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RESEARCH ARTICLE

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What are key characteristics of adults with advanced heart failure discharged from ICU?

Elizabeth A. Edmiston PhD, RN[1,2] | Heather K. Hardin PhD, RN[3] | Mary A. Dolansky PhD, RN, FAAN[1,2]

[1]VA Quality Scholars Program, Veterans Affairs Northeast Ohio Health System, Cleveland, Ohio, USA

[2]Frances Payne Bolton School of Nursing, Case Western Reserve University, Cleveland, Ohio, USA

[3]School of Nursing, Indiana University School of Nursing, Indianapolis, Indiana, USA

Correspondence
E. A. Edmiston, Frances Payne Bolton School of Nursing, Case Western Reserve University, 10900 Euclid Avenue, Cleveland, OH 44106, USA.
Email: eag98@case.edu

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Abstract

Background: As the number of people with heart failure and treatment complexity increases, many hospitals are implementing Advanced Heart Failure Intensive Care Units (AHFICU). However, little evidence concerning the clinical characteristics of people admitted to AHFICUs exists. Understanding the clinical characteristics of people admitted to the AHFICU will assist nurses with implementing tailored interventions to ensure high-quality care delivery.

Aim: The purpose of this study was to describe the clinical characteristics of people who are admitted to and discharged from an AHFICU.

Study Design: Baseline data from a longitudinal descriptive study were collected on adults ($N = 43$) admitted to an AHFICU. Heart failure severity, self-management ability, cognition, sleep quality, and other clinical characteristics were assessed.

Results: Most study participants were New York Heart Association functional class IV ($n = 24$) or class III ($n = 14$), indicating poor functional capacity. Over half had mild cognitive impairment and poor sleep quality was prevalent (92.7%). Participants had adequate levels of heart failure knowledge, but low levels of heart failure self-management decision-making and ability.

Conclusions: Interventions to address the unique clinical characteristics of AHFICU patients include sleep hygiene, integration of cognitive, sleep, and self-management assessments into the electronic medical record. Addressing the unique clinical needs of people with heart failure will lead to patient-centered, evidence-based, and safe care.

Relevance to Clinical Practice: Understanding characteristics of this population addresses this evidence gap and targeted clinical interventions to address unique discharge needs of this population are proposed. Sleep quality education should be done throughout hospitalization on sleep strategies and self-management coaching to facilitate adoption of new sleep routines. Healthcare providers should ensure each patient has care support upon discharge and take cognitive status into consideration during teaching. Addressing self-management readiness should include providing scenarios as part of discharge preparation. Providers must include addressing comorbidities and how they may affect heart failure self-management, such as teaching about sleep apnea device use and encouraging compliance.

KEYWORDS
cognitive function, discharge planning, heart failure, self-management, sleep quality

1 | INTRODUCTION

More than 64 million people have heart failure around the world and will only increase because of an aging population.[1] Between 10% and 51% of adults hospitalized with heart failure are admitted to an intensive care unit, a wide variation depending on the size of the hospital and geographic region.[2] Because of the increased use of intensive care units and potential unique characteristics of people with heart failure, hospitals around the world are creating Advanced Heart Failure Intensive Care Units (AHFICU). These specialized units aim to provide targeted expert care to people with heart failure.[3] As more people are being diagnosed with heart failure and strategies to treat heart failure improve, the need for more specialized inpatient care has become evident, especially concerning discharge self-management interventions. The discharge needs of people with heart failure are highly complex; therefore, it is imperative that teams provide patient-centered, evidence-based, and safe care, which requires an understanding of factors related to heart failure self-management after discharge from the AHFICU. Nursing and medical staff, as well as all multidisciplinary teams, need guidance on the unique characteristics of this population to provide tailored interventions to achieve optimal outcomes during hospitalization and after discharge. It seems likely that people admitted to an AHFICU have severe heart failure and require specific interventions. However, there is little evidence concerning the clinical characteristics of people discharged from an AHFICU to home. Therefore, the characteristics of people with heart failure discharged to home from an AHFICU are examined in this study.

