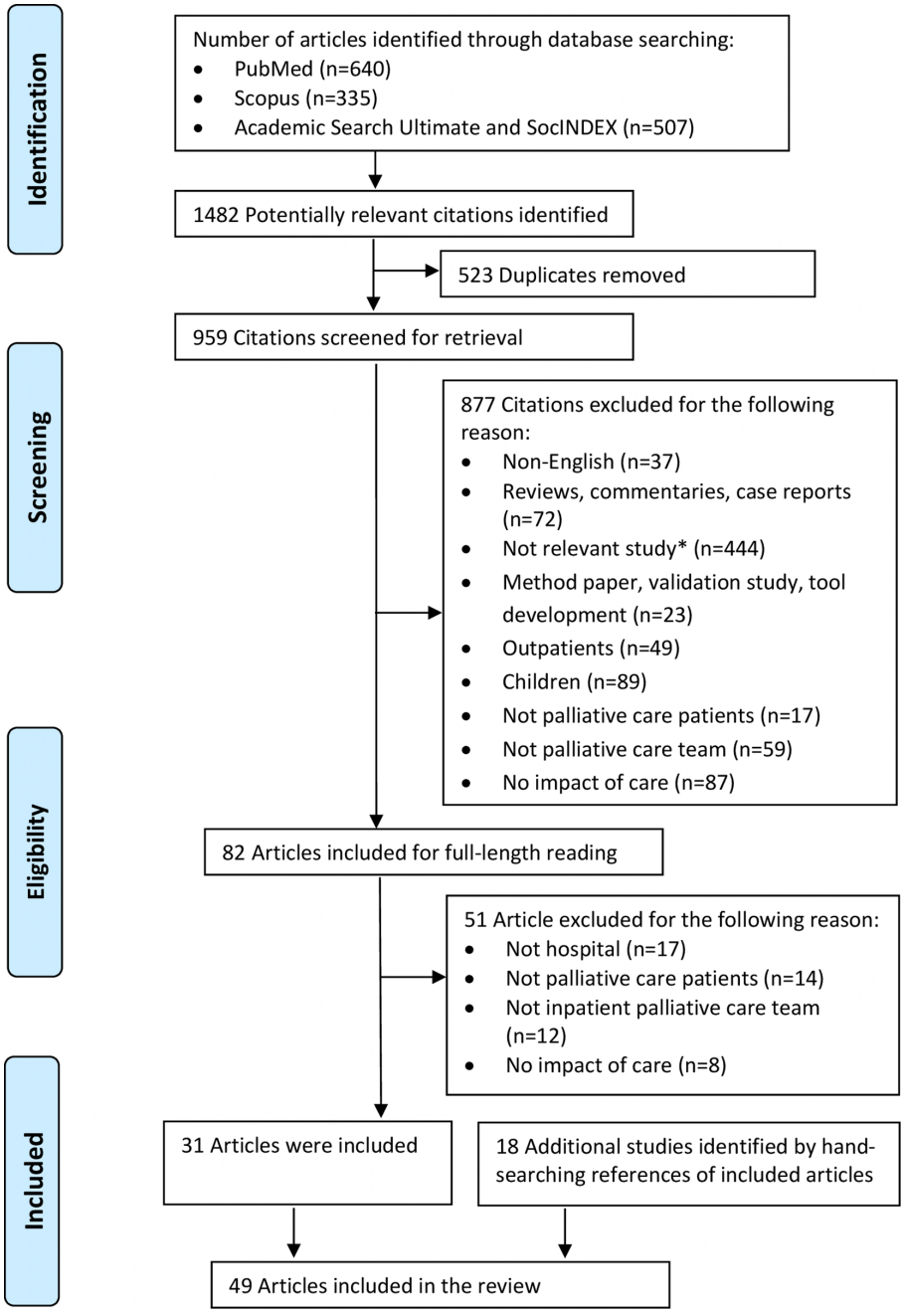

Figure 1 Flow diagram of article selection.*The study addresses medical interventions such as surgery,chemotherapy etc.

of palliative care consult service as reported in the paper was classified as being associated with improvement, no difference, deterioration and mixed results in specific outcomes. As this was a descriptive study, an extracted data was directly entered in tables and then synthesised into a narrative summary.

RESULTS

Citations and publications

The present searches yielded 1482 potentially relevant citations, of which 523 were duplicates. After the initial screening of titles, abstracts and keywords, 82 (9%) publications of the remaining 959 were retained for full-text examination. These 82 articles were assessed according to the predefined inclusion and exclusion criteria, resulting in the inclusion of 31 publications. The main reasons for exclusion were publications not measuring impact of care (10%), not inpatient hospital setting (8%), not palliative care team (7%) and not palliative care patients (3%). By examination of the reference list of all included 31 papers, 18 additional relevant studies were identified. Thus, the final number of included studies was 49 (figure 1).

