

THE VALIDITY OF THE SHONA VERSION OF THE EQ-5D QUALITY OF LIFE MEASURE

ABSTRACT: Introduction: The EQ-5D, a generic health related quality of life measure developed in Europe, has been recently translated into Shona, the language of the majority of Zimbabweans. Although the reliability of the Shona version of the EQ-5D has been established within a community setting, the reliability and validity of the measure within a group of Shona speaking people with disabilities has not been examined

Aim: The aim of the study was to examine the reliability and concurrent validity of the Shona version of the EQ-5D, within the context of a house-to-house survey of disability in a high-density area of Harare, Zimbabwe.

Methods: As part of a house-to-house survey of disability in a high-density area in Zimbabwe, 588 Shona speaking subjects with disability/morbidity or their proxies were asked to respond to the Shona version of the EQ-5D questionnaire. Those who were able to understand the concept filled in the visual analogue scale. A test-retest was done to determine the reliability of the EQ-5D. Timed walking was used to investigate the validity of the domain of mobility and the International Classification of Impairment, Disability and Handicap Beta Draft (ICIDH2) was used as the gold standard for usual activities and self care. The concurrent validity of the anxiety/depression domain was determined against the Shona Symptom Questionnaire, which is a validated screen for depression in the Zimbabwe population. No measure of pain could be found which had been validated in Zimbabwe.

Data analysis: The Intraclass-correlation (ICC) and Pearson's correlation co-efficient were used to determine the test re-test reliability of the descriptor section and visual analogue scale of the EQ-5D respectively. The t-test, ANOVA, and post-hoc Scheffe test were used to compare the EQ-5D with the measures of function.

Results:

Each domain of the Shona EQ-5D demonstrated reliability on the test re-test (ICC ranging from .58 for self care to .85 for mobility, $p < .01$). The first and second scores on the visual analogue scale were significantly correlated (Pearson's $r = .79$, $p < .001$). Those who reported no problems with mobility walked significantly faster than those who reported some problems with mobility ($t = -6.2$, $p < .001$). The mean number of activity limitations using the International Classification of Functioning was significantly different between those who reported no, some or severe limitations in usual activities ($F = 39.9$, $p < .001$). Of those reporting no, some and severe problems with self-care .6%, 13.6% and 62.5% respectively were found to have functional limitation in dressing on the ICIDH2 (the numbers were too small to apply statistical analysis). There was a significant difference between the mean number of affirmative answers in the Shona Symptom Questionnaire in respondents who reported no, moderate and severe problems with anxiety/depression ($F = 70.7$, $p < .001$).

Discussion and conclusion: It is concluded that the EQ-5D is a robust indicator of health related quality of life across different cultures. It is suggested that the Shona version of the EQ-5D can be used with confidence in a sample of Shona speaking subjects. Physiotherapists in the region are encouraged to translate and validate questionnaires to ensure that research with non-English speaking members of the Southern African population is performed with appropriate instrumentation.

KEY WORDS: QUALITY OF LIFE, EQ-5D, ZIMBABWE, VALIDITY

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INTRODUCTION

Globalisation has resulted in growing international collaboration in clinical research and a concurrent increase in the need for internationally comparable instruments to assess outcomes (Bullinger et al., 1998). An important outcome measure is the health related quality of

life of the participants and this is often used in international studies either to evaluate change over time or to discriminate between two groups at a specific point in time (Beaton, Bombardier, Hogg-Johnson, 1996). The majority of established measures stem from Anglo-American literature (Bullinger et al., 1998)

and in Southern Africa, research is often undertaken which requires the use of these instruments. However, health status measures developed in one country cannot simply be translated for use in a different cultural context (Wagner et al., 1998).

One of the most commonly used measures of health related quality of life is the European Quality of Life-5 dimensions or EQ-5D. It is a generic single index measure, validated in several European countries which has been used to measure health for both clinical and economic appraisal (Bakker and van der Linden, 1995). The EQ-5D describes health-related quality of life in terms of five dimensions or domains: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each domain is subdivided into three categories indicating no problem, a moderate problem or an extreme problem (Kind, Dolan, Gudex, Williams, 1998). It includes a rating of own health by means of a visual analogue scale (Brooks and EuroQol, 1996). At present, there are many authorised translations of the EQ-5D including many European language versions of the EQ5D (Greiner and Team, 2000), a South African Afrikaans version (Rabin, 2000) and a Japanese version (Ikeda, Skai, Tamura, Tsuchiya, 2000).

