

# Validation of the Arabic version of Sydney Swallow Questionnaire

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## Original Article

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### ABSTRACT

**Introduction:** Clinicians in dysphagia field use validated questionnaires extensively in clinical and research settings to detect oropharyngeal dysphagia and provide information for diagnosis and management decisions. The study aims to develop an Arabic version of the Sydney Swallow Questionnaire (A-SSQ) and assess its reliability, consistency, and validity in individuals with oropharyngeal dysphagia who are speaking the Arabic language. The questionnaire was administered to 15 participants with oropharyngeal dysphagia of various etiologies. It was a case control study and the sample was 100 adults aged more than 18 years old; 50 cases with different etiologies and 50 healthy controls. Both the cases selected and controls received a copy of both the validated Arabic version of Eating Assessment Tool (A-EAT-10) as well as a copy of the Sydney Swallow Questionnaire translated into Arabic to answer their questions. Retesting was done on all cases to determine the reliability of test-retest, with an interval of 14 days. Validity was proven to be high. In addition, the reliability of tests was significant.

**Results:** The Arabic version of SSQ is found to be a reliable and valid tool to be used to screen and measure the subjective severity of oropharyngeal dysphagia. It showed excellent internal consistency among cases (Cronbach's  $\alpha = 0.924$ ), excellent test-retest reliability (Intra-class correlation coefficient = 0.99). A significant difference was found in the scores of A-SSQ between controls as well as the oropharyngeal dysphagia cohort.

**Conclusion:** The A-SSQ is a reliable as well as a validated questionnaire that can be utilized to assess dysphagia in the Arabic-speaking population in relation to anatomic region, consistency of the food bolus, and kind of dysfunction.

**Key Words:** Dysphagia, questionnaire, validation.

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## INTRODUCTION

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Clinicians use validated questionnaires in clinical and research settings to detect oropharyngeal dysphagia and provide diagnosis, management decisions, and follow-up information. Questionnaires are regarded as ideal tools that are precise, time-saving assessments, non-invasive, easy to comprehend, and cost-effective<sup>[1]</sup>.

Questionnaires are considered valuable instruments to survey knowledge, attitudes, practice as well as determining the preferences of the patient<sup>[2]</sup>. It was stated that to assess oropharyngeal dysphagia, previously validated English self-evaluation questionnaires that need to be translated and revalidated in other languages so that a higher percentage of participants from different countries can respond<sup>[3]</sup>.

Many questionnaires to detect oropharyngeal dysphagia were translated into other languages and revalidated. There are only two approved forms tackling dysphagia in Arabic, Dysphagia Handicap index (A-DHI)<sup>[5]</sup>, as well as Eating Assessment Tool (A-EAT-10)<sup>[4]</sup> and but none of them

can give an idea about the possible underlying cause of dysphagia or the different consistencies. In this study, the validated Sydney Swallow Questionnaire (SSQ), a patient self-reported questionnaire Arabic version, was mainly developed to evaluate oropharyngeal dysphagia's severity symptoms and apply them in clinical practices. Numerous studies have established its valuable content, discriminant construct as well as predictive validity, and reliability of test-retest in a variety of groups, including head and neck cancer (HNC) elderly patients<sup>[6]</sup>, geriatric populations<sup>[7]</sup>, and individuals with Duchenne muscular dystrophy<sup>[8]</sup>. Only a Swedish and a French translation have been verified in oropharyngeal dysphagia cases, and no other translation available<sup>[9,10]</sup>. Many methods were utilized to evaluate the test's validity, including face, content, and criterion validity, as well as internal consistency. Retesting was done to determine dependability.

In this study, we aim to make a SSQ Arabic version as well as to verify its reliability, consistency, and validity in population with oropharyngeal dysphagia who are speaking the Arabic language.

**PATIENTS AND METHODS:**

**2.1. Ethical consideration:** An informed consent has been obtained from the participants recruited in the current research. The confidentiality, as well as the privacy of participants, were guaranteed. During the study design process, deceptive methods were excluded. The subjects had the option to withdraw from the research at any time. The Ain Shams Institute's Ethical Committee of Human Research approved this research (reference number; FWA 000017585).

