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Citation for final published version:

Hewitt, Rachael M., Pegington, Mary, Harvie, Michelle and French, David P. 2020. How acceptable is a weight maintenance programme for healthy weight young women who are at increased risk of breast cancer? *Psychology and Health* 35 (7) , pp. 854-871.
10.1080/08870446.2019.1690146 file

Publishers page: <https://doi.org/10.1080/08870446.2019.1690146>
<<https://doi.org/10.1080/08870446.2019.1690146>>

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**How Acceptable is a Weight Maintenance Programme for Healthy Weight Young
Women Who Are at Increased Risk of Breast Cancer?**

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Declaration of Interests: none

Running head: Acceptability of a weight maintenance programme

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Abstract

Objective: To determine if a weight gain prevention intervention is acceptable to young women with a normal Body Mass Index and a moderately increased or high risk of breast cancer. **Design:** Qualitative semi-structured interview study involving 14 women aged 26-35 years who were registered with a Family History Clinic in Manchester, UK, due to family history of breast cancer. Participants' views were analysed thematically. **Results:** Four themes were produced: 1) *perceptions of a healthy lifestyle*: women's perceptions included health-related behaviours and subjective wellbeing; 2) *construing a healthy weight*: women rely on appearance, feelings and others opinions to construe weight instead of quantitative indicators; 3) *configuring a useful programme*: the idea of a programme that is remotely accessible; provides a point of contact; and promotes general wellbeing was appealing. Women believed information explaining the link between lifestyle and breast cancer would facilitate behaviour change; 4) *the importance of will(power)*: women recognised that commitment to a programme is affected by time, money and readiness to change. **Conclusion:** A weight gain prevention intervention that focuses on wellbeing and behaviour change appears acceptable to many healthy weight women. Future research should examine whether women's expressed acceptability translates into actual acceptability of such a programme.

Keywords: weight gain; prevention; acceptability; weight maintenance; lifestyle intervention.

Introduction

Breast cancer is the most common form of cancer among women in the UK and worldwide. Incidence has increased by 25% since the early 1990s, with 54,751 women in the UK diagnosed with the disease in 2015 (Cancer Research UK, 2018). Various factors heighten women's risk of developing breast cancer, including late age of first pregnancy, early menarche and late menopause, and age and family history (Anderson, Schwab & Martinez, 2014). Weight gain after the age of 18 years before menopause is also a well-defined risk factor (Keum et al., 2015; Rosner et al., 2017) that increases women's risk irrespective of family history (Harvie, Howell & Evans, 2015).

Weight loss is associated with decreased risk of breast cancer (Hardefeldt, Penninkilampi, Edirimanne & Eslick, 2017) suggesting weight loss programmes could be implemented for cancer prevention. However, weight loss is only achieved and maintained long term by approximately 20% of those intending to lose weight (Wing & Phelan, 2005). Thus, interventions to prevent weight gain are likely to be an appropriate strategy to help women to maintain a normal weight (i.e. body mass index [BMI] between 18.5 and 24.99kg/m²; World Health Organisation, 2019) throughout adult life and lower their risk of breast and other cancers (Colditz & Peterson, 2018).

Some quantitative studies have independently demonstrated that weight gain prevention is a useful weight management approach among different female populations, including a mixed-weight group of female college students aged 18-29 years (Katterman, Goldstein, Butryn, Forman & Lowe, 2014) and premenopausal black women aged 25-44 years who were in the overweight or obese BMI range (Bennett et al., 2013). However, these studies were conducted in the US and are not specific to young women in the normal BMI range with a family history of breast cancer, or women from other countries (Hutchesson, Hulst & Collins, 2013). Further, the overall effectiveness of such interventions is unclear due

to the heterogenous study findings (Hutchesson et al., 2013) and the perceived acceptability of these interventions has not been explored. Weight gain prevention is a promising prevention strategy for young women with a family history of breast cancer, but it has received little empirical attention to date.

Before a behaviour change intervention is developed, the Medical Research Council recommend that researchers investigate whether the idea of a potential intervention is acceptable to those who will receive it (Craig et al., 2008) to maximise patient adherence and acceptability in the target population if it were to be implemented into routine practice. In addition, there is a wealth of evidence that the provision of risk information alone is unlikely to produce large or sustained changes in behaviour, even when risk information is personalised to the recipient (French, Cameron, Benton, Deaton & Harvie, 2017). Given this, it was important to assess acceptability of other behaviour change techniques such as goal setting or self-weighing that might be of more use (Locke & Latham, 2019; Madigan, Daley, Lewis, Aveyard & Jolly, 2015), and to assess views on the format of the intervention, e.g. face-to-face versus remote.

