



ORIGINAL ARTICLE

Validity and reliability of Turkish version of rhinitis and mini-rhinitis quality of life questionnaires

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Abstract

Background: The aim of the present study was to develop the Turkish version of Rhinitis Quality of Life Questionnaire (RQLQ) and mini-RQLQ for clinical and research purposes.

Methods: Study included 55 patients with Allergic Rhinitis (AR), aged 18–69. Demographic characteristics and symptom score (T4SS) were recorded. All patients filled in the Turkish RQLQ and mini-RQLQ. Reliability analysis included internal consistency and item-total score correlations. Construct validity analysis was performed by Known Group method by correlation of RQLQ and mini-RQLQ scores with T4SS and SF36.

Results: Mean age of patients was 36.4 ± 10.6 . Mean T4SS was 4.7 ± 4.1 . Cronbach's α scores of all RQLQ domains were above 0.90 and those of mini-RQLQ were above 0.80. All items were significantly correlated with their domains. All correlation coefficients for item versus domain score were above 0.75 for RQLQ and above 0.84 for mini-RQLQ. Total RQLQ score was correlated with SF36 domains except physical functioning domain. Total mini-RQLQ score was significantly correlated with all SF36 domains (all $r > -0.46$). T4SS revealed significant correlation with RQLQ practical score ($r=0.38$). On the other hand, T4SS was correlated significantly with practical, nose and total scores of mini-RQLQ ($r=0.33, 0.48, 0.34$ respectively).

Conclusions: Health is the complete state of well-being and AR has major impact on quality of life (QoL), therefore it seems essential to include QoL measures in clinical evaluation along with traditional parameters. This study has demonstrated that RQLQ and mini-RQLQ are valid measures for use in Turkish patients with AR.

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Introduction

Allergic Rhinitis (AR), which is characterized by nasal itching, sneezing, rhinorrhea, nasal congestion and conjunctival symptoms, is the most common allergic disease with a worldwide prevalence of 5–40%.^{1–4} Clinical findings of AR including nasal itching, sneezing and nasal discharge, impair health related quality of life (HRQoL) in patients.⁵ HRQoL is impaired in these patients not only by these clinical findings, but also by the influence of AR on the daily life of the patient. Such influences include daytime fatigue, learning impairment, decreased cognitive functioning, and decreased productivity.⁶

Health related quality of life is defined as the effect of disease and its treatment as the patient perceives it.^{7,8} There are two types of HRQoL questionnaires: generic and disease specific.⁹ Generic instruments measure the influence of a disease on the patient and are applicable to all medical conditions.⁹ An example of the generic instrument is the SF36 questionnaire which is used for reliability analysis in this research.⁹ However, disease specific questionnaires measure the problems associated with a specific disease condition.⁹ Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) is a disease specific questionnaire specifically designed to measure the impact of AR on the patient and the mini-RQLQ has been developed as the shorter version of this questionnaire to increase efficacy of use in clinical settings.^{10,11}

As described above, measurement of HRQoL is complementary to clinical evaluation of AR. Therefore, the aim of the present study was to develop a Turkish version of RQLQ and mini-RQLQ for clinical and research purposes.

Methods

Subjects and study design

The study included 55 patients with AR, aged between 18 and 69 years. Diagnosis of AR depended on clinical findings such as nasal itching, sneezing, nasal congestion and rhinorrhea. Demographic characteristics including age, sex, education, and duration of AR were recorded. Symptom score using T4SS was evaluated for all and the patients were asked to fill in the Turkish RQLQ and mini-RQLQ.

The rhinoconjunctivitis quality of life questionnaire and mini rhinoconjunctivitis quality of life questionnaire.

