



**Research Article**

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## Adaptation and Validation of The Moroccan Arabic Version of the Early Childhood Oral Health Impact Scale (ECOHIS)

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### Abstract

**Objective:** This study aimed to translate and culturally adapt the ECOHIS native English version into Moroccan Arabic, and to assess the psychometric characteristics of the version thereby obtained. **Methods:** The ECOHIS original English version was sequentially subjected to translation into Moroccan Arabic, back-translation into English, committee review, and pre- testing in 30 children seeking dental treatment. The final Moroccan Arabic version further underwent an analysis of psychometric properties on a random sample of 130 child subjects. **Results:** The reproducibility was estimated by two administrations of the questionnaire separated by a period of 4 weeks, to a group of 30 parents working in the dental treatment center of Casablanca with an excellent reproducibility ( $r = 0.78$ ). The internal consistency demonstrates the reliability of the questionnaire with  $\alpha$  Cronbach's coefficient of 0.80. **Conclusion:** These psychometric properties make the Moroccan Arabic version of ECOHIS useful to assess Oral Health-Related Quality of Life in children between zero and five years of age and their families in Morocco.

**Keywords:** Early Childhood Oral Health Impact Scale, Quality of life, Moroccan Arabic, Morocco.

### INTRODUCTION

The Oral Health-Related Quality of Life (OHRQoL) concept has been found for the past few decades, and despite its emergence, it has remarkable effects on the clinical practice of dentistry and also in dental research [1]. Therefore, the quality of life was defined by The World Health Organization (WHO) as a perception of person attitude in life according to the community value systems in which they live, and in relation with their aims, expectations, criteria, and fears [2]. Indeed several questionnaires measuring oral health-related quality of life (OHRQoL) have been developed and validated in several languages and used for public health policies, research, and clinical practice. Using a scoring system, OHRQoL questionnaires gauged children's and adolescents' responses to therapeutic interventions of oral conditions, including caries treatment, traumatic dental injuries treatment, and orthodontic treatment [3].

The Early Childhood Oral Health Impact Scale (ECHOIS) was developed and validated in English in the United States to assess the impact of oral health problems and related treatment on the quality of life of pre- school children (aged three to five years) and their families [4]. Studies have determined that the ECOHIS is valid for assessing the impact of OHRQoL in children between zero and five years of age and their families in Canada [5].

Thus its use in Morocco, an Arabic-speaking country, first requires translation. However, a too-literal translation is perilous, as it can result in misinterpretation due to misleading connotative meanings. Indeed, some phrases, when translated too literally, may lose all meaning in another culture [6]. It is therefore necessary, when localizing quality of life instruments, for the translation process to ensure semantic, experiential and inferential equivalence [7]. To that end, investigators must ensure that the meaning of each item is carried over into the target cultures, and that it conveys the same construct after translation. Some situations may have meaning in the source culture (original version), but not in the

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target culture (translated version); these need to be replaced by more appropriate situations that preserve the purpose and meaning covered by the items [8, 9]. The same exercise needs to be applied to certain concepts, which because of cultural differences do not elicit the same representations [8]. In addition, the psychometric characteristics of the translated version have to be assessed [6].

The main aim of the present study was to translate and culturally adapt the ECHOIS to a Moroccan Arabic context. A further aim was to assess the psychometric characteristics of the translated version. Data analysis was performed in the medical informatics laboratory at the Faculty of medicine and pharmacy of Casablanca using SPSS software (version 16.0, SPSS Inc., Chicago, IL, USA). For all statistical tests, the significance level was set at  $p \leq 0.05$ .

## METHODS

The Moroccan version of the ECHOIS has two sections: a section devoted to sociodemographic variables: age, sex, socioeconomic status of parents, the intellectual level of the mother and the date of the last visit of the parents to the dentist and treatments received by the children.

The second section includes the ECOHIS score, which was measured using a questionnaire completed by parents. In the first part, parents were asked to answer 13 to a list of items. They were asked whether their children had difficulties encountered during activities of daily life (eating, drinking, talking, sleeping, staying in a good mood, smiling, working, self esteem, behavior in front of other children) indicating the severity, frequency of discomfort and the oral problem responsible.

In the first section the impact on children, there are four areas:

1. Symptoms of the child (1 item).
2. Functions of children (4 items).
3. Child psychology (2 items).
4. The image of the child in front of you and in front of others (2 items).

The impact on the family section, there are two areas:

1. Parental distress (2 items).
2. The function of the family (1 item).
3. The financial side (1 item).

The questionnaire is scored using a simple five-point Likert scale with responses ranging from "never" to "very often" (equivalent to a score of 0 and 4, respectively).

