




EMPIRICAL STUDIES

Palliative care delivery at nursing homes before and after an educational intervention from professionals' perspective: A pre-post design

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Abstract

Background: The principles of palliative care were developed in hospices and specialised palliative care units and have not been sufficiently adapted to and evaluated in nursing homes. Therefore, an educational intervention from an interprofessional education perspective was performed within the project Implementation of Knowledge-Based Palliative Care in Nursing Homes. The aim of this study was to evaluate professionals' experience of palliative care delivery before and after the educational intervention.

Methods: The educational intervention for nursing home professionals consisted of five 2-h seminars over 6 months at 20 nursing homes. The intervention and control groups consisted of 129 and 160 professionals from 30 nursing homes respectively. The questionnaire 'Your experience of palliative care' was completed 1 month before (baseline) and after (follow-up) the intervention. Descriptive and inferential statistics were calculated.

Results: The positive effects at follow-up concerned the use of a valid scale for grading symptoms, attendance to the needs of next of kin (including bereavement support), documentation of older persons' wishes regarding place to die and conversations about their transition to palliative care and about how they were treated.

Conclusions: This study demonstrates a promising interprofessional educational model. However, the paucity of improvements brought to light at follow-up indicates

Trial registration: NCT02708498 that adheres to CONSORT guidelines.

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a need for research directed towards a revision of this model. Supervision of professionals during palliative care delivery is one suggestion for change.

KEYWORDS

evaluation study, interprofessional education, nursing home, palliative care, pre–post design, professional perspective, residential care

BACKGROUND

Improving the access to general palliative care for older persons is urgent worldwide, which places demands on the professionals' competence in providing it [1–5]. The number of older persons with serious health-related suffering requiring palliative care will increase rapidly, with 22 million more people in 2060 than in 2016 [4]. The World Health Organization (WHO) stresses that the greatest increase in palliative care needs in the future will be among older persons, and nursing homes have therefore become a major arena for the provision of palliative care [1,6,7]. With an ageing population and the unequal availability of palliative care depending on where one lives [6,7], a need for initiatives to improve palliative care for older persons has emerged [1].

A palliative care approach involves both general and specialised palliative care provision. General palliative care is provided in nursing homes by professionals who do not have specialised palliative care competence [3,8,9]. It is strongly recommended that palliative care needs to be based on a person-centred approach rather than a prognosis- and disease-centred approach [10,11]. A need to integrate general palliative care to alleviate the suffering among older persons and their next of kin has been indicated [4].

To support the development, implementation and follow-up of knowledge-based palliative care for persons in their final stage of life, two documents were framed in Sweden: a national care programme and a national knowledge support document [12,13]. However, evidence of interventions to improve palliative care for older persons is lacking [14,15]. A Cochrane review regarding such interventions in nursing homes identified two randomised controlled trial (RCT) studies of satisfactory quality [16]. These studies concentrated on professionals' education in palliative care and reported a greater extent of documented advanced care plan discussions and less discomfort among older persons with end-stage dementia. The review discovered slight evidence that interventions aimed at improving palliative care had better outcomes for older persons than usual care, and it was concluded that more research is needed [16].

To ensure that older persons receive high-quality care, it is important that professionals collaborate and communicate [17,18]. Interprofessional education (IPE) is one way to improve professionals' collaboration and the quality of care, especially concerning care for vulnerable persons (e.g. older persons in nursing homes) [19]. IPE occurs when two or more professionals learn with, from and about each other [17], and collaboration promotes mutual understanding and an exploration of ways to combine their expertise to improve the quality of care [18]. A Cochrane review focusing on the effectiveness of IPE interventions stressed that educational meetings, either alone or in combination with other interventions, could improve professional practice. Such meetings with high attendance and a mixture of interactive and didactic formats have been shown to be highly effective [20].

Several studies have revealed educational gaps among professionals in nursing homes, both in basic nursing care competence and in specific areas related to palliative care, such as insufficient knowledge, skills and symptom management training [16,20–25]. Other studies have emphasised that professionals need support concerning ethical issues, such as existential conversations about death and dying [26–29]. However, there are only a limited number of studies on palliative care interventions in nursing homes. Against this background, the project Implementation of Knowledge-Based Palliative Care in Nursing Homes (KUPA) was launched for professionals and front-line managers [30]. The project demonstrates strategies to diminish professionals' competency gaps in palliative care in nursing homes [30]. The aim of this study was to evaluate professionals' experience of palliative care delivery before and after the educational intervention in palliative care in nursing homes.

METHODS

Design

This study consisted of a pre–post design to evaluate the educational intervention using a questionnaire about professionals' experiences of palliative care delivery.