RQLQ has been developed by Juniper et al and was published in 1991.¹² RQLQ is composed of seven domains: sleep, non-hay fever symptoms, practical problems, nasal symptoms, eye symptoms, activities and emotions that are calculated from a total of 28 questions while mini-RQLQ is composed of five domains: activity limitations, practical problems, nose symptoms, eye symptoms and other symptoms with a total of 14 questions. Responses to each item are given according to a Likert type scale of seven points ranging from 0 to 6. All items are equally weighted and higher scores show worse outcome. Domains and total scores are the mean of the items included.

Adaptation into Turkish

Adaptation of the RQLQ and mini-RQLQ into Turkish was performed in four steps. The first step was the translation of the English RQLQ and mini-RQLQ into Turkish by two independent translators who are both native Turkish speakers (forward translation). The second step included formation of a single translation by the translators and two paediatricians (consensus forward translation). Next the Turkish RQLQ and mini-RQLQ were translated back into English by two independent translators and a conceptual equivalence with the original questionnaire was achieved by minor rewording after revision by the original developers of the questionnaires (back translation). The last step included giving out the questionnaires to 10 patients with AR and asking them about the ease of comprehension (cognitive debriefing).

Symptom score

T4SS is used to assess symptom severity in patients with AR. It includes nasal itching, ocular itching, sneezing and nasal discharge and is scored by the patients themselves from 0 to 3 with increasing severity. Scores for all domains are summed up to reveal the total score.

Statistical analysis

Reliability and validity analysis were performed using the SPSS 13.0 statistical package.

Reliability analysis included internal consistency and item-total score correlations. Cronbach's α coefficient was calculated for every sub-scale of the instrument to evaluate internal consistency. Correlations of each item and total score were assessed by Pearson's correlation analysis. P values less than 0.05 were considered as statistically significant and r values above 0.4 suggest strong correlation.

Construct validity analysis was performed by Known Group method by correlation analysis between T4SS and RQLQ and mini-RQLQ scores. Moreover correlation analysis was performed between RQLQ and mini-RQLQ scores and a general QoL questionnaire, SF36 scores.

Results

Descriptive findings

This study included 55 patients (18 male 37 female) aged between 18 and 69 years (mean \pm SD was 36.4 ± 10.6 years) (Table 1). Among the patients who had answered the question about their education ($n=49$), 45% had graduated from elementary school while 26.5% had graduated from university. Mean T4SS score was 4.7 ± 4.1 .

Reliability analysis

The Internal Consistency of the RQLQ was tested by Cronbach's α scores and item-total correlations. Sleep, non-hay fever symptoms, practical problems, nasal symptoms, eye symptoms, activities and emotions domains of

Table 1 Mean values of the RQLQ and mini-RQLQ domains and total score in male and female patients

| | Males (n=18) | Females (n=37) | p | 95% CI |
|-------------------------------|--------------|----------------|------|------------|
| RQLQ | | | | |
| <i>Sleep</i> | 0.7±1.1 | 1.9±1.9 | 0.01 | -2.2(-0.3) |
| <i>Non-hay fever symptoms</i> | 1.7±1.7 | 2.3±1.9 | 0.33 | -1.6-0.6 |
| <i>Practical problems</i> | 3.1±2.2 | 2.3±2.1 | 0.22 | -0.5-1.9 |
| <i>Nasal symptoms</i> | 3.1±1.9 | 2.3±1.9 | 0.19 | -0.4-1.8 |
| <i>Eye symptoms</i> | 2.2±1.8 | 2.1±1.9 | 0.84 | -0.9-1.2 |
| <i>Activities</i> | 4.2±1.0 | 3.7±1.9 | 0.55 | -1.1-1.9 |
| <i>Emotions</i> | 1.9±1.6 | 2.4±1.9 | 0.29 | -1.6-0.5 |
| <i>Total score</i> | 3.3±0.9 | 3.1±1.8 | 0.80 | -1.3-1.6 |
| Mini-RQLQ | | | | |
| <i>Activity limitations</i> | 1.3±1.1 | 2.3±1.8 | 0.03 | -1.9(-0.1) |
| <i>Practical problems</i> | 2.4±1.5 | 2.5±2.1 | 0.82 | -1.2-0.9 |
| <i>Nose symptoms</i> | 2.6±1.5 | 2.6±1.9 | 0.98 | -1.0-1.0 |
| <i>Eye symptoms</i> | 1.7±1.6 | 2.4±2.1 | 0.25 | -1.8-0.5 |
| <i>Other symptoms</i> | 1.5±1.4 | 2.5±1.9 | 0.04 | -2.1(-0.1) |
| <i>Total score</i> | 1.9±1.2 | 2.4±1.7 | 0.21 | -1.5-0.3 |

