ABSTRACT

Aims: To validate Sinhala version of HLS-EU-Q16 and assess the relationship between level of health literacy and control of blood sugar among diabetics and blood pressure among hypertensives.

Study Design: This study evaluated the psychometric properties of Sinhala translation of HLS-EU-Q16 (HLS-EU-Q16-Sinhala) adhering to the standard methods. Following forward and backward translations, the Sinhala version of the questionnaire was applied to a group of 252 patients with chronic non-communicable diseases. Test-retest agreement was examined using a random subgroup of 120 patients. We assessed the association between the level of health literacy and the degree of glycaemic control among diabetics (n=1205, males 453) and blood pressure control among hypertensives (n=755, males 402) selected from outpatient department.
Results: The HLS-EU-Q16-Sinhala total score ranged from 22 to 72 with mean (SD) of 52.1 (7.7). The overall Cronbach alpha was 0.84 and the Corrected item-total correlation ranged from 0.32 to 0.60. The Interclass correlation coefficient (ICC) for the test-retest reliability was 0.65 (95% CI; 0.55-0.71). Diabetics with “poor” glycaemic control had low HL (40.0) compared to those with “intermediate” (52.6) or “good” (52.1) control (P=.03), after adjusting for age, gender and education level. Similarly, hypertensives with “poor” blood pressure control had low HL (45.0) compared to “intermediate” (52.3) or “good” (53.5) control (P=.03), after adjusting for the same covariates.

Conclusions: This study indicates that the psychometric indices of the Sinhala version of the HLS-EU-Q16 are adequate for it to be used to assess HL among Sinhala speaking subjects. Further, it shows that patients with poor HL fail to achieve their primary treatment goals in diabetes and hypertension.

Keywords: Diabetes; hypertension; health literacy; HLS-EU-Q16; Sri Lanka.

1. INTRODUCTION

Health Literacy (HL) which assesses the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions [1] is linked with many aspects of health across a wide age range. The role of HL as a key determinant of health related quality of life (HRQL) [2] self-reported health [3,4], health behavior [4], disease control and success of preventive programs [5] is clearly evident.

Inadequate HL has been reported from many countries. In the USA 26% community dwelling adults were found to have low HL while further 20% had marginal HL [6]. In Germany 12.3% had “inadequate” and further 31.9% “problematic” HL [7]. HL varies with age and in Germany the rate of poor HL was 47% among 15-45ys, 55% among 46-64ys and 66% among those 65 and above [8]. Only 18.9% attendees of an outpatient clinic in Egypt had satisfactory HL [9]. Poor HL is prevalent among marginalized populations such as immigrants [10,11] and refugees [12]. Among refugees in Sweden, 60% had inadequate functional HL while 27% had inadequate comprehensive HL [12].

Numerous instruments are available to measure different types of HL. HLS-EU-Q47 developed by the European Health Literacy Society is widely used and it has been validated in six Asian countries [13]. Based on the original questionnaire, shorter versions; HLS-EU-Q16 and HLS-EU-Q8 have been developed in order to provide rapid HL screening tools, mainly for clinical set-ups [14].

There is a scarcity of research related to HL in Sri Lanka. The lack of a valid instrument to measure HL among locals could partly contribute to this lacuna. Since HL is a key determinant of health and should be used in enhancing patient care, valid instruments should be available for clinicians to assess HL. In order to incorporate HL in patient care, the instrument, apart from its validity, has to be brief and manageable in busy clinical settings.

In this study we aimed to validate a Sinhala version of HLS-EU-Q16 and administer it among outpatient clinic attendees in a tertiary care hospital with either long standing hypertension or diabetes in order to assess the role of HL in achieving the primary treatment goals in controlling these diseases.

2. MATERIALS AND METHODS

2.1 Validation of Sinhala Version of HLS-EU-Q16

We followed the guidelines described by Boynton and Greehalgh in 2004 [15] and Tsang et all in 2017 [16] during the cross cultural adaptation of HLS-EU-Q16 questionnaire. Two doctors fluent in both English and Sinhala languages translated the original questionnaire (forward translation) to Sinhala language, blinded to each other. One was informed about the purpose of translation while the other was not informed. Two translations were combined to maximize the clarity and understandability of items and the combined version was back translated to source language (backward translation) by two different health professionals, fluent in both source and target languages, to assess the comparability with the original version.

