

Original Article

The Hospital at Home Model vs Routine Hospitalization for Acute Heart Failure: A Survey of Patients' Preferences

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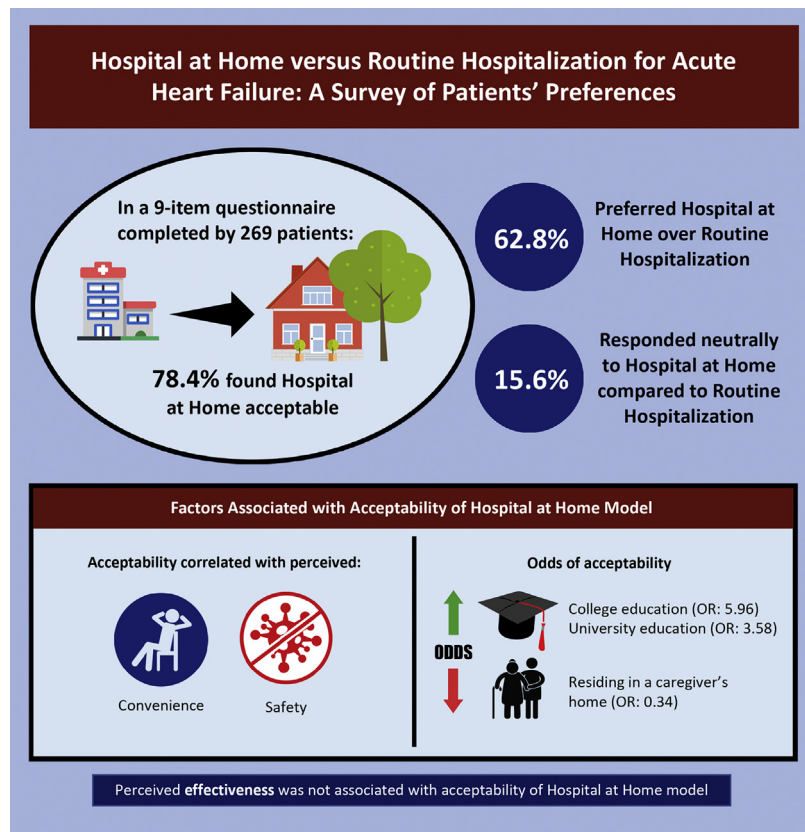
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See page 269 for disclosure information.

ABSTRACT

Background: Patients with heart failure (HF) experience recurrent hospitalizations and may prefer a Hospital at Home (HaH) model over routine hospitalization.

Methods: We administered a 9-item questionnaire on perceived effectiveness, safety, convenience, and acceptability of a HaH model among patients hospitalized for HF at 2 academic hospitals in Ontario. The primary outcome was HaH care acceptability, defined as a preference for or neutrality to HaH care over routine hospitalization. We used partial Spearman rank correlations (ρ) and multivariable logistic regression analyses to explore associations with outcomes.

Results: Of 297 eligible patients, 269 (90.6%) completed the questionnaire. The mean age was 76.2 (standard deviation, 12.3) years; 48.3% were female; and 70.5% lived in their own home, commonly with a relative or caregiver (67.9%). As many as 211 patients (78.4%; 95% confidence interval [CI] 73.0%-83.2%) found HaH care acceptable, with 169 (62.8%; 95% CI, 56.8%-68.6%) preferring HaH care over routine hospitalization. Perceived convenience (ρ , 0.57; $P < 0.001$) and safety (ρ , 0.37; $p < 0.001$) were associated with HaH acceptability, whereas perceived effectiveness was not (ρ , 0.14; $P = 0.021$). A college (adjusted odds ratio [aOR], 5.96; 95% CI, 2.01-17.62; $P = 0.001$) or university (aOR, 3.58; 95% CI, 1.07-12.06; $P = 0.039$) education was associated with greater odds of HaH acceptability, whereas residing in a caregiver's home was associated with lower odds (aOR, 0.34; 95% CI 0.14-0.84; $P = 0.019$).

