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# Validation of the Arabic version of swallowing quality of life questionnaire

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## Abstract

**Background:** Dysphagia is caused by sensorimotor function disruption of swallowing. In 2000, McHorney et al. first developed the SWAL-QOL (swallowing quality of life questionnaire). It is considered to be one of the initial self-rated tools which is dysphagia-specific.

The SWAL-QOL has been translated into many languages such as Dutch, French, Chinese, Swedish, Persian, German, and Arabic (its linguistic validation was tested only but its validation and reliability has not been determined). The aim of this study was to determine the validity and reliability of the Arabic version of SWAL-QOL (ASWAL-QOL) in adult patients complaining of oropharyngeal dysphagia. Patients were enrolled from the outpatient swallowing clinic of Main University hospitals starting from the first of March 2018 to the end of May 2019. According to these criteria, sums of 100 patients were involved in the study and they completed the ASWAL-QOL together with Dysphagia Handicap Index (DHI).

**Results:** There was a strong correlation between the eating desire, eating duration, and food selection in ASWAL-QOL and the functional domain in (DHI). This was found as well between mental health and social functioning in ASWAL-QOL and emotional domain in (DHI) that was used for convergent validity. While checking reliability, nearly most of the domains demonstrated stability over short term as well as excellent internal consistency reliability.

**Conclusion:** The current study illustrated that the ASWAL-QOL questionnaire is a valid and reliable tool to evaluate the impact of difficulties in swallowing on the quality of life in patients suffering from oropharyngeal dysphagia.

**Keywords:** Oropharyngeal dysphagia, SWAL-QOL, Arabic language, Quality of life, Questionnaire

## Background

Dysphagia is caused by sensorimotor function disruption of swallowing [1]. There are variable causes of dysphagia such as stroke, head and neck tumors, multiple sclerosis, Parkinson's disease, and dementia. In addition, there are multiple complications caused by dysphagia as pneumonia, malnutrition, dehydration, and death in severe cases [2]. There are also multiple psychosocial consequences associated with swallowing problems such as anxiety, depression, shame, and fear. Therefore, dysphagia has a negative effect on the patient's quality of life [3, 4].

Although there are many instruments that are used to evaluate the health-related quality of life (QOL) in patients complaining of dysphagia, there are only few instruments that were designed particularly to assess the impact of dysphagia on QOL as the Eating Assessment Tool (EAT-10) and Deglutition Handicap Index [5, 6].

In 2000, McHorney et al. first developed the SWAL-QOL (swallowing quality of life questionnaire). It is considered to be one of the initial self-rated tools which is dysphagia-specific [7–9]. It has been commonly used and can be considered in dysphagia research as a gold standard regarding QOL aspects due to its broad range applications. It helps in the evaluation of the impact of swallowing problems on the quality of life in patients with dysphagia caused by different diseases, and it has satisfactory psychometric properties [9–12].

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SWAL-QOL includes 44 items that evaluate 10 QOL swallowing-related features: general burden, food selection, eating duration, eating desire, fear of eating, sleep, fatigue, communication, mental health, and social functioning with a sum of 30 items, in addition to 14 items that assess clinical symptoms.

The SWAL-QOL has been translated to many languages such as Dutch [13], French [14], Chinese [15], Swedish [16], Persian [17], German [18], and Arabic [19] (its linguistic validation was tested only but its validation and reliability has not been determined).

The aim of this study was to determine the validity and reliability of the Arabic version of SWAL-QOL (ASWAL-QOL) in adult patients complaining of oropharyngeal dysphagia.

## Methods

The current study design was a prospective one. The study protocol was approved by the ethics committee in the faculty of medicine, Egypt. All the patients involved signed written informed consent before participating in the study.

### Participants

Patients were enrolled from the outpatient swallowing clinic of Main University hospitals starting from the first of March 2018 to the end of May 2019.

The inclusion criteria included oropharyngeal dysphagia diagnosed by a phoniaticians using clinical examination. The exclusion criteria were (1) inability to provide informed consent, (2) symptoms of esophageal dysphagia, and (3) evidence of cognitive impairment such as aphasia and dementia.

