# RELIABILITY AND VALIDITY OF THE TURKISH VERSION OF THE SWALLOW QUALITY OF LIFE QUESTIONNAIRE

## RESEARCH ARTICLE

### ABSTRACT

**Purpose:** The purpose of this study was to translate the Swallow Quality of Life Questionnaire (SWAL-QOL) into Turkish and to test its reliability and validity among patients with neurogenic swallowing disorders.

**Methods:** One hundred and five patients (mean age= 57±15.4 years, mean weight= 69.5±16.3 kg, mean height=162.8±22.4 cm) completed the Turkish version of the SWAL-QOL (T-SWAL-QOL) and short form of the World Health Organization Quality of Life Questionnaire (WHO QOL-BREF). The internal consistency, test-retest reliability and criterion validity of T-SWAL-QOL as psychometric analysis were explored. Reliability was estimated using tests of internal consistency and test–retest reliability. The correlation between T-SWAL-QOL and WHO-QOL-BREF was calculated to evaluate criterion validity.

**Results:** The internal consistency of T-SWAL-QOL was found to be high with 0.88 Cronbach's alpha value for test and 0.91 Cronbach's alpha value for retest. General burden, eating duration, eating desire and social subscales were found to have good test-retest reliability (r=0.696, r=0.790, r=0.787, r=0786, p<0.001; respectively) and, food selection, fear of eating, sleep, fatigue, communication and mental health were found to have excellent test-retest reliability (r=0.832, r=0.833, r=0.841, r=0.839, r=0.883, r=0.847, p<0.001; respectively). A weak/moderate correlation was found between the T-SWAL-QOL and WHO-QOL-BREF (p<0.05).

**Discussion:** The T-SWAL-QOL was shown to be a valid and reliable questionnaire in dysphagia evaluation. This study will contribute to solve the problem about the lack of a scale to measure the dysphagia specific quality of life in Turkey.

**Key words:** Deglutition; deglutition disorders; quality of life

# YUTMA YAŞAM KALİTESİ ANKETİ'NİN TÜRKÇE VERSİYONUNUN GÜVENİRLİK VE GEÇERLİLİĞİ

## ARAŞTIRMA MAKALESİ

### ÖZ

**Amaç:** Bu çalışmanın amacı; Yutma Yaşam Kalitesi Anketi (SWAL-QOL)'nin Türkçe'ye çevrilmesi ve nörojenik yutma güçlüğü olan hastalar arasında güvenirlik ve geçerliliğinin test edilmesidir.

**Yöntemler:** Yüz beş hasta (ortalama yaş= 57±15.4 yıl, ortalama ağırlık= 69.5±16.3 kg, ortalama boy=162.8±22.4 cm) SWAL-QOL'ın Türkçe versiyonu (T-SWAL-QOL) ve World Health Organization Quality of Life Questionnaire (WHO QOL-BREF)'ın kısa formunu tamamladı. T-SWAL-QOL'ın iç tutarlılığı, test-tekrar test güvenirliği ve kriter geçerliliği psikometrik analizler olarak araştırıldı. Güvenirlik; iç tutarlılık ve test-tekrar test güvenilirliği testleri kullanılarak değerlendirildi. Kriter geçerliliği değerlendirmek için T-SWAL-QOL ve WHO-QOL-BREF arasındaki korelasyon hesaplandı.

**Sonuçlar:** T-SWAL-QOL'ın iç tutarlılığı test için Cronbach's alpha değeri 0.88, tekrar test için 0.91 olmak üzere yüksek bulundu. Genel yakınma, yeme zamanı, yeme isteği ve sosyal alt başlıklarının test-tekrar test güvenirliği iyi (sırasıyla; r=0.696, r=0.790, r=0.787, r=0786, p<0.001) ve besin seçimi, yeme korkusu, uyku, yorgunluk, iletişim ve mental sağlık test-tekrar test güvenirliği mükemmel bulundu (sırasıyla; r=0.832, r=0.833, r=0.841, r=0.839, r=0.883, r=0.847, p<0.001). T-SWAL-QOL ve WHO-QOL-BREF arasında zayıf/orta düzeyde korelasyon bulundu (p<0.05).

