



Structural validity of the Mental Health Continuum-Short Form: The bifactor model of emotional, social and psychological well-being



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ARTICLE INFO

Article history:

Received 16 August 2014

Received in revised form 11 November 2014

Accepted 12 November 2014

Available online 5 December 2014

Keywords:

Well-being

Bifactor model

Emotional well-being

Social well-being

Psychological well-being

Mental health continuum

ABSTRACT

The Mental Health Continuum-Short Form (MHC-SF) is a growingly popular questionnaire designed to assess three components of well-being: emotional, social, and psychological. The main goal of the present study was to evaluate the structural validity of the MHC-SF and test the bifactor model of the MHC-SF, which includes one general factor and three specific factors of well-being. Sample 1 consisted of 1095 Serbian students (aged 18–26 years), while Sample 2 included 325 Serbian adults (aged 27–63 years). The bifactor model of the MHC-SF yielded the best fit to the data across the two samples. The results showed that the general factor of well-being accounted for substantially greater amount of variance of the MHC-SF than three specific factors of well-being. After controlling for the general factor, three specific factors explained a small portion of variance in well-being. In addition, the three subscales of the MHC-SF showed low reliability as estimated by omega-subscale coefficients, indicating that these subscales comprise too small amount of reliable variance to interpret. The present findings suggest that researchers should not calculate separate scores for three types of well-being when using the MHC-SF and that alternative measures of specific components of well-being should be considered.

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1. Introduction

A comprehensive assessment of well-being, covering both hedonic, i.e., subjective well-being (feeling good and satisfied) and eudaimonic, i.e., psychological well-being (functioning well on both intrapersonal and interpersonal levels) has been considered crucial to fully capture an individual's positive mental health (Keyes, 2005). Recent decades have witnessed the considerable progress achieved in the field of measuring well-being and researchers have reached a broad consensus on the best self-report instruments for assessing subjective well-being. Two scales are considered the gold standards in the field of subjective well-being: the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) for the assessment of affective well-being and the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) for the assessment of life satisfaction. The PANAS and the SWLS have been used with success over the past thirty years, and have remained the most frequently used instruments for measuring subjective well-being.

Contrary to the assessment of subjective well-being, the assessment of eudaimonic well-being has been plagued by a number of

problems in recent decades, and there is no gold standard for its assessment. Furthermore, the Ryff's Scales of Psychological Well-Being (Ryff, 1989), the most widely used measure of eudaimonic well-being, have been disputed on various grounds. The criticism has focused especially on the theoretically proposed multidimensionality of the Ryff's Scales, designed to measure the six dimensions of psychological well-being: self-acceptance, positive relations with others, autonomy, purpose in life, environmental mastery, and personal growth. A number of studies have shown that the Ryff's Scales do not measure six distinct dimensions (e.g., Springer & Hauser, 2006), that some subscales overlap considerably (van Dierendonck, Díaz, Rodríguez-Carvajal, Blanco, & Moreno-Jiménez, 2008), and that they do not adequately measure high levels of psychological well-being (Abbott, Ploubidis, Huppert, Kuh, & Croudace, 2010).

Only recently there have been attempts to integrate different aspects of well-being and develop instruments aimed at assessing both hedonic and eudaimonic components of well-being. The most prominent model that integrates core indicators of hedonic and eudaimonic well-being is Keyes's model of positive mental health (Keyes, 2002). Keyes's model encompasses three components: emotional well-being (EWB; positive emotions and life satisfaction), psychological well-being (PWB; positive individual functioning, consisting of six above mentioned Ryff's elements of

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psychological well-being), and social well-being (SWB; positive social functioning, consisting of five elements: social coherence, social acceptance, social actualization, social contribution, and social integration). The instrument initially used for the assessment of positive mental health as described by Keyes, was the Mental Health Continuum-Long Form, a 40-item self-report questionnaire (MHC-LF; Keyes, 2002, 2005). Although the MHC-LF received empirical support for its validity and reliability, it has not been widely used in the research and has been recently replaced with the Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2008).

The MHC-SF consists of 14 items, that were chosen as the items with greatest face validity, i.e., which best describe each facet of well-being. The EWB subscale includes three items (two for positive emotions, and one for life satisfaction), while the PWB (six items) and SWB (five items) subscales include only one item for each of the theoretically proposed dimensions. The MHC-SF is a brief, theoretically grounded scale, and fits well with the recent emphasis on multidimensional and comprehensive assessment of psychosocial functioning (e.g., Ro & Clark, 2009). These qualities made the scale highly attractive for researchers and, since its introduction, the MHC-SF has become one of the most popular well-being instruments and has been widely used in the area of positive mental health (Hone, Jarden, Schofield, & Duncan, 2014).

The MHC-SF has been translated into a number of languages and validated across different cultural contexts (Joshi, Wissing, Khumalo, & Lamers, 2013; Karaš, Ciecuch, & Keyes, 2014; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011; Petrillo, Capone, Caso, & Keyes, in press). However, limitations and inconclusive findings on the structure of the MHC-SF in previous research warrant further exploration of its structural validity. Previous studies which examined the factor structure of the MHC-SF have two substantial shortcomings. First, although the original three-factor structure of the MHC-SF has been supported in previous studies using the confirmatory factor analyses, most of these studies yielded fit indices that can be considered only marginally acceptable by conventional criteria (e.g., Brown, 2006). Surprisingly, the researchers have not tried to identify the sources of misfit, nor have suggested the need for scale refinement, although the fit for the original three-factor model was far from excellent in most studies. Second, previous studies did not examine whether the three components of well-being as measured by the MHC-SF capture the unique variance of well-being over and above general factor of well-being. Given that the MHC-SF was developed as a broad, multidimensional scale aimed at measuring three relatively distinct components of well-being, it seems essential to test whether the MHC-SF allows for a precise scaling of individuals on three specific well-being dimensions.

The present study extends research into the validity of the MHC-SF by using a bifactor model, a psychometric tool which enables researchers to parse the specific and common variance and evaluate whether the use of subscales is justified. A bifactor model consists of one general factor and a number of specific factors, allowing each item to load both on the general factor and specific factor (e.g., Reise, 2012; Reise, Moore, & Haviland, 2010). It has been widely used over the past few years and has helped researchers clarify the structure of scales aimed at measuring multidimensional constructs such as intelligence (Gignac & Watkins, 2013), depression (Brouwer, Meijer, & Zevalkink, 2013), self-esteem (McCain, Jonason, Foster, & Campbell, 2015) and impulsiveness (Reise, Moore, Sabb, Brown, & London, 2013), but it has not yet been applied in studies investigating the psychometric properties of the MHC-SF. A bifactor model seems to be most appropriate to examine the structure of well-being as measured by the MHC-SF, for at least two reasons. First, the MHC-SF fits well in the description of broad measure which encompasses heterogeneous

indicators because it consists of items capturing diverse aspects of well-being, both hedonic and eudaimonic, and both intrapersonal and interpersonal. Second, as argued by Reise and colleagues (2007), the bifactor model is reasonable solution for the multidimensional scales (such as the MHC-SF) aimed at measuring complex constructs (such as well-being) which consist of moderately associated components (such as hedonic and eudaimonic well-being).

To the best of our knowledge, this is the first study to examine the dimensionality of the MHC-SF and evaluate the viability of the MHC-SF subscale scores by applying a bifactor model. In line with recent findings supporting the bifactor model of well-being (Chen, Jing, Hayes, & Lee, 2013), the present study hypothesized that the model with three specific factors and one general factor of well-being would be the best-fitting solution. The findings from bifactor modeling of the MHC-SF are of great practical importance and could provide important information on the best practices for using the MHC-SF and interpreting the MHC-SF scores (e.g., whether the use of the MHC-SF subscales is plausible). Thus, the main aim of the present research was to evaluate whether the MHC-SF is a valid tool for the assessment of distinctive components of well-being, i.e., whether this scale is able to delineate the specific features of emotional, psychological and social well-being.

2. Methods

2.1. Sample and procedure

Two samples were used in the present study. Sample 1 consisted of 1095 undergraduate students (73% females; mean age = 21.20 years, $SD = 1.86$, range 18–26 years) from the University of Novi Sad, Serbia. Sample 2 included 325 Serbian adults (52% females; mean age = 43.76 years, $SD = 8.73$, range 27–63 years). The participation in the study was anonymous and voluntary.

2.2. Instruments

The Mental Health Continuum-Short Form (MHC-SF; Keyes et al., 2008) consists of 14 items aimed at measuring three components of well-being: emotional (3 items), social (5 items), and psychological (6 items). Participants were asked to rate how often they felt a certain way during the past month, on a 6-point scale from *never to every day*. The MHC-SF was translated into Serbian using the back-translation procedure. One of original authors of the MHC-SF (Corey Keyes) supervised the translation process and approved the final version of the Serbian MHC-SF.

2.3. Statistical analysis

Confirmatory factor analysis (CFA) was conducted by EQS 6.1 software. The parameter estimates in CFA were obtained using the robust maximum likelihood method with the Satorra-Bentler chi-square (SB χ^2), because the assumption of multivariate normality was not fulfilled (Mardia's coefficient of multivariate kurtosis = 39.94 in Sample 1 and 47.78 in Sample 2). Participants with one or more missing items were excluded from the analyses. Several fit indices were used to evaluate the model: SB χ^2 , SB chi-square to degrees of freedom ratio (SB χ^2/df), the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Bentler-Bonett Normed Fit Index (NFI), Non-normed Fit Index (NNFI), and Akaike Information Criterion (AIC). The χ^2 value should be nonsignificant to indicate a good fit, but when the sample is large, as in the present study, a nonsignificant χ^2 test is rarely

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