

Impact of the pharmacist on pain in hospice and palliative care: a systematic literature review

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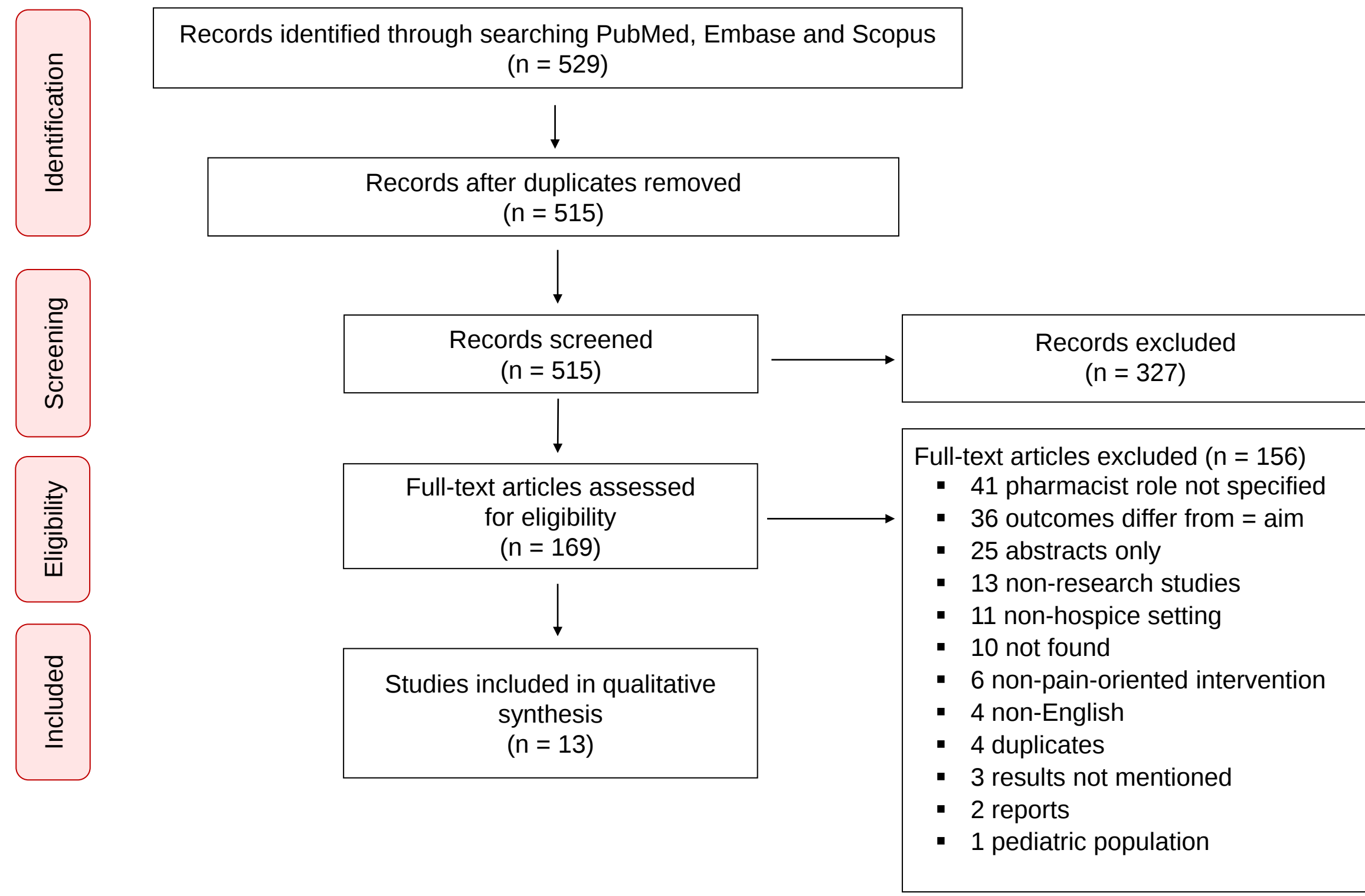
INTRODUCTION

- Guidelines from the American Society of Health-System Pharmacists (ASHP) recommend pharmacist involvement in hospice and palliative care
- The inclusion of pharmacists as members of the team in hospice/palliative care has the potential to improve clinical outcomes and demonstrate cost savings, particularly in pain management
- Opportunities for pharmacists in pain management include patient counseling, optimizing medication use, and recommending/adjusting therapies
- The objective of the current study was to describe the impact of pharmacists on pain management in hospice/palliative care

