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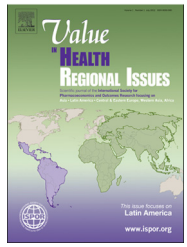

A Comparison of EQ-5D-3L Index Scores Using Malaysian, Singaporean, Thai, and UK Value Sets in Indonesian Cervical Cancer Patients

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ABSTRACT

Objectives: To gain insight into the most suitable foreign value set among Malaysian, Singaporean, Thai, and UK value sets for calculating the EuroQol five-dimensional questionnaire index score (utility) among patients with cervical cancer in Indonesia. **Methods:** Data from 87 patients with cervical cancer recruited from a referral hospital in Yogyakarta province, Indonesia, from an earlier study of health-related quality of life were used in this study. The differences among the utility scores derived from the four value sets were determined using the Friedman test. Performance of the psychometric properties of the four value sets versus visual analogue scale (VAS) was assessed. Intraclass correlation coefficients and Bland-Altman plots were used to test the agreement among the utility scores. Spearman ρ correlation coefficients were used to assess convergent validity between utility scores and patients' sociodemographic and clinical characteristics. With respect to known-group validity, the Kruskal-Wallis test was used to examine the differences in utility according to the stages of cancer. **Results:** There was significant difference among utility scores derived from the four value sets, among which the Malaysian value set yielded higher utility than the other three value sets. Utility obtained from the Malaysian value set had more agreements with VAS than the other value sets versus VAS (intraclass correlation coefficients and Bland-Altman plot tests results). As for the validity, the four value sets showed equivalent psychometric properties as those that resulted from convergent and known-group validity tests. **Conclusions:** In the absence of an Indonesian value set, the Malaysian value set was more preferable to be used compared with the other value sets. Further studies on the development of an Indonesian value set need to be conducted.
Keywords: cervical cancer patients, EQ-5D, Indonesia, utility, value sets comparison.

Introduction

The EuroQol five-dimensional questionnaire (EQ-5D) is the preferred instrument for assessing utility in health technology assessment (HTA) in many countries [1–3]. The three-level EQ-5D (EQ-5D-3L) consists of two parts: the EQ-5D descriptive system and the EQ-5D visual analogue scale (VAS). The EQ-5D descriptive system comprises five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. For each dimension, there are three possible response categories (no problem, some problem, and severe problem), resulting in 243 health states. Each EQ-5D health state can be converted into a single summary index format called utility. Utility score generally ranges from 0 (death) to 1 (perfect health) [4]. Utility is important in economic evaluation because it is required to generate quality-adjusted life-years (QALYs) [5], which is an outcome in the cost-utility analysis method of economic evaluation [6].

The EQ-5D health state is converted into a utility score using a country-specific scoring algorithm, namely, value set [4]. At present, the EQ-5D-3L is available in Indonesian language. Nevertheless, the value set for Indonesia has not been developed yet. In the absence of a country-specific value set, a value set from another country, particularly from nearby countries, can be used [7]. The first and widely used value set was the UK value set [8]. It was frequently applied to other populations when a country-specific value set was absent [1]. In Southeast Asia, several countries have their own value sets, including Thailand, Malaysia, and Singapore [9–11].

Conflicts of interest: The authors have indicated that they have no conflicts of interest with regard to the content of this article.

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Previous comparisons of utility scores derived from different countries' value sets suggest substantial differences [12,13] Choice of value set might potentially interfere in decision making because variation in utility score due to difference valuation will lead to different cost-effectiveness ratio results [14,15]. Given the absence of a national value set for Indonesia, it remains unclear which foreign value sets should be used in Indonesia. To our knowledge, there has been no published study on a comparison of different value sets applied in an Indonesian sample. Our study is the first study to gain insights into the approach to select the most suitable foreign value set for calculating utility in the Indonesian population. Similar studies had been conducted in Thailand [16], Switzerland [17], and Sweden [18] to determine the most suitable foreign value sets for calculating utility given the absence of a national value set.