After getting original version [3] the translation of the ECOHIS following the recommendations of the International Test Commission took place [5]. Two bilingual translators had been recruited to translate the questionnaire from English to Moroccan Arabic. One of them is an orthodontist and the other is an expert methodologist. Both translators have translated the original version independently. Both translations were compared, all differences obtained were discussed, a consensus on the amendments was established to maintain the integrity of the original questionnaire. This latest version has been tested among a sample 12 parents having the same characteristics as those of the validation study.

This Moroccan dialect version was back translated into English by two others bilingual translators natives of the country source. One of them is an English literature professor; the other is an engineer with no particular knowledge in the field of dentistry. None of the translators have taken part in the first translation, or read the Questionnaire source.

The final version was developed after an Expert meeting including all people involved in the process of this cross-cultural adaptation, translators, coordinator, an Orthodontics professor in the Faculty of Dental Medicine of Casablanca and two expert methodologists in the field cross-cultural validation.

The final version obtained after the process of translation was further tested on 30 Moroccan children requiring dental treatment within the dental treatment hospital in Casablanca aged range was 2 to 5 years. After a few modifications, the final Moroccan Arabic version underwent an analysis of psychometric properties on random sample of parent subjects.

100 Moroccan children requiring dental treatment within the dental treatment hospital in Casablanca during the period between January and February 2016 were invited to take part in this psychometric analysis study. The age range was 2 to 5 years; the Arabic version of the ECHOIS had been self-administered to patient's parents, as well as 30 parents belonging to the medical and administrative staff within the center whose children were also aged between 2 and 5 years.

Those who met the following criteria was included in the study: pre-school Moroccan children aged between 2 and 5 years with no physical or mental disability, and parents speaking Moroccan dialect fluently.

All the children of an age that doesn't belong to the interval 2-5 had been excluded; the unfilled questionnaires were excluded from the study.

This study was approved by the committee of thesis that serves as the ethics committee in our institution. Informed consent was obtained from parents participating in the study.

Assessment of validity and reliability of the Moroccan version of the ECOHIS Data was inputted and organized using the soft-ware SPSS version 17.0 (SPSS Inc., Chicago, United States). Construct validity of the Moroccan version of the ECOHIS was determined by correlating the ECOHIS scores with DMFT scores (Spearman's rank correlation). To evaluate discriminant validity, differences in ECOHIS scores between children with caries and those without caries were assessed using the Mann-Whitney U-test (non-parametric test equivalent to t-test). Reliability was assessed in two ways: internal consistency and test-retest reliability. Internal consistency was assessed by determining the mean item correlation of the ECOHIS items using Cronbach's alpha statistic.

Test-retest reliability was assessed by determining the level of agreement between the results of the first and repeated ECOHIS questionnaire using the intraclass correlation coefficient (ICC) in a one-way random effect parallel model.

## RESULTS

A total of 130 questionnaires were completed, 100 questionnaires completed by parents of children followed at the dental treatment center of Casablanca, and 30 questionnaires (test-retest) fulfilled twice by 30 subjects among the medical and administrative staff of the Center.

The age range of the children followed within the dental center is from 2 to 5 years with an average of  $44.27 \pm 12.525$  months (42 females and 58 males) and  $40.97 \pm 11,625$  months for medical staff children (14 females and 16 males).

Socio-economic level was low for 70% of the parents of children receiving treatment in the dental treatment center. Only 7% of the mothers had a high educational level, whereas 42% had a low education level.

58% of the families visited the dentist in less than a year (<1 year). (Table I)

**Table 1:** Characteristics of parents and children participating in the study (n = 130).

	CCTD Casablanca Patients (n=100)	Dental Staff (n=30)
<b>Age (average+ SD)</b>	44,27(12,525)	40,97(11,625)
<b>Sex</b>		
Male	63,7%	53,3%(16)
Female	36,3%	46,7%(14)
<b>Socio economic level of the father</b>		
▪ High	4%(4)	10
▪ Average	26%(26)	17
▪ Low	70%(70)	3
<b>Level of education of the mother</b>		
▪ No diploma	29%(29)	3,3%(1)
▪ Primary	22%(22)	10%(3)
▪ Secondary	42%(42)	26,7%(8)
▪ Post graduate	7%(7)	60%(18)
<b>Annual income of parents/DH</b>		
▪ <150000	53%(53)	0%(0)
▪ 15000-30000	19%(19)	3,3%(1)
▪ 30000-60000	15%(19)	20%(6)
▪ 60000-120000	8%(8)	26,7%(8)
▪ ≥ 120000	5%(5)	50%(15)
<b>Parents last visit to the dentist</b>		
▪ <1year	58%(58)	53,3%(16)
▪ 1-2 years	19%(19)	16,7%(5)
▪ 2-5 years	6%(6)	10%(3)
▪ ≥5 years	17%(17)	20%(6)

The "test-retest" reproducibility was estimated at 0,78 with an alpha of 0,78 by two administrations of the questionnaire separated by a period of 4 weeks, to a group of 30 parents working in the dental treatment center of Casablanca (table II).

