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Treatment pathways in patients with heart failure with preserved ejection fraction and obesity: perspectives from cardiology specialists and patients

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Abstract

Background: Obesity, highly prevalent in patients with heart failure with preserved ejection fraction (HFpEF), may make HFpEF more difficult to diagnose by masking its signs. The aim of this study was to identify challenges patients and health-care professionals (HCPs) face in diagnosing and treating patients with HFpEF and obesity.

Methods: An anonymous, US population-based online survey was conducted in September 2020 among 114 patients with obesity and a self-reported diagnosis of HFpEF and 200 HCPs.

Results: In the typical medical journey, almost half of patients (45%) were diagnosed with HFpEF within one month of discussing symptoms with an HCP; however, the remaining patients waited an average of 22 months for diagnosis, most of whom (78%) received their diagnosis from a cardiologist. Most patients (65%) perceived their cardiologist as the coordinator of their HFpEF care. The treatments most recommended by cardiologists for the ongoing treatment of HFpEF included lifestyle changes (91%), diuretics (87%), beta blockers (76%), and angiotensin-converting enzyme inhibitors (71%). Heart failure specialists (29%) were more likely than general cardiology specialists (12%) to report recommending prescription weight-loss medications for management of HFpEF. Most cardiologists reported not having received formal training in obesity management.

Conclusions: Cardiology specialists play a central role in the diagnosis and management of HFpEF, but optimal coordination is needed to improve obesity management in patients with HFpEF.

Key words: heart failure, obesity management, surveys and questionnaires, cardiology.

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Introduction

More than 600 million adults worldwide have obesity, and the prevalence is expected to increase to 1.1 billion.^{1,2} Obesity is a major risk factor for heart failure (HF). After adjusting for other established risk factors, the risk of HF increases in a graded fashion with rising body mass index (BMI), and that risk is two-fold in individuals with BMI >30 kg/m² versus those with normal BMI.³ There is a strong association of obesity with HF with pre-

served ejection fraction (HFpEF) compared with HF with reduced ejection fraction (HFrEF). Indeed, the obesity pandemic is thought to be the main driver for the increasing prevalence of HFpEF relative to HFrEF.^{4,5} In patients with obesity, the diagnosis of HFpEF can be challenging. The clinical picture of patients with HFpEF may be similar to that of patients who have obesity and are merely deconditioned. Moreover, obesity is associated with much lower natriuretic peptide levels in patients with HFpEF with

levels frequently below cut-offs that have historically been proposed for diagnosis of HF.^{6,7} Even echocardiography-based estimates of congestion such as E/e' ratio and left atrial volume are lower in patients with obesity-related HFpEF, further contributing to systematic under-recognition of HFpEF in patients living with obesity.^{8,9} Expert assessment and use of evidence-based diagnostic algorithms (such as H₂FPEF and HFA-PEFF) can assist with the diagnosis and guide the need for further testing.

HFpEF is a heterogeneous syndrome and there are limited treatment options. Diuretics are the mainstay to improve symptoms, and sodium glucose cotransporter-2 (SGLT-2) inhibitors are the only drugs that have been shown to improve clinical outcomes. Therefore, it is essential to adopt a *phenotype-based* approach to the management of patients with HFpEF, wherein specific comorbidities contributing to the progression of the disease should be targeted as well. Obesity is present in 60-70% of patients with HFpEF, and is associated with a greater burden of symptoms, worse quality of life, and greater risk for HF hospitalization.^{8,10,11} Weight loss has been shown to improve exercise capacity and quality of life in HFpEF,¹² and may even improve cardiac function and hemodynamic abnormalities.^{13,14} Thus, management of weight is an important aspect in patients with HFpEF and obesity.

Given the challenges in diagnosis and management of patients with HFpEF and obesity, it is essential to map the typical medical journey of these patients and identify potential areas for improvement. The aim of this survey-based study was to delineate the various medical touch points of patients with HFpEF and obesity, understand the role of cardiology specialists in diagnosing and managing them, and to identify the factors that influence their diagnosis and management.

Materials and Methods

Study design and participants

This cross-sectional survey was conducted in the US between September 3, 2020, and September 29, 2020. The subjects included patients with obesity who self-reported a diagnosis of HFpEF, and healthcare professionals (HCPs) who cared for such patients. All respondents were recruited via email using an online platform consisting of members who provided permission to be contacted for research purposes. Participants were informed of the nature of the survey, consented to taking part, and could withdraw at any time during the survey. Qualified participants who completed the entire survey were provided a modest monetary incentive. Western Institutional Review Board determined this study to be exempt from review, as it involved survey procedures with adequate provisions to protect the privacy of participants and maintain data confidentiality.