RQLQ had successful Cronbach's α scores of 0.92, 0.97, 0.96, 0.92, 0.92, 0.95 and 0.91, respectively. Similarly Cronbach's α scores of the domains of mini-RQLQ were also successful with values above 0.80 for all.

All items were significantly correlated with their own domains for both RQLQ and mini-RQLQ. All correlation coefficients for item versus domain score were above 0.75 for RQLQ and above 0.84 for mini-RQLQ.

Validity analysis

Validity of RQLQ was tested with known groups' validity using correlation with SF36 scores and T4SS values. Correlation of domain and total scores of RQLQ revealed that most scores were correlated except for the correlations between RQLQ activity domain and SF36 physical functioning score ($r=-0.04$), RQLQ sleep domain and SF36 mental domain ($r=-0.28$), RQLQ practical score and SF36 physical functioning, general health and vitality domains ($r=-0.24$ for all), RQLQ nose score and SF36 physical functioning and vitality domains ($r=-0.26$ and $r=-0.19$ respectively), RQLQ eye score and SF36 vitality domain ($r=-0.28$). Total RQLQ score was correlated with all domains of SF36 except the physical functioning domain (Table 2). Total mini-RQLQ score was significantly correlated with all SF36 domain scores (Table 3).

Correlation of RQLQ domain and total scores with T4SS revealed significant correlation only with RQLQ practical score ($r=0.38$). On the other hand, T4SS was correlated significantly with practical, nose and total scores of mini-RQLQ ($r=0.33, 0.48, 0.34$, respectively).

Discussion

Health related quality of life is the measurement of the patient's perception of the influence of the disease and treatment.^{7,8} AR is the most common allergic disease with

major influence on the patient's daily life, thereby impairing HRQoL.^{5,6} Thus, clinical evaluation of patients with AR needs to incorporate HRQoL evaluation. The aim of the present study was to assess the reliability and validity of the Turkish forms of RQLQ and mini-RQLQ.

Validity of a measure is its capacity to measure what it aims to measure.¹³ In this study, correlation with SF36 was used for the validity analysis. The Turkish form of SF36 has been previously validated.¹⁴ Although significant correlation was found between many of the domains there were some domains that did not show significant correlation. This is an expected phenomenon because generic measures of HRQL lack specificity^{15,16} and are insensitive to specific effects of a particular disease condition on the patient.¹⁵ Therefore, it can be accepted that correlation of the Turkish form of RQLQ with SF36 was successful.

Another analysis which was carried out for validation assessment was the correlation of RQLQ scores with T4SS. However, significant correlation of T4SS was determined to exist only with the practical score. This was an unexpected phenomenon since both evaluate clinical outcome. In a previous study on children with AR, we have detected a significant correlation with the Paediatric RQLQ and T4SS.¹⁷ However, it has also been reported that a patient's HRQL cannot be predicted only on the basis of disease severity.^{18,19} This difference can be explained by the fact that QoL measurement in adults can be influenced by many aspects of life besides the severity of the clinical symptoms themselves. Adults may be more willing to include these daily influences to their answers to RQLQ. On the other hand, T4SS was significantly correlated with all domains of mini-RQLQ. This also supports the above explanation that, since RQLQ is a longer questionnaire asking for more details about HRQoL, significant correlation was lost with T4SS but mini-RQLQ is a shorter form of questionnaire allowing it to be more correlated with the symptoms score.

