Review Article

Outcome measures in palliative care training interventions: a systematic review of trial-based studies

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Background: The ability of health care clinicians to offer a palliative approach to care to their patients with progressive, life-limiting illness has become critical as demand for these services increases. Numerous training initiatives exist to assist clinicians who are not palliative care specialists in the development of palliative care skills, however there is little consensus on how to best measure the effectiveness of these education programs. We conducted a systematic review of palliative care training intervention trials to examine the outcomes measures used.

Methods: We searched MEDLINE, CINAHL, PsycINFO, Embase, HealthSTAR, and five trial registries for studies and protocols published since 2000. Eligible studies were trials assessing palliative care training for clinicians. Interventions had to address at least two of six palliative care-related domains, based on the National Consensus Project: identification or assessment; illness understanding; symptom management; decision making (e.g., advance care planning); coping (patient and caregivers); and referral (coordination/care planning). Each article was reviewed independently by a minimum of two reviewers for inclusion and extraction of relevant data.

Results: Of 1,383 articles reviewed, 36 studies met the inclusion criteria, 16 (44%) of which focused on palliative care communication skills. Among all the trials, 190 different measures were reported. Only 11 validated measures were used in at least 2 studies, including the End-of-Life Professional Caregiver Survey (EPCS) for clinicians and the Quality of Dying and Death Questionnaire (QODD) for caregivers. Clinician and patient/caregiver reported outcomes were measured in 75% and 42% of studies, respectively. Half of the trials employed a study-created questionnaire. Data from administrative (n=14) and/or qualitative (n=7) sources were also used. Nine studies, almost exclusively those with a communication skills focus, assessed clinician interactions as an outcome.

Conclusions: We found considerable diversity in outcomes among the trials reviewed. Further examination of the outcomes used in the broader literature and development of these measures is needed. This will assist towards establishing meaningful and consistent metrics for assessing the impact of palliative care education, to inform evidence-based scaling of effective programs.

Keywords: Palliative care; outcome and process assessment; education; health personnel; training programs

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Introduction

There is growing consensus among health care clinicians and researchers that palliative care should be integrated earlier in the serious illness trajectory (1-3) and that this can be facilitated by generalist clinicians providing primary palliative care to their patients (4,5). Many local and national training programs have been initiated to help develop these skills among primary care physicians, nurses, and non-palliative care specialists (6-10). A systematic review by Brighton *et al.* in 2017 which evaluated studies of end-of-life care communication skills training, found 153 unique training interventions (11). We recently completed a systematic review that reported on the effectiveness of 22 palliative care education programs that had been evaluated in controlled trials (10). We identified five main outcome themes: palliative care awareness, palliative care delivery, communication, well-being, and care processes, with most studies reporting a significant positive impact in at least one outcome. However, no reviews have gone in depth about the outcome measures used in the assessment of palliative care education interventions (8,10-15).

Several reviews have examined measures used to assess the impact of specialized palliative care, such as in advanced cancer care, on patient outcomes (16-23). A compilation by Teno *et al.* in 2005 of measures deemed pertinent to end-of-life care identified nearly 300 instruments (24). This list was expanded upon in a 2007 systematic review which found an additional 64 measures of specialized end-of-life care (18). The measures cited largely consist of patient or family reported outcomes, including satisfaction with care, quality of life, extent of pain and symptoms, functionality, and health care use. Place of care/death and health care costs were also commonly used system-level outcomes for evaluating palliative care program effectiveness (25). Nonetheless, outcomes for assessing the effectiveness of palliative care programs tend to be different and further downstream from outcomes relevant to evaluating the effectiveness of education interventions on health care clinicians. Medical training is intended to promote the uptake of knowledge and a change in practice by clinicians. This purpose needs to be reflected in the assessment measures. To our knowledge, no current reviews specifically examine outcome measures used in palliative care education interventions delivered to interprofessional clinicians.

We completed a systematic review of controlled trials and protocols of palliative care education interventions for interprofessional health care clinicians to address this gap in knowledge. Our objective was to examine the outcome measures evaluated across these studies to identify common measures or themes that may inform future high-level studies of palliative care training interventions. We present the following article in accordance with the PRISMA reporting checklist for systematic reviews (26) (available at https://apm.amegroups.com/article/view/10.21037/apm-22-947/rc).

Highlight box

Key findings

- Our review identified 36 trials of palliative care training programs.
- Among these studies 190 different measures were reported. Eleven validated measures were used in two or more trials.

What is known and what is new?

- Many palliative care training initiatives exist, however there remains little consensus on how to best measure the effectiveness of these education programs.
- We examined the outcome measures used across trials to identify common measures that may inform future high-level studies of palliative care training interventions.

What is the implication, and what should change now?

- We found little commonality among the measures employed and many of the trials did not assess actual behavior change or its impact.
- We provide recommendations for evaluating palliative care training interventions and for further research in its measurement.

Methods

Review aims

We completed a systematic literature review to find and describe outcome measurements used in trial studies and protocols of palliative care training interventions. We completed our review in spring 2022. Our goal was to find palliative care training initiatives for health care professionals and compare the measures used. The protocol for this systematic review was registered with PROSPERO (reg CRD42022271741), as part of a larger review.

Search strategy

We searched seven bibliographic databases: MEDLINE, CINAHL (Cumulative Index to Nursing & Allied Health Literature), Embase, PsycINFO, HealthSTAR, the Cochrane Database of Systematic Reviews and Clinical Trials and, the Web of Science (Arts & Humanities Citation Index;

Science Citation Index Expanded, Social Sciences Citation Index, Conference Proceedings Citation Indices). We also searched the following five trial registries: ClinicalTrials.gov, EU Clinical Trials Register, Australian New Zealand Clinical Trials Registry (ANZCTR), International Standard Registered Clinical/Social Study Number Registry (ISRCTN), and International Clinical Trials Registry Platform (ICTRP). We searched for English language studies published from 2000 to February 2022 (though training could occur in languages other than English).

We used the following subject headings and related terms in our search: Palliative Care (including end of life, terminal care, etc.); Health Personnel (including clinician, medical staff, etc.); Health Knowledge, Attitudes, Practice (including skill, experience, etc.); and Education/Training combined with the "AND" Boolean operator. We included search strategies (hedges) for choosing Trials or Reviews in the search algorithm to identify these studies (for the full search strategy, refer to Appendix 1) (27). We also searched through the reference lists of all original study articles and reviews found. The trial registration numbers of all registered or published study protocols identified were searched using Google Scholar to identify any related publications, i.e., published protocol or completed study.

Inclusion and exclusion criteria

Eligible studies were either a randomised controlled trial or a quasi-experimental study (i.e., had a control group) that had been registered with a trial registry. We included completed published studies, published protocols, and trial registries of research analyzing the effect of palliative care training for generalist clinicians. The intervention population could include members of any health care profession who can provide primary palliative care (excluding palliative care specialists), including health care students and postgraduate medical students, working in any setting. We defined palliative care as care of any serious illness requiring palliation or hospice care that cause a decline in health, resulting in death (10,28). We defined training as an in-person or online intervention, consisting of interactive instruction (10,29). The focus of this education could range from teaching early palliative care to that at end of life. Additionally, to meet the criteria of teaching a palliative approach to care, the intervention needed to address at least two of the following palliative care components: assessment/identification (early identification of those who may benefit from a palliative approach to care and/or comprehensive assessment of their needs); illness understanding; decision making (such as advance care planning); symptom management; coping (assessing the ability of the caregiver and/or family to cope); and referral (such as care planning and/or coordinating with specialists). These components were derived from Jacobsen *et al.* (30). guidelines for outpatient palliative care, originally described by the National Consensus Project for Quality Palliative Care (31). We excluded studies of pediatric palliative care interventions, those without an interactive piece, and those based solely on educating patients or family caregivers.

Selection process

We used the Rayyan collaborative review platform to manage title, abstract, and full text screening (32). A minimum of two reviewers from the research team completed screening independently and in duplicate. All articles potentially meeting the inclusion criteria at the title/abstract stages advanced to the next screening stage. At the full text screening stage, we resolved disagreements through discussion in the research team.

Data extraction and analysis

We extracted data using a standardised template with specified fields, including study design, data sources, measurement intervals, and specific measures. Two reviewers (VCB and DBB) independently extracted data from included study publications and then consolidated findings; differences were resolved through joint review and discussion. We reported all study measures listed in all publications of included studies. Measures identified were grouped by theme to describe and compare these outcomes across the studies. We also identified "commonly" used measures, defined as being used by two or more studies (18). In our previous systematic review, we assessed the risk of bias of the published, completed trials using the Cochrane Risk of Bias 2 tool (RoB 2) or the ROBINS-I tool (Risk of Bias In Non-randomized Studies) (10).

