BMJ Open

'OUT OF SYNC': A QUALITATIVE INVESTIGATION OF PATIENTS' EXPERIENCES OF ATRIAL FIBRILLATION AND PERCEPTIONS OF WEIGHT MANAGEMENT.

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2022-065995
Article Type:	Original research
Date Submitted by the Author:	23-Jun-2022
Complete List of Authors:	Bates, Rachel; University of Birmingham; John Radcliffe Hospital Bailey, Cara; University of Birmingham, School of Nursing Topping, AE; University of Birmingham , Institute of Clinical Sciences ;
Keywords:	Adult cardiology < CARDIOLOGY, Cardiac Epidemiology < CARDIOLOGY, Pacing & electrophysiology < CARDIOLOGY, Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, NUTRITION & DIETETICS, QUALITATIVE RESEARCH

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'OUT OF SYNC': A QUALITATIVE INVESTIGATION OF PATIENTS' EXPERIENCES OF ATRIAL FIBRILLATION AND PERCEPTIONS OF WEIGHT MANAGEMENT.

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Word count:3993

Key words: Atrial fibrillation, overweight, weight loss, patients, COM-B, qualitative

ABSTRACT

Objectives: To explore ways to enhance the design of risk factor management and weight-loss services for people with overweight/obesity and atrial fibrillation (AF).

Background: AF is the most common cardiac arrhythmia, with serious consequences for health and quality of life. Some evidence indicates weight reduction in people with AF and overweight/obesity may improve symptoms. This population may require additional support with weight management due to factors associated with aging and health.

Design: Qualitative investigation based on semi-structured interviews.

Methods: 12 adult participants (4 female, 8 male) with diagnosed AF and a current or previous BMI>27kg/m^2 were recruited at a large tertiary cardiac referral centre in southern England. Participants completed quality of life and AF symptom questionnaires using Think-Aloud technique and semi-structured interviews relating to their weight management experiences, needs and preferences. Interviews were audio recorded and analysed thematically using the COM-B behaviour change model as a theoretical framework.

Results: Three main themes were identified. *Being Out of Rhythm* explores the psychological and physical impact of AF on weight management; *Doing the Right Thing* discusses participants' weight management experiences; *Broaching the Subject* explores participants' perspectives on weight management conversations with clinicians.

Conclusions: There was dissatisfaction with the weight management advice received from health care professionals including cardiologists. Participants wanted open, non-judgemental discussion of cardiac health implications of overweight/obesity supported by referral to weight management services. Improved communication including research findings regarding the benefits of weight-loss as a factor in AF management might increase motivation to adhere to weight-loss advice in this population.

ARTICLE SUMMARY

Strengths and limitations of this study

- Explores views and experiences of patients with AF, illuminating barriers to weight management

- The COM-B behaviour change model facilitated application of findings to strategies to improve clinical practice
- Only included the views of people willing to discuss weight management
- Participants were recruited from an ethnically homogeneous population, further research is needed to fully reflect the perspectives of the wider population.

Competing Interests: The authors declare they have no competing interests

INTRODUCTION

Mounting evidence demonstrates weight-loss improves symptoms and slows disease progression in people with atrial fibrillation (AF) and overweight[1]. Yet despite convincing evidence of the health benefits, few cardiac patients with overweight achieve healthy weight management in the long-term[2]. Weight-loss is a complex and sometimes onerous undertaking, subject to multifactorial biological, behavioural[3], socioeconomic, environmental and personal influences[4, 5]. Incidence of AF increases with age, meaning patients are likely to be older and experience more concurrent conditions than the populations in general weight management studies. Better understanding of the lived reality of these factors could improve the design of weight management services for this population.

A qualitative synthesis of studies examining weight management among myocardial infarction (MI) patients undertaking cardiac rehabilitation found the cardiac event served as a "wake-up call", revealing the extent of damage to health[6-8]. Although motivated to lose weight, individuals often felt overwhelmed and lacked knowledge and strategies to enact lifestyle changes[6-8]. Referral to weight management services was valued and access to supervised exercise facilities allayed safety concerns[6, 8]. Personalisation of services increased acceptability and compliance[8].

The experiences of people with AF are different from those recovering from MI – AF is not acutely life-threatening, cardiac rehabilitation is not routinely provided, treatment success rates vary[9]. Growing evidence indicates advice to patients with AF should include proactive weight management[10, 11] but the guidance on how to tailor advice and services to meet patients' needs is limited. No existing qualitative literature explores the experiences of people with overweight and AF, hence this study.

The study was carried out in accordance with the Declaration of Helsinki and the principles of Good Clinical Practice. Ethical approval was granted by London-Bromley Research Ethics Committee (20/LO/0356).

Language and Definitions

Overweight and obesity are defined by the World Health Organisation as a body mass index (BMI) equal to or greater than 25 kg/m^2 or 30 kg/m^2 respectively[12]. The inclusion criteria for this study adopted a BMI of 27 kg/m^2 or greater, in line with other quantitative studies of

overweight and AF[10, 11]. The term “overweight” is used in this report to describe a BMI of 27 kg/m^2 or over, except when discussing other studies which specifically investigate obesity.

METHODS

Patient and Public Involvement

Advice on study design, relevance and acceptability was obtained from two volunteers with AF (one volunteer also had BMI>27kg/m^2) via a Patient and Public Involvement (PPI) bulletin. Minor alterations to the patient information sheet were made as advised. No changes to the study design were suggested.

Design

A qualitative interview study design was used to explore patients’ perspectives and experiences[13] of living with AF and overweight. Because weight management involves behaviour change, the COM-B model[14] was used as the theoretical framework. COM-B identifies capability, opportunity and motivation as the three essential elements for behaviour change. These elements form the hub of the Behaviour Change Wheel that represents the complexity of the economic, social and political influences that interact with COM elements ultimately determining behavioural choices[15]. The model was embedded in study design, as a topic guide for interviews, and as a framework for data analysis to enhance theoretical coherence and consistency[16]. The study is reported following the COREQ guidelines[17] (appendix A) to ensure comprehension and transparency.

Context and Sampling

Twelve participants were purposively recruited from outpatient services at a large tertiary referral centre in southern England. All participants had to have AF, have current or previous BMI of 27 kg/m^2 or over, and be able to converse in English in order to gain an understanding of the weight management issues they faced[13] (see Table 1 for selected participant characteristics). Recruitment continued until data saturation was reached. Potential participants were approached during hospital appointments by the direct care team and provided with a patient information sheet. Fourteen patients were approached in total; two declined, stating they did not wish to discuss weight management.

Age range	Employment	Education	BMI	Type of AF	Years since AF diagnosis	Symptomatic	Reported previous weight loss (kg)	Weight loss method
70-79	Retired teacher	Higher	30	Paroxysmal	>10	Yes	19 (regained)	Very low calorie (self directed)
70-79	Retired from food industry	Secondary	43	Paroxysmal	5	Yes	Not reported	Very low calorie (self directed)
60-69	Cook	Secondary	25	Paroxysmal	>10	Yes	19	Dietary, self-directed
60-69	Hospitality	Further	28	Persistent	9	Yes	22 (regained)	Slimming World
50-59	Tradesperson	Secondary	28	Persistent	<1	Yes	4	Diet and exercise, self-directed
60-69	Leisure industry (retired firefighter)	Further	41	Persistent	2.5	Yes	50 (partially regained)	Slimming World
50-59	Retired firefighter	Secondary	37	Persistent	1.5	Yes	19 (regained)	Previously Slimming World. Now on BHF diet (LOSE-AF study)
60-69	Nurse	Higher	41	Paroxysmal	9	Yes	Not reported	Various
60-69	Carer	Further	36	Paroxysmal	>10	Yes	11	Diet and exercise, self-directed
60-69	Tradesperson and business owner	Secondary	31	Persistent	>10	No	53 (partial regain)	Previously Aloe Vera diet. Now Cambridge 1:1 (LOSE-AF study)
50-59	Teacher	Higher	34	Persistent	3	Yes	28 (partial regain)	SlimFast
70-80	Retired electronics engineer	Further	37	Persistent	<1	Yes	7	Cambridge 1:1 (LOSE-AF study)

Table 1. Selected participant demographics and characteristics

Data Collection

Interviews were conducted by an experienced female, M-level trained, research nurse (RB). This information was included in the patient information sheet. One participant was previously known to RB through participation in an unrelated clinical trial. All others were unknown. Interviews were conducted over the telephone due to the COVID-19 pandemic that restricted research and elective clinical activity. The participant known to RB chose to be interviewed face-to-face in a research facility clinic room after attending a hospital appointment. Two participants were interviewed with their partner in attendance. Interviews lasted between 31 and 100 minutes with an average duration of 55 minutes.

The interview process was carefully planned by RB, CB & AT to encourage participants to feel comfortable and able to speak openly about their weight management experiences with a focus on service improvement[18]. Participants' experiences were explored using semi-structured interviews[19]. To reduce any discomfort discussing weight and to focus on AF[20] participants began by completing two questionnaires: Atrial Fibrillation Symptom Severity Scale[21]; EQ-5D-5L[22] using a Think-Aloud[23] technique. RB encouraged participants to verbalise their thoughts whilst completing the questionnaires which enables deeper reflection, self-awareness and insight into the meanings behind their responses about behaviours and decisions[23]. The Think-Aloud technique facilitated identification of instances where questionnaire responses reflected adaptations in expectations to accommodate worsening health[24], and has been used previously to explore the support needs of patients with AF[25]. A topic guide based on the COM-B model helped frame the ongoing interview around physical and psychological capabilities, opportunities, and motivation for weight management with reference to the questionnaire responses[18]. For example, "In the category "Usual Activities" you answered "I have slight problems doing my usual activities" - can you tell me a bit about what your usual activities include? What do you consider the reasons for these problems? [Capability]".

Analysis

Interviews were audio recorded and transcribed by a researcher (RB). Field notes were written to record responses, reflections, assumptions and evolving interpretations following each interview and supplemented during transcription[20]. A summary of the interview was provided to each participant before analysis to confirm it captured an accurate representation of their views, meanings, and intentions. Participants had the opportunity to

clarify any parts they did not agree with (no participants asked for changes to be made) and to confirm their continuing consent for their data to be used.

The transcribed data were imported to a spreadsheet and coded line-by-line to identify processes and phenomena by RB and checked by CB and AT. Codes were mapped onto the COM-B framework and organised into sub-themes. As working themes were identified, a re-coding process was carried out to maintain thematic coherence[26] (see Table 2 for examples of this process). As coding progressed, themes were identified reflecting the interplay between the elements of the COM-B model (see Figure 1). The resulting schema was checked against the original interviews to ensure participants' various perspectives were fairly represented[27] and agreed within the research team.

