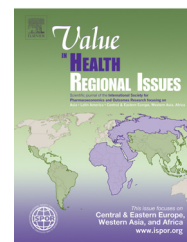




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Health-Related Quality-of-Life Measures: Evidence from Tunisian Population Using the SF-12 Health Survey

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ABSTRACT

Objective: To explore reporting differences related to sociodemographic characteristics affecting different health status indicators to assess their impact on the measurement of self-reported health status among the Tunisian population using the Tunisian version of the 12-item Short-Form Health Survey (SF-12). **Methods:** Psychometric properties of the SF-12 were validated for a random sample of individuals (N = 3864) aged 18 years and older. The SF-12 summary scores were derived using the standard US algorithm. The principal-component analysis was used to confirm the hypothesized component structure of the SF-12 items. **Results:** “Known-subgroup” comparisons showed that the SF-12 discriminated well between groups of respondents on the basis of sex, age, education, and socioeconomic status, providing evidence of construct validity. The results suggest the existence of reporting differences related to the sociodemographic characteristics affecting the health status indicators. For a given latent health status,

women and oldest people are more likely to report physical activity limitations and chronic diseases. Mental health problems are over-reported by divorced people and underreported by the oldest people. In addition, highly educated and socially advantaged people more often report social activities limitations due to the problems of physical and mental health. **Conclusions:** The findings showed that the Tunisian version of the SF-12 is a reliable and valid measure, and suggest its potential for measuring health-related quality of life in large-scale studies, specifically when overall physical and mental health are the outcomes of interest instead of the typical eight-scale profile.

Keywords: health-related quality-of-life measures, reporting bias, SF-12, Tunisia.

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Introduction

In recent decades, several global health organizations have focused on generic instruments for measuring physical and mental health to assess social heterogeneity in self-reported health status and building broad coalitions around a measure of population health compatible with the World Health Organization’s definition of health: “Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity” [1].

The measurement of health-related quality of life (HRQOL) seems to be necessary because it will monitor the population’s health status over time, to compare the impact of health conditions of individuals and identify differences in health status between women and men and between social categories. HRQOL, however, is a multidimensional concept that includes physical, psychological, and social domains of health and is broadly accepted as an important outcome measure of health care [2]. The two main approaches to measuring HRQOL are generic and disease-specific instruments, and most of the experts recommend the use of both concurrently [3]. HRQOL is therefore

interested in the ultimate outcome of the medical action and represents, at the time, an indicator of the efficiency of care choice. It is the subjective perception of the patient about his or her disease and its treatment. Regarding the generic instruments, the 36-item Short-Form Health Survey (SF-36) is probably the one that is most widely used [4,5].

The 12-item Short-Form Health Survey (SF-12), however, is a multipurpose, generic 12-item questionnaire developed from the SF-36 that is one of the most widely used health status evaluation tools [6,7]. The SF-12 provides a shorter but still valid and reliable alternative to the SF-36 for use in large samples. The SF-12 yields an eight-scale profile of scores as well as physical and mental health summary measures: physical functioning (PF, two items), role limitations due to physical functioning (role-physical [RP], two items), bodily pain (BP, one item), general health (GH, one item) perceptions, vitality (VT, one item), social functioning (SF, one item), role limitations due to emotional problems (role-emotional [RE], two items), and mental health (MH, two items). Answers to questions of these subscales are combined (weighted) with Physical Component Summary (PCS-12) and Mental Component Summary (MCS-12) scale scores.

Conflict of interest: The author has indicated that he has no conflicts of interest with regard to the content of this article.

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Studies using the SF-12 have verified the questionnaire as a valid and reliable measure for evaluating overall community health status [8,9] as well as minority ethnic groups [4,10]. Studies have shown that it would properly distinguish various health status indicators among elderly people [11,12]. Similarly, well-documented research works have shown that the SF-12 summary scores are acceptable measures of HRQOL in patients with different diagnoses such as MH disorders [13], osteoarthritis [14], retinal diseases [15], low back pain [16], and obesity [17]. Studies have found, however, that although the instrument showed acceptable validity and reliability, its factor structure in some countries with different cultures might not follow the intended structure of the instrument [12,18].

As a recent publication noted, because the ability to accurately and efficiently measure physical and mental health is of great importance in academic and clinical settings and the SF-12 takes less than 6 minutes to administer and provide such information, the questionnaire is quickly becoming one of the most popular instruments not only in its original country but also among investigators from other nations [19]. The SF-12 has been translated into most major languages such as Spanish, French, German, Swedish, Japanese [20], Italian, Russian, Greek, and Chinese [21,22].

