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Hope and the Use of Behavioral Strategies Related to Diet and Physical Activity

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Abstract

Background—Use of specific behavioral strategies such as portion control or meal planning is important for weight management, yet studies of determinants of strategy use are limited. This study explored the concept of hope and its association with use of behavioral strategies.

Methods—Data are from a larger cross-sectional survey conducted in 2009 among 178 patients of a city-county sponsored primary care clinic in the Midwest region of the USA. Hope was measured with subscales representing “agency” (determination in meeting goals) and “pathways” (perception of ways to meet goals), and a total score. Diet and physical activity-related strategies were captured with 5 and 2 scales, respectively.

Results—Analyses showed a significant ($p < .05$) association between both the total hope score and the agency subscale and all behavioral strategy measures. The pathways subscale was significantly associated with physical activity-related strategies, and a subset of diet-related strategies.

Conclusions—The hope measures should be explored further in the context of a weight loss intervention to determine their predictive association to the use of specific behavioral strategies.

Keywords

nutrition; weight management; physical activity

INTRODUCTION

The obesity epidemic has led to an increased focus on identifying effective programs and policies that can bring about changes in diet and exercise related behavior. (Flegal, Carroll, Ogden, & Curtin, 2010) To evaluate and continually improve such interventions, it is

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important to measure the cognitive and behavioral processes involved so that outcomes can be clearly linked to specific intervention components. Considerable work has been done in this regard, and improvements in the outcomes of interventions have been noted over time, (Jeffery et al., 2000) but gaps in our understanding of behavioral determinants remain.

Most interventions encourage the use of behavioral strategies in order to meet expert dietary and physical activity recommendations. In the realm of dietary behavior such strategies may include self-monitoring of eating behavior, strategies for portion control, meal planning, food preparation, and for modifying eating behaviors in social situations. In regard to physical activity, strategies might include self-monitoring of activity, and incorporating physical activity into one's day.(USDA, January 2005) While such strategies are commonly taught in intervention studies, they are rarely measured. Similarly, studies of determinants of these behavioral strategies are limited, with most research having focused on determinants of more distal measures such as dietary intake or minutes of physical activity. Understanding modifiable determinants of the use of behavioral strategies has the potential to provide a more detailed picture of the behavior change process, and thus helps to reveal specific strengths and weaknesses of interventions.

One potentially influential determinant of diet and physical activity behavior is the concept of hope. Hope is sometimes defined as a unidimensional construct involving the perception that goals can be met. (Snyder et al., 1991) Snyder and colleagues (Snyder, et al., 1991) expanded this into a construct with two major elements. The first is "agency," which refers to a sense of "successful determination in meeting goals." The second is the perception that there are successful "pathways" available to reaching one's goals. Snyder further proposed that these elements are "reciprocal, additive, and positively related, though not synonymous." One may, for example, feel confident in their ability to meet goals, but unable to identify pathways to do so, and the converse could also occur. Further, the process of developing a sense of agency and pathways to action is believed to be iterative. The hope construct is distinguished from self-efficacy in that the latter is behavior-specific confidence, whereas the former is a more general disposition.(Snyder, et al., 1991) This disposition is believed to be modifiable, and in fact, a central focus of psychological counseling where persons are provided encouragement and positive feedback as they strive to develop and reach personal goals. Diet and physical activity behaviors are complex. Measuring behavior-specific self-efficacy for each strategy may be cumbersome in an intervention evaluation, and thus a more general measure of disposition may be useful.

This construct of hope has been studied in the context of a few health behaviors,(Mathis, Ferrari, Groh, & Jason, 2009) but has not been examined in association with the use of diet and physical activity-related behavioral strategies. Previous studies have shown self-efficacy to be a strong correlate of positive dietary behavior (Nothwehr, 2008) along with goal setting. (Nothwehr & Yang, 2007) It is reasonable to assume, therefore, that the construct of hope, which to some degree integrates aspects of both of these constructs, will also be associated with strategy use. This study is designed to examine this association in a sample of low-income, overweight adults. We hypothesized that both the "agency" and "pathways" subscales, as well as the total scale score would be positively associated with use of diet and physical activity-related behavior strategies.