Separate surveys (Supplementary Material) were used for patients and HCPs; however, many of the topics were aligned to permit comparisons between the two sample groups. The

surveys were developed using information from a literature review and qualitative interviews with HCPs and patients with HFpEF and obesity. The study samples were independent, *i.e.*, the patients and HCPs surveyed were not matched pairs. The surveys consisted of a variety of yes/no, multiple-choice, and Likert-scale questions (on a scale from one to seven). Patients were queried regarding their HFpEF signs and symptoms, the experience leading up to diagnosis of HFpEF, and the management they were receiving for both HFpEF and obesity. HCPs were asked about their approach to diagnosing and managing HFpEF and obesity in patients who had both conditions.

To qualify for the study, patients were required to be US residents, 30 years of age and older, and have obesity [body mass index (BMI) ≥ 30 kg/m²] based on self-reported height and weight. Additionally, patients had to be diagnosed with heart failure by an HCP and identify that the type of heart failure was *diastolic heart failure/Preserved Ejection Fraction (HFpEF)*. We included HCPs in the survey if they were employed in US facilities (except Maine and Vermont, to comply with Sunshine reporting requirements), but did not practice at a government facility or ambulatory surgical center. All HCPs were required to be board-certified or board-eligible, and in practice for three to 35 years. Qualified HCPs were physicians, nurse practitioners (NPs), and physician assistants (PAs) practicing in primary care (family practice, general practice, or internal medicine) or in cardiology. In this paper, all HCPs practicing mainly in cardiology will be referred to as *cardiology specialists*, or simply *specialists*. Cardiology specialists who identified their subspecialty as heart failure are further denoted as *heart failure specialists*. HCPs were eligible for inclusion if they reported treating ≥ 5 [primary care practitioners (PCPs)] or ≥ 8 (cardiology specialists) patients with HFpEF and obesity in the past month.

Statistical analyses

We performed descriptive statistical analysis (means, frequencies) using Q Research Software for Windows 23 (A Division of Display, Inc., New South Wales, Australia). Tests of differences (chi square, t-tests) within respondent types were performed using Q Research Software tables; additional analyses were performed using Stata/IC 14.1. Statistical significance was set at $p < 0.05$, using 2-tailed tests. Data are presented as number and percentage for categorical variables, and continuous data expressed as the mean \pm standard deviation (SD) unless otherwise specified. Data specifically calculated to identify the number of months between diagnosis and treatment for the primary pathway followed a Poisson distribution, where the SD was calculated as the square root of the mean. Patient survey responses that followed a common sequence of key events related to the diagnosis and management of HFpEF were analyzed and termed the *typical medical journey* and will be referenced as such; unless specifically noted as the typical medical journey, data refer to the entire patient sample.

Results

Characteristics of survey respondents

Characteristics of included HCPs and patients are presented in Table 1. The survey included 114 patients with HFpEF and obesity (mean age: 55.7 years; 57% women). Although all patients had a BMI ≥ 30 kg/m² based on self-reported weight and height, only about half (54%) reported being diagnosed with obesity by an HCP. The most common HCP-diagnosed comorbidity reported by patients was hypertension, followed by obesity, sleep

apnea, type 2 diabetes, and hypercholesterolemia. Among the 200 HCPs surveyed, 139 (69.5%) were cardiology specialists. The majority of cardiology specialists were physicians (84.8%), followed by NPs (12.9%) and PAs (2%) (Supplementary Table 1). Most of the specialists were male (78%) and practiced in suburban settings (60%).

Typical medical journey

The typical medical journey, which was reported by 76% of the surveyed patients, involved the following sequence of events:

Table 1. Sample characteristics.

