

Original Article

Models of Palliative Care in Long-Term Care: An Integrative Review

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Abstract

Background: Integrating palliative care services in long-term care lag because of the lack of support and resources. The results are fragmented care coordination, unavailability of palliative and hospice care services in long-term care facilities, lack of advanced care planning, inefficient referral to hospice hospitals, and underutilization of palliative care services in long-term care facilities.

Objective: The aim of the review is to summarize available models of palliative care services in long-term care facilities.

Methods: A literature search was conducted in June 2018. The databases included were CINAHL complete, MEDLINE complete, PubMed, and PsychINFO.

Results: The search resulted in a total of 510 articles. Ten articles were included in the review. Three major categories identified about the models of palliative care in long-term care: palliative care based on setting, based on provider, and based on disease focused. Types of palliative care services include psychosocial services, care coordination, consultation, patient education, symptom management, spiritual support, and home visits. Most of the outcome reported in the included studies have been positive. However, the majority of the studies highlighted the lack of generalizability of the result because of various reasons such as inadequate sample, lack of statistical power, high attrition rate and poor methodology design.

Conclusion: There is no consistent evidence to support which model is effective. the findings of this review demonstrate the necessity for a robust research design to compare various palliative care models.

Keywords: palliative care, long-term care or nursing home or residential care or assisted living and models of care.

Introduction

Palliative care is specialized care that prevents and alleviates suffering by early identification, assessment of needs, and provision of treatment to address pain, physical symptoms, psychosocial problems, and spiritual distress. The aim of palliative care is providing quality of life for the patient and their families with advanced illness (World Health Organization, 2018). The beneficiaries of this service predominantly are patients who were diagnosed with cancer. However, healthcare providers recognize that this service can benefit patients with an advanced illness such as patients with advanced dementia,

late-stage congestive heart failure, and end-stage renal disease where treatments are no longer useful. Palliative care becomes an alternative option for a patient who wants emphasis on comfort and increasing their quality of life versus continuing with aggressive medical treatment and life-prolonging measures. Indeed, palliative care is such an essential service in caring for patients with advanced illness.

Palliative care service is offered initially within the hospital premises. The recognition to expand this service becomes apparent with the increasing number of patients who are transferred to long-term care. The word long-term care is often

associated with the nursing home. Nowadays, this is not the case. Long-term care refers to a continuum of medical and social services designed to support the needs of people living with chronic health problems that affect their ability to perform everyday activities (McCall, 2001). Long-term care constitutes community care (Home Health, Adult Day Care, Hospice), institutional care (Nursing Home, Supportive Housing), and informal care (Home-based care).

The increasing pressure on hospitals to reduce the length of stay of patients in the hospital drives the increase in the number of admission of patients in long-term care with advanced illness and patients who require end-of-life services. Long-term care such as the skilled nursing facilities are often not equipped to manage such complex individuals with advanced diseases because they lack the resources and trained health care professionals to meet such demands (Unroe et al., 2015).

The result is poor outcome which increases the chances of being re-hospitalized, which translates to an increase cost (O'Carey and Stefos, 2016). With this problem, there is an apparent need to integrate palliative care services in long-term care.

Integrating palliative care services in long-term care is behind because of the lack of support from government agencies in terms of reimbursement (Mor and Teno, 2016). When a patient with advanced illness is admitted in a skilled nursing facility, they don't get enrolled in palliative care services. Instead, they receive rehabilitative services under Medicare Part A.

This happens because the facility is not able to bill when patients are enrolled in palliative care, even if that is the services they needed. This is the same case with getting hospice services. There is a fragmented payment system and reimbursement of Medicare and Medicaid.

The lack of support results to fragmented care coordination, unavailability of palliative and hospice care services in long-term care facilities, lack of advanced care planning, inefficient referral to hospice hospitals, and underutilization of palliative care services in long-term care facilities (Mor and Teno, 2016). Thus, there is a need to address these challenges to improve access to palliative care services to enhance the quality of

care for patients with advanced illness. It is imperative to examine which model of care is capable of improving outcomes to drive policy change.

The aim of the review is to summarize available models of palliative care services in long-term care facilities. Specifically, the study would like to answer what are the available models of care delivering palliative care services in long-term care facilities?