There is little direct evidence from qualitative studies on acceptability of a weight gain prevention intervention for young women at higher risk of breast cancer due to their family history. Wright et al. (2015) found that women with a high risk of breast cancer valued the information that weight is a modifiable risk factor, believing that this would attenuate further weight gain or motivate a future weight loss attempt (Wright et al., 2015). These women also felt motivated to change and gained a sense of control over their lifestyle habits after learning about the link between weight gain and breast cancer risk (Wright et al., 2015). However, these findings are not directly generalizable to the present population as the intervention promoted weight loss and the female participants were in the overweight or obese BMI range (Wright et al., 2015).

Qualitative research involving young women who are in the normal BMI range and are at risk of breast cancer would build on previous research in this area. Qualitative research would overcome a main limitation of earlier quantitative studies (Bennett et al., 2013; Hutchesson et al., 2013; Katterman et al., 2014); clarifying whether women perceive weight gain prevention as an acceptable weight management strategy. Also, involving females younger than those who participated in previous studies is necessary because women gain weight rapidly between the ages of 18 and 35 years, as indicated by the Health Survey for England 2017 (National Health Service Digital, 2018).

The present qualitative study therefore aimed to explore whether the idea of a weight gain prevention programme to reduce women's cancer risk is acceptable to women aged 18-35 years in the normal BMI range who are at increased risk of developing breast cancer. Specific objectives were to investigate what young women require from a weight gain prevention programme; an appropriate programme title; young women's beliefs and experiences of weight control; and whether these women believe a healthy lifestyles programme is a meaningful and realistic option for breast cancer risk reduction.

Methods

Design

A cross-sectional, qualitative study involving semi-structured interviews.

Participants

Female participants who had an increased risk of breast cancer due to a family history of the condition were identified from the Family History Clinic at Wythenshawe Hospital (south Manchester, UK). The participants were affiliated with the clinic due to being relatives of women who had received a diagnosis of breast cancer.

Eligible women were aged 18-35 years old, spoke English, had a BMI between 18.5-24.99 kg/m² and either a moderately increased (17% to 30%) or a high (> 30%) lifetime risk of breast cancer (National Institute for Health and Care Excellence, 2017). Women were excluded if they had an existing chronic medical condition; were trying to gain weight; had a medical condition that limited their weight; or had an eating disorder, drug or alcohol dependency. Women were also excluded from the study if they had previously undergone weight loss surgery, or had received a former diagnosis of cancer (except non-melanoma skin cancer or intra-epithelial neoplasia) or a psychological disorder (e.g. borderline personality disorder, bipolar psychotic disorder, self-harm). The aforementioned conditions and weight management interventions were specified because they were likely to affect the women's views about weight management and their capacity to participate in an interview.

Recruitment

Ethical approval was obtained from West of Scotland REC 5 (IRAS project number: 242772, REC reference: 18/WS/0050). Staff from the Family History Clinic sent out postal invitations to women of eligible age who were identified from the electronic database of patient records. Respondents were asked to complete and return a self-check eligibility sheet in the pre-paid envelope provided. Details of the study were also advertised on posters displayed within the clinic and on the website of Prevent Breast Cancer; a Manchester-based charity.

Materials

Interview Schedule

A semi-structured interview schedule (see Appendix 1) was developed for the purpose of this study. Questions were derived from the study aims, relevant literature and were informed by the academic and clinical perspectives of the research team. Following initial interviews with

young women, the interview schedule was reviewed by the research team and refined based on their feedback.

Procedure

Interested and eligible participants were contacted by telephone to confirm their eligibility and arrange interviews. Emails were sent to participants confirming the time, date and location of their interview. Before commencing an interview, written informed consent was obtained from participants. The interviewer, who was female, aged 23 years, and had a BMI of 20.3 kg/mg², followed the interview schedule and utilised probes to gather more detail and clarify ambiguous responses. Interviews lasted between 50-90 minutes and were recorded using an encrypted Dictaphone.

Analysis

An inductive Thematic Analysis was conducted (Braun and Clarke, 2006). The interview data was analysed from an essentialist/realist theoretical standpoint, which acknowledges the “experiences, meanings and the reality of participants” (Braun and Clarke, 2006, p.81).

Audio recordings of the interviews were transcribed verbatim. Names were replaced with pseudonyms and the women’s age, breast cancer risk (%) and BMI were stated alongside the corresponding pseudonym, respectively. Transcripts were coded using a non-selective approach; elements of the data that were considered relevant to the research question and aims were assigned a code before similar codes were collated into candidate themes (Braun & Clarke, 2013). Members of the research team independently and inductively coded one transcript before meeting to discuss the coding process and resolve any discrepancies in the codes retrieved. The lead author coded the remaining transcripts and actively searched for

manifest themes across the data set. Surface level themes were identified, reviewed and refined as necessary before they were defined and titled.