Kirkpatrick Training Evaluation Model

The Kirkpatrick Training Evaluation Model describes four levels of evidence for measuring the effectiveness of an intervention based on four levels of impact: reaction (i.e., satisfaction with the training), learning, behavior, and results (i.e., effect of behavior change) (33). This model is

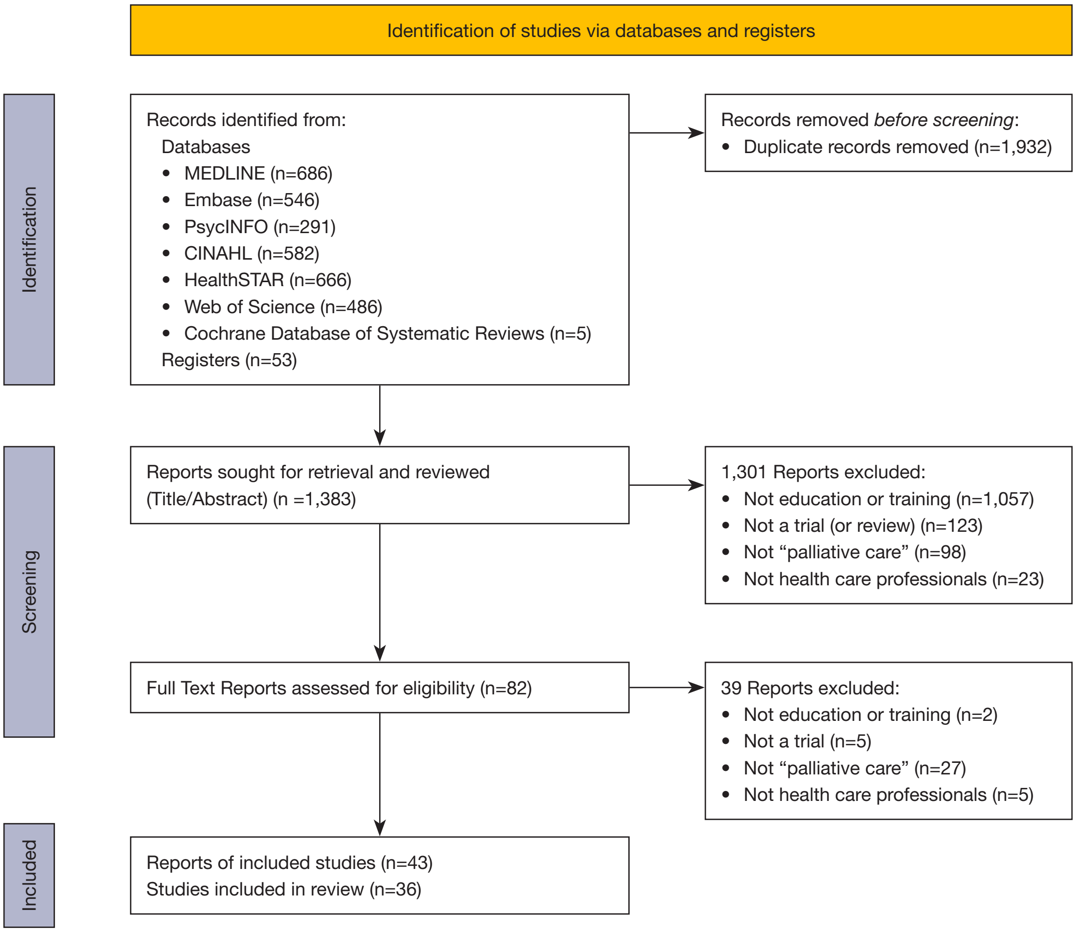

Figure 1 PRISMA study search strategy flow diagram.

an internationally recognized framework for assessing the outcomes of educational programs (34). We classified the outcomes in each study relative to the Kirkpatrick model to determine the levels of evidence represented in the study. We also assessed all commonly used measures specifically, in terms of the Kirkpatrick level(s) of evidence addressed.

Results

Study selection

Our search strategy found 1,383 articles or trial registries, including original papers and review studies. In total, 51 review studies were identified, of which 37 were found to be relevant, and hand searched for original papers that the search did not capture. After the initial screening of all original papers, 55 full text articles and 27 published protocols were examined; 36 studies were eligible for inclusion, 28 with published results and 8 with published protocols only (see PRISMA flow chart *Figure 1*). We did not find nor exclude any papers or reviews that had a strictly pediatric focus, that also passed the other exclusion criteria. Our search using the trial registry numbers identified the published protocols of five included studies (included in the 36 reviewed studies) that were not found from the search of the bibliographic databases. Overall, 16 (44%) of the study interventions focused on palliative care communication, while the others covered palliative care in general. Thus, we separated General Palliative Care and Communication studies into *Table 1* and *Table 2*, respectively, to allow for comparison of measures used across like studies.

Description of studies and interventions

Thirty of the studies included were randomized controlled trials (RCTs) (9 clustered RCTs, 21 RCTs), along with four

Table 1 General palliative care focus studies

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels[£]
Agar, 2015[†]; 2017[†], IDEAL Project (Implementing Dementia End of life care At Local aged care facilities) (35,36)	To compare facilitated family case conferencing to usual care for end-of-life care and outcomes for residents with advanced dementia living in nursing homes	Nurses, community nurses, care assistants, general practitioners, allied health professionals	Self-completed survey: Clinicians, and Family Members, Patient clinical data (nurse assessed), Administrative data	Clinicians—nurses: - Comfort Assessment in Dying with Dementia Scale - Symptom Management at the End of life in Dementia Scale - Quality of Life in Late-stage Dementia Scale - EuroQol-5 Dimension-5 Level (EQ-5D-5 L) Scale - Palliative Care for Advanced Dementia Questionnaire (qPAD) Families/caregivers: - End of Life in Dementia Scale - Comfort Assessment in Dying with Dementia Scale - Symptom Management at the End of life in Dementia Scale - Satisfaction with Care at the End of life in Dementia Scale Patient clinical data: - Functional Assessment Staging of Alzheimer's Disease Scale - Australia–modified Karnofsky Performance Status Scale - Bedford Alzheimer Nursing Severity Scale - Aged Care Funding Instrument Scale - Palliative Care Outcomes Collaborative Scale Administrative data: - Place of death - Involvement of GP/other services - Emergency department visits - Hospital admissions (number and days) - Formal symptom assessments - Symptom management last day - Health care cost	II, III, IV
Ahlström, 2018** (37); Bökberg, 2019** (38)	To evaluate the effectiveness of an educational intervention on palliative care in nursing homes	Staff (commonly assistant nurses, nurses, occupational therapists and physiotherapists)	Self-completed survey: Clinicians, and Family Members, Interviews with Clinicians, Patients, and Caregivers, Administrative data (registry based on clinician submitted data), Qualitative focus groups, Participant observations	Clinicians—mixed: - Person-Centered Care Assessment Tool for staff - Person-Centered Climate Questionnaire for staff - Your Experience of Palliative Care Questionnaire - Preparedness for implementation [Focus Groups] Patient interviews: - WHO Quality of Life Questionnaire (modified) - Person-Centered Care Assessment Tool for patients (modified) - Person-Centered Climate Questionnaire for patients (modified) Families/caregivers: - WHO Quality of Life Questionnaire - Participation of next of kin in care in nursing homes questionnaire (study created) - Quality of life (study created) [Interviews] - WHO Quality of Life Questionnaire (modified) [Interviews] - Participation of next of kin in care in nursing homes questionnaire (study created) [Interviews] - Experience with intervention [Interviews] Administrative data: - Symptom management provided - Oral health provided - Bereavement follow-up offered, etc. - Participant observations (ethnography)	I, II, III, IV
Bishop, 2019, End-of-Life Nursing Education Consortium project (12)	To increase competence in primary palliative care	Registered nurses (acute and ambulatory care units)	Clinician self-completed survey	Clinicians—nurses: - Palliative Care Practices of Registered Nurses Survey (adapted) - Practice change 3 months post education (Y/N)	II

Table 1 (*continued*)

Table 1 (*continued*)

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels[£]
Broese, 2020[†], COMPASSION (COPD Palliative and Supportive care Implementation) study—protocol published [completed trial not published] (39)	To study the effect of implementing an integrated palliative care approach	Pulmonologist, respiratory nurses, hospital palliative care consultants, general practitioners specialized in asthma and COPD or palliative care, regional palliative care consultants	Self-completed survey: Clinicians, Patients, and Caregivers, Administrative data, Interviews with Clinicians, Patients, and Caregivers	Clinicians—mixed: - End-of-Life Professional Caregiver Survey - Measurement Instrument for Determinants of Innovation Questionnaire (role identity) (modified) - Satisfaction with care provided to patients question (study created) - Intervention dosage delivered report (study created) Patients: - Functional Assessment of Chronic Illness Therapy Palliative Care Scale - Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being Scale (FACIT-Sp-12) - Hospital Anxiety and Depression Scale - Clinical COPD Questionnaire - Intervention dosage received (modified) - Satisfaction with provided care (study created) Families/caregivers: - Caregiver Reaction Assessment Scale - Satisfaction with care provided to patients question (study created) Administrative data (1 year pre to 1 year post): - Emergency department visits - Hospital admissions (number and days) - ICU admissions (number and days) - Place of death - Place of care final week Interviews—all: - Experience with intervention and acceptability	I, II, III, IV
Catania, 2017[**]; 2021[**], INFO-QoL (40,41)	To determine the feasibility of a nursing intervention focused on quality of life assessment in palliative care	Hospice/palliative care team members: physicians, nurses, nurse assistants	Patient self-completed survey, Patient clinical data (nurse assessed), Administrative data, Clinician interviews	Patients: - Acceptability of intervention survey (study created) Patient clinical data: - INFO-QoL questionnaire (study created) - Palliative Outcome Scale (Italian version) Administrative data: - Use of INFO-QoL questionnaire - Composite Patient Management Score (adapted) Clinicians—nurse interviews: - Experience with intervention	I, III, IV
Chang, 2021, End of Life Care for All, Palliative Care Education and Practice, PUMCH-Johns Hopkins Geriatrics conference, and Doctor-Patient Communication Teachers' training Program (42)	To teach the concept and core principles of palliative care and develop these skills	Residents	Assessed observations in practice/simulation (simulated patients), Clinician self-completed survey	Assessed observations in practice/simulation: - Humanities and medical skills test score (study created) Clinicians—medical residents: - Self-assessment questionnaire on interest in humanistic medicine (study created)	II, III
Curtis, 2011 (43)	To improve ICU end-of-life care	ICU staff (nurses)	Self-completed survey: Clinicians and Family Members, Administrative data	Clinicians—nurses: - Quality of Dying and Death Questionnaire Families/caregivers: - Quality of Dying and Death Questionnaire - Family Satisfaction in the ICU Administrative data: - ICU days before death - Time from admission to withdrawal of mechanical ventilation	II, III, IV

Table 1 (*continued*)