Characteristics of survey respondents	Patients with HFpEF and obesity (n=114)	
Mean age, years (SD)	55.7 (13.1)	
Gender, n (%)		
Female	65 (57)	
Male	49 (43)	
Mean age of symptom onset, years (SD)	47.0 (11.6)	
Ethnicity, n (%)*		
White	97 (85)	
Black/African American	18 (16)	
Spanish/Hispanic or Latino	9 (8)	
Asian	4 (4)	
American Indian or Alaska Native	2 (2)	
Other	1 (1)	
Prevalence of top 5 self-reported comorbidities that have been diagnosed by an HCP, n (%)		
Hypertension (high blood pressure)	73 (64)	
Obesity	61 (54)	
Sleep apnea	51 (45)	
Type 2 diabetes	48 (42)	
Hypercholesterolemia	43 (38)	
BMI class, n (%)		
Class 1 (30 - <35 kg/m ²)	48 (42)	
Class 2 (35 - <40 kg/m ²)	29 (25)	
Class 3 (≥ 40 kg/m ²)	37 (32)	
Characteristics of survey respondents	HCPs (n=200)	Cardiologists (n=139)
Setting, n (%)		
Urban	62 (31)	44 (32)
Suburban	113 (57)	83 (60)
Rural	25 (13)	12 (9)
Gender, n (%)		
Male	138 (69)	108 (78)
Female	59 (30)	30 (22)
Transgender	2 (1)	1 (1)
Do not identify as female, male or transgender	1 (1)	0 (0)
Mean time in practice, years (SD)	17.4 (8.1)	17.4 (8.3)
Provider specialty, n (%)		
Primary care**	61 (31)	-
Total cardiologists	139 (70)	139 (100)
Clinical cardiology specialists	94 (47)	94 (68)
Heart failure specialists	27 (14)	27 (19)
Heart failure clinic specialists	18 (9)	18 (13)

*Responses may exceed 100% due to multiple responses allowed. **Primary care providers included physicians, nurse practitioners, and physician assistants specializing in internal medicine, general practice, and family practice.

HFpEF, heart failure with preserved ejection fraction; SD, standard deviation; BMI, body mass index; HCPs, healthcare providers; PCP, primary care physician.

onset of HFpEF symptoms, initial discussion of the condition with an HCP, diagnosis of HFpEF by a cardiology specialist, and initiation of treatment (Figure 1). The remaining patients (24%) recalled experiencing these key events in a different sequence – for example, some patients reported being treated for their symptoms prior to a discussion or diagnosis of HFpEF.

Diagnosis

Patients' perspective

Nearly half of the patients (46%) recalled a provider discussing HFpEF prior to diagnosis. Patients most commonly reported having this discussion with cardiology specialists (85%), followed by PCPs (44%), pulmonologists (21%), and nutritionists (13%). At the time of diagnosis, patients reported that HCPs discussed treatments for HFpEF (79%), causes of HFpEF (61%), how HFpEF is related to, or impacts, other health conditions (61%), and progression of HFpEF (54%). Younger patients with HFpEF and obesity (age 30-45 years) were more likely than older patients (age >61) to report that progression was discussed at diagnosis (63% vs 40%). Patients recalled that their HCPs diagnosed HFpEF based on the following: echocardiogram (74%), heart function test (57%), physical exam (56%), blood tests (55%), symptoms (54%), stress test (52%), imaging such as x-ray, magnetic resonance imaging (MRI), computed tomography (CT) scan (50%), cardiac catheterization (39%), and physical function test (22%) (Supplementary Table 2).

Providers' perspective

Cardiology specialists reported personally diagnosing HFpEF in 80% of their patients with HFpEF and obesity, facilitated with the following: echocardiogram (97%), physical exam (87%), review of patient medical history (70%), order/review of blood tests (69%), stress test (53%), imaging such as x-ray, MRI, CT scan (42%), heart function test (29%), cardiac catheterization (24%), and physical function test (22%) (Supplementary Table 2). The

specific heart function and physical function tests performed were not captured by the survey.

When explaining HFpEF to patients at diagnosis, cardiology specialists were more likely than PCPs to use the terms *stiff heart* (73% vs 31%, $p<0.05$), *heart failure with preserved ejection fraction* (58% vs 38%, $p<0.05$), and *diastolic heart failure* (58% vs 26%, $p<0.05$), and less likely to use *general heart failure* (39% vs 72%, $p<0.05$) and *general heart condition* (17% vs 41%, $p<0.05$). A similar number of cardiology specialists and PCPs reported using the terms *thickened heart* (42% vs 44%) and *heart failure with ejection fraction >50%* (42% vs 36%).