The sample size was established using Malterud, Siersma and Guassora's (2016) *Information Power* model, which provided a concrete framework that the researcher could consult in order to reduce ambivalence and confidently decide the number of interviewees required (Saunders et al., 2017). The number of participants was continually appraised in relation to the study aims; the specificity of the sample; the theory underlying the research; the quality of the interview dialogue between the interviewer and interviewees; and the cross-case analysis (Malterud et al., 2016). Data collection stopped after 14 interviews because the researchers agreed that the sample held adequate information power; comprehensive eligibility criteria was developed to determine the sample; the term *acceptability* was clearly defined using the Theoretical Framework of Acceptability (Sekhon, Cartwright & Francis, 2017); and the dialogue in each interview was focused and relevant to the study aims.

Results

Of the 139 women who were invited to participate, 28 eligible women responded and 14 women aged 26-35 years were recruited. All participants were recruited via postal invitation. The mean age and BMI of the participants was 30.9 years ($SD = 2.4$) and 21.7 kg/m² ($SD = 2.0$), respectively. None were known BRCA gene mutation carriers. Four women had children. Twelve women identified as white British, one woman identified as white British/Irish, and one woman identified as 'other'. Many of the interviewees were educated to degree level ($n = 9$) or higher ($n = 3$). The sample was evenly spread in terms of deprivation as there were at least two participants in each Index of Multiple Deprivation quintile. One woman currently smoked, three had smoked previously and the others had never smoked. Five women did not drink alcohol and for those who reported drinking alcohol, the mean

number of units consumed per week was 7.4 ($SD = 6.1$). The mean duration of moderate and vigorous physical activity that women had undertaken in the week before their interview was 136.4 minutes ($SD = 94.6$). Two women self-identified as vegetarians and another as pescatarian.

Four themes were generated from the data: (a) *perceptions of a healthy lifestyle*, (b) *construing a healthy weight*, (c) *configuring a useful programme*, and (d) *the importance of will(power)*.

Perceptions of a healthy lifestyle

The women interviewed generally associated a ‘healthy lifestyle’ with health-related behaviours that influence physical wellbeing; performing physical activity, eating healthily, not smoking and not drinking large quantities of alcohol. The majority also acknowledged factors that affect mental and emotional wellbeing and emphasised the importance of an intervention that promotes both mental and physical wellbeing. Diet, in particular, featured prominently the women’s explanations of a healthy lifestyle and most advocated that a ‘balanced’ diet was key to maintaining a healthy lifestyle:

“I do try to have sort of a healthy balance of carbohydrates, erm proteins, as well as treats and fats and sort of things that are not so healthy, but I think if you don’t overdo it then to me that’s quite healthy and balanced [...] just sort of that moderation” (Claire: aged 30; breast cancer risk: 33%; BMI: 20.02 kg/m²).

The women also recognised that being physically active contributed to a healthy lifestyle, but it was those with children who were keen for additional support with physical activity. Mothers noted the challenge of finding time to exercise and sought advice on how to incorporate more physical activity into their daily routine:

“I have young children and fitting exercise in as an activity in itself is quite difficult to do because I don’t often have a lot of time on my own and there’s demands

throughout the day [...] I probably don't do enough in terms of exercise. That's something I'd like to change" (Jane: aged 33; breast cancer risk: 20%; BMI: 20.82 kg/m²).

Although the women tended to discuss diet when construing a healthy lifestyle, their conceptualisations of this term also encompassed factors that influence their mental health and wellbeing:

"a good amount of sleep, good work-life balance, making sure you have adequate rest" (Jane).

"it's important to see family and friends because it gives you chance to talk about things [...] if I didn't see anyone I'd become quite sad I think" (Sally: aged 25; breast cancer risk: 20%; BMI: 20.48 kg/m²).

A number of interviewees were aware of the link between their emotional and physical wellbeing. One woman described the *"knock-on effect"* (Gemma: aged 32; breast cancer risk: 20%; BMI: 25.39 kg/m²) that her mental health had on her ability to perform health-related behaviours, like cooking from scratch, that she associated with a healthy lifestyle:

"I'll wake up in the morning and I'll be lying in bed and I'll think today's going to be one of those days that I can't be bothered with anyone or anything [...] it's when I sit down on the couch all day because I'm feeling that low" (Candice: aged 31; breast cancer risk: 40%; BMI: 23.74 kg/m²).

Those that discussed the mind-body connection felt that mental wellbeing should be recognised as a main, if not the overarching, theme of a healthy lifestyles programme:

"wellbeing needs to sit alongside all of the topics because if you haven't got your wellbeing sorted, and yeah they all inter-link, but again sort of your own emotional health, you can't do physical activity and eat healthily and have a good, healthy sleep"

routine if you are in an unfit state to do that” (Emma: aged 30; breast cancer risk: 40%; BMI: 23.16 kg/m²).

“if there was gonna be information provided on wellbeing and diet and stuff, I’d have it 50 50, I don’t think one would be more important than the other” (Hallie: aged 29; breast cancer risk: 33%; BMI: 19.68 kg/m²).

Thus, having a positive mental wellbeing may be more important to these women in terms of maintaining a healthy lifestyle, as the women’s ability to perform health-related behaviours was perceived to depend on their mental and emotional state.

