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Obese women's barriers to mammography and Pap smear: The possible role of personality

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Abstract

Obese women are at increased risk of developing and dying from cancer, but are less likely than non-obese women to receive cancer screening examinations. Our qualitative study explores obese women's barriers to Pap smears and mammograms in greater depth than previous research. We also seek to understand why some obese women undergo screening while others do not. A purposive sample of moderately to severely obese women over age 40 was recruited from community-based organizations, health clinics, and retail establishments. Semi-structured in-depth interviews (N=33) informed by the Theory of Care-Seeking Behavior and three prior focus groups of obese women (N=18) were recorded and transcribed. Qualitative analysis was iterative, using a grounded theory approach involving a series of immersion/crystallization cycles. Participants verified many barriers to cervical and breast cancer screening previously identified in the general population, including fear, modesty, competing demands, and low perceived risk. Participants also highlighted several weight-related barriers, including insensitive comments about weight, and equipment and gowns that could not accommodate them. Comparison of participants who were up-to-date with both Pap smears and mammograms with those not up-to-date with either screening showed no discernable differences in these barriers, however. Instead, we found that the participants who followed through on their cancer screenings may share certain personality traits, such as conscientiousness or self-regulatory ability, that allow them to complete difficult or feared tasks. Our research therefore suggests that personality may act as an important mediator in health

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Disclosures

None

behavior, and should be taken into account in future theoretical models and health behavior interventions, particularly for obese women.

Keywords

Obesity; cancer screening; Pap smear; mammography; personality; barriers

Introduction

Obesity, defined as a body mass index (BMI) ≥ 30 kg/m², is a major cause of morbidity and mortality in the United States. One in three adult Americans is obese, and one in 18 is severely obese (BMI ≥ 40 kg/m²), with the highest prevalence among middle-aged and African-American women.(1) Obesity is associated with higher incidence of and mortality from breast and cervical cancers,(2, 3) as well as later stage diagnosis of breast cancer.(4) However, despite their elevated risk, obese women are less likely than non-obese women to receive breast and cervical cancer screenings.(5–7)

There are many possible reasons for lower cancer screening rates among women who are obese. In the general population, higher cancer screening rates are associated with certain health beliefs, such as higher perceived susceptibility to cancer, greater perceived benefits from screening, and higher perceived self-efficacy,(8, 9) while barriers such as fear, fatalism, embarrassment, and lack of access are associated with lower cancer screening rates.(9, 10) In addition, women who are obese may face unique barriers to cancer screening, for instance embarrassment about weight, heightened anxiety regarding physical privacy, and perceptions of increased pain and discomfort from cancer screening procedures. (11, 12) They may also delay preventive exams to avoid weight bias in healthcare settings – e.g., negative beliefs, attitudes, stereotypes, or behaviors toward overweight and obese persons.(12, 13) Finally, many women who are obese have several comorbid illnesses, and more immediate health demands may outweigh routine or preventive screenings.(14)

A number of prior studies have speculated about potential patient barriers to Pap smears and mammography among women who are obese.(7, 11, 12, 15, 16) Adams et al. (1993) found that higher weight was associated with increased reluctance to obtain pelvic examinations, however they did not explore the particular reasons for this reluctance.(16) Olsen et al. (1994) found that women with higher BMI were more likely to cancel physician appointments, including Pap smears and pelvic examinations, and the primary reason given for delaying medical care was embarrassment about weight.(15) Unfortunately, Olsen et al.'s data on the specific reasons for delayed physician visits in obese women is limited to a single multiple choice question that does not specifically address cancer screening. Wee et al. (2005) found that obese white women (but not African-American or Hispanic obese women) had lower prevalence of cervical cancer screening, and the authors identified embarrassment and discomfort as the primary reasons they avoided Pap smears.(11) Because it was a secondary analysis of the National Health Interview Survey (NHIS), Wee et al.'s study was not specifically designed to study either women who are obese or barriers to cancer screening, and therefore the response options to capture the reasons for not

undergoing cervical cancer screening were limited. Contrary to Wee's findings regarding racial and ethnic differences, Ferrante et al.'s study did find lower rates of Pap smears among obese black and Hispanic women.(17)