**2.2. Study design:** the study is case control. 50 cases with oropharyngeal dysphagia ( $\geq 18$  years old) of different etiologies and 50 control subjects were recruited. The research was held from October 2018 to December 2021.

**2.3. Pilot study:** Four Arabic bilingual, competent phoniaticians translated the Arabic version of (A-SSQ). A trained professional translator acquainted with both Arabic and English and Arabic back-translated the items of the questionnaire into English and compared them to the original items. After evaluating the pilot results, the (A-SSQ) was pilot-tested on 15 patients (18 years old) with oropharyngeal dysphagia of various etiologies, and it was adjusted based on their recommendations.

**2.4. Validation study:** it was subsequently applied to the selected subjects and controls. Both the chosen participants and controls received the validated copies of (A-EAT-10), and a copy of (A-SSQ) translated into Arabic to answer their questions. The patients were selected from the Phoniatic clinic; Ain shams University Hospitals (El-Demerdash Hospital and Ain Shams University specialized hospital) attending the dysphagia clinic.

Inclusion criteria included Egyptian, Arabic native-speaking adults  $> 18$  years, as well as signs or suspicion of swallowing issues. Exclusion criteria were: Unconscious patients, patients whose native language is not Arabic, patients with mental disorders or on nasogastric tube feeding or gastrostomy, and also those younger 18 years old. The phoniatician read the transcripts of both questionnaires to the illiterate individuals and examined their response, but if the patient could not comprehend the questions, he or she was disqualified.

**2.5. Study of reliability:** the selected cases were retested after 2 weeks.

The 20<sup>th</sup> version of Statistical Package for Social Sciences (SPSS) was utilized in order to analyze data. Means and standard deviations presented the quantitative variables. Qualitative data were expressed as percentages and numbers. A student t-test was utilized for comparing quantitative data, whereas the Chi-square test was utilized to compare qualitative data. ROC curve analysis was utilized to verify the validity of different quantitative variables for differentiation between groups and determine

the best cut-off values. In addition, Pearson's correlation test was utilized to quantify the linear correlation between different quantitative variables. Cronbach's Alpha was utilized for evaluating the internal consistency of different items of the A-SSQ score among cases and controls. The reliability of retest was estimated using Intra-class correlation coefficient as well as Cronbach's Alpha. The significance level was set at *p*-value less than or equal to 0.05.

**RESULTS:****3.1. Statistics of the results:**

**1. Raw scores:** Table (1) displays the median gender, age, and age range of the controls as well as patients enrolled in this study.

**Table (1):** describes the comparison between controls as well as patients enrolled in this study regarding demographic data.

Mean	Cases (N=50)		Controls (N=50)		
	SD	Mean	SD		
Age	54.24	15.86	45.88	14.19	
	N	%	N	%	
Gender	Male	29	58.0%	24	48.0%
	Female	21	42.0%	26	52.0%

**3.2. Tests of validity:**

1-Internal consistency.

2-criterion validity.

3-content validity.

4- Face validity.

**1- Internal consistency:** Internal consistency is a metric that takes into account the correlations between various items on the same testing. It determines if numerous items can assess the same basic concept provide comparable results. The A-SSQ's internal consistency among cases using Cronbach's a coefficient was 0.924 which is considered excellent internal consistency, revealing that each item of the questionnaire is well correlated to other items.

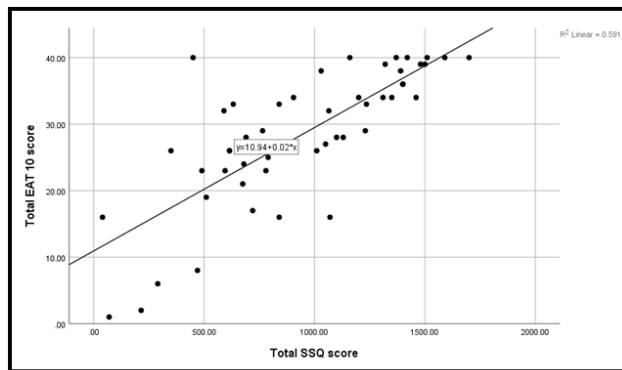
**2- Criterion validity:** It was done by correlation between total A-SSQ score and total A-EAT10 score among cases and controls.

