

ORIGINAL RESEARCH

Validation and cross-cultural adaptation of the Arabic version of the Ear Outcome Survey-16 (EOS-16)

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Abstract

Background: The Ear Outcome Survey-16 (EOS-16) has been validated according to the health-related quality of life (HRQoL) survey guidelines. It has important compatible aspects in evaluating patients with chronic otitis media (COM) suitable for consultation. This study aimed to develop and standardize the Arabic version of the EOS-16 to be used by clinicians in the Arab world while maintaining the conceptual equivalence.

Methods: A prospective cross-sectional study was conducted in Damascus between July 2023 and November 2023 to develop an Arabic version of the EOS-16. The translation was produced according to the cross-cultural adaptation guidelines. Both experts' and participants' opinions as regards face validity were obtained in this study. Internal consistency was evaluated by the Cronbach alpha coefficient. Test-retest reliability was assessed using the intraclass correlation coefficient (ICC) and Pearson correlation.

Results: A total of 81 patients enrolled in the study, with an average age of 34.75 years and a standard deviation of 11.84 years with a sex ratio of 0.62 for females. All had inactive mucosal COM (dry perforation). The overall score of the EOS-16 survey was 31.72 with a standard deviation of 13.42 suggesting bothering and influencing symptoms in COM patient's daily life. Excellent internal consistency was noted (Cronbach $\alpha = .89$). Robust correlation was found between test-retest overall scores ($r = .90$). Reallocation of the items of the EOS-16 improved the internal consistency of the subdivisions in COM patients.

Conclusion: The Arabic version of the EOS-16 is a simple, clear, reliable, reproducible, and valid HRQoL survey. It is a useful and important instrument that helps physicians in making decisions regarding the patient's treatment and follow-up.

KEYWORDS

Arabic, chronic otitis media (COM), health-related quality of life (HRQoL), otology, translation, validation

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1 | INTRODUCTION

Chronic otitis media (COM) is considered to be one of the most common causes of hearing loss with a wide prevalence ratio between 1% and 46%.¹ COM can be defined as a chronic infection in the middle ear with perforation of the tympanic membrane and secretions that occur continuously or intermittently for more than 2–6 weeks.² According to the World Health Organization (WHO) reports, in 2004 around 65–330 million people in the world were suffering from COM accompanied by otorrhoea, especially in developing countries.³ The prevalence in the adult population in the UK is estimated as 1.5% and 2.6% for active and inactive disease respectively.⁴ A study held in Saudi Arabia⁵ has reported a comparable prevalence ratio of 1.4%. A previous history of insertion of tympanostomy tubes is now probably the single most prognostic aetiological factor for COM in developed countries. The other related factors are recurrent otitis media, older siblings, and attendance at day-care centers whereas, in developing countries, many other prognostic factors are added to this list, from those we mention: poverty, overcrowding, family history, negative smoking, malnutrition, bottle-feeding and being Indigenous.^{6–8}

Hearing loss, otalgia and discharge, vertigo, and tinnitus are symptoms of COM, which can compromise the patient's quality of life and also affect their social communication and professional life.⁹ Health-related quality of life (HRQoL) is defined as “those aspects of self-perceived well-being that are related to or affected by the presence of disease or treatment.”¹⁰ Due to the chronic nature and diversity of symptoms of COM, it became crucial to adopt standardized scales and questionnaires to measure the quality of life in those patients. These metrics would help in evaluating the clinical situation and monitoring the effectiveness of treatment plans as well as for research uses.¹¹

Laakso et al. created the Ear Outcome Survey-16 (EOS-16) as a HRQoL instrument to be used for a wide range of chronic ear diseases such as otitis media with effusion (OME), tympanic membrane perforation, chronic otitis media with/without cholesteatoma, otosclerosis, etc. that makes it versatile and sensitive to several dimensions of otologic diseases. The EOS-16 consists of four subdivisions: (1) ear symptoms, questions 1,2,3,4; (2) hearing impairment, questions 5,7,8,9; (3) psychosocial impact, questions 11,12,13,14; and (4) need for care, questions 6,10,15 and 16. Patients respond to five statements regarding each item on a 5-point Likert-type scale: 0 = no problem, 1 = mild problem, 2 = moderate problem, 3 = severe problem, and 4 = very severe problem. The overall score is obtained by the sum of all items (1–16). EOS-16 has not been translated into any language yet, although it is being validated in everyday otologic practice.¹² Therefore, this study aimed to develop and standardize the Arabic version of the EOS-16 to be in use by clinicians in the Arab world.

