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# Perceived Benefits and Barriers in the Mediation of Exercise Differences in Older Black Women with and Without Obesity

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## Abstract

**Objectives** Weight control is an exercise benefit, important for older Black women, a group experiencing obesity disparities. We compared perceived exercise benefits and barriers between Black women with and without obesity and determined which mediated the weight group-exercise relationship.

**Methods** A survey ( $n = 234$ ) was administered to determine attitudinal agreement between weight groups (obese or non-obese). Multiple mediation analysis was used to investigate if attitudes mediated the weight group-exercise relationship.

**Results** High agreement with all exercise benefits was observed between women with and without obesity. Compared with women without obesity, women with obesity were more likely to report the barriers of only exercising to lose weight (OR = 2.52, 95% CI 1.40–4.55), lack of will power (OR = 1.82, 95% CI 1.05–3.19), weight (OR = 3.04, 95% CI 1.34–6.83), and cost (OR = 2.14, 95% CI 1.02–4.47). Exercising to lose weight and lack of will power mediated the weight group-exercise relationship.

**Conclusions** Women largely agreed on the exercise benefits. Lack of will power and engaging in exercise only for weight loss were barriers that were more common among older Black women with obesity. The barriers partially explained the lower exercise engagement in women with obesity. Future work may address these barriers to increase exercise in older Black women.

**Keywords** Physical activity · Exercise · Health disparities · Obesity

## Introduction

Physical activity is known to reduce the risk for of cardiovascular disease, type 2 diabetes, and some cancers that exist at higher rates in Black women [1–3]. Unfortunately, Black women exhibit some of the lowest rates of physical activity (PA) in the USA [4]. It is estimated that only 27% of Black women meet the recommendation to perform at least 150 min/week of moderate-intensity PA [5]. Data from national surveys indicate that the already low rate of PA in Black women decreases further as age and weight increase [4]. This decline

is especially salient considering that nearly 60% of Black women live with obesity, a rate disproportionately higher than that observed in men and women of all other race groups [6]. High obesity rates persist across Black women's lifespan from young to older adulthood, with class 3 (severe) obesity present at nearly twice the rate of that seen in women and men of other races in older adulthood [6]. The disparity in obesity becomes ever more concerning for Black women in older adulthood as the burden of high weight can limit physical function and PA engagement as adults age [7]. In addition to preventing chronic disease, PA also contributes to weight gain prevention and control [8]. Thus, to enhance weight control efforts and reduce weight-related morbidity, mortality and physical function decline, increased adoption and maintenance of PA is necessary for older Black women [6].

Evidence indicates that perceived benefits and barriers to PA influence engagement in the behavior. Therefore, developing successful strategies and interventions to increase PA among older Black women requires understanding their perceptions about PA [9–11]. Most evidence on PA benefits in this group has been examined qualitatively [10, 12–15]. A study using focus group methods and semi-structured interviews among a diverse population of men and women found

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that most people engage in PA due to the associated health benefits (including weight loss) [14], a theme reiterated in other qualitative studies [13, 16, 17]. Weight management was also reported as a motivator to engage in PA among a sample of mostly female, older Black adults, the majority of whom had overweight or obesity [17]. Maintaining good physical and mental health, especially to sustain independence while aging and to engage in daily activities, were motivators for PA engagement in older Black women with obesity [16]. Reduction of elevated disease risk due to family health history [13] and treatment of existing chronic disease [10] are also important perceived benefits for Black women. Using a mixed methods approach, Huebschmann et al. contributes that Black women's perceived benefits of PA include better sleep quality and feeling better about their bodies [10]. The social aspects of PA, including giving and receiving social support and participating in PA with other Black women, are among the benefits most reported by Black women [10, 16, 17]. This is also true for older Black women who engage in PA for common reasons like social support, enjoyment related to PA engagement with others, and the ability to play with younger relatives (e.g., grandchildren) [16, 17]. The identified benefits hold intrapersonal and interpersonal relevance for older Black women, yet coexist alongside barriers that also influence PA engagement.

