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Review Article

A Systematic Review of the Effects of Advance Care Planning Interventions in Nursing Homes

Collin E. Burks MD [a,b,*], Omid Salaami MD [a,b], Sarah E. Cantrell MLIS [c], Neema K. Sharda MD [a], Mamata Yanamadala MBBS [a]

[a] Division of Geriatrics, Duke University School of Medicine, Durham, NC, USA
[b] Geriatric Research, Education, and Clinical Center, Durham Veterans Affairs Health Care System, Durham, NC, USA
[c] Duke University Medical Center Library & Archives, Duke University School of Medicine, Durham, NC, USA

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A B S T R A C T

Background: Advance care planning (ACP) interventions are implemented to achieve outcomes such as improving end-of-life care and increasing goal-concordant care. ACP has been studied across various settings, but it is important to study the impacts of ACP in nursing homes.
Objective: To review and evaluate the outcomes of ACP interventions in nursing homes.
Design: Systematic review of randomized controlled trials.
Methods: A search was last performed on March 27, 2023, using MEDLINE, Embase, CINAHL Complete, Cochrane Library, and clinicaltrials.gov. Eligible studies were randomized controlled trials that studied the impact of ACP interventions in nursing homes with residents over the age of 18. The Cochrane Risk of Bias tool 2.0 was used to determine the studies' risk of bias. The ACP Outcomes Framework was utilized to organize the results into 5 domains: Process, Action, Quality of Care, Health Status, and Health Care Utilization. No meta-analysis was possible because of heterogeneity in study interventions and outcomes.
Results: Twenty-three studies met criteria for inclusion in this review. Most studies were at low or medium risk of bias. The study interventions included resident and family education, staff education, structured discussions, communication with primary medical teams, and use of specialists. A slight majority of Action and Process outcomes were positive, whereas Quality of Care outcomes were mixed. A minority of Health Care Utilization and Health Status outcomes were positive. Multi-component interventions and interventions featuring staff education were often successful.
Conclusions: ACP interventions in nursing homes yield beneficial outcomes in some domains. Limitations to this review include the presence of heterogeneity in types of study interventions and outcomes, as well as underpowering of many study outcomes. Further work is needed to improve ACP implementation, identify which interventions are most beneficial, and ensure sustainability of beneficial interventions.

As the place of death for approximately 25% of adults aged 65 years and older in the United States,[1] nursing homes must provide high-quality end-of-life (EOL) care. The provision of high-quality EOL care relies on many components, one of which is advance care planning (ACP). ACP, variably defined as a process or an intervention, often involves several elements, including a person sharing their goals and preferences for future medical care.[2,3] ACP encompasses completing advance directives, establishing orders such as a do-not-resuscitate order or a do-not-hospitalize order, and/or eliciting and documenting goals of care in the medical record.

For nursing home residents, who have limited life expectancies as well as a high prevalence of cognitive impairment and current or future loss of decision-making capacity, ACP is thought to be particularly important. It has been hypothesized that ACP interventions will achieve outcomes such as increasing goal-concordant care, improving the dying experience, decreasing unwanted hospitalizations, and reducing health care costs. In 2016, Martin et al[4] published a systematic review of the effects of ACP interventions on nursing home residents and concluded that ACP interventions have benefits, including reducing hospitalizations and improving care concordance.[4] However, the evidence was from mostly low-quality studies, and they called for high-quality studies to be performed.

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* Address correspondence to Collin E. Burks, MD, Duke University School of Medicine, Box 3003, Durham, NC 27710, USA.
E-mail address: collin.burks@duke.edu (C.E. Burks).

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In the last decade, numerous randomized controlled trials (RCTs) have been conducted in nursing homes to study the impact of ACP interventions. An update of the literature is necessary to review the evidence. The aim of this systematic review is to use published RCTs to review and evaluate the outcomes of ACP interventions in nursing homes.

Methods

Design

This systematic review was prospectively registered with PROSPERO (CRD42021241932). It was carried out using the Cochrane Handbook for Systematic Reviews of Interventions[5] and was reported following the PRISMA 2020 statement: an updated guideline for reporting systematic reviews.[6] A protocol was not prepared.

Search Strategy

MEDLINE (via PubMed), Embase (via Elsevier), CINAHL Complete (via EBSCO), and the Cochrane Library (via Wiley) electronic databases as well as the clinicaltrials.gov registry were searched from database inception to present. The search used a combination of database-specific controlled vocabulary and keywords searched in the titles or abstracts for RCTs representing advance directives and skilled nursing facilities. The search strategies were peer-reviewed prior to execution using the PRESS checklist.[7] The original search was conducted on March 21, 2021; a search update was conducted on March 27, 2023, to identify newly published studies. The complete search strategy can be found in the Supplementary Material.

Citations were uploaded to Covidence (Veritas Health Innovation, Melbourne, Australia), a systematic review screening software, for screening.

Selection Process

Inclusion criteria required studies to examine the effects of ACP interventions in nursing homes in RCTs. ACP was defined broadly as the process of determining values, goals, and preferences that inform medical care, including the creation of advance directives, medical orders, and care plans. Interventions were defined broadly as any effort to increase ACP, including education of staff, residents, and families, and process changes including enhancing communication and engaging specialists. Nursing homes were defined as post-acute and long-term care facilities that provide medical care, which includes both skilled nursing and nursing homes and their equivalents internationally. Exclusion criteria included any observational studies or resident populations of individuals aged <18 years. There were no restrictions on type of randomization or type of control used in the RCTs. There were no restrictions on measured or reported outcomes of ACP interventions. Authors O.S. and M.Y. independently screened all studies, and any discrepancies were arbitrated by N.K.S.

After a systematic search, 23 studies fit criteria (Figure 1).

Data Extraction and Risk of Bias

Data were extracted using a predefined form by the authors. The included data were study and facility/resident characteristics, study inclusion and exclusion criteria, intervention and control group differences, ACP intervention description, duration of intervention, and outcomes reported. All primary outcomes were extracted. Secondary outcomes were extracted from many of the studies; however, for the studies that had numerous secondary outcomes, including outcomes at numerous time points, the authors used abstracts as a guide to include only the outcomes deemed most important by study authors as well as judgment on whether the outcome added new meaning to the study's primary outcome. One author (O.S.) extracted the data, which was confirmed by a second author (M.Y.) with any discrepancies arbitrated by a third author (N.K.S.).

The ACP Outcomes Framework, developed by a Delphi panel in 2017, was used to organize the outcomes into 5 domains, in an effort to contribute toward a more standardized reporting of outcomes.[8] The work of McMahan et al, in their 2021 scoping review of ACP outcomes,[9] informed our approach to using this framework. The 5 domains are Process, Action, Quality of Care, Health Status, and Health

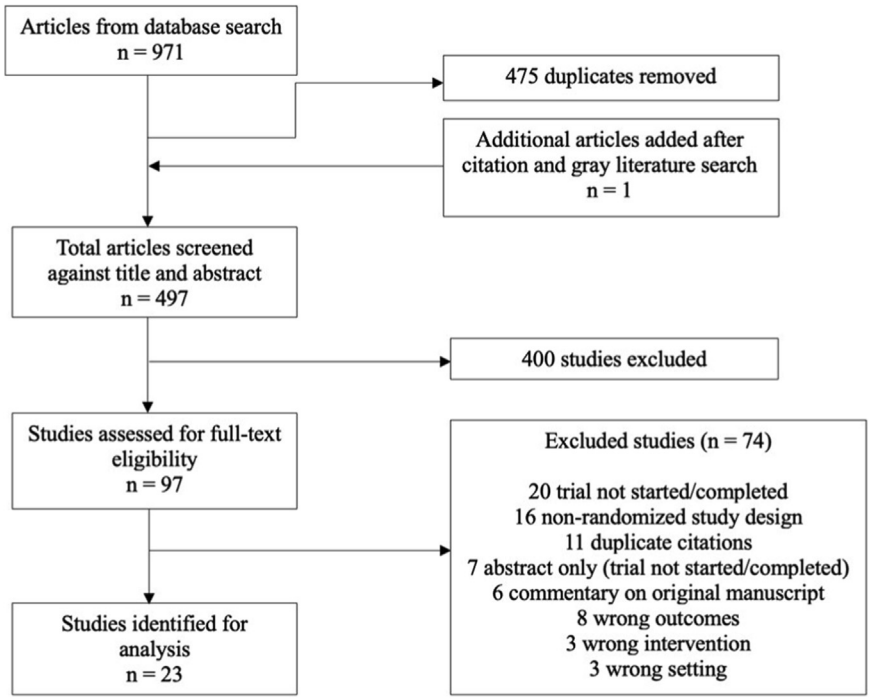

Fig. 1. Process of identifying studies for inclusion in review.

