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Improving Palliative Care Knowledge of nurses caring for heart failure patients

Author and corresponding author

Sana Ali[1,4*], Kim McMillan[2*] and Freya Kelly[3*]

Abstract

Background Approximately 80% of patients with advanced heart failure (HF) die within five years of diagnosis and may benefit from palliative care (PC). PC is underutilized in HF patients. One barrier is nurses' insufficient knowledge of PC. This quality improvement project aimed to enhance the PC knowledge of nurses caring for patients with HF in a Canadian tertiary care setting.

Method This project was guided by the Knowledge-to-Action framework. Semi-structured interviews were conducted to identify nurses' learning needs, which informed the development of the educational sessions. These sessions were delivered using hybrid, virtual, and asynchronous modalities. PC knowledge tests were used pre- and post-intervention to evaluate the nurses' PC knowledge. The data were presented using descriptive statistics.

Results Thirteen nurses attended the educational sessions. Ten responses were received for both the pre- and post-knowledge tests. Most participants had more than 10 years of experience, were 41 years or older, and had received prior PC training. The post-test showed improved knowledge (90–100%) of opioid use for symptomatic relief of dyspnea, advanced care planning (ACP) discussions, and communication processes. Knowledge of NSAID use in patients with HF increased by 60%. All nurses demonstrated an understanding of ACP concepts before and after the education. PC concept understanding increased from 80 to 90%.

Conclusions Educational sessions improved nurses' PC knowledge, and future education should emphasize improving PC perceptions and symptom management. However, evaluating the effectiveness of PC education is challenging because of low participation. Further research with a larger sample, longer implementation time, ongoing evaluation of PC knowledge, and nurses with diverse ages and experiences is required to understand the impact of PC education.

Keywords Palliative care, Heart failure, Nurse, Knowledge, Education

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*Correspondence:
Sana Ali
sanali@toh.ca
Kim McMillan
kim.mcmillan@uottawa.ca
Freya Kelly
fkelly@ottawaheart.ca

[1] The Ottawa Hospital, 501 Smyth Road, Ottawa, ON K1H 8L6, Canada
[2] Faculty of Health Sciences, School of Nursing, University of Ottawa, 200 Lees Ave, Ottawa, ON K1N 6N5, Canada
[3] Advance Practice Nurse, Cardiac Supportive Care, The University of Ottawa Heart Institute, 40 Ruskin St, Ottawa, ON K1Y4W7, Canada
[4] Ottawa Hospital Research Institute, Ottawa, Canada

Introduction

According to the Heart and Stroke Foundation of Canada, approximately 750,000 Canadians currently suffer from heart failure (HF), and more than 100,000 new cases of HF are identified each year [1]. The global prevalence of HF is projected to increase by approximately 25% by 2030 [2]. In Canada, hospitalization due to HF is a significant issue, and approximately 25–50% of patients are readmitted within one month of discharge [1, 3]. Individuals with HF typically exhibit higher rates of comorbidities, leading to increased hospital mortality and longer hospital stays than those diagnosed with other health conditions [3]. The healthcare expenditure for HF in Canada is expected to surpass $2.8 billion per year by 2030 [1]. The risk of sudden cardiac death is significantly higher in patients with HF [4, 5]. Approximately 80% of individuals diagnosed with advanced HF do not live beyond five years, and approximately half of those diagnosed with New York Heart Association (NYHA) class IV HF die within the first 12 months [6, 7]. Consequently, professional organizations and experts suggest initiating palliative care (PC) at an early stage in the progression of HF [4, 6–9]. PC is defined as:

> *"An approach that improves the quality of life of patients and their families' facing problems associated with life-threatening illnesses. It prevents and relieves suffering through early identification, correct assessment, and treatment of pain and other problems, whether physical, psychosocial, or spiritual" [10].*

Approximately 38.5% of the 40 million individuals globally in need of PC annually have cardiac disease [10]. People with HF do not have the same access to PC as people with other life-limiting illnesses, including cancer [11–13]. This leads to a lack of satisfaction among patients with HF in terms of symptom management and psychosocial concerns such as loneliness and inadequate emotional support [8]. Advanced care planning (ACP) and goals of care (GOC) discussions have been shown to have a positive effect on quality of life and reduce anxiety and depression, ultimately leading to improved care outcomes [14, 15]. Nevertheless, individuals with HF often encounter communication delays, lower ACP completion rates, and inadequate GOC discussions [5, 16]. A retrospective study revealed that >80% of hospitalized patients with HF did not have ACP documentation in their medical records [17]. Other studies have revealed that only one-quarter of hospitalized patients with HF have reported resuscitation preferences [16]; only 37% of patients were aware of poor prognosis and 36% of these patients died alone [18].