2 | METHODS

2.1 | Study design

A prospective cross-sectional study was conducted in Damascus between July 2023 and November 2023 to develop an Arabic version

of the EOS-16 and assess its validity and reliability. The study methodology was reviewed and approved by the scientific committee of the Faculty of Medicine, Damascus University. Written Informed consent was obtained, and all queries were answered.

2.2 | Participants

Patients with inactive mucosal chronic otitis media between 18 and 55 years were included in the study. The distinct nature of the COM was revealed by obtaining a clinical history and performing the microscopic examination and pure tone audiogram (PTA). Pure-tone average values were calculated in dB of the air and bone conduction hearing loss as the mean of the 0.5, 1, 2, and 4 kHz thresholds. Exclusion criteria were patients younger than 18 years, prior ear surgery, physical disability, non-proficiency in Arabic, and hearing loss for other causes than COM, etc.

2.3 | The translation and cultural adaptation of the Arabic version of the EOS-16

The translation and adaptation of the EOS-16 survey were driven by the recommended stages of Beaton et al.¹³ Three bilingual translators wrote separately in the forward translation of the EOS-16 survey into Arabic; two of them were doctors while the other one was an English teacher (naive translator). The same three translators made a synthetic version which was returned to English by two fluent speakers of both English and Arabic languages who were unaware of the original EOS-16 version; by such a process, we ensured that the developed Arabic version reflects the same item content. All translations were reviewed by the authors and an expert committee (composed of Otolaryngologists, language professionals, and a methodologist) to build a consensus among the reports. Thereafter, the Pre-final version of EOS-16 was applied to 15 healthy volunteers in a face-to-face interview to examine their ability to understand the items. Agreement about the adapted EOS-16 was accomplished; we used “I suffered” instead of the general term “I have had” in the first two items. We rephrased “my hearing has worsened” to “my hearing ability decreased” in item number 7. As well for item number 8, we used “My hearing problems increased with noise” in place of “I have had problems hearing because of background noise.” We used “restrict practicing my hobbies” instead of “limit my hobbies” in item number 12. Moreover, we used “the past tense” instead of “the present perfect tense.” This was done to remind any change in the participant's lifestyle and because of its simplicity for the population.

2.4 | Face validity

The Arabic version of the EOS-16 was presented to a jury of experts which consisted of five professors working in the field of Otolaryngology, to obtain their opinions regarding the survey. Each gave a point of 5. After completing the EOS-16 survey at Time 1, five phrases

assessing the face validity of the participants were presented to match the 5-point Likert-type scale; 1 = totally disagree, 2 = disagree, 3 = undecided, 4 = agree, and 5 = strongly agree. These phrases were about; the ease and clarity of the items, the entire problems covered by the EOS-16 items, the probability of future assessment follow-up, the lack of important items, and the privacy violation of the participants.¹⁴

2.5 | Statistical analysis

Statistical computations and analyses were performed using IBM SPSS Statistics version 26 software. Patient's responses were organized and summarized numerically into a relative frequency table to boil down the data and capture the information. Percentages described each unique category. Distribution properties of the survey items, subdivisions overall score, and participants' face validity were estimated by mean and standard deviation. The level of significance was selected at 1% and 5% for testing assumptions.

2.6 | Internal consistency

Cronbach's alpha was conducted to measure the internal consistency within the items group. Acceptable values of 0.70 or over yield no further divisible items set into discrete smaller blocks.¹⁵ Scale mean and variance and alpha, if an item was deleted, were calculated. Corrected item-total correlation of more than 0.3 expressed at least a moderate correlation between an item and the sum of the other items.¹²

2.7 | Construct validity

Construct validity was analyzed using two main components: convergent validity and discrimination validity. Convergent validity was the moderate correlation ($r > .40$) between the items and the four subdivisions of the scale. Discrimination validity was the correlation of the items of each subdivision with each other, which should be greater than the correlations with other items of the other subdivisions. Question number 14 (I feel like my ear problems have negatively affected my quality of life) was considered a general quality of life assessment and thus be used for validation purposes. The hypothesis was that (subjective evaluation requires subjective responses).

