

Review Article**Interventions to Promote End-of-Life Conversations: A Systematic Review and Meta-Analysis**

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Abstract

Context. Although several interventions aimed to promote end-of-life conversations are available, it is unclear whether and how these affect delivery of end-of-life conversations. Measuring the processes associated with high-quality end-of-life care may trigger improvement.

Objectives. To estimate the effect of interventions aimed to promote end-of-life conversations in clinical encounters with patients with advanced chronic or terminal illness or their family, on process indicators of end-of-life conversations.

Methods. Systematic review with meta-analysis (PROSPERO no. CRD42021289471). Four databases (PubMed, CINAHL, PsycINFO, and Scopus) were searched up to September 30, 2021. The primary outcomes were any process indicators of end-of-life conversations. Results of pairwise meta-analyses were presented as Risk Ratio (RR) for occurrence, standardized mean difference (SMD) for quality and ratio of means (ROM) for duration. Meta-analysis was not performed when fewer than four studies were available.

Results. A total of 4,663 articles were scanned. Eighteen studies were included in the systematic review and 16 entered at least one meta-analysis: documented occurrence (n = 8), patient-reported occurrence (n = 4), patient-reported-quality (n = 4), duration (n = 4). There was significant variability in settings, patients' clinical conditions, and professionals. No significant effect of interventions on documented occurrence (RR 1.54, 95% CI 0.84–2.84; I² 91%), patient-reported occurrence (RR 1.52, 95% CI 0.80–2.91; I² 95%), patient-reported quality (SMD 0.83, 95% CI –1.06 to 2.71; I² 99%), or duration (ROM 1.20, 95% CI 0.95–1.51; I² 65%) of end-of-life conversations was found. Data on frequency were conflicting. Interventions targeting multiple stakeholders promoted earlier and more comprehensive conversations.

Conclusion. Heterogeneity was considerable, but findings suggest no significant effect of interventions on occurrence, patient-reported quality and duration of end-of-life conversations. Nevertheless, we found indications for interventions targeting multiple stakeholders to promote earlier and more comprehensive conversations. *J Pain Symptom Manage* 2023;000:e1–e34. © 2023 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Clinical encounter, conversations, end of life, meta-analysis, systematic review, terminally ill

Key Message

This systematic review with meta-analysis found no significant effect on process indicators of interventions aimed to promote end-of-life conversations in clinical

encounters with patients with advanced chronic or terminal illnesses or their family. Heterogeneity was considerable and further investigation into their implementation as a collaborative, person-centered effort is warranted.

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Introduction

High-quality end-of-life care relies on optimal treatment of symptoms and psychosocial, spiritual and existential support for both patient and family,^{1,2} and on knowledge of patients' care preferences to deliver care aligned with their preferences. This requires effective and regular communication such as in advance care planning (ACP) conversations and shared decision-making.^{1,2}

Engagement in end-of-life conversations by patients or family, measured in different ways,³ varies significantly: from 18%⁴ to 73%⁵ in cancer to 9.5% up to 70% in nursing home settings.^{6,7} Indeed, how end-of-life conversations are being defined varies across studies,⁸ and adopting a broad definition may be reasonable.

Over the last 30 years, investments have been made to develop resources, strategies and conceptual frameworks for improving end-of-life conversations.^{9–13} However, social and healthcare professionals (hereafter professionals)-led end-of-life conversations are still sub-optimal from the perspective of both patients and their family.¹⁴ Their measurement based on quality standards represents a milestone and indicators have been identified at the level of physical environment, process, and outcome.^{15,16} In serious illnesses, the conversation process mediates goal-concordant care,¹⁷ which constitutes a priority outcome in palliative care.¹⁸ Therefore, measuring this process is critical to ensure high-quality conversations and improve the care provided. Process indicators offer objective and straightforward measures on how care is delivered and can be tracked and easily targeted in interventions aimed to improve the quality of care.^{19,20} National consensus bodies recommend ameliorations in the way end-of-life conversations are delivered with respect to their occurrence, quality, timing, frequency, and duration.^{21–24}

Several international palliative care guidelines recommend accurate documentation of end-of-life conversations in the clinical record not limited to their occurrence.²⁵ Terminally-ill patients who report any end-of-life communication have better quality of death compared to patients who do not²⁶ and the quality of dying improves as the quality of conversations increase.²⁷ High-quality end-of-life communication has been associated with improved outcomes for patient and family,^{4,8,28} while absent, late, or poor professionals-patient/family communication contributes to aggressive, lower-quality and patients' non-preferred treatment.^{3,29} The "Conversation ready" framework for improving end-of-life care assumes that the quality of documentation depends on the effectiveness and reliability of patients and families engagement, and therefore it can be employed as a basic process measure.³⁰

There is widespread support for the need to start end-of-life conversations early in the disease trajectory

to give patients and family support, promote preparedness for the upcoming worsening, and offer the opportunity to raise questions with professionals to sustain understanding and involvement of patients in making care decisions.²⁵ Unfortunately, conversations usually take place late in the disease trajectory with professionals newly involved in the patient's care, and difficult decisions are made in the heat of the moment.⁵ One-third of conversations usually take place within one month of death.³¹

A series of conversations may be needed to promote understanding and shared decisions by making information more digestible and allowing processing time.³² When end-of-life conversations are held on an ongoing basis, they strengthen trust and rapport, and favor the elicitation of personal values and goals and their revisit as the patient's conditions change.³³ Also, family satisfaction increases with frequency^{34,35} of conversations and more frequent contact is associated with not providing aggressive care.³⁶

Finally, it is recommended to arrange adequate time for conversation to allow patients and families to ask questions and express their views without feeling rushed into a decision.^{32,37} Family satisfaction increases when professionals take the time to listen,³⁸ but end-of-life conversations are often brief.^{38,39}

Several interventions aimed to promote end-of-life conversations have been developed but there is no review summarizing evidence on their effects on how end-of-life conversations are delivered. Previous systematic reviews mainly examined effects on communication skills,^{40,41} and on patients' or family caregivers' outcomes.⁴² Measuring process indicators that may predict high-quality end-of-life care can support quality improvement efforts by identifying areas of amelioration. Therefore, this paper looks at the end-of-life conversations in terms of occurrence, quality, timing, frequency, and duration.^{21–24}

The interventions aimed to promote end-of-life conversations have been assessed in trials that varied from explanatory, examining effects in ideal circumstances, to pragmatic in usual care conditions.⁴³ The type of trial is often not stated explicitly. Describing the trial approach informs the applicability of interventions aimed to promote end-of-life conversations.

Therefore, we systematically reviewed the literature and conducted meta-analyses with the primary objective to estimate the effect of interventions aimed to promote end-of-life conversations in clinical encounters with patients with advanced chronic or terminal illnesses or their family on occurrence, quality, timing, frequency, and duration of end-of-life conversations. The secondary objective was to describe trial approaches (explanatory vs. pragmatic).

Method

Design

A systematic review according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines⁴⁴ (Table A1) was performed. The protocol was registered on 6 December 2021 (PROSPERO CRD42021289471).

Search Strategy and Selection Criteria

Searching PubMed and one giant database (e.g., Scopus, Embase) at minimum is recommended for systematic reviews.⁴⁵ We searched four databases (PubMed, CINAHL, PsycINFO, and Scopus) on 30 September 2021 from inception. Searches employed controlled vocabularies and free terms, without temporal or language limits. Search strategies were adapted for each database (Appendix 2). The reference lists of included articles were screened manually to identify potentially relevant publications. Also, the PROSPERO register of systematic reviews was searched for ongoing and recently completed reviews.

In the present study, end of life conversation was defined as a clinical interaction engaging professionals and patients with advanced chronic or terminal illness, or their family, and aimed to promote patient and/or family understanding of illness progression or care options, or elicit patient's care preferences at the end of life.¹³ Studies were included if they 1) covered at least one element of this definition; 2) involved adults with advanced, progressive, incurable conditions approaching the end of life¹⁵ and/or their family. Studies involving only family caregivers were also eligible; 3) were intervention studies (i.e., pre post studies, clinical trials, controlled clinical trials, and randomized controlled trials) aimed to promote end-of-life conversations in clinical encounters, regardless the clinical setting and people targeted (i.e., patients, family caregivers, and/or professionals); 4) reported on the effect of interventions on at least one process indicator of end-of-life conversations (i.e., occurrence, quality, timing, frequency, or duration); and 5) were published in peer reviewed journals.

We excluded studies on interventions which targeted the general public or older people more generally (e.g., health campaign, public health initiatives, and policy), or were part of multi-faceted programs and the effect of the individual component of the intervention that related to end-of-life communication was not clearly recognizable and assessable.

As we focused on process outcomes, studies only assessing the impact of interventions on family-related (e.g., psychological distress) or patient-related outcomes (e.g., hospitalizations) were also excluded. Patient/family care outcomes represented additional

data that were extracted for descriptive purposes, when available.

Article Screening and Study Selection

S.G. and Y.A. independently screened titles and abstracts, removed duplicates, and reviewed the full text of potentially relevant articles, and discussed any disagreement or uncertainty regarding eligibility until reaching consensus.

Quality Assessment

S.G. and Y.A. assessed study quality using the Qual-Syst tool for quantitative research.⁴⁶ This 14-item tool scored whether specific criteria were met ("fully" = 2, "partially" = 1, "not at all" = 0). Items not relevant for a particular study design were excluded from the summary score that was calculated for each paper and allowed for direct comparison of studies with different designs. Studies were classified as high (>0.9), moderate (0.7-0.9) or low quality (<0.7).

Applicability Assessment

Trial approaches vary from explanatory, examining effects in ideal circumstances, to pragmatic when applicability of the intervention in usual care across a range of settings is relevant.⁴³ The approach becomes more explanatory as it moves away from usual practice towards ideal circumstances, offering insights in whether the intervention could work at all.

S.G. and Y.A. independently assessed applicability using the PRagmatic Explanatory Continuum Indicator Summary-2 (PRECIS-2) tool,⁴³ which focuses on trial design choices and comprises nine domains: 1) eligibility criteria; 2) recruitment; 3) setting; 4) organization (expertise and resources to deliver the intervention); 5) flexibility-delivery of intervention; 6) flexibility-measures to ensure adherence to the intervention; 7) follow up; 8) primary outcome; and 9) primary analysis. Each domain was scored on a 5-point scale (1 = very explanatory to 5 = very pragmatic). With insufficient information, we assigned a score of three.

A mean score across studies for each domain and a mean applicability rating for each study were calculated. Domains and studies were classified as mostly explanatory (<4) or mostly pragmatic (≥ 4) according to the mean domain score and the mean applicability rating, respectively.

Data Extraction

Data were entered into a standardized spreadsheet under the following headings: study characteristics; sample characteristics; narrative summary of findings; and quantitative results (number and proportion of individuals with self-reported or documented occurrence of end-of-life conversations in medical record; mean values (standard deviation [SD]) of patient-reported quality

and duration of end-of-life conversations). S.G. and Y.B. independently extracted all data, and solved disagreements by consensus with P.DG.

Primary Outcomes

The primary outcomes were process indicators of end-of-life conversations: occurrence, quality, timing, frequency or duration. Occurrence: the proportion of patients reporting, or with documented conversations. Quality: the quality of conversations either perceived by patients, family caregivers, or professionals, or according to their thematic content. Timing: time before death. Frequency: number of conversations per patient irrespective of the timing. Duration: length of conversations. Occurrence was expressed as percentage, quality as mean (SD) for quantitative measures (e.g., quality of care item) or thematic domains of conversations (e.g., values and goals, prognosis) for qualitative measures, timing as mean or median, frequency and duration as mean.

Data Analysis and Synthesis

Interventions were categorized into those targeting patients, professionals, or multiple stakeholders, and according to system level strategies e.g., alerts, electronic documentation template, and the number of sessions (one-time vs. multiple-sessions interventions).

We used prevalence ratios for occurrence, standardized mean difference (SMD) for patient-reported quality and ratio of means (ROM) for duration of end-of-life conversations. A random-effect model meta-analysis with unrestricted maximum likelihood using the sample size as a weighting factor was performed when any of the primary quantitative outcomes was assessed in at least four studies. Hartung-Knapp method was applied.⁴⁷ Heterogeneity was assessed using the Cochran Q test via a Mantel-Haenszel test and quantified by I² statistic.⁴⁸ Subgroup analyses with random-effects models investigated the association between documented occurrence and persons targeted, system strategies, and number of sessions. Sensitivity analyses for outliers were also performed.

Funnel plots were used for publication bias. Results were considered statistically significant at 2-tail $P < 0.05$. R v 4.1.2 was used for all analyses.

Results

Review Process

A total of 4,663 articles were identified; 32 full texts remained after screening titles and abstracts. Seventeen were excluded (Table A2). Three additional articles were identified from reference lists; thus 18 studies were included (Fig. 1). These assessed five process

outcomes: occurrence,^{31,49–58} quality,^{49,50,52,53,55,56,58–63} timing,^{31,55,58} frequency,^{31,55} and duration^{62–65} of end-of-life conversations (Table 1 and 2). Two articles could not be included in any meta-analyses: one⁶⁰ did not quantify the quality of conversations, and one⁶¹ did not provide overall estimates of changes in the patient-reported quality of conversations.

Characteristics of Included Studies

Thirteen^{31,49–60} studies were conducted in the United States, two^{62,63} in Australia, one⁶⁴ in the Netherlands, one⁶⁵ in France, and one⁶¹ in Japan; all but two^{51,57} were published after 2005. Ten^{49–52,55,59,60,63–65} studies were classified as high, five^{31,53,56,57,62} as moderate and three^{54,58,61} as low quality (Table A3).

Thirteen^{31,49–52,54–57,61,62,64,65} studies were hospital-based, three^{59,60,63} involved both clinics and inpatient services, and two^{53,58} only clinics.

Studies involved patients with cancer,^{50–52,54–57,59–65} end-stage pulmonary,^{31,49,51,52,56,57,59,65} cardiac,^{51–53,56,57,59,65} liver,^{51,52,59,65} renal,^{52,56,57} or metabolic disease,^{52,57} or multiple severe comorbidities^{51,58,59}. Only one study involved patients with dementia,⁵⁶ gastrointestinal,⁵⁷ infectious,⁵⁷ neurologic,⁵⁷ or rheumatologic⁵⁷ end-stage disease. Among professionals, studies most frequently involved oncologists,^{50–52,55,60,62–64} or internists^{49,51,52,57,59} (Table 1, A4).

Definition of End-of-Life Conversations

In the included studies, end-of-life conversations were defined as discussions, conversations, communications, talks, or information about symptom management,^{51,53} treatment plans,^{51,53,61} end-of-life care,^{57,59,60,63} goals of care,^{52,54–56,58} treatment options with their benefits and harms,^{54,55,61,62,64} illness trajectory and prognosis,^{52–54,56,58,60,62,63} and patients' values or care preferences^{31,49–51,55,56,58,62,64,65} (Table 1).