The provision of PC in patients with HF in a hospital setting has been shown to decrease the duration of hospital stay, lower the cost of care, reduce readmissions, alleviate symptom burden, and minimize the number of unnecessary interventions performed near the end of life [19–22]. Despite this, evidence suggests that the number of PC referrals for HF patients in hospitals is low and often integrated late into the illness trajectory [8, 23–26]. Various barriers to providing PC for patients with HF in hospitals have been identified, including a lack of knowledge, care coordination and collaboration, misconceptions about PC, inadequate funding, poor patient-family communication, a shortage of PC experts, an unpredictable HF trajectory, difficulties in determining the right time for referral to PC, a lack of education and experience, time constraints, and clinician apprehension about engaging in advance care planning (ACP) and goals of care (GOC) conversations [12–14, 18, 25, 27–35]. One important barrier is the lack of PC knowledge among healthcare professionals, including nurses. Education and collaboration among healthcare providers can help to overcome these barriers [36]. This quality improvement project (QIP) aimed to improve the PC knowledge of nurses caring for patients with HF in a Canadian tertiary care setting.

Method

Setting

The QIP was conducted at a Canadian tertiary cardiac care center. The study population consisted of nurses ($N = 145$) who provided care to patients with HF in three inpatient units.

Design and implementation

This QIP was guided by the action cycle of the knowledge-to-action framework, which involves identifying the problem, adapting knowledge to the local context, assessing barriers to knowledge use, selecting, tailoring, and implementing interventions, evaluating outcomes, and monitoring and sustaining knowledge use [37].

Step 1: Identifying the problem: The engagement of key stakeholders is crucial for identifying facilitators of and barriers to the integration of PC knowledge. The key stakeholders included an outpatient PC advanced practice nurse (APN), an inpatient PC APN, a clinical educator, care facilitators, and PC champions in each unit. Stakeholders expressed concerns about the gap between theoretical knowledge and practical experience in addressing the PC needs of patients with HF. This is thought to be due to the high staff turnover and busy work environment. A literature search was conducted using PubMed, Cochrane, and MEDLINE to determine the extent of the knowledge-practice gap in relation to current HF PC practices and guidelines. Relevant articles published in English between 2015 and 2022 were included and reviewed.

Step 2: Adapting knowledge to the local context: To adapt to the local context, the organizational structure was evaluated, and key stakeholders were identified and consulted. Key stakeholders were actively involved in each stage of the project for their valuable suggestions to plan the intervention and implementation that would meet the needs of nurses and adapt PC knowledge to the local context.

Step 3: Assessing barriers/facilitators of knowledge use: Semi-structured interviews consisting of three questions were conducted with three staff members and a nurse educator to assess facilitators and barriers to nurses' PC knowledge use and learning needs (Supplementary Material 1). The main themes identified included PC concepts, time to PC initiation, symptom management, ACP/GOC communication, emotional support, multidisciplinary team coordination, lack of well-documented GOC in the patient's chart, and inpatient/outpatient PC service options. The themes identified in the interviews were similar to those in the literature, including PC principles, communication techniques, symptom management, and the timing and content of PC conversations [8, 12, 25, 38, 39].

Step 4: Select, tailor, and implement the intervention: Hybrid educational sessions were designed based on themes identified through interviews to address the nurses' learning requirements. The education sessions were implemented over a six-week period, with options for in-person, virtual, and asynchronous participation.

Step 5: Evaluation outcomes: Pre- and post-PC knowledge tests were conducted to assess knowledge acquisition. The tests were accessible through barcodes, links, and papers to encourage their completion.

Steps 6 and 7: Monitoring and sustaining knowledge use: Ongoing monitoring and evaluation of knowledge use were not possible because of the short duration of the QIP. Although the QIP itself lasted eight weeks (six weeks of implementation and two weeks of evaluation), long-term knowledge use was sustained given the integration of key stakeholders from the institute. Educational materials remain accessible to encourage continuous knowledge use.

