Can J Cardiol. Author manuscript; available in PMC 2015 July 07.

Published in final edited form as:

Can J Cardiol. 2012 ; 28(4): 483–489. doi:10.1016/j.cjca.2011.11.020.

Referral and use of heart failure clinics: What factors are related to utilization?

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Abstract

Background—Due to its growing prevalence, heart failure (HF) has become a major burden worldwide. HF clinics have been shown to reduce hospital readmissions, and generally have favorable effects on quality of life, survival and care costs. This study investigated the rates of referral and utilization of HF clinics, and examined factors related to program use.

Methods—This study represents a secondary analysis of a larger prospective cohort study conducted in Ontario. In hospital, 474 HF inpatients from 11 hospitals across Ontario completed a survey that examined predisposing, enabling and need factors affecting HF clinic use. Clinical and demographic data were extracted from medical charts. One-year later, 271 HF patients completed a mailed survey that assessed referral to and use of HF clinics. Data were collected between the years 2006–2008 and analyses ensued in 2010.

Results—Forty-one patients(15.1%) self-reported referral, and 35(12.9%) reported attending a HF clinic (85% of those referred) at 1 of 16 sites. Generalized estimating equations showed that factors related to greater program use were: having a HF clinic at the site of hospital recruitment(Odds Ratio[OR]=8.40, p=0.04), referral to other disease management programs(OR= 4.87, p=0.04), higher education(OR=4.61, p=0.02), lower stress(OR=0.93, p=0.03) and lower functional status(OR=0.97, p=0.03).

Conclusion—Similar to previous research, only one-seventh of HF patients were referred and used a HF clinic. Both patient-level and health-system factors were related to HF clinic use. Given the benefits of HF clinics, more research examining how equitable access can be increased is

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Disclosures: None

needed. Also, the appropriateness and cost repercussions of use of multiple disease management programs should be investigated.

Keywords

Disease management; Heart Failure; Referral and Consultation; Rehabilitation; Utilization

There is a high prevalence and incidence of heart failure (HF) globally, {{5676 Miller, L.W. 2001; 5677 Young, J.B. 2004; }} and it is associated with high mortality, morbidity and cost of care.{{756 Lee, D.S. 2004; 5679 Medical Advisory Secretariat, Ministry of Health and Long-Term Care 2009; }} The course of HF is marked by frequent exacerbations that lead to hospital readmissions. The reasons for high admission rates are multifactorial, and include both patient and health-care provider factors. {{3377 Tsuyuki, R.T. 2001; }} At the patient level, readmissions result not only from clinical factors, but from behavioral factors such as non-adherence to self-management recommendations. Moreover, given the complexities in managing HF, research shows that post-hospitalization medical care is not always optimal. {{3887 Berkowitz, R. 2005; 4741 Ehrmann Feldman, D. 2009; }}

Over the last decade, HF management programs have been established to address these challenges in HF outpatient care.{{2767 McAlister, F.A. 1999}} In particular, multidisciplinary outpatient HF clinics provide patient education on how to manage HF and recognize HF-specific symptoms, medication review and dose titration, risk-factor management, prescription of a home-based exercise schedule, monitoring of therapy compliance, family-centred education, inter-provider communication, and timely follow-up. {{3136 Malcom, J. 2008; }}

Use of outpatient HF management programs is shown to reduce morbidity, mortality and health care costs. For example, a meta-analysis of randomized controlled trials demonstrated that multidisciplinary HF disease management programs (DMPs) are associated with a 26% reduction in HF hospitalizations, a 19% reduction in all-cause hospitalization and a 25% reduction in mortality.{{3196 McAlister, F.A. 2004; }}Based on this evidence, Canadian, {{2029 Arnold JMO, Liu P, Demers C, Dorian P, Giannetti N, Haddad H, et al. 2006; }} American,{{5187 Jessup, M. 2009; 5189 Heart Failure Society Of America 2006; }}and European{{4978 European Society of Cardiology 2008; }} guidelines promote referral to such clinics for patients with a recent HF hospitalization or at high risk of clinical deterioration. Despite these guidelines however, limited research that is available suggests that few patients access these programs.{{5680 Gharacholou, S.M. 2011; 4741 Ehrmann Feldman, D. 2009; 4805 Howlett, J.G. 2009; 4493 Jurgens, C.Y. 2006; }}

In order to investigate access to HF clinics an established framework{{198 Andersen, R.M. 1995; }} was applied in the current study. The objectives of the current study were to: (1) describe the rates of HF clinic referral and use, and (2) examine health-system and patient factors related to HF clinic use.