Table 1
Overview of Studies

Study, Year (in Order by year)	Population (NH Residents)	Country	Intervention Strategy	Intervention	Intervention Level	Outcome Domain*	Measured Outcomes	Results (Intervention Listed First)	Overall Risk of bias†
Garland et al,[11] 2022	≥ 65 y, elevated mortality risk I: 271 C: 442	Canada	1. Structured discussion	60-min structured discussion between patient/CG and NH staff.	Resident	Quality of care Quality of care	Comprehensiveness of ACP‡,§ Comfort assessment in dying‡,§	Increased: 5.21-fold higher odds of respondents rating ACP comprehensiveness as being better; 95% CI 3.53, 7.61 No difference	Some concerns
McCreedy et al,[12] 2022	Long-stay (>100-d) and short-stay (<100-d) residents with advanced illness Long stay: I:1485 C: 2417 Short stay: I: 873 C: 1342	USA	1. Resident and family education	5 preloaded 6- to 8-min long videos that addressed general GOC, GOC for advanced dementia, hospice, hospitalization, and ACP for healthy patients. ACP Champions (clinical social workers) offer video at admission, after hospitalization, every 6 mo, and decision points for a topic related to existing videos.	Resident	Action Health care utilization	New DNH order[2] Hospitalization[2]	Increased: Proportion of residents with orders: - Long stay: 9.3 vs 4.2, 95% CI 0.3, 9.8 - Short stay: 8.0 vs 3.5, 95% CI 0.5, 8.3 No difference	Some concerns
Fischer et al,[13] 2021	SNF rehab residents, LACE >7 I: 60 C: 60	USA	1. Specialist 2. Medical team communication	ALIGN (Assessing and Listening to Individual Goals and Needs), a patient/caregiver-centered intervention that provides psychosocial care that targets communication, goal alignment, and caregiver support was conducted through a specialized palliative care social worker making an initial in-SNF visit with the patient and caregiver to complete a comprehensive clinical needs assessment. Patients were followed from admission up to 45 d after SNF discharge with follow-up visits in person or by phone.	Facility	Action Health status Health care utilization Health care utilization Health status Process Process Health status	AD in chart§ Quality of life§ Hospitalizations§ Hospice referrals§ Mortality§ Patient knowledge§ Caregiver knowledge§ Caregiver burden§	Increased: 91% vs 40%, $P < .001$ No difference No difference No difference No difference No difference No difference No difference	Some concerns
Lamppu et al,[14] 2021	Finnish speaking with severe comorbidity and <12-mo prognosis I: 151 C: 173	Finland	1. Staff education	Based on a training-needs survey from intervention wards, 4 afternoon training sessions were held for nurses and physicians covering the basics of good palliative care, ACP, and discussing these issues with residents and their relatives, good symptom management, adverse effects of hospitalizations, communication skills, tailoring end-of-life care, supporting relatives, and confronting challenging situations in end-of-life care using participants' own experiences. Training sessions used adult learning theory focusing on learners setting their own aims and goals for building new competencies. Sessions led by experienced geriatrician with experience in LTC research and clinical practice as well as palliative care.	Staff	Health status Health care utilization Health care utilization Health care utilization Action Health status	Quality of life‡ Hospital days†,§ ED visits§ Total hospital costs§ ACP discussions§ Mortality§	No difference No difference No difference No difference No difference No difference	Low risk
Loomer et al,[15] 2021	Short-stay (<100-d) residents from 360 NHs With advanced illness I: 2538 C: 5290 Without advanced illness: I: 23,302- C: 50,815	USA	1. Resident and family education	Five 6- to 10-min ACP videos (general goals of care, GOC for advanced dementia, hospice, hospitalizations, ACP for healthy patients) outlining 3 broad approaches to care (intensive, basic, comfort) were made available on admission via tablet computers and shown to residents or proxies	Resident	Health care utilization Health care utilization Health care utilization Health care utilization	Hospital transfers per 1000 person days alive§ At least 1 hospital transfer§ At least 1 burdensome treatment§ Hospice enrollment§	No difference No difference No difference No difference	Low risk

(*continued on next page*)

Table 1 (*continued*)

Study, Year (in Order by year)	Population (NH Residents)	Country	Intervention Strategy	Intervention	Intervention Level	Outcome Domain*	Measured Outcomes	Results (Intervention Listed First)	Overall Risk of bias†
Deng et al,[16] 2020	I: 74 C: 74	China	1. Structured discussion	Three 1-h structured discussions between research nurse and patient on patient's current situation, personal values, and wishes for life-sustaining treatment	Resident	Quality of care Action Health status Health care utilization	Decisional conflict‡,§ Preference for CPR, mechanical ventilation, or artificial feeding‡,§ Overall quality of life concerns‡,§ ED visit, hospitalization, or outpatient visit§	Reduced: 3.39 vs 2.78 (0-4 scale, higher score indicates higher level of certainty) Reduced: 19.3% vs 28.6%, $P < .05$ No difference No difference	Low risk
Forbat et al,[17] 2020	1700 residents from 12 facilities in stepped wedge trial	Australia	1. Specialist 2. Staff education	Palliative Care Needs Rounds were conducted by a specialist palliative care clinicians (nurse practitioner and nurse) and attended by nursing home staff. Rounds consisted of an hour-long staff only triage meeting using a checklist to discuss up to 10 residents at risk of dying without a plan in place and who have high symptom burden. Case-based education was included.	Facility	Health care utilization Health care utilization Health care utilization	Length of stay in acute care‡ Number of hospitalizations per facility-month§ Cost savings§	Reduced: length of stay reduced by 0.22 days, $P = .038$; 95% CI [-0.44, −0.01] Reduced: 4.3 vs 5.6 Net annual cost saving of hospitalizations across all 12 facilities (Australian Dollar): $1,759,011	Low risk
Liu et al,[18] 2020	1700 residents from 12 facilities in stepped wedge trial. Resident deaths: I: 263 C - 208	Australia	1. Specialist 2. Staff education	Palliative Care Needs Rounds were conducted by a specialist palliative care clinicians (nurse practitioner and nurse) and attended by nursing home staff. Rounds consisted of an hour-long staff-only triage meeting using a checklist to discuss up to 10 residents at risk of dying without a plan in place and who have high symptom burden. Case-based education was included.	Facility	Quality of care Process Action Action Action	Staff-reported quality of death§ Staff-reported confidence in caring for people at end of life§ ACP documentation§ Documentation: power of attorney§ Health directions§	Increased: Adjusted treatment effect 8.1, $P < .01$; 95% CI 3.8, 12.4 Increased: pre- vs postintervention for intervention group: 29.4 vs 34.2 (higher scores indicate higher confidence), $P < .01$, 95% CI 2.7, 6.7 Increased: 30% vs 42%, $P < .01$ No difference Increased: 3% vs 7%, $P = .03$	Low risk
Mitchell et al,[19] 2020	Long stay (>100 day) residents from 360 NH With advanced illness: I—4171 C—8308 Without advanced illness I—5764 C−11,773	USA	1. Resident and family education	Five 6- to 10-min ACP videos (general goals of care, GOC for advanced dementia, hospice, hospitalizations, ACP for healthy patients) outlining 3 broad approaches to care (intensive, basic, comfort) were made available on admission and every 6 mo via tablet computers and shown to residents or proxies.	Resident	Health care utilization Health care utilization Health care utilization Health care utilization	Hospital transfers per 1000 person days alive‡,§ At least 1 hospital transfer§ At least 1 burdensome treatment§ Hospice enrollment§	No difference No difference No difference No difference	Low risk
Tappen et al,[20] 2020	Residents without cognitive impairment I: 97 C: 95	USA	1. Resident and family education	Research team visited participant and reviewed and answered questions regarding content of the decision aid "Go to the Hospital or Stay Here." Participants were given a printed copy of the Guide, asked to re-read guide, and think about what their decision would be should an acute change in condition occur.	Resident	Process Process Quality of care Health care utilization Action	Knowledge‡ Decisional preparation‡ Decisional conflict‡ Hospital transfers‡ Care preference‡	Increased: Knowledge change 1.8 vs 0.6 (greater increase in points indicates greater knowledge change), $P = .006$ Intervention group at post-test vs 3 mo later: Reduced: 39.59 vs 36 (higher scores indicates a decision aid is more useful), $P = .046$ Reduced: 8.95 vs 15.73 (lower scores indicate less conflict), $P = .001$ No difference No difference	Some concerns

