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**Research Article**

# Exploring The Difficulties Of Cross-Cultural Adaptation: An Overview Of The A-Soho-5 Study

Fatema Alhammadi[1*], Aziza Eldarrat[2], Basaruddin Bin Ahmad[3], Sarliza Yasmin Bt Sanusi[4], Mohd Zulkarnain Bin Sinor[5]

[1*]School of Dental Sciences Health, University Sains Malaysia (USM), Kelantan, Malaysia
[2]College of Dentistry, University of Science & Technology of Fujairah (USTF), Fujairah, UAE
[3]School of Dental Sciences Health, University Sains Malaysia (USM), Kelantan, Malaysia
[4]School of Dental Sciences Health, University Sains Malaysia (USM), Kelantan, Malaysia
[5]School of Dental Sciences Health, University Sains Malaysia (USM), Kelantan, Malaysia

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**ABSTRACT**

**Aim:** To describe pilot testing of the Scale of Oral Health Outcomes for 5-year-old children (SOHO-5), including the evaluation of its psychometric properties subsequent to its Cross-Cultural Adaptation (CCA) to the Arabic language.
**Methodology:** A pre-test was conducted among 32 pairs of five-year old children and their parents total of 64 participants. Reliability assessment was through computing Cronbach's alpha coefficient and assessing inter-item correlation, and Item-total score correlation. Construct Validity was assessed using pearson's correlation to examine associations between total score of the draft Arabic-SOHO-5(A-SOHO-5) and the original version of SOHO-5. Face validity was assessed by gathering participant feedback on the relevance and appropriateness of A-SOHO-5 items. Content validity was established through the insights of experts engaged in both the synthesis process and the final expert committee.
**Results:** Both the child self-report and parental proxy report versions of the questionnaire exhibited satisfactory face validity. Cronbach's alpha scores were 0.93 and 0.72 for the child and parental questionnaires, respectively. The inter-item correlations were positively correlated for both versions of the questionnaire, with the exception of one item in the parent's version. The item-total correlations were positive in both versions and exceeded the arbitrary threshold of 0.20. Parent's A-SOHO-5 scores showed significant associations withthe original Scale of English SOHO-5 (E-SOHO-5).
**Conclusion:** This study established the validity and reliability of the A-SOHO-5 as a suitable measure for Oral HealthRelated Quality of Life (OHRQoL) among Arabic-speaking five-year-old children in the United Arab Emirates (UAE).

**Keywords:** Validity, Reliability, Psychometric Properties, Oral health, Quality of life

## Introduction:

In the majority of developed countries, dental caries remains a significant oral health issue, impacting 60-90% of schoolchildren(1). Among preschool children, over 90% of caries cases go untreated, with toothache being prevalent in both developed and developing countries(2). In the UAE, dental caries is highly prevalent, particularly among children aged 5 to 6 years, compared to 12-year-olds. For instance, in Abu Dhabi, the prevalence of dental caries among children aged 4 to 6 years ranged from 78.85% to 95%, while in Ajman, the prevalence ranged from 72.9% to 76.1%(3).
The repercussions of untreated dental caries significantly affect a child's quality of life. The presence of persistent pain, discomfort, compromised dietary intake, irritability, sleep disturbances, increased hospitalizations, limitations in daily activities, and frequent school absenteeism all contribute to a notable decline in their overall well-being and quality of life(2,4). Therefore, measuring of OHRQoLshould be one of the primary outcomes of oral health services evaluation(5).