Methods

Design and Procedure

This study represents a secondary analysis of a larger prospective study on cardiac rehabilitation (CR) referral strategies.{{4941 Grace, S.L. 2011; }} Ethics approval for human research was obtained from all participating hospitals, which included 11 acute care hospitals in Ontario, Canada. Of these hospitals, 5 (45.4%) were academic, 7 (63.6%) were tertiary (onsite catheterization laboratory and revascularization facilities), 7 (63.6%) had an established HF clinic and all 11 (100%) were located in urban centers.

Between 2006 and 2008, medically stable consecutive coronary artery disease (CAD) and/or HF inpatients were approached by trained research assistants on general cardiology inpatient units and cardiac surgery and catheterization floors during business hours. After the patients were consented, medical chart data were extracted and each participant was provided with a self-report survey that assessed factors affecting healthcare utilization according to Andersen's Behavioral Model of Healthcare Utilization.{{198 Andersen, R.M. 1995; }} One-year post-recruitment, participants were mailed a second follow-up survey assessing self-reported HF clinic referral and use.

Participants

Inpatients with diastolic or systolic HF as a primary or secondary diagnosis were selected. Ascertainment of HF was determined by: (1) HF diagnosis indicated in the inpatient hospital chart, (2) NYHA class III or IV indicated in patient chart,{{199 The Criteria Committee of the New York Heart Association 1994; }} and/or (3) patient self-report of a HF diagnosis.

Of the 873 HF inpatients approached, 474 consented to participate in the study (176 declined participation and 223 patients were excluded). Reasons for exclusion were based on criteria for the larger study.{{4941 Grace, S.L. 2011; }}

Measures

Independent variables—Environmental (i.e., health system) and individual factors (i.e., patient-level) affecting HF clinic use were identified from previous studies that have evaluated HF clinic{{4741 Ehrmann Feldman, D. 2009; 2747 Houde, S. 2007; 4805 Howlett, J.G. 2009; }} and CR participation.{{3602 Grace, S.L. 2008; 5344 Grace, S.L. 2004; }} The factors were extracted from medical charts, or assessed by patient self-report with psychometrically-validated scales available. A summary of constructs is presented in Figure S1.

Environmental (Health-System) Factors: In the present study, health-system variables included: hospital type (academic or other), whether the hospital recruitment site had an established HF clinic (yes/no), and referrals by a health care provider to other outpatient DMPs (yes/no). The latter variable was computed by counting the number of services other than a HF clinic to which the patient indicated a referral. These services included: CR, diabetes education, stroke rehabilitation, smoking cessation clinics, occupational/physical therapy or consultation with a registered dietitian.

Patient-Level Variables: According to Andersen's framework,{{198 Andersen, R.M. 1995; }} (1) characteristics predisposing utilization, (2) characteristics enabling utilization, and (3) need-related factors were assessed as outlined below. The relevant factors were assessed in the baseline survey unless otherwise indicated.

Predisposing Factors: Sociodemographic characteristics assessed through chart report included age and sex. Ethnocultural background, work status, level of education and gross annual family income were assessed by self-report. The Beck Depression Inventory-II (BDI-II) was administered to assess depressive symptoms.{{4876 Beck, A.T. 1996; }}

Enabling Factors: The sociodemographic characteristics of rurality (living greater or less than 30 minutes from the closest acute care site), marital status (yes/no) and living arrangements (alone or with family) were assessed via self-report.

The ENRICHD Social Support Inventory (ESSI){{120 Mitchell, P.H. 2003; }} was used to measure social support. The Perceived Stress Scale (PSS){{266 Cohen, S. 1983; }} was used to examine the degree to which situations in one's life are appraised as stressful.

Need Factors: Clinical indicators of objective need that were extracted from clinical charts included cardiac risk factors (yes/no; hypertension, hyperlipidemia, diabetes, smoking history, family history of heart disease and overweight/obesity), left ventricular ejection fraction (LVEF; greater or less than 40%) and NYHA class (I-IV). Body mass index (BMI), cardiac history (yes/no) and comorbid conditions (count) were extracted from clinical charts, and where absent were supplemented with self-report data.