The EQ-5D has been translated into Shona (Jelsma, Chivaura, De Cock, De Weerd, 2000a) and a test-retest study on a community sample indicated that it was a reliable measure in this context (Jelsma et al., 2001). The reliability of use in a population of people with disability or morbidity was not established. During the translation process, issues were raised regarding the validity of the EQ-5D as a measure of health related quality of life in the Zimbabwean context (Jelsma et al., 2000a). For example, it was noted that the English concepts of health sound inappropriate when translated because some health states are seen to have a spiritual rather than a physical origin (Mararike, 1999). There was an obvious need to investigate the validity of the Shona version of the EQ-5D.

Concurrent or criterion validity "refers to the relationship between the scores obtained on the tool and either criterion states or measures whose validity is

known" (Payton, 1988). Instruments that had been used previously and ideally validated within the Shona speaking context were therefore identified as the "gold-standards" against which the Shona EQ-5D could be measured. It was hypothesised that if the domain of mobility were valid, there would be a significant difference between the gait speed of those who reported no and some mobility limitation. The International Classification of Impairment, Disability and Handicap (ICIDH) (World Health Organisation, 1980) has been used satisfactorily in at least two studies in Zimbabwe (Hanekom and Marks, 1991), (Jelsma et al., 1999). It was therefore suggested that if the revised International Classification of Impairment, Disability and Handicap Beta Draft (ICIDH2) (World Health Organisation, 1999) and the domain of usual activities measured the same construct, there would be a significant difference between the mean number of activity limitations classified using the ICIDH2 in the respondents who reported no, some or severe problems with usual activities. The self-care domain could be regarded as valid if there was a difference in proportion of respondents who were found to have limitations in the ICIDH2 activity of dressing for each level of the domain of self-care.

During the translation process, the idea of depression and anxiety were reported to be the most difficult of all the EQ-5D concepts to capture in Shona (Jelsma et al., 2000a). Fortunately the Shona Symptom Questionnaire, short form, has been developed which is a validated screen for depression in the Zimbabwe population (Patel and Todd, 1996). It consists of eight items that include statements concerning tearfulness, problems with sleeping, thoughts of suicide, problems with daily activities, life role etc. If the EQ-5D was a valid measure of depression, it was expected that those who reported severe depression would score the highest mean number of positive responses on the Shona Symptom Questionnaire, followed by those reporting moderate anxiety/depression.

The reliability of scales to measure pain within Zimbabweans with minimal levels of education has been questioned

(Jelsma, Machiri, Madzivire, 1997) and as no "gold-standard" for the measurement of pain/discomfort could be identified, the validity of this domain was not examined.

The aim of this study was therefore to determine, in a population with disability, the reliability of the Shona version of the EQ-5D and the concurrent validity of the mobility, anxiety/depression, usual activities and self-care domains when compared with other measures.

METHODOLOGY

Sample:

In March to May 2000, a house-to-house survey of 3 133 family units living on 1 309 randomly selected stands was undertaken in Highfield, a high-density area of Harare. Health related quality of life questions based on the EQ-5D but with the inclusion of a cognitive domain were used to screen for disability. Those who either had two moderate problems or one severe problem in the different domains were invited in to interview. Those who were older than 16 years and able to respond without reliance on a proxy were included in the analysis. The follow-up clinic was attended by 588 subjects with different types of morbidity/disability who underwent a medical examination. The responses of these subjects form the basis of this study.

The Medical Research Council of Zimbabwe approved the study. Informed consent was obtained before any interview was commenced and participants were assured of strict confidentiality. Although the budget did not allow for the provision of medication, subjects who attended the clinic were given a small allowance. All subjects received a full medical examination and were referred to appropriate services when necessary.

Instrumentation:

The subjects received a full medical examination from a medical practitioner and the primary and secondary diagnoses were coded using the International Classification of Diseases, Ninth Revision (ICD9) (World Health Organisation, 1977). The Shona version of the EQ-5D, which had been translated according to the EQ-5D protocol (Jelsma

et al., 2000a) and found to be reliable in a high-density setting (Jelsma et al., 2001), was administered. The time taken to walk 30 meters at a comfortable pace was measured (Wijlhuizen and Ooijendijk, 1999). The adult subjects were asked to respond to the Shona Symptom Questionnaire (Patel and Todd, 1996) to determine whether they reported symptoms of depression. The International Classification of Impairments, Disabilities and Handicaps Beta Draft (World Health Organisation, 1999) was used to classify the activity limitations of the subjects as reported in interview.

Procedure:

Subjects were interviewed in a Church Hall that was located in the residential district. At interview each subject responded to the Shona EQ-5D, the Shona Symptom Questionnaire, an interview on activity limitations, underwent a full medical examination and timing of a 30-meter walk. On most occasions, the EQ-5D was administered a second time by a different research assistant at the conclusion of the interview (i.e. approximately 45 minutes later) to determine reliability.