Conclusions: A majority of patients with HF perceived HaH care to be an acceptable alternative to routine hospitalization, prioritizing perceived convenience and safety over effectiveness. Postsecondary education and living independently without caregiver support were associated with HaH acceptability.

Heart failure (HF) is a leading cause of hospitalization in older adults in high-income countries.¹ The incidence of HF hospitalizations has tripled in less than 3 decades.² Patients admitted for HF experience longer hospital stays than those admitted for other conditions, and 20%-30% are readmitted within 30 days.³⁻⁵ HF hospitalizations and readmissions pose a significant economic burden to healthcare systems, accounting for more than 70% of annual HF-related medical expenditures⁶—which are estimated to reach \$2.8 billion by 2030.⁷ In addition, patients hospitalized for HF reported worsened health-related quality of life (HrQOL) compared to those not hospitalized.⁸ The substantial incidence of HF and its strain on patients and healthcare systems present a need to explore cost-effective alternatives to routine hospitalization.

Hospital at Home (HaH) is a model in which hospital ward-level care is delivered to patients by healthcare professionals in their own homes. In HaH programs, patients are offered monitoring, visits from nurses and physicians at least daily, intravenous diuretics, and digital electrocardiograms in their homes. In the event of clinical deterioration requiring transfer to a traditional hospital, patients can either seek input

RÉSUMÉ

Introduction : Puisque les patients atteints d'insuffisance cardiaque (IC) sont hospitalisés à répétition, ils peuvent préférer le modèle d'hospitalisation à domicile (HAD) à l'hospitalisation habituelle.

Méthodes : Nous avons fait passer un questionnaire de neuf items sur l'efficacité, la sécurité, la commodité et l'acceptabilité perçues du modèle d'HAD aux patients hospitalisés atteints d'IC de deux hôpitaux universitaires de l'Ontario. Le critère de jugement principal était l'acceptabilité des soins en HAD, définie par la préférence ou la neutralité à l'égard des soins en HAD plutôt qu'à l'égard de l'hospitalisation habituelle. Nous avons utilisé les corrélations partielles sur les rangs de Spearman (ρ) et les analyses multivariées de régression logistique pour examiner les associations avec les résultats.

Résultats : Au sein des 297 patients admissibles, 269 (90,6 %) ont rempli le questionnaire. L'âge moyen était de 76,2 (écart type, 12,3) ans; 48,3 % étaient des femmes et 70,5 % vivaient dans leur propre maison, généralement avec un parent ou un soignant (67,9 %). Jusqu'à 211 patients (78,4 %; intervalle de confiance [IC] à 95 %, 73,0 %-83,2 %) trouvaient les soins en HAD acceptables : 169 (62,8 %; IC à 95 %, 56,8 %-68,6 %) préféraient les soins en HAD à l'hospitalisation habituelle. La commodité (ρ , 0,57; $P < 0,001$) et la sécurité perçues (ρ , 0,37; $p < 0,001$) étaient associées à l'acceptabilité de l'HAD, tandis que l'efficacité perçue ne l'était pas (ρ , 0,14; $P = 0,021$). Une formation collégiale (ratio d'incidence ajusté [RIAA], 5,96; IC à 95 %, 2,01-17,62; $P = 0,001$) ou universitaire (RIAA, 3,58; IC à 95 %, 1,07-12,06; $P = 0,039$) était associée à une plus grande probabilité d'acceptabilité de l'HAD, tandis que le fait de vivre au domicile du soignant était associé à une plus faible probabilité (RIAA, 0,34; IC à 95 %, 0,14-0,84; $P = 0,019$).