Overview of the included studies

All 49 publications (online supplemental table 1) assessed impact of palliative care consult service in inpatient hospital setting. Most studies (21 (42%)) were before-and-after studies, 12% were concurrent

cohort studies, and 10% were randomised controlled trials. Strength of the evidence of most included papers were low according to Joanna Briggs Institute Critical Appraisal Tool (see online supplemental table 1).

The sample size ranged from 12 to 73 145 patients, providing a total sample of 104 743 patients, 658 family members and 98 nurse participants. Studies were performed with cancer/non-cancer palliative care populations, their family members and/or staff. The follow-up of the patients in included studies ranged from 1 day after initial consultation till discharge of the patient or death in several time points. Main types of palliative care interventions provided by palliative care consult service included pain and symptom management (n=11 and 31), advanced care planning (n=13), goals of care discussion (n=10), emotional and psychological support (n=9), discharge planning (n=7), patient referral to other services (n=6), education of patients, relatives and other healthcare providers (n=6), family meetings and decision making (n=4 and 4), communication (n=4) and prognostic understanding (n=4). Palliative care team composition varied greatly between studies. Some studies showed palliative care team to be as small as two palliative care specialists, mainly doctor and nurse, included in the studies, while others involved other specialists as well, such as psychologist, social worker, psychiatrist, chaplain and pharmacist (online supplemental table 1).

Table 1 provides the summary of the effect of palliative care consult service on different outcomes which were classified as patient, family, staff and system level. As the papers were assessing and measuring several outcomes in the studies, each of them was scored separately in the table, thus the sum does not result in final number of included papers. A total of 28 different outcome variables were extracted from reviewed studies, 18 of them showing improvement in outcome variable, 7 provided no difference and 3 of them provided inconclusive results.

Effect of palliative care consult service on patient outcomes

Fifteen patient outcomes that were extracted from included publications were quality of life, pain, depression, other symptoms, patient satisfaction with care, spiritual well-being, length of stay, survival, social support, advanced care planning, patient performance, admission/discharge, disease burden, mortality and patient preferences.

Patient quality of life was assessed in three studies[12 19 34] where improvement was observed in two of them.[12 34] Pain and symptom management was the most frequent intervention provided by palliative care consult service (34%). Fifteen studies[11–13 15 17 28 34–42] showed that palliative care consult service reduced pain intensity scores in patients, while three of the studies did not show any difference.[3 20 43] Management of depression and depressive symptoms were improved in five studies,[12 13 15 34 38] while six studies[3 11 14 19 37 43] showed no difference in the outcome of interest. Improvement of other symptoms was shown in 11 studies,[11–15 28 34 37–40] while 3 studies showed no difference[3 20 43] and 1 study[41] provided mixed results. Five studies[3 34 42 44 45] showed improvement in patient satisfaction with care provided by palliative care consult service in inpatient setting. Length of stay was measured in seven studies[3 16 28 46–49] were three studies[3 28 48] exhibited shorter length of stay in the hospital, other three studies[16 46 49] showed no difference in median number of days spent in the hospital, and one study[47] provided mixed results. No difference in median and 90-day survival for the patients was found in two studies[3 46] as compared with one[50] showing longer survival for the patients. Patients' social support and discussion of psychosocial issues were addressed in two studies,[14 15] where one of them[14] showed no significant difference. Advanced care planning was assessed and improved in seven of the studies,[3 12 19 39 51–53] while one study[46] showed no significant difference. Patient overall performance and functional scale showed no difference in one study[43] in patient functioning. Patient admission/discharge from the hospital and patient disease burden has improved in five[3 40 49 54 55] and two of the studies,[19 55] respectively. Inpatient mortality showed improvement in three studies,[50 55 56] while one study[16] showed no difference in results. Discussion with patients on their treatment preferences showed no statistically significant difference in two studies.[46 51]

Effect of palliative care consult service on family outcomes

Four different family outcomes were assessed in all included papers. Four studies[28 43–45] showed improvement in family satisfaction with care provided by palliative care consult service, two studies[16 48] showed no difference, while one study[17] showed mixed results. Another study examined family understanding of diagnosis, where improvement was observed.[40] No statistically different results were observed in psychological symptoms of family members[46 48] and family reported patient quality of dying.[48]

Effect of palliative care consult service on staff outcomes

Eight different outcomes were measured in staff level. Among them, satisfaction on provided care was improved in one paper,[20] while another paper showed no significant difference in provided care.[16] Two papers[57 58] showed the improvement of patient referral to different services such as hospice, palliative care unit and home. Three studies[48 53 59] showed improvement in communication with patients and their families, while staff awareness in palliative care showed no significant difference.[50] Four of the studies[28 58 60 61] showed improvement in giving recommendations to patients, families and other healthcare providers. Healthcare providers stress levels were assessed and improved in one study.[42] Improvement was also observed in staff prescription patterns[20 36 62]

Table 1 Summary: the effect of palliative care consult service on different outcomes from 49 included studies