METHODS

- A systematic literature review using the PRISMA guidelines was designed to search articles in PubMed, Scopus, and Embase between 2010-2019.
- Articles were identified using a search strategy encompassing relevant MeSH, index and key terms (e.g. pharmacist, pharmacist services, pain, pain management, and hospice care)
- Inclusion criteria were studies discussing pain management in hospice/palliative care detailing the impact of pharmacist intervention
 - Impacts assessed include clinical, cost or interventional outcomes such as therapy recommendations, dosage modifications, prevention of adverse events, or cost-effectiveness
- Studies focused on pediatric hospice care, non-English articles and conference abstracts were excluded
- The review was conducted using the Covidence web application

Figure 1. PRISMA flow chart of publication selection process



RESULTS

- A total of 13 articles were identified to meet inclusion criteria for the qualitative analysis:
 - Seven (54%) prospective evaluations of the impact of a clinical pharmacist on patient's pain control
 - Four (31%) retrospective assessment of pharmacist led intervention, and
 - Two (15%) pharmacist responses to surveys estimating their contribution to hospice care services
- Pharmacist involvement in a multidisciplinary hospice care team had a positive impact on both clinical (reduction in pain intensity, symptom scores and recommendations for new treatments) and cost outcomes
- Overall, this systematic review demonstrates the benefit of pharmacist inclusion in hospice and palliative care services, with evidence for improvement of pain and symptom management and cost-effectiveness of treatment rendered