Setting

The Swedish welfare system

The Swedish healthcare system is largely tax funded, and the responsibility for healthcare is shared among 21 county councils (inpatient and outpatient specialist healthcare and primary healthcare) and 290 municipalities (care for older persons and persons with longstanding disabilities). Sweden has a policy [31] that supports older persons living in their own homes for as long as possible [32,33]. The right to an apartment in a nursing home is based on the ill or frail older person's need for everyday care, as assessed by municipal social workers. The around-the-clock care provided in Swedish nursing homes is overseen by a Registered Nurse who instructs and delegates nursing care to assistant nurses [34,35].

Assistant nurses and care assistants, those who provide the main care for older persons, are the most common professionals in nursing homes in Sweden. Assistant nurses can have up to 3 years of vocational education at *gymnasium* level with focus on elderly care. The care assistants have no training (or only a short training of less than a year) in elderly care. All Registered Nurses (RNs) have a university education in healthcare to at least Bachelor's level and often they have specialist education in elderly care at Master's level. RNs instruct assistant nurses and care assistants and delegate nursing care and medical tasks to them [36]. Registered occupational therapists, Registered physiotherapists and unit managers (commonly social workers or Registered Nurses) have also a university degree, at least at the Bachelor's level. Physicians work as consultants at nursing homes. In this study, the terms 'professional' and 'IPE' cover all of the above-mentioned staff, including the sub-professionals such as assistant nurses and care assistants.

The research setting

This study is an evaluation of the KUPA project educational intervention within a framework of intervention and control nursing homes [30]. Thirty nursing homes were included in the project; large and small nursing homes in rural and urban areas across two counties in southern Sweden are represented. The intervention was implemented in 20 nursing homes and the remaining 10 served as control nursing homes.

The educational intervention

The educational intervention consisted of IPE seminars carried out at the workplace to enable dissemination to the

entire team [37]. At each nursing home, a group of 8–10 professionals participated in the seminars. Five 2-h seminars were held over 6 months. Two experienced Registered Nurses led the seminars, and project meetings were held weekly to allow the seminar leaders to share questions among themselves and with the project leader. Knowledge and skills were conveyed at the educational seminars to be transferred into routine practice in the nursing homes. The participants received an educational booklet before the intervention for use during and between the seminars [30,38]. The booklet described five themes – the palliative approach and dignified care, next of kin, existence and dying, symptom relief and collaborative care – and contained assignments to be completed between each seminar [38]. The assignments could be, for instance, to interview the next of kin of a seriously ill older person, listen to a radio programme about life and death or talk to an older person about their symptoms. Completed assignments were discussed in each subsequent seminar. During the last seminar, suggestions for further clinical development were given to the participants, for example, engage in end-of-life discussions, promote the participation of next of kin and strengthen team collaboration. An important goal of the seminars was to create a collaborative team environment in which the professionals could share tips, advice and practical examples with each other.

Sampling and participants

The participants were professionals working at one of the 30 nursing homes included in the KUPA project [30]. The selection of nursing homes was decided to fulfil that the intervention and control group took place in parallel within the two counties. The inclusion criteria were permission from the health and social care manager in each municipality and that the unit managers wanted the nursing home to participate in the project. The nursing homes which were included represented both urban and rural areas in the two counties. The exclusion criterion was previous training in palliative care in the nursing home.

In next step, the strategic sampling to the intervention and control group consisted of representation of all the professions [30]. The dropout rate at follow-up was 38.5% (182 of the 471 included at baseline), and the reasons for dropping out are shown in Figure 1. As compared with the participants, the dropouts were significantly older (mean = 2.8 years, $p = 0.032$) and had been longer at the present workplace (mean = 2.0 years, $p = 0.018$). Of the 289 participants, 129 were from the intervention nursing homes and 160 from the control nursing homes (Figure 1). Their background characteristics are presented in Table 1.

