

WHO's oral health assessment questionnaire for adult: psychometric properties of the Arabic version

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Objective It has been well recognized that, oral health is more than beautiful teeth. Mouth has been considered to be the mirror of whole body, as much as a healthy mouth means healthy body. Given the epidemic status of oral diseases, monitoring the oral health status is essential for oral health promotion. The World Health Organization (WHO) have provided standard epidemiological survey methodology that requires systematic oral examination, data collection and recording system. Language barrier may be a reason to hinder extensive use of such important instruments in countries where English language is not predominantly used. Therefore, our aim was to standardize an Arabic translation of the WHO instrument for wide spread use in many nations around the world. This would improve the standardization and quality of the oral health data in Arabic speaking countries.

Methods Initially, the forward translation of WHO Oral Health Assessment questionnaire for adults was conducted from English to Arabic language. Backward translation of Arabic version to English language was done by professional English translator and the result was compared with original text to identify differences. A nominal group technique (NGT) was used in order to obtain expert's opinion from a group of ten specialists who also helped to culturally adapt the questionnaire.

Results The content validity index and ratio was calculated. After few recommended adjustments the final Arabic version was produced. After removing one question the overall impact score of the questionnaire improved considerably to acceptable level. When computing the internal consistency coefficient, it was found to be 0.88 for the subscales (which means good to excellent).

Conclusion The results of this study prove that, the Arabic version of the WHO Oral Health Survey Questionnaire is reliable instrument to be used for oral health evaluation of adults among Arabic speaking populations.

Keywords psychometric, oral health, survey, questionnaire, validity, adults

Introduction

It has been well recognized that oral health is more than beautiful teeth. Mouth has been considered to be the mirror of the whole body, as much as the healthy mouth means a healthy body. The oral-systemic disease relationship is well established in scientific literature.¹ Therefore, it is very important to closely monitor the oral health status to continuously prevent the incidence of oral diseases and promote oral health and the quality for individuals and communities. As reported by most countries around the world, oral diseases are considered as the major public health issues globally.² In order to better control this epidemic condition, the World Health Organization (WHO) has provided standard epidemiological survey methodology requirements for systematic oral examination, standard data collection, and recording system.^{3,4} On the other hand, the language barrier may be a reason to hinder the extensive use of such an important instrument in countries where English language is not predominantly used. Therefore, our aim was to make an Arabic translation of the instrument available for use in many nations around the world. This would improve the standardization and the quality of the research as well as making more comparable data available for better understanding of the oral health situation in Arabic-speaking countries. Likewise, it can help with the standardized reporting of different interventions conducted in those countries.

WHO Oral Health assessment questionnaire for adult

This questionnaire is published as a part of the "Oral health surveys basic methods, 5th edition" by the World Health Organization in 2013.⁵ This tool is particularly designed for self-reporting of individual's oral health information. Aside from demographic information, the rest of the questions are pertaining to risk and protective factors for individual's oral health outcomes as well as the frequency of personal oral hygiene and the utilization of oral health services. Other information such as socioeconomic status, place of residence, frequency of sugar intake and participation in any specific oral health program are inquired. The 16 primary items in this tool were assessed individually based on different responses. For more efficient use of this instrument, the WHO has encouraged countries to culturally adapt with necessary adjustments if needed.

Methods

The forward translation of WHO Oral Health Assessment questionnaire for adults was conducted into Arabic language. This step was followed by backward translation of this document into English language by professional English language translator. The English translation was compared with original text of the questionnaire to identify differences. Few items were slightly

adjusted or modified based on professional recommendations. For using nominal group technique (NGT) a professional committee of 11 specialists was formed.

Meetings were held by two professional translators, two psychologist, five dental public health specialists and two epidemiologists in order to evaluate and culturally adapt the pre-final version of Arabic questionnaire. After linguistic and cultural adaptation, the final Arabic version of the WHO Oral Health Assessment questionnaire for adults was finalized with complete experts' consensus.

Statistical analysis

For the calculation of the content validity index (CVI) and content validity ratio (CVR) for the questionnaire, an expert panel composed of eight specialists in dental public health and pediatric dentistry were asked to provide comments independently on the necessity of each question was evaluated: (a) not necessary, (b) useful, (c) essential; as well as relevancy, clarity and simplicity of each question. Using a three-point rating scale, the CVR for the total scale was calculated following the expert's final evaluation. According to Lawshe table, an acceptable CVR value for eight expert panels is 0.75.⁶ Based on the proportion of rating by experts for each item, the CVI was computed.⁷ Polit and Beck recommended 0.80 as the acceptable lower limit for the CVI value (e.g. 6 of 8 experts should rate 3 or 4).⁷

By using qualitative and quantitative methods, the face validity of the questionnaire was assessed. In the qualitative stage, 25 adults were asked to evaluate the questionnaire in terms of potential difficulties in responding to the Arabic version of the Oral Health Questionnaire. In the quantitative stage, the impact score (frequency \times importance) was computed to determine the percentage of adults who identified the item was important or quite important. The items related with an impact score of equal or greater than 1.5 (corresponding to mean frequency of 50% and a mean importance of 3 on a 5-point Likert scale) were considered appropriate.