Quote	Initial codes (Initial framework theme)	Re-coded to	COM-B category	Theme
"It bothers me.. not the actual.. It bothers me that I can hear it in my ears more than anything" – male, age 70-79	Annoying symptoms (What it feels like for me)	Psychological impact of AF	Motivation	Being out of rhythm
"At the minute, touch wood.. it feels like it wants to start, like at work today it kind of skipped a beat and I thought oh no please don't start!" – female, age 60-69	Touching wood (Motivation); Dreading relapse (Capability – Psychological)	Psychological impact of AF	Motivation	Being out of rhythm
"I know if I lost half a stone I would feel that little bit quicker, a bit lighter, but I wouldn't want to lose any more than that because it would like take that bit of strength away" – male, age 50-59	Being big and strong (Motivation - reflective)	Desire to lose weight - confounding factors	Motivation	Doing the right thing
"But yeah that's what I'd like, to go through foods with me, to say well no you can't really have that – I'm only thinking I'll have that because it's got no sugar in it – do you know what I mean? But I don't think about maybe the fat content. I think about the sugar content, I think oh great I can have that – do you know what I mean? So.. It's someone to sit and educate me, more than anything." female, age 60-69	Nutritional knowledge (Capability - psychological); Desired help (Opportunity – physical); Wanting to talk about weight (Motivation – automatic); Changing diet (Behaviour Change)	Weight management knowledge; Desired help	Capability, Opportunity, Motivation; Behaviour Change	Doing the right thing
"I can't remember exactly what she said but I think it was around the weight issue. But none of them, none of them have said that the weight was an issue for any of the procedures that were going to be done, so I didn't make much of it other than to say you know that.. But it's usually that if you lose a bit of weight then.. I don't know I can't remember what they said but basically lose some weight – it wasn't an order, it was just advice." - male, age 50-59	Risks not explained (Motivation – reflective); Choosing what to hear (Motivation – automatic).	Patient education	Motivation	Broaching the subject
"Years ago when I lived in [city] um, they could, sounds silly I know but they could put the gym on prescription for so many months, which is what one doctor done for me and I used to go to the gym, um, oh two, three times a week then.." - female, age 60-69	Having weight loss prescription (Motivation – reflective); Doing exercise (Capability – physical).	Being referred	Motivation, Opportunity	Broaching the subject

Table 2. Examples of coding and thematic analysis process

FINDINGS

Participants

The sample included four women and eight men, a gender ratio which corresponds to the general AF population[28]. Ages ranged from 50 to 76. A range of socioeconomic, educational, and professional backgrounds were represented. All participants identified as White British, consistent with the demography of the AF population managed at the study site.

Time since AF diagnosis ranged from four months to fifteen years. Five participants had paroxysmal AF (occurring in self-limiting episodes lasting less than one week) and seven had persistent AF (lasting more than one week). Eleven participants reported comorbidities which impacted on their activities of daily living and quality of life.

BMI ranged from 25 (after sustained weight-loss) to 43 kg/m^2. All participants reported having lost weight at some point in life, from 4kg to 53kg, but most, at least partially, had regained weight.

Being out of rhythm

Being out of rhythm describes the physical and psychological disruption AF caused to participants' lives. Symptoms impeded day-to-day activities, corresponding with the capability component of COM-B. Participants characterised these limitations as a life having lost its rhythm: They could no longer live the life they wanted while experiencing AF and were left waiting to regain their rhythm, both cardiologically and metaphorically. Waiting for treatment, uncertainty of its effectiveness, and fear of relapse appeared to sap motivation to engage in healthy lifestyle behaviours.

> "I just feel edgy when it's out of sync… I can't wait for it to drop back into rhythm"
> – female, age 70-79

The physical impacts of AF included fatigue, breathlessness, chest pain, palpitations, and faintness and ranged in severity from mild to debilitating. Nine of the twelve participants had been hospitalised with severe symptoms, and eleven had undergone cardioversion or ablation for symptom management. Although reassured by their cardiologists that AF is not life-threatening, the onset of symptoms could still induce significant anxiety and sometimes panic. This was typified by a healthcare professional participant, who struggled to reconcile her objective clinical understanding of AF with the subjective distress she felt when experiencing arrhythmias:

> "It is horrible, it is horrible... and it can come on at any time so if I'm at work or at a meeting… you haven't even got a chance to be away from anyone noticing you're not very well … you don't want people to know you're in AF. Especially people my office who are nurses, they're not going to take much notice really!" – female, age 60-69

Symptoms impacted family activities, work, housekeeping, hobbies and sleep patterns. The sense of life being suspended was experienced as a *Life on hold*. Some participants felt unsafe and deliberately limited their activities for fear of precipitating an episode of AF or damaging their heart. Participants who had previously been active identified their symptoms as a cause of weight gain. Inability to exercise impacted energy expenditure, but could also affect motivation by disrupting social lives and removing pleasure. Physical limitations often had psychological ramifications, causing frustration and anxiety about deteriorating health and aging.

> "It's doing my head in to a point. I hate it. Frustration is a massive thing because I'm in my 50s and like I said I'm an ex-firefighter and all that stuff and I'm used to being healthy and active, I'm not someone for sitting around and watching TV all day." – male, age 50-59

Returning to sinus rhythm was for some the only way to regain health and previous lifestyles. This resulted in postponing weight management attempts until such a time when, back in rhythm, they would regain the mental energy to focus on diet and the physical capability to exercise.

Doing the right thing

All participants recognised overweight as unhealthy and undesirable, and articulated positive health behaviours as *Doing the right thing*. Inability to sustain weight-loss despite following advice to the best of their ability caused significant frustration.

> "I try and eat healthily – we *do* eat healthily – we have fruit and veg more, far more than five portions a day, so I believe we eat healthily. I try and exercise, um, so at the moment I'm on this healthy diet that the British Heart Foundation recommend, and my wife's good at measuring out portion sizes and this sort of thing… So we've been doing that for a couple of weeks now and it's ok but I've only lost – for me – hardly anything, like a pound or two" – male, age 60-69

Many participants expressed a sense of unfairness and perceived social judgement toward people with overweight. For some, this created internal conflict as they sought to counter assumptions, while simultaneously berating themselves for a lack of self-discipline. Others

viewed their own ill-health as a cause of weight gain, not a consequence of long-term overweight. Four male participants with physically demanding jobs associated being big with being strong.

All participants reported having lost weight at some point in life, citing general health concerns or body image as motivating factors. Organised diet programmes and meal replacement products were identified as helpful in achieving significant weight-loss by six participants. Others preferred to self-manage, drawing on calorie reduction and exercise advice from a variety of sources. Repeat cycles of dieting and weight regain were common across the participants. Loss of motivation was frequently cited as precipitating weight regain, often associated with relaxing diet regimes around holidays or weddings. Only one participant maintained her weight-loss in the long term, which coincided with significant changes in her lifestyle and personal relationships.

Body as victim, body as culprit illustrates participants' experiences of managing weight in a body over which they did not feel fully in control. The body was seen as a victim of illness and aging, with AF conceptualised as an external aggressor to be kept at bay through medication and management of risk factors. Conversely, the body could play the role of culprit in the struggle to achieve a healthy weight, being pre-disposed to weight gain by "genetic" factors or childhood eating habits. Two participants described food as an addiction, experiencing bodily cravings which they lacked the psychological strength to overcome

Broaching the subject

Broaching the subject explores participants' perceptions of consultations where weight management was discussed (or not). Participants indicated they would be open to discussing their weight within the context of a clinical consultation, but perceived health care professionals were reluctant to engage in frank discussion. Only one participant knew that overweight is a risk factor for developing AF, and none were aware of evidence for weight-loss improving AF symptoms[10, 11]. Many reported doctors "mentioning" their weight, which became repetitive and irritating when not accompanied by specific explanations of the health risks, or offers of help.

> "The trouble is, it's all very well them saying "You should lose weight" but I couldn't. You know it's difficult to find proper sensible advice on how to do this. You know there are all these companies that set up but they're in there to make money." – male, age 70-79

Many appeared to deny that their health might be damaged by their overweight having never been unequivocally told. When healthcare professionals broached weight management but

omitted to refer patients to relevant services, patients sometimes interpreted that their weight was not yet a cause for concern and that behaviour change could be postponed. Some reported requesting help, but that the sort of help they wanted was not available. Preferences varied widely, from very low calorie meal replacements, dietician review, cognitive behavioural therapy, to bariatric surgery. The profusion of conflicting weight management advice in the media and suspicions about commercial motivations of providers discouraged some participants from committing.

Sova was the sole participant who reported having a meaningful conversation about weight with her cardiologist. She saw this conversation as positive and constructive, despite feeling confronted.

> "That was a good conversation. Quite a scary one but a good one in that respect because no-one's actually said AF and weight – that's the first. And also that's the first time I've ever actually had that proper conversation about it" – female, age 60-69

On discussion with participants of evidence linking weight-loss with improvement in AF, all indicated this information would motivate them to persist with weight management.

DISCUSSION

Summary of findings

This is the first qualitative study to explore the weight management experiences of people with AF and overweight. Interviews with twelve participants were analysed using a COM-B framework to illuminate factors affecting sustained weight management. The analysis identified three main themes: Being out of rhythm; doing the right thing; and broaching the subject. The interplay between the themes and the elements of COM-B (Fig 1.) highlights areas where improvements in service provision and communication could support patients to initiate and persist with healthy behaviour change.

Participants in this study appeared unaware of the potential benefits of weight-loss to manage AF. Further, while all participants recognised overweight as a general health risk, most failed to make the association to their own cardiac health. Those who recognised the general health risk of overweight expressed self-blame and anger at their perceived weakness and lack of self-control to sustain weight-loss.

The role of COM-B

COM-B provided a guide for the interviews and analysis, creating a framework for better understanding behaviour change. In this study participants reported having changed behaviour and demonstrated capacity, opportunity and motivation to do so but changes were short-lived and not sustained or habituated

The focus on participants' capabilities, opportunities and motivations uncovered various barriers to weight management including reduced physical activity due to AF symptoms, fear of damaging the heart, inadequate communication and support from healthcare professionals, knowledge gaps, and lack of access to 'trusted' advice and weight management services. Identification of strategies to overcome these barriers could be guided by reference to the outer rings of the Behaviour Change Wheel[15], for example education and enablement of patients with AF though cardiac rehabilitation provision[29].

Participants had all lost weight

Somewhat unexpectedly, participants universally reported successful weight-loss efforts– albeit rarely sustained in the longer term. This in contrast to the commonly held assumption of healthcare professionals that people with overweight are non-compliant with recommended health behaviours[30]. Indeed, research shows most people with overweight have tried or are trying to lose weight[31]. Participants were demoralised by health care professionals' failure to acknowledge weight-loss, a finding consistent with previous studies of weight management[32].

AF symptoms interfered with weight management

The experience of AF symptoms impacted on participants' willingness to engage in regular exercise that might contribute to weight management. Concerns about damaging the heart are unfounded, indeed studies have shown physical exercise reduces AF burden and improves quality of life[33]. Food was seen as a source of comfort during times of anxiety caused by AF symptoms, provoking resistance to weight management through calory-restriction alone. Several participants spoke of postponing weight-loss attempts until an anticipated future time when treatment would restore sinus rhythm. Advances in AF treatment are successfully restoring sinus rhythm in a greater number of patients[34], but to rely solely on medical intervention as the solution would be misplaced. It would seem patients need to become true partners in their care, but that will require greater candour in consultations about lifestyle change as a recommended strategy to improve AF and overall health[35].

Participants didn't associate AF with overweight

The findings indicate there were significant gaps in knowledge of AF risk factors. Reframing health communication to underscore the weight-loss and AF message might serve to better motivate healthy behaviour change.

People who have experienced MI report fear of dying motivated subsequent weight-loss attempts[6, 7, 8]. The participants who had experienced severe, sudden-onset AF described experiencing fear, vulnerability and disrupted self-image comparable with those who have had an MI. This fear did not translate into motivation to lose weight possibly because, unlike cardiovascular disease, AF is not widely associated with overweight in the public consciousness[36].

Lack of awareness of the overweight-AF connection suggests communication of research findings is limited in consultations with patients. A recent survey conducted at three hospitals in Belgium found nearly 70% (n=143) of participants were aware of the benefits of weight reduction for AF management[37]. It would be valuable to examine if health messaging and advice are different and offer learning to enhance the content of consultations and/or pathways of care.

Getting the tone of weight conversations right is paramount

In common with the wider weight management literature [32, 38], participants in this study wanted frank, non-judgemental discussion focussed on the health impact of overweight, positive reinforcement of steps they were currently taking, and referral to weight-loss support services. Advice from health care professionals was seen as 'trustworthy' while commercial services were often viewed with suspicion.