Reliability is used to describe the stability of a measure.⁶ Internal consistency and Cronbach's reliability analysis of

Table 2 Correlation of RQLQ domains and total score with SF36 domains

| | Total | Sleep | Non-hay symptoms | Practical problem | Nasal symptoms | Eye symptoms | Activity | Emotion |
|---------------------------|----------|----------|------------------|-------------------|----------------|--------------|----------|----------|
| SF-36 | r | r | r | r | r | r | r | r |
| Physical function | -0.16 | -0.52 | -0.51 | -0.24 | -0.26 | -0.36 | -0.04 | -0.52 |
| Physical role difficulty | -0.60 | -0.49 | -0.64 | -0.32 | -0.34 | -0.42 | -0.49 | -0.64 |
| Pain | -0.67 | -0.41 | -0.63 | -0.31 | -0.36 | -0.53 | -0.59 | -0.68 |
| General health | -0.51 | -0.49 | -0.53 | -0.24 | -0.29 | -0.54 | -0.61 | -0.57 |
| Vitality | -0.59 | -0.38 | -0.59 | -0.24 | -0.19 | -0.28 | -0.44 | -0.65 |
| Social | -0.79 | -0.43 | -0.61 | -0.57 | -0.53 | -0.47 | -0.69 | -0.74 |
| Emotional role difficulty | -0.65 | -0.39 | -0.58 | -0.39 | -0.40 | -0.43 | -0.52 | -0.54 |
| Mental | -0.59 | -0.28 | -0.49 | -0.34 | -0.33 | -0.31 | -0.49 | -0.65 |

Table 3 Correlation of mini-RQLQ domains and total score with SF36 domains

| | Total | Activity limitations | Practical problems | Nose symptoms | Eye symptoms | Other symptoms |
|---------------------------|----------|----------------------|--------------------|---------------|--------------|----------------|
| SF-36 | r | r | r | r | r | r |
| Physical function | -0.53 | -0.49 | -0.37 | -0.43 | -0.47 | -0.52 |
| Physical role difficulty | -0.67 | -0.69 | -0.51 | -0.58 | -0.57 | -0.59 |
| Pain | -0.63 | -0.53 | -0.38 | -0.45 | -0.55 | -0.72 |
| General health | -0.55 | -0.48 | -0.37 | -0.44 | -0.52 | -0.56 |
| Vitality | -0.46 | -0.48 | -0.25 | -0.25 | -0.28 | -0.69 |
| Social | -0.71 | -0.63 | -0.63 | -0.59 | -0.51 | -0.68 |
| Emotional role difficulty | -0.47 | -0.37 | -0.44 | -0.45 | -0.37 | -0.45 |
| Mental | -0.48 | -0.36 | -0.45 | -0.36 | -0.28 | -0.61 |

Turkish RQLQ and mini-RQLQ was found to be adequate in this study. The only questions with high Cronbach's α values in item analysis of RQLQ were question d in emotions domain, question d in nasal domain, question c in practical domain and question a in sleep domain. In the analysis of mini-RQLQ items, questions c and b in activity and nasal domains were found to have high Cronbach's α values. However, we found that their correlation with their own domains were higher than the other two domains so they were not regarded as problematic questions.

The main limitation of the study was lack of re-evaluation of the RQLQ and mini-RQLQ in the patients after treatment because disease specific QoL questionnaires are sensitive to changes over time and are mostly used to compare the effects of treatment.^{9,15}

In conclusion, since allergic rhinoconjunctivitis is a disease that has a major impact on QoL and health is a complete state of well-being, it seems to be essential to include HRQoL measures in clinical evaluation as well as the other parameters that are traditionally used. However, HRQoL measures need to be adapted to the native language of the patient and thus require cultural adaptation as well as the translation. This study has demonstrated that both RQLQ and mini-RQLQ are valid measures for use in Turkish patients with AR.

Conflict of interest

The authors have no conflict of interest to declare.

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