**Tartışma:** T-SWAL-QOL'in disfaji değerlendirmesinde geçerli ve güvenilir bir ölçek olduğu gösterildi. Bu çalışma; Türkiye'de disfajiye özel yaşam kalitesini değerlendiren ölçek eksikliği ile ilgili problemin çözümüne katkı sağladı.

**Anahtar kelimeler:** Deglüsyon; deglüsyon bozuklukları; yaşam kalitesi

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## INTRODUCTION

Quality of life defines the state of well-being. It can be considered under two titles which are the ability to perform daily activities which reflects physical, psychological and social well-being, and satisfaction which is associated with the functionality level, disease control and treatment symptoms (1).

Dysphagia is a result of various diseases and affects an individual's quality of life (2). Beside the physical signs of dysphagia, it may result in critical health problems such as dehydration, malnutrition, pneumonia and even in death. It also causes social and emotional problems. So the clinician should focus on psychological factors and determination the effects of dysphagia on quality of life.

In clinical evaluation, some outcome measures are used to determine the effect of dysphagia on quality of life (3-6). Swallow Quality of Life Questionnaire (SWAL-QOL) is one of the most widely known patient based and dysphagia spesific item questionnaire (7-9). Therefore, it has been translated into French, Dutch, Chinese, and Swedish since its first publication in 2000 (10-13).

There is no dysphagia spesific quality of life questionnaire for Turkish speaking people. So there is a lack of dealing with this issue. The purpose of this study was to translate the SWAL-QOL into Turkish and investigate validity and reliability of Turkish version of SWAL-QOL (T-SWAL-QOL) on patients with neurogenic swallowing disorders. Thus a clinically valid and reliable quality of life questionnaire will be presented to use of Turkish clinicians during dysphagia evaluation.

## METHODS

SWAL-QOL: SWAL-QOL, which is a 44 item questionnaire contains 10 subscales. The dysphagia related quality of life subscales include burden, eating duration, eating desire, food selection, communication, fear, mental health and social functioning. The generic quality of life subscales include fatigue and sleep. The questions can be divided into two types. Some questions are about definition of the frequency and some questions are about the items' degree of agreement. Both frequency and evaluation questions are in the

form of a 5 point Likert scale. All subscales range from 0 to 100, a higher score indicates more impairment. 20-30 minutes is required to complete the questionnaire (7-9).

The short form of the World Health Organization Quality-of-Life Measure (WHOQOL-BREF): WHOQOL-BREF is a generic quality of life questionnaire which is developed through the World Health Organization. It is a 28 item scale which includes four concepts of life quality. The concepts are psychological, physical, and social relationships and environment. All concepts range from 0 to 100, a higher score indicates better quality of life. It has a well documented reliability, validity and also has Turkish version study (14).

### Translation of the SWAL-QOL

The English version of the SWAL-QOL was translated into Turkish by two physical therapists who are experts in their field. Two translations were examined by four expert physical therapists and converted into a single scale. An expert whose mother language was English and who is studying in a different profession than health back translated the latest form of the translated scale into English. The English translation of the scale and the original form were compared. The committee on the back-translated form made necessary adjustments after the consensus. The back-translation was presented to the creator of the scale and after getting the approval; a pilot study was performed on 10 patients for cultural adaptation.

### Study subjects

The study was performed on the patients who had neurogenic swallowing disorders in Swallowing Rehabilitation Unit, Department of Physical Therapy and Rehabilitation, Faculty of Health Sciences, Hacettepe University. The essential written approval was obtained from the creator of SWAL-QOL, Colleen A. McHorney. The ethical approval was obtained from Hacettepe University, Non-invasive Clinical Research Ethics Committee.