Race- and gender-specific PA barriers unique to Black women have also been examined through mostly qualitative methods. In a racially diverse sample of older adults, Mathews et al. found that only Black participants mentioned the cost related to recreational facilities as a barrier to PA in focus groups [17]. The costs associated with access to recreational facilities is a consistent barrier for this demographic [15, 18], similarly echoed in a mixed methods study where the cost of PA equipment was a barrier [10]. The barrier of cost intersects with time, as Black women described that perspiration from PA engagement made it necessary to restyle ruined hairstyles that were initially expensive to achieve and subsequently had to be redone [10, 13, 15]. Quantitative evidence supports the role of concerns about sweating out hairstyles in Black women's decisions to engage in PA [10, 11], which was similar between younger and older Black women [10]. Additional reported barriers included lack of motivation [10, 19], lack of Black women PA role models [15], little experience doing PA [13, 14], safety concerns [15], and competing life priorities [13, 15, 16] that cast PA as a self-indulgent luxury Black women cannot afford and experience guilt for doing [13]. Though qualitative methods have advanced the knowledge and practice in this area, quantitative methods have been applied far less [12], but are necessary to fully conceptualize the nature of low PA among older Black women. Given the disproportionately high prevalence of obesity that persists across the life course in Black women, understanding the role of weight in physical activity behavior in older Black women is important.

Comparison of exercise behaviors and perceived benefits and barriers in older Black women with and without obesity may help us understand the influence of weight on PA while aging. This study will quantitatively examine the relationship between weight and exercise behavior and perceived benefits and barriers among older Black women. Our objectives are to (1) compare perceived exercise benefits and barriers and exercise behaviors and (2) determine which benefits and barriers, if any, mediate the weight group-exercise relationship. This paper will report our findings to provide a nuanced picture of the factors that affect exercise among older Black women.

## Methods

Data for this secondary analysis were sourced from a church-based randomized controlled trial to promote colorectal cancer screening and exercise in Black men and women [20]. We used trial data from the 6-month follow-up assessment, and included only female participants from the control group who did not receive a PA intervention, but did receive a fruit and vegetable intervention [21]. To evaluate specific exercise attitudes relevant to this population, some assessment measures were created or modified based on focus group results described elsewhere [22].

Detailed data collection methods were previously described [20]. Eligible participants were at least 50 years old, Black, and attended church in one of the study regions (Flint, Michigan and Raleigh, Durham, and Greensboro, North Carolina). This analysis excluded women who were underweight (BMI < 18.5 kg/m<sup>2</sup>) and all men. The Institutional Review Board at the University of North Carolina at Chapel Hill approved this study.

## Measures

### BMI and Demographic Measures

BMI was calculated using self-reported height and weight. Women were classified as obese (BMI ≥ 30) or non-obese (BMI = 18.5–29.9). Additional measures included age, marital status, education, health status, and income. In addition, a co-morbidities index was created by summing all positive responses to the questions “Have you been diagnosed with any of the following illnesses: high blood pressure, heart disease, diabetes, arthritis, or cancer?”

### Perceived Exercise Benefits and Barriers

Perceived barriers to exercise (9 items) and perceived benefits of exercise (8 items) were measured using a 4-point Likert scale (1 = *agree a lot*, 4 = *disagree a lot*). Items were created

based on previous research [4] and the focus group findings with women with obesity. Examples of existing items included “I don’t have any place to exercise,” or “I will control my weight if I exercise.” The new items included “I usually only exercise if I am trying to lose weight,” “I am uncomfortable with how I look while exercising or while wearing exercise clothing,” “My current weight makes it difficult for me to exercise,” and “I enjoy exercising.” Each item was dichotomized into “Agree” (values 1–2) and “Disagree” (values 3–4).