Van den Block et al,[21] 2020	I: 425 C: 588	7 European countries (Belgium, England, Finland, Italy, the Netherlands, Poland, and Switzerland)	1. Staff education	Using a train-the-trainer approach, support staff introduced palliative care over 1 y to nursing home staff using the PACE Steps to Success Program, a multicomponent intervention to integrate basic nonspecialist palliative care in nursing homes. Steps include (1) ACP with residents and families; (2) assessment, care planning, and review of needs and problems; (3) coordination of care via monthly multidisciplinary review meetings; (4) delivery of high-quality care focusing on pain and depression; (5) care in the last days of life; and (6) care after death.	Staff	Quality of care Process	Staff report of resident comfort in last week of life[†] Staff report of knowledge of palliative care	No difference Increased: 0.61 vs 0.59 (higher score indicates more knowledge), $P = .03$; 95% CI 0.001, 0.03	Some concerns
Goossens et al,[22] 2019	Dementia or mixed wards I: 160 C: 151	Belgium	1. Resident and family education 2. Staff education	A multicomponent intervention included: 1. Education: 2 4-h workshops reviewing the 3 steps to shared decision making (Choice Talk, Option Talk, Decision Talk) aimed at all types of NH staff 2. Implementation support: NH management committed to implement the intervention by participating themselves and by being prepared to review and update their internal ACP policies 3. Supporting materials provided: postcards of pointers, page of recommendations, PowerPoint presentation 4. Information campaign: "Shared decision-making. Your choice, our care" informed residents and families of ACP and why shared decision making is important	Staff, Facility	Action Process Process Action	Level of shared decision making[‡,§] Staff competence[§] Staff-rated importance of shared decision making[§] Frequency of shared decision making[§]	At 3 mo: Increased: 53.5 vs 25 (higher scores indicate more shared decision making present), $P < .001$ At 6 mo: Increased: 56 vs 22.3, $P < .001$ At 3 mo: Increased: 3.91 vs 3.75 (higher scores indicate more competence), $P = .010$ At 6 mo: Increased: 3.95 vs 3.72, $P = .041$ At 3 mo: Increased: 4.64 vs 4.49 (higher scores indicate more important), $P = .031$ At 6 mo: No difference At 3 mo: No difference At 6 mo: No difference	Some concerns
Sævareid et al,[23] 2019	Long-term residents I: 77 C: 77	Norway	1. Staff education 2. Structured discussion	A project team was established within each ward consisting of a coordinator (preferably a nurse), ward manager, and NH physician. An ACP guide was developed and provided to the project team to carry out ACP. In addition, a 2-d training seminar was held consisting of a presentation, discussion, and use of guide through role play. A pocket card for spontaneous ACP conversations was also created and provided. Project teams would then train other staff at the ward.	Staff	Action Action Action Action Health care utilization Action Quality of care	Documented conversation[§] Documentation of preferences, hopes, and worries[§] Preferences regarding future life-sustaining treatment or hospitalization[§] Patient opting for life-sustaining treatments or hospitalizations[§] Received life-sustaining treatments or hospitalizations[§] Decisions limiting life-sustaining treatments or hospitalizations[§] Care concordance[§]	Increased: 36.8% vs 10.7%, $P < .001$ Increased: 52.6% vs 17.3%, $P = .006$ No difference Increased: 33.3% vs 3.8%, $P = .02$ No difference No difference Increased: 20% vs 10.3%, $P = .037$	High risk

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Table 1 (*continued*)

Study, Year (in Order by year)	Population (NH Residents)	Country	Intervention Strategy	Intervention	Intervention Level	Outcome Domain*	Measured Outcomes	Results (Intervention Listed First)	Overall Risk of bias†
Aasmul et al,[24] 2018	Long-term residents with life expectancy >6 mo I: 297 C: 248	Norway	1. Staff education	In connection with the COSMOS trial, all nurses, physicians, and NH managers were invited to a 2-d educational seminar that included lectures, training, and role-play with ACP education and training on involving family and initiating communication via open- vs close-ended questions and active listening. At least 2 nurses from each unit were required to participate and appointed as ambassadors who would implement their training and the COSMOS intervention on their unit. Communication between the primary nurse and family was to be held monthly whereas formal meetings between patient and care team was to be held quarterly. Researchers followed up ambassadors with every-other-week phone calls and with a midway, 1-d seminar.	Staff	Action Action Action Action Action Quality of care Quality of care Health status	Conversation with physician‡ Conversation with primary nurse‡ Monthly phone calls to family‡ Contact with family during the last month‡ Documented communication activities‡ Staff-reported satisfaction with communication‡ Family-reported satisfaction with communication‡ Nursing staff distress‡	No difference At 4 mo: Increased: intervention effect OR 3.99, $P < .01$, 95% CI 1.6, 9.4 At 9 mo: No difference No difference At 4 mo: Increased: intervention effect OR 6.5, $P < .05$, 95% CI 1.6, 3.5 At 9 mo: No difference No difference Increased: intervention effect OR 1.9, $P < .01$, 95% CI 0.80, 2.91 Increased: intervention effect 0.4, $P < .05$, 95% CI 0.02, 0.85 At 4 mo: Reduced: intervention effect −1.8 (larger negative change indicates less distress), $P = .012$, 95% CI [-3.1, −0.4] At 9 mo No difference	Low risk
Brazil et al,[25] 2018	Residents with dementia and without decision-making capacity I: 51 C: 91	Northern Ireland	1. Resident and family education 2. Specialist 3. Structured discussion 4. Medical team communication	An experienced registered nurse was selected as ACP facilitator and completed the Respecting Choices 'Online ACP Facilitator Curriculum' and 'The End of Life for All' (e-ELCA) online training programs in addition to face-to-face orientation on ACP and dementia by "local expertise." The ACP facilitator scheduled structured family meetings. Participants were mailed the booklet 'Comfort care at the end of life for persons with dementia—a guide for caregivers (Northern Ireland version). In the initial meeting, booklet contents were reviewed, and family members were assisted to reflect on resident's goals, values, and beliefs as well as end-of-life care options. In the second meeting, facilitator would present a draft ACP based on the prior discussion to review and sign. The ACP was placed in the medical record and a copy was sent to the resident's GP.	Resident	Quality of care Quality of care Health status Action Health care utilization	Family decisional conflict‡,§ Family satisfaction with care§ Caregiver distress§ DNR documentation§ Hospital admissions§	Reduced: 18.3 vs 30.7 (lower scores indicate less conflict), difference in mean −10.5, 95% CI -16.4, −4.7, $P < .001$ Increased: 144.6 vs 133.6 (higher scores indicate more satisfaction), difference in mean 8.6, 95% CI 2.3, 14.8, $P = .01$ No difference No difference No difference	High risk
Cohen et al,[32] 2019	Long stay (>90 d) advanced dementia and English-speaking proxy I: 172 C: 156	USA	1. Resident and family education 2. Medical team communication	12-min ACP video (describing features of advanced dementia followed by options for intensive, basic, or comfort care) for proxies shown by research assistant via tablet computers during baseline interview followed by documentation of preferred level of care that was sent to residents' clinician, nursing unit, social worker, and medical record.	Resident	Quality of care Quality of care Quality of care Quality of care	Care concordance for any preference§ Care concordance if comfort care preferred§ Care concordance if basic care preferred§ Care concordance if intensive care preferred§	No difference Increased: 10.8% vs 2.5%, $P = .042$, AOR 2.48, 95% CI 1.01, 6.09 No difference No difference	High risk