Shame, vulnerability and stigma are widely reported by people with obesity[39]. Perceptions that healthcare professionals judge patients negatively on the basis of their body-size can be counterproductive to motivating engagement in weight management[32, 40, 41] and may lead to avoidance of healthcare encounters[42, 43]. This may be amplified for people with AF in response to feelings of vulnerability due to symptoms; a finding in this study echoing others that explored the experiences of people living with AF[25, 44].

Healthcare professionals are encouraged to discuss weight opportunistically[45] but many participants in this, and other weight management studies[32], have little recollection of the subject being raised. Some participants interpreted this omission to mean their weight was not a concern, again supported in the literature[32]. Patients expect healthcare professionals to discuss their weight when it is clinically relevant, and feel let down when they do not[38], a sentiment echoed by some participants in this study. Opportunistic "mentions" of weight and

what they perceived as poor quality information left participants feeling irritated and patronised, especially when not backed up by explanations of the impact of weight-loss on their health, congruent with other studies[32].This dissonance between patient preferences and healthcare professionals' interactions may be due to lack of skills when discussing weight management or fear of engendering a negative reaction[46].

Almost all participants in this study, similar to others[32], indicated a willingness to be referred to weight management services. Referral to cardiac rehabilitation has been shown to be motivational to patients with cardiovascular disease and overweight[6, 8]. Explaining the evidence-based benefits of weight-loss to improving AF symptoms, and providing a referral might go some way to addressing the absence of control described in this study. This may offer some agency over both the *out of rhythm* body and prognosis.

Limitations

This study reflects only the views of people who were willing to discuss weight management as those who were unwilling declined the invitation to participate. The sample was homogeneous - all participants identified as white British. This represented the demographic profile of patients treated for AF at the study centre, and may limit transferability.

The study was conducted during the COVID-19 pandemic. Some participants noted that their responses to questions were affected by temporaneous restrictions placed on access to opportunities to exercise and socialise. COVID-19 social distancing precautions necessitated the use of telephone interviews for data capture. Historically, telephone interviews were considered "second rate" but arguably they give control to the interviewee who is on their own territory[47]. Telephone interviews provide visual anonymity, minimising perceived judgement based on physical appearance to which people living with overweight may be sensitised[32], and reduce the temptation to follow "cultural scripts"[48] associated with healthcare encounters.

RECOMMENDATIONS

The findings clearly identify the need to improve communication, particularly strengthening the signalling of important research based evidence to patients where weight management might improve AF symptoms and disease progression. This message could be incorporated in face-to-face discussions in out-patient clinic, in patient information leaflets, or posters

displayed in waiting areas accompanied by details of weight-loss services available through the hospital and in the community.

Locally and more widely, healthcare professionals may benefit from additional training to increase confidence and efficacy in discussing weight with patients. Future research could investigate health education behaviour change among healthcare professionals by applying COM-B to identify gaps in their capability, opportunity and motivation to intervene.

Weight management advice needs to be reinforced with a referral. Options available to clinicians are limited and tend to involve primary care referrals (e.g. NHS Digital Weight Management Programme, commercial weight management programmes). Extending access to these schemes to secondary care teams could provide another opportunity to support patients with weight management.

CONCLUSIONS

This study highlights the importance of sensitive and thoughtful weight management discussion with AF patients and the importance of sharing research findings about weight-loss as a means of reducing symptom burden and reversing disease progression. Patients appeared open to difficult conversations about weight within health consultations and expected professionals to address this topic candidly with them. Offering positive feedback on weight management efforts, providing reassurance about the effect of exercise on AF, and offering a referral to appropriate services are all ways in which healthcare professionals can promote weight management behaviour change. Skills training to augment healthcare professionals' confidence when discussing weight management may contribute to person-centred care within this population.

ACKNOWLEDGMENTS

Dr Maria Clark for advice on use of the COM-B model.

Crad Allerton and Tony Elliott for providing PPI advice

Dr Kim Rajappan for providing clinical oversight.

LEGEND

Figure 1. Map of themes with relation to COM-B elements[15]

COMPETING INTERESTS

There are no competing interests for any author

FUNDING

This work was supported by Oxfordshire Health Services Research Committee grant number 2020-1349.

STUDY REGISTRATION

The study is registered at https://www.researchregistry.com/ ID researchregistry5142

ETHICS STATEMENT

The study was carried out in accordance with the Declaration of Helsinki and the principles of Good Clinical Practice. Ethical approval was granted by London-Bromley Research Ethics Committee (20/LO/0356).

CONTRIBUTORSHIP STATEMENT

Rachel Bates: Conceptualisation; Methodology; Investigation; Data curation; Writing, original draft; Project Administration; Funding acquisition.

Cara Bailey: Conceptualisation: Methodology; Writing, review and editing; Supervision

Annie Topping: Conceptualisation Methodology; Writing, review and editing; Supervision

DATA SHARING STATEMENT

Data are available University of Birmingham UBIRA eData repository with a CC-BY licence DOI: https://doi.org/10.25500/edata.bham.00000851

REFERENCES

1 Powell-Wiley T, Poirier P, Burke L, et al. Obesity and Cardiovascular Disease: A Scientific Statement From the American Heart Association.*Circulation* 2021;143(21):e984-e1010. doi: 10.1161/CIR.0000000000000973. Published online first 22 April 2021.

2 Gomadam P, Douglas C, Sacrinty M, et al. Degree and Direction of Change of Body Weight in Cardiac Rehabilitation and Impact on Exercise Capacity and Cardiac Risk Factors. *Am J Cardiol* 2016; 117:580-5. doi: 10.1016/j.amjcard.2015.11.045. Published online first 7 December 2015.

3 Ghosh S, Bouchard C. Convergence between biological, behavioural and genetic determinants of obesity. *Nat Rev Genet* 2017;18(12):731-748. doi: 10.1038/nrg.2017.72. Published online first 9 October 2017.

4 Garip G, Yardley L. A synthesis of qualitative research on overweight and obese people's views and experiences of weight management. *Clin Obes* 2011;1(2-3):110-26. doi: 10.1111/j.1758-8111.2011.00021.x.

5 Greaves C, Poltawski L, Garside R, et al. Understanding the challenge of weight loss maintenance: A systematic review and synthesis of qualitative research on weight loss maintenance. *Health Psychol Rev* 2017 Jun;11(2):145-163.doi: 10.1080/17437199.2017.1299583. Published online first7 April 2017.

6 Gallagher R, Kirkness A, Armari E, et al. Weight management issues and strategies for people with high cardiovascular risk undertaking an Australian weight loss program: A focus group study. *Nurs Health Sci* 2012;14(1):18-24. doi: 10.1111/j.1442-2018.2011.00651.x.Published first online 31 Jan 2012.

7 Nadarajah S. A Phenomenological Study on Lived Experiences of PsychoSocio-Spiritual Healing in Cardiac Rehabilitation Patients. 2012. http://hdl.handle.net/10713/2316

8 Kramer-Kile M. Diet Projects: A Study of Cardiac Rehabilitation Participants Engaged in Changing Dietary Practices.*Semantic Scholar* 2013 Corpus ID 149024773.

9 Andrade JG, Champagne J, Dubuc M, et al. Cryoballoon or Radiofrequency Ablation for Atrial Fibrillation Assessed by Continuous Monitoring. *Circulation* 2019;140(22):1779-1788. doi: 10.1161/CIRCULATIONAHA.119.042622. Published first online 21 October 2019.

10 Abed HS, Wittert GA, Leong DP, et al. Effect of Weight Reduction and Cardiometabolic Risk Factor Management on Symptom Burden and Severity in Patients With Atrial Fibrillation. *JAMA* 2013;310(2050-2060). doi: 10.1001/jama.2013.280521.

11 Pathak R, Middeldorp M, Meredith M, et al. Long-Term Effect of Goal-Directed Weight Management in an Atrial Fibrillation Cohort. *J Am Coll Cardiol* 2015;65(20):2159-69. doi: 10.1016/j.jacc.2015.03.002. Published first online 16 March 2015.

12 World Health Organisation. *Obesity.* [Online] https://www.who.int/health-topics/obesity. Visited 28 June 2021.

13 Cresswell J. *Research Design Qualitative, Quantitative and Mixed Methods Approaches.*3rd Edition. Thousand Oaks, CA: SAGE, 2009:3-21

14 Michie S, van Stralen MM, West R.The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;6:42. doi: 10.1186/1748-5908-6-42.

15 Michie S, Atkins L, West R. *The Behaviour Change Wheel: A Guide to Designing Interventions.* London: Silverback Publishing, 2014.

16 Bradbury-Jones C, Taylor J, Herber O. How theory is used and articulated in qualitative research: Development of a new typology. *Soc Sci Med* 2014;120:135-41. doi: 10.1016/j.socscimed.2014.09.014. Published first online 6 September 2014.

17 Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;19(6):349-57. doi: 10.1093/intqhc/mzm042. Published first online 14 September 2007 Sep 14.

18 McIntosh M, Morse J. Situating and constructing diversity in semi-structured interviews. *Glob Qual Nurs Res* 2015;2: 2333393615597674. doi: 10.1177/2333393615597674. Published first online eCollection Jan-Dec 2015.

19 Mitchell G. Use of interviews in nursing research. *Nurs Stand* 2015;29(43):44-8. doi: 10.7748/ns.29.43.44.e8905..

20 Whiting L. Semi-structured interviews: guidance for novice researchers.Nurs Stand 2008; 22(23):35-40. doi: 10.7748/ns2008.02.22.23.35.c6420.

21 Dorian P, Cvitkovik S, Kerr C, et al. A novel, simple scale for assessing the symptom severity of atrial fibrillation at the bedside: The CCS-SAF Scale. *Can J Cardiol* 2006;22(5):383-6. doi: 10.1016/s0828-282x(06)70922-9

22 EuroQol Research Foundation. EuroQol EQ-5D-5L. https://euroqol.org/eq-5d-instruments/eq-5d-3l-about/ 2017 Amsterdam

23 Charters E. The Use of Think-aloud Methods in Qualitative Research An Introduction to Think-aloud Methods. *Brock Education Journal* 2003;12:12-38. doi: https://doi.org/10.26522/brocked.v12i2.38

24 Bailey C, Kinghorn P, Orlando R, et al. Using 'think-aloud' and interview data to explore patient and proxy completion of health and capability measures at the end of life. In: J. Coast (Ed.), *Qualitative methods for health economics*. London, UK: Rowman & Littlefield 2017:231-244

25 Zhang L, Gallagher R, Lowres N, et al. Using the 'Think Aloud' Technique to Explore Quality of Life Issues During Standard Quality-of-Life Questionnaires in Patients with Atrial Fibrillation. *Heart Lung Circ* 2017;26(2):150-156. doi: 10.1016/j.hlc.2016.05.121. Published fist online 14 July 2016

26 Saldaña, J. *The Coding Manual for Qualitative Researchers.* 3rd Ed. Los Angeles 2015: SAGE: 188-193

27 Carter N, Bryant-Lukosius D, DiCenso A, et al. The use of triangulation in qualitative research. *Oncol Nurs Forum* 2014;41(5):545-7. doi: 10.1188/14.ONF.545-547

28 Magnussen C, Niiranen TJ, Ojeda FM, et al. Sex Differences and Similarities in Atrial Fibrillation Epidemiology, Risk Factors, and Mortality in Community Cohorts. *Circulation* 2017;136(17):1588-1597. doi: 10.1161/CIRCULATIONAHA.117.028981. Published first online 16 October 2017

29 Williamson TM, Wilton S, Arena R, et al. Abstract P215: A Qualitative Exploration Of Barriers And Facilitators To A Cardiac Rehabilitation-based Weight Loss Program For Patients With Atrial Fibrillation And Obesity. *Circulation* 2022; 145:AP215. https://doi.org/10.1161/circ. Published first online 7 April 2022.