2.8 | Test-retest reliability

The test-retest reliability of the EOS-16 items and the overall score was assessed using the intraclass correlation coefficient (ICC), and Pearson correlation respectively. ICC values less than 0.40 can be considered as poor; between 0.40 and 0.59 as fair; between 0.60 and 0.74 as good; and between 0.75 and 1.00 as excellent.¹⁶ Statistical

uncertainty of ICC values was demonstrated using a 95% confidence interval (CI). Precision in maintaining the same conditions as regards time, place and interviewer during the occasions of the interviews was accomplished, thus improving repeatability was assured.

3 | RESULTS

3.1 | Description of the studied population

A total of 81 patients were enrolled in the study, with an average age of 34.75 years, extremes ranging from 18 to 55 years and a standard deviation of 11.84 years. The study sample included 31 (38.3%) men and 50 (61.7%) women. All patients had inactive mucosal COM (dry perforation). The majority of perforations were non-marginal with a percentage of 97.3% (central 54.1%, posterior 27% and anterior 16.2%). The left ear was affected by 43.2%, the right ear by 33.3% and both ears by 23.5%. More than half of the participants, 53.09%, had a duration of evolution less than 5 years, while 20.99% and 25.92% of the patients had between 5 and 10 years and more than 10 years respectively. All participants had performed PTA and had an air-bone gap according to the audiogram data (Table 1).

3.2 | Face validity

The five professors approved the final version of the Arabic EOS-16 after making the suggested modifications; the scores were 5, 5, 4.5, 4.5, and 4, resulting in an average total score of 92%. They assured the relevance, simplicity, and clarity of the Arabic version of the survey.

The participants agreed with the clarity, easy understanding, and comprehensive assessment of the items and most would like to follow up on their condition in the future. They disagreed about lacking important items, suggesting that the Arabic version of the EOS-16 addressed the symptoms and problems associated with ear disorders. Finally, almost all participants announced that the EOS-16 items did not violate their privacy. Participants' face validity of the EOS-16 survey is shown in (Table 2).

4 | THE ARABIC VERSION OF THE EAR OUTCOME SURVEY-16 (TABLE A1)

4.1 | Description of the EOS-16 survey

The average time of introduction of the survey was about 5 min. The total responses for each question are described in (Table 3). The mean overall score of the EOS-16 survey was 31.72 with a standard deviation of 13.42. The scores of the four subdivisions of the EOS-16 were 6.01, 8.09, 10.15, and 7.47 with respectively standard deviations of 4.28, 4.49, 4.64, and 3.54 (Figure 1). All subdivisions were rated at least a moderate problem and suggested bothering and influencing

TABLE 1 Descriptive audiometric data.

		Worse ear			Better ear		
		Air threshold	Bone threshold	Air-bone gap	Air threshold	Bone threshold	Air-bone gap
One-side affected	Mean	36.84	12.73	24.11	20.89	11.20	9.69
	SD	11.81	6.21	8.37	11.60	5.32	9.57
	Min	15.00	2.50	6.25	5.00	1.25	0.00
	Max	58.75	27.50	41.25	53.75	25.00	37.50
Both-side affected	Mean	40.54	13.66	26.88	39.82	13.00	26.82
	SD	8.20	7.23	4.70	9.91	7.05	6.61
	Min	30.00	5.00	18.75	22.50	0.00	15.00
	Max	58.75	27.50	32.50	56.25	25.00	38.75

Abbreviations: Max, maximum; Min, minimum; SD, standard deviation.

TABLE 2 Descriptive statistics for participants face validity.