Mitchell et al,[26] 2018	Long stay (>90 d) advanced dementia and English-speaking proxy I: 172 C: 156	USA	1. Resident and family education 2. Medical team communication	12-min ACP video (describing features of advanced dementia followed by options for intensive, basic, or comfort care) for proxies shown by research assistant via tablet computers during baseline interview followed by documentation of preferred level of care that was sent to residents' clinician, nursing unit, social worker, and medical record.	Resident	Action Action Action Action Action Health care utilization	DNH documentation at 6 mo[†] Documentation to withhold tube-feeding[§] Documentation to withhold IV hydration[§] Goals of care discussion documented[§] Documentation of preference for comfort care[§] Burdensome treatments per 1000 resident-days[§]	No difference Increased: 70.1% vs 61.9%, AOR 1.79, 95% CI 1.13, 2.82 No difference No difference No difference No difference	Low risk
Hanson et al,[27] 2017	Advanced dementia and English-speaking proxy I: 151 C: 151	USA	1. Resident and family education 2. Staff education 3. Structured discussion	18-min goals of care video decision aid shown by research staff during initial visit followed by a structured discussion by NH team. The NH team consisted of nurses, social workers, therapists, nutritionists who completed 1 h of training reviewing the video decision aid, learning VALUE principles, and observing short role-play of goals of care conversation.	Resident; Staff	Quality of care Quality of care Quality of care Action Quality of care Quality of care Action Health care utilization	Satisfaction with communication[‡] Goal concordant care[‡,§] Family concordance with clinicians[‡,§] MOST completion at 9 mo[§] Family-reported symptom management[§] Family-reported satisfaction with care at end of life Documentation of palliative care content in care plans[§] Hospital transfers per 90 person-days[§]	Increased: 6.0 vs 5.6 (higher scores indicate higher satisfaction), $P = .05$ No difference No difference Increased: 35% vs 16%, $P = .05$ No difference No difference Increased: 5.6 vs 4.7 (higher scores indicate more content); $P = .02$ Reduced: 0.078 vs 0.163, $P = .02$; RR 0.47, 95% CI 0.26, 0.88	Some concerns
Reinhardt et al,[28] 2014	Residents with advanced dementia not already in hospice I: 47 C: 40	USA	1. Specialist 2. Structured discussion 3. Medical team communication	A palliative care team, consisting of a physician and a social worker, used a structured face-to-face meeting with each family member after speaking with the primary care team about the resident's condition. Topics included resuscitation, hospitalization, artificial nutrition and hydration, and pain/symptom management. Meets took an average of 47 min, and specific care plan decisions were communicated to the primary care team.	Facility	Quality of care Quality of care Health status Health care utilization Action Action Action Action Action Action Action Action	Satisfaction with medical care[§] Symptom control[§] Surrogate well-being[§] Hospice referral[§] Documentation: MOLST[§] Documentation: DNR[§] Documentation: DNI[§] Documentation: DNH[§] Documentation: No feeding tube[§] Documentation: No IVs[§] Documentation: No antibiotics[§] Documentation: Comfort care[§]	Increased: 8.2 vs 7.3 (higher scores indicate more satisfaction), $P < .05$ No difference No difference No difference Pre- vs postintervention for intervention group: Increased, 88% vs 100%, $P < .01$ Pre- vs postintervention for intervention group: Increased: 75% vs 94%, $P < .01$ Pre- vs postintervention for intervention group: Increased: 60% vs 83%, $P < .001$ Pre- vs postintervention for intervention group: Increased: 25% vs 30%, $P < .01$ Pre- vs postintervention for intervention group: Increased: 33% vs 57%, $P < .01$ Pre- vs postintervention for intervention group: No difference Pre- vs postintervention for intervention group: No difference Pre- vs postintervention for intervention group: No difference	Some concerns

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Table 1 (*continued*)

Study, Year (in Order by year)	Population (NH Residents)	Country	Intervention Strategy	Intervention	Intervention Level	Outcome Domain*	Measured Outcomes	Results (Intervention Listed First)	Overall Risk of bias†
Volandes et al,[29] 2012	Residents without severe cognitive impairment I: 50 C: 51	USA	1. Resident and family education	Residents viewed a video decision aid shown on a portable computer. The video decision aid was 6 min and depicted care categorized as life-prolonging, limited, and comfort care accompanied by visual images of the typical treatments.	Resident	Action Quality of care	Resident preference for comfort care* Concordance of preferences with documentation in the medical record§	Increased: 80% vs 57%, $P = .02$, rate ratio 1.4, 95% CI 1.1, 1.9 No difference	Low risk
Casarett et al,[30] 2005	I: 107 C: 98	USA	1. Structured discussion 2. Medical team communication	Research assistants conducted structured interviews with residents to identify goal of care, treatment preferences, and palliative care needs in order to screen for hospice eligibility. Residents' physicians were notified and asked to authorize a hospice informational visit.	Resident	Health care utilization Quality of care Health care utilization Health care utilization Health care utilization Health care utilization Health status Health care utilization	Hospice referral within 30 d‡ Satisfaction with medical care‡ Hospice enrollment at 6 mo§ Hospice enrollment at time of death§ Acute care admissions per resident§ Days in hospital per resident§ Mortality at 6 mo§ Place of death: nursing home§	Increased: 20% vs 1%, $P < .001$ Increased: 4.3 vs 2.2 (higher ratings indicate higher satisfaction), $P = .01$ Increased: 25% vs 6%, $P < .001$ No difference Reduced: 0.28 vs 0.49, $P = .04$ Reduced: 1.2 vs 3.0, $P = .03$ No difference No difference	Some concerns
Molloy et al,[31] 2000	NH: I: 3 C: 3 Resident: I: 527 C: 606	Canada	1. Staff education 2. Medical team communication	Three registered nurses employed by NHs attended a 2-day workshop on educating hospital staff, nursing home staff, residents, and families about advance directives and measuring capacity to complete advance directives—termed "LetMeDecide". The nurses would then provide educational in-services and meet to with resident or proxies at baseline and after 1 year to educate about "LetMeDecide" and complete or update advance directives. If advance directives were completed, physicians reviewed and signed directives with the original remaining in the chart.	Staff	Action Quality of care Health care utilization Health care utilization Health care utilization Health status	Completed ADs‡,§ Satisfaction with care‡,§ Total hospitalizations per patient over 18 mo‡,§ Hospitalization days per patient over 18 mo‡,§ Hospital cost per resident‡,§ Mortality‡,§	Increased: 70% vs 57% No difference Reduced: 0.27 vs 0.48, $P = .001$ Reduced: 2.61 vs 5.86, $P = .01$ Reduced: $3490 vs $5,239, $P = .013$ No difference	Some concerns
Siegert et al,[33] 1996	Long-term residents with decision-making capacity I: 16 C: 20	USA	1. Resident and family education	Intervention group participants watched an advance directive videotape produced by a nationally recognized patient advocacy group that focused on living wills.	Resident	Process Action	Comprehension of living will and CPR‡,§ Care preferences§	No difference No difference	Low risk

ACP, advance care planning; AD, advance directives; AOR, adjusted odds ratio; C, control group; COSMOS, communication, systematic pain assessment and treatment, medication review, organization of activities, and safety; CPR, cardiopulmonary resuscitation; DNH, do not hospitalize; DNI, do not intubate; DNR, do not resuscitate; ED, emergency department; EOL, end of life; GOC, goals of care; I, Intervention group; IV, intravenous; LACE, length of stay in days, acuity, comorbidity, emergency room visits in past 6 months; LTC, long-term care; MOST, medical orders for scope of treatment; MOLST, medical orders for life-sustaining treatment; OR, odds ratio; NH, nursing home; RR, relative risk.