Data analysis:

Data analysis was done using Epi6 (Centers for Disease Control, 1996) and SPSS Release 8 (SPSS Inc, 1997). The reliability of the EQ-5D was tested by determining the Intra-class correlation (ICC) between the first and second responses. The difference in the time taken to walk 30 meters between those reporting no problems and some problems with walking about was tested using the t-test. (Obviously the walking speed of subjects who were "Confined to bed", the third level of mobility, could not be tested.) The ANOVA was used to test whether the mean number of positive responses to the ICIDH2 and the Shona Symptom Questionnaire was significantly different between the different levels of the usual activity and anxiety/depression respectively. The Sheffe post-hoc test was performed to determine where the significant differences lay. The proportion of subjects on each level of the self-care domain with

problems in dressing was described. Pearson's product moment correlation co-efficient was calculated for the first and second VAS scores.

Results:

Table 1 describes the demographic characteristics of the subjects. The mean age was 36.9 (Standard Deviation, SD=20.43) Females predominated in all age groups, but particularly in the younger categories. In terms of education, 27% had had seven or less years and 52% ten or less years of schooling and 75% were unemployed.

Table 1: Table of gender and age of subjects (n=588)

Age	Male	Female	Total
16-24 years	26	63	89
25-34 years	23	103	126
35-44 years	20	75	95
45-54 years	19	98	117
55-64 years	10	63	73
65-74 years	24	47	71
75+ years	8	9	17
Total	130	458	588

Table 2 describes the health states of the subjects. Most problems were reported in the domains of pain/discomfort and anxiety/depression with 42% reporting severe pain, and 38.5% severe anxiety/depression. The single largest category was of some problems with mobility (63%). Very few subjects reported problems in the domain of self-care (9%). The most common diagnoses included

Table 3: Twenty most common primary health conditions (n=588)

Condition	Frequency	Percent
Headache	88	10.0
Osteoarthritis	55	9.3
Back pain	50	8.5
HIV/AIDS	41	7.0
Soft tissue conditions	18	3.1
Peripheral Neuropathy	18	3.1
Cerebro-vascular Accident	17	2.9
Asthma	14	2.4
Gastro-intestinal disorder	14	2.4
Trauma	14	2.4
Epilepsy	12	2.0
Tuberculosis	12	2.0
Cataracts	12	2.0
Conjunctivitis	11	1.9
Hypertensive Heart Disease	10	1.7
Neurosis	9	1.5
Pelvic Inflammatory Disease	8	1.4
Deafness	7	1.2
Polyarthritis	6	1.0
All other disorders	172	29.3
Total	588	100

headaches, osteoarthritis, HIV/AIDs and backache (Table 3).

The test-retest of the EQ-5D was administered to 197 subjects and of these 130 (66.7%) were able to respond to the

Table 2: Health status of the subjects (n=588)

Dimension	Mobility		Self care		Usual Activities		Pain/discomfort		Anxiety/depression	
Level	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1.0	188	33.0	497	87.2	162	28.4	36	6.3	111	19.5
2.0	375	65.8	61	10.7	325	57.0	297	52.1	246	43.2
3.0	7	1.2	12	2.1	83	14.6	237	41.6	213	37.4
Total	570	100.0	570	100.0	570	100.0	570	100.0	570	100.0
Missing	18		18		18		18		18	
Total	588		588		588		588		588	

visual analogue scale. The intra-class correlations indicated good agreement and were .85 (95% Confidence intervals CIs .81-.88 for mobility), .58 (CIs = .48-.66) for self-care, .79 (CIs=.73-.88) for usual activities, .66 (CIs .57-.73) for pain and .72 (.65-.78) for anxiety/depression. The first and second scores on the visual analogue scale were significantly correlated (Spearman's rho = .79, $p < .001$). Those who reported no problems with mobility walked significantly faster (mean = 25.2 seconds, SD=7.8) than those who reported some problems with mobility (mean=31.7 seconds, SD=12.1, $t=-6.2$, $p < .001$). The results of the ANOVA ($F=39.9$, $p < .001$) and post-hoc Sheffe tests indicated that there was a significant difference in the mean number of activity limitations using the ICIDH2 for those who reported no (mean=.70, SD=.68), some (mean=.97, SD=.86) or severe limitations (mean=1.8, SD=.99) in usual activities ($p < .05$). Of those reporting no, some and severe problems with self-care, .6%, 13.6% and 62.5% respectively were found to have functional limitation in dressing on the International Classification of Functioning (the numbers were too small to apply statistical analysis).