The main purpose of this study was to explore the reporting differences related to sociodemographic characteristics affecting different health status indicators to assess their impact on the measurement of HRQOL. The originality of this study lies in registering in an economic framework for measuring HRQOL and reflecting on the construction of two synthetic latent variables from different health status indicators using the Tunisian version of the SF-12 to scale them by comparison and measure differences in self-reported health status to each indicator in the Tunisian population.

Methods

The Tunisian Version of the SF-12

The SF-12 is the abridged practical form of the SF-36. It is a widely used screening device for measuring physical, mental, and social well-being to assess quality of life [23,24,49]. The SF-12 was developed as a shorter alternative to the SF-36, and it includes 12 questions and eight scales: PF (two items on limitations doing moderate activities and climbing several flights of stairs), RP (two items on less accomplishment than one would like to achieve and limitation in kind of work or other activities), BP (one item on pain interference with one's normal work), GH (one item on GH perception), VT (one item on having energy), SF (one item on interference of physical health or emotional problems with one's social activities), RE (two items on less accomplishment than one would like to achieve and not being careful in doing activities as usual), and MH (two items on feeling calm or peaceful and feeling sad or blue).

The 8 health concepts were selected from 40 concepts included in the Medical Outcomes Study [25]. Those chosen represent the most frequently measured concepts in widely used health surveys and those most affected by disease and treatment (see Fig. 1).

As for the SF-36, permission was taken from the Quality Metric Incorporated to develop the Tunisian version of the SF-12. The SF-12 has been useful in comparing general populations, comparing the relative burden of diseases, differentiating the health benefits produced by a wide range of different treatments, screening individual patients, and unfavorable self-evaluations of GH status [6]. The International Quality of Life Assessment (IQOLA) Project is translating, validating, and norming the SF-12

for use in multinational clinical trials and other international studies [20,23,26].

Based at the Health Assessment Laboratory at New England Medical Center, the project began in 1991 with sponsored investigators from numerous countries. In addition, researchers from more than 30 other countries, including Tunisia, translated and validated the SF-12 using IQOLA Project methods. The translation and cross-cultural adaptation steps that were used to translate the SF-12 English version to the Tunisian version, however, were equal to those adopted by the IQOLA Project. During the process of translation, the wording of some items was changed to identify health concepts adopted in the Tunisian version. The changes in some terms made the Tunisian version of the SF-12 more objective and easier to understand and administer.

The Tunisian version of the SF-12 has been administered successfully to the illiterate population as well as to young and older adult patients by investigators trained in this purpose. Completion requires from 2 to 6 minutes, with a high degree of acceptability and data quality [7]. The eight SF-12 scales are ordered in terms of their factor content (i.e., construct validity) and grouped into two summary measures that are important in their use and interpretation. The MH, RE, and SF scales and the MCS measure have been shown to be the most valid SF-12 scales for measuring mental health. This pattern of results has been replicated in both cross-cultural and longitudinal tests using the method of known-groups validity. The PF, RP, and BP scales and the PCS measure have been shown to be the most valid SF-12 scales for measuring physical health.

Response categories for items vary from two- to six-point scales, and raw scores for items range from 1 to 6. After recoding raw scores for some items (BP, GH, VT, and one item from MH), the raw scores could be transformed to provide scores for eight scales, each ranging from 0 (the worst) to 100 (the best). This method of scoring assumes that item or items belonging to each scale can be transformed or summed without standardization of scores or item weighting [7,27]. We used this method to calculate scale scores. To calculate the PCS-12 and the MCS-12 scores, however, we used the Quality Metric Health Outcomes Scoring Software 2 (see Table 3). All the 12 items are used to produce scores for the PCS-12 and the MCS-12 and apply a norm-based scoring algorithm empirically derived from the data of a US general population survey [28]. It has been recommended that the US-derived summary scores, which assume a mean of 50 and an SD of 10, should be used to facilitate cross-cultural comparison of results [29,30].

Data and Descriptive Statistics

The data used for these analyses were obtained from a cross-sectional population-based study conducted in Tunis, Tunisia, by the National Institute for Public Health in 2012. The SF-12 was administered to a random sample of individuals aged 18 years and older. Participants were grouped, proportionally to the Tunisian population, by sociodemographic characteristics according to a three-stage sampling methodology. In the first stage, a random sample of building blocks was selected in proportion to the size of the Tunisian population. In the second stage, households were randomly selected by systematic sampling. In the third stage, an eligible participant was selected by simple random sampling in each household. A total of 3864 individuals were interviewed in their domicile. Individuals reported information on sociodemographic variables such as sex, age, marital status, education, income, and social status, with the latter three serving as proxy estimators of socioeconomic status.

Results are expressed as mean and SD for quantitative variables and as counts and percentages for categorical variables.

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