### Physical Activity

PA was assessed using a validated self-report measure from the parent trial, WATCH study, that assessed seven recreational activities of moderate-to-vigorous intensity (run/jog, bike, active sports, dance, swim, walk/hike, and aerobics) and included an “other” question where participants could self-report other activities [23]. For each activity selected participants indicated its frequency (rarely or never, 1–3 times/month, 1–2 times/week, 3–4 times/week, or  $\geq 5$  times/week) and duration  $< 20$  min (computed as 15 min) or  $\geq 20$  min (computed as 30 min). These numbers were multiplied for each activity, and the resulting minutes/week were multiplied by the metabolic equivalency task (MET; 1 MET = 1 cal/kg/h) value for the activity to create activity MET score in MET hours/week, a measure of caloric energy expenditure used to categorize the intensity of PA. The Compendium of Physical Activities was used to assign standardized intensities to reported activities by MET hours/week [24]. Activities rated as “other” were included in the calculation for MET hours/week if they were considered at least moderate intensity (MET  $> 3$ ) [24]. A dichotomous PA variable was also created based on whether participants did or did not meet the PA recommendation of 150 min/week of moderate or vigorous activity [20].

### Statistical Analysis

Chi-square tests and logistic regression analyses were performed using SAS 9.3 (Cary, NC). Chi-square tests were used to test the relationship between weight group and exercise attitudes and total MET hours/week. Because level of education (college graduate vs. less than college graduate) was significantly different between women with and without obesity (Table 1), it was included as a control variable in all analyses. Income was not included as a control variable due to a high amount of missing data that would have resulted in listwise deletion of cases; of the sample, 14% in the parent study did not answer the income question, and among the sample included in the analysis, there was no significant difference in income level between women with and without obesity. Age and marital status did not differ by weight group. Logistic regression was used to calculate odds ratios comparing the

likelihood that women with or without obesity agreed with a given exercise attitude (benefit or barrier). Items that were significantly associated with weight group in the adjusted models were selected as potential mediators of the relationship between weight group and MET hours/week. A multiple mediation model was used to examine the total and specific indirect effects of each potential mediator. Bootstrap analysis, a nonparametric sampling procedure, was performed using Mplus 6.2 to test the significance of the indirect effects [25]. This calculation was repeated with 5000 samples to yield a parameter estimate for the specific indirect effects.

## Results

### Participant Characteristics

A sub-sample of 234 older Black women participating in the control arm of the randomized controlled trial met eligibility criteria for this study. On average they were  $63.8 \pm 7.9$  years old, 33% reported at least a college education, and 40% were married or living with a partner (Table 1). Over half the sample had obesity ( $n = 121$ ). Women with obesity reported significantly fewer mean MET-hours/week of PA ( $6.5 \pm 7.2$ ) than women without obesity ( $9.9 \pm 10.7$ ;  $p = 0.006$ ). Women with obesity were more likely to state that they were actively trying to lose weight than women without obesity ( $p < 0.0001$ ).

### Exercise Attitudes

There was high endorsement of all exercise benefits (75.7–95.0%) and no significant differences by weight group (Table 2). “I enjoy exercising” had the lowest endorsement in women both with (80.2%) and without (75.7%) obesity. For women with obesity, the most common barrier was “I only exercise if I am trying to lose weight.” This differed for women who were not obese, who noted time was the most common exercise barrier.

Unadjusted analyses indicated that women with obesity were more likely than women who were not obese to engage in exercise for weight loss, to feel uncomfortable during exercise, to find exercise difficult because of their weight, lack the will power to do exercise, and feel that exercise is too costly. After adjusting for education, four barriers were associated with obese weight status: only exercising to lose weight, lack of will power for exercise, weight as a barrier to exercise, and that exercise costs too much (Table 2).

### Mediation Analysis

The four barriers significantly associated with weight group were tested as potential mediators of the weight group-



