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Review Article

The Effects of Advance Care Planning Interventions on Nursing Home Residents: A Systematic Review

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A B S T R A C T

Background: Advance care planning (ACP) encompasses a process by which people may express and record their values and preferences for care and treatment should they lose the capacity to communicate them in the future. We believe the effects that ACP can have on the nursing home population is distinct from others and sought to gain insight into the outcomes of relevant studies on the topic.
Aim: To identify the effects of ACP interventions on nursing home residents.
Design: Systematic review.
Methods: A comprehensive literature search was conducted using the following 4 electronic databases, Embase, Medline, PsychINFO, and CINAHL, with no limits on year or language. Gray literature search of relevant journals was also performed as was reviewing of the reference lists of all included articles. Inclusion criteria were randomized controlled trials, controlled trials, pre/post study design trials and prospective studies examining the effects of ACP on nursing home residents. A detailed narrative synthesis was compiled as the heterogeneous nature of the interventions and results precluded meta-analysis.
Results: The initial search yielded 4654 articles. Thirteen studies fitted inclusion criteria for analysis. The ACP interventions included (1) 5 studies evaluating educational programs; (2) 5 studies introducing or evaluating a new ACP form; (3) 2 studies introducing an ACP program with a palliative care initiative; and (4) 1 study observing the effect of do not resuscitate orders on medical treatments for respiratory infections. A range of effects of ACP was demonstrated in the study populations. Hospitalization was the most frequent outcome measure used across the included studies. Analysis found that in the nursing home population, ACP decreased hospitalization rates by 9%–26%. Of note, in the 2 studies that included mortality, the decrease in hospitalization was not associated with increased mortality. Place of death is another important effect of ACP. Analysis found significant increases in the number of residents dying in their nursing home by 29%–40%. Medical treatments being consistent with ones' wishes were increased with ACP although not to 100% compliance. Two studies showed a decrease in overall health costs. One study found an increase in community palliative care use but not in-patient hospice referrals.
Conclusions: ACP has beneficial effects in the nursing home population. The types of ACP interventions vary, and it is difficult to identify superiority in effectiveness of one intervention over another. Outcome measures also vary considerably between studies although hospitalization, place of death, and actions being consistent with resident's wishes are by far the most common. Very few studies with high quality methodology have been undertaken in the area with a significant lack of randomized controlled trials. More robust studies, especially randomized controlled trials, are required to support the findings.

The proportion of people reaching older age is increasing globally because of significant advances in medicine and technology. In 2013, the proportion of older persons over 80 years of age, "the oldest old," was 14%, and this is projected to reach 19% by 2050.[1] Unfortunately, not all are maintaining their functional independence to live in the

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community, leading to larger numbers requiring care in nursing homes.[2] The population in nursing homes is increasingly frail with multiple comorbidities. This is reflected by the high incidence of acute healthcare utilization[3] with hospital admission incidence reported to be 0.62 admissions per person-year among the nursing home residents and 0.26 among the community dwellers.[4] A systematic review by Arendts et al[5] has shown the range of emergency department (ED) transfers to be 0.2–1.5 transfers per nursing home bed per year with large variations existing not just between but within geographic areas.

The nursing home population has the unique characteristic of 24-hour access to nursing or support staff care. Despite the increasingly large ratio of residents to staff, this still enables care delivery in the facility that would be difficult to give in the community. Knowing how detrimental unnecessary hospital admissions can be to residents[6,7] and that research has shown both residents and families have a preference for treatment in the facility,[8] interventions to reduce hospital transfer from nursing homes are common.

Advance care planning (ACP) has been one of these targeted interventions with legislation or policy supporting it since the 1990s in the United States of America (USA) (Patient Self Determination Act), 2005 in the United Kingdom (Mental Capacity Act), and 2011 in Australia (Australian National Framework for Advance Care Directives).[9] There are many different types of ACPs used in nursing homes, some of which are specific to the facility or group of facilities. ACP may also be included within medical treatment orders such as do-not-resuscitate (DNR) orders, do-not-hospitalize (DNH) orders, and the newer physician orders for life-sustaining treatments (POLST). However, if these medical treatment orders are unilateral decisions made by physicians, they would not be in keeping with the ethos of ACP, which is regarded as recording the "voice of the patient."[10]

In the last 2 years, there have been 10 studies looking specifically at the effects of ACP in nursing homes, 7 of which are of retrospective design and, therefore, not included in this review.[11–17] A systematic review by Sharp et al[18] has shown that the majority of older people welcome the chance to discuss end-of-life care, with most perceiving the risk of leaving it too late.