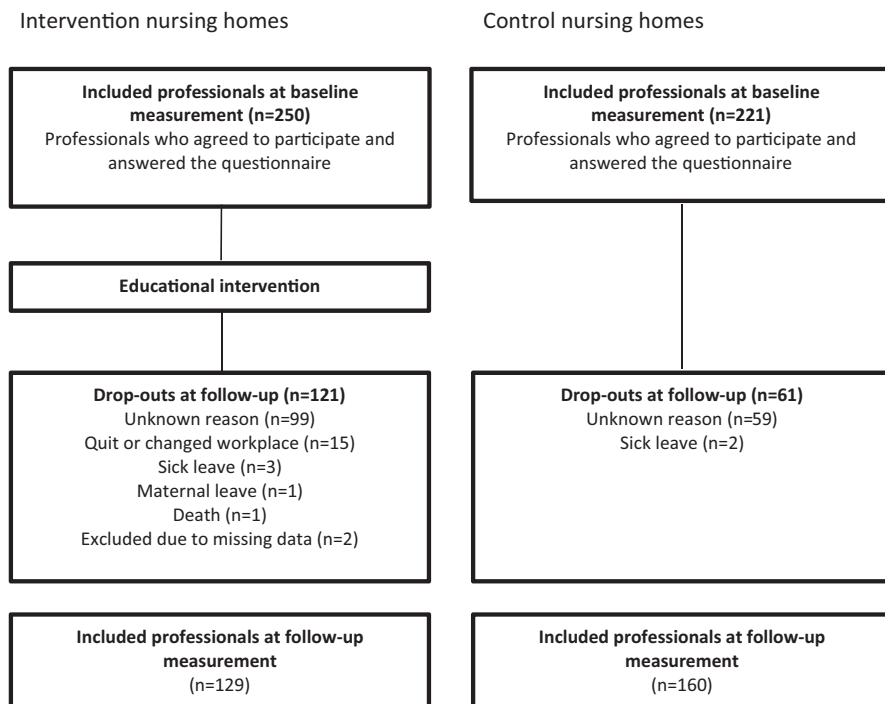


FIGURE 1 Flow chart presenting the inclusion procedure for the study participants

TABLE 1 Background characteristics of participating professionals in the intervention and control groups at baseline ($n = 289$)

Background variable	Intervention group $n = 129$	Control group $n = 160$	p -value
Gender, n (%)			
Male	10 (7.8)	8 (5.0)	0.327
Female	118 (91.5)	152 (95.0)	
Unknown	1 (0.7)		
Age in years, m (SD) [min–max]	45.5 (11.1) [21–65]	47.0 (10.2) [21–65]	0.337
Work Experience			
With general palliative care, n (%)	115 (89.1)	149 (93.1)	0.319
With specialist palliative care, n (%)	15 (11.6)	13 (8.1)	0.328
In years, m (SD), [min–max]	12.0 (9.4) [0–44]	14.0 (10.0) [0–38]	0.074
Profession, n (%)			
Assistant nurse	111 (86.0)	133 (83.1)	0.500
Care assistant	8 (6.2)	16 (10.0)	
Registered occupational therapist	1 (0.8)	1 (0.6)	
Registered physiotherapist	1 (0.8)	3 (1.9)	
Registered nurse	6 (4.6)	3 (1.9)	
Others	1 (0.8)	3 (1.9)	
Unknown	1 (0.8)	1 (0.6)	
Management position, n (%)	3 (2.3)	2 (1.3)	0.480

Data collection

The managers and/or the contact persons at both the intervention and control units were informed about the study's aim and the participation details. In most nursing homes, the contact person informed the professionals about the study; in some, the researchers were invited to present the

study via regular meetings. Each unit manager or contact person distributed the questionnaire to all the professionals. Both the intervention and control groups answered the questionnaire 1 month before and after the 6-month intervention (May 2015–February 2017). The data collection was conducted at the same time for the intervention and control units (Figure 1). Up to three reminders

were given to the contact person at each nursing home to be forwarded to the professionals at both baseline and follow-up.

The questionnaire

During the KUPA project's planning stage, no questionnaire was found in the literature to measure professionals' experiences of palliative care delivery in nursing homes. Therefore, a newly developed questionnaire was applied, entitled 'Your experience of palliative care'. It covers a broad perspective on palliative care in 46 questions, including 7 sociodemographic ones (Table 1). Each participant answered the questionnaire and the questions have a response format with 3–5 categories. The questions were presented as *experience of palliative care delivery*. In addition, the term 'patient' was changed to 'older person'.

The questionnaire was developed by Linnaeus University's Center for Collaborative Palliative Care in Sweden and was guided by the National Palliative Care Program [39], the National Swedish Cancer Survey [40], the Quality from the Patient's Perspective instrument [41] and the Swedish Register of Palliative Care [13,42,43]. The questionnaire has been evaluated for content validity through cognitive interviews with healthcare professionals in different care contexts, and an evaluation of the relevance of the questions is ongoing among more than 400 professionals. In the present study, 38 of the original 46 questions were considered relevant by the research team. They represent three domains: symptom management; conversation and support; and encounter. Symptom management refers to extent and frequency of symptom assessment, alleviation of symptom, frequency of bed sores and assessment of oral hygiene. Conversation and support include personal care contact, support offered to both older person and next of kin, conversation about transition to palliative care and the attendance to wish for a place to die. Encounter refers to how the older person has been treated by the professionals.

Data analysis

Descriptive and inferential statistical methods were used. Absolute and relative frequencies were used for nominal data, and medians (Mdn) and quartiles (Q1–Q3) were used for ordinal data. To investigate whether there was a difference between the intervention group (IG) and the control group (CG) in terms of sociodemographic variables at baseline, the Mann–Whitney U-test and Chi-square test were used.