30 Phelan SM, Burgess DJ, Yeazel MW, et al. Obesity stigma and patient care. Obes Rev 2015;16:319-326. doi: 10.1111/obr.12266. Published first online 5 March 2015

31 Piernas C, Aveyard P, Jebb S. Recent trends in weight loss attempts: repeated cross-sectional analyses from the health survey for England. *Int J Obes* 2016;40(11):1754-1759. doi: 10.1038/ijo.2016.141. Published first online 16 August 2016.

32 Ananthakumar T, Jones N, Hinton L, et al. Clinical encounters about obesity: Systematic review of patients'perspectives. *Clinical Obesity* 2019;10: e12347. https://doi.org/10.1111/cob.12347

33 Elliott AD, Mahajan R, Pathak RK, et al. Exercise Training and Atrial Fibrillation. *Circulation* 2016; 133:457–459. doi: 10.1161/CIRCULATIONAHA.115.020800. Published first online 5 January 2016.

34 Kirchhof P, Benussi S, Kotecha D, et al. ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS . Eur J Cardiothorac Surg 2016 Nov;50(5):e1-e88. doi: 10.1093/ejcts/ezw313. Published first online 23 September 2016

35 Dineen-Griffin, S; Garcia-Cardenas, V; William, et al. Helping patients help themselves: A systematic review of self-management support strategies in primary health care practice. *PLOS ONE* 2019;14(8):e0220116. doi: 10.1371/journal.pone.0220116

36 American Heart Association. Who is at risk for Atrial Fibrillation? https://www.heart.org/en/health-topics/atrial-fibrillation/who-is-at-risk-for-atrial-fibrillation-af-or-afib Last reviewed Last Reviewed: 31 July 31 2016. Accessed 28 January 2021.

37 Delesie, M; Desteghe, L; Bertels, M, et al. Motivation of overweight patients with atrial fibrillation to lose weight or to follow a weight loss management program: a cross-sectional study. *Acta Cardiol* 2021:24;1-10. doi: 10.1080/00015385.2020.1848274. Published first online 24 November 2020..

38 Malterud K, Ulriksen K. Obesity, stigma, and responsibility in health care: A synthesis of qualitative studies. *Int J Qual Stud Health Well-being* 2011;6(4). doi: 10.3402/qhw.v6i4.8404. Published first online 22 November 2011.

39 Ogden J, Clementi C. The Experience of Being Obese and the Many Consequences of Stigma. *Journal of Obesity* 2010; 429098. doi: https://doi.org/10.1155/2010/429098

40 Albury C, Hall A, Syed A, et al. Communication practices for delivering health behaviour change conversations in primary care: a systematic review and thematic synthesis. *BMC Fam Pract* 2019 Aug 3;20(1):111. doi: 10.1186/s12875-019-0992-x.

41 Williams O, Annandale E. Obesity, stigma and reflexive embodiment: Feeling the 'weight' of expectation. Health 2020;24:421-441. doi: 10.1177/1363459318812007. Published first online 14 November 2018

42 Albury C, Strain W, Brocq S, et al. The importance of language in engagement between health-care professionals and people living with obesity: a joint consensus statement. Lancet Diabetes Endocrinol 2020;8(5):447-455. doi: 10.1016/S2213-8587(20)30102-9.

43 Ratansi Z. How to discuss weight loss with patients and provide ongoing support. *GP Online* 02 Januray 2020. https://www.gponline.com/discuss-weight-loss-patients-provide-ongoing-support/obesity/obesity/article/1669445

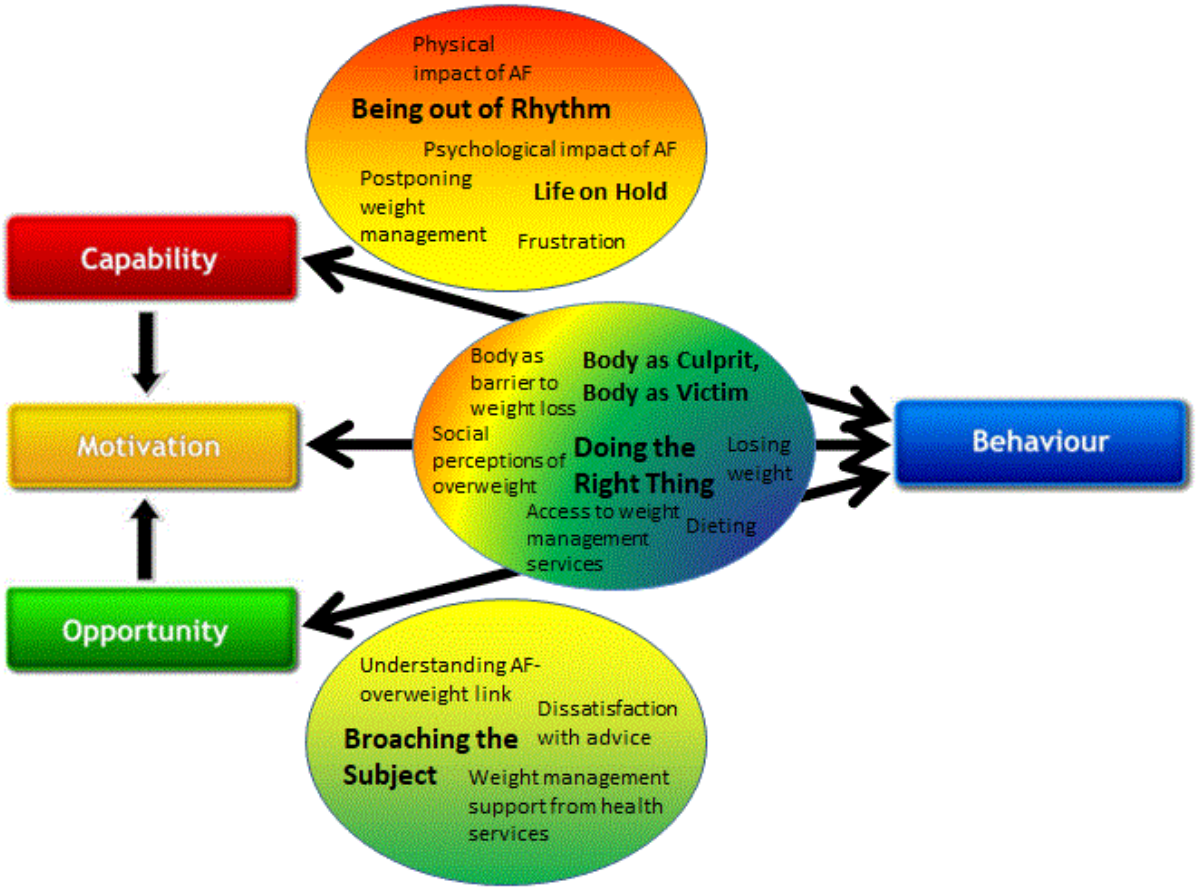
44 Stridsman M, Strömberg A, Hendriks J, et al. Patients' Experiences of Living with Atrial Fibrillation: A Mixed Methods Study. *Cardiol Res Pract*. 2019;6590358.
doi: 10.1155/2019/6590358 Published first online 3 December 2019.

45 National Institute for Health and Care Excellence. *Obesity prevention Clinical guideline [CG43].* London. First published 13 December 2006; last updated 13 March 2015. https://www.nice.org.uk/guidance/cg43

46 Dewhurst A, Peters S, Devereux-Fitzgerald A, et al. Physicians' views and experiences of discussing weight management within routine clinical consultations: A thematic synthesis. *Patient Educ Couns* 2017;100(5):897-908. doi: 10.1016/j.pec.2016.12.017. Published first online 21 December 2016

47 Cachia M, Millward L. The telephone medium and semi-structured interviews: a complementary fit. *Qualitative Research in Organizations and Management* 2011;6:265-277. doi: 10.1108/17465641111188420

48 Goddard C. Cultural Scripts. In: *Culture and Language Use*. 2nd ed. G Senft, J Ostman and J Verschueren eds. Amsterdam: John Benjamins 2009:68-80


Physical impact of AF
Being out of Rhythm
Psychological impact of AF
Postponing weight management
Life on Hold
Frustration
Capability
Motivation
Opportunity
Body as barrier to weight loss
Body as Culprit, Body as Victim
Social perceptions of overweight
Doing the Right Thing
Losing weight
Access to weight management services
Dieting
Behaviour
Understanding AF-overweight link
Dissatisfaction with advice
Broaching the Subject
Weight management support from health services

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	6
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	6
Occupation	3	What was their occupation at the time of the study?	6
Gender	4	Was the researcher male or female?	6
Experience and training	5	What experience or training did the researcher have?	6
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	6
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	6
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	6, 13, 14
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	4, 6
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	4
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	4
Sample size	12	How many participants were in the study?	4
Non-participation	13	How many people refused to participate or dropped out? Reasons?	4
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	6
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	6
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	5,9
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	6
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	6
Field notes	20	Were field notes made during and/or after the inter view or focus group?	6
Duration	21	What was the duration of the inter views or focus group?	6
Data saturation	22	Was data saturation discussed?	4
Transcripts returned	23	Were transcripts returned to participants for comment and/or	6

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	7
Description of the coding tree	25	Did authors provide a description of the coding tree?	7
Derivation of themes	26	Were themes identified in advance or derived from the data?	7
Software	27	What software, if applicable, was used to manage the data?	7
Participant checking	28	Did participants provide feedback on the findings?	6, 7
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	9, 10, 11, 12
Data and findings consistent	30	Was there consistency between the data presented and the findings?	8-12
Clarity of major themes	31	Were major themes clearly presented in the findings?	9, 10, 11
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	10, 11

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

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'OUT OF SYNC': A QUALITATIVE INVESTIGATION OF PATIENTS' EXPERIENCES OF ATRIAL FIBRILLATION AND PERCEPTIONS OF WEIGHT MANAGEMENT.

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2022-065995.R1
Article Type:	Original research
Date Submitted by the Author:	24-Aug-2022
Complete List of Authors:	Bates, Rachel; University of Birmingham; John Radcliffe Hospital Bailey, Cara; University of Birmingham, School of Nursing Topping, AE; University of Birmingham , Institute of Clinical Sciences ;
Primary Subject Heading:	Cardiovascular medicine
Secondary Subject Heading:	Qualitative research
Keywords:	Adult cardiology < CARDIOLOGY, Cardiac Epidemiology < CARDIOLOGY, Pacing & electrophysiology < CARDIOLOGY, Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, NUTRITION & DIETETICS, QUALITATIVE RESEARCH

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'OUT OF SYNC': A QUALITATIVE INVESTIGATION OF PATIENTS' EXPERIENCES OF ATRIAL FIBRILLATION AND PERCEPTIONS OF WEIGHT MANAGEMENT.

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Word count: 4273

Key words: Atrial fibrillation, overweight, weight loss, patients, COM-B, qualitative

ABSTRACT

Objectives: To explore ways to enhance the design of risk factor management and weight-loss services for people with overweight/obesity and atrial fibrillation (AF).

Background: AF is the most common cardiac arrhythmia, with serious consequences for health and quality of life. Some evidence indicates weight reduction in people with AF and overweight/obesity may improve symptoms. This population may require additional support with weight management due to factors associated with aging and health.

Design: Qualitative investigation based on semi-structured interviews.

Methods: 12 adult participants (4 female, 8 male) with diagnosed AF and a current or previous BMI>27kg/m^2 were recruited at a large tertiary cardiac referral centre in southern England between September 2020 and January 2021. Participants completed quality of life and AF symptom questionnaires using Think-Aloud technique and semi-structured interviews relating to their weight management experiences, needs and preferences. Interviews were audio recorded and analysed thematically using the COM-B behaviour change model as a theoretical framework.