Author, Year (Country)	Study Aim	Study Design	Patient population	Pharmacist role	Key Findings/Results
Valgus, 2010 (US)	Describe a pharmacist-led, interdisciplinary method of care delivery begun at the University of North Carolina; describe the characteristics of the population seen and the role of the individual members of the interdisciplinary team, and provide an early analysis of the program's impact on symptom improvement	Prospective analysis and retrospective medical chart review for studying the impact of a pharmacist led multidisciplinary team for supportive care in cancer patients	Adult cancer clinics: radiation, surgical, gynecologic, hematology, and medical	Drug therapy management under physician direction. Two delivery models: (1) consult service, with care provided at clinic where patient already seen, and (2) structured visits at separate clinic with initial assessment (cognitive/medication) by pharmacist. Encounters studied included consultation by nurse/pharmacist (28.6%) or nurse/pharmacist/physician (22.7%); 10.3% included pharmacist consultation alone	Across first 18 months of service, patient volume and encounters increased from 4.5 to 6.6 per month, and 13 to 20 per month, respectively. Among a subset of 54 patients assessed on pain medication, encounters with the service resulted in 40% of patients receiving an increased dose, 23% receiving a new medication, 15% switched to another opioid, and 15% with no change; methadone was the most common addition/switch. Among a subset of 49 patients assessed, reductions in symptom scores for pain, nausea and constipation decreased and maintained across three visits.
Chen, 2014 (China)	Compare the effectiveness of opioid treatment between cancer patients receiving interventions from Clinical Pharmacist Led Guidance team (CPGTs) and a comparable control group.	Prospective, multicenter, double armed controlled cohort study	18 years or older, diagnosed with cancer pain by an oncologist, and able to receive opioid treatment for more than two weeks. Patients previously treated with opioids were also included	(1) physician and patient education, drug-use monitoring, evaluation of drug responses, (2) consultation in cases of pain or in case of complications (without prescribing), (3) monitoring drug efficacy and toxicity (follow-up)	CPGT resulted in better pain control (scale 1-10) by site (bone [3.1 vs. 4.2, P=0.038], body [1.2 vs. 3.6, P=0.041], visceral [1.9 vs. 3.1, P=0.024], nerve [2.7 vs. 4.8, P=0.045]) and improved QOL (48.3 vs. 37.6, P=0.032, scale 0-60). Adverse events were significantly reduced in the CPGT group for constipation, nausea and vomiting.
Geum, 2019 (Korea)	Evaluate the impact on pain management by multidisciplinary palliative care team (mPCT) and the team pharmacist.	Retrospective analysis of the medical chart review. Patient reported pain intensity was recorded three times: (1) seven days before palliative care unit (PCU) admission (day -7), (2) on the day of admission (day 0), and (3) seven days after admission (day 7)	18 years or older, hospitalized for 7+ days between April 2014 and December 2015, after being transferred from the wards, emergency center, or outpatient clinics due to worsening of oncologic pain.	(1) recommending medications and evaluating analgesics, (2) validation and intervention of analgesic prescriptions based on the type and severity of pain, dose, routes, and schedule, (3) assessment of contraindications, drug interactions, and adverse effects, (4) patient counseling for nonadherent patients, (5) educating staff on evidence-based treatment with new analgesics	Mean pain intensity and appropriate use of analgesic improved gradually for patients admitted in the PCU with the mPCT. Mean pain intensity score was 2.66 on day 7 of PCU and 4.05, 3.16 on day 0 and day -7, respectively. As per the Korean Cancer pain management guidelines, appropriateness of analgesic doses (for chronic pain: 87.2%, 80.3%, and 95.7% on day 7, day 0, and day 7, respectively; P= .003; for breakthrough pain: 88.9%, 88.9%, and 96.6% on day 7, day 0, and day 7, respectively; P=0.049) and the rate of reassessment of each patient's pain to adjust the medication for breakthrough pain (63.2%, 68.4%, 91.5% on day 7, day 0, day 7, P<0.001) both significantly improved over time.
Wilby, 2014 (Qatar)	Create a baseline inventory of clinical pharmacy interventions after establishment of an academic cross-appointment in palliative care and to assess the perceived importance of interventions made.	Prospective, single-center characterization study. Data collected included: (1) number of patients admitted to palliative care while study pharmacists were on service, (2) actual or potential drug therapy problem, (3) clinical pharmacist intervention for resolution of identified drug therapy problem, and (4) acceptance by the prescriber, if applicable. Responses of an online survey from the pharmacist in Qatar and Canada were compared for assessing importance of each type of recommendation.	Palliative care service between September 1, 2013 and December 1, 2013. Additional data was also collected via pharmacist survey.	(1) identifying actual or potential drug therapy problem (2) assignment of an intervention/recommendation for the identified problem (3) ranking of the perceived importance of each of the recommendation given by study pharmacists	32 patients were seen (the average intervention rate of 3.0 per intervention per patient). On removal of education-related interventions, 81% of pharmacist's recommendations were accepted by physicians. Discontinuation of drug therapy (29%) and initiation of drug therapy (25%) recommendations were most common while referral to other professionals (2%) was least common. A significant difference existed between overall rankings for each question between pharmacists in Canada and Qatar (p<0.05). Initiation of drug therapy (10) (p=0.955), discounting of drug therapy (10) (p=0.758) and , physician/nurse education (10) (p=0.918) were among highly rated interventions/recommendations among the pharmacists from Qatar and Canada.