An exploratory factor analysis was carried out to define the underlying constructs of the questionnaire, followed by principle components analysis with varimax rotation.

The reliability of the questionnaire was measured by the difference in a score that eventually shows the true score, rather than the random error to the extent that measures provide consistent results. There are two common forms of reliability methods. The internal consistency of a scale relates to its homogeneity, where the higher the coefficient value, the higher the reliability and the lower the standard error of measurement. The internal consistency was assessed with a Cronbach's alpha coefficient that ranges between 0 and 1. The values equal to or less than 0.7 indicate satisfactory internal consistency.⁸ The test-retest reliability measures stability over time, when applying the same test to the same subjects at different points of time. To perform this test, a total of 25 adults were randomly selected from the Arabic-speaking population to complete the Arabic version of the oral health survey questionnaire. This process was repeated 2 weeks later, using exact same manner as the first round. The estimate of intra-class correlation coefficient was calculated to determine the reliability of the scale using test-retest method. In order to interpret the agreement levels, the following categories were selected: "0.0–0.2" for small level, "0.21–0.40" for fair level, "0.41–0.60" for moderate level, "0.61–0.80" for substantial level and "0.81–1" for almost perfect level.⁹

Results

After conducting NGT method, the culturally adapted final Arabic translation of questionnaire was available. Out of 16 original questions, only one question related to Alcohol use was excluded. The remaining questions were related to oral health self-assessment (7 questions), accessibility to dental treatment (2 questions), diet (1 question) and socio-economic status (3 questions). The rest of the findings are reported as follows:

a) Content validity: When considering the total scale, the mean score for content validity index (CVI) was 0.9, demonstrating acceptable result. However, the content validity ratio (CVR) of the question number 15 was found to be lower than expected indicating that this question does not have the optimum level content validity. After exclusion of this question, the overall CVR was 0.81, which was at the satisfactory level based on Lawshe table. A few items were slightly adjusted or modified based on recommended professional reviews. When consensus was reached on semantic, idiomatic, and conceptual equivalence, the final Arabic version was produced.

b) Face validity: The impact score was computed for face validity assessment. The index was found to be equal or greater than 1.6 (range: 1.7 – 4.8) except for question (15). After removing this question, the overall impact score of the questionnaire improved considerably (3.5) to a satisfactory level. At this stage, the qualitative face validity was recognized by all participants by declaring that they had no ambiguity in reading questions and comprehending them.

c) Reliability: The Cronbach's alpha coefficient was calculated in order to evaluate the internal consistency and reliability for this questionnaire. The calculated value was 0.85 with subscales ranged from 0.75 to 0.91 which were beyond the acceptable thresholds. After computing the internal consistency coefficient (ICC), it was found to be 0.88 and the values were 0.72–0.91 for the subscales (which means good to excellent). These findings confirm the steadiness of the Arabic version of WHO questionnaire.

Confirmatory Factor Analysis (CFA): The principal component factor analysis was used to analyze questionnaire. The Comparative Fit Index (CFI) and Square Error of Approximation were computed. The CFI was 0.89 and RMSEA was 0.041. Also, the confidence interval was less than 0.01, which demonstrates the existence of correlation between variables. Therefore, these analyses confirmed the suitability of the data.

The results of CFA for five-factor model for WHO Oral Health Survey questionnaire indicated satisfactory fit of the suggested model. The factors were as followed:

- i. Factor 1 (Oral health self-assessment) including 7 items (item 3, 4, 5, 6, 7, 8, 9).
- ii. Factor 2 (Accessibility to dental treatment) including 2 items (item 10, 11).
- iii. Factor 3 (Diet) including 1 item (item 13).
- iv. Factor 4 (Socio-Economic status) including 3 items (item 12, 14 and 16).

Discussion

When translating a questionnaire into another language, it must accurately reflect the content and the intent of the Original toll; so that the translated questions contain the same meaning as the Original version. It's also important to ensure the quality and cultural appropriateness of the translated instrument into

new language. Similarly, it is important that the translated name of the instrument demonstrates adequate psychometric properties in terms of validity and reliability.

Oral health disparities are mainly related to lifestyle and many other factors. This condition is considered as a major public health problem. Millions of children and adults are affected and based on available reports, the burden of oral diseases is very prominent globally.¹⁰ Using standard surveillance system for oral health status and programs is highly crucial for better oral health care, maintenance, as well as oral disease prevention, protection and promotion for individual and communities over time.^{3,4} Other potential benefits of such system would be the availability of data for administrators and decision makers for using the most cost-effective plan and make the best use of resources towards oral health promotion.¹¹

On the other hand, the availability of standard Arabic version of WHO recommended instrument may facilitate the generation of quality standard data in many Arabic-speaking

countries. In general, our results support the standardization (reliability and validity) of the Arabic version of the WHO Oral Health survey questionnaire.

Conclusion

The results of this study prove that, the Arabic version of the WHO Oral Health survey questionnaire is reliable tool to be used as a self-reported instrument for evaluating oral health among population in Iraqi and other Arabic speaking countries. This 15 digit Arabic version of the WHO Oral Health Survey Questionnaire will improve measuring the oral health status of the Iraqi people as well as other Arabic-speaking nations around the world.

Conflicts of Interest

There are no conflicts of interest. ■

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