**Table 1** Demographic characteristics of the study sample

Variable	Non-Obese ( <i>n</i> = 113)	Obese ( <i>n</i> = 121)	Sig. <sup>a</sup>
BMI, mean (SD)	26.3 (2.49)	35.3(4.24)	< 0.0001
Age, mean (SD)	64.5 (8.5)	63.0 (7.00)	0.14
Income, <i>n</i> (%) <sup>b</sup>			
< 20,000	19 (16.8)	22 (18.2)	0.39
20,000–49,999	33 (29.2)	50 (41.3)	
50,000–99,999	32 (28.3)	31 (25.6)	
100,000+	7 (6.2)	6 (5.0)	
Marital Status, <i>n</i> (%)			
Married or w/ a partner	49 (43.4)	46 (38.0)	0.70
Never married	11 (9.7)	10 (8.3)	
Divorced/separated	29 (25.7)	39 (32.2)	
Widowed	24 (21.2)	26 (21.5)	
Education, <i>n</i> (%) <sup>b</sup>			
Some High School	5 (4.4)	5 (4.1)	0.15
High School/GED	29 (25.7)	28 (23.1)	
Some College/Trade School	32 (28.3)	53 (43.8)	
College Graduate	25 (22.1)	19 (15.7)	
More than College	21 (18.6)	15 (12.4)	
Uninsured, <i>n</i> (%)	6 (5.3)	6 (5.0)	0.90
Self-reported health, <i>n</i> (%)			
Excellent	8 (7.1)	6 (4.9)	0.01
Very good	48 (42.5)	37 (30.6)	
Pretty good	48 (42.5)	56 (46.3)	
Fair/poor	9 (7.9)	22 (18.2)	
Co-morbidities, <i>n</i> (%) <sup>b</sup>			
0	29 (25.6)	15 (13.2)	0.01
1	31 (27.4)	32 (28.3)	
2	33 (29.2)	40 (35.4)	
3+	17 (15.0)	26 (23.1)	
Physical activity			
MET-hours/wk., mean (SD)	9.9 (10.7)	6.5 (7.2)	0.006
Meets PA Recs (150 min/wk), <i>n</i> (%)	39 (34.5)	32 (26.5)	0.18
Currently trying to lose weight, <i>n</i> (%)	48 (45.7)	95 (81.2)	< 0.0001

<sup>a</sup> *p* value for paired t-tests (continuous variables) and Chi-Square tests (categorical variables)

<sup>b</sup> Frequencies do not total to 100% due to missing data

exercise (MET-hours/week) relationship, controlling for education (Fig. 1). There were no significant indirect effects (Table 3) for weight and cost as mediators of the weight group-exercise relationship. However, significant direct effects were observed for the barriers, “I usually only exercise when I am trying to lose weight” and “I don’t have the willpower to exercise.”

## Discussion

This study employed a quantitative approach to examine weight status, exercise, and perceived exercise benefits and barriers in older Black women. Our findings confirmed that

the odds of experiencing the barrier “I usually only exercise when trying to lose weight” were significantly higher among older Black women with obesity than without. This barrier, along with a lack of willpower, mediated the weight group-exercise relationship and helped explain some of the disparities in exercise behaviors between older women with and without obesity. Meeting the exercise recommendations has been associated with younger age and a current weight loss attempt in a church-based survey of Black women [26], an interesting finding that somewhat reflects our older adult sample where 95% of Black women with obesity were currently trying to lose weight. While the proportion meeting exercise recommendations was not different between women in either weight group, women with obesity had significantly lower