	Mean	SD	Totally disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly agree (%)
1. The ease and clarity of the items.	4.08	0.7	1.7	1.7	5.0	70.0	21.7
2. The entire problems covered by the EOS-16 items.	4.13	0.68	0.0	1.7	11.7	58.3	28.3
3. The probability of future assessment follow-up.	3.95	0.81	0.0	5.0	20.0	50.0	25.0
4. The lack of important items.	1.72	0.49	30.0	68.3	1.7	0.0	0.0
5. The privacy violation of the participants.	1.38	0.52	63.3	35.0	1.7	0.0	0.0

Abbreviation: SD, standard deviation.

TABLE 3 Total responses for each question.

Question	Mean	SD	No problem (%)	Mild problem (%)	Moderate problem (%)	Severe problem (%)	Very severe problem (%)
Pain (Q1)	1.37	1.33	37	19.8	19.8	16	7.4
Itch (Q2)	1.54	1.3	28.4	22.2	25.9	13.6	9.9
Pressure (Q3)	1.44	1.49	42	13.6	16	14.8	13.6
Moisture (Q4)	1.65	1.45	32.1	17.3	17.3	19.8	13.6
Tinnitus (Q5)	2.01	1.37	19.8	17.3	21	25.9	16
Dizziness (Q6)	1.4	1.41	37	23.5	14.8	12.3	12.3
Hearing loss (Q7)	2.19	1.22	11.1	14.8	35.8	21	17.3
Hearing with noise (Q8)	2.22	1.46	18.5	16	14.8	25.9	24.7
Sound localization (Q9)	1.67	1.35	25.9	24.7	16	23.5	9.9
Protection from water (Q10)	2.51	1.41	14.8	9.9	16	28.4	30.9
Daily challenges (Q11)	2.27	1.46	17.3	16	16	23.5	27.2
Hobbies limitation (Q12)	2.01	1.45	23.5	13.6	21	22.2	19.8
Worsen symptoms (Q13)	3.2	1.08	3.7	3.7	16	22.2	54.3
Impact on HRQoL (Q14)	2.67	1.36	13.6	3.7	21	25.9	35.8
Doctors consultation (Q15)	2.19	1.47	18.5	18.5	13.6	24.7	24.7
Ear drops (Q16)	1.38	1.37	37	22.2	14.8	17.3	8.6

Abbreviations: Q, question, SD, standard deviation.

FIGURE 1 Mean and standard deviation of the scores obtained for the subdivisions of the EOS-16.

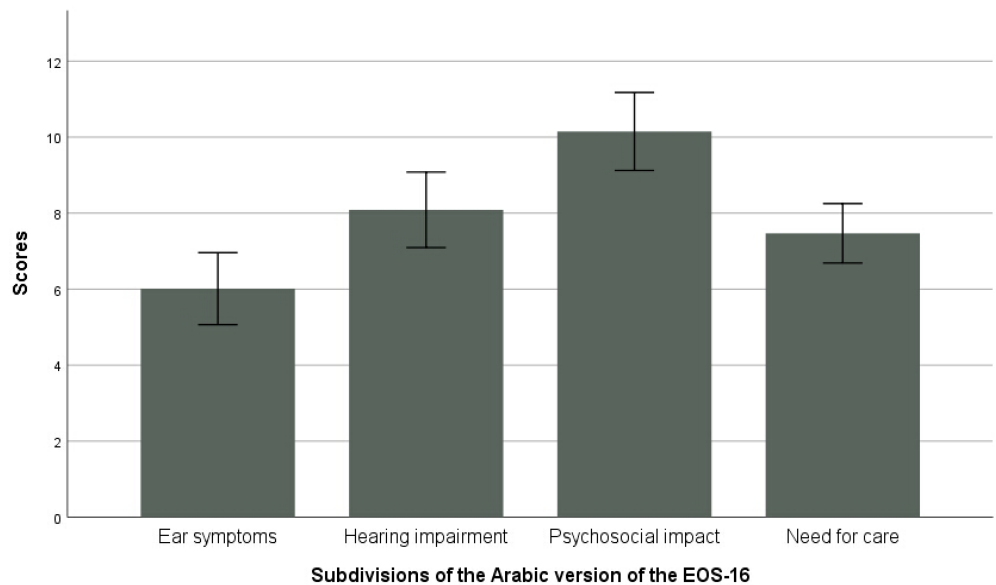


TABLE 4 The mean scores of Ear Outcome Survey-16 items and the correlations of item-to-item, subdivisions, and internal consistency.