According to these criteria, a sum of 100 patients were involved in the study and completed the ASWAL-QOL as well as the Arabic version of Dysphagia Handicap Index (DHI) [20].

### Instrument

The SWAL-QOL is a 44-item questionnaire that is designed to assess dysphagia over 10 quality of life domains, and it has a supplemental section on symptom frequency. The 10 domains are burden, eating duration, eating desire, food selection, communication, fear, mental health, social role, fatigue, and sleep. The symptom scale includes 14 dysphagia-related symptoms: coughing, choking, gagging, and drooling. Each domain is scored on a 5-point Likert scale that ranges from 1 (worst state) to 5 (best state). All scales are transformed to provide a range of 0 to 100, in which a score of "0" represents the worst score and "100" the most ideal score.

*To test validity*, the patients were required to complete the (DHI) to test for convergent validity which illustrates

if two similar constructs correspond with one another or not [20]. It is a self-rated 25-item questionnaire that evaluates the disabling effect of dysphagia on the emotional, functional, and physical characteristics of the patient's life. DHI share items in common with SWAL-QOL as symptoms related to swallowing which explains using it to determine the convergent validity.

DHI is better in the evaluation of the swallowing handicap and its complications, but the SWAL-QOL is more accurate in exploring the QOL. The DHI has 9 items in the functional subscale, 9 items in the physical subscale, and 7 items in the emotional subscale. There are three answers for every item: never, sometimes, and always, with a proposed scoring of 0, 2, and 4, respectively, so the total DHI score range is 0–100.

*To test reliability*, we used test-retest reliability as well as internal consistency. Test-retest reliability was implemented on 10 of the 100 patients who completed the Arabic version of SWAL-QOL again with an interval of 1–2 weeks.

### Statistics analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. *P* values < 0.05 were considered to be statistically significant.

Convergent validity: correlations were computed through Pearson's correlations (*r*). High correlation if the values are between  $\pm 0.50$  and  $\pm 1$ , a moderate correlation between  $\pm 0.30$  and  $\pm 0.49$ , and a low correlation below  $\pm 0.29$ .

The internal consistency is a measure of the degree of interrelation between items in each domain. It is evaluated using Cronbach's  $\alpha$  coefficient which is interpreted as follows: a value > 0.7 is considered "acceptable," a value > 0.8 is considered "good," and a value > 0.9 is considered "excellent."

Test-retest reliability was assessed by estimating the intraclass correlation coefficient (ICC) to detect the stability of ASWAL-QOL over time.

## Results

The patients' characteristics are summarized in Table 1.

The summary for causes of dysphagia is demonstrated in Table 2. It shows that post stroke constituted 23% of the cases, head and neck masses (as laryngeal, pharyngeal, nasopharyngeal, thyroid masses) were 20%, vocal fold immobility (either unilateral or bilateral) was 13%, gastroesophageal reflux was 8%, dysphagia after surgeries (thyroidectomy, laryngectomy, excision of glomus jugulare, paraganglioma, and tongue base resection) was 11%, unknown cause was 22%, post radiotherapy was 2%, and multiple myeloma was 1%.

**Table 1** Demographic characteristics ( $n = 100$ )

	No.	%
<b>Age (years)</b>		
20–29	6	6.0
30–39	12	12.0
40–49	21	21.0
50–59	24	24.0
60–69	20	20.0
> 70	17	17.0
Median (Min.–Max.)	53.0 (21.0–88.0)	
Mean $\pm$ SD	53.20 $\pm$ 14.44	
<b>Education</b>		
Primary + preparatory	59	59.0
Secondary	26	26.0
University	15	15.0
<b>Social state</b>		
Single	10	10.0
Married	84	84.0
Divorced	2	2.0
Widow	4	4.0
<b>Duration of dysphagia</b>		
< 6 months	61	61.0
6 months–< 1 year	19	19.0
1–< 1.5 years	7	7.0
> 1.5 years	13	13.0
Median (Min.–Max.)	4.0(1.0–18.0)	
Mean $\pm$ SD	9.09 $\pm$ 19.74	
<b>Help needed in completing the questionnaire</b>		
Independent	64	64.0
Someone helped	36	36.0