Results: Three main themes were identified. *Being Out of Rhythm* explores the psychological and physical impact of AF on weight management; *Doing the Right Thing* discusses participants' weight management experiences; *Broaching the Subject* explores participants' perspectives on weight management conversations with clinicians.

Conclusions: There was dissatisfaction with the weight management advice received from health care professionals including cardiologists. Participants wanted open, non-judgemental discussion of cardiac health implications of overweight/obesity supported by referral to weight management services. Improved communication including research findings regarding the benefits of weight-loss as a factor in AF management might increase motivation to adhere to weight-loss advice in this population.

ARTICLE SUMMARY

Strengths and limitations of this study

- Explores views and experiences of patients with AF and overweight, illuminating barriers to weight management

- The COM-B behaviour change model facilitated application of findings to strategies to improve clinical practice
- Only included the views of people willing to discuss weight management
- Participants were recruited from an ethnically homogeneous population; further research is needed to reflect the perspectives of the wider population.

Competing Interests: The authors declare they have no competing interests

INTRODUCTION

Mounting evidence demonstrates weight-loss improves symptoms and slows disease progression in people with atrial fibrillation (AF) and overweight[1]. Yet despite convincing evidence of the health benefits, few cardiac patients with overweight achieve healthy weight management in the long-term[2]. Weight-loss is a complex and sometimes onerous undertaking, subject to multifactorial biological, behavioural[3], socioeconomic, environmental and personal influences[4, 5]. Incidence of AF increases with age, meaning patients are likely to be older and experience more concurrent conditions than the populations in general weight management studies. Better understanding of patients' lived reality of these factors could improve the design of weight management services for this population.

A qualitative synthesis of studies examining weight management among myocardial infarction (MI) patients undertaking cardiac rehabilitation found the cardiac event served as a "wake-up call", revealing the extent of damage to health[6-8]. Although motivated to lose weight, individuals often felt overwhelmed and lacked knowledge and strategies to enact lifestyle changes[6-8]. Referral to weight management services was valued and access to supervised exercise facilities allayed safety concerns[6, 8]. Personalisation of services increased acceptability and compliance[8].

The experiences of people with AF are different from those recovering from MI – AF is not acutely life-threatening, cardiac rehabilitation is not routinely provided, treatment success rates vary[9]. Growing evidence indicates advice to patients with AF should include proactive weight management[10, 11] but guidance on tailoring advice and services to meet patients' needs is limited. No existing qualitative literature explores the experiences of people with overweight and AF. The objective of this study is to identify practical ways to address perceived barriers to weight reduction through better understanding of patients' experiences and perspectives.

METHODS

Ethics

The study was carried out in accordance with the Declaration of Helsinki and the principles of Good Clinical Practice. Ethical approval was granted by London-Bromley Research Ethics Committee (20/LO/0356).

Language and Definitions

Overweight and obesity are defined by the World Health Organisation as a body mass index (BMI) equal to or greater than 25 kg/m^2 or 30 kg/m^2 respectively[12]. The inclusion criteria for this study adopted a BMI of 27 kg/m^2 or greater, in line with previous quantitative studies of overweight and AF[10, 11]. The term “overweight” is used in this report to describe a BMI of 27 kg/m^2 or over, except when discussing other studies which specifically investigate obesity.

Patient and Public Involvement

Advice on design, relevance and acceptability was obtained from two volunteers with AF (one also had BMI>27kg/m^2) and previous research experience via a Patient and Public Involvement (PPI) bulletin. Minor alterations to the patient information sheet were made as advised. No design changes were suggested.

Design

A qualitative interview study design was used to explore patients’ perspectives and experiences[13] of living with AF and overweight. Because weight management involves behaviour change, the COM-B model[14] - which identifies capability, opportunity and motivation as the three essential elements for behaviour change - was used as the theoretical framework. These elements form the hub of the Behaviour Change Wheel that represents the complexity of the economic, social and political influences that interact with COM elements ultimately determining behavioural choices[15]. The model was embedded in study design, as a topic guide for interviews, and as a framework for data analysis to enhance theoretical coherence and consistency[16]. Using an interpretive description approach[17] we sought clinically usable explanations for weight management behaviours by exploring complex patient experiences through the conceptual COM-B model.

Context and Sampling

Twelve participants were purposively recruited from outpatient services at a large tertiary referral centre in southern England between September 2020 and January 2021. All participants had to have AF, have current or previous BMI of 27 kg/m^2 or over, and be able to converse in English (see Table 1 for selected participant characteristics). Written informed consent was obtained from all participants. Potential participants were approached during hospital appointments by the direct care team and provided with a patient information sheet. Fourteen patients were approached in total; two declined, stating they did not wish to discuss weight management. Recruitment continued until data saturation was reached.

Age range	Employment	Education	BMI	Type of AF	Years since AF diagnosis	Symptomatic	Reported previous weight loss (kg)	Weight loss method
70-79	Retired teacher	Higher	30	Paroxysmal	>10	Yes	19 (regained)	Very low calorie (self directed)
70-79	Retired from food industry	Secondary	43	Paroxysmal	5	Yes	Not reported	Very low calorie (self directed)
60-69	Cook	Secondary	25	Paroxysmal	>10	Yes	19	Dietary, self-directed
60-69	Hospitality	Further	28	Persistent	9	Yes	22 (regained)	Slimming World
50-59	Tradesperson	Secondary	28	Persistent	<1	Yes	4	Diet and exercise, self-directed
60-69	Leisure industry (retired firefighter)	Further	41	Persistent	2.5	Yes	50 (partially regained)	Slimming World
50-59	Retired firefighter	Secondary	37	Persistent	1.5	Yes	19 (regained)	Previously Slimming World. Now on BHF diet (LOSE-AF study)
60-69	Nurse	Higher	41	Paroxysmal	9	Yes	Not reported	Various
60-69	Carer	Further	36	Paroxysmal	>10	Yes	11	Diet and exercise, self-directed
60-69	Tradesperson and business owner	Secondary	31	Persistent	>10	No	53 (partial regain)	Previously Aloe Vera diet. Now Cambridge 1:1 (LOSE-AF study)
50-59	Teacher	Higher	34	Persistent	3	Yes	28 (partial regain)	SlimFast
70-80	Retired electronics engineer	Further	37	Persistent	<1	Yes	7	Cambridge 1:1 (LOSE-AF study)

Table 1. Selected participant demographics and characteristics

Data Collection

Interviews were conducted by an experienced female, M-level trained, research nurse (RB). This information was included in the patient information sheet. One participant was previously known to RB through participation in an unrelated clinical trial. All others were unknown. Interviews were conducted by telephone due to the COVID-19 pandemic that restricted research and elective clinical activity. The participant known to RB chose to be interviewed face-to-face in a research facility clinic room after attending a hospital appointment. Two participants were interviewed with their partners in attendance, who occasionally commented in the background. Interviews lasted between 31 and 100 minutes with a mean of 55 minutes. Interviews were audio recorded and transcribed verbatim by RB.

The interview process was carefully planned by RB, CB & AT to encourage participants to feel comfortable and able to speak openly about their weight management experiences with a focus on service improvement[18]. Participants' experiences were explored using semi-structured interviews[19]. To reduce any discomfort discussing weight and to focus on AF[20] participants began by completing two questionnaires frequently used in quantitative studies of AF and hence well validated: Atrial Fibrillation Symptom Severity Scale[21]; EQ-5D-5L[22] using Think-Aloud[23], a technique previously explored in nursing research by CB[24] who provided training and oversight to RB. Participants were encouraged to verbalise their thoughts whilst completing the questionnaires which enables deeper reflection, self-awareness and insight into the meanings behind their responses about behaviours and decisions[23]. The Think-Aloud technique facilitated identification of instances where questionnaire responses reflected adaptations in expectations to accommodate worsening health[24], and has been used previously to explore the support needs of patients with AF[25].

A topic guide (Appendix A) based on the COM-B model helped frame the ongoing interview around physical and psychological capabilities, opportunities, and motivation for weight management with reference to the questionnaire responses[18]. For example, "In the category "Usual Activities" you answered "I have slight problems doing my usual activities" - can you tell me a bit about what your usual activities include? What do you consider the reasons for these problems? [Capability]". No pilot test was performed but the topic guide was allowed to development as the interviews progressed to follow new lines of enquiry.

Rigour

Several strategies were used to address rigour. Triangulation[26] was carried out by providing a summary of the interview to each participant before analysis to confirm it reflected their views, meanings, and intentions, and to allow for clarification (no participants asked for changes to be made). Reflexivity was facilitated by writing field notes to record responses, reflections, and assumptions following each interview and during transcription. The researchers' subjectivity was examined using the Peshkin [27, 28] model of reflection to sharpen awareness of the effect of assumptions, values and biases in shaping the study findings.

The study is reported following the COREQ guidelines[29] (Appendix B) to ensure comprehension and transparency.

Analysis

The transcribed data were imported to a spreadsheet and manually coded line-by-line using the Eclectic Coding process[30] to identify processes and phenomena. Process Codes, which capture action[30], were widely used to emphasise the active nature of behaviour change within the COM-B model. Descriptive Codes were used to summarise topics, and Values Codes to label participants' perspectives[30].

RB carried out the initial coding. Coding and subsequent thematic development were reviewed and discussed between RB, CB and AT to reach consensus.

Codes were mapped onto the COM-B framework and organised into sub-themes. As working themes were identified, a re-coding process was carried out to maintain thematic coherence[30] (see Table 2 for examples of this process). As coding progressed, themes were identified which transcended the COM-B divisions or reflected the interplay between them (see Figure 1). The colour-coded COM-B framework was therefore dismantled, and the individual codes reorganised within the overarching themes. The resulting schema was checked against the original interviews to enrich the authenticity of the description by returning to the participants' voices and ensure participants' various perspectives were fairly represented[26].

Quote	Initial codes (Initial framework theme)	Re-coded to	COM-B category	Theme
"It bothers me.. not the actual.. It bothers me that I can hear it in my ears more than anything" – male, age 70-79	Annoying symptoms (What it feels like for me)	Psychological impact of AF	Motivation	Being out of rhythm
"At the minute, touch wood.. it feels like it wants to start, like at work today it kind of skipped a beat and I thought oh no please don't start!" – female, age 60-69	Touching wood (Motivation); Dreading relapse (Capability – Psychological)	Psychological impact of AF	Motivation	Being out of rhythm
"I know if I lost half a stone I would feel that little bit quicker, a bit lighter, but I wouldn't want to lose any more than that because it would like take that bit of strength away" – male, age 50-59	Being big and strong (Motivation - reflective)	Desire to lose weight - confounding factors	Motivation	Doing the right thing
"But yeah that's what I'd like, to go through foods with me, to say well no you can't really have that – I'm only thinking I'll have that because it's got no sugar in it – do you know what I mean? But I don't think about maybe the fat content. I think about the sugar content, I think oh great I can have that – do you know what I mean? So.. It's someone to sit and educate me, more than anything." female, age 60-69	Nutritional knowledge (Capability - psychological); Desired help (Opportunity – physical); Wanting to talk about weight (Motivation – automatic); Changing diet (Behaviour Change)	Weight management knowledge; Desired help	Capability, Opportunity, Motivation; Behaviour Change	Doing the right thing
"I can't remember exactly what she said but I think it was around the weight issue. But none of them, none of them have said that the weight was an issue for any of the procedures that were going to be done, so I didn't make much of it other than to say you know that.. But it's usually that if you lose a bit of weight then.. I don't know I can't remember what they said but basically lose some weight – it wasn't an order, it was just advice." - male, age 50-59	Risks not explained (Motivation – reflective); Choosing what to hear (Motivation – automatic).	Patient education	Motivation	Broaching the subject
"Years ago when I lived in [city] um, they could, sounds silly I know but they could put the gym on prescription for so many months, which is what one doctor done for me and I used to go to the gym, um, oh two, three times a week then.." - female, age 60-69	Having weight loss prescription (Motivation – reflective); Doing exercise (Capability – physical).	Being referred	Motivation, Opportunity	Broaching the subject

Table 2. Examples of coding and thematic analysis process

FINDINGS

Participants

The sample included four women and eight men, a gender ratio which corresponds to the general AF population[31]. Ages ranged from 50 to 76. A range of socioeconomic, educational, and professional backgrounds were represented. All participants identified as White British, consistent with the demography of the AF population managed at the study site [Table 1].