Conclusions : Une majorité de patients atteints d'IC considéraient que les soins en HAD étaient une alternative acceptable à l'hospitalisation habituelle, et accordaient la priorité à la commodité et à la sécurité perçues plutôt qu'à l'efficacité. La formation postsecondaire et le fait de vivre de façon indépendante sans l'aide d'un soignant étaient associés à l'acceptabilité de l'HAD.

from HaH personnel or self-trigger emergency transfer via ambulance services to the emergency department. In a meta-analysis, pooled data from 3 small European randomized controlled trials and 3 observational studies suggested that HaH models increase the time to readmission, improve HrQOL, and reduce costs of index hospitalization compared to routine hospitalization in select patients with decompensated HF.⁹ However, the small sample size of the pooled data prevents any definitive conclusions from being drawn. Additionally, these results could not be generalized to North American settings, where the acceptability, feasibility, and effectiveness of HaH care for HF patients have yet to be demonstrated.

With the aim of developing and testing a patient-centred HaH model for the management of decompensated HF, we conducted a cross-sectional survey of patients hospitalized for HF to assess the acceptability and perceived safety, convenience, and effectiveness of an HaH model of care. We hypothesized that a majority of patients would find HaH an acceptable model of care relative to routine hospitalization.

Materials and Methods

Study design

This cross-sectional survey was conducted among hospitalized patients at 2 large academic hospitals in Ontario, Canada (Hamilton General Hospital and Juravinski Hospital) from January, 2016 to March, 2016. This study was conducted as a substudy of the Patient-Centered Care Transitions in Heart Failure (PACT-HF) trial.^{10,11} The study was approved by the research ethics boards of participating hospitals.

Eligibility criteria

A research nurse screened consecutive adult patients admitted to the hospital with a primary diagnosis of HF. The diagnosis of HF was confirmed using serum N-terminal prohormone brain natriuretic peptide values and/or the Boston criteria.^{12,13} The nurse used a standardized script to obtain consent from eligible patients. Patients were excluded if they were hemodynamically unstable or had been admitted to a critical care setting, were unable to respond to the survey questions due to cognitive impairment, or did not have a formal or informal caregiver who played a supportive role in their healthcare. We used this approach because we aimed to survey only those patients who would qualify for the HaH intervention, to assess the feasibility of recruitment should such a model be implemented. None of the patients had experienced an HaH model of care; rather, they were surveyed regarding their perceptions following a standardized verbal description of the intervention.

Questionnaire

We modified existing questionnaires to explore patient perspectives on the acceptability of the HaH care model as an alternative to routine admission for HF.^{14,15} Questions exploring perceptions of effectiveness, safety, and convenience were included. We obtained informal, qualitative feedback from HF nurses and patients to further refine our questionnaire. We used language at the level of high-school literacy, pilot-tested the questionnaire in a small focus group of patients, and edited the language and format based on feedback.

The final questionnaire included questions on demographics and a 9-item questionnaire, which utilized a 7-point Likert scale to ensure that discrimination among patient responses would be possible (S1 Study Questionnaire).

Data collection

A trained registered nurse provided the paper-based questionnaire to consenting patients, who self-administered the questionnaires on the first day of hospitalization. We wanted to survey perceptions of patients in this window of time to assess the feasibility of recruiting patients into an HaH model of care, which would be offered to suitable patients within the first day of hospitalization. We estimated that a sample size of 250 would provide > 90% statistical power, with use of a one-sided binomial test to detect a 15% increase in the proportion of patients who found the HaH model acceptable vs those who found it unacceptable. Patients who could not self-administer the questionnaire received assistance from the nurse in completing the questionnaire. The nurse also

Table 1. Baseline characteristics of patients with decompensated heart failure included in the survey