Construing a healthy weight

Similarly to their conceptualisations of a healthy lifestyle, the women considered a range of factors when construing a healthy weight:

“I think just to keep myself in a more positive place, that’s what it comes down to. Yeah, for body and mind, just knowing that things start to slow down, so my metabolism is starting to slow down, so I’ve got to work a little bit harder now [...] erm the more I can do these days is more beneficial. I do not want that doctor to turn round at any point to say you’ve got this, this could’ve been saved by you not eating unhealthily, not drinking” (Linda: aged 35; breast cancer risk: 33%; BMI: 22.69 kg/m²).

Whilst weight maintenance was considered important, this group were not hugely concerned by weight per se. The women were aware of their approximate weight, but many did not own weighing scales and suggested that weight maintenance is only “*one indication*” (Jane) of their health. The perceptions of others and feeling healthy were valued more highly than the number on the scales:

“I don’t have scales here myself. I’ll really only worry if someone says to me oh you look like you’ve lost weight or I start to feel worse or whatever” (Tess: aged 28; breast cancer risk: 25%; BMI: 19.22 kg/m²).

All of interviewees also judged their weight by their appearance rather than using weighing scales. The women reported looking for changes in their complexion and dress size:

“I wasn’t really that bothered about the numbers on the weighing scales but when you look in the mirror and [...] your face looks kind of podgy and you’re sort of just a bit shiny” (Emma).

“I’m kind of comfortably a sort of size eight to ten, erm, and I feel like that’s kind of a bit of an indication [...] I feel like I’ve - it’s noticeable on me if I sort of get above that really, that I sort of gained a bit” (Gemma).

The women also look for changes in their body shape and consider the appearance and body shape of their family members when contemplating how their weight might change in the future:

“I’m not really bothered what I weigh anymore because I’m more bothered about what I look like and that I look healthy and like you know toned n things like that. It’s not actually the numbers that I’m bothered about” (Sally).

A number of the interviewees were *“not sure how good of a reflection body mass index is erm of being healthy”* (Sandy: aged 30; breast cancer risk: 20%; BMI: 21.79 kg/m²). Many women doubted the validity of body mass index as a tool because they felt that being classed a healthy weight did not necessarily correspond with making healthy choices:

“you could be slim but your BMI, you’re not eating healthily – you’re slim coz you’re not eating [...] say if you’re trying to put on weight, and then you put it on but actually you’re no better than you were then because it’s just fat, it’s not muscle. I

think it's really important erm you know the fat muscle water thing you know, coz that's really the measure of how healthy you are" (Hallie).

The women also felt that body mass index alone may not be a suitable measure for tracking healthy weight maintenance. It was thought that women might struggle to maintain their current weight because they would gain muscle and thus become heavier if encouraged to be more physically active:

"if you start becoming healthy, you'll all of a sudden start gaining muscle [...] You need to kind of combine it with paying attention to your shape or strength [...] when you just focus just specifically on weight erm, you get a lot of demotivated people - particularly women who aren't that muscly. They all of a sudden start gaining weight and start eating because they need the energy for exercise and they suddenly think that they're gaining loads of weight and then stop" (Jamie: aged 32; breast cancer risk: 40%; BMI: 26.48 kg/m²).

Configuring a useful programme

The title, content and format of the prospective healthy lifestyles programme were considered. The name, healthy lifestyles programme, was deemed appropriate because *"it says everything it needs to on the tin"* (Linda). It was noted that title was not specific to the target audience, but most felt *"it's probably better keeping it sort of generalised"* (Gemma) because *"people are scared of the words breast cancer"* (Tess).

In terms of the programme format, the interviewees felt it would be useful to have a *"point of contact"* (Sandy). This group of women were goal-oriented. For example, Jamie stated *"if I have a definite target, I'll reach the target"*. Therefore, it was important to have someone on-hand to answer the women's questions, encourage them to set and strive towards personal goals and recognise when goals are achieved:

“then they’ve always got that reassurance as well and like, you know these healthy choices that you’re making you know are great and well done, you’re doing the right thing, you’re on the right lines and you can sort of encourage and I think that’s more sustainable because they’re making their own choices” (Claire).

The women also felt it would be useful to have a source of online support. Apps, especially, were considered acceptable and accessible, as some of the women reported using health-related apps previously:

“I used to use an app on my phone called Fitness and I know a few people that use the app [...] people just use their phones every day, don’t they? They’re always in their hands so it’s useful to have an app on your phone, definitely” (Jade: aged 30; breast cancer risk: 25%; BMI: 20.27 kg/m²).

Ultimately, most women desired a programme that can be accessed easily, that fits into their current schedule and offers both face-to-face and online support:

“I think it’s definitely important to have that initial face to face contact [...] but obviously people have busy lives so maybe it could be like once a month or every two months or something and also maybe to have like an online resource that women can access in the meantime, erm for like maybe recipe ideas or [...] just little bits of information that might help to spur women on” (Claire).