Only one prior qualitative study has specifically examined barriers to pap smears from the obese patient's perspective.(12) There has been no direct qualitative research on barriers to mammography among women who are obese, although one study reported physicians' barriers to performing both breast and cervical cancer screenings on patients who are obese (18). These include difficulty performing pelvic and breast exams, challenges overcoming patient refusal, and lack of appropriately sized equipment to accommodate severely obese patients. Amy et al. (2006) – the only previous qualitative study specifically designed to elucidate the reasons for delaying pap smears among women who are obese – used focus groups and a one page survey with six closed-ended questions to identify weight-related barriers. Their results suggest the most important factors are disrespectful treatment and negative attitudes by providers, embarrassment about weight, unsolicited advice about weight loss, and medical equipment too small to accommodate them.(12) The purpose of our interview study is to provide further insight into the perspectives of women who are obese and examine in greater depth their barriers to both cervical and breast cancer screenings. Additionally, we aimed to understand why some women who are obese undergo cancer screening while others do not. We did not include colorectal cancer screening in our study as there is not consistent evidence that obese women are less likely to receive colorectal cancer screening.(6)

Methods and Procedures

Study Sample

This was a qualitative study using semi-structured in-depth interviews of 33 women, conducted between March 2009 and August 2010 in New Jersey. Participants were recruited from community-based organizations, health clinics, and retail establishments. We purposively sampled women who were between 40 and 74 years old and moderately to severely obese. To simplify recruitment procedures, we used a cutoff weight of 220 pounds to establish eligibility. This weight corresponded to the lower limit of moderate obesity (BMI at least 35) for height of 67 inches (90th percentile height in women in a similar sample).(17) Women who did not speak English, were pregnant, or had a history of breast or cervical cancer were excluded. We also excluded women who did not have an established source of care, as we wanted to focus on barriers unique to obesity, as opposed to barriers relating to access to care. The study protocol was approved by the Institutional Review Board of the University of Medicine and Dentistry of New Jersey. All participants provided informed consent and received \$30 in cash or a gift card of equal value after completing the interview.

Data Collection

Interviews were conducted by telephone or in-person by two trained qualitative interviewers (JF, ER). The interview guide was informed by the Theory of Care-Seeking Behavior(19) and modified after pretesting with three focus groups of obese women (N= 18). According

to the Theory of Care-Seeking Behavior, patients' health-care seeking behaviors are influenced by the interaction of *psychosocial* (affect, utility beliefs, norms, and habits) and *facilitator* (access, transportation, insurance) variables. We focused our questions on psychosocial variables because prior research showed disparities in cancer screening among obese women persisted after controlling for facilitator variables.(20) Participants were asked to describe their: *affect* (i.e., feelings such as anxiety, fear, or embarrassment) about breast and cervical cancer and their prior experiences with getting mammograms and Pap smears; *utility beliefs* (i.e., their beliefs, perceived importance, and perceived barriers to getting mammograms and Pap smears); *norms* (i.e., social influences from professionals, friends, and family regarding mammograms and Pap smears); and *habits* (i.e., their usual practices related to health and seeking health care). We also asked participants to describe how their weight affected their healthcare experiences in general, as well as its specific impact on their experiences with mammograms and Pap smears. Finally, we asked what could be done to improve care for overweight women and to make getting mammograms and Pap smears more pleasant.

Interviews lasted 60–90 minutes, and were digitally recorded, transcribed verbatim, and de-identified. Recruitment and interviews continued until data saturation was achieved, i.e., when no new information was emerging (N=33). Transcripts were imported into ATLAS.ti (Atlas.ti Scientific Software Development GmbH, Berlin, Germany) for coding and analysis.