Some people admitted to an AHFICU may be discharged to home from the intensive care unit, necessitating interventions that include unique discharge planning to assess the patient's ability to self-manage at home and to provide patient education to fill their heart failure self-management knowledge gaps. For example, discharge interventions often include assessment of competence in the management of multiple medications, how to monitor sodium intake, identification of heart failure symptoms such as daily weight, and integrating physical activity or pacing activities during activities of daily living.[4,5] Competence in heart failure self-management is crucial for avoiding future heart failure hospitalizations, as it is projected that at least one in five heart failure admissions is directly linked to the inability to manage medications or diet.[4,5]

Evidence suggests that adults with heart failure often have multiple comorbid conditions, are at risk for impaired cognition, report high rates of depressed mood and anxiety, have poor sleep quality, and reduced self-care ability.[6–10] It is important to understand specific characteristics of AHFICU patients to ensure that nursing interventions target this unique population.[11]

What is known about the topic

- A growing population of aged, heart failure patients has inspired creation of specialized units to care for critically ill adults with advanced heart failure.
- These patients have unique needs, but little is known about the clinical characteristics and discharge needs of this unique population.

What this paper adds

- This paper sheds a light on specific and related characteristics of advanced heart failure patients who were admitted to an intensive care unit, specifically their self-management ability, sleep quality, cognitive function, and several other relevant characteristics.
- Clinical implications according to each result are added to help further specialized care for this population.

Comorbidities add to the complexity of self-management for people with heart failure and may hinder their ability to self-manage multiple chronic conditions. Common comorbid conditions for people with heart failure include diabetes, renal failure, sleep-disordered breathing, and anaemia.[12] Comorbid illnesses in adults with heart failure often contribute to sleep loss and fragmented sleep.

Recent studies suggest that more than 40% of adults hospitalized for heart failure have impaired cognitive function at baseline and the incidence of impaired cognition can reach up to 80% in older adults with heart failure living in the community.[13,14] Cognitive function includes several mental processing abilities, including attention, executive function, and memory, all of which are necessary for adequate self-care.[10] Furthermore, functional decline risk increases six times and mortality risk increases five times in this population when adults have impaired cognition.[15–18]

Adults with heart failure also experience poorer sleep quality than the general population, with around 75% reporting sleep disturbances.[6] This is especially concerning, because poor sleep quality in patients with heart failure is associated with lower incidence of cardiac event-free survival.[19] In addition, poor sleep quality experienced by critically ill patients while in intensive care unit is related to cognitive impairment,[20] which can contribute to less effective self-management of heart failure.[19]

Depressed mood and anxiety are also associated with poor outcomes in adults with heart failure. Depression is inversely associated with self-management abilities in heart failure and other chronic illness populations.[21,22] Greater depressive symptoms are associated with reduced cognitive function in people with heart failure.[23] Evidence suggests that the prevalence of anxiety is as high as 63% in patients with heart failure.[24] Anxiety interferes with patients' self-care abilities and can hinder learning, impair coping, and predict worse disability, more physical symptoms, and poorer functional status, all of which influence self-care.[11] Anxiety may also affect sleep quality in people admitted to the intensive care unit.[25]

It is essential that nurses working in AHFICU or with this population of patients in other settings understand the distinctive characteristics of this population, as cognitive impairment, mortality risk, self-management readiness, and sleep quality have implications for discharge readiness. No previous studies have examined discharge readiness in this population. Therefore, the purpose of this study is to examine the clinical characteristics of people with heart failure who are discharged to home from an AHFICU. The results will inform recommendations for targeted clinical interventions to ensure patient-centered quality care.