*Characterized using the ACP Outcomes Framework, as discussed in the review.[4] Calculated using revised Cochrane risk-of-bias tool (RoB 2).

†Calculated using revised Cochrane risk-of-bias tool (RoB 2).

‡Primary outcome of study.

§Study not adequately powered to detect this outcome, either as stated in study or interpreted by the authors of this review because of lack of mention in study.

Care Utilization. Within these domains, subdomains were created to further categorize the outcomes; this subdomain categorization was created using McMahan et al's work as a model.

The revised Cochrane risk of bias tool for individual and cluster randomized trials (RoB 2) was used.[10] Domains evaluated included randomization process, deviations from intended interventions, missing outcome data, measurement of the outcome, selection of the reported result, and overall bias, which were rated as low, high bias, or some concerns as dictated in the algorithm. In the cluster-randomized trial evaluation, timing of identification of recruitment of participants was also evaluated. Authors O.S. and M.Y. independently assessed risk of bias and any discrepancies were arbitrated by N.K.S.

Data Synthesis

All studies were included regardless of the risk of bias. It was not possible to pool results into a meta-analysis given the heterogeneity in both interventions and outcomes.

Results

Study Characteristics

There was a total of 23 RCTs identified, with 12 studies from USA, 6 from Europe, 2 from Australia, 2 from Canada, and 1 from China. The intervention strategies included resident and family education (11 studies), staff education (9), communication with the primary medical team (7), structured discussions (7), and/or specialist utilization (5). Eleven studies used a single intervention strategy, 9 utilized 2 intervention strategies, 2 used 3 intervention strategies, and 1 used 4 strategies. The interventions were targeted at the resident level (13 studies), staff level (7), and/or facility level (5). Two studies targeted multiple levels. Table 1 displays the study characteristics.

Some studies examined only long-term nursing home residents, whereas other studies examined only short-term residents or a combination. The number of residents in each study ranged from 36 to over 80,000,[15,32] with the majority of studies enrolling between 100 and 1000 participants.

Risk of Bias of Studies

There was low risk of bias in 10 studies, some concerns of bias in 10 studies, and high risk of bias in 3 studies. The most frequent type of bias encountered was risk of bias in measurement of the outcome. The authors' interpretation of risk of publication bias in this systematic review is low.

Results by Domain and Subdomain

Process

Knowledge. Four studies assessed the effect of ACP interventions on either caregiver, staff, or resident knowledge. Knowledge was increased in 2 studies[20,21] and unchanged in 2 studies.[13,32] In one well-designed, multicomponent intervention study focused on implementing a palliative care approach within nursing homes, Van den Block et al,[21] found staff knowledge of palliative care, as measured by the Palliative Care Survey (PCS; 0-1 scale), was higher in the intervention group by 0.02 ($P = .03$, 95% CI 0.001, 0.03).

Attitudes. One study examined attitudes; after their educational-focused intervention, Goossens et al[22] examined staff ratings of the importance of shared decision making shared decision making and found the intervention group staff rated SDM more important at 3 mo ($P = .031$).

Self-efficacy. Two of the 3 studies that measured outcomes related to self-efficacy had positive findings. In their implementation of Palliative Care Needs Rounds, which consisted of a monthly hour-long review of up to 10 high-risk residents, Liu et al[18] found that the staff-reported Capacity to Adopt Palliative Approach (9 questions, higher scores indication greater capacity) improved pre- and postintervention from 29.4 to 34.2 ($P < .01$; 95% CI 2.7, 6.7).

Action

Documentation of values and preferences. Documentation of values and preferences was an outcome in 13 studies, with 10 of the studies having at least 1 positive outcome in this subdomain. Five studies examined the completion of advance directives or MOST/MOLST forms as an outcome, and all showed increased completion rates.[13,18,27,28,31] Four studies posed questions about participants' care preferences after giving them information or scenarios, with 2 studies finding no differences and 2 studies finding preference changes toward less intensive care.[16,20,29,32] In one thoughtful study consisting of a multicomponent intervention (a video decision aid followed by a structured discussion), Hanson et al[27] found more documentation of palliative care content in care plans at 9 mo, as measured by a 0-10 scale with higher scores indicating more content (5.6 vs 4.7, $P = .02$).

Communication. One study, Aasmul et al,[24] examined communication activities and found an increase in the number of conversations between family and the resident's primary nurse as well as contact with the family in the last month of life at 4 mo, but these measures were not sustained at 9 mo. There was no difference in other communication measures.

Decision making. One study, Goossens et al,[22] examined decision making and found that the level of shared decision making during formal ACP conversations increased after their intervention ($P <$ .001), but the frequency did not.

Quality of care

Care concordance. Effects of ACP interventions on care concordance were evaluated in 4 studies. Two studies found no difference.[27,29] However, Cohen et al[32] found that care concordance increased for those who preferred comfort care (10.8% vs 2.5%, $P = .042$; AOR 2.48, 95% CI 1.01, 6.09), whereas Sævareid et al[23] found increased concordance between patient preferences and life-sustaining treatment or hospitalizations (20% vs 10.3%, $P = .037$).

Communication. In the 3 studies that examined communication measures related to quality of care, all had positive findings.[11,24,27] With communication a major focus of their intervention, Aasmul et al[24] found that both staff and family perceived improved communication (staff: intervention effect 1.9, $P < .01$; 95% CI 0.80, 2.91; family: intervention effect 0.4, $P < .05$, 95% CI 0.02, 0.85).

Medical care. Intervention impact on quality of care was evaluated in 7 studies, 4 of which had positive outcomes.[18,25,28,31] In their well-designed Palliative Care Needs Rounds, Liu et al[18] examined and found improved quality of death via staff-reported Quality of Death and Dying Inventory short form (adjusted treatment effect 8.1, $P < .01$, 95% CI 3.8, 12.4).

Decisional conflict. The 3 studies that examined decisional conflict as an outcome all found reduced decisional conflict after their interventions.[16,20,25]

Health status

Mortality. The 4 studies that examined mortality rate after intervention found no difference.[13,14,30,31]

Quality of life. The effect of ACP interventions on quality of life was assessed in 3 studies, none of which found a difference.[13,14,16]

Caregiver burden and distress. The effects on caregiver burden and caregiver distress were each examined in one study, both finding no difference.[13,25]

Health care utilization

Hospitalizations and length of stay. Of the 13 studies that examined hospitalizations or length of stay in acute care, ACP interventions resulted in a reduction in 4 studies.[17,27,30,31] However, those studies that found reductions had impressive results; for example, Molloy et al,[31] found a 44% reduction in total hospitalizations per patient (0.27 vs 0.48, $P = .001$) and 55% reduction in hospitalization days per patient (2.61 vs 5.86, $P = .01$) over 18 mo.

