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The Health Action Process Approach Applied to African American breast cancer survivors

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Abstract

Objectives—The Health Action Process Approach (HAPA) is a relevant model for understanding physical activity (PA), yet it has not been examined in cancer survivors or minorities. In this study, we assessed the Health Action Process Approach (HAPA) in African American breast cancer survivors using covariance modeling.

Methods—A total of 304 African American breast cancer survivors (Mean age = 54 years) participated in a web-based survey assessing demographic and medical characteristics as well as constructs of the HAPA. A two-step covariance modeling approach was used to assess the structural relationships among the constructs.

Results—The hypothesized measurement model fit the data; however, general severity was not significantly associated with the remaining constructs. General severity was removed and the fit did not change significantly. The final model, which adjusted for covariates, provided a reasonable fit to the data and accounted for significant variance in intentions (49%) and PA (42%). Action ($\beta = 0.1$, $p < 0.01$) and coping ($\beta = 0.3$, $p < 0.01$) planning mediated the relationship between intentions and behavior.

Conclusions—The HAPA appears to be a relevant model for understanding PA in African American breast cancer survivors. However, more work is needed to determining whether these relationships can be replicated in other breast cancer survivor samples.

Keywords

Breast cancer; African American; cancer survivors; cancer survivorship; Health Action Process Approach; Physical Activity

INTRODUCTION

Physical activity (PA) is associated with a number of benefits for cancer survivors including improvements in cardiorespiratory fitness, reductions in body mass index, and improvements

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in physical function, cancer-related fatigue, and certain symptoms [1–3]. Despite the benefits associated with PA, many cancer survivors fail to meet current recommendations, with African American breast cancer survivors reporting the lowest compliance to PA [4, 5]. Inactivity in this population may be a contributing factor to comorbidities and poor cancer-specific outcomes [6, 7]. Understanding the correlates of PA may enable researchers to develop lifestyle interventions that boost compliance of PA in African American breast cancer survivors.

Prior studies examining the correlates of PA in cancer survivors have focused exclusively on the Transtheoretical model or the Social Cognitive Theory [8–11]. One novel theoretical framework that deserves attention is the Health Action Process Approach (HAPA) [12]. The HAPA is a social cognitive model designed initially to overcome limitations of other theoretical frameworks [12]. The HAPA is unique because it is a combination of a stage-based (i.e., transtheoetical model) and continuum theory (Theory of Planned Behavior) [12]. The HAPA consist of three phases (i.e., pre-intentional, intentional, and action), organized into pre-intentional motivational processes and post-intentional volitional processes [13]. Key elements of the motivational phase include developing favorable perceptions of PA (*i.e., outcome expectations*), situational confidence to start an exercise program (*i.e., motivational self-efficacy*), and perceived threat to an outcome (*i.e., risk perceptions*) [12].

The HAPA also proposes to bridge the gap between intentions and behaviors by providing a variety of beliefs and dispositions that guide individuals to successful adoption and maintenance of health behaviors [12]. Constructs relevant for initiating and maintaining behaviors are revealed in the volitional phase. The behaviors include: developing specific goals (*i.e., action planning)* and plans to stick to those goals *(i.e., coping planning*); navigating situational barriers (*i.e., coping self-efficacy*); and resuming the behavior after a slip *(i.e., recovery self-efficacy)* [12]. The ability to bridge the intention to behavior gap distinguishes the HAPA from the Theory of Planned Behavior [12]. Bridging the intention to behavior gap is important because intentions to be active do not necessarily translate to actions.

The HAPA is relevant for African American breast cancer survivors because it will help to (a) assess their ability to navigate situational and planning-related barriers (i.e., coping self-efficacy and coping planning); (b) examine their ability to set specific and measurable goals (i.e., action planning), and (c) examine their confidence in reinitiating planning after a lapse if behavior (recovery self-efficacy). The volitional strategies presented here are important for vulnerable populations, especially those who make multiple attempts to initiate behaviors, but experience slips that become insurmountable. Studying these constructs in this population will help to determine which constructs can be used in future intervention studies.