Outcomes (no of studies)		Study design (no of studies)	Improvement (no of studies)	No difference (no of studies)	Deterioration (no of studies)	Mixed results (no of studies)
Patient (87)	QOL (3)	RCT (2) Quasi-experimental study (1)	2	1	–	–
	Pain (18)	RCT (3) Quasi-experimental study (1) Concurrent cohort study (1) Concurrent cohort study and Qualitative (1) Historical cohort study (3) Before-and-after study (9)	15	3	–	–
	Depression/depressive symptoms (11)	RCT (3) Quasi-experimental study (2) Concurrent cohort study (1) Historical cohort study (1) Before-and-after study (4)	5	6	–	–
	Other symptoms (15)	RCT (3) Quasi-experimental study (1) Concurrent cohort study (1) Historical cohort study (1) Before-and-after study (9)	11	3	–	1
	Satisfaction with care (5)	RCT (2) Concurrent cohort study (1) Concurrent cohort study and Qualitative (1) Qualitative study (1)	5	–	–	–
	Spiritual well-being (1)	Quasi-experimental study (1)	1	–	–	–
	LOS (7)	RCT (3) Controlled before-and-after study (1) Before-and-after study (3)	3	3	–	1
	Survival (3)	RCT (2) Concurrent cohort study (1)	1	2	–	–
	Social support/ psychosocial issues (2)	Quasi-experimental study (1) Before-and-after study (1)	1	1	–	–
	ACP (8)	RCT (3) Quasi-experimental study (1) Before-and-after study (4)	7	1	–	–
	Performance (1)	Before-and-after study (1)	–	1	–	–
	Admissions/discharge (5)	RCT (1) Concurrent cohort study (1) Historical cohort study (1) Before-and-after study (2)	5	–	–	–
	Disease burden (2)	Quasi-experimental study (1) Historical cohort study (1)	2	–	–	–
	Mortality (4)	RCT (1) Concurrent cohort study (1) Historical cohort study (1) Cross-sectional study (1)	3	1	–	–
	Patient preferences (2)	RCT (1) Before-and-after study (1)	–	2	–	–
Family (11)	Satisfaction with care (7)	RCT (1) Concurrent cohort study (1) Before-and-after study (3) Qualitative (2)	4	2	–	1
	Understanding of diagnosis (1)	Before-and-after study (1)	1	–	–	–
	Psychological symptoms (2)	RCT (1) Before-and-after study (1)	–	2	–	–
	Family reported quality of dying (1)	Before-and-after study (1)	–	1	–	–

Continued

Table 1 Continued

Outcomes (no of studies)		Study design (no of studies)	Improvement (no of studies)	No difference (no of studies)	Deterioration (no of studies)	Mixed results (no of studies)
Staff (21)	Satisfaction on provided care (2)	RCT (1) Before-and-after study (1)	1	1	–	–
	Referral to different services (2)	Case–control study (1) Before-and-after study (1)	2	–	–	–
	Communication with pts and families (3)	Concurrent cohort study (1) Before-and-after study (2)	3	–	–	–
	Awareness in palliative care (1)	Concurrent cohort study (1)	–	1	–	–
	Recommendations to pts, families and other healthcare providers (4)	Before-and-after study (4)	4	–	–	–
	Stress (1)	Concurrent cohort study and Qualitative (1)	1	–	–	–
	Prescribing patterns (3)	Historical cohort study (2) Before-and-after study (1)	3	–	–	–
	Elimination of unnecessary interventions (5)	Concurrent cohort study (1) Historical cohort study (2) Before-and-after study (2)	4	–	–	1
System (13)	Costs (13)	RCT (1) Quasi-experimental study (2) Concurrent cohort study (3) Case–control study (2) Before-and-after study (4) Cross-sectional study (1)	9	–	1	3

ACP, advance care planning; LOS, length of stay; pts, patients; QOL, quality of life; RCT, randomised controlled trial.

and elimination of unnecessary interventions,[50 55 63 64] while one study[65] exhibited mixed results.

Effect of palliative care consult service on system outcome

From the system outcomes, cost of care was assessed in 13 of the papers.[3 18 28 49 54 56 57 63 66–70] Nine of them[3 18 28 49 54 56 57 63 66] showed an overall cost reduction when introducing palliative care early during hospital admission, three studies[67 69 70] provided mixed results, and one study[68] showed no difference in early and late palliative care consultation cost-effectiveness.

DISCUSSION

Main findings

Present update of the systematic literature review included 49 full-text articles assessing impact of palliative care consult service in inpatient hospital setting published from their inception till February 2020. Studies addressed effect of palliative care consult service on patient, family, staff and system outcomes. In total, 28 different variables were identified and extracted from the studies. Among them, 18 domains showed overall improvement in the outcome of interest, seven provided no difference between the groups and three indicated inconclusive results.