As for the programme content, there was support for the provision of quick and healthy recipes that the whole family can enjoy. Many explained that *“it’s hard to get the right mix and the right balance of different types of food”* (Charlotte: aged 30; breast cancer risk: 33%; BMI: 21.28 kg/m²) and that *“you do kind of get stuck in a little bit of a routine with what you’re eating”* (Sandy). Thus, novel recipe ideas were regarded useful because they would motivate women to consume a wider variety of healthy foods. Also, a number of women identified portion control as an issue. Jamie believed that providing new recipes that specified

portion sizes would increase women's sense of control over the quantity of food they consume:

“if I just tried to eat the same food but eat two thirds of it, I'm very aware that I'm not eating what I'm used to eating, whereas if I eat a completely different meal, and the portion is sized within the instructions, I think that would work better than trying to use smaller plates or trick myself” (Jamie).

However, usually, the content that the interviewees thought would provide personal benefit differed to the content that they believed similar others would find useful. For example, weight monitoring was considered an acceptable service, but most felt it would be more beneficial and motivating for women trying to lose weight:

“I can see the value of it [weight monitoring] for people who are yeah, are on a weight loss programme” (Jane).

Similarly, the interviewees demonstrated a clear understanding of what they must do to lead a healthy lifestyle, but felt that similar others lack this knowledge and would benefit from understanding what actions they could take to lead a healthier lifestyle:

“I seem to have that extra bit of knowledge, but I'm fully aware that a lot of the time the general public don't have that knowledge and need a bit of input and structure and help” (Claire).

The participants were less confident in their understanding about how weight, alcohol consumption, physical activity and diet link to breast cancer. The women thought that healthy lifestyles education would greater their awareness of how and why these factors influence their cancer risk and encourage them to make healthier choices:

“I've got a vague understanding of this increases it, this decreases it, but that's kind of the extent of my knowledge [...] I think the more I understand the more likely I am t-to stick to any plan that I was on - to try and be more healthy” (Charlotte).

The women generally believed that they did not need to reduce their alcohol intake because alcohol is not a “*major part*” (Jade) of their lifestyle. Yet, the interviewees felt that being educated about the different types and appropriate quantity of alcohol would heighten their awareness of their alcohol intake and motivate them to alter their drinking habits:

“I’d never know how many units are in a glass of wine [...] I never really look at calories in alcohol or things like that. If there was something that said don’t have more than one bottle of wine a week just for example then that’s more likely to make me a bit more conscious of it” (Gemma).

The importance of will(power)

The interviewees acknowledged that committing to a healthy lifestyles programme would require effort of will and the desire to maintain a healthy weight. The women recognised that a range of factors could prevent them from committing to a programme:

“some people might not want to change their lifestyle, some might not feel they are able to or it’s not for them. I think there’s lots of reasons why people wouldn’t engage, but that wouldn’t necessarily be to do with the programme or how it was set up. I think i-it’s a complex issue” (Julie: aged 33; breast cancer risk: 33%; BMI: 21.48 kg/m²).

A number of interviewees explained how psychological factors, such as poor mental health and “*readiness to change*” (Emma), could negatively impact their willingness to engage with a programme:

“it’s a real struggle to feel motivated to do any of those things if you’re struggling with self-confidence, anxiety, depression” (Jane).

As well as feeling psychologically unprepared, some of the women felt that being physically unprepared would reduce their willingness to adhere to a healthy lifestyles programme,

particularly to the dietary aspect of a programme. Sandy, for example, described how her will to eat healthily decreases when she fails to plan meals and purchase ingredients in advance:

“we find that we’re more likely to eat the wrong sort of things if we’ve not been shopping [...] we’ll end up having a take away or fish and chips or something because we’re tired and if you’ve not got things in” (Sandy).

The women believed a lack of willpower could lower adherence, but perceived other, more practical factors, as significant barriers to engaging with and sticking to a healthy lifestyles programme:

“having that willpower I suppose to stick to it could be an issue but [...] if we go to do something we generally stick to it. Our biggest thing is time and money” (Jade).

Some women thought that a programme should support women to understand the reasons underlying their unhealthier habits, otherwise *“it’s just a waste of everyone’s time and it sets them [women] up to fail”* (Emma):

“you’re not a terrible person with no willpower, it’s sort of linked to your body clock and it’s to do with things that might be going on in your life [...] helping people to rationalise maybe why they’re leaning towards being a bit more unhealthy” (Claire).

Discussion

The present study aimed to explore whether the idea of a weight gain prevention programme to reduce women’s breast cancer risk is acceptable to young women in the normal BMI range who are at increased risk of breast cancer. This research also aimed to understand young women’s views and experiences of weight control; what these women require from a weight gain prevention programme; and to determine an appropriate programme title.