Time since AF diagnosis ranged from four months to fifteen years. Five participants had paroxysmal AF (occurring in self-limiting episodes lasting less than one week) and seven had persistent AF (lasting more than one week). Eleven participants reported comorbidities and five reported two or more, which impacted on their activities of daily living and quality of life, the most common being ischaemic heart disease, type 2 diabetes mellitus, and joint pain.

BMI ranged from 25 (after sustained weight-loss) to 43 kg/m^2. All participants reported having lost weight at some point in life, from 4kg to 53kg, but most, at least partially, had regained weight.

Being out of rhythm

Being out of rhythm describes the physical and psychological disruption AF caused to participants' lives. Symptoms impeded day-to-day activities, corresponding with the capability component of COM-B. Participants characterised these limitations as a life having lost its rhythm: They could no longer live the life they wanted while experiencing AF and were left waiting to regain their rhythm, both cardiologically and metaphorically. Waiting for treatment, uncertainty of its effectiveness, and fear of relapse appeared to sap motivation to engage in healthy lifestyle behaviours. A female participant who experienced infrequent, random onset AF episodes reflected on how a sense of suspense affected her psychologically:

> "I just feel edgy when it's out of sync… I can't wait for it to drop back into rhythm"
> – female, age 70-79

The physical impacts of AF included fatigue, breathlessness, chest pain, palpitations, and faintness and ranged in severity from mild to debilitating. Nine of the twelve participants had been hospitalised with severe symptoms, and eleven had undergone cardioversion or ablation for symptom management. Although reassured by their cardiologists that AF is not life-threatening, the onset of symptoms could still induce significant anxiety and sometimes

panic. This was typified by a healthcare professional participant, who struggled to reconcile her objective clinical understanding of AF with the subjective distress she felt when experiencing arrhythmias:

> "It is horrible, it is horrible... and it can come on at any time so if I'm at work or at a meeting… you haven't even got a chance to be away from anyone noticing you're not very well … you don't want people to know you're in AF. Especially people my office who are nurses, they're not going to take much notice really!" – female, age 60-69

Symptoms impacted family activities, work, housekeeping, hobbies and sleep patterns. The sense of life being suspended was experienced as a *Life on hold*. Some participants felt unsafe and deliberately limited their activities for fear of precipitating an episode of AF or damaging their heart. Participants who had previously been active identified their symptoms as a cause of weight gain. Inability to exercise impacted energy expenditure, but could also affect motivation by disrupting social lives and removing pleasure. Physical limitations often had psychological ramifications, causing frustration and anxiety about deteriorating health and aging as expressed by a male participant whose career in the fire service had been truncated by AF:

> "It's doing my head in to a point. I hate it. Frustration is a massive thing because I'm in my 50s and like I said I'm an ex-firefighter and all that stuff and I'm used to being healthy and active, I'm not someone for sitting around and watching TV all day." – male, age 50-59

None of the participants attributed weight gain solely to AF although some cited reduced physical capacity due to AF symptoms as a contributing factor. Returning to sinus rhythm was for some the only way to regain health and previous lifestyles. This resulted in postponing weight management attempts until such a time when, back in rhythm, they would regain the mental energy to focus on diet and the physical capability to exercise.

Doing the right thing

All participants considered overweight unhealthy and undesirable, and articulated positive health behaviours as *Doing the right thing*. All four elements of the COM-B model are reflected within this theme – participants reported motivation to lose weight and intentional behaviour change but felt their health or bodily constitution hindered their capability, or lacked the opportunity to access appropriate services. Inability to sustain weight-loss despite following advice to the best of their ability caused significant frustration. A male participant who had previously lost but then regained weight following a high-protein commercial

weight-loss programme reflected on the slower measurable effects of his current low-fat, calorie controlled approach:

> "I try and eat healthily – we *do* eat healthily – we have fruit and veg more, far more than five portions a day, so I believe we eat healthily. I try and exercise, um, so at the moment I'm on this healthy diet that the British Heart Foundation recommend, and my wife's good at measuring out portion sizes and this sort of thing… So we've been doing that for a couple of weeks now and it's ok but I've only lost – for me – hardly anything, like a pound or two" – male, age 60-69

Many participants expressed a sense of unfairness and perceived social judgement toward people with overweight. For some, this created internal conflict as they sought to counter assumptions, while simultaneously berating themselves for a lack of self-discipline. Others viewed their own ill-health as a cause of weight gain, not a consequence of long-term overweight. Four male participants with physically demanding jobs associated being big with being strong.

All participants reported having lost weight at some point in life, citing general health concerns or body image as motivating factors. Organised diet programmes and meal replacement products were identified as helpful in achieving significant weight-loss by six participants. Others preferred to self-manage, drawing on calorie reduction and exercise advice from a variety of sources. Repeat cycles of dieting and weight regain were common across the participants. Loss of motivation was frequently cited as precipitating weight regain, often associated with relaxing diet regimes around holidays or weddings. Only one participant maintained her weight-loss in the long term, which coincided with significant changes in her lifestyle and personal relationships.

Body as victim, body as culprit illustrates participants' experiences of managing weight in a body over which they did not feel fully in control. The body was seen as a victim of illness and aging, with AF conceptualised as an external aggressor to be kept at bay through medication and management of risk factors. Conversely, the body could play the role of culprit in the struggle to achieve a healthy weight, being pre-disposed to weight gain by "genetic" factors or childhood eating habits. Two participants described food as an addiction, experiencing bodily cravings which they lacked the psychological strength to overcome

Broaching the subject

Broaching the subject explores participants' perceptions of consultations where weight management was discussed (or not) and relates to opportunity and motivation within COM-B. Participants indicated they would be open to discussing their weight within the context of

a clinical consultation, but perceived health care professionals were reluctant to engage in frank discussion. Only one participant knew that overweight is a risk factor for developing AF, and none were aware of evidence for weight-loss improving AF symptoms[10, 11]. Many reported doctors "mentioning" their weight, which became repetitive and irritating when not accompanied by specific explanations of the health risks, or offers of help. A male participant whose weight had increased since retirement expressed frustration at a perceived lack of practical advice and support from health care professionals:

> "The trouble is, it's all very well them saying "You should lose weight" but I couldn't. You know it's difficult to find proper sensible advice on how to do this. You know there are all these companies that set up but they're in there to make money." – male, age 70-79

Many appeared to deny that their health might be damaged by their overweight having never been unequivocally told. When healthcare professionals broached weight management but omitted to refer patients to relevant services, patients sometimes interpreted that their weight was not yet a cause for concern and that behaviour change could be postponed. Some reported requesting help, but that the sort of help they wanted was not available. Preferences varied widely, from very low calorie meal replacements, dietician review, cognitive behavioural therapy, to bariatric surgery. The profusion of conflicting weight management advice in the media and suspicions about commercial motivations of providers discouraged some participants from committing.

Only one participant reported having a meaningful conversation about weight with her cardiologist. As a health care professional who described her lifelong overweight as a source of shame and anxiety, she saw this conversation as positive and constructive, despite feeling confronted.

> "That was a good conversation. Quite a scary one but a good one in that respect because no-one's actually said AF and weight – that's the first. And also that's the first time I've ever actually had that proper conversation about it" – female, age 60-69

On discussion with participants of evidence linking weight-loss with improvement in AF, all indicated this information would motivate them to persist with weight management.

DISCUSSION

Summary of findings

This is the first qualitative study to explore the weight management experiences of people with AF and overweight. Interviews with twelve participants were analysed using a COM-B framework to illuminate factors affecting sustained weight management. The analysis identified three main themes: Being out of rhythm; doing the right thing; and broaching the subject. The interplay between the themes and the elements of COM-B (Fig 1.) highlights areas where improvements in service provision and communication could support patients to initiate and persist with healthy behaviour change.

Participants in this study appeared unaware of the potential benefits of weight-loss to manage AF. Further, while all participants recognised overweight as a general health risk, most failed to make the association to their own cardiac health. Those who recognised the general health risk of overweight expressed self-blame and anger at their perceived weakness and lack of self-control to sustain weight-loss.

The role of COM-B

COM-B provided a guide for the interviews and analysis, creating a framework for better understanding behaviour change. In this study participants reported having previously lost weight by changing their behaviour, thus demonstrating their capacity, opportunity and motivation to do so. The complexity of sustaining changes is reflected in their subsequent weight regain.

The focus on participants' capabilities, opportunities and motivations uncovered various barriers to weight management including reduced physical activity due to AF symptoms, fear of damaging the heart, inadequate communication and support from healthcare professionals, knowledge gaps, and lack of access to 'trusted' advice and weight management services. Identification of strategies to overcome these barriers could be guided by reference to the outer rings of the Behaviour Change Wheel[15], for example education and enablement of patients with AF though cardiac rehabilitation provision[32].

Participants had all lost weight

Somewhat unexpectedly, participants universally reported successful weight-loss efforts– albeit rarely sustained in the longer term. This in contrast to the commonly held assumption of healthcare professionals that people with overweight are non-compliant with recommended health behaviours[33]. Indeed, research shows most people with overweight

have tried or are trying to lose weight[34]. Participants were demoralised by health care professionals' failure to acknowledge weight-loss, a finding consistent with previous studies of weight management[35].

AF symptoms interfered with weight management

The experience of AF symptoms impacted on participants' willingness to engage in regular exercise that might contribute to weight management. Concerns about damaging the heart are unfounded, indeed studies have shown physical exercise reduces AF burden and improves quality of life[36]. Food was seen as a source of comfort during times of anxiety caused by AF symptoms, provoking resistance to weight management through calory-restriction alone. Several participants spoke of postponing weight-loss attempts until an anticipated future time when treatment would restore sinus rhythm. Advances in AF treatment are successfully restoring sinus rhythm in a greater number of patients[37], but to rely solely on medical intervention as the solution would be misplaced. It would seem patients need to become true partners in their care, but that will require greater candour in consultations about lifestyle change as a recommended strategy to improve AF and overall health[38].

Participants didn't associate AF with overweight

The findings indicate there were significant gaps in knowledge of AF risk factors. Reframing health communication to underscore the weight-loss and AF message might serve to better motivate healthy behaviour change.

People who have experienced MI report fear of dying motivated subsequent weight-loss attempts[6-8]. The participants who had experienced severe, sudden-onset AF described experiencing fear, vulnerability and disrupted self-image comparable with those who have had an MI. This fear did not translate into motivation to lose weight possibly because, unlike cardiovascular disease, AF is not widely associated with overweight in the public consciousness[39].

Lack of awareness of the overweight-AF connection suggests communication of research findings is limited in consultations with patients. By comparison, a recent survey conducted at three hospitals in Belgium found nearly 70% (n=143) of participants were aware of the benefits of weight reduction for AF management[40]. It would be valuable to examine if health messaging and advice are different and offer learning to enhance the content of consultations and/or pathways of care.