METHODS

Design and Sample

Data are from a larger cross-sectional survey conducted in 2009 among patients of a city-county sponsored primary care clinic in the Midwest region of the United States. The purpose of the larger survey was to identify predictors of future participation in a weight

management program among this largely low-income population. Eligible patients were over age 18, had a body mass index (BMI) of at least 25, and were able to speak and understand English.

Data Collection and Measures

The study utilized a practice-based research network with research assistants who are trained to conduct study activities. All procedures were approved by the Institutional Review Board of Indiana University/Purdue University, Indianapolis. A list of potentially eligible participants was generated using the clinic's electronic medical record system. Patients arriving for their usual appointments were informed of the study. Screening questions were administered to confirm eligibility, and informed written consent was obtained. Participants were later contacted by telephone to complete the survey. A total of 433 patients were identified as eligible, of which 217 (50%) consented to participate, and 178 (41%) completed the survey. The entire survey took one hour to complete, after which participants were mailed a \$40 gift card.

Age, gender, and level of education completed (less than high school; high school; more than high school) were ascertained in the screening phase of the study, while body mass index (kg/m^2) was calculated using height and weight data collected on that visit.

Measures of diet and physical activity-related behavioral strategies are described in detail elsewhere (Nothwehr, Dennis, & Wu, 2007). In brief, content was guided by focus group results, the curriculum of intervention studies such as the Diabetes Prevention Program, (Knowler et al., 2002) standard recommendations for healthy weight management, (USDA, January 2005) and a conceptual framework of chronic disease self-management (Clark, Gong, & Kaciroti, 2001) that is based on social cognitive theory. (Bandura, 2004)

Items offer a 4-point response option (almost never, sometimes, often, almost always). Responses are summed for each scale, with larger scores representing greater use of strategies. The items in each scale are presented elsewhere. (Nothwehr, et al., 2007) A scale measuring self-monitoring of diet had 6 items such as: "How often do you keep track in your head of the amount of food you eat." Planning strategies are captured in a 5-item scale which includes "How often do you plan meals ahead of time?" Preparation and buying behaviors to reduce fat intake are in a 6-item scale, while portion control is assessed in a 5-item scale including, for example, "how often do you refuse offers of food when you are not hungry?" A diet-related "social interaction" scale consists of 3 items such as: "how often do you try to bring healthy foods to social events?" Self-monitoring of physical activity behavior includes 4 items such as, "How often do you keep a record in your head of how physically active you've been during a week?" Social interaction regarding physical activity is captured with 4 items such as "How often do you... ask a friend or relative to do some physical activity with you?"

In previous administrations of these measures, test-retest procedures demonstrated intra-class correlations ranging from .62 to .85, indicating good to excellent reliability. (Fleiss, 1981) Construct validity has also been demonstrated in several ways. Use of behavioral strategies related to diet and physical activity has been shown to correlate with self-reported healthy dietary intake and a measure of physical activity respectively (Nothwehr, et al., 2007). Use of these strategies has also been shown to be positively associated with frequency of goal setting related to each respective behavior. (Nothwehr & Yang, 2007) Additional studies showed that the strategies are used more frequently by women than men, a finding consistent with other studies of gender differences in nutrition knowledge and behavior. (Nothwehr, Snetselaar, & Wu, 2006)

