



The use of hospital-based services by heart failure patients in the last year of life: a discussion paper

Gursharan K. Singh¹ · Patricia M. Davidson^{1,2} · Peter S. Macdonald^{3,4,5} · Phillip J. Newton¹

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Abstract

Individuals with chronic heart failure have high utilisation of hospital-related services towards the end of life and receive treatments that provide symptom relief without improving life expectancy. The aim of this discussion paper is to determine chronic heart failure patients' use of acute hospital-based services in their last year of life and to discuss the potential for palliative care to reduce service utilisation. A systematic search of the literature was conducted. Medline, Cumulative Index for Nursing and Allied Health (CINAHL) and SCOPUS databases were used to systematically search for literature from database commencement to September 2016. Specific inclusion criteria and search terms were used to identify relevant studies on heart failure patients' use of hospital services in their last year of life. There were 12 studies that evaluated the use of hospital-based services by chronic heart failure patients at the end of life. In all studies, it was found that chronic heart failure patients used acute hospital-based services as death approached. However, only two studies examined if palliative care consultations were obtained by patients, and neither study assessed the impact that these consultations had on service utilisation in the last year of life. Heart failure negatively impacts health status, and this is a predictor of service utilisation. Further research is needed to determine the efficacy of both primary and secondary palliative care in reducing resource use towards the end of life and improving the quality of end of life care.

Keywords Terminal care · Palliative care · Heart failure · Hospitalisation · Emergency service · Health resources

Introduction

There are 26 million patients with chronic heart failure (CHF) worldwide [1] and the prevalence continues to rise with the increase in the ageing population [2]. This complex and multifaceted syndrome is associated with poor survival [3] and is the most common cause for hospitalisations in individuals aged over

65 years old [4]. CHF is characterised by severe symptom burden comparable to that of cancer, and a poor quality of life [5].

Individuals with serious illnesses, like CHF, are more likely to use acute hospital-based services including the emergency department (ED) and the intensive care unit (ICU) towards the end of life [6]. The term end of life refers to an individual's last year of life, where a needs assessment and palliative care provision is required [7].

The use of emergency and hospital-related services at the end of life can be indicative of poor-quality end of life care for individuals who would prefer home-based or community-based care, as hospital environments and EDs can be sources of distress and exhaustion for patients approaching death [8]. Although aggressive interventions that oppose the patients' needs and preferences are more likely to occur in hospitals [9], care within the hospital may sometimes be appropriate to address the needs of the patient and manage acute exacerbations. Individuals with CHF approaching end of life have complex social and physical issues that may be better treated with non-specialist community-based palliative care services that provide primary, preventative and supportive services in the community [8]. Collaboration between primary palliative

✉ Gursharan K. Singh
19247667@student.westernsydney.edu.au

¹ School of Nursing and Midwifery, Western Sydney University, Locked Bag 1797, Penrith, NSW 2751, Australia

² School of Nursing, Johns Hopkins University, 525 N Wolfe St, Baltimore, MD 21205, USA

³ Heart Transplantation Unit, St Vincent's Hospital, 390 Victoria St, Darlinghurst, NSW 2010, Australia

⁴ Victor Chang Cardiac Research Institute, Lowy Packer Building 405 Liverpool Street, Darlinghurst, NSW 2010, Australia

⁵ University of New South Wales, Sydney High St, Kensington, NSW 2052, Australia

care and ongoing cardiological care has been shown to provide an integrated patient-centred approach to managing their patients with CHF [10]. This form of care has the potential to reduce healthcare costs and improve the quality of end of life care [11]. However, a recent report on conference proceedings and published literature has shown that there is limited research and resource allocation for care of individuals with CHF [12]. Even in countries with well-developed palliative care services, only around 4% of individuals with CHF are referred for specialist palliative care [13].

Multiple studies [14–19] have examined the use of acute hospital-based services by CHF patients at the end of life, suggesting that these individuals use a substantial amount of acute hospital-based services in the last year of life. This has become increasingly concerning with regard to the quality of end of life care delivered to these individuals, as hospital care during this time may be inappropriate for some patients or not align with their care preferences. The purpose of this article is to discuss CHF patients' utilisation of acute hospital-based services including the ED and ICU in the last year of life, the role that palliative care may play in reducing this utilisation and the barriers to implementing palliative care in CHF patients.