Both within-group and between-group analyses were performed to evaluate the intervention effects regarding the ordinal outcome variables. In the first step, separate within-group analyses were performed in the IG and CG, using the Wilcoxon signed-rank test for *experience of palliative care delivery*. In the second step, the difference scores, calculated by subtracting the baseline scores from the follow-up scores, for the IG and CG, were compared using the Mann–Whitney U-test. To prevent false discovery rate due to multiple testing, the Benjamini–Hochberg method was applied for the Mann–Whitney U-test on difference scores [44]. An acceptance rate of 20% was used in the calculation of the critical values, resulting in a p -value of <0.013 to be considered significant.

Statistical significance was overall set at $p < 0.05$. Statistical analyses were performed using IBM SPSS Statistics version 24.

RESULTS

The final sample comprised 289 participants. Their mean age was 46.4 (SD = 10.6), and the majority were women ($n = 270$, 93%). There was no significant difference between the professionals in the IG and CG regarding background characteristics at baseline (Table 1).

Experience of palliative care delivery

Regarding symptom management (Table 2), the IG and CG showed a significant increase in the frequency with which the professionals used a valid scale to grade older persons' symptoms at follow-up ($p = 0.005$, $p = 0.034$), but no difference was shown between the groups ($p = 0.226$).

Regarding conversation and support (Table 3), the IG increased significantly in terms of how often next of kin were asked about their support needs ($p = 0.047$), how often they received bereavement support ($p = 0.003$) and how often older persons' wishes regarding a place to die were documented ($p < 0.001$). The CG increased significantly in the areas of bereavement support for next of kin ($p = 0.010$) and invitations to take part in conversations about the older person's transition to palliative care ($p = 0.003$). Between-group analyses showed that the IG increased significantly more than the comparison group in terms of documentation of older persons' wishes regarding a place to die ($p = 0.008$). The opposite effect was shown for invitations to take part in conversations about the transition to palliative care ($p = 0.010$).

Regarding encounter (Table 4), the CG increased significantly at follow-up in terms of how often older persons were not taken seriously or were treated nonchalantly

TABLE 2 Professionals' ratings of their experience related to *symptom management* before and after the educational intervention in the intervention and control groups

Symptom management	Intervention group <i>n</i> = 129			Control group <i>n</i> = 160			Group comparisons <i>p</i> -value ^b
	Baseline		Follow-up	Baseline		Follow-up	
	Mdn (Q1-Q3)	Mdn (Q1-Q3)	<i>p</i> -value ^a	Mdn (Q1-Q3)	Mdn (Q1-Q3)	<i>p</i> -value ^a	
At your workplace, how often are older persons' symptoms graded using a valid, trustworthy scale such as the VAS scale or an equivalent? (range 1-5) ^c	3 (2-4)	3 (2-4)	0.005	2 (2-3)	3 (2-4)	0.034	0.226
How often are symptom assessments documented? (range 1-5) ^c	4 (2-4.5)	4 (3-4)	0.282	4 (2-4)	4 (2-5)	0.397	0.777
How often do older persons have symptoms that cannot be relieved? (range 1-5) ^d							
Pain	4 (3-5)	4 (3-5)	0.0625	4 (3-5)	4 (3-5)	0.972	0.213
Wheezing	4 (3-4)	4 (3-4)	0.0572	4 (3-4)	4 (3-5)	0.416	0.448
Nervousness/anxiety	4 (3-4)	4 (3-4)	0.080	4 (3-5)	4 (3-4)	0.920	0.248
Confusion	3 (3-4)	4 (3-4)	0.219	3 (3-4)	3 (3-4)	0.339	0.123
Dejection/depression	3 (3-4)	4 (3-4)	0.430	3 (3-4)	3 (3-4)	0.885	0.673
How often is there an individual ordination of a specifically required medicine on the list of medicines for older persons who may need it? (range 1-5) ^e							
Pain	5 (4-5)	5 (4-5)	0.631	5 (4-5)	5 (4-5)	0.833	0.621
Nervousness/anxiety	4 (4-5)	4 (4-5)	0.769	4 (4-5)	4 (4-5)	0.412	0.753
Confusion	4 (3-5)	4 (3-5)	0.320	4 (3-5)	4 (3-5)	0.431	0.745
How many of the older persons have bed sores? (range 1-4) ^e	3 (3-4)	3 (3-4)	0.262	3 (3-4)	3 (3-4)	0.192	0.090
How often are the older persons bed sores documented? (range 1-5) ^c	5 (4.5-5)	5 (5-5)	0.244	5 (5-5)	5 (5-5)	0.333	0.864
How many of the older persons receive regular assessment of their oral hygiene? (range 1-5) ^f	5 (4-5)	5 (4-5)	0.907	5 (4-5)	45 (4-5)	0.175	0.368
How often is the assessment of an older person's oral hygiene documented? (range 1-5) ^c	5 (4-5)	5 (4-5)	0.300	5 (4-5)	5 (4-5)	0.816	0.400

Abbreviation: VAS, Visual Analogue Scale.

