

# The Validation of the Voice-Related Quality of Life (V-RQOL): Arabic version

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## Original Article

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### ABSTRACT

**Objective:** This study aimed to translate the original Voice-Related Quality of Life (V-RQOL) version into Arabic language version and to evaluate the validity and reliability of the translated Arabic version of the V-RQOL in order to be used as a valuable test to assess any voice problems influencing the everyday routine duties of the Arabic speaking patients with voice disorders.

**Patients and Methods:** The V-RQOL questionnaire is made up of 10 items. The questionnaire was translated from English to Arabic by two doctors both were native Arabic speakers and fluent in English as well. Then the translated copy was revised by another two native Arabic speaking physicians and fluent in English as well. The questionnaire was applied on 50 controls healthy participants and 100 patients with voice disorders who were recruited from the Phoniatic outpatient clinic of Benha University Hospital, between the period from May 2020 till June 2021. The V-RQOL questionnaire translated version was completed twice by 30 participants with 2 weeks apart to analyze the test-retest reliability. The person completed the questionnaire by him/herself or if he/she is illiterate, it was done by the help of the physician. Additional to the V-RQOL questionnaire, the participants underwent full history taking and Full laryngeal assessment and completed the Voice Handicap Index (Arabic version) as well.

**Results:** The V-RQOL questionnaire is as valid & reliable tool as the VHI for patients with voice disorders. It was shown in the Cronbach's alpha coefficient for all 10 questions of V-RQOL and the thirty questions of VHI were 0.879 & 0.94 respectively, which indicates a very good level of reliability of both questionnaires.

**Conclusion:** The V-RQOL questionnaire clearly measures the socio-emotional aspects and the physical-functional aspects of voice disorder patients in a simple, rapid, easy way to apply and not time-consuming tool which is suitable for the countries with high population density like Egypt.

**Key Words:** Arabic, validity-reliability, voice-related quality of life.

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### INTRODUCTION

Assessing the patients with voice disorders became one of the main concerns especially during COVID-19 pandemic. This necessity has increased in comparison to the traditional risky measures of voice assessment like video-laryngo-stroboscopic examination<sup>[1]</sup>. The voice problems affect the communication, social, emotional and physical aspects of the patient's daily life activities and in turn affects their quality of life<sup>[1,2]</sup>. Routinely, an easy method to follow up the outcomes of management of voice disorders management done by the phoniatician is one of the important tools to follow any progress. In Egypt, where the study was done, the current population is around 104

million which will definitely have an impact on the health services and the financial income as well. The population projection of the UN Population Division suggest that the population of Egypt might reach 151 million by 2050 (The Egyptian center for public opinion research Baseera, "Population Situation Analysis 2016). Such an inflation will definitely have its significant impact on natural resources and might have serious implications on basic life necessity and poverty. The voice disorders are not considered a critical lethal disorder but still it affects the quality of life which in return will affect the person daily outcomes. From here we thought of a simple, low cost and valid questionnaire that can be applied easily for the Arabic speaking population especially in the developing

countries aside from the different procedures that have been used for voice disorders assessment. There are a lot of questionnaires assessing the voice quality of life aspects for the patients of voice disorders which were developed in English, gradually these measures has been translated and adapted into many languages according to the cultures of the voice researchers<sup>[3]</sup>. One of the well-known developed measures for evaluating the voice quality of life is the Voice Handicap Index (VHI) questionnaire<sup>[4]</sup>. VHI has been translated into many different languages including Arabic<sup>[5]</sup>. The Voice- Related Quality of Life (V-RQOL) is another questionnaire which is easier and less time consuming that has been used in the clinical practice, but it is still not yet translated into a valid and reliable Arabic version<sup>[6,7,8,9,10]</sup>. The V-RQOL is a scale consists of 10 statements, which reflects the effects of voice disorders on patients' quality of life in the form of the physical functioning and social-emotional domains. Large number of authors have tried to accommodate V-RQOL to their own native languages and cultures and have published their results<sup>[11,12,13,14]</sup>.

**AIM OF THE WORK:**

The aim of the work is to translate the original V-RQOL version into Arabic language and to evaluate the validity and reliability of the translated Arabic version of the V-RQOL in order to be used as a valuable test to assess any voice problems influencing the everyday routine duties of the Arabic speaking patients with voice disorders.