Table 1 *(continued)*

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels$^{£}$
Göriş, 2017 (44)	To analyze the effect of terminal patient care training on nurses' attitudes toward death in an oncology hospital	Nurses	Clinician self-completed survey	Clinicians—nurses: - Death Attitude Profile-Revised Scale - Nurse description form questionnaire (nurse characteristics including training) (study created)	II
Kinley, 2014†, GSFCH programme (45)	To facilitate the provision of quality end-of-life care	Nurse managers	Administrative data, Qualitative focus groups	Administrative data: - Resident place of death - Use of integrated care pathway for last days of life - Use of other end-of-life care tools - Completion of GSFCH accreditation Clinicians—nurse focus groups: - Themes of challenging issues	IV
Kruse, 2008*, Teaching Toolkit for Nursing Excellence at End-of-Life Transition and End-of-Life Nursing Education Consortium curriculum (46)	To change perceptions of end-of-life care	Nurses	Clinician self-completed survey	Clinicians—nurses: - Perceptions on End-of-Life Care Questionnaire	II
Lamppu, 2019; 2021† (47,48)	To determine whether staff training in palliative and end-of-life care would benefit residents' health-related quality of life or reduce their hospital days	Registered nurses, practical nurses, physicians	Clinician self-completed survey, Patient clinical data (nurse assessed)	Clinicians—mixed: - Intervention evaluation and meeting of objectives rating (study created) Patient clinical data: - 15-Dimensional Health-Related Quality-of-Life Instrument (15D) - Mini-Mental State Examination - Mini Nutritional Assessment - Clinical Dementia Rating Scale - Edmonton symptom assessment system - Pain Assessment in Advanced Dementia scale - Psychosocial Well-Being scale - Satisfaction with Care at the End-of-Life in Dementia scale Administrative data: - Hospital days over 24 months - Emergency department visits over 24 months - Cost of all hospital services over 24 months	I, III, IV
Llobera, 2017†, Protocol—published [completed trial not published] (49)	To assess the effect of appointing a palliative care leader/expert to each health care team	Physicians, Nurses, Psychologists	Clinician self-completed survey, Administrative data	Clinicians—mixed: - Palliative Needs Questionnaire (NECPAL CCOMS-ICO) - Identification and Classification of Patients Needing Palliative Care Questionnaire Administrative data: - Early identification (90 days before death) - Home death - Hospital admissions in final month - Emergency department visits in final month - Health care cost in final month	II, III, IV
Okumura-Hiroshige, 2020**, End-of-Life Nursing Education Consortium-Geriatric (50)	To improve attitudes and knowledge in palliative care provision	Nurses	Clinician self-completed survey	Clinicians—nurses: - End-of-Life care nursing attitude scale for Japanese geriatric nurses - End-of-Life nursing knowledge scale for Japanese geriatric nurses	II
Omidi, 2020 (51)	To improve perceptions of and clinical competency in providing end-of-life care to patients with cancer	Oncology nurses	Clinician self-completed survey	Clinicians—nurses: - Oncology Nurses' Perception Of End-of-Life Care Questionnaire - Nurses' Competency in the Provision of Palliative Care Survey	II

Table 1 *(continued)*

Table 1 (*continued*)

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels£
Rosemann, 2007** (52); Hermann, 2012** (53); Engeser, 2014** (54), PAMINO (Palliative Medical Initiative North Baden)	To compare an interdisciplinary palliative care training program *vs.* usual palliative care for malignant tumour patients in a primary care setting	Primary care physicians	Self-completed survey: Clinicians, Patients, and Families	Clinicians—physicians: - Palliative Outcome Scale (clinician rating) - Health service resource use questionnaire (study created) - Process indicators (Advance directive, Alternative arrangement for care, Cooperation with nursing services) Patients: - Palliative Outcome Scale (self rating) - Quality of Life Questionnaire Core-15 Palliative Care - Visual analogue scale for assessing pain Families/caregivers: - Burden Scale for Family Caregivers	II, IV
Seow, 2021†, CAPACITI (Community Access to PAlliative Care via Interprofessional Teams Improvement) Protocol—unpublished (registered NCT05120154)	To help primary care teams to operationalize an early palliative care approach	Primary care providers (physicians, nurses, social workers, managers, etc.)	Clinician self-completed survey qualitative focus groups	Clinicians—mixed: - Identification of patients requiring palliative care (study created) - End-of-Life Professional Caregiver Survey - Assignment completion & change survey (study created) - CAPACITI Competencies Survey (study created) - Assessment of Interprofessional Team Collaboration Scale II - Organizational Readiness to Change Assessment survey - Session evaluation survey (study created) - Experience with intervention [Focus Groups]	I, II
Thoonsen, 2015, 2019, RADboud university medical centre indicators for Palliative Care needs tool and training programme (55,56)	To increase early identification of patients requiring palliative care and to facilitate anticipatory, interdisciplinary palliative care planning	General practitioners	Clinician self-completed survey (including reporting from medical records)	Clinicians—physicians: - Patient identification using RADboud indicators for PAlliative Care tool - Survey reporting indicators from patient medical record (study created) including cause/place of death, GP contacts and home visits in final month, GP out-of-hours service and hospital admissions in final 3 months, explored dimensions [somatic, social and financial, activities of daily living, and spiritual and psychological]	II, III
Uslu-Sahan, 2020, Interprofessional Gynecologic Oncology Palliative Care Training (57)	To increase gynecologic oncology palliative care knowledge	Interprofessional students (nursing, medical, nutrition-dietician, and social work)	Clinician self-completed survey	Clinicians—mixed: - Palliative Care Knowledge Test - Interdisciplinary Education Perception Scale - Teamwork Attitudes Questionnaire	II
Van den Block, 2020†, Palliative Care for Older People Steps to Success Program (58)	To improve quality of palliative care provision	Nurses, care assistants	Self-completed survey: Clinicians and Patients	Clinicians—mixed: - Palliative Care Survey (PCS-Knowledge of palliative care) - Self-Efficacy in End-of-Life Care Survey - End-of-Life Professional Caregiver Survey - Opinions on palliative care (RotterdamMove2PC) survey Patients: - Comfort Assessment in Dying with Dementia Scale - Quality of Dying in Long-Term Care Families/caregivers: - Comfort Assessment in Dying with Dementia Scale - Satisfaction with Care at the End-of-Life in Dementia scale - Family Perception of Physician-Family Communication	II, III, IV
Yeun, 2015*, Palliative Care Professional Education program (59)	To increase palliative care knowledge and recognition of a good death	Nurses	Clinician self-completed survey	Clinicians—nurses: - Good Death Recognition Tool - Modified Palliative Care Tool (recognition of palliative care) - Meaning of Life Tool	II

All randomized controlled trials except where noted. We include the published protocol reference in cases where the published study featured only one aspect of a multi-part study. †, clustered randomized controlled trials; *, randomized quasi-experimental study; **, non randomized controlled trial; £, Level I = reaction, II = learning, III = behaviour, IV = results. GP, general practitioner; Y/N, yes/no; COPD, chronic obstructive pulmonary disease; ICU, intensive care unit; INFO-QoL, intervention focused on quality of life measurement; GSFCH, Gold Standards Framework for Care Homes.

Table 2 Communication focus studies

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels[£]
Brown, 2018, Codetalk (60)	To improve competence in palliative care communication	Internal medicine residents, medicine subspecialty fellows, nurse practitioner students, or community-based advanced practice nurses	Clinician self-completed survey	Clinicians—mixed: - Palliative care communication competence survey (study created)	II
Curtis, 2013 (61)	To improve provider communication with seriously ill patients	Internal medicine trainees and nurse practitioner students	Self-completed survey: Patients, Families, and Clinician assessors	Patients: - Quality of Communication Questionnaire - Quality of End-Of-Life Care Questionnaire - Personal Health Questionnaire (PHQ-8) - Short-Form Health Survey (SF-12) Families/caregivers: - Quality of Communication Questionnaire - Personal Health Questionnaire (PHQ-8) Clinician assessors: - Quality of Communication Questionnaire	II, III, IV
Epstein, 2017, Values and Options in Cancer Care program (62)	To promote patient-centered communication about disease course, prognosis, treatment decisions, and end-of-life care	Medical oncologists	Assessed observations in practice/simulation (real patients), Self-completed survey: Clinicians and Patients, Administrative data	Assessed observations in practice/simulation: - Active Patient Participation Coding (engaging patients in consultation) - Verona VR-CoDES (responding to patients' emotions) Clinicians—physicians: - The Human Connection scale Health Care Climate Questionnaire - Perceived Efficacy in Patient-Physician Interactions Scale - Estimated 2-year survival and curability of the patient's cancer (agreement with patient's estimate) Patients: - McGill Quality of Life Single-Item Scale - McGill Psychological Well-Being subscale - McGill Existential Well-Being subscale - Functional Assessment of Cancer Therapy—General Questionnaire Physical Functioning subscale - Functional Assessment of Cancer Therapy—General Questionnaire Social Functioning subscale Administrative data: - Aggressive treatment last 30 days of life (chemotherapy, potentially burdensome interventions, emergency department /hospital admission) - Hospice utilization	II, III, IV
Goelz, 2011, COM-ON-p (SPIKES/ Oncotalk based) (63)	To improve competence in early palliative care communication	Physicians	Assessed observations in practice/ simulation (simulated patients)	Assessed observations in practice/simulation: - COM-ON Checklist	III
Hallford 2011, protocol—published [completed trial not published] (64)	To evaluate the effect of an intervention on palliative care staff to improve the recognition of depression and provide support	Non-physician palliative care staff	Clinicians self-completed survey, Interviews: Staff and Family, Administrative data	Clinicians—mixed: - Knowledge of depression survey (study created) - Depression Attitude Questionnaire (adapted) - Self-efficacy in Detecting and Managing Depression Questionnaire (adapted) - Barriers to detecting and managing depression survey (study created) Administrative data: - Referrals made for depressive symptoms Interviews (Staff and Family): - Changes in staff practices	II, III
Harnischfeger, 2020, PALLI-KOM, protocol—published [completed trial not published] (65)	To evaluate a newly developed communication skills training program	Physicians	Assessed observations in practice/ simulation (simulated patients), Self-completed survey: Clinicians and Patients (simulated)	Assessed observations in practice/simulation: - COM-ON Checklist (German version) - Consideration of palliative care principles (based on EAPC-competencies) (study created) Clinicians—physicians: - Self-Efficacy in Palliative Care Scale (German version) - Thanatophobia Scale - Knowledge about palliative care services (study created) - Acceptance of and satisfaction with the training (study created) - Confidence in dealing with palliative care related topics (study created) Patients (simulated): - Quality of Physician-Patient-Interaction Questionnaire (German version)	II, III, IV