Cost. Two of the 3 studies that examined cost found cost reductions. Molloy et al found a mean cost reduction of 33% per resident (in Canadian dollars; $3490 vs control of $5,239, $P = .013$),[31] whereas Forbat et al[17] reported a net annual cost savings of hospitalizations of $1,759,011 across 12 facilities.

Hospice referral and enrollment. Five studies examined hospice referral or enrollment, with only 1 study finding an increase. In their study focused on identifying residents appropriate for hospice services, Casarett et al found a 19% increase (20% vs 1%, $P < .001$) in hospice referral within 30 d and 19% increase in hospice enrollment at 6 mo (25% vs 6%, $P < .001$).[30]

Burdensome treatment. None of the 3 studies that examined the prevalence of burdensome treatments (tube-feeding, IV therapies, invasive mechanical intervention, ICU admission) found a difference.[15,19,26]

Place of death. One study, Casarett et al,[30] examined place of death and reported no difference.

Discussion

We aimed to review and evaluate the impact of ACP interventions on outcomes in nursing homes. Twenty-three RCTs were evaluated, with significant heterogeneity in the types of ACP interventions employed and the outcomes assessed in each study.

Following the work of McMahan et al in their scoping review of ACP,[9] the ACP Outcomes Framework[8] was applied to organize our results. Categorizing the outcomes into the 5 domains of Process, Action, Quality of Care, Health Status, and Health Care Utilization, and further dividing those domains into subdomains was helpful in examining trends. The majority of outcomes across all the studies fell under the Action or Quality of Care domains, with fewer outcomes in the Process, Health Status, and Health Care Utilization domains.

Although ACP interventions were not shown to positively impact the majority of all outcomes, 19 out of the 23 studies had at least one positive outcome. A slight majority of Process outcomes, which included the subdomains of knowledge, self-efficacy, and attitudes, were positive. Similarly, a slight majority of Action outcomes, which included subdomains of documentation of values and preferences, communication, and decision making, were positive. Outcomes in the Quality of Care domain, which included care concordance, communication, medical care, and decisional conflict, were mixed. A minority of Health Care Utilization outcomes, which included hospitalizations and length of stay, cost, hospice referral and enrollment, burdensome treatment, and place of death, were positive. Finally, for most of the outcomes in the Health Status domain, which included mortality, quality of life, and caregiver burden/distress, there was no difference detected between intervention and control.

It is perhaps not surprising that Process and Action outcomes were on the whole positive, whereas the other types of outcomes were not; tailoring an intervention to implement a process change or increase completion of a MOST form, for example, is often simpler than measuring cost reduction or quality of life improvement. Although Quality of Care outcomes were mixed, all 3 studies that examined decisional conflict showed reductions in decisional conflict, an important patient- and family-centered outcome. In addition, the 3 studies that included communication measures all had positive outcomes in this subdomain, which is encouraging.

Both measuring and positively impacting outcomes in Health Care Utilization is difficult; it is important to closely examine how studies achieved positive outcomes in this domain. The 4 studies that showed reductions in hospitalizations and/or length of stay employed varied types of ACP interventions, yet staff education was a common component in 3 of the studies. This finding underscores the importance and positive impact of ongoing staff education in nursing homes.

As McMahan et al[9] noted in their review, every intervention cannot positively impact every outcome, as the range of outcomes can be quite varied, but it is important to explore the reasons why ACP interventions may not consistently result in positive outcomes. Although the focus of our analysis was not on comparing the types or numbers of intervention strategies employed, it is noteworthy that the 4 studies with no positive outcomes all used only 1 intervention strategy. Given the complexity of ACP and varying nursing home cultures, the implementation of multiple intervention strategies may yield more benefit. Other reasons for lack of beneficial outcomes, as mentioned by several study authors, include low implementation fidelity of their interventions.[15,17,19,21] Some study authors also cited a lack of ongoing intervention as a reason why longer-term outcomes were not impacted.[14,22,24] Additionally, one author cited a lack of integration into the existing nursing home processes as a reason why outcomes were not positively impacted.[26]

In studies with positive outcomes, the study authors attributed their success to various reasons, including using a whole-ward approach,[23] using existing workflows,[11,12] performing risk stratification of residents who would most likely benefit,[17] and delivering a simple intervention.[30] However, there was a variety of approaches to ACP interventions in these studies, many of which led to positive outcomes, suggesting there is likely no one way for every nursing home to approach ACP interventions. Interventions that are successful in one facility, or in one region, may not lead to the same outcomes everywhere.

A strength of this review is the exclusive analysis of RCTs. Eighteen of these 23 studies were conducted in the last 6 years. However, this review had several limitations. Many of the studies, as reported by the study authors or as interpreted by the authors of this review, were not adequately powered to detect their primary outcomes, limiting our ability to make definitive conclusions. Given our broad inclusion criteria for the definition of an ACP intervention, there was significant heterogeneity in interventions and outcomes assessed, and a meta-analysis was not possible. Some trials only included short-term residents, whereas others included only long-term residents, and some had a mixture. We limited the review to studies published in English, and most studies were conducted in the United States or Europe. Most studies did not report on whether the studied outcomes varied by a nursing home resident's race, ethnicity, or socioeconomic status. Additionally, with a focus only on RCTs, we likely missed examining important interventions that were not carried out through an RCT.

Moving forward, as others have noted,[9,34] more pragmatic trials are needed in nursing homes. Future studies could consider the constraints of the nursing home setting, including nursing shortages, and risk stratification of the residents most likely to benefit from

interventions.[11,15] Studies should continue to include staff education, and studies should consider how to maintain intervention sustainability. In addition, ensuring inclusion and reporting of diverse populations is paramount. The ACP Outcomes Framework may be helpful both for considering which outcomes to target for change as well as for reporting of outcomes. Ensuring the measured outcomes are meaningful to residents, families, and/or staff is important. As some study authors noted, larger changes in the nursing home sector may improve ACP intervention effectiveness, including strengthening the nursing home workforce and including ACP in nursing home quality guidelines.[14,22]

Conclusion

Moderate to high-quality evidence demonstrates that ACP interventions can impact positive change in nursing homes, such as reducing decisional conflict and improving communication. However, ACP interventions inconsistently result in beneficial measured outcomes across all 5 domains of Action, Process, Quality of Care, Health Care Utilization, and Health Status. Efforts to refine the implementation of ACP interventions in nursing homes should continue, as should efforts to target which outcomes matter most for residents, families, and staff. As the home of many older adults with serious illness and a place of death for a significant percentage of older adults, the nursing home is an important arena for continued work toward improving residents' quality of life and quality of death.

Disclosure

The authors declare no conflicts of interest.

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Supplementary Material

Librarian searcher: Sarah Cantrell, MLIS; Duke University Medical Center Library & Archives, Duke University School of Medicine.

Peer review of search conducted by: Brandi Tuttle, MLIS; Duke University Medical Center Library & Archives, Duke University School of Medicine.