The construct of hope is captured in a 12-item scale devised by Snyder (Snyder, et al., 1991) that includes four items as distractors, four that constitute the subscale of “agency” and four that constitute the subscale of “pathways.” Items from the agency and pathways subscales are summed to create a “total” hope scale with values ranging from 8 to 40. An example from the agency scale is “I meet the goals that I set for myself.” A pathways subscale item is “There are lots of ways around any problem.” Response options for all items were: definitely false; mostly false; don’t know; mostly true; definitely true. Inclusion of the “don’t know” option is unique to this study. The Hope Scale has demonstrated acceptable internal consistency and test-retest reliability, convergent and discriminant validity, and construct validity. (Snyder, et al., 1991)

Data Analysis

Descriptive statistics were used to characterize participants by demographic and other factors. BMI was categorized as 25-29; 30-34; 35-39; 40, and education as (high school, high school graduate, and) high school. Cronbach’s alpha was calculated for each scale as a test of internal consistency. Bivariate analyses were conducted using one-way analysis of variance (ANOVA) to describe the distribution of scale scores by demographic factors and BMI, and to identify relevant covariates for subsequent statistical modeling. Finally, multivariate regression was used to model the association between measures of hope and measures of behavioral strategies while controlling for demographic factors and BMI. Analyses were conducted using SAS version 9.2.(SAS Institute, 2008)

RESULTS

Demographics and Scale Characteristics

Seventy-two percent of participants were women, and 46% were White with the remainder almost entirely African-American. Seventy-six percent of participants had a high school degree or less, and 88% were between the ages of 50 and 64. A large majority (88%) were found to be obese (BMI > 30).

Table 1 presents characteristics of the behavioral strategy scales and the hope total scale and subscales. Cronbach’s alpha values are above the preferred level of .70 (Rosner, 1990) with the exception of that for the planning scale at .56 and the pathways subscale at .62.

Demographic and BMI Differences in Strategy Use and Hope

Though not shown, reported use of behavioral strategies was found to be significantly higher in women compared to men ($p < .05$) on six of the seven scales ($p = .09$ for self-monitoring of physical activity). In addition, participants with less education tended to report less frequent use of strategies compared to those with greater education, though these differences reached statistical significance only for the self-monitoring of diet ($p = .01$) and planning scales ($p = .04$). Participants with a higher BMI also tended to report less frequent use of strategies compared to those with a lower BMI. This reached statistical significance for the physical activity self-monitoring scale ($p = .02$). No patterns of age or race differences in strategy use were noted.

Scores for the total hope scale, agency scale and pathways scale did not differ by gender, race, or age groups. In contrast, participants with a higher BMI scored lower on all three scales (all $p < .05$; trend $p < .05$). In addition, participants with less education scored lower than those with more education on all scales, especially the total hope scale $F(1,2) = 3.17$, $p = .05$ and agency scale $F(1,2) = 3.13$, $p = .05$, with the pathways scale score being more similar across groups $F(1,2) = 1.89$, $p = .15$.

Multivariate Findings

Table 2 presents findings from multivariate models examining the association between hope and use of behavioral strategies, controlling for gender, education, and BMI. As shown, the total hope scale is positively associated with all strategy scales. The agency subscale appears to be driving this association, being strongly associated with use of behavioral strategies, while associations with the pathways subscale are mixed, especially in regard to use of diet-related strategies.

DISCUSSION

This study demonstrated positive associations between a measure of hope and use of diet and physical activity-related behavioral strategies. Consistent with this, bivariate analyses showed that lower levels of hope were associated with greater BMI. The association was mixed for the pathways subscale in regard to diet-related behaviors. Perhaps not surprisingly, self-monitoring behaviors were found to be among the stronger correlates to hope. Self-monitoring, along with self-efficacy and goal setting, is often described as part of an iterative process of self-regulation in the behavior change process. (Bandura, 2004)

Weaker associations to the pathway subscale might be due in part to the scale's lower internal consistency, resulting in less stable estimates. The planning scale also demonstrated less internal consistency than others, perhaps contributing to these findings. Results may also suggest that agency is more important than identification of pathways when it comes to engaging in diet-related strategies and should be especially targeted in interventions. For example, provision of encouragement, positive feedback and various forms of social support might be emphasized, especially in populations where pathways to successful weight management are already understood (e.g., repeat dieters). Past studies have shown that more frequent staff-participant contact, which provides opportunities to increase agency, is associated with better outcomes in weight loss trials. (Berkel, Poston, Reeves, & Foreyt, 2005; Digenio, Mancuso, Gerber, & Dvorak, 2009; Mayer-Davis et al., 2004) Further studies regarding dietary behavior, especially in the context of an intervention, could better illustrate whether the differences in subscales is meaningful, and for whom.

