

DEVELOPMENT OF A SCALE TO MEASURE ADULTS' PERCEPTIONS OF HEALTH: PRELIMINARY FINDINGS

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Given the national agenda on chronic disease self-management, the goal of the project described in this brief report was to develop a scale that measured adult perceptions about health but did not focus on a specific condition. The Perception of Health Scale (PHS) is based on earlier work that used the Health Belief Model as a focus. The 15-item PHS was administered to 322 patients in several settings, and the responses were analyzed by the method of principal components. Four factors emerged that were named: Center of Control, Self-Awareness, Certainty, and Importance of Health, each of which showed high internal consistency by Cronbach's α . Overall, the PHS is of sufficient internal consistency to make it a potentially useful tool in research designed to include a measure of personal beliefs about health. © 2007 Wiley Periodicals, Inc.

INTRODUCTION

For many years, there has been interest in the contribution of psychosocial variables, such as beliefs and attitudes, to the health status of patients (Engel, 1977). Several conceptual models have been designed to help explain how variation in health behaviors affects health status. Examples include the Health Belief Model, Theory of Reasoned Action, and Social Learning Theory (Bandura, 1999; Fishbein & Ajzen,

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1975; Rosenstock, 1974). Many applications of psychosocial variables involve participants with particular diagnoses, such as diabetes or asthma (Chambers, Markson, Diamond, Lasch, & Berger, 1999; Schwab, Meyer & Merrell, 1994). One of the motivations for developing the scale described in this article was to have a reliable measure of beliefs that did *not* focus on a particular diagnosis and that might be applicable to a number of conceptual models. An additional, practical reason was that we needed a scale that could be used with adult participants who were part of a project involving the Chronic Disease Self-Management Program (CDSMP) and who might have any of several chronic conditions (Arenson, 2003; Lorig et al., 2001). A scale that measured perceptions about *health*, rather than about a particular diagnosis, seemed well-suited to this group. Lastly, there is a current, national interest in concepts, such as literacy, beliefs, and chronic disease management (Institute of Medicine, 2004). As we considered this national agenda and other applications beyond the CDSMP, our goal was to construct a tool that could assess constructs in a multitude of settings. This article describes the development of such a tool, which we have named the Perception of Health Scale (PHS).

METHOD

We began by adapting a scale developed by Chambers, Markson, Diamond, Lasch, and Berger (1999) for a study on compliance with inhaled corticosteroids among patients with asthma. The scale included items that had themselves been adapted from several sources (Ferrini, Edelstein & Barrett-Connor, 1994a, 1994b; Saltzer, 1982; Schwab, Meyer & Merrell, 1994). For example, Schwab and her colleagues (1994) studied health beliefs and attitudes among Mexican-American patients with diabetes. One of their items, "It is God's will that I have diabetes," was used by Chambers with *asthma* substituted for *diabetes*. In the PHS, this item was further adapted to "It is God's will if I am healthy." Similar revisions were made for many of the other items. The scale is untimed and takes about 5–7 minutes to complete. Subjects respond to each item by selecting one of five choices: *Strongly Agree*, *Agree*, *Neither Agree nor Disagree*, *Disagree*, *Strongly Disagree*. The following directions are printed above the items: Here are some things people might say about being healthy, or about their own health. For each of the statements listed, circle a number between 1 and 5 to show how much you agree or disagree with each.

The first version of the PHS was administered to 100 primary care patients. A research assistant observed the patients and was available to answer questions. The patients were able to complete the scale without difficulty. Following an analysis of the data and discussions with a group of primary care physicians, one of the items was changed. The item that had read "It is entirely up to me whether I am healthy or not" was changed to "It is up to me whether I am healthy or not." The word *entirely* did seem to function as a specific determiner and be ambiguous based on the data and the discussion among the group of physicians. Using the readability statistics available in Word, the Flesch Reading Ease Score for the final version of the 15-item PHS was estimated as 86.3% and the Flesch-Kincaid Grade Level as 4.1. The scale holds a copyright designation and is available in both English and Spanish.

To assess the psychometric characteristics of the PHS, the scale was administered to four groups of adults in different settings. One group was part of an integrative medicine practice affiliated with an urban university-based clinical care setting. A

second group consisted of community adults participating in the CDSMP. The remaining groups were different samples from an urban university-based family medicine practice. Each of the 322 participants completed the scale and an anamnestic demographics sheet at their own pace, without assistance. Data collection procedures were approved by the Institutional Review Board.

The participants' responses were entered into an Excel spreadsheet that was imported into a statistical package for analysis. A 10% random sample of responses was checked for accuracy and changes were made to the worksheet, if required. In order to assess the dimensionality of the scale, the responses for each group and for the total group were analyzed by the method of principal components, followed by Varimax rotation of those factors with eigenvalues greater than 1.0 (Hotelling, 1933; Kaiser, 1958). To assess the internal consistency of any subscales identified in the clustering analysis, Cronbach's alpha coefficient was calculated, followed by the Spearman-Brown formula. The latter was used to control for the number of items in each cluster. Conforming to the criterion of Velicer and Fava, each of the clusters was required to have at least three items (Velicer & Fava, 1998).