A group of specialist doctors and university academics numbering 10 reviewed the original English version and Sinhala translation to ensure semantic equivalence and conceptual equivalence.
and content validity. Furthermore, the group assessed the clarity, naturalness and unambiguity of the Sinhala version. The pre-final version was piloted among 30 subjects selected among clinic attendees (n=20) and hospital employees (n=10). Analysis was done to determine the internal consistency and Item-total correlation and items which did not meet the validation criteria were modified until they met the validation criteria.

The final questionnaire was administered to 252 subjects selected by purposive sampling. The study sample included clinic attendees with chronic diseases such as ischemic heart disease, arthritis, diabetes or hypertension. In order to increase the diversity of the subjects we included a group of clerical staff and health care workers. The questionnaire was re-administered to a subgroup of 120 subjects, selected randomly, after three weeks.

2.2 Assessing the Association between HL and Control of Diabetes and Hypertension

The validated Sinhala version of the HLS-EU-Q16 (HLS-EU-Q16-Sinhala) was used to assess HL among two groups of patients with either diabetes or hypertension, selected randomly from medical clinic attendees in Teaching Hospital, Karapitiya. Patients with diabetes (n=1205) had been registered primarily for diabetes but they were not free of other non-communicable diseases such as hyperlipidemia, high blood pressure and myocardial ischemia. These patients were being followed up with the view to achieve tight glycaemic control and patients who were not considered for tight glycaemic control such as those with major organ failure, advanced cardiac disease or strokes with reduced mobility were excluded. Similarly 755 patients who had been registered primarily for hypertension were also studied as a separate group. Patients with disabling strokes or major organ failure who did not require tight blood pressure control were not included.

Only the patients literate in Sinhala were selected and informed written consent was obtained prior to data collection. All filled a questionnaire containing personal and disease related information and HLS-EU-Q16-Sinhala. Patients with diabetes were categorized to three groups based on the degree of glycaemic control during the previous three months determined by the latest HbA1c value or monthly fasting glucose (FBG) values.

2.2.1 Poor control
Current HbA1c >8% or all FBG of the last 3 mo were >120 mg/dL.

2.2.2 Intermediate control
Current HbA1c between 7 - 8% or at least one FBG value of the last 3 mo was >120 mg/dL.

2.2.3 Good control
Current HbA1c ≤7% or all FBG values of the last 3 mo were ≤120 mg/dL. Patients with hypertension were also categorized to three groups based on the degree of blood pressure control of the previous three months.

2.2.4 Good control
When all three BP records were equal or below 130/80 mmHg.

2.2.4.1 Intermediate control
When 1 or 2 readings were above 130/80 mmHg

2.2.4.2 Poor control
When all three readings were above 130/80 mmHg.

This study was approved by the Ethical Review Committee of the Faculty of Medicine, University of Ruhuna (Ref No; 14.6.2017:3.13, date of approval 07th Sep 2017).

2.3 Statistical Analyses
The internal consistency of the HLS-EU-Q16-Sinhala with Cronbach alpha was examined. Item-total correlations were tested to examine the contribution of each item to the total score and the intraclass correlation coefficient (ICC) of the test-retest was measured to determine the reliability of the questionnaire.

The associations between HL and glycemic control among diabetics and the degree of blood pressure control among hypertensives was examined by comparing the mean HL scores between the different categories of patients (ANOVA). Data were adjusted for age, gender and education level.

3. RESULTS

3.1 Validation of the HLS-EU-Q16(S) Version
The sample used for validation (n=252, 153 males) consisted of 152 clinic attendees with
chronic diseases such as diabetes, hypertension, coronary heart disease or arthritis, 48 health care workers and 54 clerical staff. The mean(SD) age of subjects was 58.4(8.2)ys. There were 15 subjects with tertiary education, 102 subjects with secondary education and rest with only primary education.

The HLS-EU-Q16Sinhala total score ranged from 22 to 72 with mean(SD) of 52.1(7.7). The overall Cronbach alpha was 0.84 and the Corrected item-total correlation ranged from 0.32 to 0.60. The (ICC) for the test-retest reliability was 0.65(95%CI; 0.55-0.71).