Methods

A literature search was conducted in June 2018 about the current models of palliative care in long-term care in the United States. The databases included were CINAHL Complete, MEDLINE Complete, PubMed, and PsychINFO. The search terms include palliative care, long-term care or nursing home or residential care or assisted living and models of care. There is no limitation on the date of publication.

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
English language published in the US	Countries outside the US
Published peer-reviewed journals	Literature Reviews, Systematic Reviews, Policy Analysis, Discourse studies, Exploratory studies, Ethical analysis, Psychometric studies, conceptual paper, review protocol, case study, review protocol
Palliative care or end of life care or terminal care or dying	Hospice programs or model of care
Adult participants	Pediatrics, Perinatal
Settings: long-term care or nursing home or residential care or assisted living or home-based	Hospice, In-patient care units, Hospital, specialty units, i.e., neurology palliative unit, Hematology and ED, HIV care unit
	Symptoms, treatment management, clinical pathways

The studies were eligible if they met the inclusion criteria highlighted in Table 1. The search resulted

in a total of 510 articles. The retrieved items were managed in a Zotero file reference manager. The materials were then imported to Covidence for title/abstract screening, full-text review, and data extraction. Covidence is a systematic review management application.

The selection process is presented in a PRISMA (2009) flow diagram (Figure 1).

After 114 duplicates were removed, there were 396 studies included for evaluation, which resulted in 45 full-text studies assessed for eligibility. Reasons for exclusion are outlined in Figure 1. A total of ten articles met all the required criteria and included for data extraction.

The data extraction process was tabulated in the characteristics of studies included in Appendix A which include data on the following items: study objective, location, sample characteristics, clinical characteristics, research design, service provider, types of palliative care services, a measure of outcomes, and study results.

The methodological quality of included studies was assessed using the Bowling (2009) appraisal criteria for quantitative studies and the Pearson (2004) critical appraisal for quantitative studies. The Bowling (2009) tool has 20-item measures which have a pre-determined score to rate each study. However, the researcher revised the scoring system into a yes or no items to determine the type of bias, whether it is a high or low risk. The Pearson (2004) critical appraisal tool has a 9-item questionnaire answerable by yes or no. to evaluate qualitative studies.

Data synthesis and analysis initially starts by reading the full-text to have an overall perspective of the study. A second reading to identify patterns and universal themes. A third reading to determine details with the other studies was done. The process is iterative; the researcher comes back and forth to the original articles to verify and categorize themes.

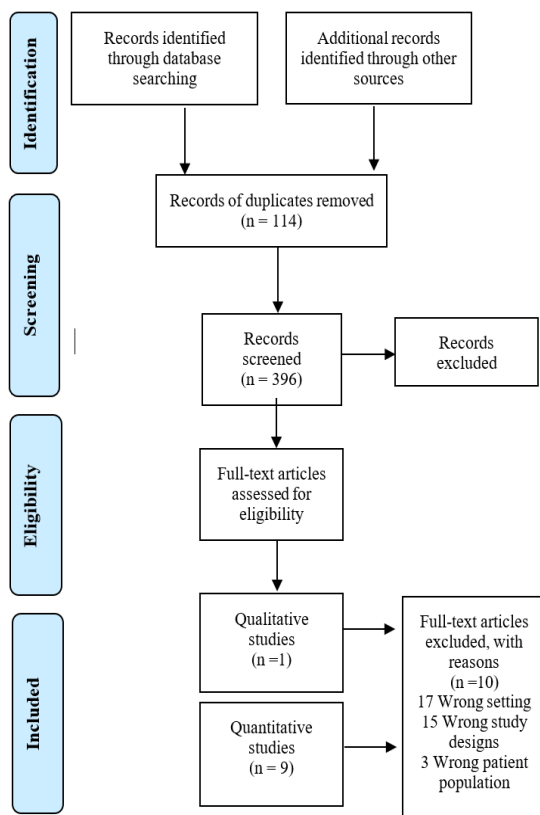
Results

There are ten total articles included in the review. The included studies are very heterogeneous in design, setting, sample characteristics, clinical characteristics, types of palliative care services provided, and outcome measures. Appendix A contains a summary of the features of the included studies.