Table 2 (*continued*)

Table 2 *(continued)*

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels[£]
Koropchak, 2006, SCOPE (Studying Communication in Oncologist Patient Encounters), protocol—published [completed trial not published] (66)	To evaluate the effect of a communication intervention on oncologists	Oncologists	Assessed observations in practice/simulation (real patients), Self-completed survey: Clinicians and Patients	Assessed observations in practice/simulation: - Communication behaviors scale (study created) Clinicians—oncologists: - Study created survey based on items from prior surveys (outcome expectancies; confidence; comfort level for addressing patients' emotional concerns) Patients: - Study created survey based on items from prior surveys (anxiety and depression; self-rating of communication with their oncologists; satisfaction with care, quality of life, social support)	II, III, IV
Lin, 2021 (67)	To evaluate the effectiveness of an end-of-life education program on shared decision making attitudes among nurses	Nursing professionals (who have received formal nursing education)	Assessed observations in practice/simulation (simulated patients), Clinician self-completed survey	Assessed observations in practice/simulation: - Standardized patient survey scale (study created) - Standardized patient survey score (study created) - Standardized patient survey global score (study created) Clinicians—nurses: - Substitute decision maker attitude scale (study created) - Substitute decision maker attitude score (study created) - Substitute decision maker attitude global score (study created)	II, III
Liu, 2020, Palliative Care Needs Rounds (68)	To determine if the intervention improves staff perceptions of residents' quality of death/dying, staff self-reported capability to care for people in the last months of life, and completion of anticipatory care documents	Registered nurses, enrolled nurses, nursing aides, activities coordinators, managers	Clinician self-completed survey, Administrative data	Clinicians—mixed: - Quality of Dying and Death Questionnaire Short Form - Capacity to Adopt a Palliative Approach Tool Administrative data: - Completion of advance care plan - Appointment of medical power of attorney	II, III
Martinsson, 2016, Information about the transition to end-of-life (69)	To determine if an educational intervention for physicians and nurses in nursing homes and hospitals increases the number of patients who receive information about the transition to end-of-life	Physicians, nurses	Administrative data (registry based on clinician submitted data)	Administrative data: - Patients who received information about the transition to end-of-life	III
Paladino, 2019[†] (70); Bernacki, 2019[†] (71), Serious Illness Conversation Guide training	To improve the occurrence, timing, quality, and accessibility of documented serious illness conversations	Physicians, advanced-practice clinicians	Self-completed survey: Patient and Family Caregiver, Administrative data	Patients: - Life Priorities survey for patients survey (study created) - Family perceptions survey (study created) - Peace, Equanimity, and Acceptance in the Cancer Experience Questionnaire - The Human Connection scale - Generalized Anxiety Disorder (GAD-7) Scale - Patient Health Questionnaire (PHQ-9) Families/caregivers: - Concordance with patient's end-of-life goals (study created) Administrative data: - Median 2-year survival - Serious illness conversation completed - Timing of first conversation - Discussion about values or goals - Discussions about end-of-life care planning - Conversations and domains discussed - Discussion documented in the accessible structured EMR module	III, IV
Slort, 2013, ACA (Availability, Current Issues and Anticipation) training programme (72)	To improve competence in palliative care communication	General practitioners	Assessed observations in practice/simulation (simulated patients)	Assessed observations in practice/simulation: - Roter Interaction Analysis System availability items	III

Table 2 *(continued)*

Table 2 *(continued)*

Lead author, year, intervention name	Objective	Target professions	Data sources (TYPE)	Outcome measures	Kirkpatrick model levels[£]
Szmuilowicz, 2010 (73)	To enhanced performance of and confidence with end-of-life conversations	Internal medical residents	Assessed observations in practice/simulation (simulated patients), Clinician self-completed survey	Assessed observations in practice/simulation: - Communication competence (study created tool) Clinicians—medical residents: - Communication competence (study created tool)	II, III
Totten, 2019[†], SICP, protocol—published [completed trial not published] (74)	To compare a team based *vs.* clinician focused approach to implementing an existing advanced care planning program	Administrators, nurses and/or medical assistants, clinicians	Self-completed survey: Clinicians, Patients, and Caregivers	Clinicians—mixed: - Experience with SICP questions (study created) - Reported use of SICP Patients: - Goal-concordant care survey (study created) - Patient-Reported Outcomes Measurement Information System (PROMIS-29) (anxiety, depression, and health) - Control Preferences Scale (decision making) - Use of health care services survey (study created) - Experience with SICP questions (study created) Families/caregivers: - Zarit Burden Interview Scale - Patient-Reported Outcomes Measurement Information System (PROMIS-29) - Hospice use, location of death, and family bereavement questions (study created) - Experience with SICP questions (study created)	I, II, IV
Walczak, 2014, CSP (Communication Support Programme), protocol—published [completed trial not published] (75)	To facilitate patients' and caregivers' ability to communicate about life expectancy and end-of-life care with their healthcare team	Currently practicing medical oncologists	Self-completed survey: Patients and Caregivers, Interviews: Caregivers, Administrative data	Patients: - Perceived Efficacy in Patient Physician Interactions Scale - Functional Assessment of Cancer Therapy—General Questionnaire - McGill Quality of Life Questionnaire - Control Preferences Scale (decision making) (adapted) - Information Styles Questionnaire (adapted - 2 items) - Peace, Equanimity, and Acceptance in the Cancer Experience Questionnaire - Understanding of life expectancy from physician scale (study created) - Rating of doctor's communication skills and manner during consultations scale (study created) - Satisfaction with care (study created) Families/caregivers: - Perceived Efficacy in Patient-Physician Interactions Scale (adapted) - Short Form Health Survey (SF-36 V.2) - Control Preferences Scale (decision making) (adapted) - Information Styles Questionnaire (adapted-2 items) - Caregivers' understanding of the patients' prognosis (study created) - Understanding of life expectancy from physician scale (study created) - Quality of Dying and Death Questionnaire [Interviews] Administrative data: - Health care in the final month including cancer-focused treatment, emergency intervention, and palliative care	III, IV
Wilkinson, 2008, Wilkinson training course from the National Advanced Communication Skills Programme for Senior Health Care Professionals in Cancer Care (76)	To increase awareness of end-of-life care communication skills and to explore strategies to implement these skills in practice	Nurses	Assessed observations in practice/simulation (real patients), Patient self-completed survey	Assessed observations in practice/simulation: - Communication Skills Rating Scale - Communication Skills Confidence Questionnaire Patients: - State Anxiety Scale - General Health Questionnaire (GHQ-12) - Patient Satisfaction Questionnaire	III, IV

All randomized controlled trials except where noted. We include the published protocol reference in cases where the published study featured only one aspect of a multi-part study. [†], clustered randomized controlled trials; [£], Level I = reaction, II = learning, III = behaviour, IV = results. VR-CoDES, Verona coding definitions of emotional sequences; COM-ON, Communication in Oncology; EAPC, European Association for Palliative Care; EMR, electronic medical record; SICP, Serious Illness Care Program.

Table 3 Commonly used questionnaire measures and Kirkpatrick level of impact*

Measure	Kirkpatrick framework level			
	Reaction: I	Learning: II	Behavior: III	Results: IV
Communication in Oncology Checklist			×	
Control Preferences Scale (decision making)			×	
End-of-Life Professional Caregiver Survey		×		
McGill Quality of Life Questionnaire				×
Palliative Outcome Scale				×
Peace, Equanimity, and Acceptance in the Cancer Experience Questionnaire				×
Perceived Efficacy in Patient Physician Interactions Scale adapted		×		×
Quality of Dying and Death Questionnaire				×
Satisfaction with Care at the End-of-Life in Dementia scale				×
Short Form Health Survey (SF-36/12)				×
The Human Connection scale		×		×

*, used by at least two unrelated studies.

non-RCTs and two randomized quasi experimental studies (*Tables 1,2*). The studies were conducted in Europe (n=14), North America (n=11), Asia (n=7), and Australia (n=4). The target audience for almost half (n=16) of the educational interventions was interprofessional, the rest were aimed specifically at physicians/residents (n=10) or nurses (n=10). Six studies included oncology care providers (including 3 studies with nurses), however two of these studies were research protocols with no results. Participant numbers among the completed studies ranged from about 20 to over 1,000 individuals in each arm. The education program duration ranged from a half day to 20 months, with 16 (44%) of the training interventions being completed in days (less than a week), 9 (25%) completed in 1 to 4 weeks, and 11 (31%) completed over a month or more. Details on the education interventions and groups of comparisons for the completed studies are provided in our prior review (10).

Description of measures used and common measures

Over half of the trials (n=23) used data from multiple data sources including participant questionnaires, administrative records, and external observer ratings. Overall, 28 studies (78%) measured clinician-reported outcomes and 15 (42%) measured a combination of patient or family reported outcomes and clinician-reported outcomes, using questionnaires (*Tables 1,2*). Half of all trials employed a study-created questionnaire(s). Data from administrative (n=14) sources were also used to examine changes in clinicians' practice and/or patient outcomes, following the training intervention. Seven trials used a mixed methods approach that included qualitative data (semi-structured interview or focus group) with clinicians (n=6) and/or patients/families (n=4), largely examining perceptions of the education intervention or resulting changes to practice. Specific to communication focused studies, half of these analysed clinician interactions with real or simulated patients as an outcome. Many of the trials (58%) collected final data within three months of completion of the training program, with 6 studies (17%) measuring final outcomes immediately after the intervention.