The idea of a prospective weight gain prevention intervention was welcomed. The title, *healthy lifestyles programme*, was deemed suitable because it was not focused on and

did not contain the words ‘breast cancer’, which many women perceived negatively and associated with distressing experiences. The women’s perceptions of a healthy lifestyle and experiences of weight management were focused around health-related behaviours, particularly physical activity and healthy eating, as well as factors that influence mental wellbeing, including sociality, sleep and mood. Participants considered weight maintenance a priority for reducing their risk of breast cancer, but also acknowledged that taking part in a programme that encourages physical activity would increase their BMI; the women believed they would gain muscle and thus, weight, by becoming more physically active. In addition, the impact of alcohol and smoking on weight and cancer risk were acknowledged, yet these lifestyle factors were not widely discussed or prioritised by the women, most likely because the majority of participants reported minimal alcohol consumption and only one woman identified as a smoker.

The programme content and structure were perceived to depend on one’s goals and knowledge of the link between weight and breast cancer. These women require a programme that is remotely accessible and provides recipe ideas and educational content that inspires them to make the changes necessary for leading the healthiest life possible in order to effectively manage their cancer risk. In particular, the women expressed a desire for information explaining the link between breast cancer, weight and lifestyle. It is possible that the provision of educational content that addresses this link would increase the women’s motivation to manage their cancer risk by adapting health-related behaviours.

These women also desire a point of contact who will reassure them of their current practices and praise them for successfully managing their weight. However, it is unclear who these women would like support from. The women discussed the advantages and disadvantages of both lay and professional support, but there was no clear consensus. Lastly, the participants were motivated to take part in a weight management cancer risk reduction

intervention. Although, they believed a willingness to change was necessary for adapting behaviour, and recognised that practical, psychological and psychosocial factors reduce women's willingness to initiate and sustain recommended lifestyle changes.

What the Present Study Adds

To date, very few qualitative studies have focused on weight gain prevention. The present qualitative study is the first of its kind to indicate that young women in the normal BMI range accept the idea of a healthy lifestyles programme as a cancer risk reduction strategy, particularly one that is remotely accessible, that reinforces and rewards healthy behaviours, and promotes physical and mental wellbeing.

Prior to this research, the facilitators and barriers that affect weight maintenance among young women in the normal BMI range who are at increased risk of breast cancer were unknown. Earlier qualitative studies involving different populations have identified that wellbeing, aesthetical concerns (Lindvall, Larsson, Weinehall & Emmelin, 2010) and acting as a role model (Reilly et al., 2015) facilitate weight maintenance. Other studies found that a lack of money and motivation (Andajani-Sutjahjo, Ball, Warren, Inglis & Crawford, 2004); women's desire to lose rather than maintain weight (Kozica et al., 2015); gender roles; a lack of time; and poor accessibility and availability of facilities and healthy foods (Welch et al., 2009) are perceived to hinder weight maintenance. The results of the present study indicate that wellbeing, appearance, time, money and having the will or motivation to change are factors that influence weight maintenance among young women in the normal BMI range with a family history of breast cancer. Notably, this study also highlighted that women's willingness to consistently maintain their weight and manage their breast cancer risk is affected by how mentally and physical prepared for change women feel.

Also, the findings highlight that young women in the normal BMI range who are at increased risk of breast cancer value the provision of education about the links between diet,

weight gain, alcohol consumption, physical activity and breast cancer risk. This reflects the finding of another qualitative study involving older and overweight women at risk of breast cancer who sought to lose weight (Wright et al., 2015) The current research reaffirms the importance of providing information about the link between lifestyle factors and breast cancer in order to inspire behaviour change, but among an alternative group of at-risk women with different goals.

Implications for Practice

Importantly, the present findings have significant practical implications for the way in which healthcare professionals interact with this at-risk group of women. Firstly, clinicians should recognise that not all women feel ready to change their behaviour. The provision of relevant information about the link between weight, lifestyle and breast cancer could better prepare women to make recommended lifestyle changes and make a potential weight gain prevention intervention more meaningful. Referring women living with mental illnesses to specialist services provided by a health or clinical psychologist may also help to improve their mental wellbeing before attempting to change their behaviour.

Secondly, it seems that clinicians may tell women what they need to do to live healthier, but fail to explain how they can modify their behaviour and why adopting healthier habits is important for managing their cancer risk. To ensure women follow lifestyle advice, clinicians should inform women about how lifestyle affects breast cancer risk. Lastly, when discussing how women can successfully manage their weight, clinicians should address health-related behaviours that enhance both mental and physical wellbeing and make patients aware that undertaking more physical activity promotes muscle growth that in turn, may increase their BMI.

Furthermore, the finding that women desire a healthy lifestyles programme that can be remotely accessed has practical implications for the programme structure. Whilst the

women emphasised the importance of having face-to-face contact with those delivering the programme, they also noted that it may not be feasible or practical to implement a programme that only offers face-to-face contact. The women expressed the need for a point of contact and content that they can access anywhere, anytime. Therefore, women might be more inclined to manage their cancer risk by making recommended lifestyle changes if they are offered a combination of physical and online support. The women generally supported the use of smartphone apps, so apps may be a useful and realistic technological platform that allow women to access the programme content easily and conveniently.