Types of studies, settings, and samples

There are nine total quantitative studies with various research designs, such as a cohort study, causal-comparative research, a randomized control trial, and a descriptive study. There is one qualitative research included using the grounded theory method. Majority of the study location is conducted in the east coast region of the United States. The average number of samples in the reviews is 181, with a median of 119. The majority are older adults with a mean age of 74. Participants are predominantly female (58%) and White or Caucasian (73%). The common diagnoses identified in the studies include cancer, congestive heart failure, chronic obstructive pulmonary disease, and dementia. Other diagnoses identified include failure to thrive, hypertension, hypothyroidism, osteoarthritis, and depression.

Figure 1. PRISMA Diagram



Study findings by category of palliative care model

There are three significant categories identified in the models of palliative care in a long-term care setting: palliative care based on setting, palliative care based on provider, and palliative care based on disease-focused.

Palliative Care Model Based on Settings

There are five models of palliative care based on the setting where the service is provided: home-based, nursing home, outpatient clinics, assisted living facility, and web-based delivery.

Palliative Care Model Based on Provider

There are two significant sub-categories based on the provider: individual provider and interdisciplinary team. The individual provider consists of nurse-led, the nurse practitioner-led, and the physician-led model. The nurse-led model is headed by a professional registered nurse appointed to manage and coordinate care.

The nurse practitioner-led model provides palliative care services and referral to other provider and hospice programs. The physician-led model can be a primary care provider or a palliative service provider who works with the physician assistant to deliver the services needed by the patient.

The interdisciplinary team model consists of various providers such as a physician, nurses, nurse practitioner, social worker, chaplain, dietitian, psychologist, psychiatrist, and palliative care specialist. The interdisciplinary team model may involve two provider or multiple providers having one common goal for the patients or numerous varied purposes in providing palliative care services.

Palliative Care Model Based on Disease

There are three models identified based on the type of disease where palliative care is provided. The disease-specific model provides palliative care services for a group of patients with the same diagnosis, for example, hepatic carcinoma. This model cohort patient and tailor the palliative care needs to be based on the symptoms associated with the disease.

The multiple advanced illness models treat a patient suffering from conditions such as congestive heart failure, chronic obstructive pulmonary disease, cancer, and dementia. This model is the most common model applied in a variety of setting from home-based, outpatient, and nursing home. The last model is the chronic disease-based model. This model is directed towards providing palliative care services to a patient suffering from hypertension, osteoarthritis, hypothyroidism, depression, and dementia. This model has been adapted in residents living in an assisted living facility.

Types of Palliative Care Services and Outcome Measure

The included studies have various types of palliative care services provided in long-term care. Examples of palliative care services include psychosocial services, care coordination, consultation, patient education, symptom management, spiritual support, home visits, and others.

Furthermore, there are various outcome measures identified in the literature to determine the impact of palliative care services on the patient. Examples include quality of life, symptom control, hospitalization rate, level of satisfaction, level of stress and distress, advance care planning, place of death, economic benefit, and medical service use.

Study findings by Outcome of the Studies

Most of the outcome reported in the included studies have been positive. Studies have noted positive symptom control, increased level of satisfaction, decrease hospitalization, decrease cost, increase change in advance directives, increase number died with hospice services, improve quality of life, and reduction of stress level.

Adverse outcomes reported in the studies are the following: no significant difference in adherence to palliative care recommendations on a patient after palliative care consultation and several methodology challenges in conducting the study about the models of palliative care.

Critical Appraisal of Studies

Nine studies were evaluated using the Bowling (2009) essential criteria of an appraisal. Majority of the reviews highlighted the lack of

generalizability of the result because of various reasons such as inadequate sample, lack of statistical power, high attrition rate, and poor methodology design. Several studies have not reported the types of error and lack adequate analysis to draw a conclusion.

There are some concerns about ethical issues and lack of pilot studies prior to the research was not reported.

Table 2. Critical Appraisal of Qualitative Studies

Bowling 2009 Appraisal Criteria	Yes	No
Aim and objective	9	0
Research questions	8	1
Variables stated	8	1
Variables clear	8	1
Design	8	1
Method appropriate	8	1
Instruments tested	6	3
Sample described	8	1
Error	2	7
Ethics	5	4
Piloted	2	7
Analysis is adequate	5	4
Results clear	7	2
Hypotheses discussed	6	3
Limitations	9	0
Conclusions	9	0
Generalizability	1	8
Implications	7	2
Conflict	7	2
Accessible data	8	1

The qualitative research evaluated using Pearson (2004) met most of the criteria, which mean there is a low risk of bias for the result.