Data Analysis

Our qualitative analysis used a grounded theory approach based on a series of immersion/crystallization cycles.(21) In this approach, a group of researchers collectively immerse themselves in the data through cycles of reading and reflection, gathering insights and themes as they emerge, until interpretations become apparent and crystallize. Initially, the research team (AF, JH, ER, JF) read transcripts jointly to understand the content and to develop a set of preliminary codes. Group analysis continued until we achieved consensus regarding coding schemes. The remaining data were then analyzed independently, with research team members meeting regularly to refine coding schemes as needed. All transcripts were independently coded by at least two research team members, and any differences in coding were resolved through group consensus. Next, data within codes were re-read and analyzed in a second immersion/crystallization cycle, and emerging themes and interpretations were compared and contrasted within and between the key sub-groups within the sample (not up-to-date in screenings versus up-to-date [mammogram within 2 years or Pap smear within 3 years])(22). It was at this point in the analysis that personality differences between these two groups emerged as a theme (specifically as it relates to the ability to push one's self to complete difficult or painful tasks). Note that we did not measure personality in this study, and further research is needed to be more precise about exactly what aspect of personality we are seeing, as it resembles a number of existing constructs, including conscientiousness, self-control, and self-regulatory ability. A third immersion/crystallization cycle was used to identify negative or disconfirming evidence for this emerging theme. The quotations included in this paper represent and illustrate our key findings.

Results

Tables 1 and 2 summarize the sample characteristics. About half of participants were white and half were black. The mean age was 55.8 years (s.d. 8.6) and mean weight was 263 pounds (s.d. 45). Participants had varying degrees of compliance with mammogram and Pap smear screening recommendations: 11 (33%) were up-to-date with both screenings; 13 (39%) were not up-to-date with either screening; and 9 (27%) were up-to-date with 1 screening.

Common barriers with the general population

Our results verified that women who are obese share many of the barriers to cervical and breast cancer screening previously identified in the general population, including modesty/embarrassment, fear of pain, fear of cancer, competing demands on their time, and the belief that they are at low risk for developing cancer. (See Table 3 for sample quotations.) While these barriers are not unique to women who are obese, our respondents did express the perception that in some cases these barriers may be *heightened* with being obese, particularly modesty concerns and fear of pain, as a result of some of the weight-specific issues discussed below. We examined barriers across racial groups, but did not detect any differences in the barriers discussed by our respondents, about half of whom were black women.

Weight-related barriers

Participants identified a number of weight-related barriers to obtaining mammograms and Pap smears, including insensitive comments about their weight, problems with equipment and gowns that could not accommodate them, and perceptions of increased pain with exams. Again, these barriers were not unique to one racial group, and the quotations presented below are from both white and black women.

Negative interactions with physicians or staff—The respondents shared anecdotes that highlighted rude or insensitive comments about their weight by physicians or staff. Some simply felt upset by these interactions, while others refused to continue seeking care with the providers. Regardless, these and similar negative experiences may contribute to women who are obese delaying screenings or even avoiding them entirely.

I was going to this one doctor, and it was a bad experience because I was overweight and he like made it a point like – actually I didn't even go back to him because he was like, "You've got to lose weight. You've got to lose weight. You're too heavy," but it was the way he was saying it [...]. I mean it was the truth, he wasn't lying, but it was just the way he said it to me, and I felt like if I wasn't overweight, I wouldn't have been treated that way. (Participant 26)

I think they do-what would be the expression-put you in a box. "Oh, you're just lazy or you just don't care. You're not doing what you need to do, so you're not going to do what I tell you to do anyway." (Participant 32)

A sentiment raised in many of the interviews is the belief that some doctors blame all of obese women's health problems on their weight or always focus on weight. For example,

My doctor had told me when I went there, and he told me, “Fat, fat, fat,” I was going there for...I wasn’t feeling good, I think I had a cold, and he dug it up again, like I said, you could go for one thing, and they will bring it up. I just think when you’re overweight you are treated different because, yeah, they talk about it more. (Participant 27)