Methods

Design and data source

A systematic search of the literature was conducted in September 2016, and a search of Medline, Cumulative Index for Nursing and Allied Health (CINAHL) and SCOPUS databases from database commencement to September 2016 was carried out in regard to the utilisation of acute hospital-based service for patients with CHF in the last year or months of life.

Eligibility criteria

Specific inclusion criteria were used to ensure all relevant literature was included. Selected literature was chosen based on whether the studies included (i) assessed the utilisation of acute hospital-based services by CHF patients at the end of life, (ii) used a sample that were adults (aged 18 years or older), (iii) had a sample with a confirmed CHF diagnosis and (iv) were published in English.

Search strategy

The search terms included hospitals or service or resource or health resource or healthcare or emergency or emergency service or ICU or intensive care unit AND cardiovascular or cardiovascular diseases or heart failure AND terminal care or end of life. There was an additional hand search of studies and grey literature.

Data extraction

The title and abstract of the studies were reviewed independently by two authors (GKS and PJN). The data from the papers that were eligible for full-text review were extracted using a data form which included the study's aim, methods, the findings and the strengths and limitations of the studies.

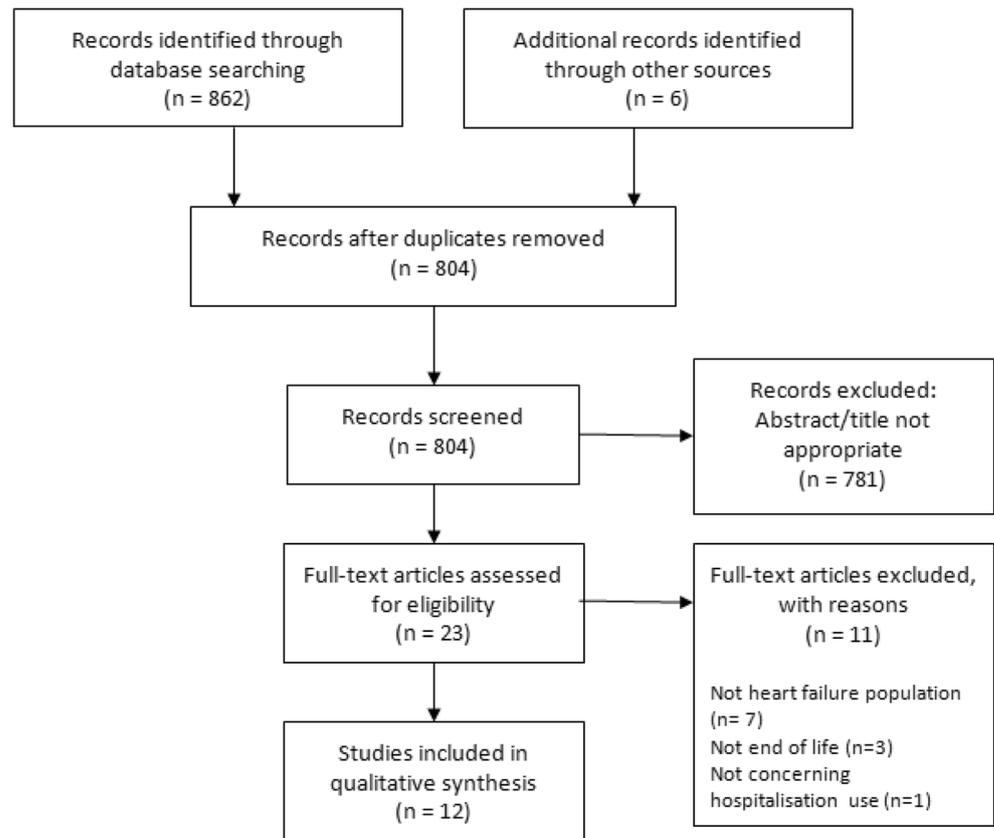
Results

The search resulted in 868 publications (Fig. 1). Twenty-three publications were selected for full-text review after reviewing the title and abstract (by GKS and PJN). A total of 12 articles met our search criteria and were selected to illustrate the objectives of this paper. Table 1 is a summary of these articles. Of these, there were 9 studies from the USA and one each from Canada, UK and Hong Kong with study populations ranging from 47 to 229,543. The main findings of the studies were that CHF patients were hospitalised frequently and often utilised the ED and ICU in the last months or year of life. Two studies reported palliative care consultations in CHF patients, but failed to discuss its impact on resource use.