ACP allows people to have a voice in their healthcare decisions should they lose the capacity to be involved in these conversations in the future. Loss of capacity may be transient, at times of acute illness or delirium, or permanent and progressive because of dementia. Dementia is estimated to affect between 50% and 80% of nursing home residents,[7,19,20] impairing their decision-making capacity, which highlights the relevance and importance of ACP for this group. Some large studies have failed to show a significant impact on care with ACP in the ambulatory population[21] because of shortcomings including difficulty with ACP interpretation[21–25] and the orders not being in a format that ambulance staff can follow.[26] However, some studies have shown positive outcomes with ACP for patients and families,[27] specifically in our nursing home populations,[28,29] thus, supporting their ongoing prioritization for healthcare services.[30]

Heterogeneity of studies, for both the ACP interventions and their outcome measures, leads to some difficulty in their interpretation and application. In the United States, the ACP focus form the late 1990s has been on POLST. These medical treatment orders and their permutations are said to be now in use, or in development, in 41 American states.[31] With POLST, research has shown that nursing home residents are less likely to receive unwanted interventions including hospitalization[32–34] and intravenous fluids.[32] These medical treatment orders are completed by physicians, in consultation with residents or their substitute medical decision-makers, taking into account residents' preferences for care as well as their current health status. They were developed to deal with the shortcomings of original ACP. In countries outside the USA, the types of ACP and the terminology referring to the different directives are very varied.[35]

Although there have been systematic reviews in the area of ACP, no reviews have focused on the nursing home population. We believed it was important to do a systematic investigation to collate the findings of the effects of ACP on this unique population as the effects found in other populations may not be generalizable to ours.

Methods

Design

This systematic review has been prospectively registered with PROSPERO.[36]

Search Strategy

In April 2015, a comprehensive literature search was conducted using the following 4 electronic databases, Embase, Medline, PsychINFO, and CINAHL, with no limits on year or language. The search strategy is available for review in Figure 1. The search yielded 4654 titles. There were no restrictions by study design at this time so as to allow identification of all studies related to the question. Hand-searching of citations in these articles, to identify additional relevant studies, was performed as well as searching of gray literature.

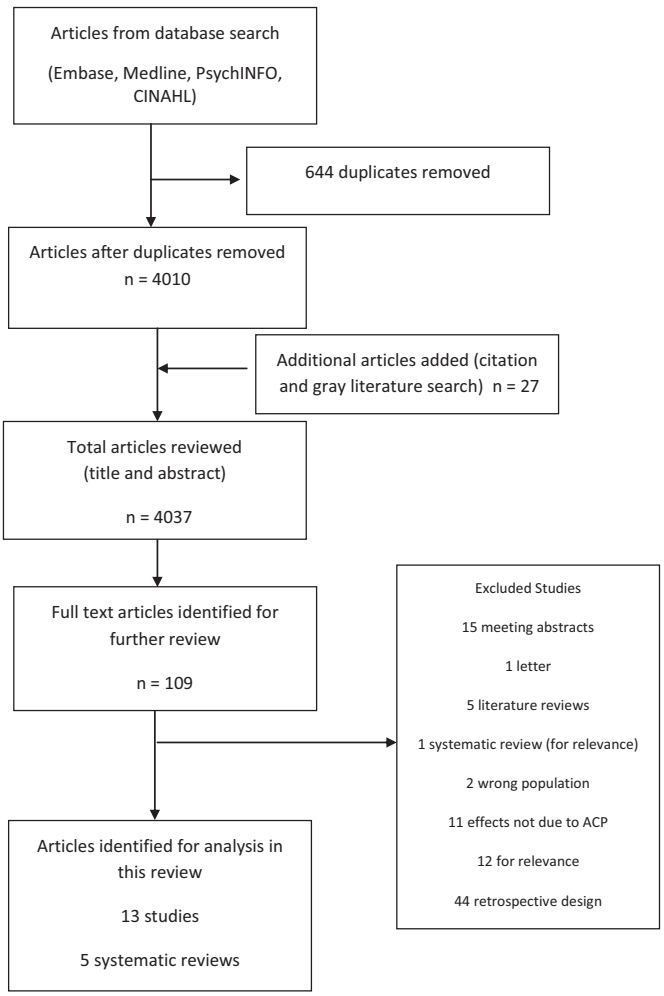

Fig. 1. Strategy used to identify published studies on ACP suitable for our analysis.

