

RELATIONS OF CHANGES IN EXERCISE SELF-EFFICACY, PHYSICAL SELF-CONCEPT, AND BODY SATISFACTION WITH WEIGHT CHANGES IN OBESE WHITE AND AFRICAN AMERICAN WOMEN INITIATING A PHYSICAL ACTIVITY PROGRAM

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Objective: To determine the effectiveness of changes in factors associated with self-efficacy theory for predicting weight change in obese women of two ethnic groups.

Design: Obese (body mass index [BMI] ≥ 30 kg/m²) White ($n=34$) and African American ($n=30$) women (mean age 44 years) were assessed on measures of body satisfaction, self-efficacy, and weight change over 20 weeks.

Setting: Community wellness centers.

Intervention: A supported exercise and nutrition information treatment.

Main outcome measures: Changes in Body Areas Satisfaction Scale (BAS), Physical Self-Concept Scale (PSCS), and Exercise Self-Efficacy Scale (ESES) scores and changes in body weight over 20 weeks.

Results: Significant improvements were found on measures of exercise self-efficacy, body satisfaction, and weight, with a trend ($P=.073$) toward significantly greater mean weight loss by the White group (-15.5 kg vs -9.1 kg). Linear multiple regression analyses, with simultaneous entry of changes in BAS, PSCS, and ESES scores, significantly predicted changes in weight for both the White ($R^2=.25$) and African American ($R^2=.50$) group. The primary predictor of weight change for the White group was change in BAS scores ($\beta=-.42$) and for the African American group was change in ESES scores ($\beta=-.68$).

Conclusions: Self-efficacy theory was supported as an explanatory model for both groups, with notable differences. Implications for weight loss intervention design and application are discussed. (*Ethn Dis.* 2007;17:19–22)

Key Words: Ethnic Difference, Obesity, Physical Activity, Self-Efficacy, Weight Loss

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INTRODUCTION

Weight loss programs have been of limited success for reducing weight, and new ideas are being sought.¹ Because of associations with increased initial weight loss and maintenance of weight loss,² some weight-reduction treatments have recently emphasized physical activity at program initiation.³ Improved perceptions of ability to complete a regimen of regular exercise may be associated with increased weight loss through both heightened energy expenditure and increased motivation to reduce energy intake.^{4,5} Perceptions of an improved body, which are associated with physical activity participation,⁶ may also give impetus to behaviors that result in weight loss.⁷

Self-efficacy is a person's perception of his or her ability to plan and act effectively to reach a goal. Self-efficacy theory posits that feelings of ability, competence, and mastery are strong predictors of performance success.⁸ Although the aforementioned propositions are embedded in self-efficacy theory and have received some empirical support,^{8–10} comparative testing of women of different ethnic groups and degrees of overweight is lacking. Because of different socialization processes and experiences, changes in weight may be associated with changes in different factors of self-perception for different ethnic groups. For example, White women have demonstrated a greater concern for an "ideal" body type than African American women.^{11–12} African American women may be more concerned with overcoming the many barriers to weight loss than are White women.¹³

Thus, the goal of this preliminary investigation was to first evaluate a model that tested the association of changes

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in self-regulation and task self-efficacy for physical activity and body satisfaction with weight changes in obese White and African American women who were beginning a physical activity and nutrition information intervention. Also of interest was contrasting the contribution of independent variables by ethnic group. On the basis of self-efficacy theory, this model was expected to significantly predict weight changes in both White and African American women; changes in body satisfaction were expected to account for the greatest amount of variance for White women, and changes in exercise barriers self-efficacy were expected to explain the greatest amount of variance for African American women.

METHODS

Participants

Groups were made up of 34 obese (body mass index [BMI] ≥ 30 kg/m²)

White and 30 obese African American women who received clearance from a medical professional to participate in a moderate exercise program. Each woman had avoided participation in regular physical activity for at least one year, and each provided informed consent. No group difference was found in age (overall mean 43.8 years, standard deviation [SD] 7.7), body mass index (BMI, overall mean 36.2 kg/m², SD 4.5), or percentage body fat (overall mean 40.2%, SD 3.4).

Measures

The Body Areas Satisfaction Scale (BAS) of the Multidimensional Body-Self Relations Questionnaire¹⁴ required responses to five items that evaluated satisfaction with specific aspects of the body (eg, lower torso [buttocks, hips, thighs, legs], weight) by using scores from 1 (very dissatisfied) to 5 (very satisfied). For females, internal consistency (.73) and test-retest reliability (.74) was adequate.¹⁴

The Physical Self-Concept Scale (PSCS) of the Tennessee Self-Concept Scale¹⁵ required responses to 14 items (eg, "I am full of aches and pains," "I don't feel as well as I should") that were scored from 1 (always false) to 5 (always true). Internal consistency (.83) and test-retest reliability over one to two weeks (.79) were adequate.¹⁵ The PSCS related to task self-efficacy.

The Exercise Self-Efficacy Scale (ESES)¹⁶ required responses to five items that began with the stem, "I am confident I can participate in regular exercise when:" (eg, "I am in a bad mood," "I feel I don't have the time"), and scores ranged from 1 (not at all confident) to 5 (very confident). Internal consistency (.82 and .76) and test-retest reliability over two weeks (.90) was acceptable.^{16,17} The ESES related to self-regulatory self-efficacy, or confidence of the ability to use internal resources to overcome barriers to exercising.