**Table 2:** Interclass coefficient during the test-retest

	Alpha Cronbach	Inter class coefficient
Test-retest results	0,787	0,794

The internal consistency demonstrates the reliability of the questionnaire with an  $\alpha$  Cronbach coefficient of 0.80(table III).

**Table 3:** Internal reliability of the ECHOIS

	Number of items	Cronbach's alpha
Child section	9	0,81
Family section	4	0,80
Total	13	0,8

## DISCUSSION

The current study showed that the Moroccan version of ECOHIS had good psychometric properties. In terms of validity, the questionnaire

presented very good convergence validity. The relationship between the score, the ECOHIS and the perception of the child's oral problems was statistically significant. The reliability of the questionnaire was confirmed by the internal consistency with a coefficient  $\alpha$  Cronbach of 0.80.

The psychometric properties of oral related quality of life measuring tools depend largely on linguistic and cultural attributes of the population. The need for validation study of the measuring instrument when applied to a new socio-cultural context has been recognized [10].

The validation of this questionnaire is only a modest contribution to what has already been established. In fact an Arabic version has already been validated in Saudi Arabia [11]. However, Brown *et al.* [11] have recognized the limitations of including Arabic versions they were long and included questions that were not suitable for children in our cultural context, such as the difficulties associated with playing musical instruments. Another Arabic version had been developed in Soudan [12] but this one could not be used since classical Arabic used there differs from the Moroccan dialect. The Moroccan dialect vocabulary was transplanted directly from the French, Spanish and Berber. Sami Jamil [13] concluded that the Moroccan dialect is quite complex because of the presence and interference of two forms of dialectal Arabic (classical Arabic and Berber), two languages (French and Spanish). Therefore, the use of validated scales in Arabic, among Moroccan children will cause enormous transcultural challenges.

Filstrup [14] using the scale OHRQL Michigan created OHRQoL questionnaires.

Participants in this study were children aged between 22 and 70 months, Most of these instruments have been developed in Anglophone countries. The ECOHIS has been translated in several countries: Brazil, Tanzania, Uganda, Iran, Turkey, Canada,... using the well-known forward-backward translation technique [15]. In our study, we followed the same translation protocol. No items had lost its meaning. The ECOHIS in its original English version of 13 items was already an instrument of good quality assessment of oral quality of life.

In our study, Cronbach's alpha index for child and the family sections was respectively 0.91 and 0.95. The Cronbach's alpha index of our study was satisfactory (0.78). It follows reliability standards [16]. This index was slightly lower than the original English ECOHIS [17] and the Turkish [18] version, and was higher than the French [19], Chinese [20] and Brazilian [21] ECOHIS.

The Inter-Class Coefficient (ICC) for the total scale of our study was 0.79 indicating good reproducibility, however this value remained lower than the one reported in French and Brazilian [19, 21], the American [22], Persian [23] and Chinese [20] studies.

By analyzing the distribution of items in our study, the most frequently reported items in both sections were practically the same as those of ECOHIS cited in the literature: in the section impact on children, the most reported items were linked to notions of "drinking", "Eating", "sleeping" and "pain". In the family impact section, these elements were "financial problems" and "feeling sad or guilty".

72% of parents reported that their children had experienced at least one impact of oral health on their quality of life. The impact on the family was reported by 66% of parents. Our study showed that Moroccans parents remember better the disease-related experiences of their children, compared with those of previous studies [21, 22].

## CONCLUSION

This study shows that the Moroccan Arabic version of the ECHOIS is apparently valid as a measuring tool of the OHRQoL in children. These

excellent psychometric properties make the Moroccan Arabic version of ECOHIS useful to assess OHRQoL in children between zero and five years of age and their families in Morocco. A study assessing the OHRQoL in children with lay Moroccan Arabic version of the ECHOIS patients would be an interesting avenue of research. A very important implication of the present study is that Arab countries can use the Moroccan Arabic version of the ECHOIS provided that the ECHOIS questionnaire is culturally and linguistically adapted.

#### Conflict of interest

The authors have no conflict of interest to declare.

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