^aWilcoxon signed-rank test. Significant values are given in bold.

^bMann-Whitney U-test. Significant *p*-values according to the Benjamini-Hochberg method for multiple tests ($p < 0.013$) are given in bold. All items have a response rate of 97.2%-100%.

^c1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = always.

^d1 = always, 2 = often, 3 = occasionally, 4 = seldom, 5 = never.

^e1 = more than half, 2 = less than half, 3 = some, 4 = none.

^f1 = none, 2 = some, 3 = half, 4 = most, 5 = all of them.

($p = 0.028$), as well as how often they were offended or badly treated ($p = 0.040$). No difference was shown within IG and between the groups.

DISCUSSION

The results showed significant changes between and/or within the IG and CG, regarding the use of a valid scale for grading symptoms, support (not least bereavement support) for next of kin, wishes concerning place to die, conversations about the transition to palliative care and how older persons felt they were treated. This result did not provide convincing evidence that the educational intervention improved professionals' experience regarding palliative care delivery. One possible explanation is that the intervention was knowledge focused, and it may take a long time for a team's increased knowledge to be reflected in their care actions.

The use of validated, trustworthy symptom assessment instruments increased at follow-up in both the IG and CG. One possible explanation for the increase in the CG is that when the professionals answered the questionnaires, their attention was drawn to the questions' content. The palliative care literature recommends that professionals in health and social services make structured evaluations of symptoms to achieve the best possible symptom alleviation [1,12,16,38]. Therefore, one of the educational seminars focused on alleviating symptoms and promoted the use of validated assessment instruments [38]. Symptom relief is one of the four cornerstones of high-quality palliative care and is also a component of the four palliative dimensions (physical, psychological, social and spiritual) [1,12,45,46]. Symptom relief knowledge is important because older persons suffering from wheezing can feel emotionally blunted, experience personality changes and be preoccupied with the symptom. These changes, in turn, may place an emotional strain on the next of kin who witnesses the older person's suffering [15].

The professionals in the IG showed an increase in the frequency with which the next of kin were asked about their own support needs and offered an opportunity to talk to someone following an older person's death. One possible explanation for the increase in these domains and in conversations about the transition to palliative care in the CG could be that while answering the questionnaire, the professionals were reminded that the Registered Nurses had previously informed them about holding these conversations with the next of kin before and following an older person's death. Professionals' communication with the next of kin facilitates the latter's involvement in the care and their understanding of the older person's condition. Knowing that older persons have a limited amount

of time to live, next of kin can find it meaningful to play some part in the planning and execution of care [47]. After an older person's death, the sorrow the next of kin feels may be alleviated by recalling the support they provided during the older person's end of life, as well as by accepting the support professionals' offer through conversation. Professionals' provision of support for next of kin and communication-based relationship with them constitute two of the four cornerstones of good palliative care [12].

The professionals in the IG experienced an increase in the frequency with which older persons' wishes regarding a specific place to die were documented. To have the opportunity to make wishes about where to end the life may facilitate a more positive experience of older persons' remaining time in life. Research has shown that older persons have a limited ability to do the things they like to do and that they do not feel in control of their future, which points to low autonomy [48]. All care should be based on respect for the individual's autonomy and integrity [49], but at the end of life this autonomy and this integrity can be threatened, hence it is important that palliative care professionals should strive to protect them.

In the CG, more professionals reported at follow-up that older persons had not been taken seriously, had been offended or had been treated nonchalantly or worse. According to the Swedish Health and Medical Services Act, everyone has the right to high-quality palliative care, regardless of age, care context or primary diagnosis [49]. One possible reason for the increase shown in the CG may be the professionals' elderly care value system training, which was offered in parallel with the KUPA project in certain nursing homes. Due to this training, the professionals may have begun to pay more attention to their attitudes towards older persons during care delivery [34,50]. This finding can perhaps be explained as an aspect of maturation because change may have occurred gradually [51].

The philosophy of palliative care has its roots in hospice philosophy and has developed from being oncology oriented to embracing a broader perspective including all who would benefit from a palliative care approach, for example, older persons [11,52,53]. Despite this, the knowledge about the older persons' trajectory needs to be developed. However, the complexity of older persons' symptoms can cause difficulty in identifying when there should be transition to a palliative care approach [6,7]. Therefore, there is a need to elaborate the palliative care theory with a deeper understanding of the ageing process. A mix of geriatric and palliative care competence should be implemented in nursing homes. Attention has been drawn to the importance of integrated palliative and geriatric services in order to optimise the care delivery and achieve a balance between ageing and dying [10].