Improvement was observed in palliative care patients' pain, other symptoms and satisfaction with care which was similar to the results of a systematic literature review by Higginson *et al* in their quantitative meta-analysis published in 2002.[27] Palliative care patients' pain and other symptoms are expected to be deteriorating over time during their disease trajectory, however, the finding on improvement of those symptoms showed the benefit of hospital based palliative care team. Patient and family satisfaction with care was also in concordance with the study by Finlay *et al* showing similar or greater satisfaction with care in inpatient setting.[23] Improvement in patients advanced care planning documentation and communication could be explained by the fact that specialised palliative care teams were more prone to discuss patients' preferences, completing of advanced directives and communicating on advanced care panning choices such as do not resuscitate convention, withdraw of mechanical ventilation and bilevel positive airway pressure. Studies show improvement in elimination of unnecessary interventions at the end of life, such as removal of electrocardiographic monitoring, multiple intravenous lines or discontinuation of chemotherapy and other unnecessary drugs at the end of life. The finding on reduction in healthcare costs is in line with other systematic literature review[21] showing that hospital costs decreased when patients were referred to a palliative care programme. Although there was minimal evidence to demonstrate an overall cost savings of palliative care programmes where the studies did not define or quantify cost-effectiveness.[21] Another study from the USA using retrospective medical records of seven hospitals investigated the benefits of

palliative care for a healthcare system.[71] The benefit was consistently greater when patients were seen within the first 48 hours compared with later in the hospitalisation, therefore, an early involvement of palliative care services emerged as advantageous to the net benefit.[71]

No difference was observed in the studies on patient survival between usual care and palliative care intervention. This finding is similar with the results from a systematic literature review and meta-analysis conducted by Kavalieratos *et al*, where none of the studies showed a decrease in survival from palliative care.[72] On the other hand, it is expected that palliative care patients have shorter survival due to progressive disease[73] and it is important that patients seen by palliative care consult service did not seem to live shorter lives. Studies showed improvement of survival with introducing early palliative care to cancer patients in outpatient ambulatory palliative care settings.[74–76] However, the same studies showed no survival benefit of palliative intervention in inpatient palliative care setting.[74–76] Patients receiving social support services and resolving their psychosocial issues provided inconclusive results, but only two studies were measuring these outcomes. All these two studies included 699 palliative care patients in total (152 cancer, 132 HIV/AIDS and 415 cancer and non-cancer).

Impact of palliative care consult service on patient and family depression scores showed no difference in results. In the majority of those studies, palliative care team did not include psychologist or psychiatrist in the care of the patients. This finding is in contrast with the studies conducted in cancer patients in inpatient hospital setting where improvement was observed in mood, depression and anxiety when early palliative care was introduced.[77 78] This could be due to involvement of psychiatrists in the care of the patients with cancer early during disease trajectory. Furthermore, a randomised controlled trial introducing integrated palliative care intervention during hematologic stem-cell transplantation in inpatient setting exhibited lower depressive and post-traumatic stress disorder symptoms.[79] Present study did not show any reduction or growth in patients' length of stay in the hospital setting. This finding is in contrast with the systematic literature review indicating reduction in the number of inpatient hospital days for palliative care patients with cancer[21] and a retrospective cohort study showing increase in the number of inpatient hospital days for lung cancer patients at the end of life.[80] No difference in patient overall performance and functional scale may be difficult to judge as only one study assessed this domain in 53 patients and was of a low quality.

This systematic literature review showed the positive effect of palliative care consult service in 18 out of 28 domains in inpatient hospital setting. Despite this evidence, there is still limited access to palliative care in many countries. The main barriers for the patients and families in receiving palliative care is the lack of referrals provided by healthcare professionals, national health policies and systems that do not often include palliative care, restrictive specialist palliative care service programme eligibility criteria and/or level of knowledge of professionals.[81 82] Lack of resources, shortage of palliative care specialists, non-integration of palliative care provision into services and the difficulties around the expansion of palliative care provision to disease other than cancer are among other barriers identified.[1 81] Integrating palliative care in hospital setting is crucial for implementing the early palliative care model[74 83] as most patients with advanced chronic disease would benefit from the initiation of palliative care and advance care planning early in the trajectory of their disease and subsequently can also make better use of other forms of palliative care, such as hospice.[84] Due to the lack of palliative care specialists and the increasing demand for palliative care in hospitals, development of robust screening tools and referral criteria is important for effective use of resources. A number of collaborative initiatives and projects have been launched testing various methods from c0-rounding hospital services[85 86] to intuition-based tools (eg, surprise question[87]) and electronic health record-based automatic triggers.[88 89]

Strength and limitations

Present systematic literature review has several strengths. First, the selection of the well-known major databases representing various disciplines, and the use of recognised search strategy to identify relevant literature in palliative care population was applied. Based on comprehensive searches, effect of palliative care consult service on patient and family outcomes was detected. Consequently, this systematic literature review includes a wide range of palliative care interventions provided by palliative care consult service, starting from pain and symptom management to family understanding of patient diagnosis. Review included publications from studies investigating all palliative care populations, such as cancer and non-cancer, in explicitly defined setting. Limitations of the study include the search that was confined to studies published in English language. In addition, in the PubMed database we searched the word 'Hospitals' as a subject heading and as a free text term in titles and abstracts. This could result in potentially missing papers including the word 'Hospitals' in title/abstract. However, the comprehensive hand search of the reference list of

included studies yielded 18 additional studies, that could otherwise have been missed.