OHRQoL is a multidimensional concept that encompasses various aspects, including individuals' comfort during daily activities, and social interactions, their self-esteem, and their satisfaction regarding oral health(4,6). Although the significance of assessing the OHRQoL in preschool children has been recognized, the development of suitable instruments for this age group has occurred later compared to tools designed to assess the OHRQoL of older children and adults(5-8). This stems from the difficulties in creating measures tailored to this age group. Children's perspectives are moulded by their experiences, family dynamics, and the broader social environment. Their comprehension of illness and health is contingent on age-related factors, encompassing, emotional, linguistic, social and cognitive development(5). Hence, parents or caregivers have traditionally acted as proxies in evaluating OHRQoL of pre-school children (7). Yet, recent evidence indicates that children aged 4-6 can provide reliable reports on more tangible aspects of their overall health and quality of life, including pain and dysfunction (5). Consequently, numerous instruments to assess the OHRQoL of preschool children have been developed recently(7). One such measure is the SOHO-5, which was specifically developed to assess the OHRQoL of preschool children in in the United Kingdom(5). It includes evaluations from both the child's and parent's perspectives.

To be employed in a population with a distinct language and culture, an instrument must undergo both CCA and psychometric evaluation(9). CCA includes translation and the consideration of any disparities between the source and target cultures, ensuring equivalence in meaning is maintained(9,10).psychometric evaluation on the other hand involves validating the translated instrument normative values (validity and reliability)(9-11). The SOHO-5 questionnaire has been cross-culturally adapted to many languages including the Brazilian Portuguese language(12), Chinese language(13), Indonesian language(14), Spanish language (15), Bengali language (16), Turkish language (17), Persian language (18) and Myanmar (Burmese-speaking) language(19).

We undertook a CCA process for the E-SOHO-5 into the Arabic language to evaluate the OHQoL of young children in the UAE. We adhered to the methodology outlined by Beaton et al. (2000) for CCA, which comprises five steps(9):

**(1) Forward translation from English into Arabic:** Performed by two independent native Arabic speakers, with each of them generating a separate Arabic translation;

**(2) Translation synthesis:** During this step, three experts independently combined the two Arabic translated versions, resulting in the production of three unified Arabic versions;

**(3) Back translation:** To ensure equivalence to the original English version, the three unified Arabic versions were translated back into English by two independent professional English speakers;

**(4) Expert committee review:** An expert committee, comprising the forward and backward translators, language professionals, research methodologists, and healthcare professionals, met to address any inconsistencies from the previous stages. They worked together to resolve these issues and ultimately finalized a draft version of the A-SOHO-5;

**(5) Pilot testing:** The primary objective of the pilot testing was to assess the clarity of the wordings and the understanding of the questionnaire items and instructions, as well as to evaluate the psychometric properties of the draft A-SOHO-5.

In this paper we aim to provide a description of the pilot testing conducted for the draft A-SOHO-5 questionnaire, including an assessment of its psychometric properties. Additionally, we aim to share the challenges and experiences encountered during the CCA process.

## Materials and Methods

This study was conducted after obtaining permission from the authors of E-SOHO-5, and the ethical approval from the Universiti Sains Malaysia (study protocol code USM/JEPeM/22090605).In addition, t he questionnaire forms and the permission to translate it into the Arabic language, was obtained from the authors and developers by email.

**The instrument:** Detailed description of the SOHO-5 scale is found elsewhere(5). In summary, the original E-SOHO-5 questionnaire is divided into 2 version: the child's self-report and the parent's proxy report. The child versionincludes questions addressed to the child, focusing onthe oral impact on their daily activities; such as eating, drinking, speaking, playing, sleeping, smiling due to pain, and smiling due to appearance. For the children version the responses to the items are recorded on a 3-point scale (no, a little, a lot). The second version is for parent's perception of the oral impact on their child's daily activities, including eating, speaking, playing, sleeping, smiling due to pain, avoiding smiling due to appearance, and whether it has ever affected the child's self-confidence, the response options are on a 5-point scale (not at all, a little, moderate, a lot, a great deal).

The cumulative SOHO-5 score for each part calculated for the seven items on oral health-related impacts, from the sum of the answers to seven questions. The final score may vary from 0 to 14 for the child, which means that, score 0 = no oral impacts and score 1-14 = Any oral impacts. For the parent's part may vary from 0 to 28, which means that, score 0 = no oral impacts and score 1-28 = any oral impacts. A higher score denotes a greater degree of oral impact on the child's quality of life.There are additional questions in both versions for a number of questions, part of which is about toothache experience and current, the other part is about global rating questions.