Database: MEDLINE (via PubMed); Original search Date: March 21, 2021; Search update: March 27, 2023

Search Set	Search Strategy	Results 3/21/21	Results 3/27/23
#1 Advance directive terms	"Advance Directives"[Mesh] OR "Living Wills"[Mesh] OR "Resuscitation Orders"[Mesh] OR "advance directive"[tiab] OR "advance directives"[tiab] OR "advanced directive"[tiab] OR "advanced directives"[tiab] OR "code status"[tiab] OR "code statuses"[tiab] OR "do not resuscitate"[tiab] OR DNR[tiab] OR "do not intubate"[tiab] OR DNI[tiab] OR "do not hospitalize"[tiab] OR "do not hospitalise"[tiab] OR "living will"[tiab] OR "living wills"[tiab] OR "feeding restriction"[tiab] OR "feeding restrictions"[tiab] OR "medication restriction"[tiab] OR "medication restrictions"[tiab] OR "instructional directive"[tiab] OR "instructional directives"[tiab] OR "value history"[tiab] OR "values history"[tiab] OR "value histories"[tiab] OR "values histories"[tiab] OR "advance care plan"[tiab] OR "advance care plans"[tiab] OR "advance care planning"[tiab] OR "advanced care plan"[tiab] OR "advanced care plans"[tiab] OR "advanced care planning"[tiab] OR "goals of care"[tiab] OR (("do not attempt"[tiab]) AND (resuscitat*[tiab] OR intubat*[tiab] OR hospital*[tiab])) OR (power[tiab] AND attorney[tiab]) OR ((healthcare[tiab] OR "health care"[tiab]) AND (proxy[tiab] OR proxies[tiab])) OR (medical[tiab] AND (order[tiab] OR orders[tiab]) AND scope[tiab] AND (treatment[tiab] OR treatments[tiab] OR therapy[tiab] OR therapies[tiab] OR therapeutics[tiab]))	21,893	25,238
#2 SNF terms	"Skilled Nursing Facilities"[Mesh] OR "Nursing Homes"[Mesh] OR "Intermediate Care Facilities"[Mesh] OR "Subacute Care"[Mesh] OR "Long-Term Care"[Mesh] OR "Transitional Care"[Mesh] OR "skilled nursing facility"[tiab] OR "skilled nursing facilities"[tiab] OR SNF[tiab] OR "transitional care"[tiab] OR "nursing home"[tiab] OR "nursing homes"[tiab] OR "convalescent care"[tiab] OR "convalescent home"[tiab] OR (("short stay"[tiab] OR rehab[tiab] OR rehabilitation[tiab] OR post-acute[tiab] OR postacute[tiab] OR "long-term care"[tiab] OR "longterm care"[tiab] OR "extended care"[tiab] OR "intermediate care"[tiab] OR "sub-acute care"[tiab] OR "subacute care"[tiab] OR "transition care"[tiab] OR "transitional care"[tiab]) AND (facility[tiab] OR facilities[tiab] OR unit[tiab] OR units[tiab] OR center[tiab] OR centers[tiab] OR centre[tiab] OR centres[tiab]))	114,972	129,049
#3 combining	#1 AND #2	1463	1719
#4 RCT/clinical trial filter	#3 AND ("Randomized Controlled Trial"[pt] OR "Controlled Clinical Trial"[pt] OR "Clinical Trial"[pt] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR trials[tiab] OR groups[tiab])	241	311
#5 Search update	#4 AND ("2021/01/01"[Date - MeSH]: "3000"[Date - MeSH])	n/a	91

Database: EMBASE (via Elsevier); Original search Date: March 21, 2021; Search update: March /27, 2023 (Note: search from the Results page)

Search Set	Search Strategy	Results 3/21/21	Results 3/27/23
#1 Advance directive terms	'living will'/exp OR 'do not intubate order'/exp OR 'do not resuscitate order'/exp OR 'advance directive':ti,ab OR 'advance directives':ti,ab OR 'advanced directive':ti,ab OR 'advanced directives':ti,ab OR 'code status':ti,ab OR 'code statuses':ti,ab OR 'do not resuscitate':ti,ab OR DNR:ti,ab OR 'do not intubate':ti,ab OR DNI:ti,ab OR 'do not hospitalize':ti,ab OR 'do not hospitalise':ti,ab OR 'living will':ti,ab OR 'living wills':ti,ab OR 'feeding restriction':ti,ab OR 'feeding restrictions':ti,ab OR 'medication restriction':ti,ab OR 'medication restrictions':ti,ab OR 'instructional directive':ti,ab OR 'instructional directives':ti,ab OR 'value history':ti,ab OR 'values history':ti,ab OR 'value histories':ti,ab OR 'values histories':ti,ab OR 'advance care plan':ti,ab OR 'advance care plans':ti,ab OR 'advance care planning':ti,ab OR 'advanced care plan':ti,ab OR 'advanced care plans':ti,ab OR 'advanced care planning':ti,ab OR 'goals of care':ti,ab OR (('do not attempt':ti,ab) AND (resuscitat*:ti,ab OR intubat*:ti,ab OR hospital*:ti,ab)) OR (power:ti,ab AND attorney:ti,ab) OR ((healthcare:ti,ab OR 'health care':ti,ab) AND (proxy:ti,ab OR proxies:ti,ab)) OR (medical:ti,ab AND (order:ti,ab OR orders:ti,ab) AND scope:ti,ab AND (treatment:ti,ab OR treatments:ti,ab OR therapy:ti,ab OR therapies:ti,ab OR therapeutics:ti,ab))	29,209	35,119
#2 SNF terms	'nursing home'/exp OR 'subacute care'/exp OR 'skilled nursing facility':ti,ab OR 'skilled nursing facilities':ti,ab OR SNF:ti,ab OR 'transitional care':ti,ab OR 'nursing home':ti,ab OR 'nursing homes':ti,ab OR 'convalescent care':ti,ab OR 'convalescent home':ti,ab OR (('short stay':ti,ab OR rehab:ti,ab OR rehabilitation:ti,ab OR post-acute:ti,ab OR postacute:ti,ab OR 'long term care':ti,ab OR 'longterm care':ti,ab OR 'extended care':ti,ab OR 'intermediate care':ti,ab OR 'sub-acute care':ti,ab OR 'subacute care':ti,ab OR 'transition care':ti,ab OR 'transitional care':ti,ab) AND (facility:ti,ab OR facilities:ti,ab OR unit:ti,ab OR units:ti,ab OR center:ti,ab OR centers:ti,ab OR centre:ti,ab OR centres:ti,ab))	139,682	158,577
#3 combining	#1 AND #2	2026	2436
#4 RCT/clinical trial filter	#3 AND ('randomized controlled trial'/exp OR 'controlled clinical trial'/de OR 'crossover procedure'/exp OR 'double blind procedure'/exp OR 'single blind procedure'/exp OR randomized:ti,ab OR randomised:ti,ab OR randomization:ti,ab OR randomisation:ti,ab OR placebo:ti,ab OR randomly:ti,ab OR trial:ti,ab OR trials:ti,ab OR groups:ti,ab)	331	429
#5 Removal of conference abstracts	#4 NOT ([conference abstract]/lim OR 'conference abstract'/exp OR 'conference abstract'/it)	208	271
#6 Search update	#5 AND [01-01-2021]/sd	n/a	76

Database: CINAHL Complete (via EBSCO); Original search Date: March 21, 2021; Search update: March 27, 2023