Intervention

The PC educational program enhances healthcare professionals' knowledge, comfort, and confidence in identifying patients' PC needs, managing symptoms, conducting ACP/GOC conversations, and improving the PC of patients with HF [11, 38, 40–42]. Therefore, educational sessions with diverse learning modalities were selected to ensure optimal attendance. Hybrid learning combines face-to-face and virtual learning and is an effective method in nursing education to enhance knowledge, problem-solving abilities, and learning satisfaction [43, 44]. The invitation for the session was distributed via email, posters, closed virtual groups, and word of mouth. The themes covered in these hybrid and asynchronous sessions included PC concepts, symptom management, and patient-family communication for ACP and GOC. Each session was 40 minutes long, with a 20-min didactic presentation and 10 min of case scenario videos, followed by 10 min for discussion, questions, and evaluation. Pre- and post-tests were conducted to assess knowledge before and after the educational sessions, respectively.

The educational sessions were designed based on the principles of Knowles's Adult Learning Theory [45]. To successfully implement changes in practice, it is crucial to communicate with staff members about the application of acquired knowledge in routine care [46]. This was emphasized at the start of the session by discussing current evidence from the literature and illustrating the benefits of PC for patients with HF, their families, and the healthcare system. In addition, these sessions were developed based on the gaps in practice identified by the learners to encourage self-directed learning. Reflecting on PC practices, using relatable examples, discussing staff experiences, and addressing patients' PC needs can enhance professional development [46]. Case scenario videos on GOC/ACP communication skills were incorporated into sessions to bridge the theory-practice gap. Case studies often depict complex situations that involve ethical dilemmas and problems that require discussion. The use of scenarios in educational sessions teaches nurses how to handle challenges and evaluate courses of action [47].

Measurement

Pre- and post-tests, commonly used in QIPs, were conducted to evaluate the impact of the educational sessions (Supplementary 2) [48]. These tests consisted of two sections: demographic data (four items) and a PC knowledge test (six items). The six items in the PC knowledge test were derived from the 29-item Palliative Care Knowledge Test used in a study that focused on the HF population, and each item had three response options: true, false, or unknown [49]. Only six knowledge questions were asked in the pre- and post-tests to accommodate nurses' busy schedules and to encourage responses and test completion. Six items in the knowledge test assessed the nurses' understanding of themes related to PC concepts, symptom management, and patient-family communication related to ACP and GOC communication. The collected demographic data included age, education, years of practice, and previous PC training.

Analysis

The demographic data and results of the pre- and post-PC knowledge tests were presented using descriptive statistics, including frequencies and percentages.

ENEthical consideration

This study was approved by the University of Ottawa Research Ethics Board. The participants were informed of the project's purpose and provided informed consent by agreeing to participate in the interview, intervention, and completion of the evaluation. To maintain confidentiality and anonymity, the participants' information was kept secure, and the interviewees were identified as Nurses 1, 2, 3, and 4. The interview notes were transcribed into electronic documents and kept secure on password-protected laptops. The pre- and post-tests, written papers, and presentations did not include participants' names or other identifying information. Attendance at the in-person/virtual sessions was not recorded with the names and work location. The asynchronous session only provided information about the number of views on the session without any identifying information about the participants. Pre- and post-tests were administered online and conducted anonymously without collecting identifying data such as names, employee numbers, or email addresses. After the completion of the project, the electronic files and other documentation will be stored in accordance with the data management and deletion protocols established by the University of Ottawa Research Ethics Board.

Table 1 Baseline characteristics of participants in pre-test and Ppost-test groups

Demographic	Pretest (*n* = 10)		Post-test (*n* = 10)	
	N	%	N	%
Age				
< 30	1	11.1%	0	0%
31–40	1	11.1%	4	40%
41–50	3	33.3%	3	30%
51–60	4	44.4%	3	30%
Education				
Diploma	4	40%	4	40%
Undergraduate	5	50%	2	20%
Masters/Graduate	1	10%	4	40%
Years of Practice				
1–3	2	20%	1	11.1%
4–10	0	0%	1	11.1%
11–20	2	20%	3	33.3%
21–30	5	50%	3	33.3%
> 30	1	10%	1	11.1%
Palliative care training				
Yes	7	70%	6	60%
No	1	10%	3	30%
Not sure	2	20%	1	10%

Results

Educational sessions were available to 145 potential participants from the three units; however, only 13 nurses (9%) attended the sessions. Only ten responses for the pre-and ten responses for post-knowledge tests were received. A review of the data indicated that seven participants completed both the pre-test and post-test, three nurses completed only the pre-test, and three nurses completed only the post-test. This discrepancy in the completion of the pre- and post-tests contributed to variations in the characteristics of the pre- and post-test groups. Missing responses were excluded from analysis.