A total of 105 patients who had neurogenic swallowing disorder were included in the study. The inclusion criterias were willing to participate the study, being over the ages of 18, getting the current score in Mini Mental Test, suffering from

swallowing disorders at least one month and having clinically stable neurological disease. Patients with severe communication and cooperation problems were excluded from the study. All patients signed the consent forms to participate the study. Diagnosis, age, gender, height, weight, education level, marital and feeding status of the patients were also noted. All patients filled in two questionnaires: T-SWAL-QOL and WHO-QOL-BREF.

## Statistical Analysis

Statistical analysis was carried out in Windows-based Statistical Package for the Social Sciences (SPSS) version 15. Arithmetical means and standard deviations (X±SD) for variables determined by measurement and percents (%) for variables determined by counting were calculated. All tests were conducted at a 5% significance level.

Reliability: The internal consistency reliability and the test-retest reliability were evaluated. The internal consistency reliability of each subscale measured using Cronbach's alpha. When the alpha value is higher than 0.80, it indicates excellent internal consistency. Test-retest reliability means the researchers would get similar results if they repeated their questionnaire soon afterwards with the same patients population. Intraclass correlation coefficient (ICC) value with 95% confidence intervals was calculated for test-retest reliability. ICC ranges from 0.00 to 1.00. 0.60-0.80 means good correlation, 0.80-1.00 means excellent correlation. (15) Test-retest reliability study was performed on totally 105 patients. A physical therapist applied the scale on same patients for two times at 2 days intervals.

Validity: The validity of an outcome measure is the ability to measure the actual functional status of the patient. The validity of the T-SWAL-QOL was determined by assessing the correlations between T-SWAL-QOL and WHO-QOL-BREF. According to the Pearson's correlation coefficient (r), the relevance levels of the correlations were accepted as r≥0.70 means strong, 0.30-0.70 moderate, r<0.30 weak correlation (15).

## RESULTS

One hundred and five patients with neurogenic swallowing disorders whose mean age were 57±15.4 years were included in the study. The mean weight of the patients was 69.5±16.3 kg and the mean height was 162.8±22.4 cm. The demographic information of participants was given in Table 1.

## Translation of the SWAL-QOL

The T-SWAL-QOL was easily adapted to the

**Table 1.** Demographic information of participants (n: 105)

| Characteristics | n | % |
|---|---|---|
| Gender | | |
| Male | 57 | 54.3 |
| Female | 48 | 45.7 |
| Diagnosis | | |
| Stroke | 74 | 70.5 |
| ALS | 15 | 14.3 |
| MS | 12 | 11.4 |
| Myastania gravis | 2 | 1.9 |
| Parkinson | 2 | 1.9 |
| Education | | |
| No education | 13 | 12.4 |
| Primary school | 53 | 50.5 |
| Middle school | 22 | 20.9 |
| University | 17 | 16.2 |
| Marital status | | |
| Single | 11 | 10.5 |
| Married | 77 | 73.3 |
| Separated | 6 | 5.7 |
| Missing | 11 | 10.5 |
| Mode of feeding | | |
| Tube dependent | 42 | 40 |
| Total oral intake | 63 | 60 |

**Table 2.** Cronbach's alpha values for each items in T-SWAL-QOL

| Scales | Internal consistency |
|---|---|
| General burden | 0.794 |
| Food selection | 0.881 |
| Eating duration | 0.891 |
| Eating desire | 0.881 |
| Fear of eating | 0.902 |
| Sleep | 0.915 |
| Fatigue | 0.909 |
| Communication | 0.932 |
| Mental health | 0.918 |
| Social | 0.880 |