Atayee, 2018 (US)	Describe an inpatient palliative care pharmacist's interventions and outcomes; Evaluate the impact on length of stay (LOS), length from admission to palliative care consult (LTC), and time from consult to discharge and death (CTD).	Retrospective study of patients under part-time palliative care clinical pharmacist care as part of a consultation team	Hospitalized patients seen by pharmacist September 1, 2015, and March 30, 2017.	(1) guiding the transdisciplinary team on medication selection, dosing adjustments and titrations, (2) educating on medications, importance of adherence, symptoms, (3) recommending changes to medication orders, labs, and diagnostic testing, (4) serving as liaison between the palliative care team and the department of pharmacy, (5) providing home medication supply at discharge, and (6) follow up communication with the outpatient palliative care team.	Pharmacist involvement resulted in a significant difference in pain consultation and days from consult to discharge VS to the patients seen by the palliative care team. In total, patients received an average of 3.5 interventions and 4.1 documented outcomes. Most common interventions and outcomes: optimized symptom drug regimen (92.75%), education of patient/provider (90%) and change in med therapy implemented (90%), healthcare professionals educated (84.5%). There was a significant difference between patients seen by pharmacist VS palliative team for: consultation of pain (80.9% vs 39.4%, p<0.005). Comparison based on pharmacist visit time within 3 days of hospitalization VS 3 or more days after hospitalization: LOS (10 VS 25, p<0.005), LTC (3.79 VS 9.48, p<0.05), and CTD (6.1 VS 14.59, p<0.005).
Edwards, 2019 (UK)	Determine whether medicines consultations for patients with advanced cancer pain are feasible and acceptable.	Prospective, multicenter study. Patients with cancer received consultation regarding medication use from the pharmacist along with baseline and post consultation questionnaires.	Patients with advanced cancer pain between November 2015 and March 2017 aged 16 years or older, aware of their diagnosis, on a prescribed opioid, not on any anticipatory medicines for end-of-life care and with capacity to provide informed consent and complete questionnaires.	Provide medicine consultation and recommendations to the patients, identify drug-related problems and provide intervention	A mean of 2.5 drug-related problems per patient were identified, most commonly including effects of drug not optimal (n=25) and unclear problem/complaints (n=7). Lack of information (n=15) and non-adherence (n=16) were the main causes reported. Intervention provided for most of DRPs and their causes was patient counselling (n=35). The intervention has a positive impact on the mean pain score pre vs post consultation (4.1 vs 4.0).
Mancini, 2012 (US)	Describe the operational aspects of multidisciplinary supportive oncology clinic.	Prospective, multicenter study of pharmacist assessments as part of the clinic regarding drug interaction, duplication in therapy, lack of efficacy and untreated condition.	Oncology patients referred to the clinic for early palliative care based on National Comprehensive Cancer Network (NCCN) guidelines.	Prior to visit: evaluation of medication list; check for drug interaction; assess for duplication therapy; form a patient-friendly medication list On the day of visit: reviewing patient's medication containers; assess for drug interaction, adverse effects, adverse effects and untreated conditions; provide recommendations and consultation service After visit: provides recommendations to team regarding medication changes, provides updated medication list , fill out the assessment, providing consultation	The results of the assessment were reported as follows: (1) Access to medication: higher cost (53.5%), transportation issues (20%), lack healthcare access (32%), (2) adherence to medication: missing at least one dose (62.7%), (3) medication therapy review: most common problems were duplication of therapy (46.7%) for breakthrough of sleep (25.6%) and pain (20.5%), drug interaction (44%) with the majority due to warfarin (24.3%) and metoclopramide (21.6%), side effects (74.7%) with most common being constipation (27.9%), lack of efficiency of drugs (94.7%) mostly the drug used for pain (31.9%), and untreated conditions (73.3%) such as fatigue (25.5%) and constipation (12.7%). Positive feedback was acquired from the patient for involvement of a pharmacist in their pain management.
Naidu, 2018 (US)	Evaluate pharmacist-initiated interventions and validate the pharmacist's role on a transdisciplinary palliative care team at a community hospital.	Single center, retrospective analysis of medical records related to patient interactions with a palliative care pharmacist.	Patients who had a palliative care consult order and a pharmacist-generated clinical note in the medical record between November 1, 2013 and October 31, 2014.	(1) participate in palliative care team rounds three times each week; (2) contribute to management plan; (3) providing medication education to patients, families, and staff; (4) coordinating interventions for pharmacy-related issues with discharge planners and physicians; (5) participating in family meetings with physicians and other palliative care team members; (6) initiate and adjust opioid doses, including transitions from parenteral to oral agents, and participate in pain and dyspnea management for end of life care patients.	Pharmacist intervention resulted in reduction (4.6 to 2.0) of pain score in acute and chronic pain suffers (5.7 to 2.5 points). Patients with interventions for moderate to severe signs of symptoms showed improvement in their condition; nausea 42/44 (95.4%), dyspnea 82/92 (89%) and anxiety 39/45 (86%). Pharmacist participated in family meeting (n=142), completed a total of 58 advance care directories and forms. A considerable cost saving was observed through direct cost reduction of \$100,000 due to treatment discontinuation initiated by the palliative care pharmacist.