The HAPA has been used to understand, explain, and predict a number of positive health behaviors (e.g., diet, PA, smoking, dental flossing) [14]. Despite its proven success, it is not widely used in the field of cancer survivorship or tested in minority populations (e.g., African Americans). Prior studies utilizing the HAPA were based primarily on international samples [12–14]. Examining the utility of the HAPA in a population of African American

breast cancer survivors addresses several gaps in the literature including theory testing in minority populations and applying the HAPA to cancer survivors. In addition, previous studies that have assessed the correlates of PA in African American breast cancer survivors have focused exclusively on barriers and facilitators to exercise or have cherry picked correlates from multiple behavioral theories [15–18]. Thus, quantitative studies that assess entire theoretical models are essential for the advancement of theory research as well as intervention development. Such data are needed desperately to address health disparities and advance intervention research in minority cancer survivors. Therefore, the purpose of this cross-sectional study was to examine the structural relationships between HAPA constructs (Figure 1) and PA using structural equation modeling (SEM).

METHODS

Study Population

AA BCSs from the Sisters Network Inc., which is the largest African American breast cancer survivorship organization in the United States. The women were recruited between May of 2012 and July of 2012 via multiple email blasts and posting of anonymous survey links on social media blog sites affiliated with Sisters Network. The email blasts reached approximately 16,000 members in their database, which includes approximately 3800 breast cancer survivors as well as healthy AA women (~12,200). Links posted on Facebook, the Sisters Network social network site, and Twitter reached approximately 6,800 healthy women and breast cancer survivors. All surveys were completed using Survey Monkey, a web-based platform that allows investigators to create surveys, perform routine updates, and manage survey responses. Inclusion criteria included being (a) diagnosed with invasive operatable breast cancer, (b) 18–80 years old at the time of the survey, (c) diagnosed with stage I to IIIc breast cancer, and (d) consent to the web-based survey administration. Participants were eliminated from the final analyses if they were not breast cancer survivors (n = 235), were not African American (n = 7), or reported being diagnosed before the age of 18 years (n = 9). Additional participants were eliminated from this analysis if they did not complete the questionnaire or if their survey responses were questionable (n = 201). The study describing the recruitment methods and sample was reported elsewhere [19]. This study refers to data from a total of 304 respondents. A $10 incentive was provided to all women who completed the survey. Institutional Review Board approval was obtained prior to data collection, and all subjects were treated in compliance with ethical standards.

Measures

PA was assessed via a self-administered instrument designed for the Women's Health Initiative [20]. The instrument consists of 9-items that assess recreational walking and light, moderate, and vigorous PA using a frequency and duration item format. The instrument was highly correlated with accelerometer counts and had high sensitivity in a sample of breast cancer survivors [21]. For the purpose of this study, minutes of walking, moderate, and strenuous PA were used to create the latent construct of PA. Minutes were light activity were ignored. The measure of PA utilized in this study has been used in prior studies of African American breast cancer survivors [6, 15] and was previously validated [21].

General Severity in this study was used as our risk perception variable. Severity was assessed with the original 5-items of the general severity scale (e.g., how severe are the following health problems if untreated). The instrument was adapted from prior studies and the factor structure has been validated in various populations [12–14, 22]. The items referred to severity of high blood pressure, high cholesterol, diabetes, and cancer recurrence if left untreated. The response scale ranged from 1 (not severe) to 5 (very severe). The internal consistency reliability for severity was 0.97 and the factor loadings were appropriate in sign and magnitude.

Self-efficacy was measured with 3 distinct subscales: Motivational Self-efficacy (e.g., I'm sure I can change to a physically active lifestyle; 3-items), Coping Self-Efficacy (e.g., I'm sure I can keep being active even if I'm tired; 6-items), and Recovery Self-efficacy (e.g., I'm sure I can be active again regularly, even if I postpone my plans several times; 3-items) [22]. Each item was rated on a 4-point Likert type response scale from 1 (not at all true) to 4 (exactly true). The instruments have been applied and validated in previous studies [12–14]. The internal consistency reliabilities for motivational, coping, and recovery self-efficacy were $\alpha = 0.88$, 0.96, and 0.87, respectively. In addition, the sign and magnitude of the factor loadings were appropriate in our sample.