Subdivisions/ Questions	Scale mean if item deleted	Scale variance if item deleted	Corrected item- total correlation	Cronbach's Alpha if item deleted	Cronbach's Alpha (total values) T1	Cronbach's Alpha (total values) T2
Total					0.89	0.91
I Ear symptoms					0.77	0.80
Q1	30.35	158.9	0.58	0.88		
Q2	30.17	167.34	0.33	0.89		
Q3	30.27	154.35	0.63	0.88		
Q4	30.06	158.31	0.54	0.88		
II Hearing impairment					0.85	0.83
Q5	29.7	160.44	0.51	0.88		
Q7	29.53	158.95	0.64	0.88		
Q8	29.49	151.4	0.74	0.87		
Q9	30.05	157.92	0.60	0.88		
III Psychosocial impact					0.88	0.89
Q11	29.44	152.9	0.69	0.87		
Q12	29.7	157.09	0.57	0.88		
Q13	28.52	162.73	0.59	0.88		
Q14	29.05	151.92	0.78	0.87		
IV Need for care					0.48	0.64
Q6	30.32	159.67	0.52	0.88		
Q10	29.21	159.89	0.51	0.88		
Q15	29.53	167.98	0.26	0.89		
Q16	30.33	171.32	0.19	0.89		

Abbreviations: Q: Question, T1: Time 1, T2: Time 2 (after 14 days).

Question	Ear symptoms	Hearing impairment	Psychosocial impact	Need for care
Q1	0.77**	0.43**	0.39**	0.45**
Q2	0.74**	0.25*	0.12	0.19
Q3	0.80**	0.49**	0.50**	0.40**
Q4	0.77**	0.37**	0.36**	0.45**
Q5	0.35**	0.77**	0.37**	0.33**
Q6	0.46**	0.51**	0.34**	0.59**
Q7	0.44**	0.82**	0.48**	0.44**
Q8	0.52**	0.89**	0.64**	0.37**
Q9	0.36**	0.84**	0.55**	0.28*
Q10	0.34**	0.37**	0.64**	0.51**
Q11	0.37**	0.64**	0.87**	0.45**
Q12	0.37**	0.39**	0.87**	0.35**
Q13	0.37**	0.42**	0.82**	0.38**
Q14	0.48**	0.67**	0.90**	0.50**
Q15	0.24*	0.15	0.14	0.71**
Q16	0.19	0.04	0.09	0.70**

Abbreviation: Q, question.

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

symptoms in the COM patient's daily life to make potential surgical decisions more appropriate.

4.2 | Internal consistency of the Arabic version EOS-16 survey

The overall internal consistency of the Arabic EOS-16 items, as measured by Cronbach α , was satisfactory for both time points (Cronbach $\alpha = .89$ for time 1 and $\alpha = .91$ for time 2). There was no significant change in Cronbach's alpha coefficients if the item was deleted or when repeated for the second time T2 (after 14 days). The item-Total Correlation (ITC), corrected for overlap with the scale total, was above 0.3 for all items except for questions 15 and 16 (Table 4).

4.3 | Construct validity

The scores for the EOS-16 items were significantly correlated with the subdivisions (internal correlation). Convergent and discrimination validity was assured for all of the subdivisions except for the need for care subdivision. The general question number 14 correlated well ($r > .40$) with all of the subdivisions (Table 5).

4.4 | Test-retest reliability

The retest survey was completed by 39 of the 81 COM patients 2 weeks after the first survey. The results indicate good to excellent

TABLE 5 Correlations between the scores of the EOS-16 items with the subdivisions (internal correlation).