Characteristic	n = 269
Age, y	76.2 (± 12.3)
LACE score	12.5 (± 2.8)
Sex	
Female	130 (48.3)
Patient living situation	
Lives alone	46 (20.8)
Lives with relative/caregiver	150 (67.9)
Lives with assisted living in a long-term care facility	25 (11.3)
Place of residence	
Own home	189 (70.5)
Family member/caregiver's home	39 (14.6)
Retirement residence	19 (7.1)
Nursing home	16 (6.0)
Respite care/rehabilitation	2 (0.8)
Other	3 (1.1)
Level of education	
Grade school	72 (27.2)
High school	96 (36.2)
College	59 (22.3)
University	38 (14.3)
Comorbidities	
Hypertension	194 (73.5)
Atrial fibrillation	121 (45.8)
Prior PCI/CABG	98 (37.1)
COPD	49 (18.6)
ICD/CRT	44 (16.7)
Severe valvular disease	32 (12.1)
Sleep apnea	28 (10.6)
Clinical characteristics at presentation	
No. of hospitalizations in past 12 mo	2.0 (1.0–3.0)
LV ejection fraction, %	46.2 (± 15.5)
Systolic blood pressure, mm Hg	134.3 (± 25.3)
Heart rate, beats per min	83.3 (± 21.0)
Respiratory rate, breaths per min	20.6 (± 4.5)
Sodium, mmol/L	137.8 (± 4.6)
Creatinine, µmol/L	114.5 (82.5–162.0)
Blood urea nitrogen, mmol/L	10.0 (6.0–14.0)
Glucose, mmol/L	7.0 (6.0–9.0)
High-sensitivity troponin-I, ng/L	31.0 (15.0–75.5)
NT-proBNP, pg/ml	6165.5 (3195.0–9000.0)
Rockwood Clinical Frailty Scale score	6.0 (5.0–7.0)
End-of-life care preferences	
Allow natural death	72 (27.4)
Resuscitation	75 (28.5)
No documented code status on chart during admission	116 (44.1)
In-hospital cardiac arrest	14 (5.3)

Values are n (%), mean (± standard deviation), or median (interquartile range).

CABG, coronary artery bypass grafting; COPD, chronic obstructive pulmonary disease; CRT, cardiac resynchronization therapy; ICD, implantable cardioverter defibrillator; LACE, Length of Stay, Acuity of Admission, Comorbidities, Emergency Department Visits in the last 6 months; LV, left ventricular; NT-proBNP, N-terminal pro B-type natriuretic peptide; PCI, percutaneous coronary intervention.

performed a chart review to obtain demographic and clinical data. Data were de-identified and transferred electronically for analysis.

Outcomes

Our primary outcome was the acceptability of the HaH model, defined by the proportion of patients who found HaH

care to be a neutral or preferred alternative to routine hospitalization for management of HF exacerbations. We assessed our primary outcome by asking patients to report the degree to which they agreed with the following statement on a 7-point Likert scale: “If I had the choice of being treated at home rather than in the hospital, I would have chosen to be treated at home.”

In the same manner, we assessed whether patients’ care preferences were driven by perceptions of effectiveness, safety, or convenience. The effectiveness of a healthcare model is defined by its ability to improve patients’ health.¹⁶ In healthcare, safety is defined as the prevention and reduction of risks, errors, and harms related to patients that occur during provision of care.¹⁷ Patient convenience involves factors such as distance traveled from home and comfort during care.¹⁸

We collected patient characteristic data to explore factors that may influence patients’ acceptance of the HaH model. This included patients’ places of residence, baseline functional status using the 9-item Rockwood Clinical Frailty Scale score, level of education, number of hospitalizations in the previous year, and LACE score (Length of Stay, Acuity of Admission, Comorbidities, Emergency Department Visits in the last 6 months)—an index that identifies patients at high risk for readmission or death within 30 days of discharge from hospital care.¹⁹

Analysis

We presented continuous variables as means with standard deviations (SDs) or medians with interquartile ranges (IQRs), based on the data distribution. We presented categorical variables as percentages. We grouped responses for each question (Q) into 7 categories, corresponding to each point on the Likert scale, and assigned each category a value from 1 to 7, corresponding to ratings from “strongly disagree” to “strongly agree” on the scale.²⁰ We defined “neutral or favourable to HaH” as having a score of ≥ 4 on statements favouring HaH care over routine hospitalization (Q1-3 and Q5-7), or a score of ≤ 4 on statements favouring routine hospitalization over HaH care (Q4, 8, and 9; [Supplemental Fig. S1](#)). We used multivariable logistic regression analyses to explore associations between patient characteristics and acceptability of HaH care (neutral or favourable = 1; disagree = 0). Clinically relevant variables, as listed in [Table 1](#), were selected for a univariable regression model. We examined the association of each variable with the outcome and fitted the multivariable model with variables that were significant ($P < 0.20$) in the univariable analyses. In the final multivariable model, we used $P < 0.05$ as a threshold for significance. We performed all analyses using SAS 9.4 (SAS, Cary, NC).