3.2 Association between HL and the Disease Control

Mean(SD) age of patients with diabetes (n=1205, 453males) was 54(8.4)ys while the mean(SD) duration of the disease was 5.1(1.2)ys. They all could converse in Sinhala language and 368 had secondary education while the rest had only primary education. Mean(SD) age of patients with hypertension (n=755, 402males) was 57.9(6.2)ys while the mean(SD) duration of the disease was 7.5(3.2)ys. Among patients with hypertension, 156 had secondary education while the rest had only primary education. Among patients with diabetes, 165 patients had “poor” glycaemic control while 350 had “intermediate” and the rest had “good” glycaemic control. Mean(SD) total HLS-EU-Q16 scores was significantly low among patients with “poor” glycaemic control compared to those with either “intermediate” or “good” control. Adjustment of data for age, gender and the education level did not change them materially.

Among patients with diabetes, 256 patients had “good control, while 308 had “intermediate control” and the rest had “poor control”. After adjusting for age, gender and education level, mean (SD) total HLS-EU-Q16 score was significantly low in patients with “poor” blood pressure control compared to those with either “intermediate” or “good” pressure control (Table 1).

4. DISCUSSION

The high internal consistency and test-retest correlation of the HLS-EU-Q16Sinhala version are indicative of the reliability of the translated questionnaire. It is relatively a short questionnaire consisted of 16 questions and most of the subjects answered the questionnaire within 4 min. They found no difficulty in understanding the items and filled the questionnaire without assistance. Hence it can be used in busy hospital clinics without interrupting routine schedules.

HLS-EU-Q16 is a shorter version of HLS-EU-Q47 developed by the HLS-EU consortium. The original questionnaire consisted of 47 items is based on a conceptual model of health literacy and measures competencies related to health relevant information namely access, obtain/understand/appraise, judge/evaluate and apply/use in three domains; health care, disease prevention and health promotion [17]. The shorter version HLS-EU-Q16 is user friendly and takes less time to fill. Furthermore, it too has been translated to many languages and used to measure HL in many settings [7, 12, 18].

We found that patients with low HL do not achieve treatment goals to the same extent as patients with higher HL and this observation is concordant with observations made elsewhere in this regard. Although our observations are restricted to hypertension and diabetes, low level of HL is linked to poor outcome in many chronic diseases such as diabetes [19], hypertension [20], and malignancy [21]. Further low HL is linked to poor QoL [22, 23], frequent hospitalization [24] and greater use of hospital services [24].

<table>
<thead>
<tr>
<th>Table 1. Association between Health literacy and the control of blood sugar and blood pressure among patients with diabetes and hypertension, respectively</th>
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<tbody>
<tr>
<td>Poor glycaemic control (n=165)</td>
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<tr>
<td>Mean(SD) Health literacy score</td>
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<tr>
<td>Poor pressure control (n=191)</td>
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<tr>
<td>Mean(SD) Health literacy score</td>
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*P adjusted for age, gender and education level
Attempts have been made to identify the determinants of HL among people. Haghighi et al found age at marriage, duration of marriage, level of education and occupation to be associated with the level of HL among Iranian women with breast cancer [25] while Palumob et al found financial deprivation to be a significant predictor of low HL among Italian citizens [24]. A study from China showed that students coming from prestigious schools and those with educated parents to have adequate health knowledge, skills and behaviors [26].

Many strategies targeting different groups have been proposed to improve HL. Attempts have been made to improve HL among different age groups, patients and high-risk groups [27,28]. Such measures are required as HL is a social determinant of health and low HL is prevalent, globally.

This study has many limitations. Our data related to HL and the control of disease outcome are applicable only for patients with long standing hypertension or diabetes attending medical clinics in a state run tertiary care facility. Further we addressed only one treatment goal; i.e. disease control and further studies which assess multitude of treatment goals including the QoL are required.

5. CONCLUSION

In conclusion, this study provides a validated translation of the HLS Q16 that can be applied to estimate HL among people conversant in Sinhala. Among patients with hypertension or diabetes, those with low HL fail to achieve primary treatment targets and attempts must be made to improve HL among them.

CONSENT

Only the patients literate in Sinhala were selected and informed written consent was obtained prior to data collection.

ETHICAL APPROVAL

This study was approved by the Ethical Review Committee of the Faculty of Medicine, University of Ruhuna (Ref No: 14.6.2017:3.13, date of approval 07th Sep 2017).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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