Interventions to Promote End-of-Life Conversations

In all, 12 unique interventions across 18 studies were identified. The interventions targeted multiple stakeholders (n = 10),^{31,49,52,53,55,60,62–65} professionals only (n = 7),^{50,51,54,56–59} or patients only⁶¹. Four studies^{60,62,63,65} involved family caregivers.

Coaching (n = 7),^{50,53,55,56,58,60,62} a patient-specific information form about end-of-life care preferences (n = 4),^{31,49,51,53} written resources such as question prompts list, information leaflet, communication guide, and communication guidelines or standardized protocols (n = 4),^{55,60,62–65} videos with educational or supportive purposes (n = 3),^{60,62,64} and a patient-specific communication tips form (n = 2)^{52,53} targeted both patients and professionals. Disclosure of more detailed information about clinical conditions⁶¹ and face-to-face meeting⁶² targeted only patients. Lectures (n = 6),^{50,54,55,57,59,64} role play (n = 6),^{50,57–60,64}

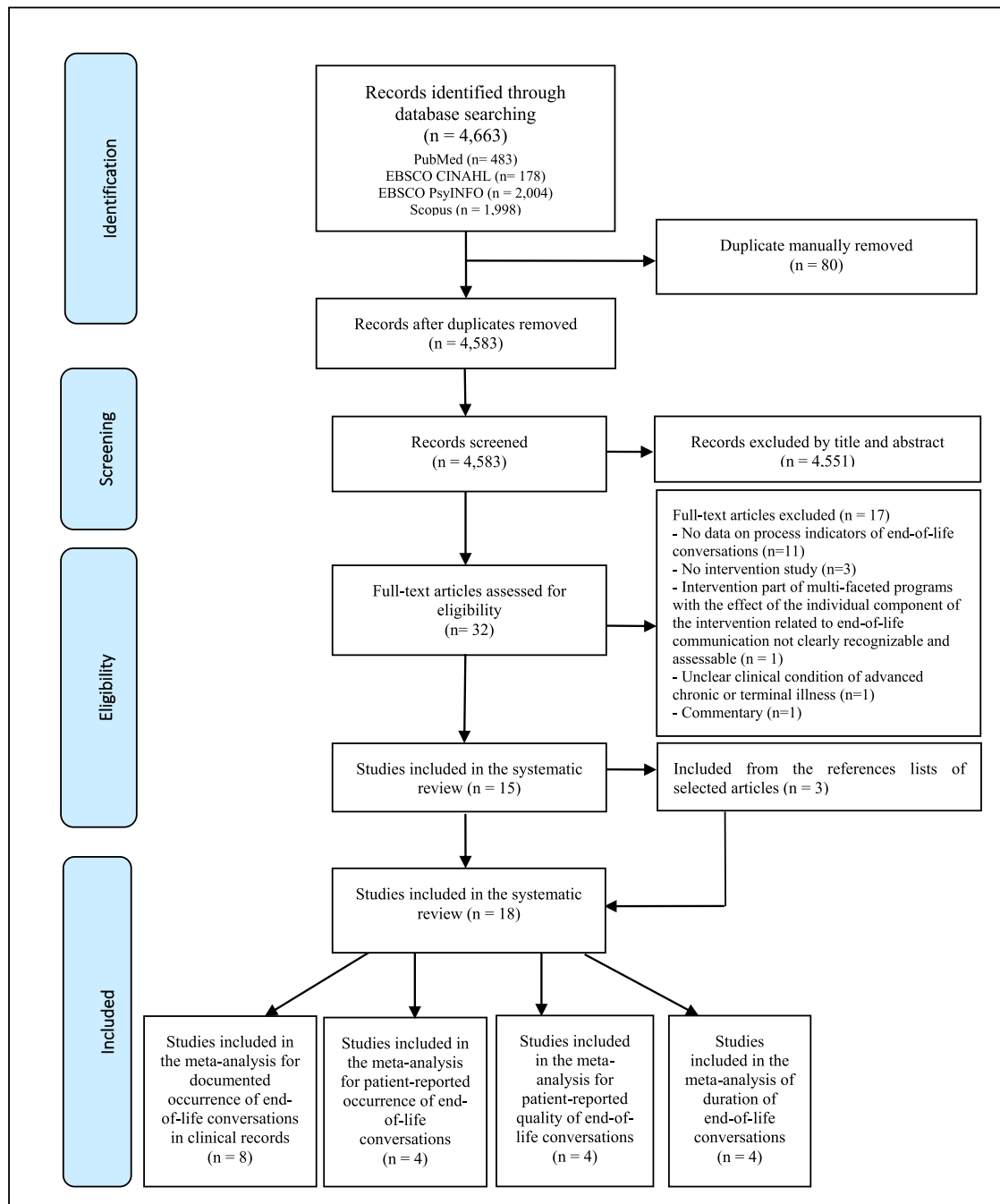


Fig. 1. PRISMA flow-chart depicting the main stages of the systematic review process. Page MJ, McKenzie JE, Bossuyt PM. et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews.

individual- or small group-based reflective discussions (n = 5)^{54,57,59,60,64} provision of a prognostic estimate (n = 1),⁵¹ or palliative care consultation (n = 1)⁵⁴ targeted only professionals. Five^{51,55–58} studies also introduced strategies at the system level. System strategies included email reminders, alerts, or administrative prompts (n = 2),^{56,57} an electronic documentation template for conversations (n = 2),^{55,58} and a trained nurse who facilitated conversations (n = 1)^{51,58}. Eight^{31,49,52,53,57,61,63,65} studies assessed one-time

interventions while ten^{50,51,54–56,58–60,62,64} multiple-session interventions. Interventions were delivered by nurses only,^{51,53,62} physicians only,^{50,63,65} experienced trainers (undefined qualification),^{56,64} or multi-professional teams^{43,54,55,57,59,60} (Table 1, 3, and A5).

Outcomes of Interventions Aimed at Promoting End-of-Life Conversations

All funnel plots exhibit asymmetry, as depicted in Figure A1. While asymmetry has traditionally been

Table 1
Characteristics of Included Studies

Author(s) (Country, year) Quality Score* Applicability**	Study Characteristics							Study Sample Characteristics					Main Findings	
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease	Life Expectancy (m)	Family Members (N) Males (%), Age, Years	Professionals Profile	Working Experience, Years ^a		
Au et al. (USA, 2012) High Mostly pragmatic	Cluster RCT / January 2004 to November 2007	Discussions about preference for EoL care	I: an individualized patient-specific feedback form based on a previous patient's survey about preference for EoL care was provided to physicians (n = 42) and their patients (n = 194) C: no patient-specific feedback for neither physicians (n = 50) nor patients (n = 182)	NA	Patient-Reported Quality of EoL Conversations Proportion of patients reporting occurrence of conversation about EoL preferences between patients and their physician or their surrogate	Patients' questionnaire (baseline and two weeks after the clinic visit)	Two hospitals / Not reported	N = 376 Chronic obstructive pulmonary disease	Not reported	-	N = 92 I: 42 M: 21 (50) Age: Not reported C: 50 M: 22 (44) Age: Not reported	Internists, lung specialists, geriatricians	Not reported	1) Improved Quality of EoL conversations Assessed with the QoC Questionnaire 0–100 in the Intervention Group (Adjusted difference 5.74 points, p = 0.03, Cohen effect size = 0.21); 2) More intervention patients reporting EoL conversations with their clinicians (Adjusted difference 27.4%, P < 0.001); 3) More intervention patients reporting EoL conversations with their surrogate (Adjusted difference 10.9%, p < 0.01).
Bickell et al. (USA, 2020) High Mostly pragmatic	Cluster RCT / Not reported	Conversations on eliciting patient values about care and treatments	I: physicians received a 2-hour small group role play session+4 coaching visits (n = 11) C: no training (n = 11) All intervention and control physicians attended a didactic lecture about the importance of conducting EoL discussions	Physician	Proportion of patients reporting occurrence of EoL conversations Proportion of patients reporting high-quality EoL conversations	Patients' questionnaire (within days after the clinic visit and at 6 months)	Three hospitals / Not reported	N = 265 Advanced cancer	< 24	-	N = 22 I = 11 M: 7 (64) Age: 44.3 (8.9) C = 11 M: 8 (73) Age: 43.5 (10.7)	Oncologists	I: 17.3 (Not reported) C: 17.0 (Not reported)	1) No difference in the occurrence of EoL conversations in intervention patients compared to control patients (52% vs. 48%, OR 0.98, 95% CI. 0.95 – 1.01); 2) No difference in the occurrence of high-quality EoL conversations (scores of 9–10 on NRS 0–10) in intervention patients compared to control patients (62% vs. 67%, P = 0.37); 3) No difference in the composite score of occurrence or quality of EoL conversations in intervention patients compared to control patients (Adjusted OR 0.84, 95% CI 0.57–1.23); 4) At 6 months, no difference in the mean number of emergency department visits and hospitalization, median time between hospice enrollment and death, chemotherapy administration, and intensive care unit admission.

(Continued)

Table 1
Continued

Author(s) (Country, year) Quality Score ^a Applicability ^{b,c}	Study Characteristics				Study Sample Characteristics				Main Findings				
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease		Life Expectancy (m)	Family Members (N) Males (%) Age, Years	Professionals Professional Profile	Working Experience, Years ^d
Clayton et al., (Australia, 2007) High Mostly pragmatic	Parallel-group RCT / October 2002 to August 2004	Discussions about prognosis and EoL issues	I: patients (and their family caregiver if present) were given a question prompt list 20–30 minutes before their consultation with the physician; physicians were asked to actively endorse and refer to the question prompt list using a standardized protocol (n = 92) C: usual consultation (n = 82)	Physician	Count of overall questions, for palliative care service, physical symptoms, treatment, prognosis, quality of life, support, concerns about professional care, caregiver and EoL issues and for patients and their family caregivers Total number of items discussed Duration of consultation	Audio-recorded consultations	Nine palliative care services (mostly outpatient clinics) / Not reported	N = 174 Advanced cancer	Not reported	N = 123 E: 70 M: NR Age: NR C: 53 M: NR Age: NR	N = 15 M: Not reported Age: Not reported	Palliative care physicians	Not reported
Connors et al., (USA, 1995) High Mostly pragmatic	Cluster RCT / January 1992 to January 1994	Discussions to elicit preferences, improve standing of outcomes, encourage attention to pain control, and facilitate planning for future decisions	I: physicians received prognosis information and patient preferences for EoL care. A skilled nurse had multiple contacts with the patient, family, physician and hospital staff to elicit and document preferences, improve understanding of outcomes, encourage attention to pain control, and facilitate planning for future decisions	Nurse	Proportion of patients reporting occurrence of EoL conver sations	Patients interview or family caregivers interview when patient interview was not possible (between days 2 and 7 and again between days 6 and 15 after study enrollment)	Five hospitals / Not reported	N = 4804 Oncologic, pulmonary, cardiac and liver end- stage disease, coma, or multiple organ system failure with sepsis	Not reported	-	N = 27 phy sician's specialty groups I: 16 physician specialty groups C: 11 physician specialty groups	Internal medicine, pulmono logy/ medical intensive care unit, oncology, surgery, and cardiology	Not reported

(Continued)

1) More overall questions ($P < 0.0001$), questions about palliative care service ($P < 0.0001$), prognosis ($P = 0.004$), quality of life ($P < 0.0001$), and support ($P < 0.0001$) in intervention patients;
2) More overall questions ($P = 0.0005$), questions about palliative care service ($P = 0.03$), prognosis ($P = 0.05$), and caregiver issues ($P < 0.0001$) in intervention family caregivers;
3) Overall, 25% more items discussed during consultations with intervention patients compared to control ($P < 0.0001$);
4) Increased consultation duration (37.8 minutes in the intervention group vs. 30.5 minutes in the control group, ratio 1.24 95% CI 1.09–1.41);
5) No difference in patients' anxiety, their satisfaction with communication, and overall measures of achievement of information needs at 24 hours and 3 weeks.
1) No difference in the prevalence or timing of documented DNR orders (Adjusted ratio of median time 1.02, 95% CI 0.90–1.15);
1) No difference in the proportion of intervention patients or family caregivers reporting discussed cardiopulmonary resuscitation preferences compared to control patients (40% vs. 37%);
2) No difference in the median days spent in intensive care units, comatose, or receiving mechanical ventilation, neither in moderate to severe self-reported pain during the five-yr study period.