Outcome expectancies was assessed with 12-items [22] that assessed positive (cons) and negative (cons) attributes of PA. Participants were asked, 'What do you think will be the consequences if you exercise regularly?' The stem was 'If I exercise regularly,' was followed by examples such as 'my quality of life would improve (pro),' and 'I would spend a lot of time trying to do it (con).' The answers are given on a four-point Likert scale ranging from (1) *not at all true* to (4) *exactly true*. The instruments have been applied and validated in previous studies [12–14]. However, prior studies have focused exclusively on positive outcome expectations (i.e., pros). Here we examined negative outcome expectations as well. The internal consistency reliabilities for pros and cons were $\alpha = 0.87$ and $\alpha = 0.80$, respectively and the factor loadings and were appropriate in sign and magnitude.

Intention was assessed with the original two items developed for the HAPA [22] and an author created item. Participants were asked, whether or not they intended to: (1) be active regularly over the next month, (2) be active at least 3 times per week, and (3) be active at least 5 times per week over the next month. Intentions were rated on a 5-point likert type response scale that ranged from 1 (strongly disagree) to 5 (strongly agree). The original two items have been used and validated in various populations [12–14, 22]. The internal consistency reliability for intentions was $\alpha = 0.70$ and the factor loadings were appropriate in sign and magnitude.

Planning was assessed using the Action and Coping Planning subscales created by Sniehotta *et al.* [23]. Action planning was measured by five items. The item stem 'I already have concrete plans… was followed by: when, where, how, how often, and with whom to exercise. With respect to coping planning, the item stem 'I already have concrete plans… was followed by examples such as 'what to do if something intervenes.' Items were rated on a 4-point likert type response scale that ranged from (1) *not at all true* to (4) *exactly true*.

The internal consistency reliabilities for action and coping planning were $\alpha = 0.96$ and 0.97, respectively.

Socio-demographic and Medical Data. All socio-demographic and medical data were self-reported by participants. We collected data on the following variables: current age, education, time out from diagnosis, disease stage at diagnosis, and comorbid conditions. We summed the number of chronic conditions (e.g., cardiovascular disease, blood sugar/diabetes, digestive disorders, arthritis, and osteoporosis) that were self-reported.

Data Analysis

Initially, descriptive statistics were used to characterize the sample, psychosocial constructs of the HAPA, and PA. Next latent variables (i.e., unobserved constructs) were computed based on the manifest variables (i.e., observed variables) that represented the factors.

Structural Equation Modeling—The data were analyzed with full-information maximum likelihood (FIML) estimation in Mplus version 5.21 software (Mplus, Inc., Los Angeles, CA). FIML yields accurate fit indices and parameter estimates when up to 25% of data are missing and thus simulated [24]. The extent of missing data ranged from <7% for the sociodemographic questions to 12% for the action planning items. All missing data was missing completely at random. To account for non-normality of the data, the robust maximum likelihood (MLR) estimator was utilized [25].

Model Testing: To examine the utility of the HAPA, a two-step approach was applied [26]. In the first step, the measurement model was examined. The measurement model consisted of correlated latent variables. The purpose of the measurement model was to assess the construct and discriminate validity of the subscales [26]. The latent constructs of PA was composed of minutes for walking, moderate, and strenuous PA. The latent constructs of severity (6-items), pros (8-items), cons (4-iems), motivational self-efficacy (3-items), coping self-efficacy (6-items), recovery self-efficacy (3-items), intentions (3-items), action planning (5-items), and coping planning (4-items) were composed of the items that were associated with their respective factor. No residual correlations were allowed among item error terms.