Selection Criteria

Inclusion criteria were studies examining an effect of advance care planning on nursing home residents. Nursing homes were defined for this review as residential aged care facilities, long-term care units, and skilled nursing facilities or care homes. ACP was defined as any advance discussions or directives, including medical treatment orders, with effect on nursing home residents. Having reviewed all the articles for relevance, articles pertaining to randomized controlled trials, controlled trials, pre/poststudy design trials, and prospective trials were assessed, with 13 studies fitting all the inclusion criteria (Figure 1). None of these studies involved appointment of a medical substitute decision-maker as the sole element of ACP. A further 5 systematic reviews were also identified as partially relevant and will be discussed separately.

Data Extraction

Data was extracted using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system. As with other systems for data extraction, it is based on the rigor of the study design. The systematic approach suggested by the GRADE working group was followed[37,38] and categorization of the studies into 4 groups according to a judgement on their evidence was performed; high, moderate, low, and very low. As per the GRADE protocol, randomized controlled trials start as high quality evidence and observational studies start as low evidence. They then moved up or down categories depending on the robustness of their study design according to GRADE criteria, as seen in Tables 1 and 2.[38] Two reviewers appraised each study with high levels of agreement. Disagreements were resolved through discussion with a third reviewer.

Data Synthesis

It was not possible to perform a meta-analysis on the pooled results because of the heterogeneous nature of the both the interventions and results. For this reason, a detailed narrative synthesis has been compiled.

Results

Study Characteristics

Seven of the studies took place in the USA, 1 took place in Australia, 1 in Hong Kong, 1 in Canada, 1 in the United Kingdom, 1 in Singapore, and in The Netherlands. The intervention in 5 studies was an educational program. For 2 of these, the ACP education was provided just to healthcare staff,[39,40] whereas in the other 3, education was provided to healthcare staff, residents, and families.[28,29,41] Five studies involved introduction or evaluation of a new ACP form in the facility.[32,42–45] Two studies involved an ACP program with a palliative care initiative[46,47] and 1 study involved observation of the effect of DNR orders on the medical treatments of residents with lower respiratory infections.[48]

Quality of the Studies

The overall quality of the study methodologies was low as can be seen in Table 3. Only 1 study was of high quality and 2 of moderate quality, using GRADE criteria. The majority, 8 of the studies, were of low quality, with 2 being of very low quality.

Hospitalization and Costs

Hospital utilization is a frequent measure used across the included studies.[28,29,43,44,46–48] In the nursing home population, ACP has been shown to decrease hospitalization rates between 9% and 26%. Mott et al[44] in their intergroup comparison found a decrease in admissions of 77% between their group 1 (opting for full medical management) and group 4 (opting for comfort measures only).[44] Associated healthcare costs is less frequently studied in these included articles but Molloy at al[28] found a significant decrease in both the hospital costs, intervention home $1772 vs control home $3869 per patient

Table 1
Evaluation of studies according to GRADE criteria

Studies	Design	Limitations	Indirectness	Inconsistency	Imprecision	Publication Bias	Quality
Caplan 2006	Controlled trial	Minor	Little or no	Little or no	Little or no	No	Moderate ⊕⊕⊕○
Hickman 2010	Controlled trial	Minor	Little or no	Little or no	Little or no	No	Moderate ⊕⊕⊕○
Levy 2008	Pre- postintervention	Minor	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Molloy 2000	Randomized controlled trial	Serious	Little or no	Little or no	Little or no	No	High ⊕⊕⊕⊕
Morrison 2005	Controlled trial	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Danis 1991	Prospective cohort	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Zweig 2004	Prospective cohort	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Tolle 1998	Prospective cohort	Very Serious	Little or no	Little or no	Little or no	No	Very Low ⊕○○○
Mott 1988	Prospective cohort	Very serious	Little or no	Little or no	Little or no	No	Very Low ⊕○○○
Livingston 2013	Pre-postintervention	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Van Soest-Poortvliet 2015	Prospective cohort	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Chan 2010	Controlled trial	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○
Kelvin 2014	Controlled trial	Serious	Little or no	Little or no	Little or no	No	Low ⊕⊕○○

Table 2
A Summary of the GRADE Approach to Grading the Quality of Evidence for Each outcome

Source of Body of Evidence	Initial Rating of Quality of a Body of Evidence	Factors that may Decrease the Quality	Factors that may Increase the Quality	Final Quality of a Body of Evidence
Randomized trials Observational studies	High Low	1. Risk of bias 2. Inconsistency 3. Indirectness 4. Imprecision 5. Publication Bias	1. Large effect 2. Dose-response 3. All plausible residual confounding would reduce the demonstrated effect or would suggest a spurious effect if no effect was observed	High (⊕⊕⊕⊕) Moderate (⊕⊕⊕○) Low (⊕⊕○○) Very Low (⊕○○○)

($P = .003$), and total healthcare costs, intervention home $3400 vs control home $5239 per patient ($P = .01$).