**- Table (2) and Figure (1):** describe the correlation between total A-SSQ score and total A-EAT 10 score among cases (using Pearson correlation coefficient).

		Total EAT10 score
Total SSQ score	Pearson Correlation	0.768
	<i>P</i> value	<0.001 HS

- Table (2) revealed that the correlation between total of both questionnaire among cases is more than 0.7, this difference was statistically highly significant. This means there is linear relationship between total scores of both questionnaires among cases.

- **Pearson correlation coefficient** is known as measuring linear correlation between two data sets utilized to analyze the statistical significance of correlation between both questionnaires in this study. A complete linear connection is indicated by an absolute value of 1. A correlation around 0 shows no linear connection between the variables. The direction of the coefficient is indicated by the sign of the coefficient.

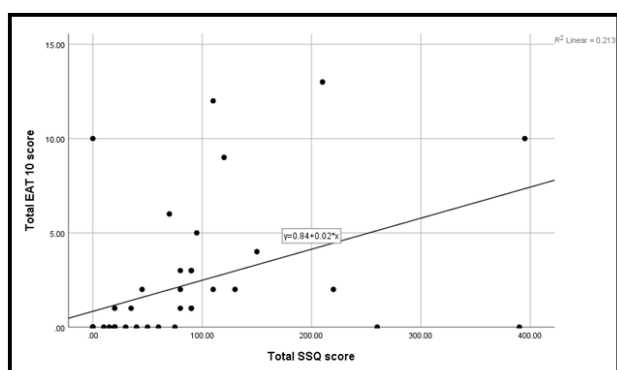


**Fig. 1:** A scatter plot showing a strong correlation between the two variables among cases.

- **Table (3) and Figure (2):** describe the correlation between total A-SSQ score and total A-EAT 10 score among controls (using Pearson correlation coefficient).

		Total EAT10 score
Total SSQ score	Pearson Correlation	0.461
	<i>P value</i>	0.001 HS

- Table (3) revealed that the correlation between the total of both questionnaires among controls is more than 0.4, this difference was statistically highly significant. That means there is also linear relationship between total scores of both questionnaires among controls.



**Fig. 2:** A scatter plot showing a positive correlation between the two variables among controls.

**3- Content validity:** It examines if the relative relevance and selection of elements within the inventory are acceptable for the assessment tool's intended application. Three skilled and multilingual phoniaticians evaluated all questions in the final Arabic version for language and culture relevance and determined that they were entirely related to the A-intended SSQ's purpose.

**4- Face validity:** Face validity showed that the questionnaire is an acceptable and sensible instrument for assessing the activity of the disease for which it was developed.

**3.3. Reliability Tests:**

It is an indication of the accuracy or consistency with which test results are measured.

**It was determined by:**

- 1- Intraclass Correlation Coefficient (ICC).
- 2- Cronbach's Alpha.

The reliability of test-retest assesses the A-SSQ's capacity to provide consistent results across time, assuming the patient's clinical state stays constant. We used the Intraclass Correlation Coefficient (ICC) and limits of agreement (LOA), the 95 percent confidence intervals of the average of the individual differences between test and retest, to assess the variability of the score over the course of two weeks.

The intraclass correlation coefficient (ICC) expresses how closely units in the same cohort resemble one another. The ICC is a score between 0 and 1, with values less than 0.5 indicating poor reliability, values between 0.5 and 0.75 indicating moderate reliability, values between 0.75 and 0.9 indicating good dependability, and any number more than 0.9 indicating outstanding reliability.