The purpose of the second step was to test the expected relationships [26]. We tested the hypothetical structure of the HAPA as proposed elsewhere [14, 22]. In the second step, we also tested the total and indirect effects between HAPA constructs and PA. This was specified by the MODEL INDIRECT statement in Mplus. Pros, cons, severity, and motivational self-efficacy were hypothesized to be related directly to intentions. Correlations were computed among the exogenous variables of pros, cons, severity, and motivational self-efficacy. Motivational self-efficacy was hypothesized to be related directly to coping self-efficacy. Intentions and coping self-efficacy were hypothesized to be related directly to action and coping planning. In addition, coping self-efficacy was hypothesized to be related directly to recovery self-efficacy. Correlations were computed on the endogenous constructs of action and coping planning. Finally, action planning, coping planning, and recovery self-efficacy was hypothesized to be directly related to PA. All relationships were examined simultaneously. We tested the the relationship between HAPA constructs and PA with (adjusted model) and without (unadjusted model) covariates.

Model Fit: All models are evaluated based on how well structural model resembled close, exact, and absolute fit to the data. According to Hu and Bentler [27], the Comparative Fit Index (CFI) and the Standardized Root Mean Square Residual (SRMR) are optimal for examining structural models with smaller sample sizes (N ≤ 250). The CFI and SRMR reveal that models are a close fit to the data when values are ≥0.95 and ≤0.08, respectively. Hu and Bentler [27] propose that using cut off values ≥ 0.96 for the CFI in combination with values of ≤ 0.10 for the SRMR results in lower type I and II error rates. We have also included the Root Mean Square Error Approximation (RMSEA) and its 95% confidence interval (CI) as an additional measure of fit. An acceptable fit of the model to the data is reached when RMSEA ≤ 0.08. Parameter estimates were expected for appropriate sign and magnitude ($z > 1.96$, $p < .05$).

RESULTS

Sample Characteristics

The sample was on average 54 years old, 7 years out from cancer diagnosis, and diagnosed with stage II disease at the time of survey administration. Most of the women were college graduates (51%) and many were currently married (49%). Approximately 48% of the sample were obese and 47% were meeting current guidelines for PA. The sociodemographic and medical characteristics of the sample were reported in Table 1.

Characteristics of latent constructs

The measures of dispersions, factor loadings, and internal consistency reliabilities for the latent constructs were reported in Table 2. On average, factors loading ranged from 0.31 to 0.97 with internal consistency reliability ranging from 0.70 to 0.97.

Structural relationships among constructs

Measurement Model—The model with anticipated correlations among the latent constructs was a close fit to the data [χ^2= 1413.9 (944), p < 0.01; CFI = 0.95; RMSEA = 0.04, 95% Confidence Interval (CI) = 0.04, 0.05; SRMR = 0.05]. However, severity was not significantly associated with the remaining constructs (All p > 0.05; See Table 3). Motivational self-efficacy, intentions, and action planning were significantly associated with all latent constructs with the exception of severity (All p < 0.05). Severity was removed from the measurement model and the resulting model closely fit the data [χ^2= 1123.9 (704), p < 0.01; CFI = 0.94; RMSEA = 0.05, 95% Confidence Interval (CI) = 0.04, 0.05; SRMR = 0.05]. PA was not significantly associated with coping self-efficacy, and recovery self-efficacy. Cons was not significantly associated with coping self-efficacy, recovery self-efficacy, and coping planning (All p > 0.05). For the remaining latent variable correlations, please see Table 3.

The unadjusted structural model—The unadjusted structural model closely fit the data [χ^2= 1180.9 (724), p < 0.01; CFI = 0.94; RMSEA = 0.05, 95% Confidence Interval (CI) = 0.04, 0.05; SRMR = 0.07]. Motivational self-efficacy (β = 0.61, p < 0.01) and cons (β = 0.16, p = 0.04) were significantly associated with intentions. Motivational self-efficacy was also significantly associated with coping self-efficacy (β = 0.42, p < 0.01). Intentions were

significantly associated with both action (β = 0.54, p < 0.01) and coping (β = 0.52, p < 0.01) planning. In addition, coping self-efficacy was significantly associated with recovery self-efficacy (β = 0.49, p < 0.01) and coping planning (β = 0.16, p = 0.02), but not action planning (β = 0.11, p = 0.09). Finally, action (β = 0.18, p < 0.01) and coping (β = 0.47, p < 0.01) planning were significantly associated with PA. Recovery self-efficacy was only marginally associated with PA (β = −0.17, p = 0.05).

