Health Self-Empowerment Theory (HSET): Predicting Health Behaviors and BMI In Culturally Diverse Adults

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Abstract

Health Self-Empowerment Theory (HSET) asserts five controllable psychological variables predict engagement in health-promoting behaviors. This study tests the theoretical integrity of HSET and its usefulness in predicting health-promoting behaviors and BMI. Results from surveying 189 predominantly low-income, overweight/obese, culturally diverse adults showed most HSET variables were positively correlated. SEM showed that four variables significantly predicted engagement in health-promoting behaviors, which mediated the relationships between BMI and (a) motivation, (b) health self-efficacy, and (c) self-praise. Results support creating psychologically-informed interventions to increase engagement in health-promoting behaviors and decrease BMI among low-income adults, particularly racial/ethnic minorities, at risk for obesity-related health problems.

Keywords: health disparities; obesity; health-promoting behaviors; empowerment; diversity

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Efforts to promote health and fight obesity have received much attention. Yet, approximately two-thirds of the adults in the U.S. are overweight, and 34% of the adults in the U.S. are obese [1-4]. Overweight and obesity are particularly prevalent and problematic among racial/ethnic minorities and low-income individuals [1,3,5].

While engaging in physical activity and healthy eating can help prevent and reverse overweight and obesity [6,7], these two behavioral strategies are less common among racial/ethnic minorities, in particular among low-income individuals, than among non-Hispanic whites. Engagement in regular physical activity is significantly less common for non-Hispanic blacks and Hispanics than for non-Hispanic whites [8-9]. Non-Hispanic white adults (22.8%) are more likely to engage in aerobic and muscle-strengthening activity than non-Hispanic black adults (17.3%) and Hispanic adults (14.4%) [10]. Additionally, non-Hispanic blacks and Hispanics are less likely than whites to meet fruit and vegetable guidelines and are more likely to consume excess calories, more total and saturated fat, and less fiber and calcium [11].

Racial/ethnic differences in engagement in health-promoting behaviors are tied to socioeconomic resources [12-13]. Individuals from low SES backgrounds report less health-promoting behaviors [12-14]. Low SES racial/ethnic minorities experience health risks linked to their stigmatized racial/ethnic status and also to their low SES [13]. When compared to non-Hispanic white individuals, racial/ethnic minority individuals, especially those with a low household income, are at a greater disadvantage because they often experience restricted access to public green spaces that promote walking and other forms of exercise [15-17]. Also, low-income racial/ethnic minorities often live in neighborhoods that are less safe and have less favorable

social processes [18], and are less likely to have referents in their immediately cultural group who engage in health-promoting behaviors. Thus, low-SES racial/ethnic minorities have sociodemographic characteristics that distinguish them from their non-Hispanic white counterparts and may impact their engagement in health-promoting behaviors.

Social Cognitive Theory (SCT), proposed by Miller & Dollard [19], has been frequently utilized to explain individuals' engagement in health-promoting behaviors. According to SCT, engagement in behaviors is determined by cognitive/personal (e.g., self-efficacy) and social/environmental (e.g., access to recreation spaces or transportation) variables. The intractability of social/environmental determinants of health behaviors complicates use of SCT with low-SES racial/ethnic minorities. Tucker and colleagues [20] have posited an alternative, culturally sensitive theory – the Health Self-Empowerment Theory (HSET) – that recognizes the intractable influence of social/environmental factors on health behaviors, and suggests that self-empowerment (psychological) variables are key to understanding and influencing health behaviors. HSET expands on SCT by emphasizing a number of personal factors that individuals can modify to promote their own health.

HSET states that there are five literature-based psychological variables that influence engagement in health-promoting behaviors. These variables are: (1) health motivation (i.e., one's level of commitment to health-related goals set for oneself); (2) health self-praise (i.e., verbal or non-verbal messages of self-affirmation to use in association with health-promoting behaviors and sustain these behaviors); (3) an adaptive coping style/skill (i.e., the use of instrumental social support to manage emotions that often negatively impact engagement in health-promoting behaviors); (4) health responsibility and knowledge (i.e., taking charge of one's health by being involved in personal health practices, and gaining knowledge related to one's health); and (5)

health self-efficacy, or weight management self-efficacy (i.e., the belief that one is capable of controlling one's weight through engaging in health-promoting behaviors).