**Table 4:** The ICC for subjects' scores during two weeks.

Item	Cronbach's Alpha	ICC* (95% CI)	F test	P value
Q1	0.94	0.88 (0.74-0.95)	15.56	<0.001 HS
Q2	0.84	0.68 (0.37-0.85)	5.18	<0.001 HS
Q3	0.91	0.83 (0.64-0.93)	10.91	<0.001 HS
Q4	0.96	0.93 (0.85-0.97)	29.44	<0.001 HS
Q5	0.97	0.94 (0.86-0.97)	31.41	<0.001 HS
Q6	0.97	0.94 (0.87-0.98)	33.25	<0.001 HS
Q7	0.97	0.94 (0.85-0.97)	30.12	<0.001 HS
Q8	0.96	0.93 (0.83-0.97)	26.06	<0.001 HS
Q9	0.94	0.86 (0.69-0.94)	13.14	<0.001 HS
Q10	0.99	0.98 (0.95-0.99)	87.02	<0.001 HS
Q11	0.96	0.93 (0.84-0.97)	26.37	<0.001 HS
Q12 min	0.93	0.84 (0.64-0.94)	11.53	<0.001 HS
Q12 x20	0.93	0.87 (0.72-0.94)	14.48	<0.001 HS
Q13	0.91	0.82 (0.61-0.92)	9.92	<0.001 HS
Q14	0.79	0.66 (0.35-0.84)	4.88	<0.001 HS
Q15	0.85	0.69 (0.40-0.86)	5.54	<0.001 HS
Q16	0.94	0.88 (0.74-0.95)	15.68	<0.001 HS
Q17	0.90	0.77 (0.52-0.90)	7.59	<0.001 HS
Total SSQ score	0.99	0.98 (0.94-0.99)	80.05	<0.001 HS

\*Intra-class correlation coefficient

Table (4): shows the ICC for patient scores within 2 weeks was 0.98, (highly significant  $p < 0.001$ ), all questions had good to excellent reliability except: Q2 had ICC=0.68, Q14 had ICC=0.66 and Q15 had ICC=0.69

**3.4. Best cut off values:** Cut-off values are the dividing points on measuring scales where the test results are divided into different categories; typically positive (indicating someone has the condition of interest), or negative (indicating someone does not have the condition of interest). Sensitivity refers to a test's ability to designate an individual with disease as positive. The specificity of a test is its ability to designate an individual who does not have a disease as negative.

**Table 5:** shows the cut off values of the different questions of the A-SSQ with their sensitivity and specificity.

Question	Cut off value ( $\geq$ )	Sensitivity	Specificity
Q1	15.00	90.8%	92%
Q2	5.00	79.5%	92%
Q3	15.00	77.3%	92%
Q4	5.00	84.1%	96%
Q5	12.50	84.1%	94%
Q6	12.50	84.1%	92%
Q7	15.00	68.2%	94%
Q8	12.50	72.7%	94%
Q9	15.00	81.8%	84%
Q10	15.00	70.5%	80%

Q11	15.00	75%	90%
Q12 (min)	25.00	84.1%	52%
Q12 (x20)	10.00	84.1%	52%
Q13	5.00	40.9%	96%
Q14	15.00	81.8%	96%
Q15	15.00	63.6%	98%
Q16	12.50	88.6%	98%
Q17	25.00	86.4%	94%

**Table 6:** shows the cut off values of the total score of the A-SSQ with its sensitivity and specificity.

Total SSQ score	Cut off value ( $\geq$ )	Sensitivity	Specificity
	212.50	96%	92%

## DISCUSSION

This study presents validation of the A-SSQ's Arabic version for the sake of screening of the oropharyngeal dysphagia clearly by addressing all the possible symptoms, quantification of symptom severity of oropharyngeal dysphagia and all the possible food consistencies in Egyptian patients. The selected patients have oropharyngeal dysphagia due to different etiologies.

The A-SSQ is made up of 17 questions for evaluation of swallowing functions of both oral and pharyngeal phases. These questions address three

items food bolus' consistency, dysfunction type, and anatomic region. The participated patients responded to all items by assigning a score from 0 to 100. For all but a single question, it employs a 100-mm-long visual analogue scale (VAS).