We assessed internal consistency of responses within each of the domains of effectiveness, safety, and convenience, and across the domains, by calculating Spearman rank correlation. We then assessed the strength of association of each question within a domain with the overall perceived acceptability of the HaH model. Our primary outcome question (Q5) was utilized as the single marker of overall acceptability of the HaH model. We examined partial Spearman rank correlation between each question within a domain and the primary outcome, after adjusting for responses to the rest of the questions.

Results

Of the 297 who were eligible, 269 (90.6%) returned the HaH questionnaire with responses and were included in the study ([Fig. 1](#)).

Study population

Baseline characteristics are presented in [Table 1](#). The mean age of patients was 76.2 (± 12.3) years. Of the 269 patients enrolled in the study, 130 (48.3%) were female. A majority of participants lived with a relative or caregiver (67.9%), and most lived in their own home (70.5%). At presentation, patients were hemodynamically stable, with a mean left ventricular ejection fraction of 46.2% ($\pm 15.5\%$), and median N-terminal prohormone brain natriuretic peptide value of 6165 (IQR, 3195–9000). Patients had a significant burden of comorbidities and medical frailty, with a mean Rockwood Clinical Frailty Scale score of 6.0 (IQR, 5.0-7.0) indicating moderate frailty and dependence on caregivers for daily activities. History of hospitalization was common, with a median of 2.0 (IQR, 1.0-3.0) hospitalizations in the preceding year. The mean LACE score was 12.5 (± 2.8), indicating high risk of readmission or death within 30 days.²¹

Acceptability of the HaH model

A majority of patients (78.4%) perceived the HaH model as being acceptable, with 62.8% favouring HaH care over routine hospitalization, and 15.6% being neutral to HaH care vs routine hospitalization. A smaller proportion of patients (21.5%) had a preference against the HaH model, with 15.2% strongly rejecting HaH care as an alternative to routine hospitalization ([Table 2](#)).

Perceived effectiveness, safety, and convenience

More than half (63.6%) of study participants responded favourably (42.7%) or neutrally (20.8%) to the idea that medical care at home can be as good as medical care in the hospital. A majority of patients (64.7%) perceived that recovery time at home is at least comparable to that in hospital. Two thirds of patients (65.1%) were neutral to (19.3%) or

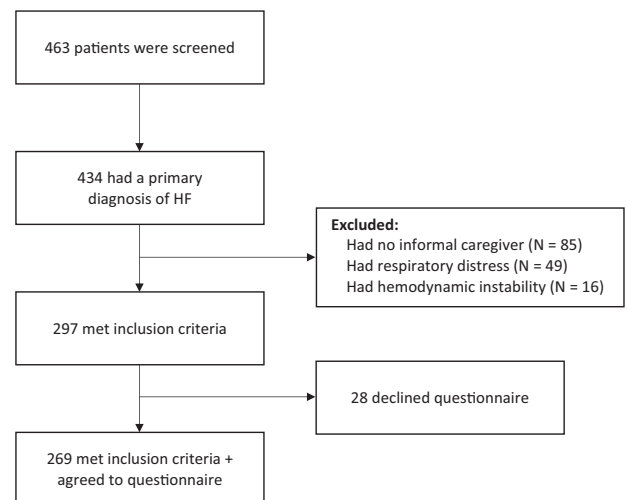


Figure 1. Screened, eligible, and included patients. HF, heart failure.