Table 3. Critical Appraisal of Qualitative Study

Pearson (2004) Critical Appraisal	Deitrick 2011
Congruity between the research methodology and the research questions or objectives	1
Congruity between the research methodology and the methods used to collect data	1
Congruity between the research methodology and the representation and analysis of data	1
Congruity between the research methodology and the interpretation of results	1
There is a statement locating the researcher culturally or theoretically	0
The influence of the researcher on the research, and vice-versa is addressed	0
Participants and their voices are adequately represented.	1
Ethical research according to current criteria or evidence of ethical approval by an appropriate body	1
Conclusions drawn in the research report appear to flow from the analysis or interpretation of the data	1

Discussion

In this review, the study investigated the models of care used in delivering palliative care services in long-term care in the United States. The result showed there are three significant models of palliative care: palliative care model based on settings, based on provider, and based on disease-focused. It is noteworthy to mention that although this model can be categorized differently. No models can stand alone. Instead, each model is integrated with one or another.

Discussion about the palliative care models

The most common setting where palliative care service is delivered in a long-term care setting is home-based and nursing home. There is a growing number of outpatient clinics that provides palliative care services in the community (Bull et al., 2012). However, there is still a shortage of studies about the effectiveness of this type of model.

Interestingly, innovative models such as web-based setting are gaining public interest, especially for individuals who have access to the internet and those who have high computer literacy (Steel et al., 2016). The primary driver for the web-based model is to expand public access to palliative care services. A closer look at the models based on provider shows that a multidisciplinary approach is widely recognized as the preferred approach compared to the individual provider because the multidisciplinary model fosters collaboration from various discipline to provide patient-centered care. Moreover, disease-focused model (Steel et al., 2016) and chronic disease model (Jerant et al., 2006) are both gaining interest to a provider who wants to cohort patients receiving palliative care even though there is a lack of evidence to support this model. Finally, given the variety of models presented, there is minimal information about which models are proven effective or successful.

Discussion about study characteristics

The review found that there is a limited number of studies that examined palliative care models in long-term settings. Furthermore, most studies have been done in the east coast region of the United States. This regional pattern is consistent with another review about the growth of palliative care in US hospitals that was conducted which showed that the highest palliative care concentration is in the East coast particularly in New England region (Dumanovsky et al., 2016). Thus, there is a poor geographical representation of studies. With regards to participant characteristics, the reviews are mostly represented by Whites or Caucasian race. There is a disparity in terms of representation of the other racial groups like Blacks, Hispanics, and Asians.

Discussion about the diagnosis, types of services, measures of outcomes

Cancer is the most common diagnosis in which a patient is enrolled in palliative care services literacy (Brumley et al., 2003; Steel, 2016; Morris and Galicia-Castillo, 2017). Health care providers have started to acknowledge advanced illnesses such as Dementia, chronic obstructive pulmonary, and heart failure as diseases that would greatly benefit patients; there is still a need for data to support how palliative care services impacts patients with advanced illness in terms of quality

of life, rehospitalization, and cost. With regards to the type of palliative care services, psychosocial services, care coordination, consultation, and patient education are the top services provided by health and social care provider (Hodgson et al., 2006; Pouliot et al., 2017). The results are very interesting since the researcher expects symptom management and control to receive the highest number of services when caring for palliative care patients. It would be interesting to compare the type of services provided in the hospital-based units palliative care if the services would emphasize symptom management rather than psychosocial services. The emphasis on the need to receive psychosocial services in the community is significant. This finding can be useful in developing innovative, palliative care models. If indeed psychosocial service is a top priority for patients in the community, there might be a need to create models of care led by a social worker, psychologist, counselor, spiritual care provider, and mental health nurses. With this finding, there is a need to create and develop a need-based psychosocial model rather than a disease-based model.