Getting the tone of weight conversations right is paramount

In common with the wider weight management literature [35, 41], participants in this study wanted frank, non-judgemental discussion focussed on the health impact of overweight, positive reinforcement of steps they were currently taking, and referral to weight-loss support services. Advice from health care professionals was seen as 'trustworthy' while commercial services were often viewed with suspicion.

Shame, vulnerability and stigma are widely reported by people with obesity[42]. Perceptions that healthcare professionals judge patients negatively on the basis of their body-size can be counterproductive to motivating engagement in weight management[35, 43, 44] and may lead to avoidance of healthcare encounters[45, 46]. This may be amplified for people with AF in response to feelings of vulnerability due to symptoms; a finding in this study echoing others that explored the experiences of people living with AF[25, 47].

Healthcare professionals are encouraged to discuss weight opportunistically[48] but many participants in this, and other weight management studies[35], have little recollection of the subject being raised. Some participants interpreted this omission to mean their weight was not a concern, again supported in the literature[35]. Patients expect healthcare professionals to discuss their weight when it is clinically relevant, and feel let down when they do not[41], a sentiment echoed by some participants in this study. Opportunistic "mentions" of weight and what they perceived as poor quality information left participants feeling irritated and patronised, especially when not backed up by explanations of the impact of weight-loss on their health, congruent with other studies[35].This dissonance between patient preferences and healthcare professionals' interactions may be due to clinicians' lack of skills when discussing weight management or fear of engendering a negative reaction[49].

Almost all participants in this study, similar to others[35], indicated a willingness to be referred to weight management services. Referral to cardiac rehabilitation has been shown to be motivational to patients with cardiovascular disease and overweight[6, 8]. Explaining the evidence-based benefits of weight-loss to improving AF symptoms, and providing a referral might go some way to addressing the absence of control described in this study. This may offer some agency over both the *out of rhythm* body and prognosis.

Limitations

This study reflects only the views of people who were willing to discuss weight management as those who were unwilling declined the invitation to participate. The sample was

homogeneous - all participants identified as white British. This represented the demographic profile of patients treated for AF at the study centre, and may limit generalisability.

The study was conducted during the COVID-19 pandemic. Some participants noted that their responses to questions were affected by temporaneous restrictions placed on access to opportunities to exercise and socialise. COVID-19 social distancing precautions necessitated the use of telephone interviews for data capture. Historically, telephone interviews were considered inferior, but arguably they give control to the interviewee who is on their own territory[50]. Telephone interviews provide visual anonymity, minimising perceived judgement based on physical appearance to which people living with overweight may be sensitised[35].

RECOMMENDATIONS

The findings clearly identify the need to improve communication, particularly strengthening the signalling of important research-based evidence to patients where weight management might improve AF symptoms and disease progression. This message could be incorporated in face-to-face discussions in out-patient clinic, patient information leaflets, or posters displayed in waiting areas accompanied by details of weight-loss services available through the hospital and in the community.

Locally and more widely, healthcare professionals may benefit from additional training to increase confidence and efficacy in discussing weight with patients. Future research could investigate health education behaviour change among healthcare professionals by applying COM-B to identify gaps in their capability, opportunity and motivation to intervene.

Weight management advice needs to be reinforced with a referral. Options available to clinicians are limited and tend to involve primary care referrals (e.g. NHS Digital Weight Management Programme, commercial weight management programmes). Extending access to these schemes to secondary care teams, along with greater involvement of the multidisciplinary team, could provide another opportunity to support patients with weight management.

CONCLUSIONS

This study highlights the importance of sensitive and thoughtful weight management discussion with AF patients and the importance of sharing research findings about weight-

loss as a means of reducing symptom burden and reversing disease progression. Patients appeared open to difficult conversations about weight within health consultations and expected professionals to address this topic candidly with them. Offering positive feedback on weight management efforts, providing reassurance about the effect of exercise on AF, and offering a referral to appropriate services are all ways in which healthcare professionals can promote weight management behaviour change. Skills training to augment healthcare professionals' confidence when discussing weight management may contribute to person-centred care within this population.

ACKNOWLEDGMENTS

Dr Maria Clark for advice on use of the COM-B model.

Crad Allerton and Tony Elliott for providing PPI advice

Dr Kim Rajappan for providing clinical oversight.

LEGEND

Figure 1. Map of themes with relation to COM-B elements[15]

COMPETING INTERESTS

There are no competing interests for any author

FUNDING STATEMENT

This work was supported by Oxfordshire Health Services Research Committee grant number 2020-1349.

STUDY REGISTRATION

The study is registered at https://www.researchregistry.com/ ID researchregistry5142

ETHICS STATEMENT

The study was carried out in accordance with the Declaration of Helsinki and the principles of Good Clinical Practice. Ethical approval was granted by London-Bromley Research Ethics Committee (20/LO/0356).

CONTRIBUTORSHIP STATEMENT

Rachel Bates: Conceptualisation; Methodology; Investigation; Data curation; Writing, original draft; Project Administration; Funding acquisition.

Cara Bailey: Conceptualisation: Methodology; Writing, review and editing; Supervision

Annie Topping: Conceptualisation Methodology; Writing, review and editing; Supervision

DATA SHARING STATEMENT

Data are available University of Birmingham UBIRA eData repository with a CC-BY licence

DOI: https://doi.org/10.25500/edata.bham.00000851

REFERENCES

1 Powell-Wiley T, Poirier P, Burke L, et al. Obesity and Cardiovascular Disease: A Scientific Statement From the American Heart Association.*Circulation* 2021;143(21):e984-e1010. doi: 10.1161/CIR.0000000000000973. Published online first 22 April 2021.

2 Gomadam P, Douglas C, Sacrinty M, et al. Degree and Direction of Change of Body Weight in Cardiac Rehabilitation and Impact on Exercise Capacity and Cardiac Risk Factors. *Am J Cardiol* 2016; 117:580-5. doi: 10.1016/j.amjcard.2015.11.045. Published online first 7 December 2015.

3 Ghosh S, Bouchard C. Convergence between biological, behavioural and genetic determinants of obesity. *Nat Rev Genet* 2017;18(12):731-748. doi: 10.1038/nrg.2017.72. Published online first 9 October 2017.

4 Garip G, Yardley L. A synthesis of qualitative research on overweight and obese people's views and experiences of weight management. *Clin Obes* 2011;1(2-3):110-26. doi: 10.1111/j.1758-8111.2011.00021.x.

5 Greaves C, Poltawski L, Garside R, et al. Understanding the challenge of weight loss maintenance: A systematic review and synthesis of qualitative research on weight loss maintenance. *Health Psychol Rev* 2017 Jun;11(2):145-163.doi: 10.1080/17437199.2017.1299583. Published online first7 April 2017.

6 Gallagher R, Kirkness A, Armari E, et al. Weight management issues and strategies for people with high cardiovascular risk undertaking an Australian weight loss program: A focus group study. *Nurs Health Sci* 2012;14(1):18-24. doi: 10.1111/j.1442-2018.2011.00651.x.Published first online 31 Jan 2012.

7 Nadarajah S. A Phenomenological Study on Lived Experiences of PsychoSocio-Spiritual Healing in Cardiac Rehabilitation Patients. 2012. http://hdl.handle.net/10713/2316

8 Kramer-Kile M. Diet Projects: A Study of Cardiac Rehabilitation Participants Engaged in Changing Dietary Practices.*Semantic Scholar* 2013 Corpus ID 149024773.

9 Andrade JG, Champagne J, Dubuc M, et al. Cryoballoon or Radiofrequency Ablation for Atrial Fibrillation Assessed by Continuous Monitoring. *Circulation* 2019;140(22):1779-1788. doi: 10.1161/CIRCULATIONAHA.119.042622. Published first online 21 October 2019.

10 Abed HS, Wittert GA, Leong DP, et al. Effect of Weight Reduction and Cardiometabolic Risk Factor Management on Symptom Burden and Severity in Patients With Atrial Fibrillation. *JAMA* 2013;310(2050-2060). doi: 10.1001/jama.2013.280521.

11 Pathak R, Middeldorp M, Meredith M, et al. Long-Term Effect of Goal-Directed Weight Management in an Atrial Fibrillation Cohort. *J Am Coll Cardiol* 2015;65(20):2159-69. doi: 10.1016/j.jacc.2015.03.002. Published first online 16 March 2015.

12 World Health Organisation. *Obesity.* [Online] https://www.who.int/health-topics/obesity. Visited 28 June 2021.

13 Cresswell J. *Research Design Qualitative, Quantitative and Mixed Methods Approaches.*3rd Edition. Thousand Oaks, CA: SAGE, 2009:3-21

14 Michie S, van Stralen MM, West R.The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011;6:42. doi: 10.1186/1748-5908-6-42.

15 Michie S, Atkins L, West R. *The Behaviour Change Wheel: A Guide to Designing Interventions.* London: Silverback Publishing, 2014.

16 Bradbury-Jones C, Taylor J, Herber O. How theory is used and articulated in qualitative research: Development of a new typology. *Soc Sci Med* 2014;120:135-41. doi: 10.1016/j.socscimed.2014.09.014. Published first online 6 September 2014.

17 Thorne S, Jensen L, Kearney MH, Noblit G, Sandelowski M. Qualitative Metasynthesis: Reflections on Methodological Orientation and Ideological Agenda.*Qual Health Res* 2004;14(10):1342-1365. doi: 10.1177/1049732304269888

18 McIntosh M, Morse J. Situating and constructing diversity in semi-structured interviews. *Glob Qual Nurs Res* 2015;2: 2333393615597674. doi: 10.1177/2333393615597674. Published first online eCollection Jan-Dec 2015.

19 Mitchell G. Use of interviews in nursing research. *Nurs Stand* 2015;29(43):44-8. doi: 10.7748/ns.29.43.44.e8905..

20 Whiting L. Semi-structured interviews: guidance for novice researchers.Nurs Stand 2008; 22(23):35-40. doi: 10.7748/ns2008.02.22.23.35.c6420.

21 Dorian P, Cvitkovik S, Kerr C, et al. A novel, simple scale for assessing the symptom severity of atrial fibrillation at the bedside: The CCS-SAF Scale. *Can J Cardiol* 2006;22(5):383-6. doi: 10.1016/s0828-282x(06)70922-9

22 EuroQol Research Foundation. EuroQol EQ-5D-5L. https://euroqol.org/eq-5d-instruments/eq-5d-3l-about/ 2017 Amsterdam

23 Ericsson K, Simon HA. *Protocol Analysis: Verbal reports as data.* Cambridge MA US: The MIT Press 1993

24 Bailey C, Kinghorn P, Orlando R, et al. Using 'think-aloud' and interview data to explore patient and proxy completion of health and capability measures at the end of life. In: J. Coast (Ed.), *Qualitative methods for health economics*. London, UK: Rowman & Littlefield 2017:231-244

25 Zhang L, Gallagher R, Lowres N, et al. Using the 'Think Aloud' Technique to Explore Quality of Life Issues During Standard Quality-of-Life Questionnaires in Patients with Atrial Fibrillation. *Heart Lung Circ* 2017;26(2):150-156. doi: 10.1016/j.hlc.2016.05.121. Published fist online 14 July 2016

26 Carter N, Bryant-Lukosius D, DiCenso A, et al. The use of triangulation in qualitative research. *Oncol Nurs Forum* 2014;41(5):545-7. doi: 10.1188/14.ONF.545-547

27 Peshkin A. In Search of Subjectivity - One's Own. *Educational Researcher* 1988;17(7):17-21

28 Bradbury-Jones C. Enhancing rigour in qualitative health research: exploring subjectivity through Peshkin's I's. *Journal of Advanced Nursing* 2007;59(3):290-298

29 Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;19(6):349-57. doi: 10.1093/intqhc/mzm042. Published first online 14 September 2007 Sep 14.