In Singapore, Teo et al[47] showed significant reduction in total health costs in both the last 3 months and last month of life associated with decreased hospitalization in the ACP group vs control. They found per-resident cost savings of SGD7129 over the last 3 months of life (US $1–SGD1.3) and per-resident cost savings SGD3703 over the last 1 month of life.[47] Caplan et al[29] showed a decrease in hospital bed use by 26% in the intervention vs control facilities from which one can safely deduce a decrease in hospital costs but cannot presume a decrease on overall healthcare costs. Similarly, Mott et al[44] showed a decrease of 79% in hospital bed days from their group for active intervention compared with their group for comfort measures only, with an associated decrease in hospital costs but not necessarily a reduction in overall healthcare costs. Levy et al[46] found no significant change in length of stay in those hospitalized 5.17 vs 3.33 days.

Place of Death

Place of death is another important studied effect of ACP. The studies found significant increases in the number of residents dying in their nursing home[29,40,44,46] by 29%–40% compared with control. Some studies compare this effect between groups according to stated wishes in their ACP; for example Mott et al[44] found that there was an increase from 55% to 85% of residents dying in their facility between group 1 (opting for full medical management) to group 4 (opting for comfort measures only). This difference reflects an effective ACP. It also reflects the influence the type and specificity of the ACP can have on the approach to the resident's care. Caplan et al[29] found that of the 32 residents in the ACP intervention group who died 100% of them died in their preferred place as specified.

Consistency With Resident's Wishes

Actions being consistent with residents' wishes are outcome measures in many of the studies.[39,40,42,43] The range of increase in effect is 13%–29% in the intervention compared with controls across these studies. However, when the ACP is broken down into different components, it becomes apparent that some directives are easier to follow than others and some ACP outcomes are easier to measure. For example, studies show ACP with regard to cardiopulmonary resuscitation can be up to 100% effective.[32,43] In contrast, the guidance of ACP with regard to the administration of antibiotics was found to be ineffective.[32] Danis et al[42] investigated variables associated with consistency and found that when treated in hospital rather than treated in the nursing home the ACP was more consistent with their expressed wishes 87% vs 46% ($P = .00003$), as most inconsistencies tended toward under treatment and they felt the approach to medical care was less aggressive in the nursing home.[42]

Use of Life-Sustaining Treatments

Use of life-sustaining treatments is another outcome measure of ACP studies, which overlaps with the outcome measure of a resident's care being consistent with their ACP wishes. It is addressed in 2 of the included studies.[32,44] Hickman et al[32] found that those opting for "comfort measures only" were significantly less likely to receive life-sustaining medical treatment than those with ACP for full active management, those with DNR orders and those with for resuscitation orders. In a sample of residents who were only for hospitalization in the event of unmanageable symptoms, 4 of 24 hospitalizations were for the use of life-sustaining treatments[43] showing it is possible for even the most specific ACP to be ignored.

Quality of Life and Satisfaction

Perceived improvements in quality of life of the resident and satisfaction of family, although difficult to measure, are studied in 2 of the included articles.[41,45] Van Soest-Poortvliet et al[45] found that establishing baseline comfort goals for residents was associated with more satisfaction with end-of-life care ($P = .03$). The effect, however, was significant only when residents were living in the nursing home for less than 6 months before they died. Chan et al[41] found with introduction of ACP, there were statistically significant improvements in overall quality of life (QOL) ($P = .034$), physical discomfort ($P = .017$), and existential distress ($P = .038$) for residents.

Mortality

Mortality associated with ACP has been measured in 2 of the included studies.[28,29] Both studies showed that ACP was not associated with increased mortality. In fact Caplan et al[29] found no significant change in mortality except for the third year of their study when the mortality rate rose in the control nursing homes by 10% rather than the intervention homes, 30.4 vs 41.6 per 100 beds ($P = .0425$). Similarly Molloy et al[28] found no significant difference in death rate between the intervention and control groups 24% vs 20% ($P = .2$) despite lower hospitalization in the intervention group.