Majority of the study used a valid and reliable instrument tested to measure outcomes. Outcome measurement has been variable and very difficult to compare from one study to another study. Quality of life remains the highest indicator when measuring the result of palliative care services in long-term care. Symptom control, hospitalization rate, and level of satisfaction indicators are important measures mentioned.

There is only one study that conducted a cost-benefit analysis of the model (Bull, 2012). Studies that analyze the economic benefit is necessary to drive change in the policy. Reviews mentioned that funding had been noted as one of the primary reasons the palliative models of care are not successfully implemented (Bookbinder et al., 2011). It is partly driven by the Center for Medicare and Medicaid Services (CMS) reimbursement of hospice services based at home and not on palliative care services. There are no incentives for palliative care services provided at the community level. Thus, economic benefit indicator must be given attention in measuring the outcome of palliative care model.

Discussion about results and rigor of studies

Most of the studies reported a positive effect which includes the control in symptoms, increase level of satisfaction, decrease hospitalization, decrease cost, increase the change in advance directives, increase the number of patients who die with advance directives, and improve quality of life. Majority of the study did not report the negative outcome of the investigation.

However, one study indicated that the model did not make any significant difference in terms of adherence with palliative care recommendation (Jerant et al., 2006). The inadequate rigor of studies has been attributed to the challenges encountered in conducting an interventional study (Temkin-Greener et al., 2017). The absence of adverse outcome reports poses a high risk of bias. The result of the critical appraisal showed that although studies provided us with positive results. The generalizability of these results is a problem because studies lack the power, design, and rigor to generalize the findings.

The dearth of studies, poor reporting of negative results, inadequate analysis, and lack of generalizability are the challenges associated with finding the most effective palliative care model in long-term care.

Future research studies

With the numerous problems identified in the discussion from lack of reviews, non-randomized sampling, lack of population representation, inadequate research design, and issues of result generalizability. There is an array of future research studies needed. The following are some of the identified areas of research based on the findings of this review. First, an investigation that focuses on other racial groups Blacks, Hispanics, Asian Americans are welcomed. Second, a systematic review of the models of palliative care in long-term care outside the United States would be interesting to compare with the United States model. Third, large-scale representative surveys to the nursing home administrator about the types of palliative care model used in a nursing home across regions are also recommended to provide an overview of the geographical representation and to determine the number of nursing home that does not have palliative care services in their facility.

Fourth, cost analysis study would be beneficial to look at the economic benefit of palliative care. Fifth, a comparative study between different models of care is still needed. Lastly, psychosocial focused palliative care modeled by the mental health provider is recommended.

Conclusion

There are three major palliative care models identified in long-term care: Palliative care model based on settings, based on provider, and based on disease-focused. There is no consistent evidence to support which model is effective. Although the majority reported positive results in symptom control, quality of life, re-hospitalization rate, and significant cost weakness was found in the generalizability of the results. More data is needed to confirm the economic benefit of the models of palliative care in a long-term setting. In conclusion, the findings of this review demonstrate the necessity for a robust research design to compare various palliative care models.

Reference

- Bookbinder, M., Glajchen, M., McHugh, M., Higgins, P., Budis, J., Solomon, N., ... Portenoy, R. K. (2011). Nurse practitioner-based models of specialist palliative care at home: sustainability and evaluation of feasibility. *Journal of Pain and Symptom Management, 41*(1), 25–34.
- Brumley, R. D., Enguidanos, S., & Cherin, D. A. (2003). Effectiveness of a home-based palliative care program for end-of-life. *Journal of Palliative Medicine, 6*(5), 715–724.
- Bull, J. H., Whitten, E., Morris, J., Hooper, R. N., Wheeler, J. L., Kamal, A., & Abernethy, A. P. (2012). Demonstration of a sustainable community-based model of care across the palliative care continuum. *Journal of Pain and Symptom Management, 44*(6), 797–809.
- Deitrick, L. M., Rockwell, E. H., Gratz, N., Davidson, C., Lukas, L., Stevens, D., ... Sikora, B. (2011). Delivering specialized palliative care in the community: a new role for nurse practitioners. *ANS. Advances in Nursing Science, 34*(4), E23-36.
- Dumanovsky, T., Augustin, R., Rogers, M., Lettang, K., Meier, D. E., & Morrison, R. S. (2016). The Growth of Palliative Care in U.S. Hospitals: A Status Report. *Journal Of Palliative Medicine, 19*(1), 8-15.
- Hodgson, N., Landsberg, L., Lehning, A., & Kleban, M. (2006). Palliative care services in Pennsylvania nursing homes. *Journal Of Palliative Medicine, 9*(5), 1054–1058.