The Duke Activity Status Index (DASI){{371 Hlatky, M.A. 1989; }} was administered to determine functional capacity as this questionnaire provides a valid estimate of functional capacity in patients with HF.{{5164 Parissis, J.T. 2009; }} The Physical Activity Scale for the Elderly (PASE){{1515 Washburn, R.A. 1993; }} was used to assess physical activity.

Finally, patient's use of healthcare services was also assessed as an indicator of need for disease management programming, and was self-reported by participants 1-year post recruitment. These included whether the patient: (i) had been to see their: (a) general practitioner (GP) and (b) heart specialist; (ii) had visited the emergency department for symptoms related to the heart; (iii) had been admitted to a hospital for HF and/or another coronary event or procedure, in the 12 months post-recruitment.

Dependent variable—The dependent variable of HF clinic use was measured by self-report forced-choice questions in the 1-year follow-up survey. Patients reported if they were referred to a HF clinic and if "yes", reported the site of use if they attended (yes/no). Telephone calls were made to all participants to verify referral and use of HF clinics specifically.

Statistical analyses

In the initial stages of analysis, a descriptive examination of self-reported HF clinic referral and use was conducted. A kappa statistic was reported to describe the level of agreement between the two variables.

Secondly, bivariate screening of health system-level and patient-level predisposing, enabling and need factors related to HF clinic use (yes/no), using chi-square and t-tests where appropriate was conducted. This was performed to enable variable selection for an adjusted model based on theoretical (i.e., Andersen's model) and empirical ($p<0.1$) criteria.

Finally, generalized estimating equations (GEE) using a binary logistic model were used to examine factors associated with HF clinic use in order to control for patient clustering within hospital recruitment sites. SPSS Version 17.0 was used for all analyses.{{1105 SPSS Inc. 2008; }}.

Results

A participant recruitment flow diagram is presented in Figure S2. Of the 474 consenting HF participants, the final cohort consisted of 271 patients who completed the one-year assessment reporting referral and utilization of HF clinics. Specific reasons for loss-to-follow-up which were considered to deem participants ineligible for HF clinic participation were as follows: moved and could not be located (n=64; 53.3%), deceased (n=46; 38.3%), too ill (n=3; 2.5%), dementia (n=1; 0.8%), and "other" (n=6; 5.1%). Supplemental Table S1 displays participant characteristics by retention status.

Self-reported referral and use of an HF clinic

HF clinic use could not be verified for 1 participant and was denoted as "missing". Of the 270 participants, 41 (15.1%) self-reported referral to a HF clinic, and 35 (12.9%) reported using the program (85% of those referred) at 1 of 16 sites. The concordance between referral to and use of a HF clinic was 92% (Cohen's 3).

Factors related to HF clinic use

Bivariate factors related to HF clinic use are shown in Table 1. GEEs were computed to predict HF clinic use. The variable LVEF < 40% was not included due to a high degree of missing data. Thus, the DASI was forced into the model as an alternate indicator of health status. The results (see Table 2) showed that 2 health system-level factors were significantly related to HF clinic use: having an established HF clinic at the site of hospital recruitment and referral to DMPs and outpatient services other than a HF clinic. With regard to patient-level factors, one each of predisposing, enabling and need factors was related to HF clinic use. Specifically and respectively, higher education, lower stress, and lower functional status were associated with greater HF clinic use.

Discussion

Research has shown that multidisciplinary outpatient HF clinics can support management of this clinical syndrome{{5188 Hauptman, P.J. 2008; 3196 McAlister, F.A. 2004}} and reduce

re-hospitalizations.{{4805 Howlett, J.G. 2009; 3182 Gustafsson, F. 2004}} Little is known however about the utilization patterns of such clinics. Results showed that 15% of study participants were referred, and 13% reported use a HF clinic, representing less than one-seventh of the study sample. The extremely high concordance (92%) between referral and use suggests that referred patients adhere to these recommendations.