Table 1
Continued

Author(s) (Country, year) Quality Score* Applicability**	Study Characteristics				Study Sample Characteristics				Main Findings				
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting / Size (N)	Patients Underlying Disease		Life Expectancy (m)	Family Members (N) Males (%), Age, years	Professionals (N) Males (%), Age, years	Working Experience, Years ^a
Curtis et al. (USA, 2013) High Mostly explanatory	Cluster RCT / October 2007 to January 2013	Discussions about palliative and EoL care	I: physician and nurse trainees received eight 4-hour sessions including overview didactic with demonstration role-play, simulation and reflective discussions (n = 21) C: usual education (n = 234)	Physician Nurse	Patients, family caregivers and clinicians surveys (during the 6-month period preceding intervention and in the 10 months following the intervention)	Primary care clinics and inpatient services / Not reported	N = 1717 Oncologic, pulmonary, cardiac or liver end-stage disease, or multiple severe comorbidities	12 to 24	N = 898 I: 412 M: 106 (26) Age: 56.8 (13.7) C: 486 M: 124 (26) Age: 56.6 (13.5)	N = 445 I: 211 M: 91 (43) Age: 30.5 (5.8) C: 234 M: 98 (42) Age: 30.3 (4.8) Clinicians evaluate tors N = 890	Internal medicine residents and nurse practitioner trainees	I: median 1.0 IQR (1-2) C: median 1.0 IQR (1-2)	1) Comparing intervention to control, no difference in reported quality of EoL conversations on the QoC questionnaire score (0-10) for patient (Adjusted b 0.38, 95% CI -0.14 to 0.90, $P = 0.15$); family caregiver (Adjusted b 0.11, 95% CI -0.77 to 0.98, $P = 0.81$); and clinician (Adjusted b 0.19, 95% CI -0.08 to 0.47, $P = 0.17$); 2) No association between the intervention and patients' physical and mental status, or family caregivers' depression score; increased depression among intervention patients ($P = 0.006$).
Curtis et al. (USA, 2018) High Mostly explanatory	Cluster RCT / February 2014 to May 2016	Talks with patients about their prognosis or goals of care	I: a patientspecific 1-page communication tips based on a previous survey was sent to patients (n = 249) and clinicians (n = 65) one week and 1 or 2 working days prior to the clinic visit, respectively C: patients completed the same survey but no information was provided to patients (n = 288) or clinicians (n = 67) management, and advance care planning	NA	Patients' questionnaire (two weeks after the clinic visit) Electronic medical record review (from the clinic visit through the following 6 months)	Seven hospitals, one cancer center, two outpatient network / Not reported	N = 494 Oncologic, pulmonary, cardiac, liver renal, or metabolic end-stage disease	<24	N = 124 M: 58 (46.8) Age: 47.2 (9.6) I: 59 M: Not reported Age: Not reported C: 65 M: Not reported Age: Not reported	Family medicine, internal medicine, oncology, pulmonology, gastroenterology, nephrology, geriatrics	Not reported	1) More intervention patients reporting occurrence of EoL conversations (74% vs. 31%, Adjusted β 1.25 [95% CI 0.94-1.56], $P < 0.001$); 2) More intervention patients with documented EoL conversations (62% vs. 17%, Adjusted β 1.25 [95% CI 0.92-1.58], $P < 0.000$); 3) Higher mean quality of EoL conversations assessed with the QoC questionnaire (a priori selection of 4 items rated from 0 to 10) in intervention patients (4.59 vs. 2.13, Adjusted β 2.02 [95% CI 0.48-3.57], $P = 0.01$); 4) No difference in depression or anxiety at 3 and 6 months.	
Parallel-group RCT / two-yr period	Discussions about illness trajectory, prognostic estimates, symptom	I: patients received nurse-led telephone-based previsit coach ingr-one-page patient activation outline constructed during the call and shared with both the patient and their physician	Nurse	Proportion of patients with documented occurrence of EoL conversations Patient-reported quality of EoL conversations	Patients' question naire and electronic record review (baseline and two weeks after the clinic visit)	Patients' question naire and electronic record review (baseline and two weeks after the clinic visit)	One heart failure outpatient clinic / 600 patients each year	N = 80 Heart failure	Not reported				

(Continued)

Table 1
Continued

Author(s) (Country, year) Quality Score ^a Applicability ^{b,c}	Study Characteristics				Study Sample Characteristics				Main Findings				
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease		Life Expectancy (m)	Family Members (N) Males (%) Age, years	Professionals Professional Profile	Working Experience, Years ^d
				along with suggestions for addressing barriers + patient activation, skills enhance ment, and role playing conversation openers (n = 4) C: regular visit (n = 39)									<p>1) More intervention patients with documented EoL conversations (73% vs. 2.6%, $P < 0.001$);</p> <p>2) Higher quality of EoL conversations assessed with the QoC questionnaire (9–10) in intervention patients ($P = 0.03$, Cohen effect size = 0.43);</p> <p>3) No difference in the quality of general conversations between intervention and control patients ($P = 0.76$, Cohen effect size = 0.13);</p> <p>4) No difference in completion of advance directives between intervention and control patients (16.1% vs. 7.7%, $P = 0.24$);</p> <p>5) No difference in palliative care referral, depression, and anxiety.</p>

(Continued)

Table 1
Continued

Author(s) (Country, year) Quality Score* Applicability**	Study Characteristics				Study Sample Characteristics				Main Findings				
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease		Life Expectancy (m)	Family Members (N) Males (%), Age, Years	Professionals Professional Profile	Working Experience, Years [†]
Epstein et al. (USA, 2017) High Mostly explanatory	Cluster RCT / August 2012 to October 2015	Discussions about disease course, prognosis, treatment decisions and EoL care	I: oncologists received a two-sessions in-office training (1.75 hours) using a brief video and feedback from standardized patients portraying roles of patients +focused learner-centered reflective feedback. Patients and their caregivers received a single one-hour coaching session incorporating a question prompt list +up to 3 follow-up phone calls in the next 3 months. C: no training	Nurse Social worker	Composite measure of quality of communication (score of engaging patients in consultation [Active Patient Participation Coding], responding to patients' emotions [Verona VR-CoDES], informing patients about prognosis and treatment choices [Prognostic and Treatment Choices [PTCC] Informing sub-scale], and balanced framing of decisions [PTCC Balanced Framing sub-scale])	Audio-recorded consultation (after the first training session)	Community-based cancer clinics, academic medical centers and community hospital / Not reported	N = 265 Advanced cancer	< 12	N = 194 M: Not reported F: 19 Age: Not reported	N = 38 M: 12 (63) Age: 43.9 (10.3) C = 19 M: 15 (79) Age: 45.3 (9.8)	Oncologists	Not reported
Hanson et al. (USA, 2017) Low Mostly pragmatic	Pre-post study / July 2015 to May 2016	Communication between the patient or patient surrogate and a treating physician or advanced practice provider, with content covering some of the following: treatment goals, and values, prognosis, cancer treatment choice, life-sustaining treatment choices, or hospice or comfort care options.	I: residents, medical students, nurse practitioners, and physicians assistants received monthly 45-minute communication skills training (didactic +group discussion) for 10 months +monthly triggered specialty palliative care consultation for 8 months	I: residents, medical students, nurse practitioners, and physicians assistants received monthly 45-minute communication skills training (didactic +group discussion) for 10 months +monthly triggered specialty palliative care consultation for 8 months	Nurse Physician Social worker	Proportion of patients with documented occurrence of EoL conversations	Medical record review / Not reported	Medical oncology unit of a 804-bed university hospital	N = 172	Advanced cancer Not reported	Not reported	Not reported	

(Continued)

1) **Improved patient-centered communication in the intervention group** (Adjusted *b* 0.34 [95% CI 0.06–0.62], *P* = 0.02) corresponding to 5.7 additional “engaging” statements (+44%), 0.6 additional responses to emotion statements (+71%), and 1.4 additional statements regarding prognosis and treatment choices (+38%);
2) No difference in quality of life and aggressive care.

Table 1
Continued

Author(s) (Country, year) Quality Score ^a Applicability ^{b,c}	Study Characteristics					Study Sample Characteristics			Main Findings				
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease		Life Expectancy (m)	Family Members (N) Males (%) Age, years	Professionals Professional Profile	Working Experience, Years ^d
Henselmans et al. (The Netherlands, 2020) High Mostly pragmatic	Four parallel arms RCT / 2016 to 2018	Discussions about the benefits and harms of the available option as well as the patient's values and preferences	Physicians' 10-hour training consisted of a reader, two group sessions (videos+role play), an individual booster session with personal feedback on a videotaped consultation, and a consultation room tool (n = 15). Patients (n = 97) received a patient communication aid (a paper brochure +question prompt list+value clarification methods)	Physicians' 10-hour training consisted of a reader, two group sessions (videos+role play), an individual booster session with personal feedback on a videotaped consultation, and a consultation room tool (n = 15). Patients (n = 97) received a patient communication aid (a paper brochure +question prompt list+value clarification methods)	Experienced trainer	Duration of consultation	Videotaped consultation	Seven hospitals / Not reported	N = 194 Advanced cancer	< 12	N = 31 M: 8 (26.9) Age: 41.5 (9.5) I: 15 M: Not reported Age: Not reported C: 16 M: Not reported Age: Not reported	Oncologists	7.7 (9.0)

1) More patients in the post-intervention cohort with documented EoL conversations compared to the pre-intervention cohort (48% vs. 29%, $P = 0.013$);

2) Increased EoL conversations over time in temporal trend analysis ($P = 0.009$);

3) Significant 15% increase in the rate of palliative care consultation; no difference in screening pain, dyspnea, and nausea while reduced screening of constipation; no difference in spiritual beliefs assessment, 30-day readmission, and intensive care unit transfer.

1) Consultation duration (minutes) of 27.51 (12.06), 30.08 (16.03), 36.27 (14.32), and 31.01 (14.27) in group A, B, C, and D respectively;

2) Increased duration of consultation in trained physicians (b 5.43, 95% CI 1.05 -9.54, Cohen' d 0.36);

3) Unchanged duration of consultation in patients receiving the communication aid (b 1.11, 95% CI -3.28 to 5.45, Cohen' d 0.07);

4) Unchanged duration of consultation when interventions were combined (b 0.95, 95% CI -3.24 to 5.71, Cohen' d 0.06);

5) No effect of any interventions on patients' satisfaction with consultation, patients' uncertainty about medical decisions, and quality of life at three months after consultation.

(Continued)

Table 1
Continued

Author(s) (Country, year) Quality Score* Applicability**	Study Characteristics				Study Sample Characteristics				Main Findings			
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease		Life Expectancy (m)	Family Members (N) Males (%) Age, Years	Professionals Professional Profile
Lakin et al. (USA, 2017) Low Mostly pragmatic	Controlled clinical trial / January 2014 to May 2015	Discussions about prognosis, values, goals, or care preferences	I: clinicians received 2.5 hours role-play-based training on the use of a conversation guide +monthly coaching (via telephonic, email or in-person) +system changes (i.e., surprise question, electronic templated, nurse coordinator was notified about patients at high risk of death within 2 yrs to coordinate conversation timing) (n = 59) C: clinicians received no intervention components except for identification of patients using the surprise question (n = 80)	Palliative care experts	Proportion of patients with documented occurrence of at least one EoL conversation before death Timing of the first documented EoL conversation before death Comprehensiveness of EoL conversations Proportion of patients with documented occurrence of EoL conversations in the advance care planning module of the electronic medical record	Electronic medical record review (dead patients)	Fourteen primary care clinics / Not reported	N = 178 Multiple severe comorbidities	<24	-	Physicians, nurse care coordinators, social workers	Not reported
Laurette et al. (France, 2007) High Mostly pragmatic	Parallel-group RCT / May 2005 to October 2005	Discussions about patients' wishes aimed to promote understanding about the goals of care and offer support	I: clinicians were asked to follow detailed guidelines for EoL conferences; family caregivers received a bereavement information leaflet (n = 63) C: usual practice (n = 63)	Physicians	Duration of consultation Cloning of family conference Timing of the first documented EoL conversation Proportion of patients with documented occurrence of EoL conversations in the advance care planning module of the electronic medical record	Cloning of family conference	22 Intensive Care (medical and surgical) Units, 15 in teaching hospital and 7 in general hospitals / median number of bed (IQR) 16 (12-21)	N = 126 Chronic obstructive pulmonary disease, chronic heart failure, cancer, cirrhosis	A few days	N = 126 I: 63 (23) M: 12 (23) Age: median 54 (IQR 46-64) C: 63 (30) Age: median 54 (IQR 47-58)	Not reported	Not reported
Pre-post study / April 2004 to March 2008	Information including disease conditions, therapeutic measures, care procedures, and treatment plans	I: disclosure of more detailed information about cancer according to the baseline level of awareness;	Not reported	Patient-reported quality of communication between patient and family Patient-reported awareness:	communication between medical professionals Patient-reported quality of communication between patient/family and professional	Patients' questionnaire (before and one week after disclosing information)	Two hospitals / Not reported	N = 73 Advanced cancer	Not reported	-	-	-

(Continued)

1) **More intervention patients with documented occurrence of at least one conversation before death** (62.4% vs. 42.9%, $P = 0.002$);
2) **No significant difference in the timing of the first documented conversation in intervention patients compared to control patients** (mean 133.7 d before death vs. 129.2 d, respectively, $P = 0.8197$);
3) **More comprehensive conversations about values and goals in intervention patients compared to control patients** (mean 2.8 elements/patient vs. mean 1.8 elements/patient, $P = 0.0301$); **no differences in the discussion of prognosis, life-sustaining treatments, or EoL planning**;
4) **More intervention patients with documented conversation in the advance care planning module of the electronic medical record** (44.4% vs. 3%, $P < 0.001$);
5) **No difference in hospice use** neither in length of hospice stay, longer family conference in the intervention group than in control (median 30 [IQR 19–45] minutes vs. 20 [IQR 15–30] minutes);
2) **Lower symptoms of post-traumatic stress disorder** ($P = 0.01$), anxiety ($P = 0.02$), and depression ($p = 0.003$) in the intervention group than in control.

1) **No improvement in the quality of any communication for disclosed group A patients on STAS-J (0–4)**;
2) **Improved communication quality between patients and families, between medical professionals, and between patient/families and medical professionals for both disclosed group B and C patients on STAS-**

Table 1
Continued

Author(s) (Country, year) Quality Score ^a Applicability ^{b,c}	Study Characteristics				Study Sample Characteristics			Main Findings						
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)		Patients Underlying Disease	Life Expectancy (m)	Family Members (N) Males (%) Age, years	Professionals (N) Males (%) Age, Years	Working Experience, Years ^d	
		Group A: disclosure of cancer diagnosis (n = 8) Group B: disclosure of life-threatening disease (n = 25) Group C: disclosure of poor prognosis (n = 40)											<p>J (0-4) ($P = 0.0035$, $P = 0.0062$, $P = 0.0013$ and $P = 0.02$, $P = 0.0082$, and $P = 0.0057$, respectively);</p> <p>3) No improvement in the quality in any communication in not disclosed group A and B patients on STASJ (0-4):</p> <p>4) Improved communication quality between medical professionals and between patients/families and medical professionals for nondisclosed group C patients on STASJ (0-4).</p>	
Paladino et al. (USA, 2019) High Mostly pragmatic	Cluster RCT / September 2012 to June 2016	Discussions about life-prolonging procedures, patients' broader values, goals, and informed preferences	I: physicians received structured communication guide+2.5 hours skilled-based training program +coaching-system changes (i.e., surprise question, email reminders, electronic documentation template) (n = 48); C: physicians received no intervention components except for identification of patients using the surprise question (n = 43); no supporting documents for patients (n = 85)	Palliative care faculty	Proportion of patients with documented occurrence of at least one EoL conversation before death Timing of the first documented EoL conversation before death Comprehensiveness of EoL conversations Frequency of documented EoL conversations Proportion of patients with documented occurrence of EoL conversations in an accessible module of the electronic medical record	Electronic medical record review (after death)	Three oncologic centres/ Not reported	N = 161 Advanced cancer	<24	-	N = 91 M: Not reported Age: Not reported I: 48 M: Not reported Age: Not reported C: 43 M: Not reported Age: Not reported	Oncologists	mean 11.5 (95% CI 9.2-13.8)	<p>1) More intervention patients with documented occurrence of at least one conversation before death (96% vs. 79%, $P = 0.005$);</p> <p>2) Earlier conversations in the intervention group than in the control group (median 143 [IQR, 71-325] d before death vs. 71 [IQR, 33-166] d, respectively, $P < 0.001$);</p> <p>3) More intervention patients with documented conversation about values/goals (89% vs. 44%, $P < 0.001$), prognosis/illness understanding (91% vs. 48%, $P < 0.001$), and life-sustaining treatment preferences (63% vs. 32%, $P = 0.004$); no difference in documented conversation about EoL ACP (80% intervention vs. 68% control, $P = 0.08$);</p> <p>4) Higher comprehensiveness ($P < 0.001$) and frequency (mean 3.1 [95% CI 2.5-3.6] conversation per patient vs. mean 2.1 [95% CI 1.4-2.8] conversation per patient, $P = 0.02$) of documented conversations in intervention patients;</p> <p>5) More intervention patients with documented conversation in the accessible module of the electronic medical record (61% vs. 11%, $P < 0.0001$).</p>