2 | METHODS

This study includes an analysis of the baseline data, or time point one, from a longitudinal descriptive study of three time points.[26] The longitudinal study sought to understand relationships among sleep quality, self-management ability, and cognitive function from admission to discharge; however, in this paper, the examination was limited to clinical characteristics of participants at the baseline data collection. A convenience sample of 43 adults diagnosed with heart failure and admitted to the AHFICU at a large urban academic medical centre in the Midwestern United States was recruited. The inclusion criteria were as follows: (1) adults admitted to the AHFICU, (2) with an admitting diagnosis of heart failure, and (3) had a prior heart failure diagnosis for at least 3 months. Exclusion criteria were: (1) inability to understand English; (2) ventilated and/or unconscious individuals; (3) any type of positive-pressure ventilation; (4) documented neurodegenerative diseases specific to cognitive impairment; (5) severe cognitive dysfunction as indicated by inability to complete the screening Mini-Cog test;[27] (6) people who lived in assisted living, long-term acute care hospitals, or any skilled or long-term care nursing facility; (7) hospice or comfort care patients; (8) long-term stay patients such as patients listed for heart transplant and waiting in-hospital; (9) patients transferred to AHFICU that have already been admitted to a hospital; and (10) active cardiogenic shock indicated by presence of two or more vasopressor medications.

Institutional Review Board approval (STUDY20190224) was obtained on 24 February 2019 without any challenges. Following approval, patients were recruited from the AHFICU. The recruitment process took place at the bedside in the AHFICU on the first day of admission, prior to 10:00 PM, to ensure accurate sleep questionnaire responses. Participants who met the inclusion criteria were identified by the researcher using electronic medical records. When a potential participant was identified, the physician or advanced practice provider in the AHFICU was notified. The provider then approached the potential participant to determine if they were interested in participating in a research study for heart failure patients. If the patient was interested, the researcher then explained the study in detail and had the patient sign the informed consent form. Data were collected on the day of admission by the researcher prior to 10:00 PM to ensure the accuracy of recall of questionnaire responses. A total of 43 participants were enrolled in the study.

3 | MEASURES

A variety of measures were used to assess clinical characteristics of heart failure in patients admitted to the AHFICU and all were valid and reliable. Assessment of heart failure self-management included three variables: heart failure knowledge was measured with the Dutch Heart Failure Knowledge Scale (DHFKS),[12] heart failure self-management heart failure decision-making was measured with self-management vignettes,[28] heart failure self-management ability was measured with the self-management subscale of the Self-Care Heart Failure Index (SCHFI).[29] Sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI).[30] Cognitive function was measured using the Montreal Cognitive Assessment (MoCA).[31] Comorbidities were measured by the Charlson Comorbidity Index score.[32] Depression and anxiety were measured by scores on the Patient-Reported Outcomes Measurement Information System (PROMIS) depressed mood and anxiety scales.[33] Current heart failure symptom severity status was measured by the New York Heart Association (NYHA) Functional Classification.[11] Other data included demographic variables such as living arrangements, education, and length of heart failure diagnosis. The electronic medical record was used to collect demographic and covariate data to reduce participant burden. Data collection was done by the researcher in the participant's private intensive care unit room and took about 1 h to complete. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 28,[34] and descriptive statistics were computed. This was a descriptive study; therefore, it was not registered with any clinical trial database.

4 | RESULTS

Participants were predominantly male, and most were older adults (See Table 1). On average, this sample had a diagnosis of heart failure for more than 8 years and at least one hospitalization in the past 6 months. All participants reported taking at least two home medications prior to hospitalization and an average of 11 home medications prior to admission to the AHFICU. Concerning obstructive sleep apnea and CPAP use, approximately 44% of the participants did not have a diagnosis of obstructive sleep apnea, and therefore, answered 'not applicable' to use of a CPAP machine at night. However, about 56% of participants did have a diagnosis of obstructive sleep apnea, but less than half of them reported use of a CPAP, even though they were prescribed a CPAP machine. Many participants who were non-compliant with CPAP use complained that the machine held water near their nose so that they continually inhaled water while they were sleeping, while others complained of general discomfort with use of the CPAP machine.