Utilisation of acute hospital-based services by chronic heart failure patients in the last year of life

There were 58% (7/12) of the included studies reporting the proportion of patients with CHF hospitalised in the last year of life with some variation between studies that may be explained by the different enrolment criteria for defining the CHF population. The higher average number of hospitalisations described by Reed and colleagues [15] may be due to the study population being involved in a randomised control trial of patients with a left ventricular ejection fraction of less than 35% and had a small sample size of only 234 individuals. Average inpatient days in the last year of life varied between 20 and 52 days [15, 16, 20], again possibly reflecting the differences in the study population. CHF patients from the Veterans Health Administration, experienced the highest average inpatient days in the last year of life [20]. These patients differ to the general population as they are more likely to have a low level of financial income, mental health, and substance abuse-related issues and have experience with distressing or warfare situations; influencing their end of life issues and needs [20].

The number of hospitalisations in the last 6 months of life were reported to be (mean (SD)) 2.5 (2.2) [14], 2.1(2.2) [21], and 3.6(2.4) [22]. The higher mean stated in the study by Lau and colleagues [22] may be explained by the study setting, Hong Kong, in which CHF patients may have a different clinical profile in comparison to patients from Western

Fig. 1 Diagram flow chart for the search strategy

countries. One study examined the average length of stay in hospital by CHF individuals in the last 1 year of life and found it to be a mean of 13.3 days [16]. Other studies reported the number of days in hospital and the number of hospitalisations in the last 6 months of life. Using these reported values, the average length of stay in hospital by CHF patients in the last 6 months of life was 11.1–13.0 [14, 21, 22] days in hospital, suggesting that the hospitalisations are more likely to occur in the last 6 months of life as opposed to the last 1 year of life.

The study by Russo and colleagues [23] had a small sample size ($n = 47$) of class IV CHF patients from a randomised control trial and found that individuals with CHF spent an average of 9.9 days in the ICU in the last 6 months of life, considerably higher than other studies in individuals with CHF [17, 21].

In the last year of life, consultations with palliative care specialists were obtained in 26.5% of patients at a median (interquartile range) of 27 (5–149) days before death [19]. The study however did not specify if the patients who received a palliative care consultation were hospitalised less in the last year of life. This contrasts to the study by Lau et al. [22] who found that 0.7% of patients with CHF received specialist palliative care in the last 6 months of life, and this may be due to the study setting, in Hong Kong with palliative care programs in its early stages in non-cancer patients.

Discussion

Patient preferences, needs and issues with use of hospital-based services

An acute hospital-based service in the last months or year of life may not always be the most appropriate place of care for individuals, based on their preferences for care provision [24, 25]. Individuals with CHF use a significant amount of hospital-based services in the last year of life. This is consistent with the fact that CHF is characterised by high prevalence, extensive symptom burden and frequent periods of acute decompensation, leading to individuals presenting to acute hospital-based services for symptom management and clinical deterioration [26].

The use of acute hospital-based services at the end of life may be appropriate to address a patient's specific health needs, but can be exhausting and distressing for other CHF patients. In addition, futile and life-prolonging treatments not aligned with some patients' care preferences are more likely to be provided in hospitals, leading to greater patient physical and psychosocial distress before death [27]. Individuals with CHF who receive life-sustaining medical therapy up until death have usually never engaged in discussions about end of life care [28], preventing patient autonomy and allowing the individual to make informed decisions about their medical

Table 1 Summary of included articles on the utilisation of acute hospital-based services in the last year of life in chronic heart failure patients