The adjusted structural model—The adjusted model and path coefficients were depicted in Figure 2. Coefficients for the final structural model were adjusted for body mass index, number of comorbidities, age, stage at diagnosis, and years out from diagnosis. The adjusted model was a reasonable fit to the data [χ^2= 1466.3 (910), p < 0.01; CFI = 0.93; RMSEA = 0.05, 95% Confidence Interval (CI) = 0.04, 0.05; SRMR = 0.06]. Few differences were observed from the unadjusted and adjusted models. Pros were nonsignificnatly associated with cons (*r* = 0.12, p > 0.05) and intentions (β = 0.02, p > 0.05). In the adjusted model, recovery self-efficacy was significantly associated with PA (p < 0.05). The final model accounted for 49% of the variance in intentions, 42% of the variance in PA, 37% of the variance in action planning, 35% of the variance in coping planning, 26% of the variance in recovery self-efficacy, and 19% of the variance in coping self-efficacy.

Impact of covariates and indirect relationships

Covariates—In the final model, BMI was significantly associated with intentions (β = 0.20, p < 0.01), action planning (β = − 0.15, p < 0.01), and PA (β = − 0.16, p < 0.01). The remaining covariates were not significantly associated with the endogenous constructs (all p > 0.05).

Indirect effects—The total indirect effects from motivational self-efficacy to PA was mediated by way of intent and coping planning (β = 0.16, SE = 0.06, p < 0.01). The total indirect effects from negative outcome expectation (Cons) to PA was mediated by way of intent and coping planning (β = − 0.04, SE = 0.02, p = 0.02). The total indirect effects from intentions to PA was mediated by both action (β = 0.08, SE = 0.04, p < 0.00) and coping planning (β = 0.26, SE = 0.07, p < 0.01). The remaining indirect effects were not statistically significant (all p > 0.05).

DISCUSSION

The finding from this study demonstrate that the majority of the HAPA pathways were consistent with theory, with the exception of the associations between positive outcome expectations (Pros), general severity (i.e., risk perception), and intentions. As hypothesized, motivational self-efficacy was significantly associated with both intentions and coping self-efficacy. Similarly, intentions were significantly associated with both action and coping planning, which mediated the relationship between intentions and behavior in our population. Inconsistent with the HAPA, coping self-efficacy was not significantly associated with action planning and recovery self-efficacy was related inversely to PA. This study provides preliminary data that the HAPA can be used a starting point for utilizing

theoretical models to understand the correlates of PA in a vulnerable population of cancer survivors.

Our data support previous research and indicate the action and coping planning were important mediators in the intention to behavior relationship [12–14, 22, 23]. The results of our study contribute to the understanding of PA in cancer survivors emphasizing the importance of action and coping planning. These data support the tenets of the HAPA, which suggest that PA is unlikely to occur without behavioral intentions [12–14]. Once intentions are formed, planning must occur for behavior to be realized. Action and coping planning are self-regulatory processes that play a critical role in the adoption and maintenance of positive health behaviors [12,13]. The associations make sense because action planning relates to specific and measurable plans (i.e., when, where, how, with whom) [22], whereas coping planning refers to the ability to troubleshoot difficulties that that may disrupt plans [22, 23]. While, they both played an important role in the intention and behavior gap, we observed stronger structural relationships between coping planning and PA than for action planning and PA. These data supports a prior study, which indicated that initiating a behavior requires action planning, but sustained participation in a behavior requires coping planning [28]. Longitudinal studies examining these two constructs are warranted.

Of interest was the significance of the severity and self-efficacy subscales. Both self-efficacy and severity are key constructs in the HAPA [29], yet they were inconsistently related to other constructs in our sample. We hesitate suggesting that the constructs of self-efficacy should be removed from the HAPA for PA in this this sample, because prior studies in cancer survivors have emphasized its importance. We can only speculate that it may be the operational definition of self-efficacy utilized and potentially the wording of the individual items. With respect to severity, we examined several similar (i.e., absolute risk and relative vulnerability) constructs, but none of these were significantly associated with the remaining constructs. It should be noted that other studies have observed similar non-significant relationships as ours [30, 31]. It could be that the high prevalence of comorbidities in this population may shield the impact that being at risk for a specific outcome may have on PA. Severity may play an important role in the consequences of PA, rather than the antecedents in this sample.