The A-SSQ is a promptly administered and readily instrument, which may applied during every visit to target the physiological aspects of swallowing impairment, and it can help in screening of swallowing impairment. It is written so that it is easy to understand and does not take long to complete. A raw score does not need any formulae to be calculated. The only thing the clinician has to do is tally up the figures.

There are just two reliable as well as valid questionnaires available in Arabic to assess self-perception of dysphagia: the A-DHI and the A-EAT-10. The latter was selected since it has been shown to be valid and reliable as a self-administered screening instrument for oropharyngeal dysphagia cases. This questionnaire was simple to conduct, easy for patients to understand, and needed just a few minutes to finish. Farahat and Mosallem noted that it is utilised as a screening tool for oropharyngeal dysphagia cases and may distinguish healthy individuals from dysphagic patients, therefore it was used in conjunction with our Arabic version of the SSQ to compare findings and get validity<sup>[4]</sup>.

The A-DHI, on the contrary, is made up of 25 questions that are primarily utilized to assess the impact of dysphagia on the emotional, functional, and physical elements of individuals' life<sup>[5]</sup>.

According to the findings of this research, SSQ'S cultural adaption and translation for patients who are speaking Arabic were deemed intelligible by all parties involved (patients, healthy subjects, pilot group, as well as the expert committee). The validity and test-retest reliability of the SSQ-f were validated in patients. The overall SSQ-f score was highly linked with the A-EAT-10, demonstrating the validity of the criteria. All A-SSQ items revealed great internal consistency and test-retest reliability in the same subjects.

Wallace *et al.* created the SSQ, which is now utilized as a particular instrument for the assessment of oropharyngeal dysphagia as well as swallowing problems in different adult patient groups<sup>[11]</sup>. In a comprehensive review of the psychometric features of questionnaires in oropharyngeal dysphagia cases, Speyer *et al.* stated that information on the psychometric qualities of the SSQ was restricted in prior research, and thus further investigation is needed<sup>[12]</sup>. Likewise, Wallace *et al.* employed a relatively small sample size in their original work and demonstrated construct

validity, test-retest, face, reliability, and content<sup>[11]</sup>. In oropharyngeal cancer patients, Dwivedi *et al.* did not evaluate any psychometric properties<sup>[13]</sup>. The Swedish validation assessed the reliability of test-retest, the concept, internal consistency, as well as discriminant and predictive validity in 20 patients subjects with swallowing issues. Manjaly *et al.* investigated responsiveness; however, their sample size was relatively small (n=9)<sup>[14]</sup>. Audag *et al.* in the French validation, assessed internal consistency, construct validity, reliability of the test-retest, as well as the effect of floor and ceiling, and set SSQ-f's cut-off scores according to the ROC curve method<sup>[10]</sup>. In our study, we measured internal consistency, face, the validity of content and criterion, reliability of test-retest, cut-off score of the total score of the A-SSQ, and cut-off scores of each question individually.

The A-SSQ questionnaire was administered to 50 adult Egyptian subjects with dysphagia, and the findings indicated that the cut-off score was 212.5.

An A-SSQ score of 212.5 was deemed abnormal in the current investigation. Nevertheless, five other cut-off values have been documented in the literature. Arenaz Ba and Bülow proposed 111 as the cut-off score for dysphagia in their SSQ version<sup>[9]</sup>.

In Wallace *et al.* SSQ, nonetheless, the cut-off score is 193 for 19 controls with a media age of 62<sup>[11]</sup>.

They were unable to determine the cause of their decreased mean value. For assessing dysphagia using the Dysphagia Outcome Severity Scale as a reference, Audag *et al.* reported a cut-of score of 118.5 (7 percent of total score) provided a specificity of 82 percent and a sensitivity of 93 percent, as well as a cut-of score of 218.5 (13 percent of total score), gave a sensitivity of 75 percent and a specificity of 100 percent<sup>[10]</sup>. Using the Penetration Aspiration Scale, a cut-off score of 755.0 (44 percent of total score) yielded a specificity of 100% and for diagnosing dysphagia.