Author, affiliation, journal	Year	Design	Number	Patient/sample	Acute hospital-based service use
Blecker, Herbert and Brancati Division of General Internal Medicine, New York University School of Medicine, New York, USA Journal of Cardiac Failure	2012	Observational	16,613	CHF patients who were Medicare beneficiaries	In the last 6 months of life: <ul style="list-style-type: none"> • 75% were hospitalised • Mean (SD) 2.1 (2.2) hospitalisations • Mean (SD) 26.1 (36.9) days in hospital • 33.5% had an ICU admission • Mean (SD) 2.8 (7.3) days in ICU • 18% mechanically ventilated
Reed et al. Duke University, School of Medicine, Duke Clinical Research Institute, Durham USA The American Journal of Cardiology	2012	Observational	234	Patients from a randomised control trial with New York Heart Association Class II-IV and left ventricular ejection fraction $\leq 35\%$	In the last year of life: <ul style="list-style-type: none"> • 95% of CHF patients were hospitalised • Mean (SD) 3.5 (2.2) hospitalisations • Mean (SD) 32.3 (28.5) inpatient days
Hanratty et al. Division of Public Health, University of Liverpool, Liverpool Palliative Medicine	2008	Observational	8004	Death from CHF (ICD9 codes 428.0, 428.1, 428.9, 425.4, 425.5 and 425.9). All individuals with a first admission for CHF (ICD9 425.4, 425.5, 425.9, 428.0, 428.1 and 428.9) in 1995 and died before end of 1998.	In the last year of life: <ul style="list-style-type: none"> • Average length of stay in hospital of 13.3 days • Admitted an average of 1.5 times • Had a mean total number of bed days as 20.2
Unroe et al. Duke Clinical Research Institute, USA Archives of Internal Medicine	2011	Observational	229,543	Individuals with a CHF diagnosis within 8 years of death using ICD-9-CM codes 428.xx, 402.x1, 404.x1, or 404.x3) on a single inpatient claim or on 3 or more carrier or outpatient claims within 20 months.	In the last 6 months of life: <ul style="list-style-type: none"> • 80.2% of CHF patients were hospitalised • Mean (SD) 4.6 (9.2) days in ICU • 50.2% of individuals stayed in ICU • 38.8% of CHF individuals spent time in a skilled nursing facility • Mean (SD) 45.3 (64.0) days in nursing facility
Kaul et al. Department of Medicine, University of Alberta, Canada Archives of Internal Medicine	2011	Observational	33,144	Individuals of Alberta aged > 65 years old with hospitalisation, ED visit or physician claim who died with a diagnosis of CHF (ICD-9-CM) code 428 or (ICD-10) code I50	In the last 6 months of life: <ul style="list-style-type: none"> • 76.2% were hospitalised • Mean (SD) 2.6 (2.4) ED visits per patient
Lau et al. Department of Respiratory Medicine, Ruttonjee Hospital, Wan Chai, Hong Kong Journal of Pain and Symptom Management	2010	Observational	175	Individuals who died from CHF in local hospitals in 2006	In the last six months of life: <ul style="list-style-type: none"> • Mean (SD) 3.6 (2.4) hospitalisations • Mean (SD) 40 (32.9) days in hospital • Mean (SD) 2.9 (1.9) ED visits • Mean (SD) 0.2 (0.6) ICU admissions • Mean (SD) 1 (0.7) patients receiving PC
Blecker et al. Johns Hopkins University, School of Med, Division of General Internal Med, Baltimore, USA Medical Care	2011	Observational	16,613	Medicare individuals who died in 2007 with a previous diagnosis of CHF (ICD-9-CM) code of 428 listed as hospital discharge diagnosis in the last 18–6 months of life	In the last 6 months of life: <ul style="list-style-type: none"> • Mean (SD) of 2.5 (2.3) hospitalisations • 81.1% of were hospitalised • Mean (SD) of 32.4 (41.3) hospitalisation days • 41.8% had an ICU admission • Mean (SD) of 4.1 (9.6) days in ICU • 16.3% mechanically ventilated
Dunlay et al. Division of Cardiovascular Diseases, Dept. of Medicine and Dept. of Health Sciences Research, Mayo Clinic, Rochester, Minnesota. Circulation: Heart Failure	2015	Observational	1369	Participants surviving hospital discharge at enrolment and death before 31 Dec. 2012 with active CHF meeting Framingham criteria, as determined by research nurses reviewing medical records	In the last year of life: <ul style="list-style-type: none"> • 81.5% were hospitalised • Median (25th–75th percentile) total days hospitalised in last year of life was 9 (3–21) per person. • 50.7% of patients with CHF who resided in a skilled nursing facility • PC consultations were obtained in 26.5% of patients

Table 1 (continued)