Using a cross-sectional design, the following research hypotheses will be investigated:

1. The HSET variables (i.e., motivation to engage in health-promoting behaviors, self-praise of health-promoting behaviors, coping through the use of instrumental social support, health responsibility, and health self-efficacy) will be positively correlated with each other.
2. The HSET variables will have direct positive associations with health-promoting behaviors, and direct and indirect negative associations with BMI; furthermore, health-promoting behaviors will partially mediate the relationship between the HSET variables and BMI (see Figure 1).

The following research question will also be addressed: Are there differences in levels of the HSET variables, levels of engagement in physical activity and eating a healthy diet, and levels of BMI in association with sex and race/ethnicity? Exploring sex and race/ethnicity differences may inform the application of HSET to various groups, particularly groups that are most negatively impacted by health disparities such as racial/ethnic minorities and women.

The sample will include an overrepresentation of overweight and obese individuals, racial/ethnic minority individuals, and individuals who live in low-income households. Such individuals could potentially benefit from this study in that it may have implications for psychological empowerment-based interventions that could enhance engagement in health-promoting behaviors and reduce BMI, helping to eliminate obesity-related health disparities.

Method

Participants

The sample for the present study consisted of 189 adults, aged 19 to 85 years (M = 42.65; SD = 12.64). The sample included an overrepresentation of individuals who self-identified as African American/Black given that: (1) they are the largest racial/ethnic minority in North Florida, in particular in the area where the study was conducted (with a population of 22.7% Black vs. 56.6% White vs. 10% Hispanic)[21]; and (2) they are the racial/ethnic minority group with the highest rate of overweight and obesity (70.3% vs. 60.6% in non-Latino Whites) in Florida [22]. Females were overrepresented in this sample (75.1% vs. 24.9% males). The sample is low-income skewed. See Table 1 for additional patient demographic information.

Measures

Demographic Data Questionnaire (DDQ). The DDQ was designed to obtain the following information: race/ethnicity, sex, age, language preference, and annual household income.

Health Behaviors Goal Agreement Rating (HBGAR) Form. This form was constructed by the present researchers to assess the degree to which health-promoting behaviors were goals for this study's participants. Health care literature shows having behavioral goals increases motivation to achieve those goals and provides support for using a goal assessment to measure motivation [21]. Yet, the present researchers were unable to find a health motivation measure that addressed motivation related to eating a healthy diet and engaging in physical activity. Participants completing the HBGAR Form were asked to rate their level of agreement that eight health-promoting behaviors (e.g., exercising and eating healthy foods/snacks) were goals for them, using a 4-point Likert-type scale (1= *strongly disagree* to 4=*strongly agree*). A sample item on this inventory is "Eating healthy foods and snacks each day is a goal for me." Scores are calculated by taking the mean of all of the items in the scale. Higher scores indicate

more motivation to engage in health-promoting behaviors. Although reliability for the HGBAR Form had not been previously assessed, good reliability was found for this sample (α= .85).

Health Self-Praise Questionnaire (HSPQ). The 10-item HSPQ was constructed by the present researchers because no known health related self-praise measures existed. The HSPQ asks participants to indicate (on a 4-point Likert-type scale, where 1=*never* and 4=*always*) how often they praise themselves, think positively about themselves, or feel good about themselves when they engage in ten specific health-promoting behaviors (e.g., eating a healthy breakfast). Scores for the HSPQ are calculated by taking the mean of all of the items. Higher scores indicate higher levels of engagement in self-praise. Although reliability for the HSPQ had not been previously assessed, for this sample it was excellent (α= .92).

Coping Questionnaire (COPE) [22]. The COPE is a 60-item questionnaire that is used to measure individuals' levels of use of various coping styles. The four-item subscale that measures use of instrumental social support, an adaptive coping style, was used in this study. This subscale was selected because social support has been linked with engagement in health-promoting behaviors [23-25]. COPE asks participants to indicate how frequently they use particular coping styles using a 4-point Likert-type scale (1=*usually don't do this at all* to 4=*usually do this a lot*). A sample item from this subscale is "I ask people who have had similar experiences what they did." Scores are calculated by summing the ratings of the items in each subscale. Higher scores indicate more frequent utilization of the coping style. The Cronbach's alpha for the use of the instrumental social support subscale has been reported to be .75 [22]. The reliability coefficient for this study was acceptable (α= .75).