In low-income populations such as those in this study, there are often many social, economic and cultural barriers to successful behavior change that are not easily amenable. While these study results suggest that programs designed to increase hope may have a positive effect on weight management behaviors, interventionists must remain realistic in their expectations for program impact given these very significant barriers. It is possible that hope is necessary, but not sufficient, for persons with significant barriers to maintain the motivation to seek solutions to or overcome those barriers. It would be interesting to examine whether increased hope with regard to weight management carries over into participants' management of other life challenges.

This study was limited to a somewhat age-restricted convenience sample of low-income adults, the majority of whom were obese. Although this limits generalizability, the Institute of Medicine has identified obesity in the urban poor as a research priority. (Committee on Comparative Effectiveness, 2009). The cross-sectional design and collection of data through self-report are also limitations.

The findings suggest that the hope scale and subscales may be useful tools in assessing the process of diet and physical activity behavior change and should be explored further in the context of a weight loss intervention where their predictive value could be ascertained. Studies involving other populations would be useful for comparison as well.

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References

- Bandura A. Health promotion by social cognitive means. *Health Education & Behavior*. 2004; 31(2): 143–164. [PubMed: 15090118]
- Berkel LA, Poston WS, Reeves RS, Foreyt JP. Behavioral interventions for obesity. *Journal of the American Dietetic Association*. 2005; 105(5 Suppl 1):S35–43. doi: 10.1016/j.jada.2005.02.031. [PubMed: 15867894]
- Clark NM, Gong M, Kaciroti N. A model of self-regulation for control of chronic disease. *Health Education & Behavior*. 2001; 28(6):769–782. [PubMed: 11720277]
- Committee on Comparative Effectiveness. *Comparative Effectiveness Research Priorities*. Institute of Medicine; Washington, DC: 2009.
- Digenio AG, Mancuso JP, Gerber RA, Dvorak RV. Comparison of methods for delivering a lifestyle modification program for obese patients: a randomized trial. *Annals of internal medicine*. 2009; 150(4):255–262. [PubMed: 19221377]
- Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among US adults, 1999–2008. *JAMA: the journal of the American Medical Association*. 2010; 303(3):235–241. doi: 10.1001/jama.2009.2014. [PubMed: 20071471]
- Fleiss, J. *Statistical methods for rates and proportions*. 2 ed.. John Wiley & Sons; New York: 1981.
- Jeffery RW, Drewnowski A, Epstein LH, Stunkard AJ, Wilson GT, Wing RR, Hill DR. Long-term maintenance of weight loss: current status. *Health Psychology*. 2000; 19(1 Suppl):5–16. [PubMed: 10709944]
- Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, Diabetes Prevention Program Research, G. Reduction in the incidence of type 2 diabetes with lifestyle intervention or Metformin. *New England Journal of Medicine*. 2002; 346(6):393–403. [PubMed: 11832527]
- Mathis GM, Ferrari JR, Groh DR, Jason LA. Hope and Substance Abuse Recovery: The Impact of Agency and Pathways within an Abstinent Communal-living Setting. *Journal of groups in addiction & recovery*. 2009; 4(1/2):42–50. doi: 10.1080/15560350802712389. [PubMed: 20689653]
- Mayer-Davis EJ, D'Antonio AM, Smith SM, Kirkner G, Levin Martin S, Parra-Medina D, Schultz R. Pounds off with empowerment (POWER): a clinical trial of weight management strategies for black and white adults with diabetes who live in medically underserved rural communities. *American journal of public health*. 2004; 94(10):1736–1742. [PubMed: 15451743]
- Nothwehr F. Self-efficacy and its association with use of diet-related behavioral strategies and reported dietary intake. *Health Educ Behav*. 2008; 35(5):698–706. doi: 1090198106296771 [pii] 10.1177/1090198106296771. [PubMed: 17602101]
- Nothwehr F, Dennis L, Wu H. Measurement of behavioral objectives for weight management. *Health Educ Behav*. 2007; 34(5):793–809. doi: 1090198106288559 [pii] 10.1177/1090198106288559. [PubMed: 16816028]
- Nothwehr F, Snetselaar L, Wu H. Weight Management Strategies Reported by Rural Men and Women in Iowa. *Journal of Nutrition Education and Behavior*. 2006; 38(4):249–253. [PubMed: 16785095]
- Nothwehr F, Yang J. Goal setting frequency and the use of behavioral strategies related to diet and physical activity. *Health Educ Res*. 2007; 22(4):532–538. [PubMed: 17032703]
- Rosner, BA. *Fundamentals of Biostatistics*. 3 ed.. PWS-Kent; Boston, MA: 1990.
- SAS Institute. version 9.2. SAS Institute, Inc; Cary, NC: 2008.
- Snyder CR, Harris C, Anderson JR, Holleran SA, Irving LM, Sigmon ST, Harney P. The will and the ways: development and validation of an individual-differences measure of hope. [Research