## Pilot testing:

A total of 32 Arabic-speaking child-parent pairs participated in the pilot study. Children were recruited from school and Nursery located in the Emirate of Sharjah, UAE. The inclusion criteria were children who were 5 years old and possessed the ability to understand and communicate in the Arabic language. For parents, the inclusion criteria include the ability to understand and communicate in both the Arabic and English languages. Informed consent was obtained before implementing the draft A-SOHO-5 questionnaire.For data collection from parents, the draft A-SOHO-5 questionnaire and the E-SOHO-5 questionnaires were provided as self-administered tools. The questionnaires were sent home with the child by one of theteachers, along with information that both the original E-SOHO-5 and translated A-SOHO-5 questionnaires should be completed. Additionally, a sociodemographic information page was enclosed for parents to complete. They were instructed to fill out the questionnaires and return them with their child to the school. Participants were given the option to contact the researcher, whose contact number was provided in the consent form, in case they had any questions or needed clarification on any of the questions. For data collection from the children, each child was individually interviewed face-to-face by the researcher. Only the Arabic version of the questionnaire was used for the children, as they were able to understand and communicate in Arabic. Participants were asked to provide their feedback on the questionnaire items, the researcher also recorded field notes capturing the responses and reactions of the participants throughout the data collection process. Face validity was evaluated by theparticipants' comments on the clarity, relevance and appropriateness of the A-SOHO-5 questionnaire items in relation to the Arabic language and culture,while content was assessed through the input of experts who were involved in the synthesis process and the final reconciliation step.

## Data analysis

The data were entered into IBM SPSS Statistics 26 for analysis. Reliability analysis was conducted using Pearson's correlation for three purposes: i) Inter-item correlation, ii) Item-total score correlation, and iii) calculating cronbach's alpha coefficient, where a value of ≥0.70 is considered acceptable. Validity analysis, specifically for the parent section of the questionnaire, involved running Pearson's correlation to assess association between the the total score of the SOHO-5 questionnaire between the draft A-SOHO-5 and the original version of E-SOHO-5.

## Results:

Characteristics of study population children and parents (N=64)

**Table 1: Descriptive characteristics of Children (Total number = 32)**

| Variables | Categories | n mean (std) | n (%) |
|---|---|---|---|
| Sex | Girls | 20 .65 (.489) | 20 62.5% |
| | Boys | 12 .33 (.492) | 12 37.5% |
| Setting | Government | 17 .76 (.437) | 17 53.1% |
| | Private | 15 .47 (.516) | 15 46.9% |

**Table 2: Descriptive characteristics of parents (Total number = 32)**

| Variables | Categories | n (%) |
|---|---|---|
| Sex | Mother | 29 (90.6) |
| | Father | 3 (9.4) |
| Nationality | Emirati | 18 (56.3) |
| | Non Emirati | 14 (43.8) |
| Monthly income | < 5000 | 1 (3.1) |
| | 5,000 - 9,999 | 6 (18.8) |
| | 10,000 - 19,999 | 5 (15.6) |
| | 20,000 - 29,999 | 8 (25.0) |
| | 30,000 - 39,999 | 4 (12.5) |
| | ≥ 40,000 | 2 (6.3) |
| | no answer | 6 (18.8) |
| Education | High school | 8 (25.0) |
| | Diploma degree and above | 24 (75.0) |

**Table3:** Cronbach's Alpha Coefficient fordraft A-SOHO-5 (children n=32 and parents n=32)

| Participants | Scale | Number of Items | Cronbach's Alpha |
|---|---|---|---|
| 32 | Draft A-SOHO-5 child version | 7 | 0.93 |
| 32 | Draft A-SOHO-5 Parent version | 7 | 0.72 |

The Cronbach's alpha coefficients for thechild's draft A-SOHO-5 and parent's draft A-SOHO-5 were 0.93 and 0.72, respectively (table3).