In-Patient Hospice and Community Palliative Care

Although many ACP studies look at in-patient hospice and community palliative care referral in association with ACP, most are of a retrospective observational nature and so are not included in this analysis. Only 1 of the studies investigated these effects, and they found no change in in-patient hospice referrals pre- and post-implementation of their intervention but community palliative care referrals increased by 23.7% ($P = .02$).[46] Mean length of stay in hospice did not differ significantly either with 24.3 days pre- vs 32.7 post-ACP intervention. The mean number of days, however, in the community palliative care programs did increase, from 1 day to 13.8 ± 25.9 days, but did not reach significance ($P = .09$).[46] No difference was found in

Table 3
Characteristics of included studies

Study Year	Population (NH Residents)	Design	Country	Intervention	Outcomes	GRADE
Caplan et al 2006	45 residents for personal intervention Facility Intervention I: 1344 residents C: 523 residents	Controlled trial	Australia	Educational program for residents, families, staff, and GPs Let me decide ACP and HITH in facilities surrounding 2 hospitals in a geographic area	Hospitalization and costs 1. Decrease in hospitalization from the NHs year 1, 22.7% decrease in admissions 2. Increase in hospitalization in control NH year 1 by 4.2% (decrease not just due to HITH as reviews increased from just 31−37 in the year) 3. Rate of admissions higher year 1 at intervention hospitals 1.341 vs 1.044 RR 1.07; 95% CI 1.03−1.11; $P = .0005$, by year 3 the rate was lower at 0.865 vs 1.254 RR 0.89; 95% CI 0.85−0.93; $P < .0001$ 4. Hospital bed use per NH bed similar in both areas at commencement 9.441 vs 9.042; RR = 1.01; 95% CI 0.98−1.04; $P = .442$ whereas after 3 years rate was more than double in the control area 5.743 vs 12.755 RR 0.74 CI 0.72−0.77; $P < .0001$ 5. Emergency calls to ambulance services-intervention vs control −1% vs +21%; $P = .0019$ Place of death 1. Place of death 32 (71%) died, 100% in their preferred place specified Mortality 1. No significant change in mortality except for the third year when the rate rose in the control NHs 30.4 vs 41.6 per 100 beds; $P = .0425$	Moderate ⊕⊕⊕○
Molloy et al 2000	I: 444 C: 374	Randomized Controlled trial	Canada	Educational ACP program, Let Me Decide, included educating staff in local hospitals and NHs, residents and families about advance directives Offering competent residents or next-of-kin an advance directive which offered choices for life-threatening illness, cardiac arrest and nutrition	Hospitalization and costs 1. Lower risk of hospitalization in intervention homes 0.27 vs 0.48 mean per patient, $P = .001$ 2. Lower mean no of hospital days in intervention group 2.61 vs 5.86, $P = .01$ 3. Mean hospital cost for intervention homes was $1772 vs $3869, $P = .003$ 4. Total healthcare cost for intervention group was $3400 vs $5239, $P = .01$ Mortality 1. Death rate similar between both groups 24% vs 20%, $P = .2$ despite lower hospitalization in the intervention group	High ⊕⊕⊕⊕
Chan et al 2010	I: 59 C: 62	Controlled trial	Hong Kong	Educational ACP program, Let Me Talk, 4 themes life stories, illness narratives, life views and end-of-life care, 4 sessions 1 hour/session	QOL/satisfaction 1. Statistically significant improvements in overall QOL, $P = .034$, physical discomfort $P = .017$, and existential distress $P = .038$	Low ⊕⊕○○
Morrison et al 2005	I: 49 C: 96	Controlled trial	USA	Educational ACP program for NH social workers randomized to intervention or control. Structured approach to completion and review of ACP with residents and other healthcare staff.	Actions consistent with wishes 1. 2/49 (5%) of intervention residents received a treatment in conflict with their prior stated wishes vs 17/96 (18%) controls, $P = .04$	Low ⊕⊕○○