Importantly, these data show that the psychosocial constructs of the HAPA were robust without the inclusion of medical and sociodemographic constructs. The only variable that was associated with model constructs was BMI. BMI has been an important contributor to various health outcomes among cancer survivors and specifically among African American breast cancer survivors [6, 15, 19]. In prior studies, BMI was significantly associated with PA, functional status, and mental health outcomes [15]. Thus, the impact of BMI on intentions, action planning, and PA is an important one to consider in future studies. These data may suggest that although overweight or obese women may have intentions to be active, they may be less willing to set specific goals or have adequate goal setting skills, which will influence their ability to adopt and maintain PA long term. Future studies should consider assessing the association between BMI and psychosocial correlates of PA.

There are several weaknesses that should be noted. These data are self-report and subject to recall and response biases. These data are also cross-sectional and do not imply causal inference. Of particular importance is that many of the instruments used here were developed for a German population; therefore, the items may not be directly relatable to African American breast cancer survivors. In addition, the items utilized for severity were focused on comorbid conditions such as cardiovascular disease, diabetes, and hyperlipidemia, with only one item reflecting cancer recurrence. Although these conditions are prevalent in African American breast cancer survivors, the genetic nature of these factors may not have the same influence on this sample as it would have on another racial or ethnic group. Furthermore, our sample was educated and may not be generalizable to other samples of African American breast cancer survivors. Despite the weaknesses, there are a number of strengths including a modest sample size, an underrepresented sample of cancer survivors, and a robust statistical method to evaluate the correlates of PA.

Overall, these data support the utility of the HAPA in a sample of African American breast cancer survivors. Although, modifications were made, the HAPA provided a reasonable fit to the data. Key constructs to consider for future studies include negative outcome expectations, motivational self-efficacy, intentions, and action and coping planning. These constructs should be assessed when developing intervention designed to improve PA in this population. To the best of our knowledge, this is the only study that we know of to test the HAPA in a sample of cancer survivors or minorities; therefore, our work is novel. Such analyses are important because limited data exist on the correlates of PA in minority cancer survivors. Additional studies are needed to determine the relevant correlates of PA as well as studies that evaluate the utility of various theoretical models in the field of cancer survivorship. Studies such as this will advance our understanding of vulnerable populations and provide important clues on strategies to consider for intervention studies.

