



Short report

Derivation of the short form of the Oral Health Impact Profile in Spanish (OHIP-EE-14)

Roberto C. Castrejón-Pérez^{1,2} and S. Aída Borges-Yáñez³

¹Programa de Maestría y Doctorado en Ciencias Médicas, Odontológicas y de la Salud, Universidad Nacional Autónoma de México, México, DF;

²Departamento de Epidemiología Clínica, Subdirección de Investigación Epidemiológica Geriátrica, Instituto de Geriátrica, México, México, DF;

³Coordinación de Salud Pública Bucal, División de Estudios de Posgrado e Investigación, Facultad de Odontología, Universidad Nacional Autónoma de México, México, DF

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Background and Objective: The Oral Health Impact Profile is the most frequently used and validated of the Oral Health Quality of Life instruments. Several short versions have been developed; and a validation of the OHIP-49 in Spanish has been published. The objective was to develop the short version of the Oral Health Impact Profile in Spanish (OHIP-EE-14).

Methods: Cross-sectional study. One hundred and thirty-one persons aged ≥ 60 years attending a social centre for the elderly, residents of a nursing home and persons seeking dental care at a dental school in Mexico City were interviewed and examined. The validity of each of the 49 questions was evaluated, and, to construct the short version, 14 items were selected. The perceived need for dental treatment, number of teeth, presence of coronal caries, root caries, presence of dental plaque and utilisation of removable prosthesis were measured. Internal consistency, repeatability and discriminant validity were calculated.

Results: The OHIP-EE-14 was reliable (Cronbach's- $\alpha = 0.918$, ICC = 0.825). Significant associations were found between OHIP-EE-14 and the number of teeth and perceived need for dental treatment.

Conclusions: The OHIP-EE-14 is a reliable and valid instrument and can be used in subjects aged 60 years and over from Mexico City.

Keywords: aged, quality of life, reproducibility of results, tooth loss.

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Introduction

The Oral health Impact Profile (OHIP-49)¹ was developed to register dysfunction, discomfort and disability related to general oral health status; it has been translated and validated in several countries²⁻⁴. The OHIP-49 consists of 49 items in seven dimensions (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap). Several abbreviated versions have been developed, the first one by Slade⁵, who, through a regression analysis, selected two questions by dimension to obtain 14 questions (OHIP-14); the translation of this version has been adopted in some countries. Other authors have developed short versions in accordance with the characteristics of the population under study^{6,7}. These versions have been derived with the model used by Slade or by the

'method of impacts'⁸. However, Locker indicated that any random selection of 14 items can reach acceptable reliability, but the questions selected might have no significance for different populations. Also, the validity of the short versions is compromised.

The aim of this study was to develop a short version of the Oral Health Impact Profile in Spanish (OHIP-EE-14) derived from the previously validated complete version in Spanish (OHIP-Mx-49)⁴.

Method

One hundred and thirty-one persons aged 60 years and over residing in Mexico City who agreed to participate and were capable of responding to the questions independently were included: 85 (64.9%) attending three social centres for the elderly, 22 (16.8%) residents of a nursing home

and 24 (18.3%) persons demanding dental care at a dental school⁴.

The 14 questions (two from each dimension) showing a statistically significant association with clinical variables were selected. Three questions regarding the use of dentures were not considered. The clinical variables studied were as follows: number of teeth (0/1-9/10-19/20-28); presence of coronal caries (yes/no); presence of root caries (yes/no); presence of dental plaque: at least one site with plaque covering $\geq 2/3$ of the surface (yes/no); and use of removable prosthesis (yes/no). Also, self-perceived need for dental treatment (yes/no) was assessed.

An interview and a dental clinical examination were performed by two standardised dentists. The Kappa value for coronal caries and root caries measurements was 0.9. The scores were calculated using the additive method¹, which has shown excellent discriminative ability^{2,9}. Internal consistency was evaluated using the Cronbach's alpha test; test-retest reliability ($n = 67$)

using the intraclass correlation coefficient (ICC) and discriminative validity with the Mann-Whitney and Kruskal-Wallis tests. A simple linear regression was performed to estimate the per cent of the variance within the OHIP-Mx-49 explained by the OHIP-EE-14. This study was approved by the Research Ethics Committee of the Dental School at the Universidad Nacional Autónoma de México.