The living arrangements for participants varied. Nearly half of participants lived with a significant other only (44.2%) and many lived alone (20.9%). Some participants lived with a significant other and dependents (11.6%), while 9.3% lived with an adult child. The remaining participants each had a unique living situation: parent, significant other and an adult child, significant other and parents, a nephew, and a friend. Results for the demographic characteristics at admission are presented in Tables 1 and 2.

Levels of heart failure self-management knowledge, decision-making, and ability varied. The DHFKS had a possible score of zero to 15 and participant scores ranged from 7 to 15 ($M = 12.59$), indicating adequate knowledge of heart failure self-management.[12] However, heart failure self-management decision-making was low with participants identifying the correct self-management decision in less than half of the vignettes. All 43 participants completed the SCHFI, but eight participants had a negative response to the first question related to heart failure symptoms, which ends the questionnaire with a zero score. Among the remaining participants, SCHFI self-management ability scores ranged from 10 to 100, with a mean score of 63, which is below the cut-off score of 70 indicating self-management adequacy.[12,29]

The NYHA classification assessed severity of current heart failure symptoms. Over half (55.8%) of participants were NYHA class IV, suggesting severe limitation of activity because of heart failure symptoms. Marked limitation, class III, was found in about a third of participants, and 11.6% were class II, having only slight limitations. No participants were class I, which is no limitation because of symptoms.

At admission to the AHFICU, cognitive status ranged from no impairment to moderate cognitive impairment. Approximately 40% of participants scores (26 or greater) indicated no cognitive impairment, while a little more than half of participants scores (18–25) indicated mild cognitive impairment, and one participant had moderate cognitive impairment. No participants had severe cognitive impairment, as it was an excluding criterion.

TABLE 1 Demographic characteristics ($N = 43$).

Variable	Frequency (%) or Mean (SD)	Range
Age (years)	61.79 (12.97)	29–89
Length of heart failure diagnosis (years)	8.77 (9.33)	0.5–40
Length of hospital stay (days)	10.47 (11.20)	2–63
Number of past hospitalizations in last 6 months	1.91 (1.97)	0–11
Number of home medications	11.0 (3.78)	2–20
Gender		
Women	11 (25.6%)	
Men	32 (74.4%)	
Continuous Positive Airway Pressure (CPAP) machine use		
Yes	10 (23.3%)	
No	14 (32.6%)	
N/A	19 (44.2%)	
Pillbox use		
Yes	29 (67.4%)	
No	14 (32.6%)	
Education		
High school	25 (58.1%)	
Technical school	1 (2.3%)	
Some college	7 (16.3%)	
Undergraduate degree	6 (14.0%)	
Graduate degree	4 (9.3%)	
Living arrangements		
Significant other	19 (44.2%)	
Alone	9 (20.9%)	
Significant other & dependent child(ren)	5 (11.6%)	
Adult child	4 (9.3%)	
Other	5 (11.6%)	

TABLE 2 Main variables.

	Mean	SD	Range
Heart failure knowledge	12.59	1.91	7–15
Heart failure self-management decision-making	1.47	0.74	0–3
Heart failure self-management ability	63.00	21.94	10–100
Overall sleep quality	11.22	4.02	2–19
Cognitive function	24.17	2.90	11–29
Comorbidity risk	7.47	2.35	3–14
Depressed mood	52.72	7.79	41.0–67.5
Anxiety	51.79	8.85	40.3–71.6
Current symptom status	3.44	0.70	2–4

Concerning sleep, nearly all participants (92.7%) reported poor sleep quality. The average global sleep quality score ($M = 11.22$) was more than double the cutoff score of five that indicates poor sleep quality. Among the various components that make up sleep quality, participants reported higher scores in sleep latency, sleep duration, and habitual sleep efficiency at admission during a heart failure exacerbation, indicating particular struggles in these areas of sleep quality.