Further research

Further high-quality research is needed to investigate the impact of palliative care consult service in inpatient hospital setting. Little research has been done on the issues of patient spiritual well-being, social support, performance and preferences, family understanding of patient diagnosis and prognosis, or staff stress.

CONCLUSIONS

The present update of the systematic literature review offers a complex review of available evidence on the effectiveness of hospital palliative care consultation service. In total, 28 different variables were identified, where 18 domains showed improvement in the outcome of interest. Effect of palliative care consult service was divided into four different categories—impact on patients, families, staff and healthcare system outcome. Numbers of variables identified as positive, neutral, negative and mixed results. Palliative care consult service was found to have a number of positive effects on 18 outcome variables, such as pain and symptom control, patient and family satisfaction with care, advanced care planning documentation and communication, elimination of unnecessary interventions and healthcare costs. Palliative care should be offered early in the disease trajectory for optimal symptom control and improvement of quality of life. More research should be conducted on factors such as patient spiritual well-being, social support, performance, family understanding of patient diagnosis and prognosis or staff stress.

Contributors EJ and ML made a contribution to the design of the work, the analysis and interpretation of data. EJ made the database searches. EJ and KP contributed to the screening process and full-text reading of the articles. EJ drafted the article, which was revised critically by ML, KP and LBM. All coauthors commented on the draft and agree on the final content.

Funding EJ was supported by the International Mobility of Researchers grant, financed by Operational Programme Research, Development and Education, Ministry of Education, Youth and Sports, Czech Republic (CZ.02.2.69/0.0./0.0/16_027/0008495) and LBM was supported by Progres Q35 research grant by Charles University.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Elene Janberidze http://orcid.org/0000-0003-4870-048X

REFERENCES

1 Kelley AS, Morrison RS. Palliative care for the seriously ill. *N Engl J Med* 2015;373:747–55.
2 Pidgeon T, Johnson CE, Currow D, *et al*. A survey of patients' experience of pain and other symptoms while receiving care from palliative care services. *BMJ Support Palliat Care* 2016;6:315–22.
3 Gade G, Venohr I, Conner D, *et al*. Impact of an inpatient palliative care team: a randomized control trial. *J Palliat Med* 2008;11:180–90.
4 Higginson IJ, Evans CJ. What is the evidence that palliative care teams improve outcomes for cancer patients and their families? *Cancer J* 2010;16:423–35.
5 Center to Advance Palliative Care. Growth of palliative care in U.S. hospitals 2018,Snapshot (2000-2016), 2018. Available: https://media.capc.org/filer_public/27/2c/272c55c1-b69d-4eec-a932-562c2d2a4633/capc_2018_growth_snapshot_022118.pdf
6 Centeno C, Lynch T, Garralda E, *et al*. 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* 2016;30:351–62.
7 Capc. National palliative care registry. A project of CAPC and NPCRC.2009-2015.How we work: trends and insights in hospital palliative care. Available: https://registry.capc.org/wp-content/uploads/2017/02/How-We-Work-Trends-and-Insights-in-Hospital-Palliative-Care-2009-2015.pdf
8 Radbruch L, Payne S. White paper on standards and norms for hospice and palliative care in Europe, part 1: recommendations from the European association for palliative care. *European J Palliative Care* 2009;16:278–89.
9 Hanson LC, Usher B, Spragens L, *et al*. Clinical and economic impact of palliative care consultation. *J Pain Symptom Manage* 2008;35:340–6.
10 Pantilat SZ, O'Riordan DL, Dibble SL, *et al*. Hospital-Based palliative medicine consultation: a randomized controlled trial. *Arch Intern Med* 2010;170:2038–40.
11 Lefkowits C, Teuteberg W, Courtney-Brooks M, *et al*. Improvement in symptom burden within one day after palliative care consultation in a cohort of gynecologic oncology inpatients. *Gynecol Oncol* 2015;136:424–8.
12 Sidebottom AC, Jorgenson A, Richards H, *et al*. Inpatient palliative care for patients with acute heart failure: outcomes from a randomized trial. *J Palliat Med* 2015;18:134–42.
13 de Santiago A, Portela MA, Ramos L, *et al*. A new palliative care consultation team at the oncology department of a university hospital: an assessment of initial efficiency and effectiveness. *Support Care Cancer* 2012;20:2199–203.
14 Kao C-Y, Hu W-Y, Chiu T-Y, *et al*. Effects of the hospital-based palliative care team on the care for cancer patients: an evaluation study. *Int J Nurs Stud* 2014;51:226–35.
15 Selwyn PA, Rivard M, Kappell D, *et al*. Palliative care for AIDS at a large urban teaching hospital: program description and preliminary outcomes. *J Palliat Med* 2003;6:461–74.
16 Cheung W, Aggarwal G, Fugaccia E, *et al*. Palliative care teams in the intensive care unit: a randomised, controlled, feasibility study. *Crit Care Resusc* 2010;12:28–35.
17 Enguidanos S, Housen P, Penido M, *et al*. Family members' perceptions of inpatient palliative care consult services: a qualitative study. *Palliat Med* 2014;28:42–8.
18 May P, Garrido MM, Cassel JB, *et al*. Prospective cohort study of hospital palliative care teams for inpatients with advanced cancer: earlier consultation is associated with larger cost-saving effect. *J Clin Oncol* 2015;33:2745–52.
19 Duenk RG, Verhagen C, Bronkhorst EM, *et al*. Proactive palliative care for patients with COPD (prolong): a pragmatic cluster controlled trial. *Int J Chron Obstruct Pulmon Dis* 2017;12:2795–806.
20 McQuillar R, Finlay I, Roberts D, *et al*. The provision of a palliative care service in a teaching hospital and subsequent evaluation of that service. *Palliat Med* 1996;10:231–9.