30 Saldaña, J. *The Coding Manual for Qualitative Researchers.* 3rd Ed. Los Angeles 2015: SAGE: 188-193

31 Magnussen C, Niiranen TJ, Ojeda FM, et al. Sex Differences and Similarities in Atrial Fibrillation Epidemiology, Risk Factors, and Mortality in Community Cohorts. *Circulation* 2017;136(17):1588-1597. doi: 10.1161/CIRCULATIONAHA.117.028981. Published first online 16 October 2017

32 Williamson TM, Wilton S, Arena R, et al. Abstract P215: A Qualitative Exploration Of Barriers And Facilitators To A Cardiac Rehabilitation-based Weight Loss Program For Patients With Atrial Fibrillation And Obesity. *Circulation* 2022; 145:AP215. https://doi.org/10.1161/circ. Published first online 7 April 2022.

33 Phelan SM, Burgess DJ, Yeazel MW, et al. Obesity stigma and patient care. Obes Rev 2015;16:319-326. doi: 10.1111/obr.12266. Published first online 5 March 2015

34 Piernas C, Aveyard P, Jebb S. Recent trends in weight loss attempts: repeated cross-sectional analyses from the health survey for England. *Int J Obes* 2016;40(11):1754-1759. doi: 10.1038/ijo.2016.141. Published first online 16 August 2016.

35 Ananthakumar T, Jones N, Hinton L, et al. Clinical encounters about obesity: Systematic review of patients'perspectives. *Clinical Obesity* 2019;10: e12347. https://doi.org/10.1111/cob.12347

36 Elliott AD, Mahajan R, Pathak RK, et al. Exercise Training and Atrial Fibrillation. *Circulation* 2016; 133:457–459. doi: 10.1161/CIRCULATIONAHA.115.020800. Published first online 5 January 2016.

37 Kirchhof P, Benussi S, Kotecha D, et al. ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS . Eur J Cardiothorac Surg 2016 Nov;50(5):e1-e88. doi: 10.1093/ejcts/ezw313. Published first online 23 September 2016

38 Dineen-Griffin, S; Garcia-Cardenas, V; William, et al. Helping patients help themselves: A systematic review of self-management support strategies in primary health care practice. *PLOS ONE* 2019;14(8):e0220116. doi: 10.1371/journal.pone.0220116

39 American Heart Association. Who is at risk for Atrial Fibrillation? https://www.heart.org/en/health-topics/atrial-fibrillation/who-is-at-risk-for-atrial-fibrillation-af-or-afib Last reviewed Last Reviewed: 31 July 31 2016. Accessed 28 January 2021.

40 Delesie, M; Desteghe, L; Bertels, M, et al. Motivation of overweight patients with atrial fibrillation to lose weight or to follow a weight loss management program: a cross-sectional study. *Acta Cardiol* 2021:24;1-10. doi: 10.1080/00015385.2020.1848274. Published first online 24 November 2020..

41 Malterud K, Ulriksen K. Obesity, stigma, and responsibility in health care: A synthesis of qualitative studies. *Int J Qual Stud Health Well-being* 2011;6(4). doi: 10.3402/qhw.v6i4.8404. Published first online 22 November 2011.

42 Ogden J, Clementi C. The Experience of Being Obese and the Many Consequences of Stigma. *Journal of Obesity* 2010; 429098. doi: https://doi.org/10.1155/2010/429098

43 Albury C, Hall A, Syed A, et al. Communication practices for delivering health behaviour change conversations in primary care: a systematic review and thematic synthesis. *BMC Fam Pract* 2019 Aug 3;20(1):111. doi: 10.1186/s12875-019-0992-x.

44 Williams O, Annandale E. Obesity, stigma and reflexive embodiment: Feeling the 'weight' of expectation. Health 2020;24:421-441. doi: 10.1177/1363459318812007. Published first online 14 November 2018

45 Albury C, Strain W, Brocq S, et al. The importance of language in engagement between health-care professionals and people living with obesity: a joint consensus statement. Lancet Diabetes Endocrinol 2020;8(5):447-455. doi: 10.1016/S2213-8587(20)30102-9.

46 Ratansi Z. How to discuss weight loss with patients and provide ongoing support. *GP Online* 02 Januray 2020. https://www.gponline.com/discuss-weight-loss-patients-provide-ongoing-support/obesity/obesity/article/1669445

47 Stridsman M, Strömberg A, Hendriks J, et al. Patients' Experiences of Living with Atrial Fibrillation: A Mixed Methods Study. *Cardiol Res Pract*. 2019;6590358.

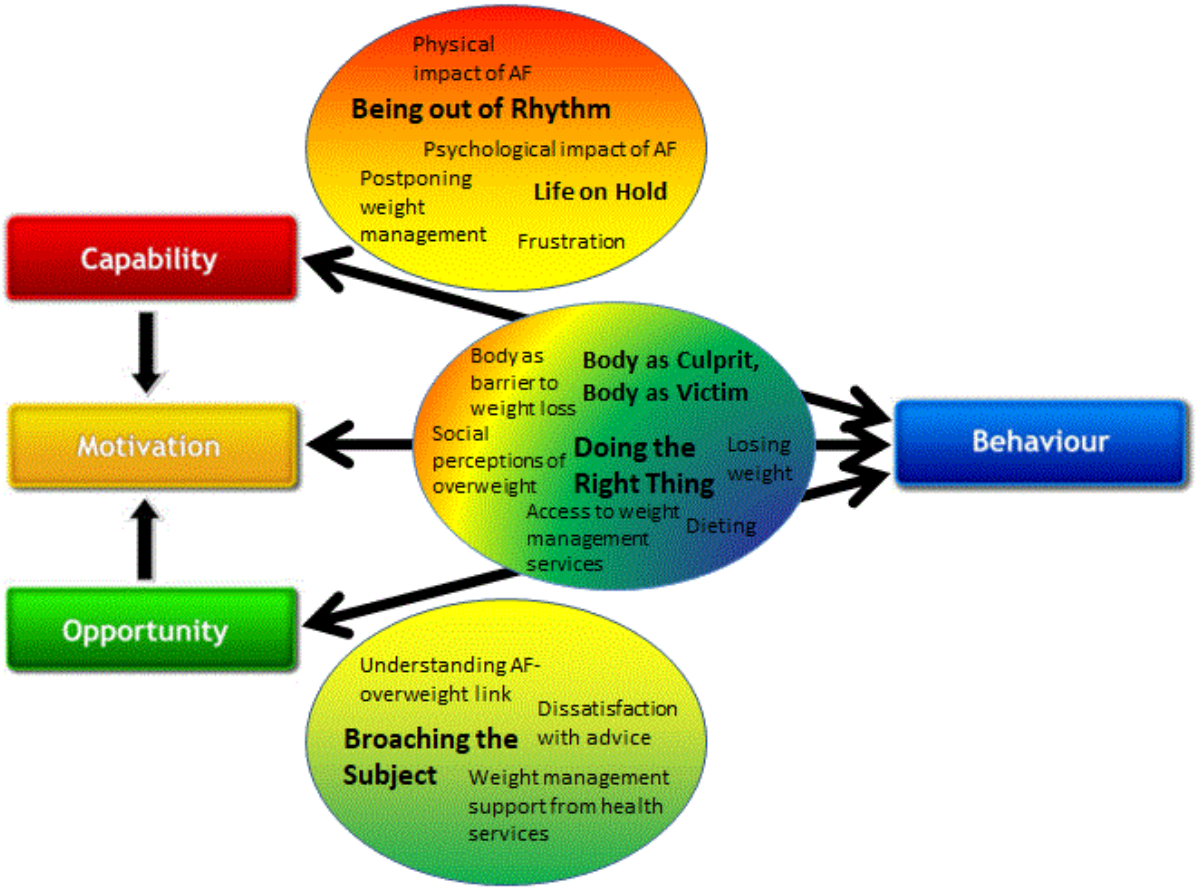
doi: 10.1155/2019/6590358 Published first online 3 December 2019.

48 National Institute for Health and Care Excellence. *Obesity prevention Clinical guideline [CG43].* London. First published 13 December 2006; last updated 13 March 2015. https://www.nice.org.uk/guidance/cg43

49 Dewhurst A, Peters S, Devereux-Fitzgerald A, et al. Physicians' views and experiences of discussing weight management within routine clinical consultations: A thematic synthesis. *Patient Educ Couns* 2017;100(5):897-908. doi: 10.1016/j.pec.2016.12.017. Published first online 21 December 2016

50 Cachia M, Millward L. The telephone medium and semi-structured interviews: a complementary fit. *Qualitative Research in Organizations and Management* 2011;6:265-277. doi: 10.1108/17465641111188420

[dataset] 51 Bates RW. Data from: Research data supporting the publication "A qualitative investigation of patients' experiences of atrial fibrillation and perceptions of weight management" June 17, 2022. https://doi.org/10.25500/edata.bham.00000851.


Physical impact of AF
Being out of Rhythm
Psychological impact of AF
Postponing weight management
Life on Hold
Frustration
Capability
Motivation
Opportunity
Body as barrier to weight loss
Body as Culprit, Body as Victim
Social perceptions of overweight
Doing the Right Thing
Losing weight
Access to weight management services
Dieting
Behaviour
Understanding AF-overweight link
Dissatisfaction with advice
Broaching the Subject
Weight management support from health services

HIWeiMan-AF Example questions for semi-structured interviews

Example questions

Capability:

"I see that in the category "Usual Activities" you have answered "I have slight problems doing my usual activities" - can you tell me a bit about what your usual activities include? What do you consider the reasons for these problems?"

"In the Self Care category, you have responded that you have no problems in washing and dressing yourself. Are there any other areas of your self-care that you feel have been affected by your health problems e.g. cooking for yourself, doing exercise"

"In the Pain/Discomfort category you have responded that you have no pain or discomfort. I'm interested to know whether your AF symptoms such as breathlessness affect your ability to do physical exercise." If affirmative response, follow up with "How does that feel to you?"

Opportunity

"Thinking about your Usual Activities, are there things that you used to do or would like to do if you had the chance?"

"If you were to try to increase your physical exercise levels, how would you do that?" If no suggestions forthcoming prompt with "Are there any exercise classes at your local community centre?" or "Are there any parks or nice places to go for a walk around where you live?" or "Do you and your partner/family/friends do any activities together"?

Motivation

"In Anxiety/Depression you have responded that you feel moderately anxious or depressed. Is there anything in particular causing this?" If response includes diagnosis of AF or related symptoms, explore further with "Can you explain to me your understanding of your heart condition? How does that affect you?"

"What sort of information and advice have you been given by health care professionals about managing your AF symptoms? How did you feel about this?"

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	7
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	7
Occupation	3	What was their occupation at the time of the study?	7
Gender	4	Was the researcher male or female?	7
Experience and training	5	What experience or training did the researcher have?	7
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	7
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	7
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	7, 14, 15
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	4
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	4
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	4
Sample size	12	How many participants were in the study?	4
Non-participation	13	How many people refused to participate or dropped out? Reasons?	5
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	7
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	7
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	6, 10
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	7, 10
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	7
Field notes	20	Were field notes made during and/or after the inter view or focus group?	8
Duration	21	What was the duration of the inter views or focus group?	7
Data saturation	22	Was data saturation discussed?	5
Transcripts returned	23	Were transcripts returned to participants for comment and/or	8

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	8
Description of the coding tree	25	Did authors provide a description of the coding tree?	8
Derivation of themes	26	Were themes identified in advance or derived from the data?	8
Software	27	What software, if applicable, was used to manage the data?	8
Participant checking	28	Did participants provide feedback on the findings?	8
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	10-13
Data and findings consistent	30	Was there consistency between the data presented and the findings?	10-13
Clarity of major themes	31	Were major themes clearly presented in the findings?	10-13
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	11, 12, 13

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.