Author, affiliation, journal	Year	Design	Number	Patient/sample	Acute hospital-based service use
Setoguchi et al. Brigham and Womens Hospital, Division of Pharmacoepidemiology and Pharmacoeconomy, Dept. Medicine, Boston, USA	2010	Observational	5836	Individuals with ≥ 2 CHF hospitalizations and died of cardiac disease	<ul style="list-style-type: none"> • PC consultations occurred a median (25th–75th percentile) of 27 (5–149) days before death. In the last 30 days of life: <ul style="list-style-type: none"> • 64% were hospitalised • 60% visited the ED • 19% had an ICU visit • 60.6% of CHF patients were admitted to a nursing home
Levenson et al. Division of General Medicine and Primary Care, Beth Israel Deaconess Medical Center, Boston, Massachusetts Journal of the American Geriatrics Society	2015	Observational	539	Adults enrolled in SUPPORT (prospective national study of outcomes and preferences) with diagnosis of exacerbation of CHF who died 1 year of study entry	In the last 6 months of life: <ul style="list-style-type: none"> • Median (25th–75th percentile) of 8% (0–34) of days spent in hospital
Duffy, Copeland, Hopp and Zalenski VA Center for Clinical Management Research, Health Services Research and Development, Ann Arbor, Michigan Journal of Palliative Medicine	2007	Observational	20,933	Veterans Health Administration decedents who died during 1 Oct 2001 and 30 Nov 2002	In the last year of life: <ul style="list-style-type: none"> • Individuals that died of CHF had a mean of 51.7 days in hospital In the last six months of life: <ul style="list-style-type: none"> • Individuals that died of CHF had a mean of 11.2 inpatient days
Russo et al. Columbia University, New York, New York, USA Journal of Cardiac Failure	2008	Observational	47	Patients with end-stage CHF (Class IV) from the REMATCH trial and randomised to the medical management group	In the last six months of life: <ul style="list-style-type: none"> • Spent an average of 39.5 days in hospital • Spent an average of 9.9 days in ICU

CHF chronic heart failure, ICU intensive care unit, ICD International Classification of Disease, ED emergency department, SD standard deviation, PC palliative care, VA Veterans Administration

treatment. Clinicians' awareness of issues influencing patients' preferences can aid in the delivery of high-quality end of life care [29]. A study by Formiga and colleagues [29] found that only 2.5% of patients with CHF had discussed their choices about life-sustaining therapies with their clinicians and that 50% of individuals preferred to continue their treatment at home when recovery seemed doubtful, while 40% of individuals preferred to be treated in hospital. Of the 50% of individuals that preferred treatment at home when recovery seemed improbable, just over half worried about caregiver burden that may result from in-home treatment towards the end of life. Two other studies [30, 31] have reported that in CHF individuals, preferences against resuscitation increased in the last 6 months of life. Patients with CHF have different and individualistic needs towards the end of life and providing tailored care in accordance with the individuals' preferences can allow for improved end of life care and quality of death.

The rise in the utilisation of health services at the end of life in the CHF population leads to greater rates of intensive care and more expenditure [17]. Additionally, in 2004–2005, CHF was considered to be the fourth most expensive medical illness, in regard to total acute inpatient costs to the healthcare system, and this is continuing to rise [18, 32]. An important

factor in the rising overall costs of CHF may be attributable to the high cost of end of life care in acute hospital-based services [33]. The increase in overall costs at the end of life may also be attributed to the change in clinical profile of CHF patients, with individuals now dying of CHF at an older age and with a greater number of comorbidities and frailty [18].

The role of palliative care in reducing service utilisation

The major concepts of palliative care include symptom control, improved quality of life and providing support to patients and caregivers [34]. Palliative care is defined as a method that aims to increase the quality of life for patients and their families experiencing issues associated with life-limiting illnesses, by preventing and relieving suffering through timely identification, continual assessment and management of pain and other physical, spiritual and psychosocial issues [35]. The extensive use of acute hospital-based services at the end of life by CHF patients, underpinned by CHF's progressive and chronic nature, unpredictable disease trajectory and excessive healthcare use calls for the introduction and greater utilisation of care in subacute and non-acute settings.

Integrated palliative care in CHF is a collaborative model used to address end of life needs of individuals [10]. Since palliative care specialists experience time and resource-related difficulties in consulting with all individuals that have an end-stage chronic illness, the most sensible solution is to train healthcare professionals and clinicians on palliative care approaches to managing these individuals [10]. The sharing of knowledge and improvement of skills are essential in developing this model, with consultations from nursing, medicine and allied health being available. This integrated collaborative approach has led to an increased number of individuals with CHF dying at home in their preferred place, a reduction in the number of ED visits for CHF and the accessibility of resources and educational events led to only 8.3% of CHF individuals requiring specialist palliative care referral [10]. Similar methods of care have followed, including the Heart Failure Model of Care [36] where palliative care is fixed in the approaches and roles of healthcare professionals. In this model of care, individuals with CHF have access to multidisciplinary and community programs, with palliative care specialists offering training and educational opportunities to primary care professionals [36]. Specialist palliative care involvement will depend on the needs of the patient and the extent to which the primary care team can address the individual's palliative care needs, including management of symptoms, support, advanced care planning and preferred place of care [36]. However, currently, gaps exist in implementing these models of care, including a lack of CHF programs within the community, a lack of funding for CHF classes led by community services, and there are little resources and capacity for services that provide care to CHF individuals in a cohesive manner. Additionally, there are issues with care coordination for high comorbid CHF patients, with patients often having multiple specialist appointments in 1 week, as opposed to all services (community services, telephone hotlines and hospital-based programs) being made available as a single unified system. [36]

Alternatively, other models of palliative care exist where non-specialist palliative care clinicians provide palliative care in the early stages of the illness, and palliative care specialists take over and provide care in end-stage CHF or during treatment decision making, where palliative care interventions increase [37, 38].