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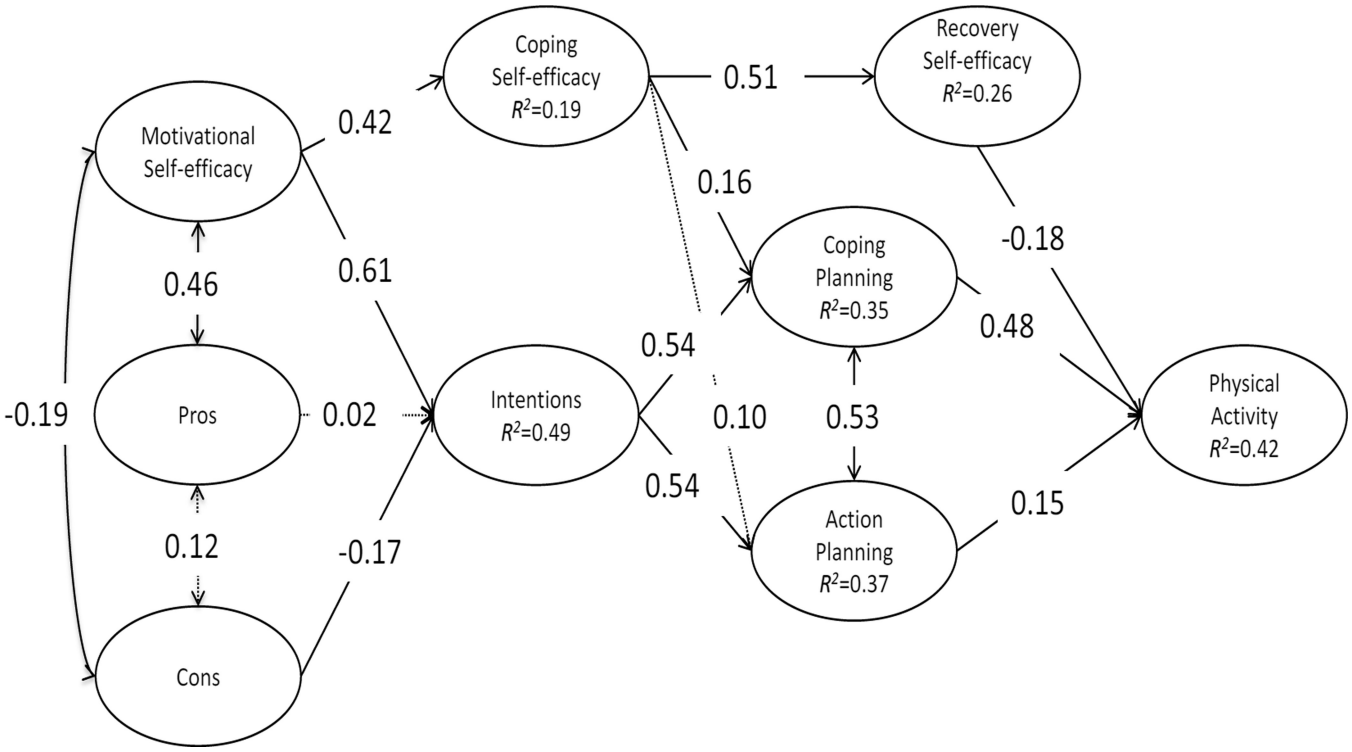

Figure 1.

Associations between the constructs of the Health Action Process Approach. Item indicators were removed to enhance clarity. Single arrows represent path coefficients, whereas double arrows represent correlations. Severity was eliminated from the model because it was not significantly associated with the remaining constructs. Associations were adjusted for age, stage of diagnosis, years out from diagnosis, number of comorbidities, and body mass index. Solid lines represent statistically significant relationships, whereas dashed lines represent non-significant relationships.