**Table 2** Proportions and odds ratios for psychosocial variables by weight status

Items (% who agree with statements)	Non-obese (n = 113)	Obese (n = 121)	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI) <sup>a</sup>
I enjoy exercising	75.7	80.2	1.30 (0.70, 2.42)	1.37 (0.72, 2.61)
I will control my weight if I exercise	90.9	95.0	1.92 (0.67, 5.46)	2.38 (0.81, 6.99)
I will have more energy if I exercise	84.4	89.2	1.52 (0.70, 3.30)	1.49 (0.68, 3.29)
I will improve my health if I exercise	91.8	93.4	1.26 (0.47, 3.39)	1.30 (0.47, 3.57)
I will be less stressed if I exercise	93.6	92.5	0.85 (0.30, 2.36)	0.85 (0.30, 2.42)
I will look and feel better if I exercise	94.6	94.2	0.93 (0.30, 2.86)	1.09 (0.34, 3.46)
I will improve my physical fitness if I exercise.	93.7	95.0	1.29 (0.42, 3.96)	1.54 (0.48, 4.91)
Exercising will decrease my chances of getting some diseases.	83.6	86.0	1.20 (0.58, 2.46)	1.20 (0.58, 2.50)
I usually only exercise if I am trying to lose weight	23.4	45.5	2.72 (1.55, 4.80)*	2.52 (1.40, 4.55)*
I do not have any one to exercise with	21.3	24.0	0.69 (0.39, 1.24)	0.68 (0.37, 1.24)
I do not have any place to exercise	16.1	12.4	0.74 (0.35, 1.55)	0.68 (0.32, 1.47)
I do not have the energy to exercise	30.3	40.3	1.56 (0.90, 2.70)	1.36 (0.77, 2.41)
I do not have the will power to exercise	28.8	43.8	1.92 (1.12, 3.32)*	1.82 (1.05, 3.19)*
I do not have time to do more exercise	33.0	32.3	0.96 (0.56, 1.67)	0.96 (0.54, 1.69)
I am uncomfortable with how I look while exercising or wearing exercise clothing	14.7	21.5	1.59 (0.80, 3.16)*	1.54 (0.76, 3.15)
My current weight makes it difficult for me to exercise	9.1	23.5	3.08 (1.42, 6.68)*	3.04 (1.34, 6.83)*
Exercising costs too much	11.6	23.1	2.29 (1.12, 4.69)*	2.14 (1.02, 4.47)*

<sup>a</sup> Adjusted for education

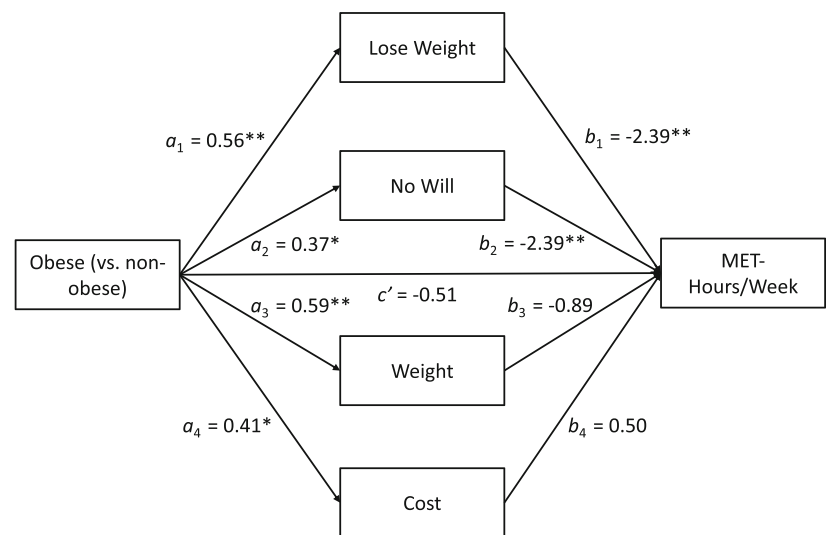
\*Statistically significant difference between groups who agree with benefits and barriers ( $p < 0.05$ )

self-reported MET-hours/week than Black women without obesity. Altogether, these results deepen our understanding of exercise barriers, showing which barriers are most impactful on exercise when assessed simultaneously. This study

elucidates some of the reasons why older Black women with obesity are insufficiently engaged in exercise.

Engaging in exercise to lose weight was a barrier among older Black women with obesity in our sample. The

**Fig. 1.** Mediation effect estimates



Note \* $p < .05$ , \*\* $p < .01$

**Table 3** Indirect effects of weight status on MET-hours/week through exercise barriers

	Unadjusted			Adjusted <sup>a</sup>		
	Estimate (SE)	<i>p</i> value	95% CI	Estimate (SE)	<i>p</i> value	95% CI
Lose weight	- 1.57 (0.74)	0.03	- .16, - 0.68	- 1.33 (0.69)	0.05	- 2.89, - 0.53
No willpower	- 1.00 (0.58)	0.08	- 2.26, - 0.30	- 0.89 (0.55)	0.11	- 2.13, - 0.23
Weight as barrier	- 0.62 (0.66)	0.35	- 2.00, 0.20	- 0.53 (0.62)	0.40	- 1.81, 0.21
Cost	0.10 (0.49)	0.83	- 0.63, 0.93	0.20 (0.45)	0.65	- 0.32, 1.15