(Continued)

Table 1
Continued

Author(s) (Country, year) Quality Score* Applicability**	Study Characteristics				Study Sample Characteristics				Main Findings				
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease		Life Expectancy (in years)	Family Members (N) Males (%), Age, Years	Professionals Professional Profile	Working Experience, Years [§]
Folink et al. (USA, 2019) Moderate Mostly pragmatic	Cluster RCT / July 2017 to March 2018	Conversations about goals, preference and prognosis that affect treatment decisions	I: physicians received alerts and 2-hour communication coaching provided in 3 sessions (n = 8) C: no training (n = 7)	Communication coach	Proportion of patients with documented occurrence of EoL conversations Comprehensiveness of EoL conversations	Medical record review / Not reported	One hospital / Not reported	N = 428 Metastatic cancer, dementia, congestive heart failure, chronic obstructive pulmonary disease, or end-stage renal disease	Not reported	N = 15 I: 8 M: 4 (50) Age: 38.5 (4.7) C: 7 M: 5 (71) Age: 34.5 (3.2)	Not reported	Not reported	1) No difference in documented conversations between intervention and control (OR 0.97, 95% CI 0.64–1.46, <i>P</i> = 0.8616); 2) Increased percentage of time among trained physicians to address emotions (from 50% to 94%), discuss priorities (from 42% to 88%), elicit understanding of illness (from 42% to 75%), discuss prognosis (from 42% to 50%), and make recommendations (from 33% to 50%); 3) No difference in documented ACP in intervention compared to control (4.5% vs. 3.8%, OR 2.01, 95% CI 0.96–4.21, <i>P</i> = 0.052); 4) Fewer overall (<i>P</i> < 0.001) and 30-day readmission rates (<i>P</i> = 0.009) in intervention compared to control; no significant difference in length of stay, palliative care referral and hospice referral.
Rinke et al. (USA, 2017) Moderate Mostly pragmatic	Follow-up study of a cluster RCT / January 2004 to September 2013	Discussions to help patients and surrogate decision makers prepare to make in-the moment decisions based on one's values and preference for care	I: an individualized patient-specific feedback form based on a previous patient's survey about preference for EoL care was provided to physicians and their patients C: no patient-specific feedback for neither physicians nor patients	NA	Proportion of patients with documented occurrence of at least one EoL conversation before death Frequency of documented EoL conversation Timing of documented EoL conversation before death	Medical record review (dead patients)	One hospital / Not reported	N = 157 Chronic obstructive pulmonary disease	Not reported	-	-	-	1) No difference in the proportion of patients with documented occurrence of at least one EoL conversation before death between intervention and control (75% vs. 72%, Adjusted OR = 1.30, 95% CI 0.58–2.92, <i>P</i> = 0.53); 2) No difference in the odds of completing an advance directive (OR 1.30, 95% CI 0.614–2.77); 3) Documentation of 451 unique EoL conversations for 115 of 157 (78%) patients; 4) No difference in the mean frequency of documented EoL conversations in intervention patients compared to control patients (mean 3.1 (SD 4.0) vs. 2.6 (SD 3.2), <i>P</i> = 0.47); 5) Occurrence of EoL conversations over 3.6 yrs (range from 9 months to 8.6 yrs); 54 of 157 (34%) EoL conversations conducted within one month of death.

(Continued)

Table 1
Continued

Author(s) (Country, year) Quality Score** Applicability**	Study Characteristics							Study Sample Characteristics					Main Findings	
	Design / Study Period	Definition of EoL Conversation	Intervention	Who Delivered the Intervention	Process Indicator(s) of EoL Conversations Investigated	Data Source (Time of Data Collection)	Setting/ Size (N)	Patients Underlying Disease	Life Expectancy (m)	Family Members (N) Males (%) Age, years	(N) Males (%) Age, Years	Professionals Professional Profile		Working Experience, Years [†]
Shorr et al. (USA, 2000) Moderate Mostly pragmatic	Pre-post study / pre- intervention cohort February to May 1995; post- intervention cohort April to June 1997	Discussions regarding EoL care and EoL issues	I: Physicians received administrative prompts to encourage EoL conversations and had a mandatory one-day educational seminar on EoL issues based on didactic lectures, small group discussions and role-playing	Ethics committee members	Proportion of patients with documented occurrence of EoL conversations	Medical record review / Not reported	One hospital / Not reported	N = 305 Cardiac, pulmonary, gastrointes- tinal, infectious, renal, oncologic, neurologic, rheumato- logic, or metabolic end-stage disease	<36	-	N = 115/167 (68.9%) comple- ted the training M: Not reported Age: Not reported	Internists	Not reported	1) No difference in documented occurrence of EoL conversations in the pre-intervention cohort compared to the post- intervention cohort (34.8%, 95% CI 28.0–42.2 vs. 33.9%, 95% CI 25.7–43.1); 2) No difference in documented DNR orders in the pre- intervention cohort compared to the post-intervention cohort (28.8%, 95% CI 22.5-36.0 vs. 27.3%, 95% CI 19.8-36.3, $P =$ 0.71).
Walczak et al. (Australia, 2017) Moderate Mostly pragmatic	Parallel-group RCT / Not reported	Discussions about prognosis and end-of- life care preference and future care options	I: Patients (n = 61) received two sessions of a nurse- led communication support programme (45- min face-to-face meeting based on a question prompt list and DVD discussing ACP+15 min telephone booster session) and caregivers could join; physicians were cued to use the question prompt list and question asking during consultation C: No communication support programme for patients (n = 49) nor physicians were cued to use the question prompt list and question asking	Nurse	Count of cues and questions for prognosis, EoL care future care options and overall for patients and their caregivers during consultations Duration of consultation	Audio-recorded consultations	Six cancer centres / Not reported	N = 110 Advanced cancer	2-12	M: Not reported Age: Not reported	N = Not reported M: Not reported Age: Not reported	Oncologists	Not reported	1) More overall cues and questions ($P = 0.025$), cues and questions about prognosis ($P = 0.010$), EoL care ($P = 0.001$), and future care options ($P = 0.028$) in intervention patients; 2) More cues and questions about prognosis in intervention family caregivers ($P = 0.014$); 3) Unchanged consultation duration (20.6 minutes in the intervention group vs. 20.4 minutes in the control group, $P = 0.307$); 4) At one month, no difference in the overall, physical, social, emotional, or functional well- being between intervention and control.

Note. Process outcomes include occurrence, quality, timing, frequency, or duration of end-of-life conversations.

The primary outcome(s) of each study is/are in bold.

Abbreviations. ACP, Advance Care Planning; C, Control; CI, Confidence interval; d, day; DNR, Do Not Resuscitate; EoL, end of life; I, Intervention; IQR, Interquartile range; m, month; NA, Not applicable; NRS, Numeric Rating Scale; QoC, Quality of care; RCT, Randomized Controlled Trial; SE, Standard error; STAS-J, Japanese version of the Support Team Assessment Schedule.

[†]Expressed as mean (SD) if not differently specified.

*According to the Quallsyst critical appraisal criteria.

**According to the PRagmatic Explanatory Continuum Indicator Summary (PRECIS) version 2 tool.

Table 2

Process Outcomes of Interventions Aimed at Promoting End-of-Life Conversations between Professionals and Patients with Advanced Chronic or Terminal Illnesses or their Family Caregivers Assessed in the Included Studies

Author(s) (Country, year)	Process Outcomes of Interventions Aimed at Promoting End-of-Life Conversations									
	Occurrence of End-of-Life Conversations			Quality of End-of-Life Conversations				Timing of End-of-Life Conversations	Frequency of End-of-Life Conversations	Duration of End-of-Life Conversations
	Occurrence of End-of-Life Conversations Documented in Medical Record	Occurrence of End-of-Life Conversations Documented in a Specific Module of the Electronic Medical Record	Patient-Reported Occurrence of End-of-Life Conversations	Quality of End-of-Life Conversations According to Their Content	Patient-Reported Quality of End-of-Life Conversations	Family Caregiver-Reported Quality of End-of-Life Conversations	Physician-Reported Quality of End-of-Life Conversations	Timing of End-of-Life Conversations	Frequency of End-of-Life Conversations	Duration of End-of-Life Conversations
Au et al. (USA, 2012)			✓		✓					
Bickell et al. (USA, 2020)			✓		✓					
Clayton et al. (Australia, 2007)				✓						✓
Connors et al. (USA, 1995)			✓							
Curtis et al. (USA, 2013)					✓	✓	✓			
Curtis et al. (USA, 2018)	✓		✓		✓					
Doorenbos et al. (USA, 2016)	✓				✓					
Epstein et al. (USA, 2017)				✓						
Hanson et al. (USA, 2017)	✓									
Henselmans et al. (The Netherlands, 2020)										✓
Lakin et al. (USA, 2017)	✓	✓		✓			✓			
Lautrette et al. (France, 2007)										
Nakajima et al. (Japan, 2015)					✓					
Paladino et al. (USA, 2019)	✓	✓		✓			✓	✓		
Pollak et al. (USA, 2019)	✓			✓						
Reinke et al. (USA, 2017)	✓						✓	✓		
Shorr et al. (USA, 2000)	✓									
Walczak et al. (Australia, 2017)				✓						✓

Table 3
Interventions Aimed at Promoting End-of-life Conversations Assessed in the Included Studies and Their Target

Author(s) (Country, year)	Targeting patient	Targeting professionals	Targeting multiple stakeholders				Targeting the system	Multiple-session intervention vs one-time intervention																											
			Patients/Family caregivers		Professionals																														
			Disclosure of more detailed information about clinical conditions	Patient-specific information form about end-of-life care preferences	Patient-specific prognostic estimate	Role play			In-person, email-based, or telephonic coaching	Lecture	Individual / small group reflective discussions	Palliative care consultation	Patient-specific information form about end-of-life care preferences	Patient-specific communication tips form	In-person or telephone-based coaching	Question prompt list / Communication guide / Information booklet	Face-to-face meeting	Video	Patient-specific information form about end-of-life care preferences	Patient-specific communication tips form	Role play	Individual / small group reflective discussions	Video	In-person or telephone-based coaching	Lecture	Question prompt list / Communication guide / guideline / protocol	Cues to use communication aids	Electronic documentation template	Email reminders / alerts / administrative prompts	Trained nurse facilitating end-of-life conversations					
Au et al. (USA, 2012)				✓																															One-time
Bickell et al. (USA, 2020)			✓																																Multiple-session
Clayton et al., (Australia, 2007)*																																			One-time
Connors et al., (USA, 1995)		✓	✓																																Multiple-session
Curtis et al. (USA, 2013)																																			Multiple-session
Curtis et al. (USA, 2018)																																			One-time
Doorenbos et al. (USA, 2016)																																			One-time
Epstein et al. (USA, 2017)*																																			Multiple-session
Hanson et al. (USA, 2017)																																			Multiple-session
Henselmans et al. (The Netherlands, 2020)																																			Multiple-session
Lakin et al. (USA, 2017)																																			Multiple-session
Lautrette et al. (France, 2007)†																																			One-time
Nakajima et al. (Japan, 2015)	✓																																		One-time
Paladino et al. (USA, 2019)																																			Multiple-session
Pollak et al. (USA, 2019)																																			Multiple-session
Reinke et al. (USA, 2017)																																			One-time
Shorr et al. (USA, 2000)																																			One-time
Walczak et al. (Australia, 2017)*																																			Multiple-session

* Family caregivers could join the programme together with the patient
† Only family caregivers were involved

linked to publication bias and selective outcome reporting, it can also be caused by heterogeneity. Methodological differences can contribute to heterogeneity, with smaller studies,⁵³ lower quality studies,^{54,58} or studies with mostly explanatory design^{52,53} tending to show larger effects. This is supported, in [Figure A1](#), by studies reporting large effects also have larger standard errors.

Occurrence

Ten studies assessed documented occurrence of end-of-life conversations: eight^{31,52–58} in clinical records, two^{55,58} in a specific module of the electronic clinical record, and four^{49–52} patient-reported occurrence. Seven of eleven^{49,51–55,58} studies showed positive results, four of eleven^{31,50,56,57} null results. Among the seven studies with positive results, one⁵³ had a wide CI with a small sample size and three^{51,55,58} showed border-significant CIs.

Eight of eight^{31,52–58} studies contributed to the meta-analysis of documented occurrence in clinical records, with no significant effect of interventions (RR 1.54, 95% CI 0.84–2.84, I^2 91%) ([Fig. 2](#)). Results were similar in sensitivity and subgroup analyses ([Fig. A2](#)).

Four of four^{49–52} studies indicated no significant effect on patient-reported occurrence (RR 1.52, 95% CI 0.80–2.91, I^2 95%) ([Fig. 2](#)).

Quality

Patients',^{49,50,52,53,59,61} family caregivers',⁵⁹ and professionals',⁵⁹ self-reports, and thematic content^{55,56,58,60,62,63} of end-of-life conversations were employed to assess quality. Quality was assessed using the Quality of Communication questionnaire,^{49,52,53,59} the Support Team Assessment Schedule-Japanese

version,⁶¹ the Numeric Rating Scale 0–10⁵⁰ or a composite score of communication measures,⁶⁰ or coding the content of conversations in thematic domains.^{55,56,58,62,63}

Three of six studies^{49,52,61} showed positive quantitative results, the other three of six^{50,53,59} null results. Only two^{49,52} studies with positive results contributed to the meta-analysis. In all, four of six^{49,52,53,59} studies contributed to the meta-analysis, which showed no effect on patient-reported quality (SMD 0.83, 95% CI –1.06 to 2.71, I^2 99%) ([Fig. 2](#)).