**Table 3.** Mean scores of the T-SWAL-QOL and test-retest reliability of T-SWAL-QOL (n:105)

| Subscales of the T-SWAL-QOL | Test | Retest | ICC | 95% Confidence interval | |
|---|---|---|---|---|---|
| | X±SD | X±SD | | Lower | Higher |
| General burden | 40.1±31.6 | 40.5±29.9 | 0.658 | 0.531 | 0.756 |
| Food selection | 63.5±31.1 | 61.1±33.1 | 0.787 | 0.698 | 0.853 |
| Eating duration | 66.5±31.7 | 66.6±33.4 | 0.804 | 0.722 | 0.864 |
| Eating desire | 55.4±27.1 | 57.6±30.4 | 0.788 | 0.701 | 0.852 |
| Fear of eating | 54.7±33 | 54.2±34 | 0.822 | 0.746 | 0.877 |
| Sleep | 47.1±29.9 | 48±30.5 | 0.843 | 0.774 | 0.892 |
| Fatigue | 45.3±30.4 | 46.3±29.5 | 0.834 | 0.760 | 0.886 |
| Communication | 48.5±32.7 | 49±34.9 | 0.873 | 0.817 | 0.913 |
| Mental health | 52±36.2 | 51.6±36.2 | 0.849 | 0.783 | 0.896 |
| Social | 40.6±33.6 | 40.2±34.9 | 0.786 | 0.698 | 0.850 |

neurogenic dysphagia population. There were not any misunderstood items in the pilot study. 59% of the patients received help (another person read the questions and write the answers) to complete questionnaires. The administration of the whole tool took 21.8±11.1 minutes to complete. Patients declared that the items were easily understandable and related to their life quality. The developer of the scale, Colleen A. McHorney, approved the backtranslation of the SWAL-QOL.

## Reliability

The internal consistency of T-SWAL-QOL was found to be high with 0.88 Cronbach's alpha value for test and 0.91 Cronbach's alpha value for retest. Except the subscale of general burden, all of the subscales had excellent internal consistency. Cronbach's alpha values for each items in T-SWAL-QOL was given in Table 2.

Mean scores of the T-SWAL-QOL for test and retest and the ICC determined for test-retest reliability with 95% confidence interval were shown in Table 3. The scores reflected poor quality of life for the patient population who had neurogenic dysphagia. The lowest score belonged to general burden with the score 40.1±31.6 and the highest score belonged to eating duration with the score 66.5±31.7. General burden, eating duration, eating desire and social subscales were found to have good test-retest reliability (r=0.696, r=0.790, r=0.787, r=0786, p<0.001; respectively) and, food selection,

**Table 4.** The correlations of the subscales of the T-SWAL-QOL with the WHO-QOL-BREF measures (n:105)

| Subscales of the T-SWAL-QOL | WHO-QOL-BREF | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Physical health | | Psychological health | | Social relationship | | Environment | |
| | r | (p) | r | (p) | r | (p) | r | (p) |
| General burden | 0.148 | 0.149 | 0.138 | 0.179 | 0.027 | 0.791 | 0.111 | 0.281 |
| Food selection | 0.112 | 0.282 | 0.178 | 0.008* | 0.226 | 0.028* | 0.239 | 0.020* |
| Eating duration | 0.221 | 0,028* | 0.098 | 0.339 | 0.124 | 0.222 | 0.289 | 0.004* |
| Eating desire | 0.191 | 0.049* | 0.219 | 0.031* | 0.053 | 0.604 | 0.014 | 0.890 |
| Fear of eating | 0.277 | 0.006* | 0.296 | 0.003* | 0.216 | 0.027* | 0.142 | 0.166 |
| Sleep | 0.423 | <0.001 | 0.414 | <0.001 | 0.300 | 0.003* | 0.397 | 0.044* |
| Fatigue | 0.444 | <0.001 | 0.342 | 0.018* | 0.356 | <0.001 | 0.382 | 0.005* |
| Communication | 0.344 | 0.001* | 0.341 | 0.001* | 0.377 | <0.001 | 0.338 | 0.021* |
| Mental health | 0.413 | <0.001 | 0.300 | 0.003* | 0.319 | 0.002 | 0.199 | 0.056 |
| Social | 0.070 | 0.497 | 0.095 | 0.355 | 0.112 | 0.272 | 0.137 | 0.180 |

fear of eating, sleep, fatigue, communication and mental health were found to have excellent test-retest reliability (r=0.832, r=0.833, r=0.841, r=0.839, r=0.883, r=0.847, p<0.001; respectively).

## Validity

The correlation between T-SWAL-QOL and WHO-QOL-BREF was assessed for validity study of the scale. The results of the correlations were given in Table 4.