A total of 11 different validated questionnaire measures were used in at least 2 trials each, including the End-of-Life Professional Caregiver Survey (EPCS) (clinicians) and the Quality of Dying and Death Questionnaire (QODD) (caregivers) (see *Table 3*). Based on administrative data, 12 studies examined health care use, including costs (n=3), hospitalizations (n=5) and/or patient place of death (n=3) (see Table S1).

Study outcome categories

Among all the trials, 190 different measures were reported. We grouped all measures used/proposed into 14 outcome categories (see Table S1 for all measures by category). These categories were determined based on our review

Table 4 Number of studies with measures in each outcome category

Outcome categories	Number of studies (n=36)	% of all studies	Number of communication studies (n=16)	% of communication studies
Quality of communication	13	36.1	12	75.0
Palliative care knowledge/confidence	13	36.1	4	25.0
Patient or family satisfaction/experience	12	33.3	6	37.5
Health care costs and/or use	12	33.3	3	18.8
Patient general health/functionality/symptoms	11	30.6	5	31.3
Provider use of intervention tools	11	30.6	5	31.3
Mental health patient reported outcomes	9	25.0	6	37.5
Quality of life	9	25.0	3	18.8
Provider satisfaction/experience with intervention	8	22.2	2	12.5
Palliative care attitudes	7	19.4	2	12.5
Provider/patient relationship	4	11.1	3	18.8
Caregiver burden/involvement	4	11.1	1	6.3
Teamwork/collaboration	3	8.3	0	0.0
Other measures, e.g., survival, goal concordance, symptom management, advance care planning	13	36.1	6	37.5

and thematic ordering of the phenomena being examined among the measures. *Table 4* presents a summary of outcome categories and the number of trials with measures in each category, for all studies and those specific to communication. Approximately one third (n=13) of the trials measured clinician's palliative care knowledge or confidence in the skills they had acquired through the intervention. Most of the communication skill trials (12 of 16) measured "quality of communication", this being through an external source (rater or patient). The remaining four studies measured clinician-reported use (74), clinician-rated competency in initiating appropriate dialogue with their patients (64,68), or evidence of these conversations in the administrative record (68,69). The other outcome categories were each represented in a third or less of the trials identified.

Kirkpatrick's four levels of training evaluation

We mapped the trial outcomes onto the Kirkpatrick model evidence levels (33) (*Tables 1,2*). Most studies (78%) used clinician reported outcomes, such as self-reported competency, which relate to Level I: satisfaction with the intervention or Level II: perception of learning. An example of a Level I measure is "Experience with SICP (Serious Illness Conversation Program)" survey and Level II, the EPCS. Assessed observations in practice/simulation (25% of all studies, 50% of communication-focused studies), which involves assessment of the clinician's interaction with a patient by an external reviewer, offers more objective evidence of clinician behavior change, denoting Level III. Level III outcomes also include clinician use of palliative care processes or tools, reported by the patient/family or extracted from administrative data. Overall, 24 (67%) trials measured Level III and 18 (50%) trials measured Level IV evidence, the latter signifying patient and system outcomes.

Table 2 presents the Kirkpatrick model level of impact assessed among the commonly used questionnaire measures identified. The majority (73%) of these measures are patient-reported outcomes (PROs) and therefore address Level IV outcomes on the Kirkpatrick model.

Discussion

Our review identified a relatively large number of trials (n=36), including protocols, of education interventions to increase generalist clinician capacity for providing a palliative approach to care. Nearly half of the studies were explicitly communication skills programs. As with prior reviews of patient palliative care interventions (16,18,24), our current study found a multitude of different measures, with extensive diversity in the types of outcomes assessed. There was little consistency in measures used between the studies; only 11 validated questionnaires were used in at least 2 of the trials we identified. Half of the studies employed a study-created questionnaire, often to measure clinician competency and/or knowledge. A vast majority (n=28, 78%) of the education intervention trials evaluated clinician reported outcomes. In contrast, fewer (n=15, 42%) of the studies assessed patient or family reported outcomes, a shortcoming inherent to the body of palliative care training research noted in prior reviews (8,17,77,78). To our knowledge, our systematic review is the first to closely examine the outcome measures of palliative care training programs for clinicians.

In reviewing studies of education interventions in health care, a broad range of outcomes are apparent, from clinician attendance at the training and their satisfaction, to system-level impact, such as acute care costs (10,18,79). Multiple levels of evidence are required to critically appraise educational interventions aimed at clinicians (33,80,81). While participant satisfaction with the program and the perception of skill acquisition are formative to knowledge uptake and application in practice, objective measures of behavior change—such as assessment of observations with simulated or real patient encounters—are necessary to empirically demonstrate the effectiveness of an education intervention (82-84).

Insights and recommendations emerged from our review regarding the incorporation of higher level outcomes as described in the Kirkpatrick model (33), namely Level III: behavior and Level IV: results (PROs). The use of validated patient/family reported outcomes relevant to palliative care, particularly those that capture care satisfaction, as opposed to less modifiable qualities such as health status, can provide objective metrics of clinician behavior. Patient or family satisfaction is more likely to be sensitive to clinician education interventions in palliative care than clinical outcomes, especially considering the majority of these studies have a short duration (≤3 months) between the intervention and post-assessment (10). In fact, it may be unrealistic to expect patient-reported outcomes such as quality of life, mental health, or physical health to be immediately impacted by clinician training. Lastly, health care system outcomes, such as acute care use, are a high level result of behavior change, though these outcomes may be too far downstream from a newly implemented education program for clinicians to show an effect (16,25,85,86).

Using assessed observations in practice or simulation shows promise for realizing more objective measurement in studies of palliative care education. Indeed, many of the trials of communication skills training used assessed observations of clinician interactions with patients as the main study outcome. However, our review identified only one non-communication specific trial that used observation of practice (42). This finding is consistent with that of a 2018 review of simulation training in palliative care which reported that the vast majority of these studies centre on communication skills, rather than including other domains of palliative care (87). The development and use of observed assessment to measure clinician behavior change has many challenges, including the cost, time, technology, and the logistics involved in implementation (88), in addition to capturing the multiple dimensions that a palliative approach to care entails. There is a need for further validated approaches that can be used to assess clinician/patient interactions in providing comprehensive palliative care.

Our study reveals several recommendations that align with many of those put forth by the European Association for Palliative Care (EAPC) for outcome measurement in palliative care (89). Many trials used data from multiple data sources, including administrative and/or qualitative sources. Using a mixed methods approach with multiple sources, and multidimensional instruments can more holistically capture the impact of a palliative care training intervention. Moving towards some level of international consistency, standard or universality of use of measures is key; the ability to compare across studies that are also evaluating other palliative care education interventions would then be possible. The few common questionnaire examples from this review are the EPCS to assess general palliative care competency and the QODD completed by caregivers, as well as the Communication in Oncology (COM-ON) Checklist for communication focused interventions. Most important is the use of validated measures that reflect the content of the intervention. Assessed observations in practice/simulation, especially for communication focused studies where the expected outcomes are more clearly defined, should be considered along with patient reported outcomes for objectively assessing behavior change in clinicians. Finally, a longer duration between the intervention and final data collection will help to evaluate long term effects of education training and will allow more time for behavior changes to potentially transpire.

Our review has several limitations. We did not assess the suitability of the given measures for each individual intervention and therefore cannot comment on the extent to which the measures represented in each study are reasonable and valid indicators of program impact. We did not assess the psychometric properties of the measures used. Our review includes studies across countries, so factors such as language and practice norms may undermine universal tools. Finally, we limited our review to trials (including registered protocols) to capture what measures were used by studies with the highest purported level of evidence. We recognize that our review excludes a large number of non-trial, single cohort studies; synthesis of the outcomes used could identify additional measures for evaluating palliative care education interventions. Future reviews should examine relevant approaches described in the broader education science literature, particularly methods for objectively capturing clinician behavior change.

Conclusions

We found considerable diversity and little commonality among the measures used in our systematic review of 36 trials examining palliative care education programs for clinicians. Nearly 200 different measures were reported among the studies. Only 11 validated measures were used in at least 2 trials. Further work is required to establish consistent measures of assessing the impact of palliative care education, to inform evidence-based scaling of effective programs.