					2. OR 5.06 retreatments being consistent with wishes 95% CI 1.12–22.87 (Houben 2014)	
Livingston et al 2013	Pre: 63 Post: 49	Pre-postintervention	United Kingdom	Educational program on ACP and end- of-life care: 10 sessions for residential and senior care workers and general nurses	Place of death 1. Significant increase in residents with dementia dying in the care home from 47% to 76%, χ^2 test = 5.3, $P = .02$ Actions consistent with wishes 1. Where recorded (n = 20) end-of-life care was consistent residents with dementias wishes 71% to 100%, $P = .04$	Low ⊕⊕○○
Van Soest-Poortvliet et al 2015	I: 148	Prospective cohort	The Netherlands	New ACP completion: Establishing "goal of care" with residents within 8 weeks after admission. Measuring outcome with End-Of-Life in Dementia–Satisfaction With Care scale (EOLD-SWC)	QOL/satisfaction 1. Significant interaction between LOS and baseline comfort goal for family satisfaction with care and quality of dying, $P = .03$ 2. Only significant for families where residents were in NH < 6 months	Low ⊕⊕○○
Danis et al 1991	I: 175	Prospective cohort	USA	New ACP completion: Prospective interview of residents with documentation of their preferences with respect to hospitalization, intensive care, cardiopulmonary resuscitation, artificial ventilation, surgery and tube feeding in event of critical illness, terminal illness or permanent unconsciousness	Actions consistent with wishes 1. In 96 events- medical treatment was consistent with the directive in 75% of cases 2. 24/96 (25%) events were inconsistent with stated wishes 3. Consistency with patients wishes occurred less often when the AD was in the chart, $P = .045$ 4. Consistency with patients wishes more often when the patient remained competent, $P = .014$ 5. Consistency with patients wishes more likely when even occurred in hospital rather than the NH 59/68 vs 13/28, $P = .00003$	Low ⊕⊕○○
Mott et al 1988	I: 110	Prospective cohort	USA	New ACP completion: Medical treatment orders form filled by practice physicians looking after the facility, 4 levels of care: maximum care (all), intermediate care (hospitalization but to avoid surgery or intensive care if possible), Intermediate, less active care (avoid hospital but using antibiotics when indicated), comfort care only (avoid hospitalization, antibiotics and IV fluids except for comfort)	Use of life-sustaining treatments 1. Those in the less aggressive treatment groups group 1 58 admissions per 1000 person months compared with 13 admissions per 1000 person months in group 4, $P < .001$ 2. 774 hospital bed days vs 162 hospital bed days; $P < .001$ (G1 vs G4) Place of death 1. Deaths occurring in NH, group 1 55% vs group 4 85%; $P < .0001$	Very Low ⊕○○○
Tolle et al 1998	I: 180	Prospective cohort	USA	New ACP evaluation: Effect of POLST form	Hospitalization 1. Low rates of hospitalization 13% (n = 24), 2/24 died in hospital 2. 15% of hospitalizations were to extend life contrary to POLST (n = 4), 85% for comfort 3. Of 24 hospitalized 85% had DNR order, no one received CPR nor ICU Actions consistent with wishes 1. LOS hospitalization rates, 85% of hospitalization for symptom control as POLST advised	Very low ⊕○○○

(*continued on next page*)

Table 3 (*continued*)

Study Year	Population (NH Residents)	Design	Country	Intervention	Outcomes	GRADE
Hickman et al 2010	I: 817 C: 894	Controlled trial	USA	New ACP evaluation: Effect of POLST form	Use of life-sustaining treatments 1. CPR usage only 1 in POLST and 4 in non-POLST, too small to comment, tube feeding was similar-too little usage to analyze 25 POLST (3.4%), 62 non-POLST (6.9%) 2. No difference in use of medical interventions b/n residents with DNR orders and traditional full code orders OR 1.4, 95% CI 0.91−2.14, $P = .12$ 3. POLST had no effect on use of antibiotics regardless of whether choices specifies 4. POLST forms for comfort measures only were significantly less likely to receive life-sustaining medical treatment than those with POLST full tx, DNR and For resuscitation orders Palliative care and hospice 1. No difference in symptom assessment or management on logistic regression for those with and without POLST forms	Moderate ⊕⊕⊕○
Levy et al 2008	I: 45 C: 27	Pre-Post intervention	USA	Making ACP a Priority- a program designed to (1) identify residents at high risk of death, (2) inform the attending physician of the resident's mortality risk, (3) obtain palliative care or hospice consultation, (4) improve ACP documentation	Hospitalization 1. No change in LOS in those hospitalized 5.17 vs 3.33 post, $P = .42$ Place of death 1. Fewer residents died in hospital post intervention 48.2% pre and 8.9% post, $P < .0001$ 2. Significance persists when covariates taken into consideration in regression Palliative care/hospice 1. Mean no of days in palliative care programs in the pre-implementation was 1 day, this increased to 13.8 ± 25.9 days, $P = .09$ 2. No change in percentage of residents referred to hospice but pall care referral increased by 23.7%, $P = .02$ 3. Mean LOS in hospice did not differ significantly 24.3 vs 32.7 days postimplementation	Low ⊕⊕○○
Zweig et al	I: 1031 residents C: 3000 residents (approx)	Prospective cohort	USA	Observational study to determine the effect of DNR orders on the treatment of NH residents with lower respiratory infection	Hospitalization 1. Less likely to be hospitalized with DNR order 23% vs 32% without, $P < .003$ 2. Even with other characteristics which make you more likely to be hospitalized	Low ⊕⊕○○