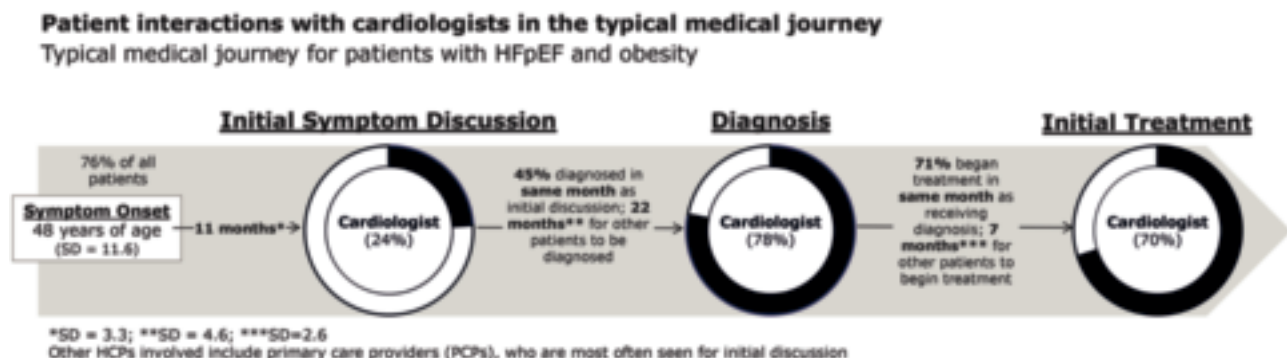
At the time of diagnosis, cardiology specialists reported discussing treatments for HFpEF (97%), causes of HFpEF (92%), interaction of HFpEF with other health conditions (74%), progression of HFpEF (71%), and referral to another HCP for HFpEF (8%). Among cardiology specialists, those sub-specializing in heart failure were directionally more likely to report discussing progression of HFpEF compared with those not sub-specialized in heart failure (80% vs 66%).

Treatment of heart failure with preserved ejection fraction and obesity

Patients' perspective

Most patients with HFpEF and obesity (65%) identified cardiology specialists as the coordinator of their HFpEF care (Figure 2). Sixty-four percent of patients in the typical medical journey also reported seeking a second opinion regarding their HFpEF diagnosis, most frequently from a cardiology specialist. At the time of the survey, the most common treatment patients reported using was medications for HFpEF (85%), followed by lifestyle changes (72%), specific diet or diet programs (36%), and prescription weight loss medication (11%).

The large majority of patients (83%) stated that their preferred source of information to learn about HFpEF and weight management would be an HCP, followed by the internet (67%) and dieticians/nutritionists (48%). From patients' perspective, heart



HFpEF, heart failure with preserved ejection fraction; SD, standard deviation.

Figure 1. Typical medical journey for patients with heart failure with preserved ejection fraction and obesity describing their interactions with cardiologists.

failure specialists were just as likely as cardiology specialists to discuss weight management with them at every visit (36%), yet they were twice as likely to prescribe prescription weight loss medication (29% vs 12%, $p < 0.05$). Among patients who had seen a cardiology specialist ($n = 96$), only a minority reported that the specialist discussed weight or weight management at most appointments (25%) or every appointment (36%).

Two-thirds (66%) of patients reported being unaware of any prescription weight loss medications. However, more than half (53%) were extremely interested in trying a prescription weight loss medication, while 26% were somewhat interested. Although 67% of patients strongly agreed that prescription weight loss medications were preferable to bariatric surgery, patients also strongly agreed that the side effects (60%) and long-term safety (51%) of such medications were concerns.