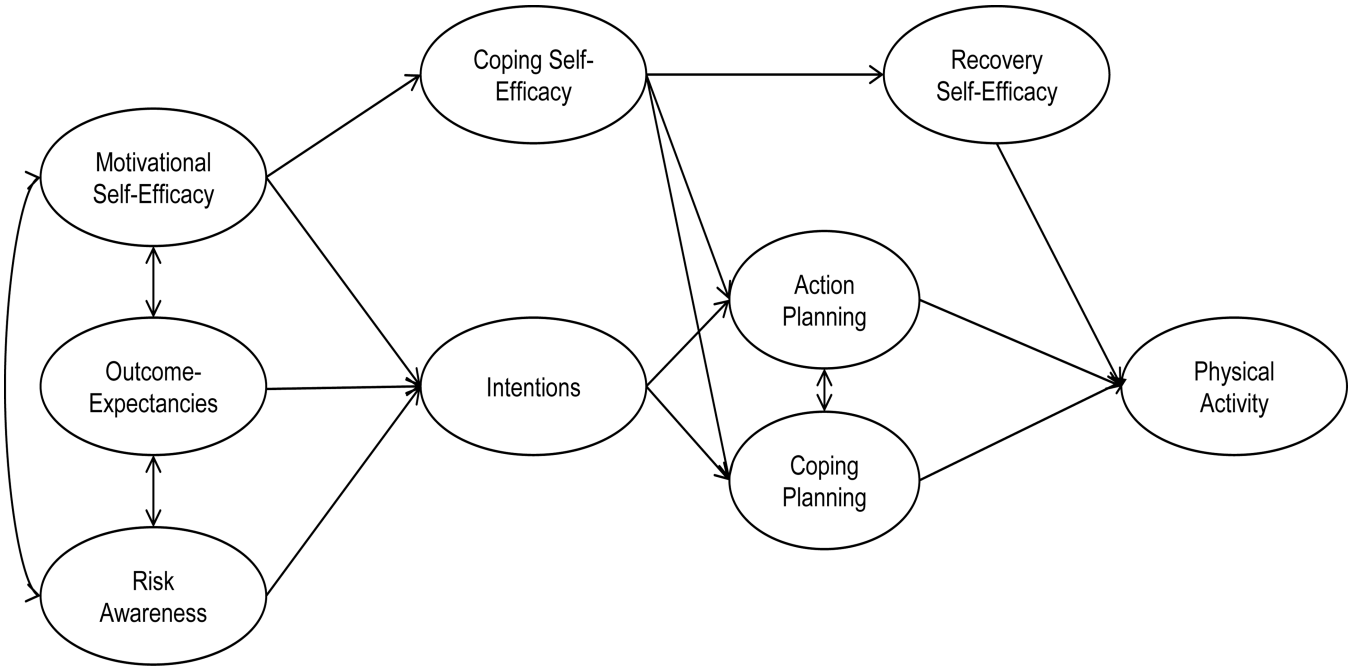

Figure 2.
The Adjusted Associations between the Constructs of the Health Action Process Approach

Table 1

Descriptive Characteristics of the African American Breast Cancer Survivors

Variable	N = 304
Age, M (SD)	54.0 (10.1)
Age group	
<50	110 (36%)
50–59	99 (33%)
60+	95 (31%)
Years out from diagnosis, M (SD)	7.2 (6.5)
Stage	
I	97 (32%)
II	127 (42%)
III+	58 (19%)
Missing	22 (7%)
% Married	49%
Education	
High school	23 (8%)
Some College	122 (40%)
College Graduate	80 (26%)
Professional School	76 (25%)
Missing	3 (1%)
Body Mass Index, M (SD)	30.4 (6.0)
% Obese	48%
Physical activity Metabolic Equivalents, M (SD)	807 (925)
% meeting guidelines	47%

M = mean; SD= standard deviation; Missing values were generated were recorded therefore sample sizes may vary from 304 total observations

Table 2

Descriptive Statistics of Study Constructs

	Minimum	Maximum	Mean	Std. Deviation	Range of Loading	Internal Consistency
Leisure time physical activity METS	0	5100	807	926	0.31 – 0.75	-
General Severity	1.0	5.0	4.0	1.4	0.83 – 0.97	0.97
Intentions	1.0	5.0	3.9	1.0	0.56 – 0.91	0.70
Coping Planning	1.0	4.0	2.6	1.0	0.90 – 0.97	0.97
Motivational Self-efficacy	1.0	4.0	3.4	0.7	0.80 – 0.94	0.88
Coping Self-efficacy	1.0	4.0	2.9	0.9	0.65 – 0.95	0.96
Recovery Self-efficacy	1.0	4.0	2.9	0.9	0.78 – 0.87	0.87
Action Planning	1.0	4.0	3.1	1.0	0.80 – 0.97	0.96
Pros	1.0	4.0	3.5	0.5	0.51 – 0.86	0.87
Cons	1.0	4.0	1.8	0.8	0.56 – 0.83	0.80

Table 3

Latent Variable Correlations

	Motivational Self-efficacy	Pros	Cons	Coping Self-efficacy	Recovery Self-efficacy	Intentions	Action Planning	Coping Planning	Physical Activity
Severity	0.09	0.1	−0.14	0.01	0.04	0.05	0.12	0.02	−0.08
Motivational Self-efficacy		0.45**	−0.19*	0.41**	0.29**	0.48**	0.53**	0.53**	0.36**
Pros			0.12*	0.28**	0.25**	0.21**	0.25**	0.30**	0.18*
Cons				0.04	0.00	−0.23**	−0.26**	−0.10	−0.16*
Coping Self-efficacy					0.49**	0.24**	0.25**	0.29**	0.14
Recovery Self-efficacy						0.17*	0.23**	0.23*	−0.03
Intentions							0.42**	0.41**	0.32**
Action Planning								0.69**	0.48**
Coping Planning									0.57**

* p< 0.05;

** p < 0.01;