Table 1 presents the baseline characteristics of the study participants. A total of 78% of the nurses in the pre-test group and 60% of the nurses in the post-test group were between 41 and 60 years of age, whereas the participation of younger nurses was lower in both groups. In the pre-test group, 40% of the nurses had diplomas, and 50% had undergraduate degrees, whereas the number of graduate nurses (40%) were greater in the post-test group. Nurses with less than ten years of experience completed the sessions in lower numbers than experienced nurses. Additionally, 78–80% of the nurses in both groups had more than ten years of clinical practice. Most nurses (70% in the pre-test group and 60% in the post-test group) had previously received PC training.

Participants were evaluated using pre- and post-knowledge tests (Fig. 1). All the nurses (100%) demonstrated a comprehensive understanding of ACP concepts before and after the educational sessions. Nurses displayed improved knowledge of opioid use for symptomatic relief of dyspnea, understanding of ACP, and GOC/ACP communication processes, with test scores improving from 90 to 100% in these areas. Post-test knowledge of Nonsteroidal anti-inflammatory drugs (NSAID) use in HF patients improved from 10 to 70%. In addition, the understanding of the concept of PC improved from 80 to 90%.

Discussion

In the first week, all staff members attended the hybrid session in virtual mode, and there was no in-person participation. Factors that may affect in-person attendance at educational events include staff shortages, high staff turnover, and the need to plan education around shift work [46]. Thus, a second virtual session was organized to accommodate nurses' busy schedules during their preferred times. The convenience and flexibility of online education, along with its accessibility and cost-effectiveness, make it an ideal choice for nurses who face difficulties attending in-person sessions because of their work, family, and other responsibilities [47]. Despite organizing sessions around staff-preferred times, hybrid and virtual session participation remained low. Ongoing evaluation and potential modifications may be required during the

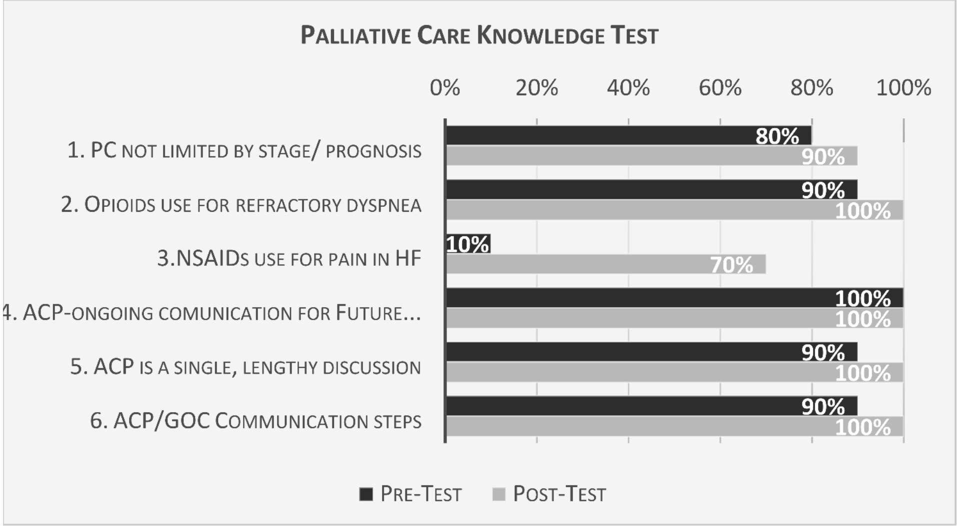

Fig. 1 Pre- and Post-Knowledge Test Results

implementation phase of a quality improvement (QI) intervention to attain the desired outcome [50]. Based on stakeholder feedback, the sessions were recorded for asynchronous online learning to improve participation. The session was available online for four weeks to make it accessible and promote flexibility for self-directed learning. Flexible educational sessions help to accommodate individual needs and enhance engagement [46]. The implementation of asynchronous sessions increased nurses' participation over a four-week period; however, the increase was not substantial. Poor attendance in education sessions can also be attributed to individual factors such as fatigue, lack of interest, lack of self-directed learning, and lack of motivation to learn [51]. Accountability is a crucial aspect of QI engagement, and it can be enhanced by making QI mandatory for all staff and actively involving nurses in QI initiatives [52].