21 Hearn J, Higginson IJ. Do specialist palliative care teams improve outcomes for cancer patients? A systematic literature review. *Palliat Med* 1998;12:317–32.
22 Yang GM, Neo SH-S, Lim SZZ, *et al*. Effectiveness of hospital palliative care teams for cancer inpatients: a systematic review. *J Palliat Med* 2016;19:1156–65.
23 Finlay IG, Higginson IJ, Goodwin DM, *et al*. Palliative care in hospital, hospice, at home: results from a systematic review. *Ann Oncol* 2002;13 Suppl 4:257–64.
24 Zimmermann C, Riechelmann R, Krzyzanowska M, *et al*. Effectiveness of specialized palliative care: a systematic review. *JAMA* 2008;299:1698–709.
25 Gaertner J, Siemens W, Meerpohl JJ, *et al*. Effect of specialist palliative care services on quality of life in adults with advanced incurable illness in hospital, hospice, or community settings: systematic review and meta-analysis. *BMJ* 2017;357:j2925.
26 Higginson IJ, Finlay IG, Goodwin DM, *et al*. Is there evidence that palliative care teams alter end-of-life experiences of patients and their caregivers? *J Pain Symptom Manage* 2003;25:150–68.
27 Higginson IJ, Finlay I, Goodwin DM, *et al*. Do hospital-based palliative teams improve care for patients or families at the end of life? *J Pain Symptom Manage* 2002;23:96–106.
28 O'Mahony S, Blank AE, Zallman L, *et al*. The benefits of a hospital-based inpatient palliative care consultation service: preliminary outcome data. *J Palliat Med* 2005;8:1033–9.
29 Penrod JD, Deb P, Luhrs C, *et al*. Cost and utilization outcomes of patients receiving hospital-based palliative care consultation. *J Palliat Med* 2006;9:855–60.
30 Ciemins EL, Blum L, Nunley M, *et al*. The economic and clinical impact of an inpatient palliative care consultation service: a multifaceted approach. *J Palliat Med* 2007;10:1347–55.
31 Hui D, Bruera E. Models of palliative care delivery for patients with cancer. *J Clin Oncol* 2020;38:852–65.
32 Joanna briggs. Joanna Briggs Institute critical appraisal tools. Available: https://joannabriggs.org/ebp/critical_appraisal_tools [Accessed 5 Jun 2020].
33 Deeks JJ, Dinnes J, D'Amico R, *et al*. Evaluating non-randomised intervention studies. *Health Technol Assess* 2003;7:1–173.
34 Hanks GW, Robbins M, Sharp D, *et al*. The impact study: a randomised controlled trial to evaluate a hospital palliative care team. *Br J Cancer* 2002;87:733–9.
35 Jack B, Hillier V, Williams A, *et al*. Improving cancer patients' pain: the impact of the hospital specialist palliative care team. *Eur J Cancer Care* 2006;15:476–80.
36 Bruera E, Brenneis C, Michaud M, *et al*. Influence of the pain and symptom control team (PSCT) on the patterns of treatment of pain and other symptoms in a cancer center. *J Pain Symptom Manage* 1989;4:112–6.
37 Edmonds PM, Stuttaford JM, Penny J, *et al*. Do hospital palliative care teams improve symptom control? use of a modified STAS as an evaluation tool. *Palliat Med* 1998;12:345–51.
38 Braiteh F, El Osta B, Palmer JL, *et al*. Characteristics, findings, and outcomes of palliative care inpatient consultations at a comprehensive cancer center. *J Palliat Med* 2007;10:948–55.
39 Delgado-Guay MO, Parsons HA, Li Z, *et al*. Symptom distress, interventions, and outcomes of intensive care unit cancer patients referred to a palliative care consult team. *Cancer* 2009;115:437–45.
40 Ellershaw JE, Peat SJ, Boys LC. Assessing the effectiveness of a hospital palliative care team. *Palliat Med* 1995;9:145–52.
41 Iwase S, Murakami T, Saito Y, *et al*. Preliminary statistical assessment of intervention by a palliative care team working in a Japanese General inpatient unit. *Am J Hosp Palliat Care* 2007;24:29–35.