AD, advance directive; CPR, cardiopulmonary resuscitation; CI, confidence interval; GP, general practitioner; HITH, hospital in the home; ICU, intensive care unit; LOS, length of stay; NH, nursing home; OR, odds ratio; RR, relative risk; Tx, treatment.

end-of-life symptom assessment or management between those with and those without ACPs in the 1 study in which it was examined.[32]

DNR Orders and Interventions

One study showed no difference in medical interventions including hospitalization for residents with full code and residents with DNR orders,[32] whereas a large study investigating the effect of DNR orders on hospitalization of residents with lower respiratory infection found 23% of those with DNR orders, and 32% of those without DNR orders, were hospitalized.[48]

The Systematic Reviews

The literature search yielded 5 systematic reviews of partial relevance to this review. One had performed a meta-analysis while the others had a narrative synthesis. Houben et al[49] conducted a meta-analysis on concordance between patient preferences for end-of-life care and end-of-life care delivery. They included 3 studies on effect of the ACP intervention vs control, and found in favor of intervention. Of note, 1 of the included studies involved nursing home residents. Brinkman et al[50] systematically examined the effect of ACP on end-of-life care. Of the 113 studies included, they found 95% of them were observational, many retrospective in design, and 32% included nursing home populations. They found ACP was associated with decreased use of life-sustaining treatments, decreased hospitalizations, and increased use of in-patient hospice and community palliative care. Kirolos et al[51] examined interventions to improve in-patient hospice and community palliative care referral, and 5 of the 6 studies included demonstrated an increase in in-patient hospice referral. Only 1 of their studies included an ACP intervention and, thus, was included in our analysis. This study did not show an increase in in-patient hospice referrals but did show an increase in community palliative care referrals.[46]

Robinson at al[52] studied the effectiveness of ACP interventions for people with pre-existing cognitive impairment and dementia. They found 2 studies that showed decrease in hospitalization and 1 study that showed increase in in-patient hospice use. Their conclusion was that the nursing home is too late for ACP conversations with only 36% of residents having capacity. Arendts et al[53] examined the interface between a residential aged care facility and the emergency department and found a complex interplay of factors influencing hospitalization from facilities including the type of facility, the functional and clinical status of residents, and individual facility transfer policies. They did find that ACP is helpful and compliance with it is generally good.

Discussion

Interventions

Findings from this review show beneficial effects for ACP interventions in the nursing home population, but the evidence supporting the findings is of generally low quality. The variability in the interventions was considerable, but over 75% could be classified broadly into 2 categories: (1) educational programs; or (2) introduction and evaluation of a new ACP in the facilities. Five of the 13 studies took either an educational approach for staff or an educational approach for staff, families, and residents; the most multifaceted of which included education of staff outside facilities including general practitioners and emergency department staff.[28,29,39–41] Five of the 13 introduced or evaluated a new ACP in the facility, all of which were in the format of medical treatment orders.[32,42–45] Two of these involved POLST[32,43] and 3 were individual to the facility.[42,44,45] These 2 categories of ACP interventions along with a third, the examination of other medical treatment orders including DNR and DNH, are the most common interventions included in the area of ACP study. Comparing the types of interventions in this review is difficult as the grading of the studies was more focused on the study design than their proven outcome effects. The studies using educational programs were more robust generally in their design, but there is insufficient evidence to conclude that educational programs are better than introduction of new ACPs in facilities.