Other variables included comorbidity risk, depressed mood, and anxiety. The Charlson Comorbidity Index scores ranged from three to 14, with a mean score of 7.47, indicating a high risk of one-year mortality. A score of two or less is considered a low comorbidity score, and a score greater than two is considered high.[35] Depressed mood *t*-scores ($M = 52.7$) and anxiety *t*-scores ($M = 51.8$) were similar to the average US population (*t*-score of 50).[33]

5 | DISCUSSION

Overall, the clinical characteristics of adults with advanced heart failure who were admitted to an AHFICU had significantly more comorbidities, greater heart failure symptoms, poorer sleep quality, and greater cognitive function impairment than other comparable studies. Participants in this study had greater cognitive impairment when compared with other ICU samples that include all types of patients; however, there are no other studies looking at this unique advanced heart failure population.[16] The reason for the greater level of cognitive impairment found in this sample may be multifactorial such as heart failure symptom severity, poor sleep quality, and fatigue from spending hours in the emergency department.[36]

More than 90% of this sample reported poor sleep quality, a much greater proportion than reported in other samples of self-reported sleep quality in heart failure patients and general patients in intensive care units.[25] Poor sleep quality may be because of the severity of symptoms, diuretic medications, or poor sleep hygiene behaviours, such as an inconsistent sleep routine and sleeping with a television on.

Heart failure self-management knowledge, decision-making, and ability were assessed using three tools. This was the first study to assess heart failure knowledge in an intensive care unit sample and participants had adequate heart failure knowledge. Other large studies undertaken with outpatient heart failure populations that measured heart failure knowledge showed similar knowledge scores, with a mean of around 12.[37] This sample may have had higher scores because of a greater level of experience with the disease as evidenced by the advanced disease state and long length of diagnosis time ($M = 8.8$ years). However, slightly over a third of the participants demonstrated adequate heart failure self-management ability. The level of self-management ability was comparable to other study results of hospitalized heart failure populations;[38,39] however, the findings point to a major problem: If patients cannot self-manage, they are likely to have exacerbations and be readmitted.

Additional evidence of the inability to self-manage was identified using a pilot of heart failure self-management decision-making vignettes. The vignettes included basic decision-making for symptom management, such as what to do if the patient was so short of breath that they were uncomfortable at rest sitting upright in a chair. Participants were not able to demonstrate adequate self-management decision-making on three heart failure-specific self-management vignettes representing common clinical situations that required differing degrees of ability, using the symptoms of shortness of breath, weight gain, and oedema, which were transformed into a quantitative measure from semi-structured interview scenarios for this study.[28] More than half (53.5%) of the participants could not pass two of the three scenarios, highlighting that the sample could not apply their heart failure knowledge to a higher level of self-management decision-making and ability.

Comorbidity scores were expected to be high in the heart failure population. This sample had a higher comorbidity score than another study, where only 38.35% of adults with heart failure had a Charlson Comorbidity Index score greater than two.[35] When comparing this population to general medical intensive care patients, Advanced Heart Failure Intensive Care Unit patients in this sample had higher comorbidity burden than general medical patients.[40] Overall, this increased burden indicates a high risk of mortality within 1 year, which is associated with poorer self-management ability.[35,40]

The levels of depressed mood and anxiety in the study sample were similar to the average US population (T-score of 50), but different than other heart failure-specific studies that found major depression in 20%–40% of heart failure patients and anxiety in up to 63% of heart failure patients.[9,23,41] However, most studies that have examined depression and anxiety in heart failure use other measures than the PROMIS scale, and no studies measured heart failure patients in the intensive care unit. Five participants (11.6%) were prescribed antidepressants at admission, which may have influenced levels of depressed mood and anxiety in this sample. Other depression and anxiety instruments may have more questions regarding somatic symptoms, which may also be associated with heart failure symptoms, comorbidity symptoms, or sleep deprivation. This may have led to falsely elevated depression and anxiety scores in the other heart failure samples. It is also possible that lower levels of depressed mood and anxiety in this sample may be associated with the long length of diagnosis time ($M = 8.8$ years) also found in this study sample. Furthermore, it is possible that the lower level of depressed mood may indicate that advanced heart failure participants have greater resilience than other samples of patients with heart failure. The last possible explanation is that the short-form PROMIS measures may not capture depressed mood and anxiety as other instruments do. For example, a recent study undertaken on left ventricular assist device patients measured depressed mood with the short-form PROMIS depressed mood subscale with a *t*-score result of 50.5,[42] which reflect the current sample's scores. At a minimum, depression and anxiety need to be assessed in every patient with heart failure at admission, and those with depressed mood and/or anxiety should be monitored for an increase in symptoms and treated if necessary.