Implications for Future Research

In line with the Medical Research Council's guidelines for developing complex interventions (Craig et al., 2008), future research should aim to develop and trial a healthy lifestyles programme in clinical settings in order to determine the feasibility of such a programme and assess whether it changes women's behaviour. Such a programme should include a wide range of behaviour change techniques, and not just provision of risk information, and feasibility studies should examine the experienced acceptability of these techniques.

Although the idea of a healthy lifestyles programme was accepted, women may not accept the lifestyle recommendations offered by this programme if actually offered it. Thus, a feasibility study would establish whether the programme is acceptable to the target audience as anticipated. Also, assessing the feasibility of recruiting women to one of two versions of a healthy lifestyles programme would help to ascertain whether the intervention should be marketed as a health and wellbeing programme, rather than as a weight gain or breast cancer prevention programme. Determining a suitable marketing strategy would hopefully maximise patient acceptability and engagement in a healthy lifestyles programme if it were to be implemented into routine practice. Such evaluations should consider the extent to which there is variation in uptake, engagement and effectiveness between different demographic groups,

including further qualitative work to understand and ideally overcome barriers experienced by women with low socioeconomic status or minority ethnicities.

Strengths and Limitations

The sample contained a good spread in terms of deprivation as assessed by residential location, in contrast to much research that does not include the most deprived (Bonevski et al., 2014). The sample comprised mainly educated, white women, despite Manchester being a culturally and ethnically diverse city. The women interviewed were fairly conscious of their lifestyle habits, unlike others in the population from which the present sample was drawn, who exceed alcohol recommendations and fail to meet physical activity and dietary recommendations (Pegington et al., 2018). Thus, caution should be taken when generalising the current findings to the wider population, who, it seems, may be in greater need of a lifestyle intervention than the participants in the present study.

Most participants chose to be interviewed in their own home rather than in a clinical setting, where participants often feel intimidated and give socially desirable responses (Holloway & Galvin, 2017). Yet, the presence of socially desirable responses cannot be ruled out. As the interviewer (and lead author) came from Manchester and was similar to the interviewees in terms of age, gender and BMI, this may have helped the interviewer to develop rapport and gain the women's trust (Le Gallais, 2008), which is likely to have enhanced the richness of the information provided (Braun & Clarke, 2006). The analysis involved four researchers from diverse research backgrounds, which should have mitigated the results produced being overly influenced by the research team.

Finally, the interview schedule was developed with input from the weight gain prevention literature and the clinical and academic perspectives of two research dietitians and a health psychologist. Therefore, the interview schedule had a broad scope and did not reflect the views of one perspective. However, alternative cancer risk reduction strategies were not

covered in the interview schedule, so it is unclear what these women think about a healthy lifestyles programme in relation to other preventative measures including surgery and chemoprevention.

Conclusions

These young women who are in the normal BMI range and who are at increased risk of breast cancer believe that a weight maintenance programme is an acceptable cancer risk reduction strategy. Such an intervention should include a focus on promoting subjective wellbeing to increase acceptability, as well as being likely to augment changes in health-related behaviours. A remotely accessible programme and point of contact who will recognise and reassure women about their current habits would be desirable and a realistic structure for a novel programme. Finally, a healthy lifestyles programme should offer healthy recipes and educational content in order to bridge the gaps in women's knowledge and ultimately, motivate them to effectively manage their risk of breast cancer by making behavioural changes that engender a healthy weight, body and mind.

Acknowledgements

This research was supported by the National Institute for Health Research (NIHR) Biomedical Research Centre (IS-BRC-1215-20007) in Manchester. DPF, MP and MH are supported by the NIHR Manchester BRC. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health. Thank you to the participants who agreed to be interviewed and provided their views and opinions, without which this research project would not have been possible.

Declaration of Interests: none

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Appendix 1

Schedule for Interview on Healthy Lifestyles Programme for Healthy Weight Young Women Who Are at Increased Risk of Breast Cancer

1) Perceptions of a healthy lifestyle and healthy weight:

- a. Can you tell me what comes to mind when you hear the term “healthy lifestyle”?
(Describe what, if anything, you are thinking of? Particular behaviours? Strict approach? Flexible approach? Short-term? Long-term?)
- b. Can you explain what, if anything, you do to lead a healthy lifestyle?
(Eat the recommended 5 a day? Drink the recommended two litres of water? Play sport? Alcohol free days?)
- c. What would you say is a healthy weight?
- d. Has your weight changed much over the course of your life?
(Can you tell me more about that?)
- e. Have you ever thought that you were not a healthy weight?
(Can you tell me when? Why do you think that?)
- f. Do you think your weight is likely to change in the future?
(Why? When?)