Ma, 2016 (US)	Evaluate pharmacist interventions and patient outcomes of a pharmacist-led outpatient palliative care practice.	Single-center, retrospective analysis of medical records conducted at cancer center with a transdisciplinary clinic with two pharmacists.	18 years or older, with a diagnosis of cancer between March 2011-2012.	(1) assess, initiate, stop, and or adjust therapy for the management of pain, nausea/vomiting, under physician direction, (2) optimize medication therapy, (3) compose clinical encounter and documented recommendations for therapy in the electronic medical record, (4) schedule follow-up visits to monitor symptoms and medication use.	Patients with severe pain (48%) showed gradual decrease in pain over the four visits. More patients (64%) were found in the stable pain state by the end of the four visits. Pain medication problems identified by the pharmacist included lack of efficacy, nausea, vomiting decreased with increase number of patient visits to the setting. Majority of patients (61%) were assigned a change in the opioid dosage as an intervention.
Pawlowska, 2015 (Poland)	To provide an overview of the current state of pharmacy practice at Polish residential hospices.	Cross-sectional survey with three types of questionnaires addressed to pharmacists, hospice directors and hospice physicians.	Pharmacists, hospice directors and hospice physicians at 93 residential hospices identified through a web database in 2012.	(1) providing advices on drugs and medical devices (75%) followed by various other responsibilities such as dispensing of drugs and medical devices, co-participation in therapy management, participating in rationalizing of drug therapy and monitoring adverse reactions, (2) participation in clinical trials and training hospice care staff, preparing sterile drug formulations, preparing enteral feeding solutions and compounding drugs, (3) advise members of the therapeutic team, providing opinions to physicians, advise on pharmacotherapy choices.	Ten (63%) pharmacists estimated their involvement in this service at a level of 100%. The hospice directors and physicians indicated the necessity for including the pharmacist within the therapeutic team more frequently than respondents employed at hospices where there was no pharmacist contribution (p=0.02480 and 0.003, respectively). There was no statistically significant difference between the opinions of in the three groups of respondents regarding the benefits associated with providing pharmaceutical services at a hospice except for better selection of drugs for individual patients was indicated more often by hospice pharmacists than hospice directors (p=0.03) and physicians (p=0.02). Majority of the opinions regarding benefits employing pharmacist in hospice care were; improved access, decrease cost of the pharmacotherapy, and proper drug storage.
Yamada, 2018 (Japan)	Evaluate the effect of continuous interventions for pain management and opioid-induced side effects in outpatients with cancer.	Single-center, prospective study. Four pharmacists interviewed patients from the first visit for opioid introduction to interventions via telephone to assess pain patterns, doses, side effects, and recommendation acceptance rates.	Outpatients administered opioid treatments for cancer pain relief and who received pharmacist interventions from October 2014 to March 2016.	(1) introduction to opioids at the first visit, (2) interventions through telephonic interviews between 3-7 days of first visit, (3) daily patient counseling, (4) training patient to assess pain intensity and pain response to analgesics, how to treat breakthrough pain using rescue doses, and how to prevent or treat side effects caused by analgesics, (5) increasing opioid doses or administering alternative opioids was recommended to the physicians in case of need for titration of analgesic preparation for pain control, (6) recommended adequate antiemetic or laxative drugs for symptom management	Pain intensity decreased gradually along with increase of visits (occasion) with the pharmacists. A significant change in the worst, average, and least pain scores at visits 2 and 3 compared with those at occasion 1 (p<0.001). Side effects scores showed a significant difference only between visit 1 and 3 (n=18, p=0.030). Pharmacist provided 48 new recommendations with an acceptance rate of 85.4%; maximum accepted (21/25) recommendations were change of dose (n=25) out of which (n=20) there were dose changes for opioids.
Ise, 2014 (Japan)	Examine the clinical, educational and research activities of pharmacist in a palliative care team, their perceived contribution to the team or why they don't contribute.	Multicenter, prospective study using questionnaires mailed to pharmacists in cancer hospitals across the country	Pharmacists working in the palliative care for cancer patients from November 2012 to January 2013.	(1) ward rounds, counselling patients, managing adverse drug effects, drug interactions, strategies for titration and rotation of drugs, provided information/suggestions about the efficacy, adverse effects, and interactions of drugs used to alleviate symptoms, informed the primary pharmacists about patient pharmacotherapy requests, (2) education and research activity of palliative care: organizing conferences, presenting research work.	Clinical activity provided by pharmacist were direct counselling of the patients regarding opioids (29%) and adverse effects due to opioids (13%). As a part of the palliative care team they provided suggestions to the team regarding managing adverse effects of opioids (35%), rotation of opioids (34%), pharmacology of opioids (34%), drug interaction of opioids (33%) and managing adverse effects of opioids (21%), pharmacological production of opioids (21%). Pharmacists are most commonly involved in providing suggestion to team's primary pharmacist sometimes (35%) and often/always (24%), 70% pharmacist agreed on some level of contribution to the palliative care team, 16% reported they could not contribute and main perceived reasons for no contribution were insufficient time (90%) and/or staff (68%).