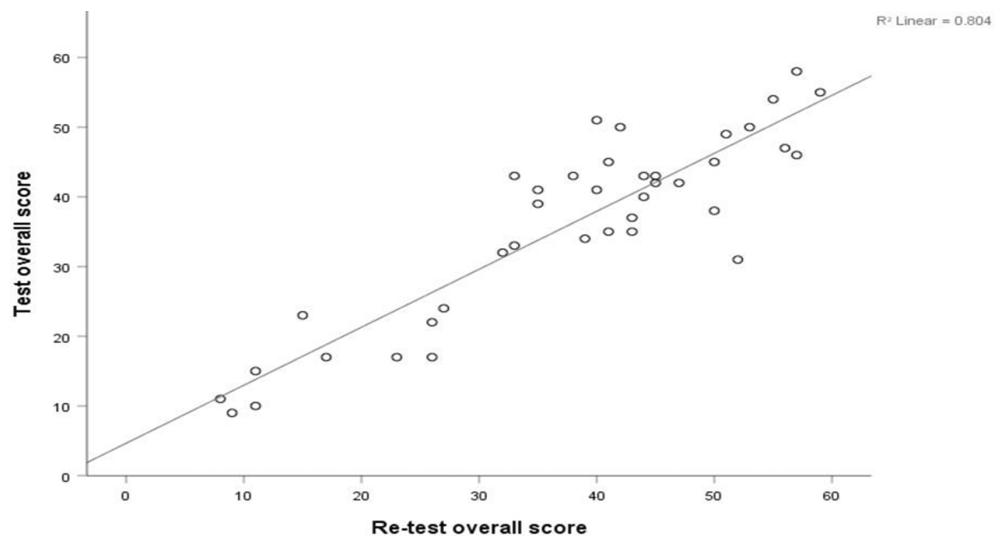
TABLE 6 Test re-test reliability of the EOS-16 items.

Item	ICC	95% CI	Sig
Q1	0.878	0.767 0.936	0.000
Q2	0.620	0.276 0.801	0.002
Q3	0.700	0.428 0.843	0.000
Q4	0.632	0.298 0.807	0.001
Q5	0.742	0.507 0.865	0.000
Q6	0.843	0.701 0.918	0.000
Q7	0.904	0.817 0.950	0.000
Q8	0.825	0.666 0.908	0.000
Q9	0.856	0.726 0.925	0.000
Q10	0.876	0.764 0.935	0.000
Q11	0.730	0.486 0.859	0.000
Q12	0.733	0.490 0.860	0.000
Q13	0.788	0.595 0.889	0.000
Q14	0.940	0.886 0.969	0.000
Q15	0.934	0.873 0.965	0.000
Q16	0.874	0.759 0.934	0.000

Abbreviation: Q, question.

correlations (>0.7) using the intraclass correlation, which means good to excellent test-retest reliability. All ICCs were statistically significant ($p < .001$) except for items 2 and 4, which indicates that the pre-test scores were significantly associated with the post-test scores (Table 6). A robust correlation was found between the test-retest overall score ($r = .90$) (Figure 2).

FIGURE 2 Test re-test overall scores correlation.



5 | DISCUSSION

The concept of health-related quality of life has gradually gained large consensus to monitor the health of the population, allocate resources concerning need, diagnose the nature, severity, and prognosis of disease, and most importantly, evaluate the treatment's effectiveness.¹⁰ There are few HRQoL measures suitable for the developing world. It is essential to invest in these measures to guide health interventions.¹⁷ This study highlights the important role of the EOS-16 survey in evaluating patients' daily lives affected by COM, including ear symptoms, hearing impairment, psychosocial impact, and the need for care. The objective of cross-cultural adaptation is to remove the difficulties that prevent the optimal transfer of the semantic, idiomatic, experiential, and conceptual content of the original article.¹⁸

The choice of the EOS-16 survey was motivated by its important compatible aspects in evaluating COM patients by including subjective assessment of the severity of perceived problems. The ease and short time required for administration were additions supporting its use in consultation. Significant measurements have been revealed through the Arabic version of the EOS-16 that can be taken as a reference to evaluate the COM patients at least in the Middle East region and to take into account the calculated clinical scores above which the intervention can be considered satisfactory for the patient and the doctor.

The development of the Arabic version of the EOS-16 survey followed the standard steps for the translation of instruments. It was conducted on a population of 81 individuals and showed good psychometric properties for both time points. Internal consistency for the whole survey was excellent with an alpha coefficient of Cronbach being 0.89. The overall internal consistency in the original study was >0.8. The original research was conducted on patients with a wide variety of illnesses which all have been excluded from our population except for COM disease.