Table 2. Survey results on acceptability of a Hospital at Home care model (HaH) among patients with decompensated heart failure (n = 269)

Survey question (Q)	Responses, n (%)							
	Strongly disagree	Moderately disagree	Mildly disagree	Neutral	Mildly agree	Moderately agree	Strongly agree	Neutral or favourable to HaH
Primary outcome: acceptability								
Q5. If I had a choice, I would choose to be treated at home.	41 (15.2)	6 (2.2)	11 (4.1)	42 (15.6)	19 (7.1)	35 (13.0)	115 (42.8)	211 (78.4)
Secondary outcome domain: effectiveness								
Q9. People recover faster in the hospital than at home.	47 (17.5)	19 (7.1)	12 (4.5)	96 (35.7)	24 (8.9)	27 (10.0)	44 (16.4)	174 (64.7)
Q3. Medical care at home can be as good as medical care in hospital.	43 (16.0)	23 (8.6)	32 (11.9)	56 (20.8)	29 (10.8)	38 (14.1)	48 (17.8)	171 (63.6)
Q8. If I had an emergency at home, it would take too long for medical care to arrive.	70 (26.0)	24 (8.9)	29 (10.8)	52 (19.3)	28 (10.4)	28 (10.4)	38 (14.1)	175 (65.1)
Secondary outcome domain: safety								
Q2. At home, I would be less likely to get confused or catch an infection from someone.	12 (4.5)	6 (2.2)	9 (3.4)	64 (23.8)	36 (13.4)	46 (17.1)	96 (35.7)	242 (90.0)
Q7. Hospital treatment can result in complications, such as skin problems, falls, infections. and confusion.	20 (7.4)	9 (3.4)	12 (4.5)	101 (37.6)	42 (15.6)	27 (10.0)	58 (21.6)	228 (84.8)
Q6. I would feel safe being treated at home.	14 (5.2)	7 (2.6)	7 (2.6)	57 (21.2)	40 (14.9)	50 (18.6)	94 (34.9)	241 (89.6)
Secondary outcome domain: convenience								
Q1. I would be more comfortable being treated at home than in hospital.	42 (15.6)	8 (2.9)	9 (3.4)	33 (12.3)	43 (16.0)	41 (15.2)	93 (34.6)	210 (78.1)
Q4. It would bother me (or my family) to have nurses and doctors coming into my home.	132 (49.1)	31 (11.5)	14 (5.2)	31 (11.5)	16 (6.0)	21 (7.8)	24 (8.9)	208 (77.3)

Table 3. Factors independently associated with acceptability* of a Hospital at Home care model (HaH) among patients with decompensated heart failure (n = 253)

Patient characteristic	Adjusted OR (95% CI)	P
Education		
Grade school (reference)	1	
High school	2.03 (0.96–4.28)	0.063
College	5.96 (2.01–17.62)	0.001
University	3.58 (1.07–12.06)	0.039
Place of residence		
Own home (reference)	1	
Family member/caregiver home	0.34 (0.14–0.84)	0.019
Retirement residence	0.56 (0.15–2.12)	0.390
Nursing home	0.41 (0.09–1.82)	0.244
Medical history		
COPD	0.56 (0.26–1.22)	0.145
End-of-life care preference		
Allow natural death (reference)	1	
Resuscitation	0.44 (0.17–1.15)	0.093
Not documented in chart	0.52 (0.21–1.29)	0.159
Other variables		
Rockwood Clinical Frailty Scale score	1.19 (0.92–1.54)	0.183

CI, confidence interval; COPD, chronic obstructive pulmonary disease; OR, odds ratio.

* Responding neutrally to or in agreement with the statement: “If I had a choice, I would choose to be treated at home.” Clinically relevant variables were included in a univariable regression analysis. Variables that were associated with the outcome in the univariable analysis ($P < 0.20$) were included in the multivariable model. The univariable model included, in addition to the variables above, age, sex, living situation (lives alone, lives with relative or caregiver, lives in long-term care facility), number of hospitalizations in the past year, history of implantable cardioverter defibrillator or cardiac resynchronization therapy, prior percutaneous coronary intervention or coronary artery bypass grafting, and Length of Stay, Acuity of Admission, Comorbidities, Emergency Department Visits in the last 6 months (LACE) score.

disagreed with (45.7%) the notion that it would take too long for medical care to arrive to their home in the event of a sudden deterioration.