Providers' perspective

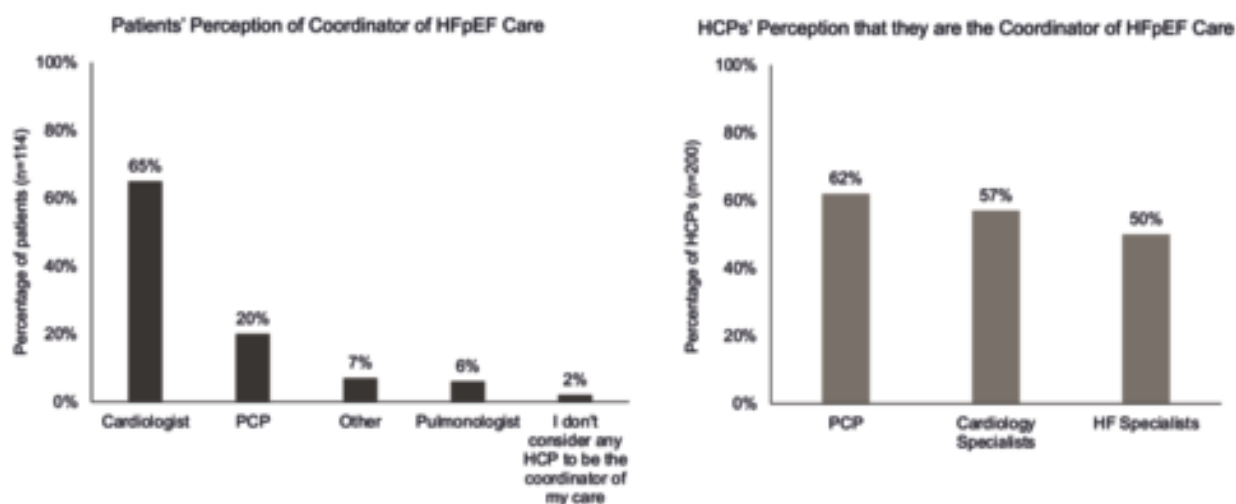
The majority of the HCPs (62% of PCPs and 57% of cardiology specialists) self-identified as the coordinator of care for their patients with HFpEF and obesity (Figure 2). Cardiology specialists were more likely than PCPs to report that they initiate (74% vs 35%, $p < 0.05$) or adjust (47% vs 31%, $p < 0.05$) treatment for HFpEF, and were less likely to report that they refer the patient to other providers for HFpEF management (5% vs 37%, $p < 0.05$). Approximately a third of cardiology specialists (34%) reported involving other HCPs in the care of their patients with HFpEF and obesity, most frequently referring patients to a registered dietician/nutritionist (22%).

Nearly 9 out of 10 cardiology specialists reported having primarily recommended lifestyle changes for their patients with HFpEF (Figure 3). More than half (60%) reported discussing weight management with their patients with HFpEF and obesity at almost every visit, with a lower proportion reporting this dis-

ussion at every visit (24%). Less than half ($n = 63$; 45%) of the cardiology specialists reported prescribing anti-obesity medications. Among these 63 HCPs, 70% reported prescribing orlistat, 52% liraglutide, 46% naltrexone-bupropion, 44% phentermine/topiramate, and 40% phentermine.

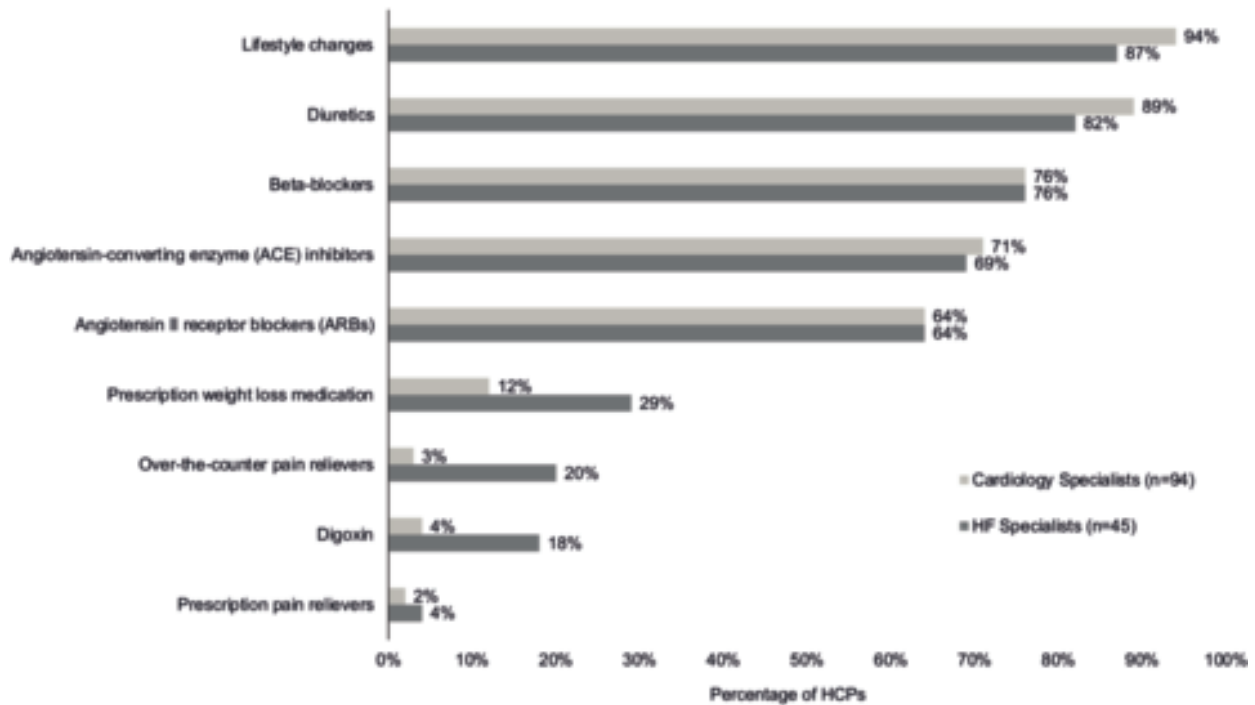
Half of the cardiology specialists (51%) felt that for their patients to lose weight, they would need to completely change their lifestyle. Only 40% of the cardiology specialists considered it their responsibility to actively contribute to the weight loss efforts of their patients (Figure 4). Heart failure specialists were more likely than general cardiology specialists to report feeling this responsibility (60% vs 40%), and to believe that the patients were beyond the point where they could lose weight without help (22% vs 7%) (Figure 4). The key barriers to obesity management identified by HF specialists and general cardiology specialists were lack of patient motivation and compliance (80% and 82%), lack of time during patient visit (49% and 55%), patient comorbidities (53% vs 43%), and lack of appropriate treatments (53% and 43%).