The internal consistency for EOS-16 subdivisions was adequate. However, regarding the "need for care" subdivision, it was a little bit unacceptable (Cronbach alpha 0.48), such a finding can be attributed

to the fact that water precautions restrict daily life and practicing hobbies; However, it has a limited clinical benefit and latent importance on the postoperative outcomes. In addition, it does not cause a significant change in the rates of seeking medical advice or using ear drops.^{19,20} Bächinger et al. developed and validated the Zurich chronic middle ear inventory (ZCMEI-21) questionnaire to quantify HRQoL in 76 patients with COM. They involved the protection of the ear from water in the activity limitations subdivision and medical consultations and ear drops in the medical resources subdivision.²¹ Similar methods and results were found between our and their study regarding means and standard deviations for items, subdivisions, Item-total correlations, and Cronbach's alpha. A strong correlation was found between means scores of the items of our and their studies, indicating that the data and the survey were very representative and convenient to the COM patients.

Question number six is best correlated with hearing impairment and the need for care subdivisions but because of its similarity in mean and standard deviation with the ear symptoms subdivision's items, thus, it will be added the ear symptoms subdivision similar to the Bächinger et al study.²¹ It seems wise to reallocate the items of the subdivisions for the COM patients to be in the following arrangement: ear symptoms subdivision: Q1, Q2, Q3, Q4, and Q6, hearing impairment subdivision: Q5, Q7, Q8, and Q9, psychosocial impact subdivision: Q10, Q11, Q12, 13 and Q14 and need for care subdivision: Q15 and Q16. Thereafter, it improves the internal consistency of the subdivisions (Table 7). Although the Item-total correlation for questions 15 and 16 was less than 0.3, elimination did not proceed at this stage of the adaptation as our experts had considered these questions a useful part of the clinical record, similar to Phillips et al study.²²

The test-retest reliability of the Arabic version of EOS-16 was also acceptable (intraclass correlation coefficient [ICC] ranged between 0.62 and 0.94 for the EOS-16 items Table 5, with these findings, the results of the translated version are representative and stable between measurements taken at the time of the first and second surveys); moreover, they remain unaffected by factors such as the

TABLE 7 The mean scores of Ear Outcome Survey-16 items and the correlations of item-to-item, subdivisions, and internal consistency after reallocation.

Subdivisions/ Questions	Scale mean if item deleted	Scale variance if item deleted	Corrected item- total correlation	Cronbach's Alpha if item deleted	Cronbach's Alpha (total values) T1	Cronbach's Alpha (total values) T2
Total					0.89	0.91
I Ear symptoms					0.78	0.84
Q1	30.35	158.9	0.58	0.88		
Q2	30.17	167.34	0.33	0.89		
Q3	30.27	154.35	0.63	0.88		
Q4	30.06	158.31	0.54	0.88		
Q6	30.32	159.67	0.52	0.88		
II Hearing impairment					0.85	0.83
Q5	29.7	160.44	0.51	0.88		
Q7	29.53	158.95	0.64	0.88		
Q8	29.49	151.4	0.74	0.87		
Q9	30.05	157.92	0.6	0.88		
III Psychosocial impact					0.89	0.91
Q10	29.21	159.89	0.51	0.88		
Q11	29.44	152.9	0.69	0.87		
Q12	29.7	157.09	0.57	0.88		
Q13	28.52	162.73	0.59	0.88		
Q14	29.05	151.92	0.78	0.87		
IV Need for care					0.79	0.81
Q15	29.53	167.98	0.26	0.89		
Q16	30.33	171.32	0.19	0.89		

Abbreviations: Q, question; T1, time 1; T2, time 2.

memory of the responder, hence increasing the accuracy of the survey. Nevertheless, itch and moisture were not reliable items either because of the intermittent mucoid discharge provoked by water or by blockage of the Eustachian tube or ear-washing habit which is supposed to increase the moisture levels associated with ear itch.^{23,24}

Finally, because of the absence of agree-upon criteria “the gold standards” for validating health measures, this survey can give normative values for COM patients that can be used in clinical practice and research settings. Further studies should investigate the usefulness of the Arabic version of EOS-16 in evaluating the quality of life and treatment outcomes in patients with other chronic ear diseases. A potential limitation is the inclusion of one country. Therefore we recommend performing an adaptation for this version before using it locally by any other population. Another limitation warrants the suitability of the survey for patients above 55 years old.