Search Set	Search Strategy	Results 3/21/21	Results 3/27/23
#1 Advance directive terms	(MH "Advance Directives+") OR (MH "Living Wills") OR (MH "Resuscitation Orders") OR (TI "advance directive" OR AB "advance directive") OR (TI "advance directives" OR AB "advance directives") OR (TI "advanced directive" OR AB "advanced directive") OR (TI "advanced directives" OR AB "advanced directives") OR (TI "code status" OR AB "code status") OR (TI "code statuses" OR AB "code statuses") OR (TI "do not resuscitate" OR AB "do not resuscitate") OR (TI DNR OR AB DNR) OR (TI "do not intubate" OR AB "do not intubate") OR (TI DNI OR AB DNI) OR (TI "do not hospitalize" OR AB "do not hospitalize") OR (TI "do not hospitalise" OR AB "do not hospitalise") OR (TI "living will" OR AB "living will") OR (TI "living wills" OR AB "living wills") OR (TI "feeding restriction" OR AB "feeding restriction") OR (TI "feeding restrictions" OR AB "feeding restrictions") OR (TI "medication restriction" OR AB "medication restriction") OR (TI "medication restrictions" OR AB "medication restrictions") OR (TI "instructional directive" OR AB "instructional directive") OR (TI "instructional directives" OR AB "instructional directives") OR (TI "value history" OR AB "value history") OR (TI "values history" OR AB "values history") OR (TI "value histories" OR AB "value histories") OR (TI "values histories" OR AB "values histories") OR (TI "advance care plan" OR AB "advance care plan") OR (TI "advance care plans" OR AB "advance care plans") OR (TI "advance care planning" OR AB "advance care planning") OR (TI "advanced care plan" OR AB "advanced care plan") OR (TI "advanced care plans" OR AB "advanced care plans") OR (TI "advanced care planning" OR AB "advanced care planning") OR (TI "goals of care" OR AB "goals of care") OR (((TI "do not attempt" OR AB "do not attempt")) AND ((TI resuscitat* OR AB resuscitat*) OR (TI intubat* OR AB intubat*) OR (TI hospital* OR AB hospital*))) OR ((TI power OR AB power) AND (TI attorney OR AB attorney)) OR (((TI healthcare OR AB healthcare) OR (TI "health care" OR AB "health care")) AND ((TI proxy OR AB proxy) OR (TI proxies OR AB proxies))) OR ((TI medical OR AB medical) AND ((TI order OR AB order) OR (TI orders OR AB orders)) AND (TI scope OR AB scope) AND ((TI treatment OR AB treatment) OR (TI treatments OR AB treatments) OR (TI therapy OR AB therapy) OR (TI therapies OR AB therapies) OR (TI therapeutics OR AB therapeutics)))	15,141	17,366
#2 SNF terms	(MH "Nursing Homes+") OR (MH "Skilled Nursing Facilities") OR (MH "Subacute Care") OR (MH "Long Term Care") OR (MH "Transitional Care") OR (TI "skilled nursing facility" OR AB "skilled nursing facility") OR (TI "skilled nursing facilities" OR AB "skilled nursing facilities") OR (TI SNF OR AB SNF) OR (TI "transitional care" OR AB "transitional care") OR (TI "nursing home" OR AB "nursing home") OR (TI "nursing homes" OR AB "nursing homes") OR (TI "convalescent care" OR AB "convalescent care") OR (TI "convalescent home" OR AB "convalescent home") OR (((TI "short stay" OR AB "short stay") OR (TI rehab OR AB rehab) OR (TI rehabilitation OR AB rehabilitation) OR (TI post-acute OR AB post-acute) OR (TI postacute OR AB postacute) OR (TI "long-term care" OR AB "long-term care") OR (TI "longterm care" OR AB "longterm care") OR (TI "extended care" OR AB "extended care") OR (TI "intermediate care" OR AB "intermediate care") OR (TI "sub-acute care" OR AB "sub-acute care") OR (TI "subacute care" OR AB "subacute care") OR (TI "transition care" OR AB "transition care") OR (TI "transitional care" OR AB "transitional care")) AND ((TI facility OR AB facility) OR (TI facilities OR AB facilities) OR (TI unit OR AB unit) OR (TI units OR AB units) OR (TI center OR AB center) OR (TI centers OR AB centers) OR (TI centre OR AB centre) OR (TI centres OR AB centres)))	83,377	92,717
#3 combining	S1 AND S2	1244	1424
#4 RCT/clinical trial filter	S3 AND ((ZT "randomized controlled trial") OR (MH "Randomized Controlled Trials") OR TI ("randomized controlled trial" OR "controlled clinical trial" OR randomized OR randomised OR randomization OR randomisation OR placebo OR randomly OR trial OR trials OR groups OR "single blind" OR "single blinded" OR "double blind" OR "double-blinded) OR AB ("randomized controlled trial" OR "controlled clinical trial" OR randomized OR randomised OR randomization OR randomisation OR placebo OR randomly OR trial OR trials OR groups OR "single blind" OR "single blinded" OR "double blind" OR "double-blinded))	42	63

Database: Cochrane Library (via Wiley) Original search Date: March 21, 2021 Search update: March 27, 2023 (Note: Search from Advanced > Search Manager)

Search Set	Search Strategy	Results 3/21/21	Results 3/27/23
#1 Advance directive terms	[mh "Advance Directives"] OR [mh "Living Wills"] OR [mh "Resuscitation Orders"] OR "advance directive":ti,ab OR "advance directives":ti,ab OR "advanced directive":ti,ab OR "advanced directives":ti,ab OR "code status":ti,ab OR "code statuses":ti,ab OR "do not resuscitate":ti,ab OR DNR:ti,ab OR "do not intubate":ti,ab OR DNI:ti,ab OR "do not hospitalize":ti,ab OR "do not hospitalise":ti,ab OR "living will":ti,ab OR "living wills":ti,ab OR "feeding restriction":ti,ab OR "feeding restrictions":ti,ab OR "medication restriction":ti,ab OR "medication restrictions":ti,ab OR "instructional directive":ti,ab OR "instructional directives":ti,ab OR "value history":ti,ab OR "values history":ti,ab OR "value histories":ti,ab OR "values histories":ti,ab OR "advance care plan":ti,ab OR "advance care plans":ti,ab OR "advance care planning":ti,ab OR "advanced care plan":ti,ab OR "advanced care plans":ti,ab OR "advanced care planning":ti,ab OR "goals of care":ti,ab OR (("do not attempt":ti,ab) AND (resuscitat*:ti,ab OR intubat*:ti,ab OR hospital*:ti,ab)) OR (power:ti,ab AND attorney:ti,ab) OR ((healthcare:ti,ab OR "health care":ti,ab) AND (proxy:ti,ab OR proxies:ti,ab)) OR (medical:ti,ab AND (order:ti,ab OR orders:ti,ab) AND scope:ti,ab AND (treatment:ti,ab OR treatments:ti,ab OR therapy:ti,ab OR therapies:ti,ab OR therapeutics:ti,ab))	1833	2359
#2 SNF terms	[mh "Skilled Nursing Facilities"] OR [mh "Nursing Homes"] OR [mh "Intermediate Care Facilities"] OR [mh "Subacute Care"] OR [mh "Long-Term Care"] OR [mh "Transitional Care"] OR "skilled nursing facility":ti,ab OR "skilled nursing facilities":ti,ab OR SNF:ti,ab OR "transitional care":ti,ab OR "nursing home":ti,ab OR "nursing homes":ti,ab OR "convalescent care":ti,ab OR "convalescent home":ti,ab OR (("short stay":ti,ab OR rehab:ti,ab OR rehabilitation:ti,ab OR post-acute:ti,ab OR postacute:ti,ab OR "long-term care":ti,ab OR "longterm care":ti,ab OR "extended care":ti,ab OR "intermediate care":ti,ab OR "sub-acute care":ti,ab OR "subacute care":ti,ab OR "transition care":ti,ab OR "transitional care":ti,ab) AND (facility:ti,ab OR facilities:ti,ab OR unit:ti,ab OR units:ti,ab OR center:ti,ab OR centers:ti,ab OR centre:ti,ab OR centres:ti,ab))	13,197	15,770
#3 combining	#1 AND #2	162	218
#4 RCT/clinical trial filter	Limit to Trials	155	210
#5 Search update	Limit to: 2021 − 2023	n/a	60

Registry: ClinicalTrials.gov; Original search Date: March 21, 2021; Search Update: March 27, 2023 (Note: Use the Advanced Search)

In the Other Terms box, enter:

"skilled nursing facility" OR "skilled nursing facilities" OR SNF OR "transitional care" OR "nursing home" OR "nursing homes" OR "convalescent care" OR "convalescent home" OR "short stay" OR rehab OR rehabilitation OR post-acute OR postacute.

In the Intervention/treatment box, enter

"advance directive" OR "advance directives" OR "code status" OR "code statuses" OR "do not resuscitate" OR DNR OR "do not intubate" OR DNI OR "do not hospitalize" OR "do not hospitalise" OR "living will" OR "living wills" OR "power of attorney"

20 studies retrieved on March 21, 2021.

15 studies retrieved on March 27, 2023.