42 Hartwig K, Dean M, Hartwig K, *et al*. Where there is no morphine: the challenge and hope of palliative care delivery in Tanzania. *Afr J Prim Health Care Fam Med* 2014;6:E1–8.
43 Sasahara T, Miyashita M, Umeda M, *et al*. Multiple evaluation of a hospital-based palliative care consultation team in a university hospital: activities, patient outcome, and referring staff's view. *Palliat Support Care* 2010;8:49–57.
44 Roza KA, Lee EJ, Meier DE, *et al*. A survey of bereaved family members to assess quality of care on a palliative care unit. *J Palliat Med* 2015;18:358–65.
45 Yang GM, Ewing G, Booth S. What is the role of specialist palliative care in an acute hospital setting? A qualitative study exploring views of patients and carers. *Palliat Med* 2012;26:1011–7.
46 Carson SS, Cox CE, Wallenstein S, *et al*. Effect of palliative Care-Led meetings for families of patients with chronic critical illness: a randomized clinical trial. *JAMA* 2016;316:51–62.
47 Norton SA, Hogan LA, Holloway RG, *et al*. Proactive palliative care in the medical intensive care unit: effects on length of stay for selected high-risk patients. *Crit Care Med* 2007;35:1530–5.
48 Braus N, Campbell TC, Kwekkeboom KL, *et al*. Prospective study of a proactive palliative care rounding intervention in a medical ICU. *Intensive Care Med* 2016;42:54–62.
49 Morrison RS, Dietrich J, Ladwig S, *et al*. Palliative care consultation teams cut hospital costs for Medicaid beneficiaries. *Health Aff* 2011;30:454–63.
50 Colombet I, Montheil V, Durand J-P, *et al*. Effect of integrated palliative care on the quality of end-of-life care: retrospective analysis of 521 cancer patients. *BMJ Support Palliat Care* 2012;2:239–47.
51 Bischoff K, O'Riordan DL, Marks AK, *et al*. Care planning for inpatients referred for palliative care consultation. *JAMA Intern Med* 2018;178:48–54.
52 Kao C-Y, Wang H-M, Tang S-C, *et al*. Predictive factors for do-not-resuscitate designation among terminally ill cancer patients receiving care from a palliative care consultation service. *J Pain Symptom Manage* 2014;47:271–82.
53 Mun E, Umbarger L, Ceria-Ulep C, *et al*. Palliative care processes embedded in the ICU workflow may reserve palliative care teams for refractory cases. *Am J Hosp Palliat Care* 2018;35:60–5.
54 Penrod JD, Deb P, Dellenbaugh C, *et al*. Hospital-Based palliative care consultation: effects on hospital cost. *J Palliat Med* 2010;13:973–9.
55 Pan CX, Gutierrez C, Maw MM, *et al*. Impact of a palliative care program on tracheostomy utilization in a community hospital. *J Palliat Med* 2015;18:1070–3.
56 Thygeson NM, Wang M, O'Riordan D, *et al*. Self-Reported California Hospital palliative care program composition, certification, and staffing level are associated with lower end-of-life Medicare utilization. *J Palliat Med* 2016;19:1281–7.
57 Whitford K, Shah ND, Moriarty J, *et al*. Impact of a palliative care consult service. *Am J Hosp Palliat Care* 2014;31:175–82.
58 Virik K, Glare P. Profile and evaluation of a palliative medicine consultation service within a tertiary teaching hospital in Sydney, Australia. *J Pain Symptom Manage* 2002;23:17–25.
59 Penrod JD, Luhrs CA, Livote EE, *et al*. Implementation and evaluation of a network-based pilot program to improve palliative care in the intensive care unit. *J Pain Symptom Manage* 2011;42:668–71.
60 Chong K, Olson EM, Banc TE, *et al*. Types and rate of implementation of palliative care team recommendations for care of hospitalized veterans. *J Palliat Med* 2004;7:784–90.
61 Manfredi PL, Morrison RS, Morris J, *et al*. Palliative care consultations: how do they impact the care of hospitalized patients? *J Pain Symptom Manage* 2000;20:166–73.