Audag *et al.* confirmed the construct validity, and found an inverse connection to the DOSS as well as an association with PAS<sup>[10]</sup>. An inverse connection to the A-EAT 10 was found in the present investigation, confirming the criteria validity. According to Farahat and Mosallem, the A-EAT-10 retains its validity and reliability as a self-administered screening instrument for oropharyngeal dysphagia cases<sup>[4]</sup>. The median scores revealed equivalent findings to the previous version EAT-10 in substantially separating dysphagia sufferers from healthy people. This extraordinarily substantial association between the A-SSQ and the A-EAT 10 can be attributed to the reason that both surveys can detect dysphagia.

Nonetheless, there is no certified instrument for the SSQ-f. Wallace *et al.* validated the SSQ using a non-validated global evaluation score that included all radiological and clinical data<sup>[11]</sup>.

With Cronbach's alpha values greater than 0.9, the A-SSQ displayed strong internal consistency across instances. The SSQ-f shows good internal consistency for all questions with Cronbach's alpha value higher than 0.70. Arenaz Ba and Bülow created a factor analysis matrix for the Swedish version of the SSQ and found that all questions except Q12 (relating to how long it takes to eat) contributed substantially to dysphagia diagnosis<sup>[9]</sup>. Same finding was found in our study as Q12 negatively correlated with other questions by inter item correlation matrix. Audag *et al.* in the French validation did not observe such contribution<sup>[10]</sup>. This could be interpreted that the meal time can be variable in healthy non dysphagic controls.

The Intraclass correlation coefficient (ICC) was utilized in order to verify the reliability of test-retest in the current study. It showed patient's ICC scores within 2 weeks was 0.98, which denotes excellent reliability.

The same results were obtained by the authors of the Swedish version of SSQ, who reported an ICC of 0.98 for overall scores within 14 days. The SSQ-f showed the ICC was 0.97. Wallace *et al.* demonstrated an excellent test-retest reliability<sup>[11]</sup>.

In the current study, all questions had good to excellent reliability except Q2 had ICC=0.68, Q14 had ICC=0.66 and Q15 had ICC=0.69 while in the French version, only three questions were characterized by an ICC <0.700, Q3: 0.632, Q7:0.548 and Q8:0.669

Except for Q1 (degree of dysphagia), Q3 (difficulty swallowing thick liquids), Q8 (difficulty initiating swallowing), and Q12 (how long does it take to eat), all questions achieved a level of 0.7 in the Swedish validation.

The present study's results demonstrated that the A-SSQ could differentiate between dysphagic patients and controls, as denoted by the elevated median of all questions and the total SSQ score in cases compared to the mean of all questions as well as the overall SSQ score in controls, with a statistically substantial difference. These findings are compatible with Arenaz Búa and Bülow who found that dysphagia cases in the Swedish version demonstrated more elevated scores compared to controls, denoting elevated predictive validity, which contributes to differentiating between subjects with/without dysphagia<sup>[9]</sup>.

In the current study, results revealed the best cut-off values for each question unlike other studies that

revealed the cut-off value for only the overall score. The cut-off score for Q1 (How much difficulty do you have swallowing at present) is  $\geq 15$ . If a patient scores  $\geq 15$ , this implies the presence of oropharyngeal or oesophageal dysphagia.

If the cut-off score for Q2 (How much difficulty do you have swallowing thin liquids) is  $\geq 5$  and Q3 (How much difficulty do you have swallowing thick liquids)  $\geq 15$ , this could imply oro-pharyngeal dysphagia in the form of drooling or aspiration.

If the cut-off score for Q4 (How much difficulty do you have swallowing soft foods)  $\geq 5$ , this could imply poor posterior propulsion and rolling of the tongue.