**Table 2** Classification of cases according to the cause of dysphagia ( $n = 100$ )

Causes	No.	%
Post stroke	23	23
H/N mass	20	20
VF immobility	13	13
GERD	8	8
Post surgical	11	11
Unknown	22	22
Post radiotherapy	2	2
Multiple myeloma	1	1

The score distribution of the ASWAL-QOL scales, shown in Table 3, for the studied sample (100 patients) showed a mean score that ranged from 37.9 to 52.4.

### Validity

Convergent validity, demonstrated in Table 4, was obtained through a comparison of the similar items in ASWAL-QOL with those in the DHI. There was a strong correlation between the eating desire, eating duration, and food selection in ASWAL-QOL and the functional domain in DHI. This was found as well between the mental health and social functioning in ASWAL-QOL and the emotional domain in DHI. However, there was a moderate correlation between the symptoms scale in ASWAL-QOL and the physical domain in DHI.

The score distribution of DHI is demonstrated in Table 5.

### Reliability

#### Internal consistency

According to Table 6, all the scales showed Cronbach  $\alpha$  coefficients > 0.70. Cronbach  $\alpha$  coefficients were > 0.9 (excellent) for symptoms, communication, mental health, social functioning, and the overall score. The Cronbach  $\alpha$  coefficient was > 0.8 (good) for general burden, food selection, fear of eating, fatigue, and sleep. The rest of the items showed Cronbach  $\alpha$  coefficients > 0.7 (acceptable). This demonstrates that the items in each scale are homogenous and examine various aspects of the same characteristics.

#### Test-retest reliability

In the 2-week retest reliability, Pearson's correlations ranged from 0.50 to 0.99 ( $P < 0.05$ ) and ICC ranged from 0.50 to 0.99, which was significant for all the scales except for the symptoms scale. Thus, most of the domains demonstrated excellent internal consistency reliability as well as stability over short term.

### Discussion

Self-reported instruments that demonstrate the patient's perspective are crucial elements of the comprehensive process of dysphagia evaluation [9]. SWAL-QOL is a self-report questionnaire used to evaluate the impact of swallowing problems on QOL [9]. Its original version was translated to different languages and has been used as a gold standard tool in various dysphagia researches tackling QOL aspects [13–19].

The SWAL-QOL was translated to Arabic (it was subjected to cross-cultural adaptation), but its validity and reliability has not been tested. Thus, the purpose of this study was to determine the validity and reliability of the