- Jerant AF, Azari RS, Nesbitt TS, Edwards-Goodbee A, & Meyers FJ. (2006). The palliative care in assisted living (PCAL) pilot study: successes, shortfalls, and methodological implications. *Social Science & Medicine*, 62(1), 199–207.
- McCall, N. (2001). *Who will pay for long-term care? Insights from the partnerships program 1st edition*. Health Administration Pr. USA
- Mor, V., & Teno, J. M. (2016). Regulating and paying for hospice and palliative care reflections on the Medicare hospice benefit. *Journal of Health Politics, Policy & Law*, 41(4), 697-716.
- Morris, D. A., & Galicia-Castillo, M. (2017). Caring About Residents' Experiences and Symptoms (CARES) Program: A Model of Palliative Care Consultation in the Nursing Home. *American Journal of Hospice & Palliative Medicine*, 34(5), 466–469.
- O' Carey, K., & Stefos, T. (2016). The cost of hospital readmissions: evidence from the VA. *Health Care Management Science*, 19(3), 241-248.
- Pouliot, K., Weisse, C. S., Pratt, D. S., & DiSorbo, P. (2017). First-Year Analysis of a New, Home-Based Palliative Care Program Offered Jointly by a Community Hospital and Local Visiting Nurse Service. *American Journal of Hospice & Palliative Medicine*, 34(2), 166–172.
- Steel, J. L., Geller, D. A., Kim, K. H., Butterfield, L. H., Spring, M., Grady, J., ... Tsung, A. (2016). Web-based collaborative care intervention to manage cancer-related symptoms in the palliative care setting. *Cancer*, 122(8), 1270–1282.
- Temkin-Greener, H., Ladwig, S., Ye, Z., Norton, S. A., & Mukamel, D. B. (2017). Improving palliative care through teamwork (IMPACTT) in nursing homes: Study design and baseline findings. *Contemporary Clinical Trials*, 56, 1–8.
- Unroe, K. T., Cagle, J. G., Lane, K. A., Callahan, C. M., & Miller, S. C. (2015). Nursing home staff palliative care knowledge and practices: Results of a large survey of frontline workers. *Journal of Pain & Symptom Management*, 50(5), 622-629.
- World Health Organization. (2018). *WHO definition of palliative care*. Retrieved from <http://www.who.int/cancer/palliative/definition/en/>

Appendix A

Search Strategy

CINAHL Complete

(MM "Palliative Care") AND (long-term care or nursing home or residential care or assisted living) AND models of care

Medline Complete

(MH "Palliative Care") AND (long-term care or nursing home or residential care or assisted living) AND models of care

PsychINFO

MM "Palliative Care" AND (long-term care or nursing home or residential care or assisted living) AND models of care

PubMed

("Palliative Care"[Mesh] AND (("long-term care"[MeSH Terms] OR ("long-term"[All Fields] AND "care"[All Fields]) OR "long-term care"[All Fields] OR ("long"[All Fields] AND "term"[All Fields] AND "care"[All Fields]) OR "long term care"[All Fields]) OR ("nursing homes"[MeSH Terms] OR ("nursing"[All Fields] AND "homes"[All Fields]) OR "nursing homes"[All Fields] OR ("nursing"[All Fields] AND "home"[All Fields]) OR "nursing home"[All Fields]) OR (residential[All Fields] AND care[All Fields]) OR (assisted[All Fields] AND ("life"[MeSH Terms] OR "life"[All Fields] OR "living"[All Fields]))) AND (("Model Driven Eng Lang Syst"[Journal] OR "models"[All Fields]) AND care[All Fields]) AND ("humans"[MeSH Terms] AND English[lang])