<sup>a</sup> Adjusted for education

discrepancy between women's perception of the role of exercise, and its true contribution to weight loss, may stem from a misconception that exercise causes weight loss. Rather, reduction in calorie intake from foods and beverages is the primary driver of weight loss, but maximum weight loss results from a combination of increased exercise and lower calorie intake [27]. Black women seeking weight loss may benefit from education about the amount of exercise recommended for weight loss, behavioral skill building and rehearsal of exercise to appropriately estimate intensity and exertion [28].

Lack of willpower was found to mediate the relationship between obesity and exercise. This finding is consistent with the previous research on exercise among Black women [12, 15, 29]. For Black women, competing life priorities leading to fatigue, stress, and disengagement from self-care (e.g., exercise, healthy eating) is a major exercise barrier across the life course [13, 15, 30]; also seen among Black non-exercisers with a higher BMI than exercisers [10]. It is possible that when Black women communicate a lack of willpower, they may also be expressing a general sense of role overwhelm. Perhaps this phenomenon in Black women is best characterized by the Superwoman Schema, a framework describing the superwoman/strong Black woman role which specifies Black women's competing life priorities of aid and caregiving as liabilities that lead to stress-related health behaviors, like postponing self-care [31]. It is plausible that obesity and insufficient exercise due to barriers like lack of willpower are more present in Black women who ascribe to this schema, thus reflecting the inherent health liability of the superwoman/strong Black woman role [31]. It is unclear why older Black women with obesity would be more likely to report lower willpower. Women who prioritize aid and caregiving responsibilities over self-care may be more likely to be obese, or obesity could be associated with lower self-esteem [32], leading to more internal attributions for low exercise (will power) vs. external ones (competing demands). While more research is needed to understand the drivers of no willpower to exercise, future studies should consider quantifying the role competing demands play as a barrier to exercise, and the intersection of age in that dynamic. Development of novel measurement tools is essential to advance understanding of the

complexity of Black women's lived experiences and the impact on health and behaviors. Tools such as the Giscombe Superwoman Schema Questionnaire [33] are positioned to expand the evidence base and capture the broad spectrum of Black women's lives.

Our study found that more women with obesity reported cost as a barrier than did women without obesity. While cost is a commonly reported exercise barrier across populations [10, 12, 18], it is unclear why older women with obesity would report more financial exercise barriers. This relationship could be confounded by the fact that women of lower socioeconomic position are more likely to be obese [34, 35]. Our analysis controlled for education, but not income due to high missingness of this variable. Participants in the parent study could skip questions for any reason, thus it is not possible to determine the percent of participants that did not know their income vs. the percent that did not want to answer the question. The lack of exercise resources (e.g., facilities, programs, and walkable and safe areas) in lower income and predominantly Black middle-class neighborhoods may be one reason why cost is an exercise barrier for Black women with obesity [18]. Residential data was not available in this secondary analysis, but is important for future research to contextualize environmental influence on the weight-exercise relationship.

The prohibitive cost of exercise may also relate to hair care and maintenance. A mixed-method study among exercising and non-exercising Black women found that ruining/sweating out their hairstyle was a top-ranked barrier for all women of all age groups [10]. Although many more non-exercising (29%) than exercising (7%) women reported this barrier [10], exercise avoidance due to hair has been reported previously. Almost 40% of Black women surveyed about hairstyle maintenance and exercise reported avoiding exercise because of hair concerns [11]. Exercise-related hair costs are a consistent concern for Black women, relevant in their decision to exercise [10, 11, 15, 36]. Measures to assess the specific cost of hair as an exercise barrier quantitatively will deepen our understanding of cost as an exercise barrier. Additionally, interventions likely need to directly address the issue of the exercise hair tax incurred by older Black women who desire to be or are physically active. Future studies may need to target



community and policy level change to sustainably address cost by modifying the built environment to include free and low-cost exercise options across neighborhoods of various racial compositions.