**Table 3** Score distribution of ASWAL-QOL ( $n = 100$ )

Subscale	No. items	Range	Mean	SD	Median
<b>General burden</b>	<b>2</b>	<b>0–100</b>	<b>40.8</b>	<b>22.6</b>	<b>40.0</b>
1. Dealing with my swallowing problem is very difficult		0–100	40.4	24.3	40.0
2. My swallowing problem is a major distraction in my life		0–100	41.2	24.8	40.0
<b>Eating desire</b>	<b>3</b>	<b>0–100</b>	<b>45.3</b>	<b>22.8</b>	<b>40.0</b>
1. Most days, I do not care if I eat or not		0–100	46.2	28.7	40.0
2. I am rarely hungry anymore		0–100	48.8	29.0	40.0
3. I do not enjoy eating anymore		0–100	41.0	26.3	40.0
<b>Eating duration</b>	<b>2</b>	<b>0–100</b>	<b>42.6</b>	<b>24.0</b>	<b>40.0</b>
1. It takes me longer to eat than other people		0–100	39.6	24.6	40.0
2. It takes me forever to eat a meal		0–100	45.6	28.9	40.0
<b>Symptoms</b>	<b>14</b>	<b>0–100</b>	<b>49.8</b>	<b>18.7</b>	<b>44.3</b>
1. Cough		0–100	46.8	25.3	40.0
2. Choking when you eat food		0–100	45.2	23.5	40.0
3. Choking when you take liquids		0–100	45.0	23.8	40.0
4. Having thick saliva or phlegm		0–100	41.8	24.6	40.0
5. Gagging		0–100	51.8	29.1	40.0
6. Drooling		0–100	53.4	29.5	40.0
7. Problems chewing		0–100	52.0	29.0	40.0
8. Having excess saliva or phlegm		0–100	46.8	25.8	40.0
9. Having to clear your throat		0–100	37.8	18.2	40.0
10. Food sticking in your throat		0–100	49.2	28.1	40.0
11. Food sticking in your mouth		0–100	54.0	28.5	50.0
12. Food or liquid dribbling out of your mouth		0–100	60.6	31.2	60.0
13. Food or liquid coming out your nose		0–100	61.8	31.3	60.0
14. Cough food or liquid from mouth when it sticks		0–100	51.2	26.3	40.0
<b>Food selection</b>	<b>2</b>	<b>0–100</b>	<b>45.2</b>	<b>21.9</b>	<b>40.0</b>
1. Figuring out what I can and cannot eat is a problem for me		0–100	43.8	22.9	40.0
2. It is difficult to find foods that I both like and can eat		0–100	46.6	24.6	40.0
<b>Communication</b>	<b>2</b>	<b>0–100</b>	<b>52.4</b>	<b>28.9</b>	<b>40.0</b>
1. People have a hard time understanding me		0–100	54.4	30.8	40.0
2. It has been difficult for me to speak clearly		0–100	50.3	28.6	40.0
<b>Fear of eating</b>	<b>4</b>	<b>0–100</b>	<b>45.6</b>	<b>23.2</b>	<b>40.0</b>
1. I fear I may start choking when I eat food		0–100	43.8	26.3	40.0
2. I worry about getting pneumonia.		0–100	50.0	29.6	40.0
3. I am afraid of choking when I drink liquids		0–100	42.4	25.6	40.0
4. I never know when I am going to choke		0–100	46.2	28.1	40.0
<b>Mental health</b>	<b>5</b>	<b>0–100</b>	<b>40.8</b>	<b>19.9</b>	<b>40.0</b>
1. My swallowing problem depresses me		0–100	39.8	22.5	40.0
2. Having to be so careful when I eat or drink annoys me		0–100	37.8	20.5	40.0
3. I have been discouraged by my swallowing problem.		0–100	42.0	23.5	40.0
4. My swallowing problem frustrates me.		0–100	42.4	24.7	40.0
5. I get impatient dealing with my swallowing problem		0–100	41.8	22.2	40.0
<b>Social functioning</b>	<b>5</b>	<b>0–100</b>	<b>45.3</b>	<b>24.9</b>	<b>40.0</b>

**Table 3** Score distribution of ASWAL-QOL ( $n = 100$ ) (Continued)

Subscale	No. items	Range	Mean	SD	Median
1. I do not go out to eat because of my swallowing problem.		0–100	44.8	28.0	40.0
2. My swallowing problem makes it hard to have a social life.		0–100	46.6	28.0	40.0
3. My usual work or leisure activities have changed because of my swallowing problem		0–100	45.6	28.0	40.0
4. Social gatherings (like holidays or get-togethers) are not enjoyable because of my swallowing problem		0–100	43.4	28.1	40.0
5. My role with family and friends has changed because of my swallowing problem		0–100	46.0	27.9	40.0
<b>Fatigue</b>	<b>3</b>	<b>0–100</b>	<b>37.9</b>	<b>18.6</b>	<b>40.0</b>
1. Feel weak?		0–100	40.8	22.0	40.0
2. Feel tired?		0–100	35.8	19.8	40.0
3. Feel exhausted?		0–100	37.0	20.6	40.0
<b>Sleep</b>	<b>2</b>	<b>0–100</b>	<b>45.2</b>	<b>24.9</b>	<b>40.0</b>
1. Have trouble falling asleep?		0–100	45.6	26.8	40.0
2. Have trouble staying asleep?		0–100	44.8	27.0	40.0
<b>Overall</b>	<b>44</b>	<b>0–100</b>	<b>45.7</b>	<b>15.9</b>	<b>41.8</b>

Arabic version of SWAL-QOL (ASWAL-QOL) in patients complaining of oropharyngeal dysphagia.