**Table4:** Inter-item correlation matrix for child'sversion of the draft A-SOHO-5(n = 32), with seven items related to child's dental health and the effect of child's teeth on his/her daily life.

Inter-Item Correlation Matrix

| | Difficulty eating | Difficulty drinking | Difficulty speaking | Difficulty playing | Avoiding smiling (due to pain) | Avoiding smiling (due appearance) | Difficulty tosleeping |
|---|---|---|---|---|---|---|---|
| Difficulty eating | 1 | | | | | | |
| Difficulty drinking | .78 | 1 | | | | | |
| Difficulty speaking | .78 | .79 | 1 | | | | |
| Difficulty playing | .78 | .79 | 1 | 1 | | | |
| Avoiding smiling (due to pain) | .78 | .79 | .79 | .79 | 1 | | |
| Avoiding smiling (due to appearance) | .69 | .71 | .71 | .71 | .91 | 1 | |
| Difficulty sleeping | .46 | .50 | .50 | .50 | .50 | .43 | 1 |

In the child's version of the draft A-SOHO-5 as shown in table 2, the inter-item correlations ranged from 0.43 to 0.79. The inter-item correlation matrix indicates that items such as "difficulty in eating," "difficulty in drinking," "difficulty in speaking," and "difficulty in playing" are strongly correlated with each other. However, items "avoiding smiling due to pain" and "avoiding smiling due to appearance" show only a moderate relationship with the aforementioned items. Additionally, the item assessing difficulty in sleeping demonstrates a weak relationship with the other items assessed (table 4).

**Table5:** Inter-item correlation matrix for parent version of the draft A-SOHO-5 (n = 32)with seven items related to child's dental health and the effect of child's teeth on his/her daily life.

**Inter-Item Correlation Matrix**

| | Difficulty eating | Difficulty speaking | Difficulty playing | Avoiding smiling (due appearance) | Avoiding smiling to(due to or hole) | Difficulty painsleeping | Influence self-confidence |
|---|---|---|---|---|---|---|---|
| Difficulty eating | 1 | | | | | | |
| Difficulty speaking | .20 | 1 | | | | | |
| Difficulty playing | .67 | .13 | 1 | | | | |
| Avoiding smiling (due to appearance) | .19 | .78 | .08 | 1 | | | |
| Avoiding smiling (due to pain or hole) | .09 | .31 | .09 | .32 | 1 | | |
| Difficulty in sleeping | .68 | .25 | .81 | .09 | .21 | 1 | |
| Influence self-confidence | .31 | .12 | -.04 | .05 | .01 | .26 | 1 |

As shown in table 3, the inter-item correlations for the parent version of the draft A-SOHO-5 are lower compared to the child version, ranging from -0.04 to 0.81. Specifically, there is a negative correlation between the items "influenced self-confidence" and "difficulty playing (table 5).

**Table6:** Pearson correlation coefficients for the relationship between the total score of the child version of the A-SOHO-5and each of the seven items assessing daily activities (n=32).

| Item-total score correlation | | total SOHO score |
|---|---|---|
| item #4 SOHO Q1 eating difficulty | Pearson Correlation | .872** |
| | Sig. (2-tailed) | .000 |
| item #5 SOHO Q2 drinking difficulty | Pearson Correlation | .882** |
| | Sig. (2-tailed) | .000 |
| item #6 SOHO Q3 speaking difficulty | Pearson Correlation | .914** |
| | Sig. (2-tailed) | .000 |
| item #7 SOHO Q4 playing difficulty | Pearson Correlation | .914** |

| | | |
|---|---|---|
| | Sig. (2-tailed) | .000 |
| item #8 SOHO Q5 smiling pain | Pearson Correlation | .914** |
| | Sig. (2-tailed) | .000 |
| item #9 SOHO Q6 smiling look | Pearson Correlation | .850** |
| | Sig. (2-tailed) | .000 |
| item #10 SOHO Q7 sleeping difficulty | Pearson Correlation | .677** |
| | Sig. (2-tailed) | .000 |

In the child version, the item-total correlations ranged from .677 for "having difficulty in sleeping" to .914 for "having difficulty in speaking", "having difficulty in playing", and "avoiding smiling because of pain" (Table 6).These high item-total correlations indicate a strong and positiverelationship between each individual item and the total score of the questionnaire.