Despite the established benefits of HF clinics, evidence shows that referral,{{5680 Gharacholou, S.M. 2011; }}and subsequent enrollment{{4805 Howlett, J.G. 2009; }} into HF clinics is low. The findings in this study of rates of referral and enrollment are congruent with the current literature. Firstly with regards to referral, the largest and most comprehensive study to date reported that among 57,969 patients hospitalized with HF at 235 hospital sites in the United States using the Get With the Guidelines (GWTG) program, 11,150 (19.2%) patients were referred to a HF DMP, which was similar to the 15% referral rate in the current study.

With regard to enrollment, one Canadian retrospective study showed that among 8,731 HF patients from the Improving Cardiovascular Outcomes In Nova Scotia (ICONS) provincial registry,{{4805 Howlett, J.G. 2009; }} 11% of HF patients enrolled in one of four HF clinics. Similar to the Gharacholou et al. and current studies, all patients discharged with a HF diagnosis were followed to assess HF clinic enrollment.

Given the demonstrated benefits of these services, this is discouragingly low. It could be argued that capacity is insufficient and thus to be cost-effective, only patients with frequent re-admissions would warrant referral to such services. The appropriateness then of this rate of use could be supported if need factors were significantly related to HF clinic use. However, number of emergency department visits was unrelated to use. The appropriateness of patients accessing HF clinics is also not supported in that the presence of risk factors, comorbidities, and other healthcare visits were all unrelated to use. This finding is similar to the CR literature where most studies have found no relationship between use of CR programs and burden of prognostic indicators.{{3602 Grace, S.L. 2008; 511 Cooper, A.F. 2002; }} However, patients with lower ejection fraction and functional status were more likely to use HF clinics. It has been demonstrated that HF patients with lower functional capacity are at higher risk of major cardiovascular events and reduced survival.{{5164 Parissis, J.T. 2009; }} While more research is needed, triage tools should be developed to ensure patients most in need are ensured timely access to DMPs, and perhaps that primary care-based or integrated DMPs be considered to address the care gap.

Through the lens of the behavioral model of health services utilization, we tested predisposing, enabling, and need factors affecting HF clinic use. With regard to these patient-level factors, three were found to be related to HF clinic use — higher education, lower stress and lower functional status. With regard to the former, patients with higher education were 5-times more likely to use an outpatient HF clinic. This finding is consistent with the broader cardiac literature, which shows more affluent or better educated patients are more likely to access specialized cardiac services{{511 Cooper, A.F. 2002; 5163 Alter, D.A. 2004; 2997 Suaya, J.A. 2007}} and HF clinics.{{4805 Howlett, J.G. 2009; }} and HF clinics.{{4805 Howlett, J.G. 2009; }} This is discouraging, as it has been shown that

socioeconomically-disadvantaged patients are less likely to modify lifestyle risk behaviors and have greater cardiovascular risk after a cardiac event.{{5154 Chan, R.H. 2008; 5155 Alter, D.A. 2006; }} In contrast to other studies however; {{4805 Howlett, J.G. 2009; 2747 Houde, S. 2007}} other sociodemographic factors such as age, sex and ethnocultural background were unrelated to HF clinic use.

Health System Factors Related to HF Clinic Use

Two health system factors were shown to be related to greater HF clinic use: referral to other DMPs and presence of an HF clinic at the site of index hospitalization. With regard to the former, patients that received a referral to other DMPs were nearly 5-times more likely to use a HF clinic. In fact, of the patients that used a HF clinic, over 90% had received a referral to other DMPs. There may be several reasons for such a finding. First, the patients that are using multiple outpatients programs may be in greater clinical need of such care. Second, DMP programs refer amongst their services based on patient's needs. Thus once a patient is referred to one service, they may receive a referral to another DMP based on risk factors (e.g., smoking) and comorbidities (i.e., diabetes). Similarly, Gharacholou et al. {{5680 Gharacholou, S.M. 2011; }} also found that more patients that were referred to a HF DMP were also referred to CR (20.7%) compared to those not referred (3.9%). Third, patients who use HF clinics may be informed healthcare consumers who request referral to multiple DMPs. Fourth, patients may be appropriately using different DMPs over time as they live with their chronic cardiac condition.