Although most cardiology specialists reported following clinical guidelines for HFpEF, the majority of the heart failure specialists (53%) and general cardiology specialists (66%) reported that they were either unaware of or did not follow any guidelines for obesity management. A large majority of cardiology specialists (83%) reported they had not received any formal advanced training in weight management beyond their medical education and clinical training. Lack of education on obesity/weight management for providers was reported as a barrier to managing patients with obesity by 36% of HF specialists and 44% of general cardiology specialists. Three-quarters of cardiology specialists (74%) responded that they would be interested in additional training or support for obesity/weight management, particularly education and accessibility of pharmacotherapy (27%), general conferences/workshops/webinars (22%), and education on diet/exercise (17%).



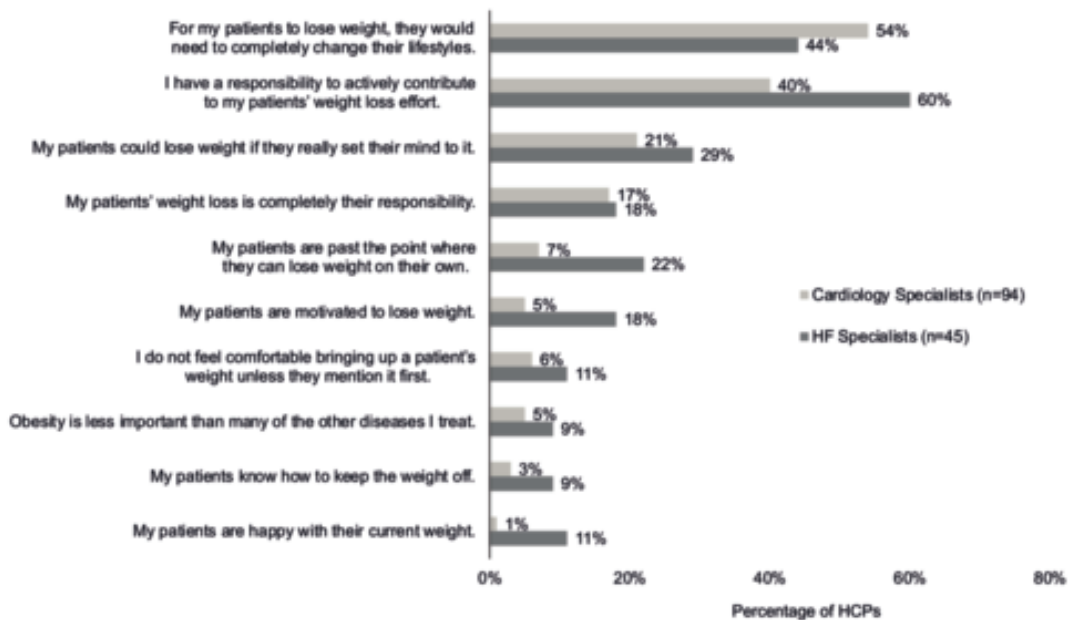
HCP, healthcare professional; HF, heart failure; HFpEF, heart failure with preserved ejection fraction; PCP, primary care provider.