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Footnote

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Appendix 1

Search strategy by database

Medline

1. Palliative Care/
2. terminal care/ or hospice care/
3. hospice.ti,ab,kf.
4. end of life.ti,ab,kf.
5. terminal*.ti,ab,kf.
6. palliative*.ti,ab,kf.
7. “serious* ill*”.ti,ab,kf.
8. ((“late stage” or advanced) adj3 (cancer or disease or illness)).ti,ab,kf.
9. or/1-8
10. health personnel/ or allied health personnel/ or case managers/ or medical staff/ or medical staff, hospital/ or hospitalists/ or nurses/ or nurse practitioners/ or nurse specialists/ or nurses, community health/ or nursing staff/ or exp physicians/
11. ((healthcare or care*) adj2 (provider* or person?el or professional* or staff)).ti,ab,kf.
12. ((health or community) adj1 (provider* or person?el or professional* or staff)).ti,ab,kf.
13. (nurse$ or doctor$ or team$ or “primary care” or physician$ or clinician$).ti,kf.
14. or/10-13
15. exp Clinical Trial/
16. clinical trial*.ti,ab,kw.
17. exp Clinical Trials as Topic/
18. random*.ti,ab,kf.
19. rct*.ti,ab,kf.
20. nonrandom*.ti,ab,kf.
21. ((singl* or doubl* or tripl* or trebl*) adj3 (blind* or mask* or method* or procedure*)).ti,ab,kf.
22. single blind method/
23. double blind method/
24. Random Allocation/
25. systematic review*.ti,ab,kf,pt.
26. meta-analysis*.ti,ab,kf,pt.
27. or/15-26
28. education/ or inservice training/ or staff development/
29. (“knowledge based” or “program*” or “train*” or “education*” or “classroom” or “learning” or “teach*” or “simulation*” or “course*” or “curriculum*”).ti,ab,kf.
30. 28 or 29
31. (practice* or behav* or competenc* or confidence or skill* or abilit* or quality or comfort or experience* or proficien* or expertise or provision* or knowledge or leadership or perception*).ti,ab,kf.
32. Health Knowledge, Attitudes, Practice/
33. professional competence/ or clinical competence/
34. or/31-33
35. 9 and 14 and 27 and 30 and 34
36. limit 35 to (english language and humans and yr=”2000 - 2021”)

EMBASE

1. Palliative Care/
2. terminal care/ or hospice care/
3. hospice.tw

https://dx.doi.org/10.21037/apm-22-947

4. end of life.tw.
5. terminal*.tw.
6. palliative*.tw.
7. “serious* ill*”.tw.
8. ((“late stage” or advanced) adj3 (cancer or disease or illness)).tw.
9. or/1-8
10. health personnel/ or allied health personnel/ or case managers/ or medical staff/ or medical staff, hospital/ or hospitalists/ or nurses/ or nurse practitioners/ or nurse specialists/ or nurses, community health/ or nursing staff/ or physicians/
11. ((healthcare or care*) adj2 (provider* or person?el or professional* or staff)).ti.
12. ((hospital or medical or health or community) adj1 (provider* or person?el or professional* or staff)).ti.
13. (nurse$ or doctor$ or team$ or “primary care” or physician$ or clinician$ or nursing staff).ti.
14. or/11-13
15. exp Clinical Trial/
16. clinical trial*.tw.
17. exp “clinical trial (topic)”/
18. random*.ti,ab,kw.
19. rct*.ti,ab,kw.
20. nonrandom*.ti,ab,kw.
21. ((singl* or doubl* or tripl* or trebl*) adj3 (blind* or mask* or method* or procedure*)).ti,ab,kw.
22. single blind procedure/
23. double blind procedure/
24. randomization/
25. systematic review*.tw.
26. meta-analysis*.tw.
27. or/15-26
28. education/ or inservice training/ or staff development/
29. (“knowledge based” or “program*” or “train*” or “education*” or “classroom” or “learning” or “teach*” or “simulation*” or “course*” or “curriculum*”).tw.
30. 28 or 29
31. (practice* or behav* or competenc* or confidence or skill* or abilit* or quality or comfort or experience* or proficien* or expertise or provision* or knowledge or leadership or perception*).tw.
32. Health Knowledge, Attitudes, Practice/
33. professional competence/ or clinical competence/
34. or/31-33
35. 9 and 14 and 27 and 30 and 34
36. limit 35 to (english language and humans and yr=”2000 - 2022”)

Healthstar

1. Palliative Care/
2. terminal care/ or hospice care/
3. hospice.ti,ab,kf.
4. end of life.ti,ab,kf.
5. terminal*.ti,ab,kf.
6. palliative*.ti,ab,kf.
7. “serious* ill*”.ti,ab,kf.
8. ((“late stage” or advanced) adj3 (cancer or disease or illness)).ti,ab,kf.
9. or/1-8
10. health personnel/ or allied health personnel/ or case managers/ or medical staff/ or medical staff, hospital/ or hospitalists/

or nurses/ or nurse practitioners/ or nurse specialists/ or nurses, community health/ or nursing staff/ or exp physicians/

11. ((healthcare or care*) adj2 (provider* or person?el or professional* or staff)).ti,ab,kf.
12. ((health or community) adj1 (provider* or person?el or professional* or staff)).ti,ab,kf.
13. (nurse$ or doctor$ or team$ or “primary care” or physician$ or clinician$).ti,kf.
14. or/10-13
15. exp Clinical Trial/
16. clinical trial*.ti,ab,kw.
17. exp Clinical Trials as Topic/
18. random*.ti,ab,kf.
19. rct*.ti,ab,kf.
20. nonrandom*.ti,ab,kf.
21. ((singl* or doubl* or tripl* or trebl*) adj3 (blind* or mask* or method* or procedure*)).ti,ab,kf.
22. single blind method/
23. double blind method/
24. Random Allocation/
25. systematic review*.ti,ab,kf,pt.
26. meta-analysis*.ti,ab,kf,pt.
27. or/15-26
28. education/ or inservice training/ or staff development/
29. (“knowledge based” or “program*” or “train*” or “education*” or “classroom” or “learning” or “teach*” or “simulation*” or “course*” or “curriculum*”).ti,ab,kf.
30. 28 or 29
31. (practice* or behav* or competenc* or confidence or skill* or abilit* or quality or comfort or experience* or proficien* or expertise or provision* or knowledge or leadership or perception*).ti,ab,kf.
32. Health Knowledge, Attitudes, Practice/
33. professional competence/ or clinical competence/
34. or/31-33
35. 9 and 14 and 27 and 30 and 34
36. limit 35 to (english language and humans and yr=”2000 - 2022”)

Psychlit

1. Palliative Care/
2. hospice.tw.
3. end of life.tw.
4. terminal*.tw.
5. palliative*.tw.
6. “serious* ill*”.tw.
7. ((“late stage” or advanced) adj3 (cancer or disease or illness)).tw.
8. health personnel/ or allied health personnel/ or nurses/ or medical personnel/ or health personnel/ or physicians/ or general practitioners/ or family physicians/
9. ((healthcare or care*) adj2 (provider* or person?el or professional* or staff)).tw.
10. ((health or community) adj1 (provider* or person?el or professional* or staff)).tw.
11. (nurse? or doctor? or team? or “primary care” or physician? or clinician?).ti.
12. or/8-11
13. education/ or inservice training/ or Professional Development/
14. (“knowledge based” or “program*” or “train*” or “education*” or “classroom” or “learning” or “teach*” or “simulation*” or “course*” or “curriculum*”).tw.
15. 13 or 14

16. (practice* or behav* or competenc* or confidence or skill* or abilit* or quality or comfort or experience* or proficien* or expertise or provision* or knowledge or leadership or perception*).tw.
17. Health Knowledge/
18. professional competence/
19. or/1-7
20. or/16-18
21. 19 and 12 and 15 and 20
22. (crossover procedure or double blind procedure or placebo$ or randomization or random sample or single blind procedure).sh.
23. exp clinical trial/ or cross-over studies/ or double-blind method/ or random allocation/ or randomized controlled trials as topic/ or single-blind method/
24. (crossover or cross over).tw.
25. (((single$ or doubl$ or trebl$ or tripl$) adj5 blind$) or mask$ or dummy or singleblind$ or doubleblind$ or trebleblind$ or tripleblind$).tw.
26. (placebo$ or random$).mp.
27. (clinical trial$ or controlled clinical trial$ or random$).pt. or treatment outcome$.mp.
28. (literature review* or systematic review* or meta anal*).tw.
29. or/22-28
30. 21 and 29
31. 30
32. limit 31 to (human and english language and yr=”2000 -Current”)

CINAHL

S1. MH “Palliative Care”
S2. MH “terminal care” OR MH “hospice care”
S3. TI hospice OR AB hospice
S4. TI “end of life” OR AB “end of life”
S5. TI terminal* OR AB terminal*
S6. TI palliative* OR AB palliative*
S7. TI “serious* ill*” OR AB “serious* ill*”
S8. TI ((“late stage” or advanced) N3 (cancer or disease or illness)) OR AB ((“late stage” or advanced) N3 (cancer or disease or illness))
S9. S1 or S2 or S3 or S4 or S5 or S6 or S7 or S8
S10. MH “health personnel” or MH “allied health personnel” or MH “case managers” or MH “medical staff” or MH “medical staff, hospital” or MH “hospitalists” or MH “nurses” or MH “nurse practitioners” or MH “nurse specialists” or MH “community health nursing” or MH “nursing staff” or MH “physicians”
S11. TI ((healthcare OR care*) N2 (provider* OR person#el OR professional* OR staff))
S12. AB ((healthcare OR care*) N2 (provider* OR person#el OR professional* OR staff))
S13. TI ((health OR community) N1 (provider* OR person#el OR professional* OR staff))
S14. AB ((health OR community) N1 (provider* OR person#el OR professional* OR staff))
S15. TI (nurse# OR doctor# OR team# OR “primary care” OR physician# OR clinician#)
S16. S10 OR S11 OR S12 OR S13 OR S14 OR S15
S17. MH education OR MH “inservice training” OR MH “staff development”
S18. TI (“knowledge based” OR “program*” OR “train*” OR “education*” OR “classroom” OR “learning” OR “teach*” OR “simulation*” OR “course*” OR “curriculum*”)
S19. AB (“knowledge based” OR “program*” OR “train*” OR “education*” OR “classroom” OR “learning” OR “teach*” OR “simulation*” OR “course*” OR “curriculum*”)
S20. S17 OR S18 OR S19