6 | CONCLUSION

The Arabic version of the EOS-16 is a simple, clear, reliable, reproducible, and valid survey. It is a useful adjunct to the patient history-taking process by which the Health-related quality of life (HRQoL) in

patients with COM can be assessed. Thus, be an important instrument that helps physician in making decisions regarding the patient's treatment and follow-up.

ACKNOWLEDGMENTS

The authors sincerely appreciate the valuable contributions made by Dr. Abdulrahman Awad, Dr. Abdulmajeed Yousfan, Dr. Areej Alassaf, and Dr. Tamar Salloum Yared and acknowledge their crucial efforts with this research.

FUNDING INFORMATION

The authors received no financial support for the research, authorship, and/or publication of this article.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

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How to cite this article: Azar A, Mohsen S. Validation and cross-cultural adaptation of the Arabic version of the Ear Outcome Survey-16 (EOS-16). *Laryngoscope Investigative Otolaryngology*. 2024;9(4):e1304. doi:[10.1002/lio2.1304](https://doi.org/10.1002/lio2.1304)

APPENDIX A

TABLE A1 The validated Arabic version of the Ear Outcome Survey-16 (EOS-16).

الإصدار 1.1					استبيان نتائج الأذن-16
التاريخ:					الاسم:
					رقم التعريف الشخصي:
فيما يلي قائمة بالأعراض والمشاكل المرتبطة باضطرابات الأذن. بمساعدة الاستبيان، سنتكمن من تحديد شدة المشكلة وتأثيرها على جودة حياتك.					
مشكلة شديدة جداً	مشكلة شديدة	مشكلة معتدلة	مشكلة خفيفة	لا مشكلة	حدد مستوى الصعوبة الذي يصف مشاكلك بدقة خلال الأشهر الثلاثة السابقة. - إذا كان لديك أعراض في كلتا الأذنين، أجب عن الأسئلة المتعلقة بالأذن ذات الأعراض الأشد. - في حال قمت بملء الاستبيان بعد تجربة علاجية لإحدى الأذنين، يرجى الإجابة عن الأذن المعالجة.
4	3	2	1	0	1. عانيت من ألم في أذني.
4	3	2	1	0	2. عانيت من حكة في أذني.
4	3	2	1	0	3. كنت أشعر بضغط في أذني.
4	3	2	1	0	4. كنت أشعر برطوبة في أذني.
4	3	2	1	0	5. كنت أسمع صوت طنين أو رنين أو وشيش في أذني.
4	3	2	1	0	6. كنت أعاني من الدوخة أو اختلال التوازن.
4	3	2	1	0	7. انخفضت قدرتي السمعية.
4	3	2	1	0	8. ازدادت معائتي السمعية مع وجود الضجيج.
4	3	2	1	0	9. كنت أواجه صعوبة في تحديد اتجاه الصوت.
4	3	2	1	0	10. كانت حماية أذني من الماء تقيد حياتي (تحدد أنشطتي).
4	3	2	1	0	11. بسبب مشاكل أذني، أواجه صعوبات في حياتي اليومية في المدرسة أو في العمل.
4	3	2	1	0	12. كانت الأعراض المتعلقة بأذني تقيد ممارستي لهواياتي.
4	3	2	1	0	13. أخاف أن تزداد الأعراض المتعلقة بأذني في المستقبل.
4	3	2	1	0	14. أشعر أن مشاكل أذني أثرت بشكل سلبي على جودة حياتي.
فوق 4 مرات	3-4 مرات	مرتان	مرة واحدة	والأمر	حدد الخيار الذي يصف حالتك بدقة خلال الأشهر الثلاثة السابقة.
4	3	2	1	0	15. راجعت الطبيب بسبب مشاكل في أذني.
4	3	2	1	0	16. استخدمت قطرات أذن من المضادات الحيوية (حسب وصفة الطبيب).

المجموع النهائي: