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Comprehensively Measuring Health-Related Subjective Well-Being: Dimensionality Analysis for Improved Outcome Assessment in Health Economics

Marieke de Vries, PhD[1,2], Wilco H.M. Emons, PhD[3], Arnoud Plantinga, MSc[1], Suzanne Pietersma, PhD[4], Wilbert B. van den Hout, PhD[4], Anne M. Stiggelbout, PhD[4], M. Elske van den Akker-van Marle, PhD[4,]*

[1]*Department of Social Psychology, Tilburg Institute for Behavioral Economics Research, Tilburg University, Tilburg, The Netherlands;*
[2]*Radboud University, Institute for Computing and Information Sciences (iCIS), Data Science Department, Nijmegen, The Netherlands;*
[3]*Faculty of Social and Behavioural Sciences, Department of Methodology and Statistics, Tilburg University, Tilburg, The Netherlands;*
[4]*Department of Medical Decision Making, Leiden University Medical Center, Leiden, The Netherlands*

ABSTRACT

Background: Allocation of inevitably limited financial resources for health care requires assessment of an intervention's effectiveness. Interventions likely affect quality of life (QOL) more broadly than is measurable with commonly used health-related QOL utility scales. In line with the World Health Organization's definition of health, a recent Delphi procedure showed that assessment needs to put more emphasis on mental and social dimensions. **Objective:** To identify the core dimensions of health-related subjective well-being (HR-SWB) for a new, more comprehensive outcome measure. **Methods:** We formulated items for each domain of an initial Delphi-based set of 21 domains of HR-SWB. We tested these items in a large sample (N = 1143) and used dimensionality analyses to find a smaller number of latent factors. **Results:** Exploratory factor analysis suggested a five-factor model, which explained 65% of the total variance. Factors related to physical independence, positive affect, negative affect, autonomy, and personal growth. Correlations between the factors ranged from 0.19 to 0.59. A closer inspection of the factors revealed an overlap between the newly identified core dimensions of HR-SWB and the validation scales, but the dimensions of HR-SWB also seemed to reflect additional aspects. This shows that the dimensions of HR-SWB we identified go beyond the existing health-related QOL instruments. **Conclusions:** We identified a set of five key dimensions to be included in a new, comprehensive measure of HR-SWB that reliably captures these dimensions and fills in the gaps of the existent measures used in economic evaluations.

Keywords: factor analysis, quality of life.

Introduction

The allocation of inevitably limited financial resources for health care and the evaluation of alternative treatments and interventions require assessment of the effects of treatments and interventions on health. According to the World Health Organization's (WHO's) definition of health, "Health is a state of complete positive physical, mental, and social well-being and not merely the absence of disease or infirmity" [1]. This definition was adopted at the International Health Conference held in New York in 1946 and signed on July 22, 1946, by the representatives of 61 states [2] and has not been amended since. The effectiveness of health interventions is often measured in terms of quality-adjusted life-years (QALYs) [3]. QALYs combine the quality and quantity of life into a one-dimensional outcome. QALYs are, however, currently derived from health measures that focus primarily on physical and mental functioning and not so much on social well-being [4]. As a consequence, existing scales and corresponding QALYs may not provide a comprehensive picture of the effectiveness of an intervention for a patient's health as defined by the WHO. The overarching purpose of the present research was to design a new utility measure that better fits WHO's definition and that may serve as a basis for economic appraisal of health interventions. More specifically, we identified the core dimensions of health as defined by the WHO, that is, "a state of complete positive physical, mental and social well-being."

The Need for a More Comprehensive Outcome Assessment in Health Economics

In line with the WHO definition of health, a recent Delphi consensus procedure among five stakeholder groups (i.e., patients, family of patients, clinicians, scientists, and general public) showed that economic evaluations of health care

* *Address correspondence to:* M. Elske van den Akker-van Marle, Department of Medical Decision Making, Leiden University Medical Center, P.O. Box 9600, Leiden 2300 RC, The Netherlands.
E-mail: vandenakker@lumc.nl.

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interventions need to put more emphasis on mental and social dimensions [5]. Currently, QALYs are typically calculated on the basis of various health-related quality-of-life (QOL) measures, such as the EuroQol five-dimensional questionnaire (EQ-5D), the Health Utility Index (HUI), and the Short Form- Six Dimensions derived from Short-Form 36 Health Survey (SF-6D) [6]. Such measures provide scores on a predefined set of domains relevant to the QOL, such as mobility and pain. Nevertheless, an increasingly common critique is that these measures do not capture all the domains relevant to the QOL but capture only limitations in functioning [4,7]. For example, the EQ-5D domains are mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, and sometimes a cognitive dimension is added. QALYs based on these EQ-5D domains miss some important aspects of the QOL. For example, although one may argue that domain 3 of the EQ-5D (usual activities) does seem to tap into social well-being, social well-being is not confined to only activities, but also entails aspects such as relationship quality and social support. Moreover, although domain 5 of the EQ-5D (anxiety/depression) taps into affective aspects of mental well-being, it is restricted to negative affect and does not take into account positive feelings such as happiness, satisfaction, confidence, and self-efficacy. Importantly, these positive affective states are not always inversely correlated to negative feelings, such as anxiety and depression, but can coexist and also exist independently [8].

Furthermore, current measures of health-related QOL focus mainly on determining the physical effects of treatments, which are mainly obtained with cure-related treatments. Therefore, these measurements do not optimally detect important effects of health interventions in other medical contexts such as end-of-life care [9,10], older people [11,12], mental care [13], public health [14], informal care [15,16], and in vitro fertilization [17]. To better gauge the effectiveness of health interventions, measures need to go beyond what is measurable by currently available health-related QOL assessment instruments.

For a comprehensive picture of the assessment of the effectiveness of health interventions on health, multiple terms that are used in the literature are relevant. In health economics, the QOL is a common term. Subjective well-being is a key concept in psychology, with an explicit focus on the mental and social domains of well-being, the two pillars of the WHO definition of health that seem to be under-represented in the currently available health utility measures [5]. Building on the traditional and relatively narrow way in which the QOL is conceptualized and measured in health economics, our aim was to enrich this approach by incorporating a broader perspective on the QOL, for which we will use the term health-related subjective well-being (HR-SWB). More specifically, in this article we focus on identifying the core dimensions of HR-SWB.

Identifying the core dimensions of HR-SWB is an essential step in the process of developing a new, more comprehensive outcome measure for effectiveness assessment of health care interventions suitable in all health care contexts. To have a good understanding of what stakeholders perceive as important for HR-SWB, we recently ran the aforementioned Delphi procedure. Building on the Delphi-based set of 21 domains of HR-SWB, our main objective in the research presented in this article was to investigate whether the variation on these domains can be summarized by means of a limited number of underlying HR-SWB factors. This way, we aimed to identify the core dimensions of HR-SWB. Importantly, such a set of core dimensions of HR-SWB can serve as a basis for a new, more comprehensive outcome measure, and hence contribute to improving the assessment of the effectiveness of health care interventions.

Methods

Overview

First, we constructed, pilot-tested, and adapted a draft questionnaire on the basis of the outcomes of our recent Delphi procedure [5]. We then assessed the dimensionality of the concept questionnaire and examined whether the information from the domains could be summarized using a limited number of factors. We finally determined the construct validity of the dimensions identified using the most frequently used generic health-related QOL utility measures and questions of QOL, well-being, and happiness (e.g., the EQ-5D and the Satisfaction with Life Scale [SWLS]). These dimensions can serve as a basis for a new, more comprehensive outcome measure.

Draft Questionnaire Construction

For each of the 21 Delphi-based selected domains (see Appendix A in Supplemental Materials found at http://dx.doi.org/10.1016/j.jval.2015.11.010), we formulated three questions on an average. We used multiple questions to allow for selecting those questions that best capture the meaning of each specific domain (e.g., by looking at the correlations with preselected existing scales). For the domain "self-esteem," we chose to include one question because there was abundant evidence concerning the concrete operationalization of this construct; it is common practice to include one specific question [18]. The domains that covered participants' satisfaction with daily activities, balance between obligations and leisure, and life roles were such concrete domains that we believed that it was not necessary to include multiple questions either. For the domain "autonomy," we included four questions because this was a broad concept that included many aspects [19]. Two pairs of domains resulted in almost identical questions. Therefore, we chose to combine these domains: "being able to perform activities of daily living" and "independence," and "purpose in life" and "meaningfulness."

To keep uniformity, we chose to construct the questions in such a way that all could be answered using the same answering options. That is, all the questions were phrased as statements and respondents could indicate to what extent they agreed with these statements. We used a five-point Likert scale: 1, totally not; 2, a little; 3, to a moderate extent; 4, largely; and 5, totally. There is no consensus in the scientific literature on the choice of the number of answering options (e.g., choice between five-point and seven-point scale or choice between even or uneven numbers). There is also no consensus on the types of labels that should preferably be used (i.e., frequency indications or severity indications) [20]. We chose to use a five-point scale because we believed this would give participants enough variety, but not too much. The labels we chose indicated the extent/severity of things, which enabled respondents to express whether they were hindered in reaching the best level of HR-SWB. These labels are commonly used in QOL questionnaires.

The Delphi procedure showed that some of the physical domains ("vitality," "mobility") that are part of commonly used generic health-related QOL utility measures such as the EQ-5D and the SF-6D were perceived as relatively unimportant by stakeholders. We decided to also include questions based on the domains of the EQ-5D and the SF-6D that were not among our Delphi-based selection of HR-SWB domains, because the EQ-5D and the SF-6D are the most frequently used generic health-related QOL utility measures [6,21]. The final draft questionnaire consisted of 56 questions, covering the Delphi-based selection of domains and the added domains from the EQ-5D and the SF-6D (see Table 1).