Professionally trained staff on PC facilitates coordination, early identification, quality of care provision, and communication among all stakeholders involved in the care of people with HF [53]. The hybrid and asynchronous educational interventions yielded small yet positive outcomes despite a low response rate, and demonstrated potential for enhancing nurses' PC knowledge, which could subsequently improve PC services. Participation was greater among older, more experienced, and PC-trained nursing staff, which could have resulted in high pre-test scores. Perception of PC as end-of-life care is a significant obstacle that can be addressed by improving nurses' knowledge and understanding of PC through professional training [54]. The most substantial change in the pre- and post-intervention assessment knowledge scores was observed for NSAID use for pain in HF patients. The Canadian Cardiovascular Society recommends avoiding the use of NSAIDs, as they can lead to sodium and water retention, exacerbate HF symptoms, increase the risk of cardiovascular events, and worsen HF outcomes [9]. Nurses play a vital role in identifying and assessing patients' symptoms, and can play a key role in the collaboration of effective symptom relief interventions [20]. This finding suggests the need to prioritize the improvement of PC perception and the concept and management of PC symptoms in future educational programs, particularly emphasizing the use of appropriate medications for pain management in HF.

Given the poor attendance and test completion rates, the effectiveness of the educational sessions was challenging to evaluate. Poor attendance may be attributed to various contextual factors, including lack of time due to a demanding work environment, inadequate support, and high workload resulting from high staff turnover [51]. Attendance can be improved in part by dedicating protected time and resources to educational purposes and offering support to encourage staff participation, especially for novice nurses [46]. To ensure the successful implementation of educational sessions, it is important to have a culture that prioritizes learning and supports continuing education for professional growth [51]. Although the education session was planned based on nurses' learning needs, identifying the preferred learning methods during the needs assessment, as well as a longer implementation time, could have increased participation. The timing and frequency of educational sessions and the location of training aids, such as resource folders or reference materials, may also have improved the integration of the intervention into practice [46]. Enhancing physician and nurse collaboration in QI initiatives could prove to be a highly effective strategy for achieving long-term improvement in patient care and safety given that these healthcare professionals have the most direct interaction with patients [55]. Furthermore, engaging patients in the QI initiative can facilitate their active involvement in decision-making processes regarding their care.

Limitation

One significant limitation of the QIP was the small sample size ($n = 13$). Despite using various modes of education to encourage engagement, the participation rate did not increase. The use of convenience sampling within three cardiac units further introduced the potential for sampling bias, as this non-probability method lacks the rigor of random selection [56]. Consequently, the representativeness of the sample may limit its generalizability. Although, similar to research, QI is characterized by using systematic and consistent methodology [57, 58], but it does not aim to generate new knowledge or generalize the findings; rather, it produces multiple learning outcomes regarding what works best in a specific setting associated with a clinically relevant change [50, 57–59].

The internal validity of the QIP may also have been influenced by confounding variables, as a significant proportion of participants were older and experienced professionals with prior training in PC. Moreover, some participants completed only the pre- or post-test, leading to discrepancies in the characteristics of the pre-and post-test groups. This inconsistency may have compromised the validity of the comparative analyses and made it challenging to draw strong conclusions about the effectiveness of the intervention. However, unlike research, the primary objective of QI is to improve the process and system and produce empirical evidence to understand the important trends, where data can be 'sufficiently adequate' rather than perfect without emphasizing statistical significance [50, 57–59].

The project's six-week implementation period limited its impact. A longer duration could have increased participant engagement, potentially enhancing participation rates and the overall outcomes. Finally, although the project involved key stakeholders, the lack of engagement from the hospital administration and multidisciplinary teams reduced the potential scalability of the QIP. Involving these groups could have improved the integration of education, optimized resource allocation, and promoted collaboration.

Conclusion

Education sessions in various modalities, such as hybrid, virtual, and asynchronous, have the potential to increase PC knowledge among nurses caring for HF patients. Future education should focus on HF symptom management, and improve PC concepts and perceptions related to HF. Furthermore, strategies for mandatory PC education and collaboration between multidisciplinary teams in tertiary care should be implemented. Owing to the limitations discussed above, further research with a larger sample size, longer implementation time, ongoing evaluation of PC knowledge, and increased participation of nurses of diverse ages, education, and experience is required to better understand the impact of PC education on improving nurses' PC knowledge and services for patients with HF.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12904-025-01669-7.

Supplementary Material 1

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Author contributions
All the authors equally contributed to the project and the manuscript.

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Data availability
. The data generated and analyzed during the current study are not publicly available due to confidentiality and human research ethics agreements.

Declarations

Competing interests
The authors have no conflicts of interest to disclose, and no known competing financial or personal interests that could have influenced this study.

Ethics Approval and Consent to participate
Ethical approval was obtained from the University of Ottawa Research Ethics Board. Informed consent was obtained from all participants. Participants were aware of the Project's purpose and provided consent by agreeing to participate in the interview, intervention, and completing the evaluation.

Consent for publication
Not applicable.

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