Finally, utilization of HF clinics was also associated with the presence of an established program at the hospital site of patient recruitment. Patients recruited from a site with a HF clinic were 8-times more likely to use these programs. Indeed this was the most important factor in determining which patients used a HF clinic. The availability or supply of health services is shown to be an important driver of use, over-and-above demand.{{5136 Gulliford, M. 2002; }} Moreover, it is likely that having a HF clinic on site is related to greater awareness of the benefits of such services by physicians providing care, and having established relationships with healthcare providers working in the clinics. However, broader referral mechanisms are needed to ensure that all patients regardless of where they receive care have equitable access to HF clinics, be it in person or using alternative models of care (i.e., home care, telephone support or remote monitoring).

The findings presented herein should be interpreted with caution, most notably due to design, measurement and generalizability. With regard to design, this was a secondary analysis of a larger prospective study on access to CR. The inclusion/exclusion criteria were designed for the larger study and thus were not tailored specifically for these study objectives. Moreover, due to the nature of the larger study, many patients were receiving care on hospital wards with CR referral systems. Physicians may have deemed a referral to a HF clinic as redundant if they were going to receive care in a CR program. With regard to measurement, firstly, this study did not assess an exhaustive list of patient and health system-level factors. For example, the type of HF (systolic or diastolic), symptomatology and the nature of HF (acute decompensation or chronic HF) were not measured. These are important prognostic factors that may affect referral and use of HF clinics. Secondly, many variables

were ascertained via self-report, which raises questions of bias. Chiefly, HF diagnosis could have been ascertained by patient self-report, which has uncertain validity. Additionally, HF clinic referral and use were assessed by self-report only. Although HF clinic utilization was not verified with the clinic sites, there is evidence that supports the “almost-perfect” congruence between self-report and DMP-report data.{{2938 Kayaniyil, S. 2009; }}

The final limitation is generalizability. The rates of access may not be generalizable as a result of selection and retention bias.

In conclusion, one-seventh of HF patients were referred and used a HF clinic. Over 90% of patients that reported using a HF clinic were referred to other services. At the patient-level, greater educational attainment, lower stress and lower functional status were related to greater HF clinic use. At the health system-level, presence of a HF clinic at the site of index hospitalization and referral to other DMPs were related to greater HF clinic use. Given the benefits of HF clinics, policies to achieve more equitable access based on need should be considered.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We gratefully acknowledge the study co-investigators and recruiters for efforts in patient accrual.

Funding Sources: This study was funded by CIHR and HSFC grant # HOA-80676. With regard to personnel support, Dr. SL Grace is supported by CIHR MSH-80489 and S Gravely-Witte is supported by the Ontario Women’s Health Council/CIHR Institute of Gender and Health.

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Brief Summary

This study describes heart failure (HF) clinic referral and utilization rates, and examines factors related to clinic use. Results showed that among 271 HF patients, 15% were referred and 13% used a HF clinic at 1 of 16 sites in Ontario Canada. Having a clinic at the same site as an inpatient hospitalization, being referred to another disease management program, higher education, lower stress and lower functional status were related to HF clinic use.

Can J Cardiol. Author manuscript; available in PMC 2015 July 07.

Table 1

Bivariate analyses of factors associated with HF clinic use, according to Andersen's Model (N=270[§])

	HF clinic use		p
	Yes 35 (12.9%)	**No 235 (86.7%)**	
Predisposing Factors			
Age, mean yrs (SD)	67.8 (12.2)	67.3 (11.5)	0.82
Sex, female, n (%)	9 (25.7)	60 (25.5)	0.98
White ethnocultural background, n (%)	32 (94.1)	187 (83.5)	0.11
Education, completed high school, n (%)	30 (90.9)	156 (68.1)	<0.01
Retired, n (%)	18 (54.5)	129 (56.8)	0.81
Family income < $50,000CAD, n (%)	14 (51.9)	114 (61.3)	0.35
Depression (BDI-II), mean (SD)	10.7 (8.0)	10.8 (8.7)	0.99
Enabling Factors			
Rural living, n (%)	6 (17.1)	42 (17.9)	0.92
Married, n (%)	27 (79.4)	161 (69.7)	0.24
Stress (PSS), mean (SD)	13.8 (6.1)	16.3 (6.9)	0.06
Social support (ESSI), mean (SD)	29.5 (5.6)	28.5 (6.6)	0.42
Living with family, n (%)	29 (85.3)	174 (76.0)	0.20
Need Factors			
Index Cardiac condition/procedure, n (%)			
MI	13 (38.2)	65 (27.9)	0.22
PCI	6 (17.6)	50 (21.4)	0.62
CABG	16 (47.1)	71 (30.3)	0.05
Arrhythmia/pacemaker	8 (23.5)	55 (23.5)	0.99
Diabetes, n (%)	17 (48.6)	80 (34.6)	0.11
Hypertension, n (%)	28 (82.4)	158 (73.8)	0.29
Dyslipidemia, n (%)	25 (86.2)	140 (73.7)	0.15
Smoker, current, n (%)	2 (6.1)	23 (10.1)	0.46
BMI, mean (SD)	27.6 (6.1)	28.4 (6.7)	0.53
LVEF < 40%, n (%)	21 (84.0)	81 (51.3)	<0.01
NYHA class III-IV, n (%)	5 (55.6)	65 (67.7)	0.46