Quantitative evidence showed that interventions targeting only professionals did not improve the quality of conversations perceived by family or professionals.⁵⁹ In all, six of six^{55,56,58,60,62,63} studies showed positive qualitative results based on the thematic domains of the conversations. Interventions targeting multiple stakeholders were more likely to increase the number of relevant domains (e.g., values/goals, life-sustaining treatment preferences) discussed^{55,63} and the time trained professionals addressed them,⁵⁶ compared to interventions targeting only professionals.⁵⁸ Also, interventions targeting multiple stakeholders increased the number of statements to inform patients about prognosis and treatment choices (+38%), engage patients in conversation (+44%), and respond to patients' emotions (+71%);⁶⁰ patients' and their family caregivers' cues and questions about end of life and end-of-life care also increased.^{62,63}

Timing

Three^{31,55,58} studies assessed timing. Conversations took place earlier when interventions targeted multiple stakeholders (median 143 days)⁵⁵ compared to involving only professionals (mean 133 days).⁵⁸

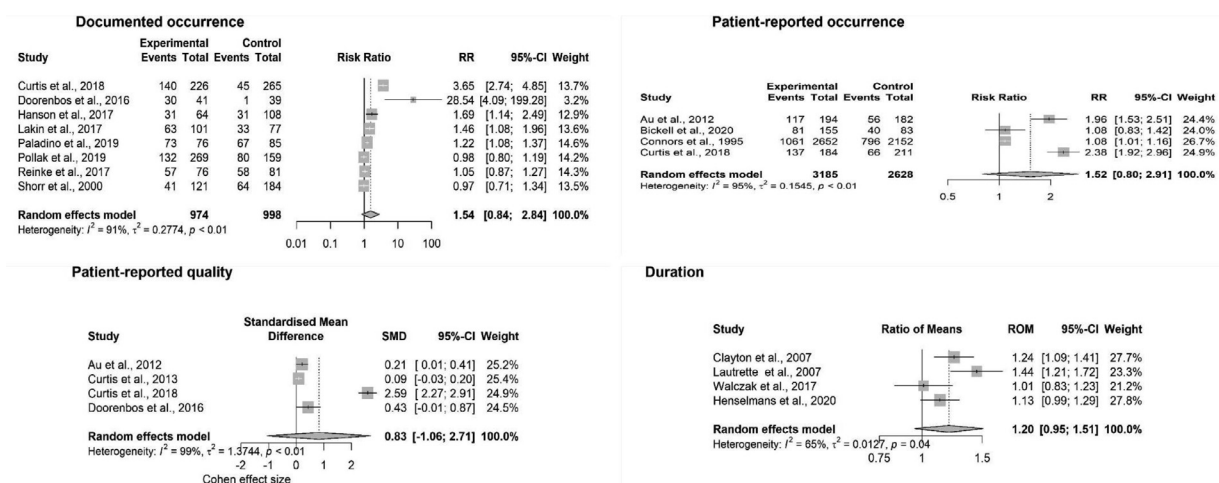


Fig. 2. Meta-analyses of interventions aimed at promoting documented occurrence in clinical records, patient-reported occurrence, patient-reported quality, and duration of end-of-life conversations. CI, Confidence interval; RR, Risk ratio; ROM, Ratio of means; SMD, Standardized mean difference.

Frequency

Of the two^{31,55} studies targeting multiple stakeholders, one⁵⁵ highlighted higher frequency of end-of-life conversations (mean 3.1 [95% CI 2.5–3.6] per intervention patient vs. 2.1 [95% CI 1.4–2.8] per control patient, $P = 0.02$), while the other³¹ found no difference (mean 3.1 (SD 4.0) vs. 2.6 (SD 3.2), $P = 0.47$).

Duration

Four studies targeting multiple stakeholders assessed the duration of end-of-life conversations.^{62–65}

Two of four^{63,65} studies showed positive results, the others^{62,64} null results. Four of four^{62,65} studies contributed to the meta-analysis, which showed no effect on duration (ROM 1.20, 95% CI 0.95–1.51, I^2 65%) (Fig. 2).

Patients- and Family Caregivers-Related Care Outcomes

Thirteen of eighteen studies assessed the impact of interventions on outcomes^{50,54,56,59,60,62–65} (Table A6).

Four^{54,56,59,65} studies (three^{54,56,59} targeting professionals only and one⁶⁵ multiple stakeholders) found significant changes with mixed results: decrease in overall ($P < 0.001$) and 30-day readmission rates ($P = 0.009$) with improvement of the content without changes in the occurrence of conversations;⁵⁶ increased occurrence of conversations in clinical records with increased palliative care consultation ($P = 0.026$) but reduced screening of constipation ($P = 0.041$);⁵⁴ decreased patients' post-traumatic stress disorder ($P = 0.01$), anxiety ($P = 0.02$), and depression ($P = 0.003$) with longer conversations;⁶⁵ increased patients' depression ($P = 0.006$) without improvement in patient, family caregivers, or clinician-reported reported quality of conversations.⁵⁹

Four^{31,51,53,57} studies assessed the impact of interventions on advance directives and one⁵⁶ on ACP. No difference in completion of advance directives neither in documented ACP was found.

Applicability of the Interventions

Fourteen^{31,49–51,54–58,61–65} studies were mostly pragmatic, four^{52,53,59,60} mostly explanatory. Among the domains of PRECIS-2 tool, eligibility criteria, recruitment modalities, flexibility in engagement, primary outcome, and primary analyses were mostly pragmatic. Setting, expertise and resources needed, flexibility in the delivery, and follow up were mostly explanatory (Table A7).

Discussion

Our systematic review on end-of-life conversations found interventions were mostly pragmatic with no effect on the occurrence, patient-reported quality or duration of conversations, regardless of who was

targeted, the introduction of system strategies, or the number of sessions. The meta-analyses showed high heterogeneity likely due to wide variability in contexts, patients' clinical conditions, and interventions delivered. However, qualitative and quantitative evidence indicated that when interventions targeted multiple stakeholders, conversations were earlier and more comprehensive (e.g., number of relevant domains addressed or information about prognosis and treatment choices), regardless of the strategies employed;^{55,60,62} unfortunately, these positive results could not be tested in meta-analyses to ascertain significant differences for the lack of power. Instead, the effect of interventions on frequency^{31,55} was limited and conflicting.

Process indicators of occurrence, quality, timing, frequency, and duration provide clear and objective measures on how end-of-life conversations are delivered, and comply with the evaluation criteria of reliability, validity, responsiveness to change, and ease of implementation to effectively guide quality improvement efforts.^{19,20}

Documented occurrence of conversations in clinical records was the most frequent process outcome,^{31,52–58} followed by patient-reported quality,^{49,50,52,53,59,61} and thematic content of conversations.^{55,56,58,60,62,63} This may reflect recommendations in most international palliative care guidelines to clearly document conversations and their content.²⁵ Tracking what has been discussed, it is helpful to put at the front elements of shared decision-making such as the patient's understanding of illness and end-of-life care options, and their values and care preference.⁶⁶ Unfortunately, several domains of conversations relevant to direct end-of-life care are poorly discussed: only half of the conversations covers psychological problems and less than 40% addresses spiritual and existential issues.⁶ Also, options in terms of palliative care are not discussed at all in 45% of conversations.⁶ Measuring the process rather than measuring only the final outcome -advance directives completion- that is often the result aimed for, allows to verify if the care goals are consistent with the patient's stated preferences. A multidisciplinary expert panel ranked consistency between documented care goals and the patient's stated preferences as the most important of a list of quality indicators for documentation of end-of-life communication and decision-making.¹³

Also, there is consensus that such information should be easily accessible by professionals within and beyond the current team involved in the care and cover conversations that have taken place at any time point over the disease trajectory.⁶⁷ Care for adults nearing the end of life is indeed coordinated by health and social care professionals in various services and organizations that would benefit from knowing about any conversations about prognosis, treatment goals, and

care plans.¹⁵ To support that patients' wishes are honored, it is crucial that the documentation is easily accessible.^{68,69} A structured, specific module on end-of-life conversations in the electronic clinical record may promote greater accessibility, and be used to monitor the effect of an intervention on process indicators of conversations, such as timing, frequency, and key content. Only two^{55,58} studies in our review assessed documented occurrence in a specific module of the electronic medical record, suggesting that despite the potential of this process measure, it is still at its dawn and likely linked with the features of the local health-care information system.

The timing of a conversation is another key process indicator to be monitored. Evidence of benefit is accumulating on initiating conversations well before the last days of life.⁷⁰ However, end-of-life conversations are hindered by several obstacles and interventions targeting only professionals may not be enough. When interventions target multiple stakeholders, they work at multiple levels by reducing professionals' uncertainties about the right time to start conversations and simultaneously increasing patients' and family caregivers' question-asking about end-of-life care,^{62,63} that was found to play an essential prompting role.⁷¹

End-of-life conversations should allow adequate time to process and digest the information that are given.³² Being in a rush is a well-known obstacle to conversations and professionals are recommended to take the time to listen to patients and create the conditions to help the conversation run smoothly.⁷² In settings such as the nursing homes where stays are usually long and patients and family are familiar with the professionals, brief but more frequent encounters that break information into multiple chunks may work better to promote understanding and, finally, shared decision-making.

Our meta-analytic findings suggest no overall effect of the interventions on any process indicators of conversations despite several positive individual study outcomes. The high heterogeneity may be responsible for these null results. Unfortunately, there was not enough power for subgroup analyses to explore whether results differed for groups such as whom was targeted, employment of system level strategies, number of sessions, setting, family involvement, and trial design. However, visual inspection of the meta-analyses plots shows that subgroups of studies have the same clear and positive direction of the intervention effect. Particularly, in the plot of documented occurrence, two^{52,53} explanatory studies found the intervention to be effective while the effect was unclear or border-significant in pragmatic studies.^{31,54–58} This suggests that the interventions have best chances to demonstrate a beneficial effect in ideal settings, while implementation in real care circumstance needs improvement. In the plot of patient-reported occurrence, interventions targeting multiple

stakeholders^{49,52} reported greater effect compared to interventions involving only professionals.^{50,51} This prompts more situational awareness that serves better understanding of illness and prognosis.

Regardless of limited effects on communication process indicators, the interventions may have taught professionals what issues to discuss⁷³ and possibly improved their sensitivity to addressing emotions.⁶⁰ Such skills need time and practice to develop, therefore these interventions may not immediately result in improved patient-reported quality of conversations. Moreover, training was often a few hours, one-time^{55–57,64} or over a few weeks.^{50,60} Link of interventions to outcomes was not an objective of the study, but unchanged anxiety^{52,53,63,65} and increased depression only in one study⁵⁹ should reassure professionals that conversations about the end of life may be emotional but probably not harmful, and encourage them to engage in such conversations.^{52,53,63}

The setting of interventions is a further recognized measure to assess the quality of care that needs to be considered.¹⁷ Only five^{53,58–60,63} studies involved out-of-hospital settings (i.e., heart failure, primary care, palliative care or cancer clinics). However, the way health care is being delivered is changing; developed countries are adopting community-centered approaches and boosting out-of-hospital care.^{74–76} Moreover, increasing care transitions in the late stages of illness may be avoided by primary care teams as better positioned to initiate and conduct regular end-of-life conversations to guide continuous care.⁷⁷ None of the studies were conducted in nursing homes, which is, among the out-of-hospital settings, at the frontline of caring for frail older people at the end of life and their family.⁷⁸ Only one⁵⁶ study involved patients with dementia and only in three^{60,62,65} studies the intervention targeted family caregivers. When family caregivers are involved in end-of-life conversations, the likelihood to limit or withdraw life-sustaining treatments increases and it facilitates transitioning toward palliative-oriented care.^{8,79} Interventions to promote end-of-life conversations should be introduced and tested in particular in community settings and involve family caregivers.

Strengths and Limitations

Our findings should be read considering the lack of a common definition of end-of-life conversations, although this offers a picture of current practice. Second, documented occurrence of conversations may not reflect actual discussions or the provision of goal-concordant care. However, the outcomes were informed by several sources of information, including patients', family caregivers' or professionals' questionnaires or interviews, and videotaped or audio-recorded consultations in addition to medical records, in an effort to capture the nuances and content of end-of-life

conversations beyond a simple binary outcome of occurrence. Third, we did not collect data about professionals' communication skills which are critical to establish trusting relationships that in turn may affect process and care outcome.⁷⁹ Last, we did not have enough power to explore the subgroup effects of interventions aimed to promote end-of-life conversations in a specific setting or when family was involved.

Conclusions

This systematic review and meta-analysis found no effect of interventions aimed to promote end-of-life conversations on occurrence, quality, timing, frequency and duration of these conversations. Nevertheless, we found indications for interventions targeting multiple stakeholders to promote earlier and more comprehensive conversations; future study should identify effective elements. Overall, studies were mostly pragmatic even if settings involved, resources, flexibility in delivering the intervention and follow up modalities were mostly explanatory. This suggests implementation of interventions can be improved. Considerable heterogeneity renders conclusions tentative. Future research should examine the effect of interventions aimed to promote end-of-life conversations by employing standardized process indicators that represent the natural, basic starting point of evaluation to elicit implementation challenges or failure, and trigger improvement.

Author Contributions

BA, JTS, PB, PDG, SG, VD, and YA. For the purposes of authorship, Prof. Di Giulio and Prof. van der Steen contributed equally. Dr Gonella had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Conceptualization: Di Giulio, Dimonte, Gonella. Methodology: Di Giulio, Gonella, van der Steen. Software: Berchiolla. Validation: Gonella. Formal analysis: Berchiolla. Investigation: Arnone, Gonella. Resources: Arnone, Gonella. Data curation: Gonella. Writing—Original draft: Di Giulio, Gonella, van der Steen. Writing—Review & Editing: Albanesi, Arnone, Berchiolla, Dimonte. Visualization: Gonella. Supervision: Di Giulio, van der Steen. Project administration: Gonella.