There were 478 responses to the Shona Symptom Questionnaire. There was a significant difference ($F=70.7$, $p < .001$) between the mean number of affirmative answers in the Shona Symptom Questionnaire in respondents who reported no (mean=3), moderate (mean=3.90) and severe problems (mean=5.8) with anxiety/depression ($p < .001$). A subject who answers five or more questions in the affirmative is regarded as a "case" in need of psychiatric support (Patel and Todd, 1996). The mean value of those reporting severe anxiety/depression was above the cut-off point for "caseness", i.e. five.

Discussion:

The subjects, although not necessarily representative of the population of Highfield, were similar in many respects to disabled populations identified through other surveys. As in other studies, the subjects were older (Allaire et al., 1999), predominantly female (Al-Ansari, 1989), (Kuruvilla and Joseph, 1999), (Badley,

Tennant, Wood, 1990) and unemployed (Cott, Gignae, Badley, 1999), (Elliott et al., 1999), (Patrick et al., 1981). Subjects with a large range of diagnoses were included and it is likely that the results can be generalised to any community-based population in Zimbabwe.

The distribution of problems in the different domains was similar to that found in the general population during a valuations exercise (Jelsma, De Weerd, De Cock, Hansen, 2000b) in that although the absolute number reporting problems was obviously greater in the subjects with disability, the greatest number of problems were reported in the domains of pain/discomfort and anxiety/depression. In both studies, relatively few problems were reported in the domain of self-care; mobility problems were far more common in the subjects with disabilities.

The first issue that was addressed was the reliability of the EQ-5D measure. Although the time between test/retest was relatively short (approximately 45 minutes), the subjects participated in several different activities in this time (medical examination, walking, responding to interviews and waiting) and were unlikely to give the same responses based on memory of the previous response. The reliability of the Shona version was found to be acceptable, as has been reported elsewhere (Jelsma et al., 2001). The high correlation between the first and second visual analogue scores was surprising, given that the subjects had widely differing education levels and over a quarter had never attended high school. However, only 60% of subjects were able to respond and this would endorse caution in the use of a visual analogue scale in subjects with less education (Jelsma et al., 1997; Jelsma et al., 2001).

Concern has been addressed that self-reported health related quality of life measures might not reflect the observed health state of the individual (Goerdt et al., 1996). Wijnhuizen and Ooijendijk reported that the concurrent validity was low between the WHO-disability questionnaire and observation and that objective evaluation of disability results in a lower rating of disability (Wijnhuizen and Ooijendijk, 1999). In

contrast, this study found that self reported mobility function was able to distinguish between individuals with different observed velocity of gait. This domain can be regarded as being both valid and responsive to changes in gait velocity.

The domain of self-care seems to be the least robust but still indicated fair to good agreement beyond chance (SPSS Inc, 1997). Despite a definite increase in the percentage that had limitations in dressing with the moderate and severe levels, about half of those who had no limitation in the ICIDH2 activity of dressing reported that they were unable to wash or dress themselves. However, the numbers were very small (only 10% reported any problem in this domain) compared to the other domains. It might be worth revisiting the translation of this domain. The domain of usual activity fared better and is likely to be a valid indicator.

It was stated during the translation process that anxiety and depression were difficult concepts to translate into Shona (Jelsma et al., 2000a). There is a growing awareness of the large contribution of depression to the global burden of disease (Murray and Lopez, 1996) and this is a particularly important domain. It was concluded that the domain demonstrated acceptable reliability (ICC=.72) and concurrent validity with the Shona Symptom Questionnaire was indicated. It is likely that the EQ-5D is measuring similar constructs to the other instruments and is therefore a valid indicator of mobility, usual activities, anxiety/depression, and to a certain extent, self care. The translation appeared to have achieved semantic equivalence which is concerned with the transfer of meaning across languages and with achieving a similar effect on respondents in different languages (Herdman, 1998). It would appear that as previously noted, Shona is able to capture the EQ-5D concepts and the respondents were able to recognise these concepts and respond appropriately (Jelsma et al., 2000a).

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, it would appear that the EQ-5D is a robust instrument and that the descriptors of health states gained

are valid indicators of functional ability across different cultures.

In order to ensure that research done with non-English speaking sectors of the Southern African population is valid, all questionnaires developed in different cultures should be subject to a rigorous translation procedure. It is equally important to test the reliability and validity of the translated version, particularly if the source culture is very different to the culture in which the instrument is to be utilised. Physiotherapists should be engaged in developing a "bank" of translated and validated instruments which can be used with confidence in the diverse cultures of the region.

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