	HF clinic use		p
	Yes 35 (12.9%)	**No 235 (86.7%)**	
History of cardiac disease, n (%)	26 (74.3)	152 (68.2)	0.47
Comorbid conditions, mean count (SD)	1.8 (1.6)	2.0 (1.6)	0.44
Functional status (DASI), mean (SD)	19.7 (11.8)	24.1 (15.1)	0.10
Physical activity (PASE), mean (SD)	64.2 (72.9)	61.3 (68.6)	0.83
Number of visits to a heart specialist in the last year, mean (SD)	3.2 (2.5)	2.8 (2.4)	0.30
Number of visits a GP in the last year, mean (SD)	8.3 (10.2)	7.6 (6.6)	0.59
ED admission for cardiac care in the last year, n (%)	17 (50.0)	103 (45.4)	0.71
Hospital cardiac readmission in the last year, n (%)	14 (42.4)	96 (42.7)	0.98
Health system level factors[≠]			
Referral to other DMPs, n (%)	33 (94.3)	161 (68.5)	0.001
Referral to CR, n (%)	26 (76.5)	132 (57.6)	0.04
Referral to a diabetes outpatient clinic, n (%)	11 (32.4)	36 (15.3)	0.01
Referral to OT or PT, n (%)	10 (30.3)	34 (15.6)	<0.01
Referral to a stroke clinic, n (%)	1 (3.3)	9 (4.5)	0.90
Referral to a dietitian, n (%)	22 (64.7)	80 (36.4)	<0.01
Referral to a smoking program, n (%)	1 (2.9)	4 (1.8)	<0.01

[§] HF clinic data is missing for 1 participant and could not be verified.

[≠] Hospital Level variables were included in the multivariate analysis only, because bivariate analyses do not take into account the clustering of patients within hospitals.

BDI, Beck Depression Inventory; BMI, body mass index; DASI, Duke Activity Status Index; PSS, Perceived Stress Scale; ESSI, Enriched Social Support Inventory; PASE, Physical Activity Scale for the Elderly; IPQ-R, Illness Perceptions Questionnaire – Revised; MI, myocardial infarction; PCI, percutaneous coronary intervention; CABG, coronary artery bypass graft; LVEF, left ventricular ejection fraction; NYHA, New York Heart Association; GP, general practitioner; ED, emergency department; CR, cardiac rehabilitation; OT, occupational therapy; PT, physical therapy; DMPs, disease management programs

Table 2

GEE analysis of factors associated with HF clinic use

Variable	Wald Chi-square	OR	95% CI	p value
Patient level factors				
Education (completed high school or greater)	5.56	4.61	1.29–16.44	0.02
Stress (greater) (PSS) *	4.80	0.93	0.87 – 0.99	0.03
Functional Status (lower) (DASI) *	4.99	0.97	0.95 – 0.99	0.03
CABG (yes)	0.31	1.29	0.52 – 3.23	0.58
Health system level factors				
HF clinic at the site of hospital recruitment (yes)	4.08	8.40	1.07 – 66.18	0.04
Referral to other DMPs (yes)	4.29	4.87	1.09 – 21.79	0.04
Hospital Type (academic)	1.75	0.56	0.24 – 1.32	0.19

GEE, generalized estimating equations; OR, odds ratio; CI, confidence interval; DMPs disease management programs; HF, heart failure; DASI, Duke Activity Status Index; PSS, Perceived Stress Scale.

* continuous scale