RESULTS

Table 1 shows the basic demographics of the total group and the groups separately. Group 2 consisted of the patients in the integrative medicine practice and they did show the highest level of education and were the least diverse, based on gender and ethnicity. Group 4 included the community adults participating in the CDSMP that was implemented in several subsidized senior housing units to low income, urban African-American adults. Groups 1 and 3 were patients in a family medicine practice.

From the components analysis that was completed with responses from the group, four clusters emerged accounting for 61% of the variance in item responses. These were as follows: (a) Center of Control ("Being healthy is largely a matter of good fortune"); (b) Certainty ("I am often confused about what to do to stay healthy"); (c) Self-Awareness ("If I exercise and eat right, I'm almost certain to stay healthy"); and (d) Importance of Health ("I think about my health a lot"). Table 2 includes the 15 items that comprise the scale. Table 3 shows the Cronbach's alpha coefficients for the clusters, where each is an estimate for a 15-item scale to allow comparisons across the subscales with unequal numbers of items. We chose the standard of 15 as this was the length of the total PHS scale. Each of the coefficients is near or above the standard accepted for individual assessment and are significantly above the level needed for group assessment (Helmstadter, 1964).

Table 1. Patient Demographics by Site and Total Sample

	<i>Group 1</i> (<i>n</i> = 72)	<i>Group 2</i> (<i>n</i> = 52)	<i>Group 3</i> (<i>n</i> = 97)	<i>Group 4</i> (<i>n</i> = 101)	<i>Total</i> (<i>n</i> = 322)
Mean age	58.8	51.0	41.7	72.8	57.0
St. dev. age	11.7	14.1	15.4	8.2	17.6
Male %	19	8	25	18	19
Caucasian %	39	86	34	11	36
Educ. % >Hs	64	92	75	11	55

Table 2. Items of the Perception of Health Scale (English Version)

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1. I think about my health a lot.
 2. Being healthy is largely a matter of good fortune.
 3. No matter what I do, if I am going to be healthy or not, it is just going to happen.
 4. It is God's will if I am healthy.
 5. If I exercise and eat right, I'm almost certain to stay healthy.
 6. I am often confused about what I should do to stay healthy.
 7. I would like to be healthier, but I just can't get myself to do what is necessary.
 8. There are so many different reports on kinds of foods that keep you healthy that I don't know what I should do.
 9. I'm willing to spend extra money on things that are healthy for me.
 10. It is up to me whether I am healthy or not.
 11. My health is the most important consideration in my life.
 12. Good health is a matter of good luck.
 13. No matter what I do, I cannot change how healthy I am.
 14. I can be as healthy as I desire.
 15. I cannot understand everything I read about healthy eating.
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DISCUSSION

Overall the PHS is of sufficient internal consistency to make it a potentially useful tool in research designed to include a measure of personal beliefs about health. Given the emphasis on chronic disease management and the implementation of programs that may include participants with several chronic conditions, an instrument like the PHS has great potential.

Because the groups reflected a primary care patient population, they included a relatively small number of men. There will be applications where this may be a limitation. We plan to include more men in another study in order to analyze the stability of the factor structure. This sample included only 62 men, which is not large enough to properly analyze responses to a 15-item scale. Lastly, while we do not know the number of individuals who refused to participate, we estimate it to be at about 15%.

When reviewing the published sources used to generate the PHS items, the four-factor solution makes sense. To illustrate, four of the items in the Center of Control cluster were revised from the Chambers et al. (1994) article on asthma. All of the Center of Control items revised from Chambers and used in the PHS scale clustered into the same subscale. This reinforces one of our emerging hypotheses that one's perception about health and disease may reflect a personal *weltanschauung*, independent of diagnosis. More work is needed in this area given the emphasis on chronic conditions and their management.

We should note that while the factor solutions were quite similar across the groups, they were not identical. For instance, the data for Group 2 did not yield a four-factor solution. Because Group 2 was the smallest as well as the best educated group and

Table 3. Internal Consistency Estimates Subscales of Perception of Health Scale (All Sites Combined)

	<i>Center of control</i>	<i>Self-awareness</i>	<i>Certainty</i>	<i>Importance of health</i>
Reliability	0.90	0.91	0.91	0.82
Items	5	3	4	3

largely Caucasian and female, it may be that these differences lead to some imprecision in the data. Clearly, more work is needed to better document the role of demographic variability as it affects the PHS factor structure.

The overall goal of developing an internally consistent instrument on perceptions about health and being healthy was achieved. Work is underway to document the validity of inferences made from the PHS. For example, does the factor structure remain stable across diagnoses such as asthma, hypertension, and diabetes? Is there variation by gender or ethnicity? How do the subscale scores contribute in any multivariable analyses?

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