Most study participants (89.6%) reported feeling at least as safe with hospital-level care at home as with care in the hospital. A majority of patients (90%) were neutral to (23.8%) or agreed with (66.2%) the idea that they would be less likely to suffer infections or delirium in their own home. Many (84.8%) believed that the risk of complications such as skin problems, infections, confusion, and falls was the same (37.6%) or lower (47.2%) at home, compared with that in the hospital.

A majority of respondents (78.1%) were neutral to (12.3%) or agreed with (65.8%) the statement that HaH would be more comfortable than routine hospitalization. Most patients (65.8%) disagreed that they or their family would feel burdened with frequent nurse and physician visits to their homes, with 49.1% strongly disagreeing with this sentiment.

Factors associated with acceptability of an HaH model of care in acute HF

In a multivariable regression model (Table 3), college (adjusted odds ratio [aOR], 5.96; 95% confidence interval [CI], 2.01–17.62; $P = 0.001$) and university (aOR, 3.58; 95%

CI, 1.07–12.06; $P = 0.039$) education were independently associated with increased odds of acceptability of HaH care relative to a grade-school education. Residing in a family member or caregiver’s home was associated with an unfavourable response to HaH care (aOR, 0.34; 95% CI, 0.14–0.84; $P = 0.019$), relative to living in one’s own home.

There was no significant association between acceptability of the HaH model and any of the following: end-of-life care preference, chronic obstructive pulmonary disease (COPD), Rockwood Clinical Frailty Scale score, LACE score, and number of hospitalizations in the past year.

Domains correlated with acceptability of an HaH model in HF

We used Spearman’s rank correlation to assess internal consistency within and between domains. Responses to questions within each domain were moderately correlated: effectiveness (ρ , 0.19–0.30; $P < 0.001$ –0.002), safety (ρ , 0.33–0.41; $P < 0.001$), and convenience (ρ , 0.26–0.35; $P < 0.001$). Safety (Q6) and convenience (Q1; ρ , 0.52; $P < 0.001$) demonstrated the strongest association with perceived effectiveness.

Using partial Spearman’s rank correlations to control for other domains, we found that convenience (Q1) (ρ , 0.57; $P < 0.001$) and safety (Q6) (ρ , 0.37; $P < 0.001$) were the only domains to show a significant correlation with HaH model acceptability.

Discussion

In this cross-sectional survey of patients hospitalized for HF in Ontario, Canada, a majority of patients viewed HaH care as an acceptable alternative to routine hospitalization. Most felt HaH care was safe, with the potential to reduce risks of complications associated with hospitalization. A majority considered HaH care to be more convenient than routine hospitalization, perceiving treatment at home to be as comfortable. More than half the respondents perceived HaH care to be at least equivalent to routine hospitalization in terms of effectiveness, facilitation of recovery, and timely emergent treatment. A third of patients were concerned that HaH care would be inferior to routine hospitalization in these respects; however, effectiveness was not associated with acceptability of HaH care. Domains that were associated with acceptability of HaH care included perceived convenience and safety. Postsecondary education was associated with increased odds of HaH care acceptability, whereas residing in a caregiver’s home was associated with decreased odds of HaH care acceptability.

We found that more than three quarters of patients (78.4%) perceived HaH care as an acceptable alternative to hospitalization, with almost two thirds of participants preferring HaH care over routine hospitalization. This finding is consistent with the literature regarding patient perceptions of HaH care. A study involving 455 elderly patients who required admission to an acute care hospital for community-acquired pneumonia, exacerbation of chronic HF, exacerbation of COPD, or cellulitis found that at 2 of the 3 sites studied, 69% of patients who were offered HaH care chose it over routine hospitalization.²² Our study corroborated this finding among patients with decompensated HF,

demonstrating that a similar proportion of such patients would opt for HaH care over routine hospitalization. The acceptance of HaH care by a majority of HF patients supports the feasibility of an HaH model of care for decompensated HF in a Canadian setting, although it should be noted that none of the patients had experienced such a model. Whether these patients would make similar choices if given the option to actually receive treatment with one model of care over another is unclear. This study was conducted prior to the coronavirus disease 2019 pandemic; the aversion of patients to hospital utilization during the pandemic gives pause, to consider that a higher proportion of patients may select an HaH model of care in the current era.