Support, U.S. Gov't, P.H.S.]. *Journal of personality and social psychology*. 1991; 60(4):570–585. [PubMed: 2037968]

USDA. US Department of Health and Human Services, US Department of Agriculture. *Dietary Guidelines for Americans 2005*. Sixth Edition. US Government Printing Office; Washington DC: Jan. 2005

Table 1

Scale characteristics ($n=178$).^a

Name	# of items	Possible range	Actual range	Mean	Std. Dev	Cronbach Alpha
Self-monitoring, diet	6	6-24	6-24	13.04	4.33	.81
Planning, diet	5	5-20	5-19	11.46	3.23	.56
Preparation/buying	6	6-24	6-24	14.28	4.37	.76
Portion control	5	5-20	5-20	13.82	3.68	.80
Social interaction, diet	3	3-12	3-12	6.68	2.58	.74
Self-monitoring, physical activity	4	4-16	4-16	8.14	2.84	.75
Social Interaction, physical activity	4	4-16	4-16	7.62	2.86	.78
Total Hope	8	8-40	4-16	30.92	5.74	.80
Agency subscale	4	4-20	4-20	15.22	3.51	.74
Pathways subscale	4	4-20	5-20	15.70	2.90	.62

^aHigher scores indicate greater use of strategies or greater hope, respectively.

Table 2

Results of multivariate models with use of behavioral strategies as the dependent variables and hope subscales and total scale as independent variables, controlling for gender, education, and body mass index.

Behavioral Strategy	Agency β (s.e.)	Pathways β (s.e.)	Total Hope β (s.e.)
Self-monitoring diet	.35 (.09) ***	.27 (.12) *	.20 (.06) ***
Planning diet	.21 (.07) **	.07 (.09)	.09 (.04) *
Preparation/buying	.32 (.10) **	.22 (.13)	.17 (.06) **
Portion control	.23 (.08) **	.20 (.11)	.13 (.05) *
Social Interactions, diet	.24 (.06) ***	.20 (.07) **	.14 (.04) ***
Self-monitoring physical activity	.23 (.06) ***	.27 (.08) ***	.15 (.04) ***
Social Interactions, physical activity	.18 (.07) **	.18 (.08) *	.11 (.04) **

*
p<.05

**
p<.01

p<.001