Like they associate it with-they say, you know, you have to lose weight, you know that your weight is-you have to lose weight. And it’s like okay I know that, but that’s not what I’m here for. I’m here for-even when I had my lymphoma they said you know you have to lose weight-and really weight had nothing to do with getting that. (Participant 21)

Equipment and gowns too small to accommodate them—Most of our respondents mentioned modesty concerns in relation to ill-fitting gowns, and several women explicitly stated that feeling exposed in gowns that are too small was a reason they avoided mammograms or Pap smears in the past.

Yeah, [...] that would probably be what affected me with that Pap smear, because when you take your clothes, you know, and the gown never fits. (Participant 26)

I always have to ask for a bigger gown, and that’s embarrassing. Especially when somebody else is in the stall. They always forget to put one or two big gowns. (Participant 20)

In discussions of Pap smears, participants also mentioned that the examination table is often too narrow to accommodate heavier women comfortably.

Exam tables are kind of narrow, and when you have to get an exam like a Pap smear that can be a little uncomfortable. Because, you know, you have to put your feet up in these stirrups and it’s already a little narrow-the thing that you’re on, so I get a little nervous. Sometimes some of the equipment could better accommodate-be wider. (Participant 21)

These kinds of problems with inadequate equipment may intensify these patients’ feelings of modesty and embarrassment during mammograms and Pap smears.

Perceptions of increased pain—Relative to mammograms, some respondents felt that having large breasts makes mammograms more painful.

It hurts like hell, because I have big breasts and you smash them flat as a rock, a pancake. And they somehow find breast tissue on your back, under your arm, and try to squeeze all of that around, too. (Participant 18)

However some respondents felt it was actually less painful with larger breasts than small breasts, because you have more breast tissue to work with – to “feed the monster,” as one woman stated. A number of respondents said that fear of pain was the primary factor keeping them from getting a mammogram, including the following woman, who said that she knows she needs to get a mammogram, but is struggling to overcome her fear of the pain:

They have you squashed between those two plates and she would warn me, but it didn't help because it hurt, and it already hurt before she started squashing more. (Participant 28)

This painful prior experience contributed to her delaying getting another mammogram. She continued, "And I should know better. My intellect can't overcome it."

In relation to increased pain with Pap smears, a few women mentioned that they suspect that their doctors automatically choose a large speculum during pap smears, making it more painful for them.

I just don't think that speculum is sized right, and maybe they think because you're a big person that, you know, vaginally they use the biggest spec-I don't know what it is, but I just don't think they choose right. (Participant 21)

While fear of pain is a barrier they share in common with the general population, many participants seemed to feel that their weight makes mammograms and Pap smears extra painful. In the case of Pap smears, this effect is mostly indirect, as in the above example of automatically choosing large speculums.

Comparison of screened and unscreened respondents

In trying to more fully understand why some women who are obese undergo cancer screening despite facing these additional barriers while others do not, we compared two sub-groups within our sample: Women currently up-to-date with both mammograms and Pap smears (N=11) and women not current on either screening (N=13). Women who were up-to-date on both screenings had higher weights and were older (see Table 2). The two groups had a similar range of levels of education.

Comparison of the participants who were up-to-date with both Pap smears and mammograms with those who were not up-to-date with either screening showed no discernable differences in terms of the barriers mentioned above, as illustrated by the following descriptions by women who were up-to-date with both screenings.

Barrier: Equipment and gowns too small to accommodate them

I don't want to go to the doctor's office and not be able to put a gown on, that was the number one thing. That was the original reason why I wouldn't go. The question-have your chest hanging out anyway, I don't need my behind hanging out too. (Participant 14)

Barrier: Perceptions of increased pain

You know that fat under your arm pit, that part that sticks out of your bra when you're heavy and it's between that and your armpit, that seems to get pinched all the time [...]. It's just very uncomfortable, that spot on your breast. (Participant 11)

Respondents who were not up-to-date with mammograms and Pap smears nonetheless seemed to have knowledge of the benefits of these screenings, suggesting that knowledge alone is not sufficient to ensure compliance. For instance, consider the following

respondents, both of whom are not up-to-date on either screening, despite the fact that they clearly understand the benefits of cancer screening.