All study participants had physical activity limitations owing to heart failure symptoms. The current symptom status of the participants in this sample was as expected for patients admitted to an intensive care unit. Although the connection of their NYHA score to

TABLE 3 Clinical implications for patients with heart failure in an advanced heart failure intensive care unit.

Clinical characteristic	Findings	Clinical implications
Sleep quality	90% of participants had poor sleep quality; Higher rate of poor sleep quality than other heart failure and intensive care unit populations	Assess sleep quality; Implement sleep behaviour change intervention; Coaching to facilitate adoption of sleep behaviour changes
Cognitive function	58.5% of participants had impaired cognitive function; Cognitive function impairment higher than other heart failure populations	Assess and monitor cognition; Educate support person(s) on cognitive status and self-management implications
Self-management	46.5% able to apply heart failure knowledge to scenarios (self-management vignettes); 37.1% able to self-manage heart failure symptoms (SCHFI Section B)	Assess decision-making and vignette scenario testing or simulations to ensure understanding; Encourage partnered self-management by including family caregiver in treatment plan
Comorbidity	Higher comorbidity score than other heart failure and intensive care unit populations	Assess potential overlap of comorbid diagnoses and align the treatment plan accordingly
Depressed mood	Depressed mood *t*-score of 52.7; Similar to United States population	Assess mood and ensure appropriate treatment as necessary
Anxiety	Anxiety *t*-score of 51.8; Similar to United States population	Assess anxiety and ensure appropriate treatment as necessary
Current symptom status	55.8% NYHA class IV; Higher than other heart failure and intensive care unit populations	Physical activity assessment should be done; Cardiac rehabilitation; Teaching on pacing activities
Home medications	Polypharmacy	Encourage pillbox use; Need for updated medication list that includes basic information on medications (reason for med, side effects, etc.)
Obstructive sleep apnea	55.9% with sleep apnea; 23.3% using CPAP; Prevalence higher than US population	Assessment of use; Teaching about use of sleeping devices and making sure that they are compliant with prescribed treatment
Living arrangements	20.9% live alone	Assessment and ensure informal or formal support, rehabilitation order, partnered management, and need for home care

their physical activity levels is conjectural, assessment of physical activity is not collected in the nursing intake forms but should be considered.

6 | OTHER CHARACTERISTICS

The average age of participants is consistent with an aging population and heart failure, as over 5% of people ages 60–69 have a diagnosis of heart failure.[43,44] Hospitalization rates were also consistent with international data indicating the high amount of heart failure-related hospitalization each year.[1] Around half of people who are diagnosed with heart failure die within 5 years of a diagnosis in the United States, so this sample group had outlived the average expectation for adults with heart failure at a mean of 8.8 years.[43]

This sample has a higher medication burden ($M = 11$) than what is reported in previous literature, where patients with heart failure were found to be prescribed around eight medications to take at home.[45] Again, this is expected with the advanced disease process of these patients and the expected high number of comorbidities associated with heart failure disease. Nursing care needs to include assistance with managing these complex polypharmacy regimens. Surprisingly, despite these medications, pillbox use was reported in only two-thirds of the sample. This rate is similar to adults with other chronic conditions, such as diabetes, where pillbox use was 50%.[46] Pillbox use is associated with better medication adherence, which enhances self-management ability. However, questions remain about whether patients fill the pillbox accurately and if the pillbox improves adherence.[46]

This sample had a greater prevalence of diagnosed obstructive sleep apnea (56%) than typical of adults with heart failure with reduced ejection fraction.[47] A systematic review obstructive sleep apnea prevalence to be 12%–53% in this population. There could be many reasons for this difference, such as the high number of males in the study or greater disease severity, both risk factors for obstructive sleep apnea.[47] Furthermore, many of the participants were noncompliant with CPAP use because of the discomfort of the actual machine while sleeping. Avenues for trialling different CPAP devices should be explored to increase patient compliance.