Palliative care is an approach to care that can be introduced early in the course of the illness by primary care providers [39], and there is an increasing amount of evidence suggesting that palliative care consultations with specialists and end of life discussions improve patient and family satisfaction, quality of life, reduces costs and enhances survival. [40–42]

Additionally, studies have shown that specialist hospital-based palliative care teams reduce utilisation of healthcare services including intensive care [43, 44] and patients with in-home specialist palliative care were less likely to visit the ED or be admitted to hospital and were more likely to die at

home, in their preferred place, compared to usual care [45]. In cancer patients, home-based care delivered by specialist palliative care teams showed a significant reduction in the proportion of individuals who were hospitalised in the last 2 weeks of life, number of ED visits in the last 2 weeks of life and the proportion of individuals that died in hospital [46, 47]. A nurse case management program in palliative care which involved consultations on symptom management, assessment of patients' needs, counselling, coordination of care and caregiver support was associated with a decrease in hospitalisations and ICU stays for cancer patients [48].

Specialist palliative care has been found to be effective for cancer patients in reducing hospital-based service utilisation towards the end of life [46–48]. CHF patients have a similar symptom burden to cancer, higher mortality and are usually hospitalised more than all forms of cancer combined [49]. Hence, there is a call for the utilisation of specialist palliative care in patients with CHF [37, 50–53] as it has been shown in recent pilot studies to improve the quality of life in CHF individuals and improve symptoms [54, 55] and reduce hospitalisations [56]. The negative impact CHF has on aspects of an individuals' health status is a predictor of CHF hospitalisations and resource use [57, 58]. Since palliative care has a focus on alleviating symptoms, quality of life and patients' function, then specialist palliative care may be relevant for CHF patients, as improved patient function can lead to reductions in hospitalisations and hospital-based resource use [58].

Barriers to implementing palliative care to reduce resource use

Despite the acknowledgement of the need and benefit of palliative care in CHF patients, challenges still exist in allowing patients timely access to palliative care [37]. The outcomes of palliative care interventions in cancer studies may be difficult to compare to CHF patients due to differences in the morbidity profile, how developed the palliative care program was and the intervention intensity [59]. There have been only a few studies on patients with CHF who receive palliative care, a small number of studies which examine certain palliative care interventions that are effective in CHF [54, 60, 61], and there is limited generalisability of these findings to other CHF patients with various clinical profiles. Additionally, numerous studies [62–64] have identified issues in communication when discussing end of life issues to CHF patients. System issues were also a difficulty in providing timely access to palliative care for CHF patients, with clinicians quoting a lack of time for communicating sensitive topics to patients [65] and a lack of planning and care coordination [66]. Furthermore, cardiologists viewed palliative care involvement as a progression or transition stage [67, 68] as opposed to having ongoing involvement of the palliative care team. This can lead to

prognostication difficulties [69] in determining when to refer the patient to palliative care. A recent review of European guidelines for the integration of palliative care in CHF suggests that there are still inconsistencies in the integration of palliative care guidelines on the degree of implementation and the degree of what is conceptually important [70]. However, guidelines recommend that palliative care is appropriate early in the trajectory as it aims to alleviate symptoms and improve quality of life [71]. Palliative care should be made available to all patients throughout their illness trajectory, as part of holistic care, and should not be solely reserved for those expected to die within a certain timeframe. A shift in this direction will ensure an improvement in the care provided to CHF patients.

Suggestions for future research

Future research is required to address the barriers to integration of palliative care into care for CHF individuals including determining and standardising the essential components of a palliative care intervention for CHF patients, who should comprise of a multidisciplinary palliative care team [58] and defining what constitutes as integration of palliative care and cardiology. This will ultimately aid in increased use of palliative care in CHF patients and a reduction in the utilisation of acute hospital-based services and inappropriate care in the last year of life.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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