Health-promoting Lifestyle Profile II (HPLP II) [26]. The HPLP II is a 52-item self-report inventory that measures level of engagement in a health-promoting lifestyle. The health

responsibility, physical activity, and healthy eating subscales of the HPLP II were used in this study. The health responsibility subscale was used to assess the health responsibility component of the Health Self-Empowerment Theory (HSET). The other two subscales (physical activity and healthy eating) were used to assess obesity-related health-promoting behaviors. HPLP II asks participants to indicate how frequently they engage in specific health-promoting behaviors using a 4-point Likert-type scale (1=*never* to 4 =*routinely*). A sample item is, "How often do you choose a diet low in fat, saturated fat, and cholesterol?" Scores are calculated by taking the mean of all of the items in each subscale. Higher scores indicate a higher level of engagement in a health-promoting lifestyle. Cronbach's alphas have been reported as .81 (health responsibility subscale), .81 (physical activity subscale), and .76 (healthy eating subscale) in the scale development study [26]. For this study, the reliability coefficients were good for health responsibility (α= .87), acceptable for physical activity (α= .73), and good for physical activity (α= .86).

Weight Efficacy Lifestyle Questionnaire (WEL) [27]. The WEL is a 20-item questionnaire that is used to measure how confident individuals are in controlling their eating behaviors. The WEL is used as a measure of health self-efficacy, a component of HSET. The WEL produces an overall weight management self-efficacy score based on five subscales: (a) negative emotions, (b) availability, (c) social pressure, (d) physical discomfort, and (e) positive activities. The WEL asks participants to rate how confident they are in resisting the listed behaviors (e.g., eating when they are anxious) using a 10-point Likert-type scale, ranging from 1 (*not confident*) to 10 (*very confident*). Scores are calculated by summing the ratings of the items in each subscale and by summing the subscale scores for an overall scale score. The overall score was used in this study. Higher scores indicate more confidence in controlling eating behaviors. A

Cronbach's alpha of .92 for the overall scale was reported in a study that used the WEL questionnaire as an assessment in an obesity treatment program for adults [28]. For this study, the reliability coefficient was excellent (α= .95).

Body Mass Index (BMI). Each participant's BMI was determined using the following standard BMI assessment formula: weight (lbs) / [height (in)]^2 x 703 [29]. Calibrated balance beam scales were used to measure each individual's weight and height.

Procedure

The present study was approved by the principal investigator's Institutional Review Board. This study was conducted in two small cities in the Southeast using a community-engaged research paradigm [30]. Academic researchers and community member research partners recruited participants in a culturally sensitive manner (e.g., attending community-based events). Recruiters used multiple methods including tabling, distributing flyers, and giving presentations about the study. One or more of these methods were implemented in a variety of community venues (i.e., churches, schools, community centers, and YMCAs) in diverse neighborhoods. Recruitment lasted 3 months.

Data collection overlapped with participant recruitment and lasted two months. Culturally diverse research team members collected data at community sites. Participants signed an Informed Consent Form and received an Assessment Battery (AB) that they could complete at the data collection session or at home. Participants who chose the latter option received mailing materials to send their completed AB to the researchers. Participants also had their height and weight measured by nurses and research assistants studying medicine.

The AB was available in English and Spanish. Participants could have a family member or a research assistant read and/or explain the AB to them. The AB took approximately 20 minutes to complete. Participants received $25 for completing the AB.

Results

Prior to conducting the analyses to address the hypotheses and exploratory research question, the demographic characteristics (e.g., age, sex, race/ethnicity, and socioeconomic status) and variables of interest (motivation to engage in health promoting behaviors, self-praise of health promoting behaviors, coping through the use of instrumental social support, health responsibility, weight management self-efficacy, health promoting behaviors, and BMI) were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of the General Linear Model. All variables were trimmed for values exceeding +/- 3 standard deviations from the mean.

Given their categorical nature, sex, race/ethnicity, and income were not normally distributed. Motivation to engage in health promoting behaviors was negatively skewed because several participants had strong agreement that being healthier was a goal for them. This variable was not transformed because of the narrow response range (i.e., 1-4); however, using the bootstrapping method normalized this measure. All other variables were fairly normal. Linearity and homoscedasticity were verified by producing and inspecting bivariate scatterplots. In addition, inspection of the correlation matrix revealed no bivariate correlations above 0.70 among the variables of interest, indicating that multicollinearity did not exist.

Hypothesis Testing

After ensuring data for the variables of interest met GLM assumptions, Pearson correlations were performed to test the hypothesis that the variables constituting the HSET

would be positively correlated (see Table 2). Results provided partial support for the first hypothesis. Health responsibility was significantly positively correlated with all of the other HSET variables. Additionally, self-praise had a significant positive correlation with motivation and coping through the use of instrumental social support. All other correlations were not significant.