Regarding validity measurement, convergent validity was used through the comparison between the ASWAL-QOL and the Arabic version of DHI. There was a strong correlation between the eating desire, eating duration, and food selection in ASWAL-QOL and the functional domain in DHI. This was found as well between mental health and social functioning in ASWAL-QOL and emotional domain in DHI. However, there was a moderate correlation between the symptoms scale in ASWAL-QOL and physical domain in DHI. This indicates that the ASWAL-QOL is a valid tool in the assessment of oropharyngeal dysphagia.

The reliability was evaluated using internal consistency and test-retest. Regarding the internal consistency, all the scales showed Cronbach's  $\alpha$  coefficient  $> 0.7$  which is acceptable. This means that the items in each scale are homogenous and evaluate different features of alike characteristics. These findings are similar to the results found in the original English version [9], Swedish [16], and Persian versions [17] of

SWAL-QOL, although these studies showed that eating duration and sleep were just below the standard cutoff point.

As for test-retest reliability, it was verified by Pearson's correlation coefficient and intraclass correlation coefficient (ICC). The excellent test-retest reliability demonstrated the steadiness of the ASWAL-QOL across time as well as the stability of the scores among 2 measurements. These results are similar to what was found in the original English version [9], Chinese [15], and Swedish [16] versions of SWAL-QOL.

It is recommended to use the ASWAL-QOL in dysphagia clinics to give a clear picture of the quality of life in patients suffering from oropharyngeal dysphagia. Moreover, further research is required to explore the differences in quality of life between different causes of dysphagia.

## Conclusions

The current study illustrated that the ASWAL-QOL questionnaire is a valid and reliable tool to evaluate the impact of swallowing difficulties on quality of life in patients suffering from oropharyngeal dysphagia. Hence,

**Table 4** ASWAL-QOL verses and DHI

Subscale	ICC	Sig.	Pearson	Sig.
Eating desire, duration, food selection versus functional domain of DHI	0.503*	$< 0.001^*$	0.524*	$< 0.001^*$
Symptoms versus physical domain of DHI	0.403*	$< 0.001^*$	0.440*	$< 0.001^*$
Mental health and social function versus emotional domain of DHI	0.561*	$< 0.001^*$	0.611*	$< 0.001^*$
<b>Overall</b>	<b>0.537*</b>	<b><math>&lt; 0.001^*</math></b>	<b>0.591*</b>	<b><math>&lt; 0.001^*</math></b>