Change in scale scores was the difference from baseline to week 20.

Procedure

The treatment group was given access to community wellness centers in the metropolitan Atlanta, Georgia, area. Monthly meetings with a trained wellness professional included instruction on available cardiovascular exercise apparatus (eg, treadmills, stationary bicycles) and administration of a cognitive-behavioral treatment protocol designed to maximize adherence to exercise.¹⁸ Three exercise sessions per week, building to 30 minutes per session at a rate of perceived exertion¹⁹ of 12 to 14 (estimated maximal oxygen consumption 50%–70%, which is generally considered to be of a moderate intensity), were assigned. Participants were informed that this exercise plan conformed to suggestions by the American College of Sports Medicine.²⁰ A computerized device was provided to record physical activity completed. Registered dietitians also provided six nutrition information sessions in a group format, on the basis of a standardized protocol.²¹ Examples of curriculum components were making better food choices, using the food pyramid, and developing a plan for snacking. Psychological factors and weight were measured at baseline and week 20.

RESULTS

Alpha values were set at .05 (two-tailed), unadjusted for multiple tests, for these preliminary analyses.²² An overall mean of 2.3 exercise sessions per week (SD .5) and 4.8 nutrition information sessions (SD 1.0) were attended and did not significantly differ by group. Scores on all self-appraisal factors significantly improved over 20 weeks for both groups (see Table 1), with no significant differences in score changes between groups. Weight loss over 20 weeks was significant for both groups. White women, however, demonstrated a trend toward greater weight loss (mean loss -7.04 kg, SD 6.49) than African American women (mean loss -4.14 kg, SD 6.21), *t*(62)=1.82, *P*=.073.

Linear multiple regression analyses, with changes in BAS, ESES, and PSCS scores simultaneously entered as independent variables, significantly predicted weight changes in both groups (see Table 2). The unique contribution made by the independent variables (*β*s) in explaining the variance in weight change, however, differed by group. For the White group, a significant contribution was made only by changes in BAS scores. For the African American group, a significant contribution was made only by changes in ESES scores (see Table 2).

Table 1. Changes in scores on self-appraisal factors and body weight over 20 weeks

	Baseline		Week 20		<i>t</i>	<i>P</i>	<i>d</i>
	Mean	SD	Mean	SD			
White (<i>n</i> =34)							
BAS	9.35	2.35	12.09	2.57	5.88	<.001	1.17
ESES	15.44	4.89	17.59	3.66	2.81	.008	.44
PSCS	37.18	4.66	38.41	4.71	2.10	.044	.26
Weight (kg)	96.32	14.43	89.28	14.51	-6.32	<.001	-.49
African American (<i>n</i> =30)							
BAS	10.40	2.31	12.73	3.00	4.65	<.001	1.01
ESES	15.37	3.62	17.10	4.13	2.50	.019	.48
PSCS	36.13	3.75	38.07	2.39	3.25	.003	.52
Weight (kg)	97.59	17.31	93.46	15.43	-3.77	.001	-.24

BAS=Body Areas Satisfaction Scale of the Multiple Body-Self Relations Questionnaire; ESES=Exercise Self-Efficacy Scale; PSCS=Physical Self-Concept Scale of the Tennessee Self-Concept Scale; SD=standard deviation; *d*=Cohen's measure of effect size.

Table 2. Results of simultaneous linear multiple regression analyses for prediction of weight change, by group

Model Variables	β	R	R ²	R ² _{adj}	F	P
White (n=34)		.500	.250	.175	3.339	.032
Δ BAS	-.423					.032
Δ ESES	-.160					.360
Δ PSCS	-.045					.810
African American (n=30)		.710	.504	.447	8.814	<.001
Δ BAS	.009					.949
Δ ESES	-.679					<.001
Δ PSCS	-.138					.358

BAS=Body Areas Satisfaction Scale of the Multiple Body-Self Relations Questionnaire; ESES=Exercise Self-Efficacy Scale; PSCS=Physical Self-Concept Scale of the Tennessee Self-Concept Scale.
The delta symbol (Δ) indicates change in score from baseline to week 20.

DISCUSSION

Ethnic group disparities in weight loss were similar to those seen in previous research.²³ Self-efficacy theory was supported as an effective explanatory model of weight loss for both the obese White and African American women assessed. Indicators of increased competence were associated with the amount of weight lost. Findings that changes in body satisfaction (BAS) for White women and changes in self-regulatory efficacy (ESES) for African American women were the primary predictors of weight change were consistent with the hypotheses.

Because providing feedback on proximal goal attainment (eg, increasing time and intensity of cardiovascular exercise) over outcome goal attainment

(eg, amount of weight actually lost) was associated with increases in body satisfaction and exercise adherence,⁶ this strategy may be especially useful for White women who may be adversely affected by slow changes in their bodies, based on the present findings. A focus on how specific self-management/self-regulatory skills (eg, thought-stopping, appropriate self-talk, stimulus control) were used proficiently in attaining (or approaching) short-term goals by countering barriers may increase self-regulatory efficacy and be especially productive for African American women.

Replication is required across other ethnic groups, socioeconomic strata, specific age groupings, and degree of overweight to increase confidence in findings and test generalizability. Investigation of causal factors is also warranted.

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SELF-EFFICACY AND WEIGHT LOSS - Annesi

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Manuscript draft: Annesi

Statistical expertise: Annesi

Acquisition of funding: Annesi

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