There was no correlation between general burden, social subscales of T-SWAL-QOL and any domains of WHO-QOL-BREF (p>0.05). There was a positive, moderate, statistically significant correlation between sleep, fatigue, communication subscales of T-SWAL-QOL and the four domains of WHO-QOL-BREF (p<0.05). There was a positive, statistically significant correlation between fear of eating, mental health subscales of T-SWAL-QOL and physical, psychological and social domains of WHO-QOL-BREF (p<0.05). The most of the dysphagia related subscales of T-SWAL-QOL, which are food selection, eating duration, eating desire have statistically significant but weak correlation between some domains of WHO-QOL-BREF (p<0.05). Table 5 showed that Pearson's correlation coefficients ranged from 0.18-0.44, in general a weak/moderate correlation between the two assessment tools.

## DISCUSSION

Swallowing disorders affect physical, psychological wellness of the patients and diminish quality of life. So quality of life become an outcome measure and should be evaluated during dysphagia rehabilitation. SWAL-QOL was developed as a dysphagia specific quality of life questionnaire in 2000 (16). The reliability and validity of the SWAL-QOL was found excellent and it was also found it was sensitive to discrimination of different levels of swallowing disorders in previous studies (8,10-13). In our study we translated SWAL-QOL into Turkish and made the validation and reliability study on 105 Turkish patients with dysphagia. The T-SWAL-QOL was found to be well-completed questionnaire by Turkish speaking patients and all items were found to be understandable. The administration of the whole tool took 21.8±11.1

minutes to complete. The other version studies of SWAL-QOL supported this finding and it also took 20 minutes to complete in French version (10-13).

T-SWAL-QOL applied to neurogenic patients with dysphagia. T-SWAL-QOL scores showed that the quality of life of the patients was affected negatively. The lowest score belonged to general burden with the score 40.1±31.6 and the highest score belonged to eating duration with the score 66.5±31.7 and food selection, eating desire, respectively in neurogenic patients with dysphagia. This meaned that the most effected parameters were related with feeding and swallowing in this study population. This result showed that T-SWAL-QOL could reflect the level of dysphagia related quality of life in Turkish speaking patients. In various studies, which included patients with dysphagia due to different diseases, it was also found that SWAL-QOL was a useful tool to distinguish different types of swallowing disorders (17-20).

There are French, Dutch, Chinese and Swedish version studies of the SWAL-QOL (10-13). The internal consistency of the SWAL-QOL was also found to be higher than 0.7 Cronbach's alpha value in the French and Swedish versions (10,13). At the same time, the SWAL-QOL was found to be the most valid and reliable questionnaire in a study, which compared the questionnaires that were used for quality of life assessments in swallowing disorders (21). In our study, the internal consistency of the T-SWAL-QOL was found to be high with 0.88 Cronbach's alpha value for test and 0.91 Cronbach's alpha value for retest. General burden, food selection, eating desire and social subscales were found to have good test-retest reliability and, eating duration, fear of eating, sleep, fatigue, communication and mental health were found to have excellent test-retest reliability. It could be concluded that the T-SWAL-QOL had reliability for repeated evaluations which means that it has a high stability over time. In terms of validity, the results showed that there was a correlation between T-SWAL-QOL and WHO-QOL-BREF in general but it was weak/moderate. This finding supported the opinion that both questionnaires measure quality of life, but the WHO-QOL-BREF focus on general quality of life and the T-SWAL-QOL is a dysphagia specific quality of life questionnaire.

In future studies, it will be investigated whether the scale may distinguish the effect of the dysphagia severity on quality of life in different patient groups and the responsiveness of the T-SWAL-QOL to treatment induced changes in patients with dysphagia.

## CONCLUSION

The T-SWAL-QOL was shown to be a valid and reliable questionnaire in dysphagia evaluation. Thus, the development of T-SWAL-QOL for Turkish population solves the clinical problem about the lack of a scale to evaluate the dysphagia specific quality of life so the T-SWAL-QOL can be used to assess dysphagia specific quality of life in clinical settings or research studies.

## CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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