**Table7:**Pearson correlation coefficients for the relationship between the total score of the parent version of the Arabic scale of oral health outcomes for 5-year-old and each of the seven items assessing daily activities (n = 32).

| Item-total score correlation | | total SOHO score |
|---|---|---|
| Difficulty eating | Pearson Correlation | .823** |
| | Sig. (2-tailed) | 0.000 |
| Difficulty speaking | Pearson Correlation | .483** |
| | Sig. (2-tailed) | 0.005 |
| Difficulty playing | Pearson Correlation | .799** |
| | Sig. (2-tailed) | 0.000 |
| Avoiding smiling (due to appearance) | Pearson Correlation | .397* |
| | Sig. (2-tailed) | 0.025 |
| Avoiding smiling (due to pain or hole) | Pearson Correlation | .406* |
| | Sig. (2-tailed) | 0.021 |
| Difficulty in sleeping | Pearson Correlation | .871** |
| | Sig. (2-tailed) | 0.000 |
| Influence self-confidence | Pearson Correlation | 0.303 |
| | Sig. (2-tailed) | 0.092 |

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

In the parent version, the item-total correlations ranged from .303 for "influence self-confidence" to .871 for "have difficulty in sleeping" (table 7). Overall, these high item-total correlations indicate a robust and positive relationship between each individual item and the total score of the questionnaire.

**Table 8:** Pearson correlation coefficient and the associated p-value (two-tailed) between the English version total score and the Arabic version total score of SOHO-5 questionnaire

| | | **English total score for SOHO** |
|---|---|---|
| **Arabic total score for SOHO** | **Pearson Correlation** | **.987**** |
| | **Sig. (2-tailed)** | **.000** |
| | **N** | **32** |

There was a significant positive correlation observed between the total score of the E-SOHO-5 questionnaire and the total score of the A-SOHO-5 questionnaire for the parent's version (table 8).

During the data collection process, numerous valuable and significant observations were made, as outlined below:

- When asking children "Have you ever not smiled because of how your teeth look?", some children associated not smiling with the colour of their teeth without being aware of the term "caries."
- Another observation when asking the same question above, was that it may trigger a reflection on something the child hadn't considered before, potentially affecting their interaction with others or their smile.Therefore, it is possible to ask the question in a positive way, for example: Do you like to laugh/smile to show people your teeth?
- One important observation was whether it is appropriate to ask children of this age about past events. Alternatively, it might be more effective to inquire about their current experiences, as a child's expression and memory are often more closely linked to present events than those occurring months or years ago. Thus, they may not recall how they felt, whether there was pain, or the circumstances surrounding the eruption of their teeth.

- Children expressed satisfaction with their teeth, even if some had dental issues. Consequently, the researcher must be adept at tailoring questions to the child, determining whether to pose each question individually or combine certain inquiries based on the children's needs.
- The children's selection of answers was significantly facilitated by an innovative method employed by the researcher in this study. They utilized hand movements, employing gestures to indicate varying degrees. When interacting with children, the researchers brought their palms together to signify a little and moved them farther apart to convey a lot
- Some children may require time to engage with the researcher or may not respond promptly, necessitating assistance from teachers. This factor should be considered during data collection.
- Regarding the parent's SOHO-5 version, the decision was made to exclude the response option "I don't know" when administering the questionnaire to collect data. This choice was based on the appropriateness of the question directed to parents in relation to the questionnaire's theme, the length of answer options, the absence of a specific code for it, categorizing it as missing data, and the potential for generating various guesses and questions related to it.