**PATIENTS AND METHODS:**

The V-RQOL questionnaire is made up of 10 items. The Items (1, 2, 3, 6, 7 & 9) are covering the Physical functioning domain while the items (4, 5, 8 & 10) are covering the Social-Emotional domain. Items (1 to10) are assessing the total score. Each item is scored on a 1-to 5-point scale. Putting in consideration how severe the problem and how frequent it happens. "1" was chosen when it is not a problem or one, "2" when it is a small amount, "3" for a moderate problem, "4" the problem happens a lot and "5" was chosen when the problem is as bad as it can be. The test lasted around 3 minutes for each subject.

The V-RQOL questionnaire translated version was completed twice by 30 participants with 2 weeks apart to analyze the test-retest reliability. The person completed the

questionnaire by him/herself or if he/she is illiterate, it was done by the help of the caregiver/physician.

The questionnaire was translated from English to Arabic by two doctors both were native Arabic speakers and fluent in English as well. Then the translated copy was revised by another two native Arabic speaking physicians and fluent in English as well.

The questionnaire was applied on 50 controls healthy participants and 100 patients with voice disorders who were recruited from the Phoniatic outpatient clinic of Benha University Hospital, between the period from May 2020 to June 2021.

The inclusion criteria include females and males above 18 years old, dysphonic patients, speaks Arabic as a native language, cooperative, oriented to time & place. While the uncooperative patients with mental or cognitive disorders were excluded (i.e.: dementia) from the study.

Additional to the V-RQOL questionnaire, the participants underwent a full history taking and Full laryngeal assessment and completed the Arabic version -Voice Handicap Index as well.

**Statistical Analysis:**

The research question probed to investigate the validity and the reliability of the developed Arabic version of the adult V-RQOL. The completed forms were entered onto a Microsoft Access database, and analysis was performed by linking the database to an SPSS software package (Version 26.0). Reliability analysis was determined by calculating the Cronbach alpha coefficient<sup>[15,16]</sup> and test-retest reliability. Validity was assessed by evaluation the ability of the instrument to accurately reflect changes in V-RQOL in adults. Criterion validity was assessed by correlating the V-RQOL with the VHI, an instrument that had previously been validated. Chi-square student T test and ANOVA were used to analyze different comparisons.

**RESULTS:**

**Table (1):** This table shows the mean and the standard deviation among all participants comparing the age & sex between the 2 groups (control/health group & patients with voice disorders group) showed non-significant statistical differences between the studied groups regarding age and sex ( $p=0.82$ , and  $0.94$  respectively).

	Control group		Patients with voice disorders group		P value
	No (100)	%	No (50)	%	
Sex					
Male	48	48.0	25	50.0	0.82
Female	52	52.0	25	50.0	
Age					
Mean ± SD	42.09 ± 13.3		38.40 ± 14.06		0.94
Range	15.0-73.0		15.0-75.0		
Median, IQR	39.0, 33.0-51.0		34.5, 27.75-44.25		

**Table (2):** This table shows the standard deviation, median, IQR of the second group (Participants with voice disorders) regarding the onset, duration, habits, inflammatory & neurological causes. The Case group (with voice disorders) have characteristic features as about 15% of them suffered from acute onset with median duration of disease of 3.5 months. Smoking was the habit of 14% of patients. Presence of a mass was diagnosed among 63.6% which was higher than inflammatory and neurological diagnosis (27.1%, and 20.8% respectively). V-RQOL scores constituted 50% excellent scores, 22% V. good, 16% good, 7.0% fair and 5.0% poor scores (Table 2).

	No (100)	%
Onset		
Acute	12	12.0
Acute on top of chronic	3	3.0
Gradual	85	85.0
Duration /m		
Mean $\pm$ SD	14.96 $\pm$ 57.67	
Range	0.25-564.0	
Median, IQR	3.5, 2.0-12.0	
Smoking		
Yes	14	14.0
No	84	84.0
Ex-smoker	2	2.0
Past history		
Bronchial asthma	4	4.0
Cardiac stent	1	1.0
Cancer colon	1	1.0
COVID-19	1	1.0
DM	2	2.0
HTN	4	4.0
GERD	7	7.0
Contraceptive pills	1	1.0
Previous polypectomy	3	3.0
Hyperlipidemia	1	1.0
Mesothelioma	1	1.0
Thyroidectomy	3	3.0
Thyrotoxicosis	1	1.0
NAD	77	77.0
Diagnosis (96)		
Phonasthenia	6	6.3
Hyperfunctional dysphonia	13	13.5
V F polyp	43	44.8
V F immobility	7	7.3
V F cyst	7	7.3
V F reaction	4	4.2
V F polypoid degeneration	2	2.1