A bootstrapped (10,000 samples) path analysis was performed in Mplus7 to test the hypothesis that the HSET variables would have direct positive associations with health-promoting behaviors, and direct and indirect negative associations with BMI. A robust WLSMV estimator was used given the categorical nature of the items [31]. Results indicated that self-praise of health-promoting behaviors and health responsibility had a significant positive direct effect on physical activity. Results also indicated that motivation to engage in health-promoting behaviors, self-praise of health-promoting behaviors, health responsibility, and health self-efficacy had significant positive direct effects on eating a healthy diet. Unexpectedly, motivation had significant positive direct effects on BMI. Eating a healthy diet had a significant negative direct effect on BMI. All other direct effects were not significant. The test of indirect effects revealed no significant indirect effects on BMI. See Table 3.

Results of the ANOVAs to Test the Research Question

Research Question One is as follows: Are there differences in levels of the HSET variables, levels of engagement in physical activity and eating a healthy diet, and levels of BMI in association with sex and race/ethnicity? Results of between subjects, one-way ANOVAs revealed no significant sex differences for most of the variables, except for health responsibility and motivation to engage in health promoting behaviors. Women ($M = 2.27$, $SD = 0.61$) reported significantly higher levels of health responsibility than men ($M = 2.05$, $SD = 0.60$), $F(1, 279) =$

7.89, $p < .01$. Women ($M = 3.70$, $SD = 0.45$) also reported significantly higher levels of motivation to engage in health promoting behaviors than men ($M = 3.57$, $SD = 0.44$), $F(1, 310) = 4.86$, $p < .05$. See Table 4-6 for the statistics from all of the other one-way ANOVAs using sex as the independent variable.

Results of between subjects, one-way ANOVAs showed several significant race/ethnicity differences among the investigated variables. One of these was a significant difference in self-praise of health promoting behaviors, $F(4, 255) = 3.38$, $p < .05$ in association with race/ethnicity. A series of *post-hoc t*-tests using the Bonferroni correction indicated that Asian Americans ($M = 2.95$) reported significantly higher levels of self-praise than European Americans ($M = 2.51$), $t(255) = 3.04$, $p < .05$.

It was also found that weight management self-efficacy significantly differed by race/ethnicity, $F(4, 232) = 4.57$, $p < .01$. A series of *post-hoc t*-tests using the Bonferroni correction indicated that Asian Americans ($M = 140.22$) reported significantly higher levels of weight management self-efficacy than European Americans ($M = 115.72$), $t(232) = 2.98$, $p < .05$, and African Americans ($M = 138.35$) reported significantly higher levels of weight self-efficacy than European Americans ($M = 115.72$), $t(232) = 3.83$, $p < .01$.

Health responsibility also significantly differed by race/ethnicity, $F(4, 272) = 2.66$, $p < .05$; however, the *post-hoc t*-tests using the Bonferroni correction revealed no significant specific effects. Additionally, it was found that eating a healthy diet differed by race/ethnicity, $F(4, 274) = 2.53$, $p < .05$. A series of *post-hoc t*-tests using the Bonferroni correction indicated that Asian Americans ($M = 2.60$) reported significantly more engagement in eating a healthy diet than European Americans ($M = 2.29$), $t(274) = 2.94$, $p < .05$.

Finally, Body Mass Index (BMI) significantly differed by race/ethnicity, $F(4, 188) = 11.56$, $p < .001$. A series of *post-hoc t*-tests using the Bonferroni correction indicated that Asian Americans ($M = 23.53$) had significantly lower BMIs than European Americans ($M = 32.21$), $t(188) = 4.76$, $p < .001$; than African Americans ($M = 34.87$), $t(188) = 6.29$, $p < .001$; and than Hispanics/Latinos ($M = 29.90$), $t(188) = 3.11$, $p < .05$. Additionally, Hispanics/Latinos ($M = 29.90$) had significantly lower BMIs than African Americans ($M = 34.87$), $t(188) = 3.43$, $p < .01$.

Discussion

Summary of Results

Correlation analyses partially supported the first hypothesis, showing that: (1) health responsibility had a positive correlation with all of the other HSET variables, and (2) self-praise was positively correlated with motivation and coping. None of the other correlations were significant.

The lack of correlation between self-efficacy and motivation, self-praise, and coping through use of instrumental support could be explained by the fact that the measure utilized in this study assessed how confident individuals were in controlling their eating behaviors (and not other forms of self-efficacy). From a theoretical standpoint, self-efficacy is not quite the same as weight management self-efficacy; and weight-management self-efficacy may not be related to coping through use of instrumental support. The lack of correlation between self-efficacy as measured in this study and the other HSET variables could possibly be attributed to a limited concordance between the scope of the WEL and other target behaviors.

It is also possible that the lack of correlation between motivation to engage in health-promoting behaviors and use of instrumental support/weight management self-efficacy may be due to the measure of health motivation used in this study. Although the Health Behaviors Goal

Agreement Rating (HBGAR) Form used to assess motivation in this study resulted in reliable scores for this sample, it may not be a valid measure. Future research using different measures of health motivation may find that motivation is significantly correlated with self-praise of health-promoting behaviors and health responsibility, and also with the other HSET variables. Overall, the results from testing the first hypothesis suggest that the HSET has potential for use as a theory in health promotion research; however, more research is needed to examine the correlations among its variables using measures that have evidenced reliability and validity.

The second hypothesis stated that the HSET variables would have direct positive associations with health-promoting behaviors, and direct and indirect negative associations with BMI. This hypothesis was partially supported. Most of the HSET variables (excluding coping through instrumental social support) had a significant positive direct effect on eating a healthy diet. Only self-praise and health responsibility had a significant positive direct effect on engaging in physical activity. Coping through the use of instrumental social support was not significantly related to any of the outcome variables. It may be worth exploring more planning or action-oriented coping styles in relation to engaging in health-promoting behaviors.

Results also suggested that eating a healthy diet had a significant negative direct effect on BMI. Conceptually, it seems clear that eating a healthy diet was predictive of BMI, and that physical activity was not predictive of BMI. To have a significant influence on BMI, one must engage in physical activity very frequently and intensely. Additionally, physical activity can result in possible increase in weight (and thus BMI) due to transformation of fat into muscle. Conversely, slight changes in diet (e.g., eliminating soda from one's diet) can have dramatic effects on BMI.

Health motivation had a significant positive direct effect on BMI. In other words, higher levels of motivation were associated with higher levels of BMI. This finding was in the unexpected direction and would warrant more exploration in future research.

Limitations

The majority of the sample consisted of women, individuals who were overweight or obese, and from a low-income background, which may limit the generalizability of results to individuals from other backgrounds.

The reliability and validity of two of this study's measures (i.e., Health Behaviors Goal Agreement Rating Form and the Health Self-Praise Questionnaire) had not been tested prior to this study. Yet, these measures appeared reliable with the sample in the present study. Future studies should use measures to test the HSET that have been demonstrated to be reliable and valid for the target sample.

Another limitation is the use of self-report measures (excluding BMI). Such measures can be biased and may not indicate true levels of the investigated variables and behaviors. Additionally, because this study used a cross-sectional design, it is unclear whether HSET variables are predictive of long-term engagement in health-promoting behaviors or BMI changes. Future research should assess the long-term impact of the HSET variables on health-promoting behaviors and BMI.

A final limitation is that health self-efficacy was measured by the WEL. There is limited availability of health-efficacy measures that have been validated with a sample similar to this study' sample. Health self-efficacy, although similar, is not the same as weight management self-efficacy. This may have affected the correlation of health self-efficacy (as measured in this study) and: (1) other HSET variables, and (2) physical activity behavior. Future research may

operationalize components/dimensions of self-efficacy that are concordant with target behaviors (e.g. a conceptualization of self-efficacy in relation to the pursuit of health-enhancing physical activity).

Conclusions

Overall, this study's results suggest that HSET has potential for understanding some of the psychological influences on engagement in health-promoting behaviors, particularly healthy eating, and on BMI. With some modifications to how the theory variables are measured, HSET may help understand overweight and obesity (including engagement in health-promoting behaviors) among low-income, culturally diverse adults.

Instead of focusing exclusively on coping through the use of social support, future research could study more action-oriented coping (e.g., planning, which has been empirically linked to health behaviors) [20,32]. Additionally, future research may employ the Motivators of and Barriers to Health-Smart Behaviors Inventory, a measure of motivation to engage in health-promoting behaviors that was developed and validated using culturally diverse groups [33].

This study adds to the literature on how psychological factors impact health-promoting behaviors and health outcomes. The results provide support for creating psychological empowerment-based intervention programs to increase consistent engagement in healthy eating and physical activity, as well as improve BMI among low-income racial/ethnic minority adults who are at risk for obesity-related health problems. These intervention programs may empower individuals with limited power over their health to take charge of their health behaviors regardless of their circumstances and, thus, may help reduce health disparities.

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