I know you need to get mammograms, and my last 30 hours working [as a physician] was [spent] on [reviewing] risk factors, predictors of women getting mammograms and predictors of them not. (Participant 28)

I feel certain guilt about not having done this. It's important but I haven't done anything about it. [It's important] because women my age often have undiagnosed problems and they're silent... It's something I'd like to push myself into doing. (Participant 22)

Similarly, participants in both the screened and unscreened groups reported negative prior experiences with mammograms, Pap smears, and health care providers more generally, suggesting that negative past experiences cannot fully explain why many women who are obese remain unscreened. In other words, many of the up-to-date women in our sample are compliant with the recommended screenings in spite of negative past experiences, including these examples:

I sat in the waiting room for like an hour and a half and they kept taking people who'd come after me. Finally I went to the desk and said, "Why is that happening?" You know, I want to leave already and they said, well one of our rooms has a lower table, easier to get on, and the other rooms have higher tables that are harder to get on so we were waiting to have a lower table for you to get on. I said, "Oh really? I don't have any trouble with any table, examining table," I said, "Why didn't anyone ask me?" They had just assumed that would be too hard for me to step on whatever it was to step to get on a higher table. (Participant 2)

They just, just really treated me like not even a second rate or a third rate citizen. It was just really - and if you have low self esteem issues, which you tend to if you're really overweight - when you have a doctor who's treating you that way, there's no inspiration, there's no confidence, there's no acceptance. (Participant 14)

There was also no appreciable difference between the two groups relative to their feelings about being overweight. Participants in both groups discussed shame and negative cultural messages about being overweight as well as the need for self-acceptance.

The primary difference that emerged between the two groups was that the women who were up-to-date with their cancer screenings in spite of the extra weight-related barriers they face made comments indicating that they possess the ability to force themselves to do something that they perceive as unpleasant or uncomfortable, as evidenced by phrases like "I have to do this no matter what," "I do what I have to do," "I just put it out of my mind," and "I just took a deep breath and went forward."

Personally I think, for me, it's mindset. I mean it might be embarrassing, but it's something that has to be done. So you have to decide for yourself that *I got to do this, no matter what*. (Participant 13)

The only discomfort I have is like, being exposed, because you know, you're there and your legs are up in the air and you got somebody lookin' at your vagina, but I

know, in the long run it's beneficial for me, so *I just put that out of my mind*.
(Participant 7)

I do what I have to do. I mean there are awkward situations in all of our lives.
(Participant 1)

I just kind of *took a deep breath and went forward*. I knew I had to get this done.
(Participant 14)

So, even if you're uncomfortable, *get your butt out the door and go*. That's it.
(Participant 4)

These kinds of comments were rarely voiced by the unscreened respondents. In fact, in a few cases they themselves suggested that it is largely their mindset that keeps them from following their physicians' recommendations.

And that's my life. And that's probably with health care-why I went so long sick, because I'm just really not that disciplined-I just don't really. But now I'm trying to get better like that, health-wise. (Participant 21)

In light of this, our data suggests that personality differences, particularly those relating to self-discipline and self-motivation in spite of acknowledged embarrassment, physical discomfort, and other barriers, may offer a productive area for future research, particularly in the context of cancer screening behavior, but also studies of health behavior more broadly.

Discussion

Like all studies, this research has limitations. As an exploratory, qualitative study, our discussion is intended to provide suggestions for productive directions for future research, rather than to make generalizable causal statements. Further, given that the theme of personality differences emerged inductively from the data, we were unable to actually measure the participants' personality traits, and therefore cannot be definitive about what aspects of personality we are observing. Finally, our ability to compare obese and non-obese women is limited, since we did not interview non-obese women for this study.