TABLE 3 Professionals' ratings of their experience related to *conversation and support* before and after the educational intervention in the intervention and control groups

	Intervention group <i>n</i> = 129			Control group <i>n</i> = 160			Group comparisons <i>p</i> -value ^b
	Baseline		Follow-up	Baseline		Follow-up	
	Mdn (Q1-Q3)	Mdn (Q1-Q3)	<i>p</i> -value ^a	Mdn (Q1-Q3)	Mdn (Q1-Q3)	<i>p</i> -value ^a	
Conversation and support							
How many older persons have a personal care contact, for example, a contact person or a nurse or doctor specifically responsible for them? (range 1-5) ^c	5 (5-5)	5 (5-5)	0.641	5 (5-5)	5 (5-5)	0.059	0.680
How many of the older persons and their next of kin are asked if they would like to receive information or have a conversation in private or in a common location? (range 1-5) ^c	5 (4-5)	5 (4-5)	0.511	5 (3-5)	5 (4-5)	0.735	0.869
How often are older persons offered support related to emotional and existential questions? (range 1-5) ^d	3 (3-4)	4 (3-4)	0.101	3 (2-4)	3 (2-4)	0.436	0.558
How often are older persons' next of kin offered support related to emotional and existential questions? (range 1-5) ^d	4 (3-4)	4 (3-4)	0.631	3 (3-5)	3 (3-5)	0.333	0.740
How often are older persons' next of kin asked about their own need for support? (range 1-5) ^d	4 (3-4)	4 (3-5)	0.047	3 (3-4)	3 (3-5)	0.169	0.721
Following an older person's death, is the next of kin offered an opportunity to have conversations? (range 1-4) ^e	4 (2-4)	4 (3-4)	0.003	4 (3-4)	4 (3-4)	0.010	0.561
How often are discussions held with older persons about their transition to palliative care? (range 1-5) ^d	4 (2-5)	4 (2-5)	0.816	3 (2-4)	4 (3-4)	0.461	0.734
How often are older persons' next of kin invited to take part in conversations related to the transition to palliative care? (range 1-5) ^d	5 (4-5)	4 (4-5)	0.519	5 (3-5)	5 (4-5)	0.003	0.010
Have older persons who can and wish to do so given the opportunity to take part in decisions related to their own care? (range 1-4) ^e	4 (3-4)	3 (3-4)	0.092	4 (3-4)	4 (3-4)	0.294	0.052
How many of the older persons are asked where they wish to die? (range 1-4) ^f	2 (1-3)	3 (2-4)	0.108	2 (1-3)	2 (1-3)	0.785	0.199
How often are older persons' wishes regarding a specific place to die documented? (range 1-5) ^d	3 (1-4)	5 (3-5)	0.000	3 (1-5)	3 (1-4)	0.975	0.008

TABLE 3 (Continued)

Conversation and support	Intervention group <i>n</i> = 129			Control group <i>n</i> = 160			Group comparisons
	Baseline		Follow-up	Baseline		Follow-up	
	Mdn (Q1-Q3)	Mdn (Q1-Q3)	<i>p</i> -value ^a	Mdn (Q1-Q3)	Mdn (Q1-Q3)	<i>p</i> -value ^a	
How often is an older person's stated wish to die in a specific place honored? (range 1-5) ^d	4 (3.5-5)	4 (4-5)	0.304	4 (4-5)	4 (4-5)	0.187	0.745
How often do older persons die without their next of kin, care personnel, or someone else being present? (range 1-5) ^e	4 (3-4)	4 (3-4)	0.066	4 (4-4)	4 (4-4)	0.138	0.210

Note: All items have a response rate of 98.6%-100%.

^aWilcoxon signed-rank test. Significant values are given in bold.

^bMann-Whitney U-test. Significant *p*-values according to the Benjamini-Hochberg method for multiple tests (*p* < 0.013) are given in bold.

^c1 = none, 2 = some, 3 = half, 4 = most, 5 = all.

^d1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = always.

^e1 = no, 2 = yes, sometimes, 3 = yes, often, 4 = yes, always.

^f1 = none of them, 2 = certain of them, 3 = the most, 4 = all.

^g1 = always, 2 = often, 3 = sometimes, 4 = seldom, 5 = never.

The KUPA project [30] represents an attempt to fill the knowledge gap in respect of palliative care in nursing homes.