If the cut-off score for Q5 (How much difficulty do you have swallowing hard foods)  $\geq 12.5$ , this could imply difficulty in biting, poor rolling of the tongue and chewing, and/or poor posterior propulsion of the tongue same as for Q6 (How much difficulty do you have swallowing dry foods) when the cut-off score  $\geq 12.5$

When the cut-off score for Q7 (do you have any difficulty swallowing your saliva)  $\geq 15$ , this could imply xerostomia, drooling or aspiration.

When the cut-off score for Q8 (do you have any difficulty starting a swallow)  $\geq 12.5$ , this could imply poor posterior propulsion of the tongue or delayed triggering of the swallow.

When the cut-off score for Q9 (feeling of food getting stuck in your throat when you swallow)  $\geq 15$ , this could imply the presence of pharyngeal residue all through due to weak pharyngeal peristalsis, vallecular residue after swallow due to the weak mobility of base of the tongue or pyriform sinuses residue due to cricopharyngeal dysfunction

When the cut-off score for Q10 (Do you ever cough or choke when swallowing solid foods)  $\geq 15$ , the cut-off score for Q11 (Do you ever cough or choke when swallowing liquids)  $\geq 15$ , this could imply aspiration during due to premature spillage, delayed triggering of the swallow reflex and laryngeal closure defects. It could also imply post swallow aspiration due to vallecular residue because of weak mobility of the base of the tongue or pyriform fossae residue due to cricopharyngeal dysfunction, or residue along the pharyngeal wall due to weak pharyngeal peristalsis.

When the cut-off score for Q12 (how long does it take you to eat an average meal)  $\geq 25$  minutes, this could imply the severity due to any of the mentioned causes. Mealtime is commonly seen 15 to 30 min in healthy subjects<sup>[10]</sup>. Nonetheless, Archer *et al.* illustrated that

all healthy individuals obtained a score of zero for this question<sup>[15]</sup>.

When the cut-off score for  $Q13 \geq 5$  (When you swallow does food or liquid go up behind your nose or come out of your nose?), this could imply incomplete velopharyngeal closure, resulting in pharyngeal/esophageal stop or nasal penetration (regurgitation) of the bolus passage with subsequent overflow into the nasal cavity.

When the cut-off score for  $Q14 \geq 15$  (Do you ever need to swallow more than once for your food to go down?), this could imply multiple dry swallows due to vallecular residue or pyriform fossae residue due to cricopharyngeal dysfunction, or residue along the pharyngeal wall due to weak pharyngeal peristalsis.

When the cut-off score for  $Q15 \geq 15$  (Do you ever cough up or spit out food or liquids DURING a meal?), this could imply pocketing which lead to spitting or manual removal of the bolus by finger, or it could be due to poor chewing.

When the cut-off score for  $Q16 \geq 12.5$  (How do you rate the severity of your swallowing problem today?), this could denote the patient's positive subjective impression on his swallowing problems. The higher the score, the more severe the problem is for the patient.

When the cut-off score for  $Q17 \geq 25$  (How much does your swallowing problem interfere with your enjoyment or quality of life?), this could denote the effect on patient's quality of life. The higher the score, the more affected his life is.

The A-SSQ managed to differentiate between controls and patients as the mean total score of cases =938.54 while the mean total score of controls =74.20. These results demonstrate the A-SSQ's clinical validity in evaluating individuals with dysphagia since the difference was statistically significant.

## CONCLUSION

It is obvious that the strong internal consistency of the A-SSQ items, as well as the substantial correlation detected between the overall score and the items assure the reliability of this instrument. Thus the tool is found to be reliable and valid to be used to screen and measure the subjective severity of oropharyngeal dysphagia that can be used to assess dysphagia in the Arabic speaking population as regard dysfunction type, anatomic region, and the food bolus' consistency.

## ABBREVIATIONS

Eating Assessment Tool (EAT 10)

Arabic version of EAT-10 (A-EAT-10)

Sydney Swallow Questionnaire (SSQ)

Arabic version of Sydney Swallow Questionnaire (A-SSQ)

French version of Sydney Swallow Questionnaire (SSQ-f)

## CONFLICT OF INTEREST

There are no conflicts of interest.