Nonetheless, our data suggests that women who are obese likely face unique barriers to breast and cervical cancer screening. Not only do they share many of the barriers previously identified in the general population, such as modesty, fear of pain, fear of cancer, perceptions that they are at low risk, and competing demands on their time, but many of our respondents expressed the perception that certain of these barriers are heightened with obesity. This was particularly true of modesty and embarrassment, since women who are obese are often more exposed due to ill-fitting gowns. Some participants also mentioned that because they are ashamed of their weight, they find it very difficult to expose their bodies during exams. The fear of pain may also be more intense; many felt that mammograms are more painful with larger breasts and/or breast tissue that extends under the arms.

Moreover, based on our data, these patients face a number of additional barriers that are specifically related to their obesity and that have not previously been identified in the

general population. These include rude or insensitive comments by providers and staff about their weight, and problems with supplies or equipment, such as gowns or examination tables that cannot accommodate them comfortably, and chairs they cannot sit on in waiting rooms.

This is the first qualitative study to specifically examine obese women's barriers to both breast and cervical cancer screenings. One prior study examined barriers to Pap smears from the obese patient's perspective, and our research confirms their finding that insensitive comments by physicians and inadequate equipment and gowns are among the most important barriers. This is the first qualitative study to interview women who are obese about their barriers to mammography. We also examined the additional question of what allows some women who are obese to follow through with the recommended screenings despite the added barriers they face, and our data suggests that personality may play a role. Many of the women in our sample who were currently up-to-date with their mammograms and Pap smears seemed to exhibit the ability to complete difficult or feared tasks. Although we did not specifically measure our respondents' personality traits in this study, we take this as preliminary evidence that there may be personality differences between the two groups. Furthermore, personality may play a role in some obese women's ability to *overcome* barriers to breast and cervical cancer screenings. In other words, it is not that the women who were up-to-date with their screenings faced fewer barriers; they simply were not stopped by them.

Our results therefore support the need to consider the role of personality in shaping health beliefs and behaviors, in particular those relating to cancer screening. Ideally, future research will measure personality and incorporate quantitative evaluation to test its significance. Understanding the contribution of personality characteristics in adherence to cancer screening guidelines can help us to target health behavior interventions to reach those who need it most.

While it may not be possible to modify a person's fundamental temperament, there are still things we can do as health professionals to increase adherence to cancer screening guidelines. Patients can be coached in coping skills and approaches to emotion management. Understanding the role of personality can help identify where to most productively focus these efforts. For example, while the barriers to Pap smears and mammography identified in this paper are experienced by most women who are obese, they actually stop only some of them from getting screened. Identifying the patients most likely to experience barriers as road blocks rather than inconveniences to be endured can help us focus intervention efforts on those who need it the most. Strategies such as motivational interviewing may be helpful for these women, while less intensive strategies, such as reminders, may be sufficient for other women.

Finally, it is important to note that this attention to personality is likely to help all patients, not just those who are obese, as suggested by the prior research showing an association between conscientiousness and breast cancer screening in non-obese women.(23, 24) In light of this, it may be more productive to shift the focus from identifying barriers to identifying which patients will actively avoid mammograms and Pap smears because of the barriers they face (as opposed to those who will follow through with these screenings in spite of them).

Our research further supports the need to decrease weight bias in healthcare settings. Up to 69% of overweight and obese women report experiencing weight bias from health professionals, which leads to negative emotional, social, economic, and physical health consequences.(13) Strategies for bias free practices include: not blaming patients for their weight problems; not focusing on weight when obese patients present with other primary health concerns; using sensitive language when discussing weight; weighing patients only when medically indicated; avoiding comments about weight that may be perceived as offensive; and having appropriate sized medical equipment and office furniture.(5) Improving the office environment and increasing sensitivity to the needs of obese patients will help improve the quality of their healthcare experience, which may increase their preventive behaviors.