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References

1. Ferrell BR, Twaddle ML, Melnick A, et al. National consensus project clinical practice guidelines for quality palliative care guidelines. *J Palliat Med* 2018;21:1684–1689.
2. Van der Steen JT, Radbruch L, Hertogh CM, et al. White paper defining optimal palliative care in older people with dementia: A Delphi study and recommendations from the European Association for Palliative Care. *Palliat Med* 2014;28:197–209.
3. Modes ME, Engelberg RA, Downey L, et al. Did a goals-of-care discussion happen? Differences in the occurrence of goals-of-care discussions as reported by patients, clinicians, and in the electronic health record. *J Pain Symptom Manage* 2019;57:251–259.
4. Heyland DK, Allan DE, Rocker G, et al. Discussing prognosis with patients and their families near the end of life: Impact on satisfaction with end-of-life care. *Open Med* 2009;3:e101–e110.
5. Mack JW, Cronin A, Taback N, et al. End-of-life care discussions among patients with advanced cancer: A cohort study. *Ann Intern Med* 2012;156:204–210.
6. Morin L, Johnell K, Van den Block L, et al. Discussing end-of-life issues in nursing homes: a nationwide study in France. *Age Ageing* 2016;45:395–402.
7. Vandervoort A, Houttekier D, Van den Block L, et al. Advance care planning and physician orders in nursing home residents with dementia: A nationwide retrospective study among professional caregivers and relatives. *J Pain Symptom Manage* 2014;47:245–256.
8. Gonella S, Basso I, Dimonte V, et al. Association between end-of-life conversations in nursing homes and end-of-life care outcomes: a systematic review and meta-analysis. *J Am Med Dir Assoc* 2019;20:249–261.
9. Baile WF, Buckman R, Lenzi R, et al. SPIKES—a six-step protocol for delivering bad news: application to the patient with cancer. *Oncologist* 2000;5:302–311.
10. Buckman R. *How to break bad news: A guide for health care professionals*. Baltimore, MD: John Hopkins University Press; 1992.
11. Institute for Healthcare Improvement. The conversation project. Resources for healthcare professionals. Available from: <https://theconversationproject.org/resources/healthcare>. Accessed December 14, 2021.
12. Vitaltalk website. Available from: <http://vitaltalk.org/>. Accessed December 15, 2022.
13. Sinuff T, Dodek P, You JJ, et al. Improving end-of-life communication and decision making: the development of a conceptual framework and quality indicators. *J Pain Symptom Manage* 2015;49:1070–1080.
14. Motamedi M, Brandenburg C, Bakhit M, et al. Concerns and potential improvements in end-of-life care from the perspectives of older patients and informal caregivers: a scoping review. *BMC Geriatr* 2021;21:729.
15. End of life care for adults - quality standard 2011. Available from <https://www.nice.org.uk/guidance/qs13>. Accessed April 3, 2023.
16. Hospice Friendly Hospitals. *Quality Standards for End-of-Life Care in Hospitals e Making end-of-life care central to hospital care*. Republic of Ireland: Hospice Friendly Hospitals; 2013.

17. Sanders JJ, Curtis JR, Tulsky JA. Achieving goal-concordant care: a conceptual model and approach to measuring serious illness communication and its impact. *J Palliat Med* 2018;21:S17–s27.
18. Ernecoff NC, Wessell KL, Bennett AV, et al. Measuring goal-concordant care in palliative care research. *J Pain Symptom Manage* 2021;62:e308–e314.
19. Donabedian A. An introduction to quality assurance in health care. 1st ed. New York, NY: Oxford University Press; 2002.
20. Stelfox HT, Straus SE. Measuring quality of care: considering conceptual approaches to quality indicator development and evaluation. *J Clin Epidemiol* 2013;66:1328–1337.
21. Bernacki RE, Block SD. Communication about serious illness care goals: a review and synthesis of best practices. *JAMA Intern Med* 2014;174:1994–2003.
22. Bickel KE, McNiff K, Buss MK, et al. Defining high-quality palliative care in oncology practice: an American Society of Clinical Oncology/American Academy of Hospice and Palliative Medicine guidance statement. *J Oncol Pract* 2016;12:e828–e838.
23. Committee on Approaching Death. Addressing key end of life issues; Institute of Medicine. *Dying in America: Improving quality and honoring individual preferences near the end of life*. Washington (DC): National Academies Press (US); 2015.
24. Tulsky JA, Beach MC, Butow PN, et al. A research agenda for communication between health care professionals and patients living with serious illness. *JAMA Intern Med* 2017;177:1361–1366.
25. Olsson MM, Windsor C, Chambers S, et al. A scoping review of end-of-life communication in international palliative care guidelines for acute care settings. *J Pain Symptom Manage* 2021;62:425–437. e422.
26. Zhang B, Wright AA, Huskamp HA, et al. Health care costs in the last week of life: Associations with end-of-life conversations. *Arch Intern Med* 2009;169:480–488.
27. Ramos KJ, Downey L, Nielsen EL, et al. Using nurse ratings of physician communication in the ICU to identify potential targets for interventions to improve end-of-life care. *J Palliat Med* 2016;19:292–299.
28. Wright AA, Zhang B, Ray A, et al. Associations between end-of-life discussions, patient mental health, medical care near death, and caregiver bereavement adjustment. *JAMA* 2008;300:1665–1673.
29. Mack JW, Weeks JC, Wright AA, et al. End-of-life discussions, goal attainment, and distress at the end of life: Predictors and outcomes of receipt of care consistent with preferences. *J Clin Oncol* 2010;28:1203–1208.
30. McCutcheon Adams K, Kabcenell A, Little K, et al. “Conversation Ready”: A framework for improving end-of-life care. IHI white paper. Cambridge, MA: Institute for Healthcare Improvement; 2015.
31. Reinke LF, Feemster LC, McDowell J, et al. The long term impact of an end-of-life communication intervention among veterans with COPD. *Heart Lung* 2017;46:30–34.
32. Australian Commission on Safety and Quality in Health Care. National consensus statement: Essential elements for safe and high-quality end-of-life care. Sydney, NSW, Australia: ACSQHC; 2015.
33. Rosa WE, Izumi S, Sullivan DR, et al. Advance care planning in serious illness: a narrative review. *J Pain Symptom Manage* 2023;65:e63–e78.
34. Reinhardt JP, Boerner K, Downes D. The positive association of end-of-life treatment discussions and care satisfaction in the nursing home. *J Soc Work End Life Palliat Care* 2015;11:307–322.
35. Parker SM, Clayton JM, Hancock K, et al. A systematic review of prognostic/end-of-life communication with adults in the advanced stages of a life-limiting illness: patient/caregiver preferences for the content, style, and timing of information. *J Pain Symptom Manage* 2007;34:81–93.
36. Maust DT, Blass DM, Black BS, et al. Treatment decisions regarding hospitalization and surgery for nursing home residents with advanced dementia: The CareAD Study. *Int Psychogeriatr* 2008;20:406–418.
37. Myatra SN, Salins N, Iyer S, et al. End-of-life care policy: An integrated care plan for the dying: a Joint Position Statement of the Indian Society of Critical Care Medicine (ISCCM) and the Indian Association of Palliative Care (IAPC). *Indian J Crit Care Med* 2014;18:615.
38. Engel SE, Kiely DK, Mitchell SL. Satisfaction with end-of-life care for nursing home residents with advanced dementia. *J Am Geriatr Soc* 2006;54:1567–1572.
39. Teno JM, Casarett D, Spence C, et al. It is “too late” or is it? Bereaved family member perceptions of hospice referral when their family member was on hospice for seven days or less. *J Pain Symptom Manage* 2012;43:732–738.
40. Cegala DJ. Patient communication skills training: A review with implications for cancer patients. *Patient Educ Couns* 2003;50:91–94.
41. Cegala DJ, Lenzmeier Broz S. Physician communication skills training: A review of theoretical backgrounds, objectives and skills. *Med Educ* 2002;36:1004–1016.
42. Ryan RE, Connolly M, Bradford NK, et al. Interventions for interpersonal communication about end of life care between health practitioners and affected people. *Cochrane Database Syst Rev* 2022;7:Cd013116.
43. Loudon K, Zwarenstein M, Sullivan FM, et al. The PRECIS-2 tool has good interrater reliability and modest discriminant validity. *J Clin Epidemiol* 2017;88:113–121.
44. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71.
45. Lefebvre C, Glanville J, Briscoe S, et al. Chapter 4: Searching for and selecting studies. In: Higgins J, Thomas J, Chandler J, eds. *Cochrane handbook for systematic reviews of interventions version 6.3* Cochrane; 2019.
46. Kmet LM, Cook LS, Lee RC. Standard quality assessment criteria for evaluating primary research papers from a variety of fields. 2004. Available from: <https://era.library.ualberta.ca/items/48b9b989-c221-4df6-9e35-af782082280e/download/a1cfffde-243e-41c3-be98-885f6d4dcb29>. Accessed April 22, 2022.
47. IntHout J, Ioannidis JP, Borm GF. The Hartung-Knapp-Sidik-Jonkman method for random effects meta-analysis is straightforward and considerably outperforms the standard DerSimonian-Laird method. *BMC Med Res Methodol* 2014;14:25.
48. Higgins JP, Thompson SG, Deeks JJ, et al. Measuring inconsistency in meta-analyses. *BMJ* 2003;327:557–560.
49. Au DH, Udris EM, Engelberg RA, et al. A randomized trial to improve communication about end-of-life care among patients with COPD. *Chest* 2012;141:726–735.

50. Bickell NA, Back AL, Adelson K, et al. Effects of a communication intervention randomized controlled trial to enable goals-of-care discussions. *JCO Oncol Pract* 2020;16:e1015–e1028.
51. Connors AF, Dawson NV, Desbiens NA, et al. A controlled trial to improve care for seriously ill hospitalized patients: The study to understand prognoses and preferences for outcomes and risks of treatments (SUPPORT). *JAMA* 1995;274:1591–1598.
52. Curtis JR, Downey L, Back AL, et al. Effect of a patient and clinician communication-priming intervention on patient-reported goals-of-care discussions between patients with serious illness and clinicians: A randomized clinical trial. *JAMA Int Med* 2018;178:930–940.
53. Doorenbos AZ, Levy WC, Curtis JR, Dougherty CM. An intervention to enhance goals-of-care communication between heart failure patients and heart failure providers. *J Pain Symptom Manage* 2016;52:353–360.
54. Hanson LC, Collichio F, Bernard SA, et al. Integrating palliative and oncology care for patients with advanced cancer: A quality improvement intervention. *J Palliat Med* 2017;20:1366–1371.
55. Paladino J, Bernacki R, Neville BA, et al. Evaluating an intervention to improve communication between oncology clinicians and patients with life-limiting cancer: a cluster randomized clinical trial of the serious illness care program. *JAMA Oncol* 2019;5:801–809.
56. Pollak KI, Gao X, Beliveau J, et al. Pilot study to improve goals of care conversations among hospitalists. *J Pain Symptom Manage* 2019;58:864–870.
57. Shorr AF, Niven AS, Katz DE, et al. Regulatory and educational initiatives fail to promote discussions regarding end-of-life care. *J Pain Symptom Manage* 2000;19:168–173.
58. Lakin JR, Koritsanszky LA, Cunningham R, et al. A systematic intervention to improve serious illness communication in primary care. *Health Aff (Millwood)* 2017;36:1258–1264.
59. Curtis JR, Back AL, Ford DW, et al. Effect of communication skills training for residents and nurse practitioners on quality of communication with patients with serious illness: A randomized trial. *JAMA* 2013;310:2271–2281.
60. Epstein RM, Duberstein PR, Fenton JJ, et al. Effect of a patient-centered communication intervention on oncologist-patient communication, quality of life, and health care utilization in advanced cancer: The VOICE randomized clinical trial. *JAMA Oncol* 2017;3:92–100.
61. Nakajima N, Kusumoto K, Onishi H, et al. Does the approach of disclosing more detailed information of cancer for the terminally ill patients improve the quality of communication involving patients, families, and medical professionals? *Am J Hosp Palliat Care* 2015;32:776–782.
62. Walczak A, Butow PN, Tattersall MH, et al. Encouraging early discussion of life expectancy and end-of-life care: A randomised controlled trial of a nurse-led communication support program for patients and caregivers. *Int J Nurs Stud* 2017;67:31–40.
63. Clayton JM, Butow PN, Tattersall MH, et al. Randomized controlled trial of a prompt list to help advanced cancer patients and their caregivers to ask questions about prognosis and end-of-life care. *J Clin Oncol* 2007;25:715–723.
64. Henselmans I, van Laarhoven HW, van Maarschalkerweerd P, et al. Effect of a skills training for oncologists and a patient communication aid on shared decision making about palliative systemic treatment: a randomized clinical trial. *Oncologist* 2020;25:e578–e588.
65. Lautrette A, Darmon M, Megarbane B, et al. A communication strategy and brochure for relatives of patients dying in the ICU. *N Engl J Med* 2007;356:469–478.
66. Sudore RL, Lum HD, You JJ, et al. Defining advance care planning for adults: a consensus definition from a multidisciplinary delphi panel. *J Pain Symptom Manage* 2017;53:821–832.e821.
67. Leadership Alliance for the Care of Dying People. One chance to get it right: Improving people’s experience of care in the last few days and hours of life. London, United Kingdom: UK Government; 2014.
68. Lamas D, Panariello N, Henrich N, et al. Advance care planning documentation in electronic health records: Current challenges and recommendations for change. *J Palliat Med* 2018;21:522–528.
69. Walker E, McMahan R, Barnes D, et al. Advance care planning documentation practices and accessibility in the electronic health record: Implications for patient safety. *J Pain Symptom Manage* 2018;55:256–264.
70. Brighton LJ, Bristowe K. Communication in palliative care: Talking about the end of life, before the end of life. *Postgrad Med J* 2016;92:466–470.
71. Anderson RJ, Bloch S, Armstrong M, et al. Communication between healthcare professionals and relatives of patients approaching the end-of-life: A systematic review of qualitative evidence. *Palliat Med* 2019;33:926–941.
72. Haute Autorité de Santé. Organisation of pathways – Essentials of the palliative approach 2016. Available from: https://www.has-sante.fr/jcms/c_2730546/en/organisation-of-pathways-essentials-of-the-palliative-approach. Accessed April 9, 2023.
73. Gonella S, Mitchell G, Bavelaard L, et al. Interventions to support family caregivers of people with advanced dementia at the end of life in nursing homes: a mixed-methods systematic review. *Palliat Med* 2022;32:268–291.
74. Ministry of Economic Development. Piano Nazionale Italiano di Ripresa e Resilienza [Italy’s National Recovery and Resilience Plan]. 2021. Available from: <https://www.governo.it/sites/governo.it/files/PNRR.pdf>. Accessed March 12, 2022.
75. National Health System. *The NHS long term plan*. 2019. Available from: <https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf>. Accessed December 2, 2022.
76. Maarse JH, Jeurissen PP. The policy and politics of the 2015 long-term care reform in the Netherlands. *Health Policy* 2016;120:241–245.
77. Lakin JR, Block SD, Billings JA, et al. Improving communication about serious illness in primary care: a review. *JAMA Int Med* 2016;176:1380–1387.
78. Cagle JG, Unroe KT, Bunting M, et al. Caring for dying patients in the nursing home: voices from frontline nursing home staff. *J Pain Symptom Manage* 2017;53:198–207.
79. Birkhäuser J, Gaab J, Kossowsky J, et al. Trust in the health care professional and health outcome: a meta-analysis. *PLoS One* 2017;12:e0170988.

Appendix

This supplementary material is provided by the authors to give readers additional information about the systematic review.