Figure 2. Patient and healthcare professional perceptions of the coordinator of care for heart failure with preserved ejection fraction.



HF, heart failure.

Figure 3. Treatments reported by cardiologists who treat patients with heart failure with preserved ejection fraction and obesity to be recommended for ongoing treatment and management of patients with heart failure with preserved ejection fraction and obesity (n=139).



HF, heart failure.

Figure 4. Cardiologists' level of agreement with statements about weight loss and their role in patients' weight loss management. Respondents here indicated their level of agreement was a 6 or a 7, where 1 meant *Do not agree at all* and 7 meant *Completely agree*.

Discussion

In the current study, the medical journey of patients with HFpEF and obesity was mapped, and several key findings were noted. First, cardiology specialists are commonly perceived as the coordinators of care by patients with HFpEF and obesity. Second, more than half of the patients reported a substantial time lag between discussion of HFpEF symptoms with a provider and receiving a diagnosis of HFpEF. Third, both patients and cardiology specialists acknowledged the importance of weight management in HFpEF; however, most cardiology specialists believed that weight loss did not fall within their purview, and they reported that they did not frequently prescribe anti-obesity medications. Lastly, the majority of cardiology specialists reported they were unaware of guidelines for weight management but were interested in additional training or support for obesity management.

Patients who had discussions about the risk of HFpEF prior to diagnosis were most likely to report these conversations with a cardiology specialist. Most patients recalled receiving the diagnosis of HFpEF from a cardiology specialist, with treatment initiation and management most frequently overseen by a cardiology specialist. About half of patients were diagnosed in the same month as their initial discussion with an HCP; however, 55% of patients were diagnosed, on average, 22 months after their initial discussions with an HCP. A possible reason for this delay may be due to the pitfalls of utilizing natriuretic peptides for diagnosis in patients with obesity.^{9,15} Patients with HFpEF and elevated levels of plasma natriuretic peptides have a greater risk of death and hospitalization for heart failure than those with normal natriuretic peptide levels.^{16,17} However, patients with HFpEF and obesity often have normal natriuretic peptide levels due to increased clearing of natriuretic peptides by adipocytes,¹⁸ as well as increases in external pressure on the heart that reduce wall stress.^{6,9} Therefore, it is important to not prematurely exclude HFpEF in patients with obesity with normal natriuretic peptide levels. Deconditioning from obesity should not be perceived as the sole cause of dyspnea when HFpEF may also be present.

The current study showed diuretics were reported to be the second most common prescribed therapy by HCPs; however, new research shows that, in the absence of other indications, diuretics alone may not be the most beneficial medication.¹⁹ Indeed, recent large cardiovascular outcome trials have shown that treatment with some SGLT-2 inhibitors, such as dapagliflozin, sotagliflozin, and empagliflozin, have shown beneficial effects in reducing the risk of HF hospitalization and improved quality of life in patients living with HFpEF.²⁰⁻²² Dapagliflozin's effectiveness in reducing the risk of cardiovascular death, HF hospitalization and urgent HF visits in patients with HFpEF and heart failure with mildly reduced ejection fraction (HFmrEF) resulted in recently expanded FDA approval for the treatment of heart failure regardless of left ventricular ejection.²³ Because patients with obesity-related HFpEF have greater risk for HF hospitalization, the absolute risk reduction is even greater in these patients with SGLT-2 inhibitors, and patients with obesity-related HFpEF appear to derive greater improvement in quality of life with

these drugs.¹¹ However, the degree of weight loss with SGLT-2 inhibitors is typically modest, emphasizing the priority for considering more effective weight loss interventions as well.

Obesity is a key driver of HFpEF and can lead to a phenotype with more severe hemodynamic perturbations and greater abnormalities in venous capacitance.²⁴⁻²⁶ Recently released 2022 *AHA/ACC/HFSA Guideline for the Management of Heart Failure* identified obesity as a major comorbidity for patients with HFpEF; however, the new guideline does not address obesity management.²⁷ Incorporation of actionable strategies for weight loss, ideally as part of multidisciplinary care, should be considered in future HF guidelines. In the current survey, both patients and cardiology specialists agreed that discussions of obesity management occur frequently; however, active management of obesity reportedly occurred less frequently.