## REFERENCES

1. Audag N., Goubau C., Toussaint M. and Reychler G. (2017). Screening and evaluation tools of dysphagia in children with neuromuscular diseases: a systematic review. *Dev Med Child Neurol* 59(6):591–6.
2. Bai F., Ling J., Esoimeme G., Yao L., Wang M., Huang J., Shi A., Cao Z., Chen Y., Tian J., Wang X. and Yang K. A systematic review of questionnaires about patient's values and preferences in clinical practice guidelines (2018). *Patient Preference Adherence* 12:2309–23.
3. Espitalier F., Fanous A., Aviv J., Bassiouny S., Desuter G., Nerurkar N., Postma G. and Crevier-Buchman L.(2018). International consensus (ICON) on assessment of oropharyngeal dysphagia. *Eur Ann Otorhinolaryngol Head Neck Dis.* 135(1s):S17.
4. Farahat M. and Mesallam T. A. (2015). Validation and cultural adaptation of the Arabic version of the Eating Assessment Tool (EAT-10). *Folia Phoniatria et Logopedica*, 67:231-237.
5. Farahat M., Malki K. H, Mesallam T. A., Bukhari M. and Alharethy S. (2014). Development of the Arabic version of dysphagia handicap index (A-DHI). *Folia Phoniatria et Logopedica Journal*, 29:459-467.
6. Dwivedi R.C., St Rose S., Chisholm E.J., Georgalas C., Bisase B., Amen F., Kerawala C.J., Clarke P.M., Nutting C.M., Rhys-Evans P.H., Harrington K.J. and Kazi R.(2012). Evaluation of swallowing by Sydney Swallow Questionnaire (SSQ) in oral and oropharyngeal cancer patients treated with primary surgery. *Dysphagia*; 27(4):491–7.

7. Nimmons D., Michou E., Jones M., Pendleton N., Horan M. and Hamdy S. (2016). A longitudinal study of symptoms of oropharyngeal Dysphagia in an elderly community-dwelling population. *Dysphagia*.31 (4):560–6.
8. Archer S.K., Garrod R., Hart N. and Miller S. (2013). Dysphagia in Duchenne muscular dystrophy assessed by validated questionnaire. *Int J Lang Commun Disord*; 48(2):240–6.
9. Arenaz Bua B. and Bulow M (2014). Validation in Swedish of Sydney swallow questionnaire. *BMC Res Notes* ;7:742
10. Audag N., Goubau C., Danse E., Vandervelde L., Liistro G., Toussaint M., Gregory R.(2019). Validation and Reliability of the French Version of the Sydney Swallow Questionnaire. *Dysphagia* 34, 556–566.
11. Wallace K.L., Middleton S. and Cook I.J. (2000). Development and validation of a self-report symptom inventory to assess the severity of oral-pharyngeal dysphagia. *Gastroenterology. Apr*; 118 (4):678-87.
12. Speyer R., Cordier R., Kertscher B., Heijnen B.J. (2014). Psychometric properties of questionnaires on functional health status in oropharyngeal dysphagia: a systematic literature review. *Biomed Res Int*. 2014:458678.
13. Dwivedi R.C., St Rose S., Chisholm E.J., Georgalas C., Bisase B., Amen F., Kerawala C.J., Clarke P.M., Nutting C.M., Rhys-Evans P.H., Harrington K.J. and Kazi R.(2012). Evaluation of swallowing by Sydney Swallow Questionnaire (SSQ) in oral and oropharyngeal cancer patients treated with primary surgery. *Dysphagia*. 27(4):491–7.
14. Manjaly J.G., Vaughan-Shaw P.G., Dale O.T., Tyler S., Corlett J.C., Frost R.A.(2012). Cricopharyngeal dilatation for the long-term treatment of dysphagia in oculopharyngeal muscular dystrophy.27(2):216–20
15. Archer S.K., Garrod R., Hart N. and Miller S. (2013). Dysphagia in Duchenne muscular dystrophy assessed by validated questionnaire. *Int J Lang Commun Disord*. 48(2):240–6