2) Acceptability of healthy lifestyles programme:

- a. How do you feel about being involved in a healthy lifestyles programme that is designed to help you maintain your current weight?
(Positive? Negative? Can you tell me why you feel this way?)
- b. Do you feel young women who are increased risk of breast cancer would be willing to reducing the amount of alcohol they consume?
(Why/not?)
- c. What are your views, if any, on a healthy lifestyles programme that encourages young women to eat a healthy, balanced diet?
(Would this be appropriate? Why/not?)
- d. What do you think, if anything, about³⁰ providing recipes for young women who take part in a healthy lifestyles programme?
(Advantages? Disadvantages?)
- e. Do you think helping young women who are at increased risk of breast cancer to become more physically active is worthwhile?
(Why do you think that?)

- f. Can you think of any ways to encourage young women to become more physically active?
(Group sessions, provide workout ideas)
- g. So, we've discussed diet, alcohol and physical activity, are there any other behaviours that you think could be addressed to help young women to maintain a healthy weight?
(Why?)
- h. What do you think, if anything, about offering regular weight monitoring to young women involved in a healthy lifestyles programme?
- i. What are your views, if any, about educating young women about general health and wellbeing?
(Useful/not?)
- j. In what ways, if any, would a weight maintenance programme be useful to you?
(Can you tell me why you think this? Motivational purposes?)
- k. Do you think other young women, who are at increased risk of breast cancer, would benefit from a healthy lifestyles programme that supports weight maintenance?
(Please explain why you think this?)
- l. Can you think of any reasons why young women might find it difficult adhering to a healthy lifestyles programme?
(Health behaviours of partners/spouses? Lack of social support? Children? Lack of motivation? Sedentary occupation? Perceived lack of time to cook from scratch? Perceived lack of time to take part in physical activity? Cost of ingredients/gym or sports club membership?)
- m. Can you think of any reasons why young women who are at increased risk of breast cancer would not want to be involved in a healthy lifestyles programme?
(A lack of time? Children? Cost? Confident in their own ability to maintain their own weight? Idea of this programme unappealing or offensive?)

3) Format of healthy lifestyles programme:

- a. How do you feel about Health Professionals from the Family History Clinic³¹ delivering the healthy lifestyles programme?
(Pros? Cons?)
- b. Can you tell me who, if anyone, would be suitable to run a healthy lifestyles programme for young women who are at increased risk of breast cancer?
(Other professionals; GP? Dietitian? Similar women?)
- c. What do you think, if anything, about a healthy lifestyles programme being delivered to young women at increased risk of breast cancer on an individual basis?
(One-to-one? Advantages? Disadvantages?)

- d. What are your views about delivering a healthy lifestyles programme to groups of young women at increased risk of breast cancer?
(Advantages? Disadvantages?)
- e. Tell me how you think a healthy lifestyles programme should be delivered to young women at increased risk of breast cancer?
(Online format? App? Written format e.g. booklet? Face-to-face consultations? Workshops?)
- f. Is there anything that you feel would help young women who are at increased risk of breast cancer adhere to a healthy lifestyles programme?
(Text messages? Smartphone app? Diary?)
- g. What do you think about the title “healthy lifestyles programme”?
(Does this title appeal to you? Why? Can you think of any other appropriate titles for this programme?)
- h. Can you explain how you think the healthy lifestyles programme should be advertised to young women who are at increased risk of breast cancer?
(Posters/leaflets in the Family History Clinic? Invitation only? Online? Can you think of any advantages/disadvantages of marketing the programme in this way?)

4) Understanding of weight control and the link to breast cancer:

- a. What does the term “weight control” mean to you?
(What, if anything, comes to mind when you hear the term? Weight loss? Weight maintenance?)
- b. Can you explain, if at all, why weight control is important to you?
(Personal health reasons? You want to look good for others?)
- c. Have you ever tried to control your weight?
(Engagement in weight management programmes? When was this? Why did you feel the need to control your weight then? Can you tell me what happened? How, if anything, did attempting to control your weight make you feel? Trying to lose weight? Attempt to maintain weight?)
- d. Do you feel that your weight is something that you are in control of? (Genetics? Lifestyle? Why do you think this?)
- e. Can you tell me what, if anything, you know about the link between weight and risk of developing breast cancer?
- f. What do you understand, if anything, about the link between alcohol consumption and risk of developing breast cancer?
- g. Can you explain what you know, if anything, about the link between physical activity and risk of developing breast cancer?

- h. What do you understand, if anything, about the link between diet and risk of developing breast cancer?
- i. So, we have just discussed how weight, alcohol consumption, diet and physical activity are linked to a risk of breast cancer. Would you like more information about any of the topics discussed?
(Can you explain why you would/not like more information? Other resources available? Personal research? Informed by the Family History Clinic?)

5) Other questions

- a. Is there anything you would like to add?
- b. Is there anything else that you wish to mention that we did not discuss?
(If a question comes to mind following the interview, you can get involved in the Patient and Public Involvement (PPI) groups that are run at Wythenshawe Hospital to share your views. Please take this PPI information sheet for relevant details).