## Discussion:

The objective of this study was to provide a description of the pilot testing conducted for the SOHO-5, which involved evaluating its psychometric properties following its CCA to the Arabic language.Our findings indicated that both the child and parent versions of the draft Arabic-SOHO-5 possess satisfactory psychometric properties. The standardized Cronbach's alpha for both the Arabic child's and parent's versions of SOHO-5 exceeded the established threshold of 0.70(20), indicating good internal consistency reliability. Specifically, the Cronbach's alpha level for the A-SOHO-5child version was deemed excellent(15), surpassing the Cronbach's alpha values of other translated SOHO-5 questionnaires, which ranged from 0.71(13,17)to 0.89(14).The A-SOHO-5 exhibits a high Cronbach's alpha value despite the limited number of items (seven). This is noteworthy because measures with fewer items typically tend to have lower Cronbach's alpha values(13).
The high internal consistency of the A-SOHO-5was further supported by the degree to which all items measure the same concept and the extent to which they are correlated with each other as a cohesive group. Our findings consistently demonstrated positive inter-item correlations, indicating a coherent pattern of responses and implying that the items in the questionnaire measure a related construct. Furthermore, all item-total correlations surpassed the arbitrary threshold of 0.20, which is the minimum recommended level for including an item in a scale (19). These findings demonstrate a strong correlation between individual items and the overall total score of the questionnaire, providing justification for the inclusion of all items when calculating a comprehensive OHRQoLscore(15). This suggests that the questionnaire items consistently measure the intended constructs, reinforcing the reliability of the instrument in assessing OHRQoLin Arabic-speaking children. Moreover, the construct validity of the A-SOHO-5 was evident in the strong associations with the original E-SOHO-5 in the parent version. The A-SOHO-5 also exhibited highly satisfactory face validity for both the child and parent versions. During the pilot study, allthe 5-year-old children and their parentsexhibited no challenges in comprehending the content of A-SOHO-5 and were able to provide accurate responses to the questions. As demonstrated previously, this indicates that five-year-old children can express their own perceptions regarding their OHRQoL, and research should no longer depend solely on parental proxy reports(12)

The good validity and reliability of the A-SOHO-5 can be attributed, in part, to the simplicity and clarity of the original measure. In all the previous CCA experiences of SOHO-5, the translated questionnaires consistently exhibited satisfactory psychometric properties, and ease of understanding and comprehension among participants(12-19). Overall, in CCA, SOHO-5 has demonstrated validity, reliability, reproducibility, and responsiveness to change(7).

The second contributing factor was the rigorous CCA process, which adhered to all recommended steps outlined in the guidelines(9). We specifically involved local experts fluent in both the language of the questionnaire and the target language. This is crucial to ensure the successful translation of questionnaires for children across diverse cultures. These experts provide valuable insights into the cultural nuances and meanings of specific words, minimizing potential misunderstandings.
During the pre-test, we encountered certain learning experiences that were not attributed to language or cultural differences. Instead, these lessons arose from the development and cognitive growth of the children and their ability to recall information about past events. Considerations for effective questionnaire translation for children involve assessing their maturity and cognitive abilities to ensure question appropriateness and comprehension.

It is crucial to consider whether all children will comprehend the questions similarly, regardless of the accuracy of the translation. In some instances, or questions, children may grasp face cards, while in many cases, they understand sign language or verbal communication. All these methods are effective, but the researcher, or

interviewer engaging with children must exhibit patience and wisdom to determine what is suitable for each child to express themselves, their feelings, and their answers, as one example cannot be generalized to all children.

## Conclusion:

This study undertook a CCA of the child self-report and parental proxy report versions of the E-SOHO-5 to the Arabic language. The findings demonstrated good reliability as well as face and construct validity. It offers evidence supporting the validity and reliability of both versions as measures of OHRQoL for 5-year-old children in the context of UAE.In short, when conducting questionnaires with children from different cultures, priority must be given to correct translation and consideration of the cultural meaning of the terms used. By involving local experts, using simple language, and cultural sensitivity, survey designers can ensure that children can understand the questions and provide meaningful, authentic answers.

## Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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