Development and Validation of the Body Knowledge Questionnaire

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Abstract

This study evaluated the psychometric properties (validity and reliability) of a new instrument, the *Body Knowledge Questionnaire* (BKQ), which measures weight management integration—an individual's attitudes, preferences, and behaviors associated with weight management. The BKQ has potential for use in weight management practice areas to ameliorate the global obesity problem.

Problem

The incidence of obesity in the US continues to rise with 35.1% of adults being obese in 2012 (Ogden, Carroll, Kit, & Flegal, 2014). Weight management interventions have focused on increasing physical activity or decreasing dietary intake (Blue & Black, 2005), but the efficacy of these has been short-lived (Lowe, Miller-Kovach, & Phelan, 2001). Little is known about the attitudes, preferences, and behaviors that are characteristic of weight management *integration*, information that is essential for developing new weight management strategies.

Purpose

The purpose of this research was to develop and validate the psychometric properties of the BKQ. The validation process involved evaluating the validity (content, construct, and criterion-related) and reliability (stability and internal consistency) of the new instrument.

Relevant Literature

An individual whose body mass (weight-to-height) index is ≥ 30 kg/m² is considered obese. Obesity has been linked to physiological disorders and psychological consequences leading to life-threatening chronic conditions (Kumanyika, Jeffery, Morabia, Ritenbaugh, & Antipatis, 2002). Insufficient attention has been given to the experiential aspect of weight management.

The theoretical framework for this study was Hernandez's (1991) theory of integration. According to the theory, individuals with diabetes strive to resolve the existence of the two selves: personal (self that always existed) and diabetic (self that emerged upon diabetes diagnosis). Although the theory of integration has not been applied to the field of weight management before, the authors posited it would be a useful framework based on the knowledge that previous qualitative studies have indicated that integration is an important part of the experience of those who are trying to lose weight (Johnson, 1990; White, 1984).

Research Questions

Is the Body Knowledge Questionnaire a valid and reliable instrument?

Procedures

This research was completed in two phases. Figure 1 displays the steps undertaken to complete this research. Pilot testing of the BKQ was completed in phase 1 (enclosed in hash line box of Figure 1; see Hernandez & Hernandez, 2015). Phase 2 is reported in this poster.
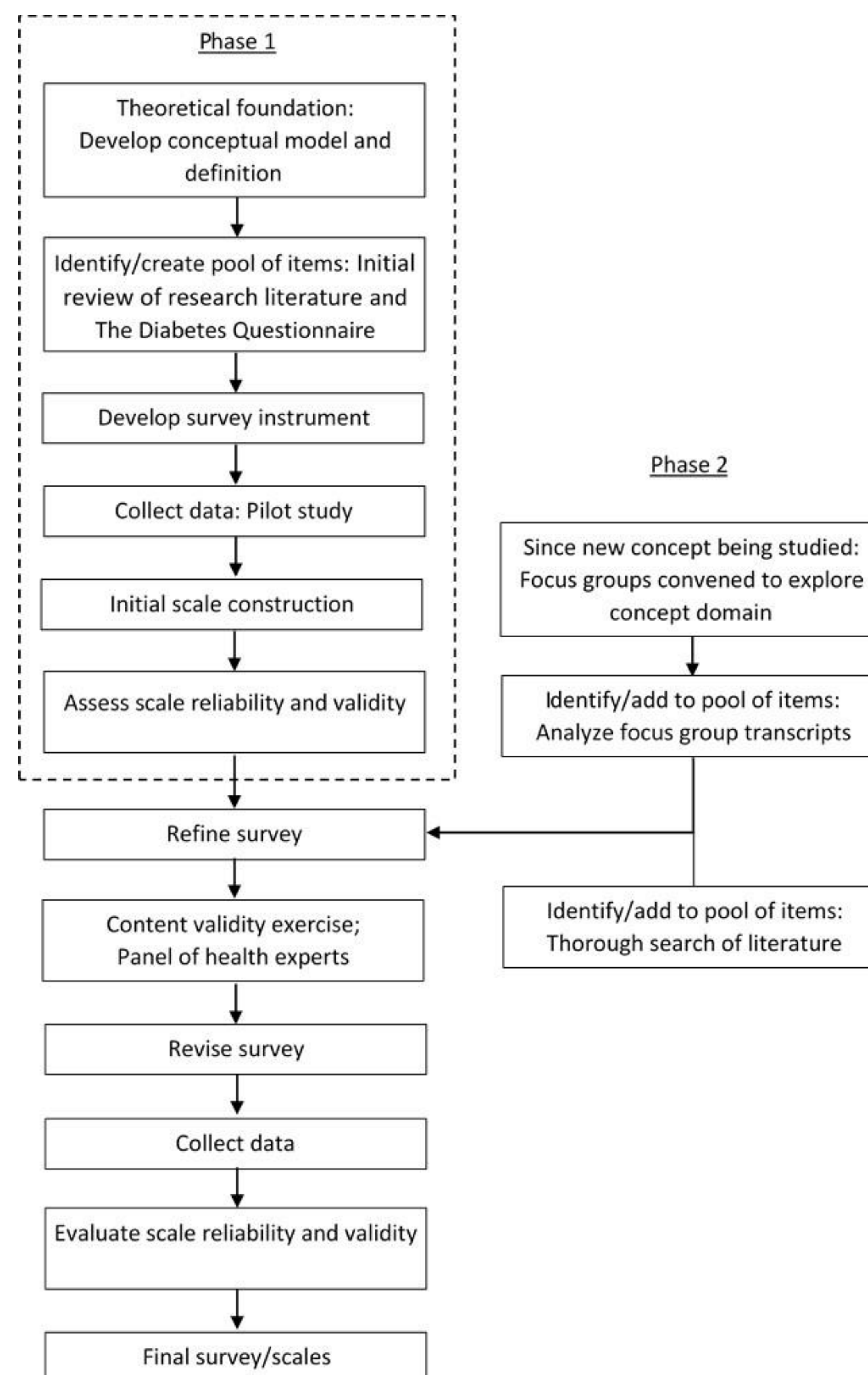

Figure 1. Process of development and validation of the BKQ.

Data Analysis

The psychometric properties of the BKQ were evaluated. Three types of validity were evaluated as follows: (a) content validity was assessed by using the TDQ, the research literature on obesity/weight management, and transcripts of focus groups as sources for questionnaire items, and then a panel of health experts completed a content validity exercise (completing the Content Validity Questionnaire and focus group) of the final version of the BKQ; (b) construct validity was assessed through exploratory factor analysis (EFA), and (c) criterion-related validity was assessed through discriminant function analysis. Two types of reliability were evaluated as follows: (a) temporal stability of the BKQ was assessed using test-retest reliability, and (b) internal consistency of the total scale and subscales was assessed through scale reliability analysis.

Findings

Content validity. All but 7 of the 66 BKQ items were derived from the TDQ, the weight management and integration literature, and the content of transcripts from four focus groups of obese and normal weight participants. A panel of experts, 30 health professionals, reviewed the BKQ and completed the Content Validity Questionnaire. A subgroup of 6 of the 30 health professionals participated in a focus group interview to finalize the BKQ, a 66-item instrument.

Construct validity. EFA was used to identify and examine the extant factors in the BKQ. Results of Horn's (1965) parallel analysis indicated that the correct number of factors to extract from the dataset was four. Results of a four-factor solution using EFA with Varimax rotation with Kaiser normalization revealed factor loadings between .45 to .80, which is considered fair to excellent (Comrey & Lee, 1992). This model explained 36.9% of the variance.

Criterion-related validity. Criterion-related validity is synonymous with predictive validity (DeVellis, 2003). For this study, discriminant function analysis (DFA) was used to test whether the main scale could accurately predict the classification of participants into normal- and obese-weight groups. Only one significant function was generated, $\Lambda = .916$, $\chi^2(1) = 13.90$, $p < .001$, which indicated that the function containing the one predictor significantly differentiated between normal- and obese-weight participants. Moreover, results of DFA with the three subscales as predictors also correctly classified participants. Again, one significant function was generated, $\Lambda = .833$, $\chi^2(3) = 28.81$, $p < .001$. Each model (full scale and three predictors) correctly classified 71% of the cases.

Findings (continued)

Test-retest reliability. Twenty-five participants completed the survey twice with an average of 8 days between completion dates. Bivariate correlation of total item scores between two completion dates yielded an $r = .80$.

Scale reliability. Results of the reliability analysis for the first factor (19 items), Food Centricity, yielded an alpha value of .93 (considered excellent). For the second factor (10 items), Psychosomatic Awareness, the Cronbach's alpha was .82 (considered good). For the third factor (10 items), Health Conscious Living, the Cronbach's alpha was .80 (considered good). The fourth factor (3 items) was not named because the Cronbach's alpha was .52 (considered poor). Scale reliability analysis of the 42-item full scale yielded a Cronbach's alpha of .92.

Limitations

A sample size of 161 is relatively small for new instrument development. An $N \geq 300$ is preferred (Comrey & Lee, 1992). The stability of the factor structure is questionable with a small sample.

Conclusions

Evidence on the validity and reliability of the BKQ suggests that it is a viable instrument for identifying the attitudes, preferences, and behaviors central to weight management in adults. The BKQ can be used to differentiate between normal- and obese-weight individuals with 71% accuracy. Nonetheless, further psychometric testing of the BKQ with a larger sample is warranted, and the revised 42-item BKQ tool should be used in weight management research to develop and/or test the effectiveness of novel weight management strategies or interventions.

Social Change Implications

The BKQ instrument has great potential for use in weight management practice areas such as dietetics, nursing and psychology. Practitioners can use the instrument to assess an individual's attitudes, preferences, and behaviours related to weight management. Attitudes preferences, and behaviors that are negative or problematic for an individual seeking to achieve or maintain a normal body weight can be identified, then strategies can be developed with the client to ameliorate one or more of these areas.

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