Outcomes; Hospitalization and Mortality

This review found that ACP reduces hospitalization of nursing home residents. These decreases were in the range of 9%–26%[28,29,43–48] and could lead to considerable hospital savings. It is difficult to say whether this always translates to overall healthcare savings but Molloy et al[28] and Teo et al[47] did demonstrate this outcome. Interestingly, where studied, mortality was not decreased by hospitalization[28,29]; an outcome that further supports treatment of nursing home residents in the facility and avoiding hospitalization where possible.

Outcomes; Consistency With Resident's Wishes

The studies showed that actions are highly consistent with resident's wishes when their ACP is completed[39,40,42,43] and lead to decreased usage of unwanted life-sustaining treatments.[32,44] This is not at a level of 100% compliance, as unwanted admissions and life-sustaining treatments are still recorded, but at much lower levels.[43] In some areas, such as antibiotics, ACP is less helpful[32]; perhaps because antibiotics can also be given as part of "comfort measures" to alleviate discomfort, secretions, and delirium, 3 of the prevalent symptoms of infection that may occur at the end of life.

Outcomes; Place of Death, Palliative Care, and Hospice

The evidence shows that residents with ACP have a high incidence of dying in their preferred place of death, which was more often, in the nursing home.[29,40,44,46] Increased need for knowledge and experience of nursing home staff in palliation at end of life is required to facilitate good dying. ACP was found to lead to increased and earlier community palliative care referrals,[46] which may indicate earlier recognition of the end-of-life phase and provision of care. However, another study found no difference in symptom assessment or management with ACP vs controls.[32] Referral to in-patient hospice was not affected by ACP in the 1 study that looked at this outcome measure,[46] but prior systematic reviews have shown an increase in in-patient hospice referrals with ACP.[50,51] In the USA, cost neutrality or savings was a policy goal of the Medicare hospice benefit at its onset.[54] A recent publication now shows that provision of in-patient hospice care did not reduce overall health costs.[54] This is worrying, as its provision, which is proven to improve quality of care,[55] should not be a money-saving exercise but a health initiative to provide good end-of-life care for nursing home residents and one would hope that it will not lead to withdrawal of this funding support.

Outcomes; QOL

QOL and satisfaction with the dying process were rarely measured in the studies reviewed but, when they were, ACP was found to improve both, in certain circumstances.[41,45] In residents residing in the nursing home for less than 6 months, establishing goals of care was found to improve family satisfaction with the death but was not significant in those present for longer periods making it less generalizable to the entire nursing home population.[45] The 1 study looking at QOL found improvements with ACP and this extended to improvements in existential distress also.[41] Again, given this is the

result from 1 small study, it would require further research to support its findings.

Outcomes; DNR Orders

The effect of DNR orders on medical treatment was addressed in 2 studies with conflicting results.[32,48] One found no difference in the medical treatments provided to residents with full code vs DNR orders.[32] The second found those with DNR orders were less likely to be hospitalized than those without.[48] The latter is more in keeping with both general consensus and systematic review of the area.[50] A DNR and DNH order is often taken as a proxy for a path toward less aggressive care, whether that was the original intention of the directive or not. Given the conflicting results from our review, we can draw no conclusions from this area.

Conclusions

The data on ACP interventions shows beneficial effects in nursing home populations; the most important of which include actions being consistent with the person's wishes and avoidance of unwanted hospitalization and life-sustaining treatments. The available evidence is generally not of high quality. Most studies in the area are of retrospective designs and, as a consequence, 44 such studies were excluded from this review.

ACP is important for frail older people where the possibility of developing cognitive impairment and losing decision-making capacity is high. With such high rates of dementia and decreased capacity in nursing home populations,[52] it does feel like the opportunity for true ACP here has been lost. Most often the ACP is completed with substitute medical decision-makers who we know do not always make the same decisions that the resident would have.[56] This highlights the need for earlier commencement of the ACP process.

This review found that ACP can have important effects in the nursing home population, but the effect measurements are being derived from very few studies. Further high quality studies, especially randomized controlled trials, are required to support the reported outcomes and to help identify the types of ACP interventions that are most effective and beneficial for a nursing home population.

Key Points

- The nursing home population has unique characteristics for ACP.
- ACP has beneficial effects for the nursing home population.
- ACP leads to actions being more consistent with resident's wishes.
- ACP decreases unwanted hospitalization and use of life-sustaining treatments, and increases probability of dying in the nursing home.
- ACP is important for decreasing unwanted medical interventions at end-of-life
- ACP can decrease healthcare costs.
- The effects found are mainly from pooled low quality studies because of lack of high quality experimental studies in the area.

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