62 Centeno C, Portela MA, Noguera A, *et al*. Impact of a new palliative care consultation team on opioid prescription in a university hospital. *BMC Palliat Care* 2009;8:2.
63 Campbell ML, Field BE. Management of the patient with do not resuscitate status: compassion and cost containment. *Heart Lung* 1991;20:345–8.
64 Souza PN, Miranda EJPde, Cruz R, *et al*. Palliative care for patients with HIV/AIDS admitted to intensive care units. *Rev Bras Ter Intensiva* 2016;28:301–9.
65 Monteleoni C, Clark E. Using rapid-cycle quality improvement methodology to reduce feeding tubes in patients with advanced dementia: before and after study. *BMJ* 2004;329:491–4.
66 May P, Garrido MM, Cassel JB, *et al*. Palliative care teams' cost-saving effect is larger for cancer patients with higher numbers of comorbidities. *Health Aff* 2016;35:44–53.
67 May P, Garrido MM, Cassel JB, *et al*. Using length of stay to control for unobserved heterogeneity when estimating treatment effect on hospital costs with observational data: issues of reliability, robustness, and usefulness. *Health Serv Res* 2016;51:2020–43.
68 May P, Garrido MM, Cassel JB, *et al*. Cost analysis of a prospective multi-site cohort study of palliative care consultation teams for adults with advanced cancer: where do cost-savings come from? *Palliat Med* 2017;31:378–86.
69 O'Mahony S, Johnson TJ, Amer S, *et al*. Integration of palliative care advanced practice nurses into intensive care unit teams. *Am J Hosp Palliat Care* 2017;34:330–4.
70 Starks H, Wang S, Farber S, *et al*. Cost savings vary by length of stay for inpatients receiving palliative care consultation services. *J Palliat Med* 2013;16:1215–20.
71 Bharadwaj P, Helfen KM, Deleon LJ, *et al*. Making the case for palliative care at the system level: outcomes data. *J Palliat Med* 2016;19:255–8.
72 Kavalieratos D, Corbelli J, Zhang D, *et al*. Association between palliative care and patient and caregiver outcomes: a systematic review and meta-analysis. *JAMA* 2016;316:2104–14.
73 Zimmermann C, Swami N, Krzyzanowska M, *et al*. Perceptions of palliative care among patients with advanced cancer and their caregivers. *CMAJ* 2016;188:E217–27.
74 Temel JS, Greer JA, Muzikansky A, *et al*. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med* 2010;363:733–42.
75 Bakitas MA, Tosteson TD, Li Z, *et al*. Early versus delayed initiation of concurrent palliative oncology care: patient outcomes in the enable III randomized controlled trial. *J Clin Oncol* 2015;33:1438–45.
76 Rugno FC, Paiva BSR, Paiva CE. Early integration of palliative care facilitates the discontinuation of anticancer treatment in women with advanced breast or gynecologic cancers. *Gynecol Oncol* 2014;135:249–54.
77 Lowery WJ, Lowery AW, Barnett JC, *et al*. Cost-Effectiveness of early palliative care intervention in recurrent platinum-resistant ovarian cancer. *Gynecol Oncol* 2013;130:426–30.
78 Walker J, Hansen CH, Martin P, *et al*. Integrated collaborative care for major depression comorbid with a poor prognosis cancer (smart Oncology-3): a multicentre randomised controlled trial in patients with lung cancer. *Lancet Oncol* 2014;15:1168–76.
79 El-Jawahri A, Traeger L, Greer JA, *et al*. Effect of inpatient palliative care during hematopoietic stem-cell transplant on psychological distress 6 months after transplant: results of a randomized clinical trial. *J Clin Oncol* 2017;35:3714–21.
80 Kim SJ, Han K-T, Kim TH, *et al*. Does Hospital need more hospice beds? Hospital charges and length of stays by lung cancer inpatients at their end of life: a retrospective cohort design of 2002-2012. *Palliat Med* 2015;29:808–16.
81 Gomez-Batiste X, Connor S. *Building integrated palliative care programs and services*, 2017.
82 Connor S, Bermedo MCS. *Global atlas of palliative care at the end of life*, 2014.
83 World Health Organisation. Palliative care, 2018. Available: https://www.who.int/news-room/fact-sheets/detail/palliative-care
84 Amano K, Morita T, Tatara R, *et al*. Association between early palliative care referrals, inpatient hospice utilization, and aggressiveness of care at the end of life. *J Palliat Med* 2015;18:270–3.
85 Riedel RF, Slusser K, Power S, *et al*. Improvements in patient and health system outcomes using an integrated oncology and palliative medicine approach on a solid tumor inpatient service. *J Oncol Pract* 2017;13:e738–48.
86 Ray EM, Riedel RF, LeBlanc TW, *et al*. Assessing the impact of a novel integrated palliative care and medical oncology inpatient service on health care utilization before hospice enrollment. *J Palliat Med* 2019;22:420–3.
87 Haydar SA, Almeder L, Michalakes L, *et al*. Using the surprise question to identify those with unmet palliative care needs in emergency and inpatient settings: what do clinicians think? *J Palliat Med* 2017;20:729–35.
88 Courtright KR, Chivers C, Becker M, *et al*. Electronic health record mortality prediction model for targeted palliative care among hospitalized medical patients: a pilot quasi-experimental study. *J Gen Intern Med* 2019;34:1841–7.
89 Avati A, Jung K, Harman S, *et al*. Improving palliative care with deep learning. *BMC Med Inform Decis Mak* 2018;18:122.