Ventricular dysphonia	2	2.1
V F granuloma	2	2.1
Non organic aphonia	2	2.1
Post thyroidectomy paresis	2	2.1
Others -----	9	2.1
Diagnosis (96)		
Inflammatory	26	27.1
Neurological	20	20.8
Mass	61	63.6
V-RQOL		
Excellent	50	50.0
V.good	22	22.0
Good	16	16.0
Fair	7	7.0
Poor	5	5.0

**SD:** standard deviation IQR: inter-quartile range

**Table (3):** This table shows the Reliability data for both questionnaires (VHI and V-RQOL) measures: internal consistency and test-retest reproducibility for domain and total scores. The Cronbach's alpha coefficient for all thirty questions was found to be 0.94. Two domains were recognized in the questionnaire (VHI): 10 questions Physical Functioning domain and 20 questions Social-Emotional domain. The Cronbach's alpha coefficient for the voice Physical Functioning domain is 0.856, and the alpha coefficient for the Social-Emotional domain is 0.925. As regard V-RQOL, two domains were recognized in the questionnaire (V-RQOL): 6 questions of Physical Functioning domain and 4 questions of Social domain. The Cronbach's alpha coefficient for the voice Physical domain is 0.792, and the alpha coefficient for the Social domain is 0.908. The ICC and the Pearson product correlation coefficients are shown in Table 3 for the domains and total scores of both of them (VHI and V-RQOL).

	Cronbach's Alpha	ICC	Pearson product correlation
VHI			
Physical functioning	0.856	0.391	0.373
Social-emotional	0.925	0.362	0.380
Total VHI	0.940	0.335	0.342
V-RQOL			
Physical	0.792	0.367	0.388
Social	0.908	0.706	0.711
Total V-RQOL	0.887	0.421	0.440

ICC: Inter-class correlation

**Table (4):** This table shows mean and standard deviations of VHI and V-RQOL domains (Physical-functioning & Social-emotional) and total scores with respect to patient’s self-assessment of voice quality.

The domain and total scores of the patients according to their self-assessment of voice quality are shown in table 4. There was a highly significant difference in scores across the three categories of both questionnaires. Those who rated their voice as either Poor or Fair had an average VHI Physical Functioning score of 19.35 (SD = 3.30), an average VHI Social- Emotional score of 41.23 (SD = 12.62), and an average VHI Total score of 60.59 (SD = 14.61). Those who rated their voice as Good had mean

scores of 11.06, 26.81, and 37.88 for physical, social, and total VHI respectively. Average excellent and V. good scores for physical, social, and total VHI were 6.22, 16.0, and 22.23 respectively.

Those who rated their voice as either Poor or Fair had an average V-RQOL Physical Functioning score of 18.46 (SD = 2.21), an average V-RQOL Social- Emotional score of 12.29 (SD = 2.78), and an average V-RQOL Total score of 30.75 (SD = 3.23). Those who rated their voice as Good had mean scores of 14.75, 8.13, and 22.88 for physical, social, and total V-RQOL respectively. Average excellent and V. good scores for physical, social, and total V-RQOL were 9.90, 5.30, and 15.14 respectively.

	Excellent	V. good	Good	Fair	Poor	ANOVA test	P value
<b>VHI</b>							
Physical functioning	3.38± 4.23	9.05± 4.39	11.06± 4.09	20.71± 3.15	18.0± 3.46	41.52	<0.001**
Social-emotional	11.62± 7.22	20.41± 9.61	26.81± 6.34	39.86± 5.27	42.6± 19.97	33.05	<0.001**
Total VHI	15.0± 9.73	29.45± 10.48	37.88± 8.55	60.57± 7.66	60.60± 21.57	52.68	<0.001**
<b>V-RQOL</b>							
Physical functioning	8.06± 1.54	11.64± 1.47	14.75± 2.59	16.71± 2.50	20.20± 1.92	99.19	<0.001**
Social Emotional domain	4.32± 0.71	6.27± 1.75	8.13± 2.36	10.57± 1.81	14.0± 3.74	64.31	<0.001**
Total V-RQOL	12.38± 1.69	17.91± 1.41	22.88± 1.45	27.29± 1.38	34.2± 5.07	278.45	<0.001**

**Table (5):** This table shows the mean and standard deviation of the V-RQOL (domains & total scores) by the diagnosis category for voice patients (Inflammatory, Neurological & Mass).