Our study demonstrated that the overall acceptability of HaH care was associated with perceptions of increased convenience and safety, and was not associated with perceived effectiveness. This may be attributed to the characteristics of patients included in the survey. Study participants were elderly and had a significant burden of comorbidities and medical frailty, dependence on caregivers for daily activities, and multiple hospitalizations. Research has shown that patients with these characteristics, which may signify advanced HF,^{23,24} commonly prioritize comfort and quality of life over clinical outcomes in their care.^{25,26} This finding is consistent with the emphasis on comfort and safety that patients demonstrated in our survey. Our prior meta-analysis⁹ evaluating the effect of HaH programs in acute HF management suggested that HaH models improve HrQOL and increase time to readmission. Taken together, these findings suggest that HaH care may be a viable alternative to routine hospitalization among select patients with acute decompensated HF.

We found that a college or university education was associated with increased acceptability of HaH care in our publicly funded healthcare system. This finding is consistent with a study examining factors associated with home care services in a population of 1537 elderly Chinese immigrants in Canada.²⁷ In this study, a postsecondary education was associated with 4 times the odds of using home care services, compared with those who did not have a postsecondary education, possibly related to greater confidence or self-efficacy, comfort with home care personnel, comfortable/safe housing, and/or other socioeconomic factors.

We found that residing in a family member or caregiver's home was associated with lower odds of acceptability of HaH care. A common concern amongst HF patients is caregiver burden.²⁸ HF caregiver burden has been associated with higher levels of stress,²⁹ as well as with caregiver and patient depression.³⁰ However, a nonrandomized clinical trial of 214 elderly patients requiring acute hospital admission for community-acquired pneumonia, exacerbation of chronic HF, exacerbation of COPD, or cellulitis demonstrated that HaH care is associated with lower levels of family member stress compared to routine hospitalization and does not appear to shift the burden of care from hospital staff to family members.³¹ Further research is warranted for conclusive evidence regarding the effects of HaH care on caregiver burden,⁹ particularly in HF care, as our study has identified this as an area of patient concern.

A potential limitation of our study was the quantitative design of the questionnaire, which limited narrative feedback and a range of opinions patients could potentially provide.¹⁴

Our questionnaire, although based on previous tools used to examine patients' preferences for home vs hospital care,^{14,15} has not been validated. Furthermore, we did not solicit opinions from informal caregivers or family members, whose preferences may inform the use of HaH programs versus routine hospitals in the event of worsening HF.³² Furthermore, our study recruited patients from institutions that share similar care practices; results may not be generalizable to patients outside our region.

Notwithstanding these limitations, our study provides a succinct overview of advanced HF patients' perceptions regarding HaH care as an alternative to routine hospitalization. By aiming to consider patients' perceptions in the design, implementation, and testing of a new model of care, our work represents engagement of patients in participatory action research within a learning healthcare system; this aspect of patient engagement has received less attention than the collection of patient-reported outcomes after an intervention is delivered.^{10,11,33-35}

Conclusions

A majority of patients admitted with decompensated HF found HaH care to be an acceptable alternative to routine hospitalization, prioritizing the convenience and safety of the model of care over effectiveness. Postsecondary education was associated with higher odds of finding HaH care acceptable. Living with a caregiver was associated with lower odds, warranting further research into potential effects of HaH care on caregiver burden. With the potential to reduce HF-associated healthcare costs and improve HrQOL and patient satisfaction, the HaH model appears to be a viable alternative to routine hospitalization as a model of HF care in Canada.

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Disclosures

The authors have no conflicts of interest to disclose.

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Supplementary Material

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