### Strengths and Limitations

Our study should be considered in the context of its limitations. The parent study recruited participants age 50 and older from predominately Black churches, thus results are generalizable only to a similar population. Understanding exercise determinants among older women with obesity is especially important because exercise, a type of physical activity, can improve physical function and guard against age-related functional loss. Furthermore, obesity in older adults contributes to functional limitations and decline [7, 37], an important factor since the majority of older Black women have obesity [6]. This study offers a unique perspective on the burden of obesity on older Black women. Quantitative methods allowed us to discover relationships between the variables of interest [38]. As we were limited to an existing data set, we were not able to examine contextual influences in intra- and interpersonal levels (e.g., weight status of family/friends), nor the built environment (e.g., home residence) in this analysis due to the differing aims of the parent study (increase colorectal screening and physical activity, improve nutrition) and resulting secondary data set, a limitation to the full explication of the weight-exercise relationship in our sample. However, future investigations should include multilevel contextual measures to advance the field's understanding of exercise and weight in older Black women. Where such measures do not exist, they must be created and validated.

The cross-sectional nature of the data limits the ability to draw conclusions about the causal effect of weight status on exercise and barriers. Even so, using multiple mediation analysis facilitated greater understanding of which barriers were most associated with exercise among older Black women with obesity. Including all relevant barriers in one mediation model allowed the observation of the relative magnitude of their indirect effects, which is not possible in a simple mediation model [25]. We have not seen this approach in the extant literature on this topic, but note the value of previous work to first identify and understand the barrier-exercise relationship. Multiple mediations are a logical next step to understand how barriers operate together, and more reflective of how they may realistically operate in older Black women's lives—not in isolation, but acting simultaneously to impact exercise.

### Conclusions

Future studies should continue to investigate the exercise attitudes of older Black women with obesity. While much has

been done qualitatively to unveil context, quantitative and mixed-method approaches are invaluable to fully ascertain how exercise barriers operate in this population. It cannot be understated that Black women's exercise experiences are informed by both their gender and race, which suggests the use of intersectional analyses of available data and exploring the interaction of race with gender on exercise barriers and exercise engagement [18]. Age is yet another intersectional variable to consider the totality of older Black women's exercise experiences. Race, gender, and age influences should be an integral part of exercise promotion and intervention. Optimistically, older Black women in our study had high agreement regarding exercise benefits. Identifying lack of willpower and exercise engagement solely for weight loss as mediating barriers to exercise among Black women with obesity may be useful for developing messages for promotion and intervention. A comparison of targeted exercise messages for women with obesity who reported exercising for weight loss found greater elaboration (deep thinking), which is associated with behavior change [39, 40], and more exercise intention among women who received messages focused on achievable outcomes vs. weight management focused messages [22]. Our findings suggest that messages which emphasize exercise benefits other than weight loss and focus on improving women's self-image related to willpower may help with improving exercise behavior.

### Practical Implications

The mediation analysis indicated that older Black women with obesity had the barriers of only engaging in exercise to lose weight and lack of willpower, which explained their lower exercise engagement when compared with women without obesity. Public health practitioners should apply tailored approaches, including messages that promote exercise benefits aside from weight loss, to women regardless of weight status. Lack of willpower and its expression as fatigue and stress indicate to practitioners that exercise is secondary to these challenges. Approaches to increase exercise engagement must also reduce stress and address fatigue in this aging population. Furthermore, Superwoman Schema denotes a stress-strength-postponement of self-care dynamic that practitioners should be aware of. Strength, however, is also an asset, benefit, and necessity for Black women who ascribe to the superwomen role. Future studies should examine the role and characteristics of Superwoman Schema in exercise engagement. A contextualized and practical tailored messaging approach may help Black women with high weight engage in exercise and reap the benefits of improved health in older adulthood.

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### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical approval** This study was approved by the Institutional Review Board of the University of North Carolina at Chapel Hill.

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