$r$  Pearson's coefficient, ICC intraclass correlation coefficient

\*Statistically significant at  $p \leq 0.05$

**Table 5** Score distribution of Dysphagia Handicap Index

Subscale	No. items	Range	Mean	SD	Median
<b>Functional</b>					
I avoid some foods because of my swallowing problem		0–4	1.54	1.33	2.0
I have changed the way I swallow to make it easier to eat		0–4	1.64	1.32	2.0
It takes me longer to eat a meal than it used to		0–4	1.39	1.44	2.0
I eat smaller meals more often due to my swallowing problem		0–4	1.47	1.36	2.0
I do not socialize as much due to my swallowing problem		0–4	1.52	1.49	2.0
I avoid eating because of my swallowing problem		0–4	1.72	1.40	2.0
I eat less due to my swallowing problem		0–4	1.68	1.36	2.0
I must eat another way (feeding tube) because of my swallowing problem		0–4	3.27	1.45	4.0
I have changed my diet due to my swallowing problem		0–4	1.90	1.41	2.0
Total	9	0–36	16.08	9.29	18.0
<b>Physical</b>					
I cough when I drink liquids		0–4	1.58	1.35	2.0
I cough when I eat solid food		0–4	1.80	1.41	2.0
My mouth is dry		0–4	1.64	1.38	2.0
I need to drink fluids to wash food down		0–4	1.37	1.30	2.0
I have lost weight because of my swallowing problem		0–4	1.74	1.45	2.0
I have to swallow again before food will go down		0–4	1.56	1.26	2.0
I choke when I take my medicine		0–4	1.86	1.41	2.0
I feel a strangling sensation when I swallow		0–4	1.60	1.31	2.0
I cough up food when after I swallow		0–4	1.88	1.42	2.0
Total	9	0–36	15.01	8.34	16.0
<b>Emotional</b>					
I am embarrassed to eat in public		0–4	1.64	1.49	2.0
I feel depressed because I cannot eat what I want		0–4	1.66	1.49	2.0
I do not enjoy eating as much as I used to		0–4	1.23	1.33	2.0
I am nervous because of my swallowing problem		0–4	1.52	1.54	2.0
I feel handicapped because of my swallowing problem		0–4	1.41	1.41	2.0
I get angry with myself because of my swallowing problem		0–4	1.64	1.49	2.0
I am afraid that I will choke and stop breathing because of my swallowing problem		0–4	1.60	1.43	2.0
Total	7	0–28	10.69	8.19	12.0
<b>Overall</b>	25	0–100	41.78	23.11	46.0

**Table 6** Reliability of ASWAL-QOL ( $n = 100$ )

Subscale	Internal consistency	Test-retest ( $n = 10$ )			
		ICC	Sig.	Pearson	Sig.
<b>General burden</b>	0.822	0.913*	< 0.001*	0.924*	< 0.001*
<b>Eating desire</b>	0.744	0.714*	0.007*	0.732*	0.016*
<b>Eating duration</b>	0.749	0.693*	0.007*	0.716*	0.020*
<b>Symptoms</b>	0.916	0.509	0.062	0.500	0.142
<b>Food selection</b>	0.832	0.671*	0.011*	0.688*	0.028*
<b>Communication</b>	0.947	0.986*	< 0.001*	0.985*	< 0.001*
<b>Fear of eating</b>	0.867	0.710*	0.008*	0.704*	0.023*
<b>Mental health</b>	0.926	0.915*	< 0.001*	0.909*	< 0.001*
<b>Social functioning</b>	0.933	0.886*	< 0.001*	0.897*	< 0.001*
<b>Fatigue</b>	0.872	0.942*	< 0.001*	0.936*	< 0.001*
<b>Sleep</b>	0.832	0.954*	< 0.001*	0.953*	< 0.001*
<b>Overall</b>	<b>0.960</b>	<b>0.727*</b>	<b>0.008*</b>	<b>0.708*</b>	<b>0.022*</b>

Internal consistency sample size = 100, test-retest sample size = 10, average test-retest interval = 2 weeks

ICC intraclass correlation coefficient,  $r$  Pearson's coefficient

\*Statistically significant at  $p \leq 0.05$



ASWAL-QOL can be used in variable clinical settings as a self-report questionnaire to provide a clear detailed picture of the quality of life in patients suffering from dysphagia, and it could be used as a follow-up tool as well to monitor the changes in quality of life throughout and after rehabilitation.

#### Abbreviations

SWAL-QOL: Swallowing quality of life questionnaire; QOL: Quality of life; ASWAL-QOL: Arabic swallowing quality of life questionnaire; DHI: Dysphagia Handicap Index

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#### Authors' contributions

RMA contributed in designing the study, collecting data, and writing and revising the manuscript. HEE designed the study, collected the data, interpreted the results, and drafted the manuscript. SMA contributed in collecting data and in writing the manuscript. All authors read and approved the manuscript.

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#### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

#### Ethics approval and consent to participate

The protocol of this study was approved by the ethics committee in the faculty of medicine, Alexandria University, Egypt. Subjects have given their written informed consent. Reference number is not available.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

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