S21. TI (practice* OR behav* OR competenc* OR confidence OR skill* OR abilit* OR quality OR comfort OR experience* OR proficien* OR expertise OR provision* OR knowledge OR leadership OR perception*)
S22. AB (practice* OR behav* OR competenc* OR confidence OR skill* OR abilit* OR quality OR comfort OR experience* OR proficien* OR expertise OR provision* OR knowledge OR leadership OR perception*)
S23. MH Health Knowledge OR MH Professional Knowledge
S24. MH professional competence OR MH clinical competence
S25. S21 OR S22 OR S23 OR S24
S26. S9 AND S16 AND S20 AND S25
S27. MH "Systematic Review"
S28. MH "Meta Analysis"
S29. TI (metaanal* or "meta anal*" or metasynthes* or "meta synethes*") or AB (metaanal* or "meta anal*" or metasynthes* or "meta synethes*")
S30. TI ("systematic review*") or AB ("systematic review*")
S31. TI (clinical N2 trial*) or AB (clinical N2 trial*)
S32. MH "Clinical Trials"
S33. MH "Random Assignment"
S34. TI (single blind* or double blind* or treble blind* or singleblind* or doubleblind* or trebleblind* or tripleblind*) or AB (single blind* or double blind* or treble blind* or mask* or dummy* or singleblind* or doubleblind* or trebleblind* or tripleblind*)
S35. TI ((singl* OR doubl* OR tripl* OR trebl*) N3 mask*) or AB ((singl* OR doubl* OR tripl* OR trebl*) N3 mask*)
S36. TI (random* OR rct*) OR AB (random* OR rct*)
S37. S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36
S38. S26 AND S37
S39. S26 AND S37 Limiters - Published Date: 20000101-20220431; English Language

Cochrane Library

MeSH descriptor: [Palliative Care] explode all trees 1709
#2 "terminal care":ti,ab,kw 706
#3 hospice:ti,ab,kw 864
#4 "end of life":ti,ab,kw 1387
#5 palliative:ti,ab,kw 7868
#6 "serious* ill*":ti,ab,kw 1
#7 #1 OR #2 OR #3 OR #4 OR #5 OR #6 9063
#8 ("knowledge based" or "program*" or "train*" or "education*" or "classroom" or "learning" or "teach*" or "simulation*" or "course*" or "curriculum*"):ti,ab,kw 250634
#9 (practice* or behav* or competenc* or confidence or skill* or abilit* or quality or comfort or experience* or proficien* or expertise or provision* or knowledge or leadership or perception*):ti,ab,kw 565744
#10 (nurse$ or doctor$ or team$ or "primary care" or physician$ or clinician$):ti,ab,kw 98870
#11 MeSH descriptor: [Health Personnel] explode all trees 9751
#12 #10 OR #11104652
#13 #7 AND #8 AND #9 AND #12 in Cochrane Reviews 5