When evaluating an intervention, it is important that new knowledge and changes meet the organisation's current needs [37]. Palliative care is an essential current topic that needs to be prioritised [1,12,54]. However, local and national authorities initiate many projects that run concurrently in nursing homes. In the competition for professionals' time and energy to change their work, it is likely that the palliative care educational intervention is not considered a high priority [55,56]. It is therefore necessary to effectively communicate the aim and content of such an intervention to capture managers' interest and motivate them to accept the implementation offer [57,58]. Another factor that can affect the dissemination rate is the complexity of implementing palliative care in nursing homes. Simple interventions are more quickly implemented than complex ones [37]. However, developing an intervention that is complex, effective and of high scientific quality is a challenging balancing act. A Cochrane review identified only three studies of sufficiently satisfactory quality for inclusion in a review of interventions aimed at improving palliative care for older persons in nursing homes [16]. The present study demonstrates the importance of evaluating the effectiveness of interprofessional workplace education for professional competence in palliative care at nursing homes. To achieve improved care, however, it is not enough to have high ambitions: the complexity of implementation in clinical practice must also be considered [59].

A possible explanation for why the educational intervention did not generate a larger effect between the IG and CG is to be found in Nielsen et al. [56], who identified facilitators and barriers in respect to the KUPA project from managers' perspective before its implementation in nursing homes. Facilitators are professionals' competence and confidence, motivation, attitudes towards work in general and leadership style. Barriers are professionals' emotional problems with respect to facing dying persons, insufficient motivation, negative attitude towards changes at work, limited resources and lack of time [56]. An enhancement of professionals' knowledge and competence can benefit every actor in nursing homes. The barriers concerning motivation and attitude towards changes at work can be transformed into facilitators through new knowledge and competence. However, there is a dearth of studies of satisfactory quality that focus on education in palliative care for professionals in nursing homes [16,20]. The National Board of Health and Welfare [12] recommends that professionals working in palliative care needs to be offered education and guidance to improve their ability to meet frail older persons' needs.

TABLE 4 Professionals' ratings of their experience related to *encounter* before and after the educational intervention in the intervention and control groups

Encounter	Intervention group <i>n</i> = 129			Control group <i>n</i> = 160			Group comparisons
	Baseline		Follow-up	Baseline		Follow-up	
	Mdn (Q1–Q3)	Mdn (Q1–Q3)	<i>p</i> -value ^a	Mdn (Q1–Q3)	Mdn (Q1–Q3)	<i>p</i> -value ^a	
How often do you perceive that older persons are not taken seriously or are treated nonchalantly by the professionals in your department? (range 1–4) ^c	3 (3–4)	3 (3–4)	0.359	3 (3–4)	3 (3–4)	0.028	0.031
How often do you perceive that older persons are offended or badly treated by the professionals in your department? (range 1–4) ^c	4 (3–4)	4 (3–4)	0.282	4 (3–4)	4 (3–4)	0.040	0.031
How do you feel generally about how the professionals in your department handle older persons receiving palliative care? (range 1–4) ^d	4 (3–4)	4 (4–4)	0.061	4 (3–4)	4 (3–4)	0.894	0.223
How do you feel about palliative care delivery at your workplace? (range 1–5) ^e	4 (4–5)	4 (4–5)	0.353	4 (3–5)	4 (4–5)	0.327	0.175
How satisfied are you with the care your department provides to older persons in the palliative stage? (range 1–5) ^f	4 (4–5)	4 (4–5)	0.218	4 (4–4)	4 (4–5)	0.280	0.830

All items have a response rate of 98.6%–100%.

^aWilcoxon signed-rank test. Significant values are given in bold.

^bMann–Whitney U-test. Significant *p*-values according to the Benjamini–Hochberg method for multiple tests ($p < 0.013$) are given in bold.

^c1 = often, 2 = sometimes, 3 = seldom, 4 = never.

^d1 = very badly, 2 = rather badly, 3 = rather well, 4 = very well.

^e1 = completely based on the department's routines, 2 = mostly based on the department's routines, 3 = as much based on the patients' needs as on the needs created by the department's routines, 4 = mostly based on the patients' needs, 5 = completely based on the patients' needs.

^f1 = not at all satisfied, 2, 3, 4, 5 = completely satisfied.

Limitations and strengths

One important limitation is that no a priori power calculations were performed. The main reason was that the outcome measures had not been used in previous studies and therefore no information about the expected effect size could be estimated. However, the sample size was probably sufficiently large since 134 participants, equally distributed between the IG and CG, would be enough to detect a medium effect size ($d = 0.5$, $\alpha = 0.05$, $1-\beta = 0.08$) using the Mann–Whitney U-test. Another limitation is that there were significant differences in the dropouts' age (2.8 years older on average) and work experience (2 years more) compared to the participants. However, the differences in age can be regarded as rather small in view of the large range (21–65 years) and are therefore not assessed as affecting the generalisability of the results. The overall dropout rate was 38.5%, which reflects the voluntary nature of participation. However, a relatively large attrition rate can negatively affect the results due to less statistical power [60]. Furthermore, no subgroup analyses have been conducted and it cannot be excluded that the intervention may have influence in different subgroups, for example, in relation to sex, work experience and profession.