Mean V-RQOL scores by diagnosis categories are listed in Table 5. Mean scores were very similar across the

categories. This indicates that the items in the V-RQOL Measure probe issues that are affected by a broad range of voice disorders and supports the generalized use of the instrument in dysphonic patients.

V-RQOL	Inflammatory		Neurological		Mass		ANOVA test	P value
	Mean (26)	SD	Mean (20)	SD	Mean (61)	SD		
Physical	8.35	6.96	10.3	7.99	7.92	6.59	0.89	0.41
Social	22.31	13.17	17.25	14.11	21.03	12.93	0.89	0.41
Total V-RQOL	30.65	19.15	27.55	20.78	28.95	18.41	0.16	0.86

**DISCUSSION**

In the current study, it showed that the A-VRQOL questionnaire is as valid and reliable tool as the A-VHI for patients with voice disorders. The Cronbach's alpha coefficient for all the 10 questions of V-RQOL and the thirty questions of VHI were 0.879 & 0.94 respectively, which indicates a very good level of reliability of both questionnaires. Comparing the Cronbach's alpha coefficient for the physical functioning domain in both A-VHI & A-VRQOL were 0.856 & 0.792 respectively. While the Cronbach's alpha coefficient for the social emotional domain in both VHI & V-RQOL were

0.925 & 0.908 respectively. These values emphasized the validity & reliability of the questionnaire (Table 3)<sup>[15,16]</sup>. These results agreed markedly with the results of a recent research on the Tamil version of V-RQOL (T-VRQOL), as authors found that the test-retest reliability (one week apart) reached 0.98, indicating a significant degree of test-retest reliability<sup>[17]</sup>.

The result of the current study showed a convergent validity? between the 2 variables (A-VRQOL & A-VHI-30). These findings accomplish the second goal of this study, which was to clarify whether to

use or not the A-VRQOL as a valuable tool. It also provides an important low-priced, rapidly, easily applicable tool for patients with voice disorders in the Arabic developing countries with highest population. The Cross-correlation was done between the A-VRQOL domains (Social-emotional and physical-functional domain) and the A-VHI-30 (physical functional and socio-emotional domain). The results of this study showed a positive correlation between A-VRQOL & A-VHI-30. There was a positive correlation between the physical-functional domain of the A-VRQOL & physical functional domain of the A-VHI-30 ( $r=0.373$ ;  $P<.001$ ) (Table 3). There was a positive correlation between the socio-emotional domain of the A-VRQOL and the socio-emotional domain of the A-VHI-30 ( $r=0.373$ ;  $P<.001$ ).

The findings of Aaby & Heimdal<sup>[13]</sup> were similar to the findings of the current study which showed a strong positive correlation between the VRQOL (Norwegian version) & the VHI. Also, The study by NilleBirk Wulff *et al*<sup>[18]</sup> results were consistent with the current study which determined that the VRQOL (Danish version) is a valuable tool for dysphonic patients' assessment.

In the current study, the A-VRQOL questionnaire and the A-VHI were applied on patients with different voice disorders (vocal fold polyp, cyst, hyper functional dysphonia, ventricular dysphonia, granuloma, etc..) and different onset of symptoms (acute, acute on top of chronic, gradual) not only one voice disorder; However, in contrast to the current study, Hogikyan *et al.* study<sup>[19]</sup>, focused only on organic voice disorders being the unilateral vocal fold paralysis that compared the VRQOL results between the patients with unilateral vocal fold paralysis who underwent Type I Thyroplasty and who were untreated and to the normals only. The study didn't compare the VRQOL results with the VHI results for the same patients. Also Mahmoud, *et al.*<sup>[20]</sup> study where different than ours as they compared the VRQOL results of participants with & without voice problems.

In this study, the average scores of VRQOL & VHI between patients with different voice disorders were nearly similar. While comparing the average results of the 2 variables between the normals and the patients with different voice disorders were significantly low in the voice disorders patients.

## CONCLUSION

The VRQOL is found to be valid and reliable comparing it to the VHI which is suitable for assessing any voice problems influencing the everyday routine duties of the Arabic speaking patients with voice disorders.

## RECOMMENDATIONS

Further research is recommended & mandatory on higher number of participants with different voice disorders to determine whether the VRQOL questionnaire is a valuable, reliable tool and clearly measures the socio-emotional aspects and the physical-functional aspects on large scale of voice disorder patients.

## CONFLICT OF INTEREST

There are no conflicts of interest.

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