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Appendix 1

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Table A1
PRISMA Checklist

Section and Topic	Item #	Checklist Item	Location Where Item is Reported
Title			
Title	1	Identify the report as a systematic review.	Title page
Abstract			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract, page 1
Introduction			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 2
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 3
Methods			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 3
Information sources	6	Specify all databases, registers, websites, organizations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 3
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 3, Appendix 2
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 3

Table A1
Continued

Section and Topic	Item #	Checklist Item	Location Where Item is Reported
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 3
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g., for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 4
	10b	List and define all other variables for which data were sought (e.g., participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 3
Effect measures	12	Specify for each outcome the effect measure(s) (e.g., risk ratio, mean difference) used in the synthesis or presentation of results.	Page 4
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g., tabulating the study intervention characteristics and comparing against the planned groups for each synthesis [item #5]).	Page 4
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 4
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 4
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 4
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g., subgroup analysis, meta-regression).	Page 4
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 4
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 4

(Continued)

Table A1
Continued

Section and Topic	Item #	Checklist Item	Location Where Item is Reported
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Page 3
Results			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 4, Fig. 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Fig. 1, Table A2 (Appendix)
Study characteristics	17	Cite each included study and present its characteristics.	Page 4, Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Table 1, Table A3 (Appendix), page 4
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g., confidence/credible interval), ideally using structured tables or plots.	Page 20-21, Table 1
Results of syntheses	20a	For each synthesis, briefly summarize the characteristics and risk of bias among contributing studies.	Page 20-21, Fig. 2, Fig. A1 (Appendix)
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g., confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Page 20-21, Fig. 2
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Page 20, Fig. A2 (Appendix)
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Page 20
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Table 1, Fig. A1 (Appendix)
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Page 21, Table 1, Fig. 2, Table A7 (Appendix)
Discussion			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 21
	23b	Discuss any limitations of the evidence included in the review.	Page 22
	23c	Discuss any limitations of the review processes used.	Page 22
	23d	Discuss implications of the results for practice, policy, and future research.	Page 22
Other Information			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 3
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 3
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 3

(Continued)

Table A1
Continued

Section and Topic	Item #	Checklist Item	Location Where Item is Reported
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 23
Competing interests	26	Declare any competing interests of review authors.	Page 23
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Available to authors

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71.

Table A2
Excluded Articles Based on Full Text Review

Author(s), year	Reason(s) for Exclusion	Reference
Alexander et al., 2006	No data on process indicators of end-of-life conversations	Alexander SC, Keitz SA, Sloane R, et al. A controlled trial of a short course to improve residents' communication with patients at the end of life. <i>Acad Med.</i> 2006; 81(11):1008-12. doi: 10.1097/01.ACM.0000242580.83851.ad.
Bernacki et al., 2019	No data on process indicators of end-of-life conversations	Bernacki R, Paladino J, Neville BA, et al. Effect of the Serious Illness Care Program in outpatient oncology: A cluster randomized clinical trial. <i>JAMA Intern Med.</i> 2019; 179(6):751-759. doi: 10.1001/jamainternmed.2019.0077.
Chikhladze et al., 2016	No intervention study	Chikhladze N, Janberidze E, Velijanashvili M, et al. Mismatch between physicians and family members views on communications about patients with chronic incurable diseases receiving care in critical and intensive care settings in Georgia: a quantitative observational survey. <i>BMC Palliat Care.</i> 2016; 22;15:63. doi: 10.1186/s12904-016-0135-2.
Curtis et al., 2012	No data on process indicators of end-of-life conversations	Curtis JR, Ciechanowski PS, Downey L, et al. Development and evaluation of an interprofessional communication intervention to improve family outcomes in the ICU. <i>Contemp Clin Trials.</i> 2012; 33(6):1245-54. doi: 10.1016/j.cct.2012.06.010.
Fakhiri et al., 2016	No intervention study	Fakhri S, Engelberg RA, Downey L, et al. Factors affecting patients' preferences for and actual discussions about End-of-Life care. <i>J Pain Symptom Manage.</i> 2016; 52(3):386-94. doi: 10.1016/j.jpainsymman.2016.03.012.
Gradwohl et al., 2020	Intervention part of a multi-faceted programme with the effect of the individual component of the intervention related to end-of-life communication not clearly recognizable and assessable	Gradwohl K, Wood GJ, Clepp RK, et al. Preventing Readmissions through Effective Partnerships-Communication and Palliative Care (PREP-CPC): a multisite intervention for encouraging goals of care conversations for hospitalized patients facing serious illness. <i>Am J Hosp Palliat Care.</i> 2020, 37(8):582-588. doi: 10.1177/1049909119891996.
Izumi et al., 2019	No data on process indicators of end-of-life conversations	Izumi S, Burt M, Smith J, et al. Enhancing Advance Care Planning conversations by nurses in a bone marrow transplantation unit. <i>Oncol Nurs Forum.</i> 2019; 46(3):288-297. doi: 10.1188/19.ONF.288-297.
Maries et al., 2018	No data on process indicators of end-of-life conversations	Maries MM, Kryworuchko J, Vininder Kour B, et al. A randomized controlled trial of a serious illness communication workshop for nurses in critical care. <i>Can J Crit Care Nurs.</i> 2018; 29(2): 58-58.
Modes et al., 2019	Secondary analysis which merged the intervention and the control groups	Modes ME, Engelberg RA, Downey L, et al. Did a Goals-of-Care discussion happen? Differences in the occurrence of Goals-of-Care discussions as reported by patients, clinicians, and in the electronic health

(Continued)

Table A2
Continued

Author(s), year	Reason(s) for Exclusion	Reference
Nedjat-Haiem et al., 2019	No data on process indicators of end-of-life conversations	record. <i>J Pain Symptom Manage.</i> 2019; 57(2):251-259. doi: 10.1016/j.jpainsymman.2018.10.507. Nedjat-Haiem FR, Cadet TJ, Amatya A, et al. Efficacy of motivational interviewing to enhance advance directive completion in latinos with chronic illness: a randomized controlled trial. <i>Am J Hosp Palliat Care.</i> 2019; 36(11):980-992. doi: 10.1177/1049909119851470.
Pajka et al., 2021	No data on process indicators of end-of-life conversations	Pajka SE, Hasdianda MA, George N, et al. Feasibility of a brief intervention to facilitate advance care planning conversations for patients with life-limiting illness in the Emergency Department. <i>J Palliat Med.</i> 2021; 24(1):31-39. doi: 10.1089/jpm.2020.0067.
Paladino et al., 2020	No data on process indicators of end-of-life conversations	Paladino J, Koritsanszky L, Neal BJ et al. Effect of the Serious Illness Care Program on health care utilization at the end of life for patients with cancer. <i>J Palliat Med.</i> 2020; 23(10):1365-1369. doi: 10.1089/jpm.2019.0437.
Paladino et al., 2020	No data on process indicators of end-of-life conversations	Paladino J, Kilpatrick L, O'Connor N, et al. Training clinicians in serious illness communication using a structured guide: evaluation of a training program in three health systems. <i>J Palliat Med.</i> 2020; 23(3):337-345. doi: 10.1089/jpm.2019.0334.
Sanchez et al., 2018	Commentary	Sanchez R, Mateo KF. Survey-based priming intervention linked to improved communication with the seriously ill. <i>J Clin Outcomes Manage.</i> 2018; 25(7):300-303.
Song et al., 2010	Unclear clinical condition of advanced chronic or terminal illness	Song MK, Donovan HS, Piraino BM, et al. Effects of an intervention to improve communication about end-of-life care among African Americans with chronic kidney disease. <i>Appl Nurs Res.</i> 2010; 23(2):65-72. doi: 10.1016/j.apnr.2008.05.002.
Steinhauser et al., 2008	No data on process indicators of end-of-life conversations	Steinhauser KE, Alexander SC, Byock IR et al. Do preparation and life completion discussions improve functioning and quality of life in seriously ill patients? Pilot randomized control trial. <i>J Palliat Med.</i> 2008; 11(9):1234-40. doi: 10.1089/jpm.2008.0078.
Wentlandt et al., 2012	No data on process indicators of end-of-life conversations	Wentlandt K, Burman D, Swami N, et al. Preparation for the end of life in patients with advanced cancer and association with communication with professional caregivers. <i>Psychooncology.</i> 2012; 21(8):868-76. doi: 10.1002/pon.1995.

Table A3
Quality Appraisal of the Studies Included in the Systematic Review According to the QualSyst Critical Appraisal Criteria^a

Author(s), year	C1. Question / Objective Suffi Ciently Described?	C2. Study Design Evident and Appropriate?	C3. Method of Subject / Comparison Group Selection or Source of Information/ Input Variables Described and Appropriate?	C4. Subject and Comparison Group characteristics Sufficiently described?	C5. Was Random Allocation Described?	C6. Was Blinding of Investigators Reported?	C7. Was Blinding of Subjects Reported?	C8. Outcome Measures Well Defined and Robust?	C9. Sample Size Appropriate?	C10. Analytic Methods Described and Appropriate?	C11. Some Estimate of Variance Reported for the Main Results?	C12. Controlled for Confounding?	C13. Results Reported in Sufficient Detail?	C14. Conclusions Supported by the Results?	Quality Rating (Total Sum/ Total Possible Sum)	Quality Rating
Au et al., 2012	2	2	2	2	1	2	N/A	2	2	2	2	2	2	2	0.96	H
Bickell et al., 2020	2	1	2	2	1	2	N/A	2	2	2	2	2	2	2	0.92	H
Clayton et al., 2007	2	2	2	1	2	2	N/A	2	2	2	2	2	2	2	0.96	H
Connors et al., 1995	2	2	2	2	1	2	N/A	2	2	2	2	2	2	2	0.96	H
Curtis et al., 2013	2	2	2	2	1	2	N/A	2	2	2	2	2	2	2	0.96	H
Curtis et al., 2018	2	2	2	1	2	2	N/A	2	2	2	2	2	2	2	0.96	H
Doorenbos et al., 2016	2	2	2	2	1	0	N/A	2	2	2	2	2	2	2	0.88	M
Epstein et al., 2017	2	2	2	2	1	2	N/A	2	2	2	2	2	2	2	0.96	H
Hanson et al., 2017	2	1	2	1	N/A	N/A	N/A	2	1	2	0	0	2	2	0.68	L
Henselmans et al., 2020	2	2	2	2	1	2	N/A	2	2	2	2	2	2	2	0.96	H
Lakin et al., 2017	2	1	1	2	0	2	N/A	2	1	2	0	0	2	2	0.65	L
Lautrette et al., 2007	2	2	2	2	2	2	N/A	2	2	2	2	0	2	2	0.92	H
Nakajima et al., 2015	2	1	1	2	N/A	N/A	N/A	1	0	2	2	0	2	2	0.68	L
Paladino et al., 2019	2	2	2	2	1	2	N/A	2	2	2	2	2	2	2	0.96	H
Pollak et al., 2019	2	1	2	2	2	0	N/A	2	1	2	2	0	2	2	0.77	M
Reinke et al., 2017	2	2	2	2	N/A	0	N/A	2	1	2	2	2	2	2	0.88	M
Shorr et al., 2000	2	2	2	2	N/A	N/A	N/A	2	1	2	2	0	2	2	0.86	M
Walczak et al., 2017	2	2	2	2	2	0	N/A	2	1	2	2	2	2	2	0.88	M

^aKmet LM, Cook LS, Lee RC. Standard quality assessment criteria for evaluating primary research papers from a variety of fields. Alberta Heritage Foundation for Medical Research; 2004. doi: [10.7939/R37M04F16](https://doi.org/10.7939/R37M04F16) Abbreviations: C, criteria; H, high; L, low; M, moderate. Note: This Qualsyst tool comprises of 14 items which were scored on the degree to which the specific criteria were met ("fully" = 2, "partially" = 1, "not at all" = 0). Items not relevant for a particular study design were marked "N/A" and excluded from the calculation of the summary score. A summary score was calculated for each paper by summing the score obtained across relevant items and dividing by the total possible score after removing any criteria that were not relevant. According to the summary score, studies were classified as high (>0.9), moderate (0.7-0.9) or low quality (<0.7).

Table A4
Data Collection Tools and Timing in the Included Studies

Data Collection Tools	Data Collection Timing
Medical records (n = 7) ^{31,52–58}	A few days after the intervention ⁵⁰
Patient questionnaires (n = 6) ^{49,50,52,53,59,61}	One or two weeks after the intervention ^{49,51–53,61}
Audio-recorded consultations ^{60,62,63}	Six to ten months after the intervention ^{50,59}
Videotaped consultations ⁶⁴	
Family questionnaires ⁵⁹	
Professionals questionnaires ⁵⁹	
Patients interviews ⁵¹	
Family caregivers interviews ⁵¹	
Clocked consultations ⁶⁵	

Table A5
Interventions Aimed at Promoting End-of-Life Conversations and Their Target

Interventions Targeting Both Patients and Professionals	Interventions Targeting Only Professionals	Interventions Targeting Only Patients	Interventions Targeting the System
Coaching (n = 7) ^{30,53,55,56,58,60,62}	Lectures (n = 6) ^{50,54,55,57,59,64}	Disclosure of more detailed information about clinical conditions ⁶¹	Email reminders, alerts, or administrative prompts ^{56,57}
Written resources such as question prompts list, communication guide, and information leaflet (n = 6) ^{55,60,62–65}	Role play (n = 6) ^{50,57–60,64}	Face-to-face meeting ⁶²	Electronic documentation template for conversations ^{55,58}
Patient-specific information form about end-of-life care preferences (n = 4) ^{31,49,51,53}	Individual- or small group-based reflective discussions (n = 5) ^{54,57,59,60,64}		Trained nurse who facilitated conversations ^{51,58}
Videos with educational or supportive purposes (n = 3) ^{60,62,64}	Cues to use communication aids (n = 3) ^{62,63,65}		
Patient-specific communication tips form ^{52,53}	Provision of a prognostic estimate ⁵¹		
	Palliative care consultation ⁵⁴		

Table A6
Patients- and Family Caregivers-Related Care Outcomes Reported in the Included Studies

Patients	Family Caregivers
Hospitalization or readmission (n = 4) ^{50,54,56,a,60}	Depression ⁵⁹
Depression (n = 4) ^{52,53,59,b,65,c}	Satisfaction with information received ⁶⁵
Anxiety (n = 4) ^{52,53,63,65,c}	
Aggressive treatments (n = 3) ^{50,51,60}	
Palliative care or hospice referral (n = 3) ^{53,56,58}	
Quality of life or well-being (n = 3) ^{59,62,64}	
Length of in-hospital or intensive care units (ICU) stay (n = 2) ^{51,56}	
Emergency department visits (n = 2) ^{50,60}	
ICU admission (n = 2) ^{50,54}	
In-hospice stay (n = 2) ^{50,58}	
Palliative care consultations ^{54,d}	
Post-traumatic stress disorder ^{65,c}	
Symptom assessment ^{54,d}	
Time in pain before death ⁵¹	
Assessment of spiritual beliefs ⁵⁴	
Satisfaction and uncertainty about medical decisions ⁶⁴	
Satisfaction with communication ⁶³	
Achievement of information needs ⁶³	
Completion of advance directives ^{31,51,53,57}	
Documentation of advance care planning ⁵⁶	

Note. Four^{54,56,59,65} studies found significant changes with mixed results. Three^{54,56,59} targeted only professionals, one⁶⁵ multiple stakeholders.