The questionnaire has not undergone any psychometric testing, which means that the measurement properties are unknown. However, given that the questionnaire comprises of single questions, psychometric evaluations of latent variables, such as factor validity and internal consistency reliability, are inappropriate. The instrument was developed by researchers with expert knowledge in questionnaire design, psychometry and palliative care, and several current evidence-based sources guided the construction of 'Your experience of palliative care'. Furthermore, healthcare professionals supported the questionnaire's content validity during cognitive interviews. However, an important shortcoming is that the questionnaire does not cover knowledge dissemination in the workplaces, which was an important goal of the inter-professional education intervention in this study.

One of this study's strengths is that the CG and IG were taken from two different counties in Sweden, lowering the risk of treatment diffusion [51]. The risk was also diminished through the use of different implementers in the two counties. However, to prevent intervention disparities between the two counties, a weekly meeting with the research team was held throughout the duration of the project. The meetings were led by the project leader, and the purpose was to continuously calibrate the intervention design.

Another strength is the inclusion of IPE in the intervention. IPE refers to when two or more professionals

learn with, from and about each other [17]. This may have had an effect on the professionals' *experience of palliative care delivery*. The intervention was based on IPE theory, which involves interactive learning focused on active collaboration [17]. A systematic review and meta-analysis [61] showed that IPE has positively impacted various healthcare disciplines. IPE seems to improve knowledge, skills and attitudes concerning collaborative teamwork. The participants were given assignments after each seminar in order to highlight their performance of their daily work, which then was reflected and discussed in the seminar groups. The learning generated was intended to be disseminated and translated into daily practice in the form of improvement of palliative care. The framework of strategies for implementation [62] emphasises the importance of building confidence through job training integrated with reflective debriefing in palliative care delivery.

Regarding generalisability, the data were collected in two counties in Sweden from 30 nursing homes in both urban and rural areas. The population included in the study consisted of members of the multidisciplinary nursing home team: assistant nurses, care assistants, Registered nurses, Registered occupational therapists, Registered physiotherapists and unit managers. Given that the data were collected from two Swedish counties and represent the multidisciplinary teams that work in nursing homes, the results can be generalisable to similar populations [51] and similar care contexts.

Since the majority of the participants were assistant nurses, the knowledge that the seminars generated is based largely on the competence of this group. This can be seen as a strength for dissemination and implementation in the nursing homes. The assistant nurses work the most closely with older persons but do not have specialist knowledge in palliative care, and therefore the translation of the knowledge from the seminars into day-to-day practice can bring about sustainable improvement [62]. However, the used questionnaire in this study may be reviewed from the proportionally largest professional perspective, that is, assistant nurses' group.

Some attempts have been made to reduce threats to the validity of the results. First, the educational intervention was implemented with the same content and at the same frequency in both counties. Second, the time between the two data collection points was the same in both counties for both IG and CG. Finally, the counties were a significant distance from each other. Furthermore, due to different political structures between the two counties, there is no formal or informal collaboration with regard to elderly care. This design was chosen to avoid overspreading effects of the intervention on the CG.

CONCLUSIONS

This study's results showed few improvements in the outcomes (experience of palliative care delivery) among professionals after the educational intervention. One reason for this may be that our intervention was knowledge focused and it takes a considerable time for team members' new knowledge to be reflected in their care actions. Nevertheless, this study highlights the significance of evaluating the effectiveness of workplace education for professional competence in palliative care delivery at nursing homes. It also confirms the complexity of implementation in clinical practice, as described in the previous literature. Future research on this educational intervention can be of interest, with the addition of clinical supervision of professionals during palliative care delivery.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interests.

AUTHOR CONTRIBUTIONS

The first author (HÅP) conducted the analysis and drafted the manuscript, and GA, KÅ, LB, ED and AS reviewed it. The project leader (GA) developed the design together with AS, and GA was responsible for applying for national research grants. All authors have read and approved the final version of the manuscript.

ETHICAL APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval for the KUPA project was obtained from Regional Ethical Review Board in Lund (reference number 2015/4). The study was conducted in accordance with Swedish Ethical Review of Research Involving Humans Act [63] and General Data Protection Regulation [64]. Before the study, the participants received both oral and written information about its purpose, about the confidential treatment of the data and the voluntary nature of participation. The participants provided written informed consent before the study commenced.

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