Table S1 Included study measures by category

Outcome category – number of studies (number of communication-focused studies) lead author, year	Outcome measures (36 studies included)
QUALITY OF COMMUNICATION – 13 (12)	
Epstein, 2017	Active Patient Participation Coding [APPC] (engaging patients in consultation)
Koropchak, 2006	Communication behaviors scale (study created)
Szmuilowicz, 2010	Communication competence (study created tool)
Goelz, 2011	Communication in Oncology (COM-ON) Checklist
Harnischfeger, 2020	Communication in Oncology (COM-ON) Checklist (German version)
Wilkinson, 2008	Communication Skills Confidence Questionnaire
Wilkinson, 2008	Communication Skills Rating Scale
Paladino, 2019; Bernacki, 2019	Conversations and domains discussed
Van den Block, 2020	Family Perception of Physician-Family Communication (FPPFC)
Brown, 2018	Palliative care communication competence survey (study created)
Curtis, 2013	Quality of Communication (QOC) Questionnaire
Walczak, 2014	Rating of doctor's communication skills and manner during consultations scale (study created)
Slort, 2013	Roter Interaction Analysis System (RIAS) availability items
Lin, 2021	Standardized Patient Survey Global Score (SPS) (study created)
Epstein, 2017	Verona VR-CoDES (responding to patients' emotions)
PALLIATIVE CARE KNOWLEDGE /CONFIDENCE – 13 (4)	
Seow, 2021	CAPACITI Competencies Survey (study created)
Liu, 2020	Capacity to Adopt a Palliative Approach Tool (CAPA)
Harnischfeger, 2020	Confidence in dealing with palliative care related topics (study created)
Harnischfeger, 2020	Consideration of palliative care principles (based on EAPC-competencies) (study created)
Broese, 2020	End-of-Life Professional Caregiver Survey (EPCS)
Seow, 2021	End-of-Life Professional Caregiver Survey (EPCS)
Van den Block, 2020	End-of-Life Professional Caregiver Survey (EPCS)
Okumura-Hiroshige, 2020	EOL care nursing knowledge scale for Japanese geriatric nurses (ELNKS-JG)
Hallford 2011 [McCabe]	Knowledge of depression survey (study created)
Omidi, 2020	Nurses' Competency in the Provision of Palliative Care survey
Van den Block, 2020	Opinions on palliative care (RotterdamMove2PC) survey
Agar, 2015	Palliative Care for Advanced Dementia Questionnaire (qPAD)
Uslu-Sahan, 2020	Palliative Care Knowledge Test (PCKT)
Bishop, 2019	Palliative Care Practices of Registered Nurses Survey (adapted)
Van den Block, 2020	Palliative Care Survey (PCS- Knowledge of palliative care)
Kruse, 2008	Perceptions on End-of-Life Care Questionnaire
Hallford 2011 [McCabe]	Self-efficacy in Detecting and Managing Depression Questionnaire (adapted)
Van den Block, 2020	Self-Efficacy in End-of-Life Care Survey (S-EOLC)
Harnischfeger, 2020	Self-Efficacy in Palliative Care Scale (SEPC) (German version)
Koropchak, 2006	Study created survey based on items from prior surveys (Outcome expectancies; Confidence; Comfort level for addressing patients' emotional concerns)
PATIENT OR FAMILY SATISFACTION / EXPERIENCE – 12 studies (6)	
Catania, 2017	Acceptability of intervention survey (study created)
Paladino, 2019; Bernacki, 2019	Family perceptions survey (study created)
Curtis, 2011	Family Satisfaction in the ICU (FS-ICU)
Wilkinson, 2008	Patient Satisfaction Questionnaire
Curtis, 2011	Quality of Dying and Death Questionnaire (QODD)
Walczak, 2014	Quality of Dying and Death Questionnaire (QODD)
Liu, 2020	Quality of Dying and Death Questionnaire (QODD) Short Form
Van den Block, 2020	Quality of Dying in Long-Term Care (QOD-LTC)
Curtis, 2013	Quality of End-Of-Life Care (QEOLC) Questionnaire
Harnischfeger, 2020	Quality of Physician-Patient-Interaction Questionnaire (QQPPI) (German version)
Walczak, 2014	Satisfaction with care (study created)
Agar, 2015	Satisfaction with Care at the End-of-Life in Dementia (SWC-EOLD) scale
Lamppu, 2019; 2021	Satisfaction with Care at the End-of-Life in Dementia (SWC-EOLD) scale
Van den Block, 2020	Satisfaction with Care at the End-of-Life in Dementia (SWC-EOLD) scale
Broese, 2020	Satisfaction with care provided to patients question (study created)
Broese, 2020	Satisfaction with provided care (study created)
Ahlström, 2018	Your Experience of Palliative Care Questionnaire
HEALTH CARE COSTS AND/OR USE – 12 (3)	
Agar, 2015	COST Health care cost
Llobera, 2017	COST Health care cost in final month
Lamppu, 2019; 2021	Cost of all hospital services over 24 months
Agar, 2015	Emergency department visits
Broese, 2020	Emergency department visits
Llobera, 2017	Emergency department visits in final month
Lamppu, 2019; 2021	Emergency department visits over 24 months
Walczak, 2014	Health care in the final month including cancer-focused treatment, emergency intervention, and palliative care
Rosemann, 2007	Health service resource use questionnaire (study created)
Llobera, 2017	Home death
Totten, 2019	Hospice use, location of death, and family bereavement questions (study created)
Epstein, 2017	Hospice utilization
Agar, 2015	Hospital admissions (Number and days)
Broese, 2020	Hospital admissions (Number and days)
Llobera, 2017	Hospital admissions in final month
Lamppu, 2019; 2021	Hospital days over 24 months
Chang, 2020	Humanities and Medical Skills Test Score (study created)
Broese, 2020	ICU admissions (Number and days)
Curtis, 2011	ICU days before death
Agar, 2015	Involvement of GP/other services
Broese, 2020	Place of care final week
Agar, 2015	Place of death
Broese, 2020	Place of death
Kinley, 2014	Resident place of death
Totten, 2019	Use of health care services survey (study created)
Epstein, 2017	Aggressive treatment last 30 days of life (chemotherapy, potentially burdensome interventions, emergency department /hospital admission)
Thoonsen, 2015, 2019	Survey reporting indicators from patient medical record (study created) including Cause/place of death, GP contacts and home visits in final month, GP out-of-hours service and hospital admissions in final 3 months, Explored dimensions (somatic, social and financial, activities of daily living (ADL), and spiritual and psychological)
PATIENT GENERAL HEALTH /FUNCTIONALITY /SYMPTOMS - 11 (5)	
Agar, 2015	Aged Care Funding Instrument (ACFI)
Agar, 2015	Australia–modified Karnofsky Performance Status (AKPS)
Broese, 2020	Clinical COPD Questionnaire (CCQ)
Lamppu, 2019; 2021	Edmonton symptom assessment system (ESAS)
Agar, 2015	Formal symptom assessments
Walczak, 2014	Functional Assessment of Cancer Therapy—General Questionnaire (FACT-G)
Broese, 2020	Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being Scale (FACIT-Sp-12)
Broese, 2020	Functional Assessment of Chronic Illness Therapy Palliative Care Scale (FACIT-Pal)
Agar, 2015	Functional Assessment Staging of Alzheimer's Disease (FAST)
Wilkinson, 2008	General Health Questionnaire (GHQ-12)
Lamppu, 2019; 2021	Mini Nutritional Assessment
Lamppu, 2019; 2021	Pain Assessment in Advanced Dementia (PAINAD) scale
Agar, 2015	Palliative Care Outcomes Collaborative (PCOC)
Llobera, 2017	Palliative Needs Questionnaire (NECPAL CCOMS-ICO)
Rosemann, 2007	Palliative Outcome Scale (POS)
Catania, 2017	Palliative Outcome Scale (POS) (Italian version)
Paladino, 2019; Bernacki, 2019	Patient Health Questionnaire (PHQ-9)
Totten, 2019	Patient-Reported Outcomes Measurement Information System (PROMIS-29)
Totten, 2019	Patient-Reported Outcomes Measurement Information System (PROMIS-29) (Anxiety, depression, and health)
Curtis, 2013	Personal Health Questionnaire (PHQ-8)
Walczak, 2014	Short Form Health Survey (SF-36 V.2)
Curtis, 2013	Short-Form Health Survey (SF-12)
Rosemann, 2007	Visual analogue scale (VAS) for assessing pain
PROVIDER USE OF INTERVENTION TOOLS – 11 (5)	
Seow, 2021	Assignment Completion & Change Survey (study created)
Liu, 2020	Completion of advance care plan
Kinley, 2014	Completion of GSFCH accreditation
Paladino, 2019; Bernacki, 2019	Discussion about values or goals
Paladino, 2019; Bernacki, 2019	Discussion documented in the accessible structured EMR module
Paladino, 2019; Bernacki, 2019	Discussions about end-of-life care planning
Llobera, 2017	Early identification (90 days before death)
Thoonsen, 2015, 2019	Patient identification using RADPAC (RADboud indicators for PAlliative Care) tool
Martinsson, 2016	Patients who received Information about the transition to end-of-life (ITEOL care)
Bishop, 2019	Practice change 3 months post education (Y/N)
Rosemann, 2007	Process indicators (Advance directive, Alternative arrangement for care, Cooperation with nursing services)
Hallford 2011 [McCabe]	Referrals made for depressive symptoms
Totten, 2019	Reported use of SICP
Paladino, 2019; Bernacki, 2019	Serious illness conversation completed
Paladino, 2019; Bernacki, 2019	Timing of first conversation
Kinley, 2014	Use of other end-of-life care tools
MENTAL HEALTH PATIENT REPORTED OUTCOMES – 9 (6)	
Agar, 2015	Bedford Alzheimer Nursing Severity (BANS)
Lamppu, 2019; 2021	Clinical Dementia Rating Scale
Hallford 2011 [McCabe]	Depression Attitude Questionnaire (adapted)
Agar, 2015	End of Life in Dementia Scales (EOLD)
Epstein, 2017	FACT-G Physical Functioning subscale
Epstein, 2017	FACT-G Social Functioning subscale
Paladino, 2019; Bernacki, 2019	Generalized Anxiety Disorder Scale (GAD-7)
Broese, 2020	Hospital Anxiety and Depression Scale (HADS)
Epstein, 2017	McGill Existential Well-Being subscale
Epstein, 2017	McGill Psychological Well-Being subscale
Lamppu, 2019; 2021	Mini-Mental State Examination
Paladino, 2019; Bernacki, 2019	Peace, Equanimity, and Acceptance in the Cancer Experience (PEACE) Questionnaire
Walczak, 2014	Peace, Equanimity, and Acceptance in the Cancer Experience (PEACE) Questionnaire
Lamppu, 2019; 2021	Psychosocial Well-Being (PWB) scale
Wilkinson, 2008	State Anxiety Scale
Koropchak, 2006	Study created survey based on items from prior surveys (Anxiety and depression; Self-rating of communication with their oncologists; Satisfaction with care, Quality of life, Social support)
QUALITY OF LIFE – 9 (3)	
Lamppu, 2019; 2021	15-Dimensional Health-Related Quality-of-Life Instrument (15D) (interview)
Agar, 2015	Comfort Assessment in Dying with Dementia (CAD–EOLD)
Van den Block, 2020	Comfort Assessment in Dying with Dementia (CAD–EOLD)
Agar, 2015	EuroQol-5 Dimension-5 Level Scale (EQ-5D-5 L)
Catania, 2017	INFO-qol questionnaire (study created)
Epstein, 2017	McGill Quality of Life (QOL) Single-Item Scale
Walczak, 2014	McGill Quality of Life Questionnaire (MQOL)
Ahlström, 2018	Quality of life (study created)
Agar, 2015	Quality of Life in Late-stage Dementia Scale (QUALID)
Rosemann, 2007	Quality of Life Questionnaire Core-15 Palliative Care (QLQ-C15-PAL)
Koropchak, 2006	Study created survey based on items from prior surveys (Anxiety and depression; Self-rating of communication with their oncologists; Satisfaction with care, Quality of life, Social support)
Catania, 2017	Use of INFO-qol questionnaire
Ahlström, 2018	WHO Quality of Life Questionnaire (WHOQOL-BREF)
PALLIATIVE CARE ATTITUDES – 7 (2)	
Göriş, 2017	Death Attitude Profile-Revised Scale (DAP-R)
Okumura-Hiroshige, 2020	EOL care nursing attitude scale for Japanese geriatric nurses (ELNAS-JG)
Yeun, 2015	Good Death Recognition Tool
Harnischfeger, 2020	Knowledge about palliative care services (study created)
Yeun, 2015	Meaning of Life Tool
Yeun, 2015	Modified Palliative Care Tool (Recognition of palliative care)
Omidi, 2020	Oncology Nurses' Perception Of End-of-Life Care Questionnaire
Chang, 2020	Self-assessment questionnaire on interest in humanistic medicine (study created)
Lin, 2021	Standardized Patient Survey Scale (SPS) (study created)
Harnischfeger, 2020	Thanatophobia Scale
PROVIDER SATISFACTION /EXPERIENCE WITH INTERVENTION – 8 (2)	
Ahlström, 2018	Experience with intervention (interview)
Broese, 2020	Experience with intervention and acceptability (interview)
Broese, 2020	Measurement Instrument for Determinants of Innovation Questionnaire (MIDI) (role identity) (modified)
Catania, 2017	Experience with intervention (interview)
Harnischfeger, 2020	Acceptance of and satisfaction with the training (study created)
Lamppu, 2019; 2021	Intervention evaluation and meeting of objectives rating (study created)
Seow, 2021	Experience with intervention (focus group)
Seow, 2021	Session Evaluation Survey (study created)
Totten, 2019	Experience with SICP questions (study created)
Uslu-Sahan, 2020	Interdisciplinary Education Perception Scale (IEPS)
PROVIDER / PATIENT RELATIONSHIP – 4 (3)	
Epstein, 2017	Health Care Climate Questionnaire (HCCQ)
Epstein, 2017	Perceived Efficacy in Patient-Physician Interactions Scale (PEPPI)
Walczak, 2014	Perceived Efficacy in Patient-Physician Interactions Scale (PEPPI) (adapted)
Ahlström, 2018	Person-Centered Care Assessment Tool for patients (P-CAT) (modified)
Ahlström, 2018	Person-Centered Care Assessment Tool for staff (P-CAT)
Ahlström, 2018	Person-Centered Climate Questionnaire (PCQ) for patients (PCQ-P) (modified)
Ahlström, 2018	Person-Centered Climate Questionnaire (PCQ) for staff (PCQ-S)
Paladino, 2019; Bernacki, 2019	The Human Connection (THC) scale
Epstein, 2017	The Human Connection (THC) scale
CAREGIVER BURDEN /INVOLVEMENT – 4 (1)	
Rosemann, 2007	Burden Scale for Family Caregivers (BSFC)
Broese, 2020	Caregiver Reaction Assessment Scale (CRA)
Ahlström, 2018	Participation of Next of Kin in Care in Nursing Homes Questionnaire (PON) (study created)
Totten, 2019	Zarit Burden Interview Scale
TEAMWORK /COLLABORATION - 3	
Seow, 2021	Assessment of Interprofessional Team Collaboration Scale II (AITCS II)
Seow, 2021	Organizational Readiness to Change Assessment survey (ORCA)
Uslu-Sahan, 2020	Teamwork Attitudes Questionnaire (TAQ)
OTHER MEASURES – 13 (6) e.g., survival, goal concordance, symptom management, ACP	
Liu, 2020	Appointment of medical power of attorney
Hallford 2011 [McCabe]	Barriers to detecting and managing depression survey (study created)
Ahlström, 2018	Bereavement follow-up offered, etc.
Walczak, 2014	Caregivers' understanding of the patients' prognosis (study created)
Catania, 2017	Composite Patient Management Score (adapted)
Paladino, 2019; Bernacki, 2019	Concordance with patient's end-of-life goals (study created)
Totten, 2019	Control Preferences Scale (CPS) (Decision making)
Walczak, 2014	Control Preferences Scale (CPS) (Decision making) (adapted)
Epstein, 2017	Estimated 2-year survival and curability of the patient's cancer (agreement with patient's estimate)
Totten, 2019	Goal-concordant care survey (study created)
Llobera, 2017	Identification and Classification of Patients Needing Palliative Care Questionnaire (IDC-PAL)
Seow, 2021	Identification of Patients Needing Palliative Care Approach
Walczak, 2014	Information Styles Questionnaire (ISQ) (adapted - 2 items)
Paladino, 2019; Bernacki, 2019	Life Priorities survey for patients survey (study created)
Paladino, 2019; Bernacki, 2019	Median 2-year survival
Ahlström, 2018	Oral health provided
Ahlström, 2018	Participant Observation Ethnography
Lin, 2021	Substitute Decision Maker Attitude Global Score (SDMA) (study created)
Lin, 2021	Substitute Decision Maker Attitude Scale (SDMA) (study created)
Lin, 2021	Substitute Decision Maker Attitude Score (SDMA) (study created)
Agar, 2015	Symptom Management at the End of life in Dementia (SM–EOLD)
Agar, 2015	Symptom management last day
Ahlström, 2018	Symptom management provided
Curtis, 2011	Time from admission to withdrawal of mechanical ventilation
Walczak, 2014	Understanding of life expectancy from physician scale (study created)
Kinley, 2014	Use of integrated care pathway (ICP) for last days of life
Hallford 2011 [McCabe]	Changes in staff practices (interview)
Ahlström, 2018	Preparedness for implementation (focus group)
Kinley, 2014	Themes of challenging issues (focus group)

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