In summary, women who are obese share many of the barriers to mammography and Pap smears previously identified in the non-obese population. They also face unique weight-related barriers, such as rude or insensitive comments about their weight, and examination gowns too small to cover them comfortably. While interventions are needed to decrease weight bias in healthcare settings to improve the quality of care for patients who are obese, our data revealed that some women who are obese are able to overcome weight bias and remain current with their cancer screenings. These women seem to possess the ability to use self-discipline to overcome their barriers. In light of this, personality may act as an important mediator in health behavior, and it should be taken into consideration in designing future theoretical models and health behavior interventions, particularly for women who are obese.

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Table 1

Study Participants

Subj #	Age	Race/Ethnicity	Weight	Screening Status
1	57	White	350	UTD Both
2	65	White	250	UTD Both
3	67	Black	270	UTD Both
4	57	White	210	UTD Both
5	57	White	280	UTD Neither
6	66	Black	250	UTD Both
7	62	Black	240	UTD Both
8	64	Black	280	UTD Pap
9	40	Black	335	UTD Pap
10	55	Black	300	UTD Neither
11	61	White	320	UTD Both
12	45	Black	350	UTD Both
13	64	Black	360	UTD Both
14	57	White	220	UTD Both
15	47	Black	220	UTD Pap
16	52	Black	220	UTD Pap
17	51	White	230	UTD Pap
18	49	White	220	UTD Neither
19	42	Black	247	UTD Pap
20	66	Mixed	260	UTD Neither
21	47	Black	230	UTD Neither
22	64	White	350	UTD Neither
23	71	White	265	UTD Mammogram
24	47	White	290	UTD Both
25	67	White	240	UTD Neither
26	45	Black	250	UTD Neither
27	43	White	240	UTD Mammogram
28	59	Black	240	UTD Neither
29	52	Black	195	UTD Mammogram
30	53	White	258	UTD Neither
31	49	White	270	UTD Neither
32	65	White	227	UTD Neither
33	56	White	228	UTD Neither

UTD: up-to-date (mammogram within 2 years, Pap smear within 3 years)

Table 2

Characteristics of participants by screening status

	Total (N=33)	Up-to-date on both screenings (N=11)	Up-to-date on one screening (N=9)	Up-to-date on neither screening (N=13)
Weight				
Under 250 pounds	15	3	6	6
250 pounds or more	18	8	3	7
Age				
40–50	10	2	4	4
51–60	11	3	3	5
60–71	12	6	2	4
Race/ethnicity				
White	17	6	3	8
Black	15	5	6	4
Mixed	1	0	0	1

Table 3

Barriers previously identified in the general population

Theme	Sample Quotation
Modesty/embarrassment	"I don't think any woman likes to have her legs just wide open, strange people lookin' at you, you know, even though it's a doctor" (Participant 7)
Fear of pain	"It was just so painful and every time I think about it, it stops me dead in my tracks. It's awful because I know you need to get mammograms [...]. But I'm going to tell you that pain was serious" (Participant 28)
Fear of cancer	"No, it's because I'm afraid. I'm afraid that they'll find something. My stupid thinking is, 'Well, if I have it, what are they going to do? I don't want chemotherapy.' [...] That's my thought process" (Participant 30)
Competing demands	"You know, because, I'm not so busy right now and that's why I'm trying to catch up with all these things I've neglected, you know, because it's hard when you're working and you've got kids and you've got a house you're running, and you've got, I had my mother-in-law move in with me 'til she passed away recently... if it wasn't critical to do, I didn't do it." (Participant 5)
Perceived low risk	"I have a girlfriend that lives on the next floor. She's had breast cancer. I have another friend who's older than her, fellow soprano in the choir [...], she just had a mastectomy a couple months back. I think about it, but I think my risk is, really-that's the problem [...] It's because I really don't think I am at as high risk" (Participant 28)

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