Methods

The data used in this study were collected from a cross-sectional study of health-related quality-of-life evaluation of patients with cervical cancer in Indonesia [19]. The study obtained the ethical approval from the Medical and Health Research Ethics Committee of the Faculty of Medicine, Gadjah Mada University, Indonesia (reference no. KE/FK/369/EC). A convenience sample of 87 patients with cervical cancer who were admitted in Dr Sardjito Hospital, a referral hospital, in Yogyakarta, Indonesia, in the period of June to December 2013 were enrolled in the study. Patients being treated in the obstetrics and gynecology ward of the hospital were approached to participate in this study. The Indonesian version of the EQ-5D-3L as provided by the EuroQol Group was applied [20]. The EQ-5D-3L health states and the VAS ratings were collected through face-to-face interviews. Informed consents were obtained from respondents before being interviewed. Three surveyors were trained and hired for the purpose of data collection. Utilities were calculated on the basis of the Malaysian [10], Singaporean [11], Thai [9], and UK [8] value sets. Table 1 presents the value sets for utility calculation from the four countries of Malaysia, Singapore, Thailand, and the United Kingdom. Two researchers were involved intensively for data check and analysis.

The differences in the utility scores derived from the four value sets were determined using the Friedman test, followed by the Wilcoxon signed rank test. These tests aimed to examine whether the use of different value sets would yield different utility scores and thus whether the use of one value set over another might potentially interfere with the QALY for cost-utility analysis.

We assessed the performance of psychometric properties among the four value sets versus the VAS to determine the most suitable value set to be applied in Indonesia. This method had been used in previous studies comparing different countries' value sets [13,16–18]. In this study, we assessed the criteria of psychometric properties as follows: agreement to represent the attribute of reproducibility and construct validity to represent the attribute of validity.

Reproducibility concerns the degree to which repeated measurements provide similar results. In addition, agreement parameters assess how close the results of the repeated measurements are, and these are driven by the characteristic of the measurement instrument [21]. In this study, agreement was assessed by using intraclass correlation coefficients (ICCs) and Bland-Altman plots. ICC relates the measurement error to the variability between study objects [21]. The Bland-Altman plot is a simple method to analyze the repeatability of a single measurement method or to compare measurements by two observers [22]. ICCs and Bland-Altman plots were used for agreement between utility scores derived from the four value sets and the VAS. Although the VAS score represents a patient's own health state assessment in contrast with utility score, which represents health states of the general population, the previous studies concluded that the VAS score was predictable from the EQ-5D health state classification, the same data used to obtain utility score [23,24].

Construct validity refers to the extent to which scores on a particular instrument relate to other measures in a manner that is consistent with theoretically derived hypotheses concerning the concepts that are being measured, for instance, expected correlations between measures or expected differences in scores between known groups [25]. In this study, construct validity was examined using convergent and known-group validity tests. Convergent validity using the Spearman ρ correlation was conducted to assess the association between the utility and the patient's characteristics of age, marital status, education level, disease stage, and duration of illness. Known-group validity using the Kruskal-Wallis test was conducted to examine the ability of the four value sets to discriminate utility scores for different cancer stages.

Results

A detailed description of patients' sociodemographic and clinical characteristics has been reported in a previous study [19]. The mean age of the patients was 51.0 ± 8.92 years. Most patients

Table 1 – Comparison of utility calculation methods using the different value sets of Malaysia, Singapore, Thailand, and the United Kingdom [8–11].

Value set	Malaysia	Singapore	Thailand	United Kingdom
Full health (health state 11111)	1	1	1	1
Starting value	1	1	1	1
Constant (at least one level 2 or 3)	−0.067	–	−0.202	−0.081
N3 (at least one level 3)	−0.116	−0.2905	−0.139	−0.269
Mobility level 2	−0.084	−0.1678	−0.121	−0.069
Mobility level 3	−0.191	−0.3040	−0.432	−0.314
Self-care level 2	−0.097	−0.1615	−0.121	−0.104
Self-care level 3	−0.16	−0.3465	−0.242	−0.214
Usual activity level 2	−0.053	−0.2555	−0.059	−0.036
Usual activity level 3	−0.122	−0.3209	−0.118	−0.094
Pain/discomfort level 2	−0.054	−0.1462	−0.072	−0.123
Pain/discomfort level 3	−0.127	−0.2291	−0.209	−0.386
Anxiety/depression level 2	−0.081	−0.1501	−0.032	−0.071
Anxiety/depression level 3	−0.086	−0.2784	−0.110	−0.236