^aDecrease in overall ($P < 0.001$) and 30-day readmission rates ($P = 0.009$) with improvement of the content without changes in the occurrence of conversations.⁵⁶

^bIncreased patients' depression ($P = 0.006$) without improvement in patient, family caregivers, or clinician-reported reported quality of conversations.⁵⁹

^cDecreased patients' post-traumatic stress disorder ($P = 0.01$), anxiety ($P = 0.02$), and depression ($P = 0.003$) with longer conversations.⁶⁵

^dIncreased rate of palliative care consultation ($P = 0.026$) but reduced screening of constipation ($P = 0.041$) in presence of increased occurrence of conversations in clinical records.⁵⁴

Table A7
 Applicability of the Interventions Assessed in the Studies Included in the Systematic Review According to the PRECIS-2 Tool^a

Author(s), year	D1. Eligibility Criteria - Who Is Selected to Participate in the Trial?	D2. Recruitment - How are Participants Recruited into the Trial?	D3. Setting - Where is the Trial Being Done?	D4. Organisation - What Expertise and Resources are Needed to Deliver the Intervention?	D5. Flexibility (delivery) - How Should the Intervention be delivered?	D6. Flexibility (Adherence) - What Measures are in Place to Ensure Participants Adhere to the Intervention?	D7. Follow up - How Closely are Participants Followed up?	D8. Primary Outcome - How Relevant is it to Participants?	D9. Primary Analysis - To What Extent are all Data Included?	Mean Applicability Rating (Total Sum/9)	Applicability
Au et al., 2012	4	4	4	4	4	5	3	5	5	4.2	Mostly pragmatic
Bickell et al., 2020	4	5	5	3	5	5	4	5	2	4.2	Mostly pragmatic
Clayton et al., 2007	4	5	5	4	4	5	2	5	5	4.4	Mostly pragmatic
Connors et al., 1995	2	5	5	3	5	5	3	5	3	4	Mostly pragmatic
Curtis et al., 2013	4	4	5	3	2	5	4	5	2	3.7	Mostly explanatory
Curtis et al., 2018	5	3	5	3	2	5	4	5	2	3.7	Mostly explanatory
Doorenbos et al., 2016	2	3	2	3	2	5	4	4	5	3.3	Mostly explanatory
Epstein et al., 2017	4	2	5	3	3	5	2	5	5	3.7	Mostly explanatory
Hanson et al., 2017	5	5	2	2	4	3	5	5	5	4.0	Mostly pragmatic
Henselmans et al., 2020	5	5	5	4	2	5	4	5	5	4.4	Mostly pragmatic
Lakin et al., 2017	5	2	5	4	2	5	4	5	5	4.1	Mostly pragmatic
Lautrette et al., 2007	5	5	5	3	2	5	3	5	4	4.1	Mostly pragmatic
Nakajima et al., 2015	3	3	2	5	5	5	4	5	5	4.1	Mostly pragmatic
Paladino et al., 2019	5	2	5	4	3	5	5	5	5	4.3	Mostly pragmatic
Pollak et al., 2019	5	5	1	4	5	5	5	5	4	4.3	Mostly pragmatic
Reinke et al., 2017	4	4	4	4	4	5	5	5	5	4.4	Mostly pragmatic
Shorr et al., 2000	5	5	1	4	5	5	5	5	5	4.4	Mostly pragmatic
Walczak et al., 2017	5	5	5	4	2	5	4	5	5	4.4	Mostly pragmatic
All studies	4.2	4.0	3.9	3.6	3.4	4.9	3.9	4.9	4.3	4.0	Four domains <4, five domains ≥ 4

Abbreviations: D, domain; PRECIS-2, PRagmatic EXplanatory Continuum Indicator Summary version 2.

Note: This PRECIS-2 tool is focused on the issue of applicability of study results and comprises of nine domains. Each domain was scored on a 5-point scale (1 = very explanatory to 5 = very pragmatic). When with insufficient information, a score of 3 was assigned. A mean score across studies for each domain and a mean applicability rating for each study was calculated. Domains and studies were classified as mostly explanatory (<4) or mostly pragmatic (≥ 4) according to the mean domain score and the mean applicability rating, respectively. Values with decimals were rounded to the lower integer.

^aLoudon K, Treweek S, Sullivan F, Donnan P, Thorpe KE, Zwarenstein M. The PRECIS-2 tool: designing trials that are fit for purpose. *J Clin Epidemiol.* 2017;88:113-121. doi:10.1016/j.jclinepi.2017.06.001.

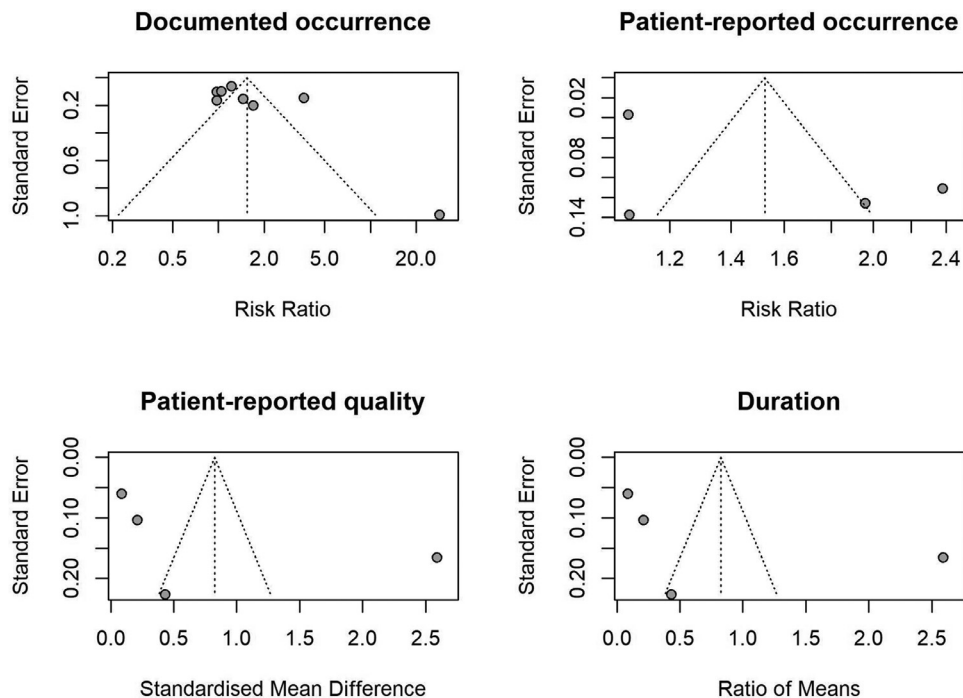


Fig. A1. Funnel plots of interventions aimed at promoting end-of-life conversations and the main outcomes of interests: documented occurrence in clinical records, patient-reported occurrence, patient-reported quality, and duration of end-of-life conversations.

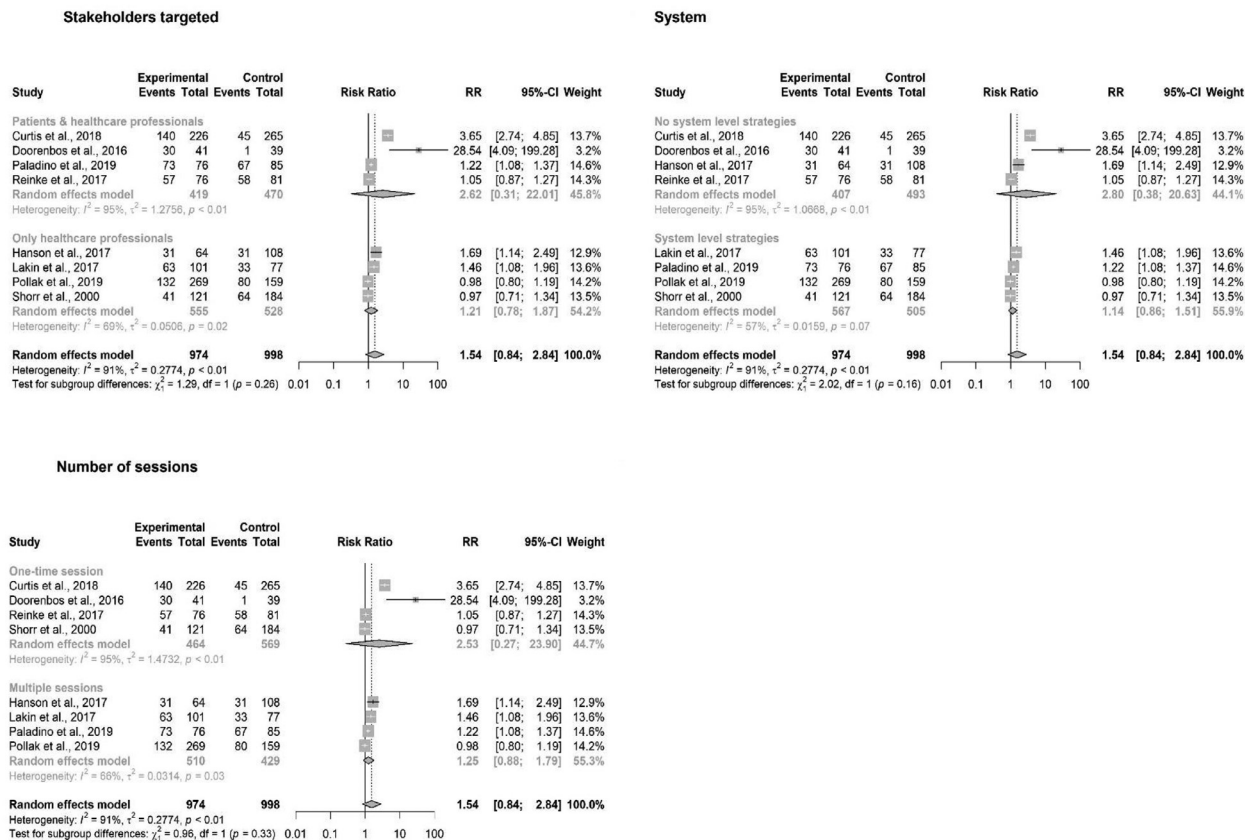


Fig. A2. Subgroup analyses of interventions aimed at promoting documented occurrence of end-of-life conversations in clinical records: stakeholders targeted, system strategies, and number of sessions. CI, Confidence interval; df, degrees of freedom; RR, Risk ratio.

Appendix 2. Search strategies and hits September 30, 2021

1. Pubmed.

Search	Query	Items
#5	(#1 AND #2 AND #3) Filters: Clinical Trial, Controlled Clinical Trial, Observational Study, Pragmatic Clinical Trial, Randomized Controlled Trial	483
#4	#1 AND #2 AND #3	10,989
#3	("Documentation"[Mesh] OR "Quality Improvement"[Mesh] OR occurrence* [Title/Abstract] OR timing [Title/Abstract] OR duration [Title/Abstract] OR quality [Title/Abstract] OR "accessibility document*" [Title/Abstract] OR frequen*[Title/Abstract])	4,695,319
#2	("Communication"[Mesh] OR "Health Communication"[Mesh] OR "Advance Care Planning"[Mesh] OR "Decision Making"[Mesh] OR information [Title/Abstract] OR conversation* [Title/Abstract] OR talk* [Title/Abstract] OR discuss* [Title/Abstract] OR new* [Title/Abstract] OR dialogue* [Title/Abstract])	5,617,810
#1	("Death"[Mesh] OR "Terminal Care"[Mesh] OR "Terminally Ill"[Mesh] OR "end-of-life" [Title/Abstract] OR "end of life" [Title/Abstract])	221,676

2. EBSCO CINAHL.

Search ID	Search Terms	Search Options	Actions
S5	S4	Limiters - Peer Reviewed; Exclude MEDLINE records; Publication Type: Clinical Trial, Randomized Controlled Trial	178
S4	S1 AND S2 AND S3	Search modes - Boolean/Phrase	23,166
S3	MH ("documentation+" OR "clinical documentation improvement" OR "quality improvement+" OR "access to information+") OR AB (documentation OR occurrence* OR frequen* OR timing OR duration OR quality OR "accessibility document") OR TI (documentation OR occurrence* OR frequen* OR timing OR duration OR quality OR "accessibility document")	Search modes - Boolean/Phrase	1,099,385
S2	MH ("communication+" OR "advance care planning" OR "decision making, patient+" OR "decision making, family") OR AB (communication OR "health communication" OR "advance care planning" OR information OR conversation* OR talk* OR discuss* OR new* OR dialogue* OR "decision making") OR TI (communication OR "health communication" OR "advance care planning" OR information OR conversation* OR talk* OR discuss* OR new* OR dialogue* OR "decision making")	Search modes - Boolean/Phrase	1,775,546
S1	MH "terminal care+" OR AB (death OR dying OR "terminally ill" OR "end of life" OR "end-of-life") OR TI (death OR dying OR "terminally ill" OR "end of life" OR "end-of-life")	Search modes - Boolean/Phrase	270,753

3. EBSCO PsycINFO.

Search ID	Search Terms	Search Options	Actions
S5	S4	Limiters - Methodology: CLINICAL TRIAL, EMPIRICAL STUDY, QUANTITATIVE STUDY; Exclude Dissertations	2,004
S4	S1 AND S2 AND S3	Search modes - Boolean/Phrase	8,025
S3	AB (documentation OR "quality improvement" OR occurrence* OR frequen* OR timing OR duration OR quality OR "accessibility document") OR TI (documentation OR "quality improvement" OR occurrence* OR frequen* OR timing OR duration OR quality OR "accessibility document")	Search modes - Boolean/Phrase	734,569
S2	DE ("Interpersonal Communication" OR "Verbal Communication" OR "communication" OR "Treatment Planning" OR "Decision Making") OR AB ("advance care planning" OR information OR conversation* OR talk* OR discuss* OR new* OR dialogue* OR "decision making") OR	Search modes - Boolean/Phrase	1,845,313

(Continued)

Continued

Search ID	Search Terms	Search Options	Actions
S1	TI ("advance care planning" OR information OR conversation* OR talk* OR discuss* OR new* OR dialogue* OR "decision making") DE ("palliative care" OR "terminally ill patients") OR AB (death OR "terminal care" OR "terminally ill" OR "end of life" OR "end-of-life") OR TI (death OR "terminal care" OR "terminally ill" OR "end of life" OR "end-of-life")	Search modes - Boolean/Phrase	109,507

4. SCOPUS.

Query	Items
TITLE-ABS-KEY (death OR terminal OR end) AND (communication* OR discussion* OR conversation*) AND (documentation OR quality OR frequen*)	1,998