Our sample inclusion and exclusion criteria were put in to place to identify patients who were likely to be discharged home. It must be noted that 56% of the participants screened did not meet the study criteria and had transferred from an outside hospital or another floor, were on a ventilator or sedated, had a documented neurological disease, and/or resided in a nursing home, assisted living, or long-term acute care hospital. Understanding the long-term discharge needs of these patients who are unlikely to be discharged home warrants further study.

6.1 | Clinical implications

Nurses who care for adults with advanced heart failure must understand the unique characteristics of this population. Clinical implications are evident for each study variable. Sleep quality assessment at admission should be completed, along with discussions throughout hospitalization on current sleep strategies, education, and implementation of strategies for sleep behaviour and self-management coaching to facilitate adoption of changing their sleep routine (see Table 3). Healthcare providers should ensure each patient has support upon discharge, whether the support be family members or formal care such as home health aides. Assisting these patients with pacing activities and staying active remains crucial. Cardiac rehabilitation should be ordered for patients when they meet the criteria, and support group participation should be encouraged.

A great need exists to integrate cognitive function assessments for these Advanced Heart Failure Intensive Care Unit patients during hospitalization (see Table 3). Healthcare providers must take cognitive status into consideration during discharge teaching. Providers need to be aware of even mild cognitive impairment in patients.

Furthermore, addressing self-management readiness should include consideration of providing patients and caregivers with scenarios or simulations as a part of discharge preparation. This would help to ensure that patients with heart failure can apply their knowledge of self-management to specific situations where they need to make self-management decisions and ensuring significant others are aware of the patient's inability to manage, teaching both the patients and their significant others. Patients with advanced heart failure likely have basic knowledge regarding their disease but may not know how to apply this knowledge.

In addition, healthcare providers must consider comorbidities and how they may conflict or align with the heart failure self-management such as sleep apnea and sleep disorder treatment and therapy for anxiety and depression. The high rate of sleep apnea in people with heart failure has implications for nursing care in Advanced Heart Failure Intensive Care Unit in teaching about use of sleeping devices and encouraging compliance with prescribed treatment. Also, referral to an inpatient sleep disorder service may be helpful for these patients. The assessment of anxiety and depression should not be overlooked, and individualized treatment, such as medication and therapy, should be encouraged. Strategies to treat depression should be discussed and the caregiver notified after permission is gained.

6.2 | Limitations

The small sample and single site were the main limitations of the study, which may have affected the results. Future multisite studies are needed that evaluate the discharge needs of patients with heart failure in an Advanced Heart Failure Intensive Care Unit. Another limitation was the self-report nature of the instruments. A more objective assessment of self-management competence is important in the future. Furthermore, assessing caregiver characteristics is essential in this population and more dyadic research will be fundamental to further successful treatment in the future.

7 | CONCLUSION

Our findings on characteristics of patients with heart failure discharged to home from an Advanced Heart Failure Intensive Care Unit differed from other intensive care unit populations and other hospitalized heart failure populations. Notably, the majority of the sample had inadequate self-management abilities, were cognitively impaired, and reported poor sleep quality. This population of patients discharged from an Advanced Heart Failure Intensive Care Unit need an interdisciplinary approach to discharge to ensure that the plan to ready the patient for discharge is correct, feasible, and achievable. Clinical implications for patients who are discharged from the Advanced Heart Failure Intensive Care Unit are notably different from those in other intensive care units and general heart failure populations and warrant specialized discharge preparation to prevent rehospitalizations.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ORCID

Elizabeth A. Edmiston https://orcid.org/0000-0001-9738-9961
Heather K. Hardin https://orcid.org/0000-0003-3589-2849
Mary A. Dolansky https://orcid.org/0000-0002-6472-1275

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