Limiters: English language, Human

Appendix B

Characteristics of Included Studies Table

<i>Study</i>	<i>Study objective</i>	<i>Setting and Location</i>	<i>Sample and Characteristics</i>	<i>Clinical Characteristics</i>	<i>Research Design</i>	<i>Provider and Disease-Focused</i>	<i>Types of Services</i>	<i>Outcome Measures</i>	<i>Results</i>
Brumley 2003	To evaluate the effectiveness of a palliative program for end-of-life care	Home-based; California	N=300 Mean age= 70; White= 65.6 %; Female= 50.9%	CHF= 19.3; COPD= 14.9; Cancer= 60.9	Cohort Study	Interdisciplinary Team; Advanced Illness Model	Psychosocial services Care coordination Consultation Patient Education Symptom management	Medical service use and satisfaction of services	Positive: Increased satisfaction, significantly fewer ED visits, Hospital days, 45% decrease in costs
Steel 2016	To examine the efficacy of a collaborative care intervention in reducing depression, pain, fatigue and improve QOL	Web-based; Pennsylvania	N=261 Mean age= 61; Male= 73%; Caucasian= 86%	Hepatocellular carcinoma and Cholangiocarcinoma= 64%	RCT	Collaborative Care; Disease-Specific Model	psychoeducation, cognitive behavioral therapy	Depression, Pain, Fatigue, QOL, caregiver stress and depression	Positive: Decrease in depression, pain, fatigue. Improvement in QOL. Reduction in caregiver stress and depression
Morris 2017	To describe the CARES program, a model of palliative care for nursing home residents	Nursing Home; Virginia	N=179 Mean age= 75; African American 45%; Female 61%	Failure to Thrive 26%; Cancer 15%, Dementia 39%	Descriptive study	Collaborative Care; Advanced Illness Model	Education, PC consultation, Spiritual support	Symptom burden, Treatment plans, Goals of care and end of life, Hospitalizations	Positive: 67% change in code status, 90% were not hospitalized, 53% died with hospice services

Hodgson 2006	To describe existing palliative care services within nursing homes in Pennsylvania, and to classify these services by level of care delivery	Nursing Home; Pennsylvania	N=91 Urban setting= 75.8%; Small size facility= 57.1%; Large 42.9%; Non-profit 67.8%	Not applicable	Causal-Comparative Study	Interdisciplinary Team; Not applicable	Home visits Spiritual support Symptom management	Not applicable	Urban facilities were more likely to provide palliative care services; Rural facilities need for training for pain management
Bull 2012	To explore organizational and financial barriers to the sustainability of palliative care	Outpatient Clinics; North Carolina	N=620 Not mentioned	Not applicable	Descriptive study	Medical led; Not applicable	Consultation Care coordination Home visits Psychosocial services	Quality, Growth, People, Compliance, Finance	Positive: Increased palliative care patients per day, 40% decrease in financial loss
Jerant 2006	To report findings of the Palliative Care in Assisted Living (PCAL) pilot study successes, shortfalls and methodological implications	Assisted Living Facility; California	N=81 Mean age= 85; Female- 43%; Caucasian 93%	HTN= 60%; OA= 36%; Hypothyroidism =29%; Depression=29 %; Dementia= 22%	Cohort Study	Interdisciplinary Team; Chronic Disease Based Model	Consultation	SF-36 Physical (PCS) and Mental (MCS) component scores and recommendation adherence	Negative: No significant differences in recommendation adherence, No significant change in PCS and MCS scores
Temkin-Greener 2017	To describe the design, rationale, and challenges if a two-arm RCT of nursing home-based integrated palliative care teams in 31 facilities	Nursing Home; New York	N=31 Number of Beds Mean= 178; For-profit= 30%; Medicare resident= 8%; Medicaid residents= 61%	Not applicable	RCT	Interdisciplinary Team; Not applicable	Staff Development	Quality indicators: place of death, number of hospitalizations, self-reported pain and depression, staff satisfaction, impact on care processes	Negative: Several challenges were encountered in conducting an interventional study