Cardiology specialists may face several challenges in managing weight. Successful lifestyle interventions are difficult to implement, rarely result in sustained weight loss, and there is no evidence to date that lifestyle interventions alone lead to improved cardiovascular outcomes. While obesity pharmacotherapy can lead to sustained weight loss, cardiology specialists have limited experience with these agents,²⁸ and certain anti-obesity agents have previously been withdrawn due to evidence of cardiovascular harm. Newer agents such as GLP-1 receptor agonists (liraglutide and semaglutide) and a GIP/GLP-1 receptor agonist (tirzepatide) have shown excellent weight-loss capabilities.²⁹ Although the long-term cardiovascular effects of these agents are currently being evaluated in patients with obesity, weight loss trials have demonstrated a safe cardiovascular profile. In light of the high prevalence of obesity in patients with HFpEF and evidence from the current study that most cardiology specialists lack formal training in obesity management, enhanced education and training may allow cardiology specialists to play a more proactive role in the management of obesity.

Limitations

As this was a cross-sectional survey, the findings come with several limitations. Diagnosis of HFpEF was self-reported by patients with HFpEF and obesity; however, screening criteria and descriptions of the condition were worded carefully to identify the patients with correct diagnoses. The possibility of recall bias cannot be excluded. Further research that includes chart audits or claims database analysis could provide validation of the self-reported data. We did not match patients to the HCPs who care for them. It is also possible that the patient population taking the survey may represent a more informed group of patients with HFpEF and obesity. Results may not be generalizable to the broader population of patients with HFpEF and obesity, as respondents may differ demographically than non-responders. There is possible responder bias among HCPs who chose to participate, indicating that not all HCPs who diagnose or treat patients with HFpEF and obesity are represented here, and those who do (particularly cardiologists) have more awareness of HFpEF and obesity than can be generalized. Although there is potential for responder bias, to mitigate this risk, the survey

topic was not revealed to respondents until they met the required screening criteria. Results may be specific to the US and may have limited generalizability to other countries.

Conclusions

Although cardiologists are viewed by patients and other HCPs as the primary diagnosticians and care coordinators for patients with HFpEF and obesity, our study demonstrated that there are opportunities for improving both awareness and education of obesity management to cardiologists.

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Contributions

All authors contributed to manuscript drafts, critically reviewed and approved the final manuscript, and agreed upon the journal target. Specifically, the authors were responsible for the following roles. JB: writing, review and editing, validation; SS: writing, review and editing; MM: writing, review and editing; CC: writing, review and editing; MSU: writing, original draft, formal analysis, validation, writing, review and editing; AH: conceptualization, funding acquisition, supervision, writing, review and editing; AS: conceptualization, funding acquisition, supervision, writing, review and editing; BB: writing, review and editing.

Conflict of interest

Javed Butler is a consultant to Abbott, American Regent, Amgen, Applied Therapeutic, AstraZeneca, Bayer, Boehringer Ingelheim, Bristol Myers Squibb, Cardiac Dimension, Cardior, CVRx, Cytokinetics, Edwards, Element Science, Innolife, Impulse Dynamics, Imbria, Inventiva, Lexicon, Lilly, LivaNova, Janssen, Medtronic, Merck, Occlutech, Novartis, Novo Nordisk, Pfizer, Pharmacosmos, Pharmain, Roche, Sequana, SQ Innovation, 3live, and Vifor.

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Melissa Magwire is a Consultant/Advisory Board Member for Novo Nordisk Inc. (Plainsboro, NJ, USA) and Boehringer Ingelheim (Ridgefield, CT, USA).

Carlos Campos is a speaker for Novo Nordisk, Lilly, and Boehringer Ingelheim (BI). He serves on the advisory board and as a consultant for Novo Nordisk, Lilly, BI and Sanofi.

Muhammad Shariq Usman has nothing to disclose.

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Online supplementary material:

Supplementary file 1. Heart failure with preserved ejection fraction patient mapping questionnaire – healthcare professionals.

Supplementary file 2. Heart failure with preserved ejection fraction patient mapping questionnaire – patients.

Supplementary Table 1. Characteristics of healthcare professionals classified as nurse practitioners and physician assistants.

Supplementary Table 2. Patient and cardiology specialist recall of methods for diagnosis and treatment of heart failure with preserved ejection fraction and obesity.