Bookbinder 2011	To evaluate the financial sustainability and feasibility of two NP-based models in an urban setting	Home-based; New York	N=114 Mean age= 79.6; Female= 75%; White 47.2%	CHF= 23%; Dementia= 17%; Cancer= 15%; COPD= 14%	Causal-Comparative Study	Collaborative Care; Advanced Illness Model	Symptom management Care coordination Psychosocial services	Symptom prevalence and distress, advance care planning, QOL, Hospitalizations	Positive: Significant decline in symptom distress, 100% compliance with advance care planning, 21% admission rate to hospice
Deitrick 2011	To explore the role of NP-providers in a specialized palliative medicine house call service	Home-based; Pennsylvania	N=6 Oacis NPs= 3; Oacis program staff (Medical director, Clinical coordinator) =3	Not applicable	Grounded theory	Nurse Practitioner-led; Not applicable	Symptom management Care coordination Psychosocial services Home visits Patient Education	Not applicable	Care management, medical management, psychosocial support, education, Housecalls
Pouliot 2017	To evaluate the effectiveness of Care Choices, a new in-home palliative care program provided by the Visiting Nurse Services of Northeastern New York and Ellis Medicine's community hospital serving New York's Capital District	Home-based; New York	N=123 Women= 60%; Men =40%	Circulatory system= 27%; cancer and neoplasms= 23%; respiratory system= 17%;	Cohort Study	Nurse-led; Advanced Illness Model	Symptom management Care coordination Psychosocial services Home visits Patient Education	Patient satisfaction with care choices, Quality of Life, Hospitalization Records	Positive: 72.7% Highly satisfied patients, stable symptom management, fewer ED visits and inpatient hospital admissions

Appendix C

Critical Appraisal Table: Quantitative Studies

Bowling 2009 Appraisal Criteria	Brumley 2003	Steel 2016	Morris 2017	Hodgson 2006	Bull 2012	Jerant 2006	Temkin-Greener 2017	Bookbinder 2011	Pouliot 2017	Yes	No
Aim and objective	1	1	1	1	1	1	1	1	1	9	0
Research questions	1	1	1	0	1	1	1	1	1	8	1
Variables stated	1	1	1	0	1	1	1	1	1	8	1
Variables clear	1	1	1	0	1	1	1	1	1	8	1
Design	1	1	1	0	1	1	1	1	1	8	1
Method appropriate	1	1	1	0	1	1	1	1	1	8	1
Instruments tested	1	1	0	0	0	1	1	1	1	6	3
Sampe described	1	1	1	1	0	1	1	1	1	8	1
Error	1	0	0	0	0	1	0	0	0	2	7
Ethics	1	1	1	1	0	0	0	1	0	5	4
Piloted	0	0	0	1	0	1	0	0	0	2	7
Analysis adequate	1	1	0	0	0	1	0	1	1	5	4
Results clear	1	1	1	0	1	1	0	1	1	7	2
Hypotheses discussed	1	1	0	0	0	1	1	1	1	6	3
Limitations	1	1	1	1	1	1	1	1	1	9	0
Conclusions	1	1	1	1	1	1	1	1	1	9	0
Generalizability	0	1	0	0	0	0	0	0	0	1	8
Implications	1	1	1	0	1	1	0	1	1	7	2
Conflict	0	1	1	1	1	0	1	1	1	7	2
Accessible data	1	1	1	1	1	1	0	1	1	8	1

Appendix D: Critical Appraisal Table: Qualitative Studies

Pearson (2004) Critical Appraisal	Deitrick 2011
Congruity between the research methodology and the research questions or objectives	1
Congruity between the research methodology and the methods used to collect data	1
Congruity between the research methodology and the representation and analysis of data	1
Congruity between the research methodology and the interpretation of results	1
There is a statement locating the researcher culturally or theoretically	0
The influence of the researcher on the research, and vice-versa is addressed	0
Participants and their voices are adequately represented.	1
Ethical research according to current criteria or evidence of ethical approval by an appropriate body	1
Conclusions drawn in the research report appear to flow from the analysis or interpretation of the data	1

Appendix E: Participant Characteristics Table

Characteristics	n	%
Type of Studies		
Quantitative Studies	9	
Cohort Study	3	
Causal-Comparative Study	2	
Randomized Control Trial	2	
Descriptive Study	2	
Qualitative Studies	1	
Grounded Theory	1	
US location		
New York	3	
Pennsylvania	3	
California	2	
North Carolina	1	
Virginia	1	
Demographic		
Sample Sizes, mean (median)	180.6 (118.5)	
Age, mean	74.2	
Female		58%
White or Caucasian		73%