Results

The overall mean age was 73.8 ± 8.3 years. The residents of the nursing home were older (83.9 ± 7.6 years) than the participants of the social centres (72.9 ± 6.7 years) and the persons demanding dental care (68.1 ± 6.2 years) ($p < 0.001$). In general, 22.0% were men; however, all the residents in the nursing home and 94% of the participants in the social centres were women, in the dental school, 95% of the subjects were men. 13% ($n = 17$) of the subjects were living alone, all

Table 1 Questions selected for the OHIP-EE-14 (Oral Health Impact Profile in Spanish).

¿En los últimos seis meses...

In the last 6 months...

- 1)... Ha tenido dificultad para masticar alimentos debido a problemas con sus dientes boca o dentaduras?
Have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?
- 2)... Ha notado que su apariencia se ha visto afectada debido a problemas con sus dientes, boca o dentaduras?
Have you felt that your appearance has been affected because of problems with your teeth, mouth or dentures?
- 3)... Ha tenido dolores de cabeza debido a problemas con sus dientes, boca o dentaduras?
Have you had headaches because of problems with your teeth, mouth or dentures?
- 4)... Ha tenido sensibilidad en sus dientes, por ejemplo, debido a alimentos o bebidas fríos o calientes?
Have you had sensitive teeth, for example, due to hot or cold foods or drinks?
- 5)... Los problemas dentales lo han hecho sentir totalmente infeliz?
Have dental problems made you miserable?
- 6)... Se ha sentido incómodo con la apariencia de sus dientes, boca o dentaduras?
Have you felt uncomfortable about the appearance of your teeth, mouth or dentures?
- 7)... Las personas le han malinterpretado algunas palabras debido a problemas con sus dientes, boca o dentaduras?
Have people misunderstood some of your words because of problems with your teeth, mouth or dentures?
- 8)... Ha evitado sonreír debido a problemas con sus dientes, boca o dentaduras?
Have you avoided smiling because of problems with your teeth, mouth or dentures?
- 9)... Ha encontrado difícil relajarse debido a problemas con sus dientes, boca o dentaduras?
Have you found it difficult to relax because of problems with your teeth, mouth or dentures?
- 10)... Se ha avergonzado un poco debido a problemas con sus dientes, boca o dentaduras?
Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?
- 11)... Ha tenido dificultades al relacionarse con otras personas debido a problemas con sus dientes, boca o dentaduras?
Have you had trouble getting on with other people because of problems with your teeth, mouth or dentures?
- 12)... Ha estado un poco irritable con otras personas debido a problemas con sus dientes, boca o dentaduras?
Have you been a bit irritable with other people because of problems with your teeth, mouth or dentures?
- 13)... Ha sufrido algún tipo de pérdida económica debido a problemas con sus dientes, boca o dentaduras?
Have you suffered any financial loss because of problems with your teeth, mouth or dentures?
- 14)... Ha sido totalmente incapaz de funcionar debido a problemas con sus dientes, boca o dentaduras?
Have you been totally unable to function because of problems with your teeth, mouth or dentures?

0) Nunca 1) Casi nunca 2) Algunas veces 3) Frecuentemente 4) Casi siempre.

of them women attendees of the social centres. Regarding civil status, in the nursing home group, 63.6% were widows and 36.4% were separated, single or divorced; in the social centre group, 52.9% were widows and 31.8% were married; in the dental school group, 12.5% were widows and 79.2% were married ($p < 0.001$).

Distribution by schooling for the total sample showed that 7.7% were illiterate, 38.5% had incomplete or complete primary school and 53.8% secondary school or higher. No differences were observed among the groups ($p = 0.49$).

The prevalence of edentulism was 20%; 20.3% had 1–9 teeth, 33.2% had 11–20 teeth and 26.8% had 20–28 teeth. 57% had at least one site with plaque covering $\geq 2/3$ of the surface. The prevalence of coronal caries was 91%, and the prevalence of root caries was 47%. 63.4% used removable prosthesis, and 69.2% of the persons perceived the need for dental treatment.

The 14 questions selected are shown in Table 1. The lowest score for the OHIP-EE-14 was 0, and the highest was 48 of 56; descriptive summaries for the scores are presented in Table 2.

The seven dimensions showed Cronbach's alpha coefficients ranging from 0.4 to 0.8, with the lowest scores observed in the physical pain dimension. Overall, the OHIP-EE-14 showed a high alpha

coefficient of 0.918 (95% CI = 0.895–0.938). The ICC for the OHIP-EE-14 was 0.825 (95% CI = 0.711–0.894), with the lowest correlations identified in the psychological discomfort and social disability dimensions (Table 3). The mean score for the OHIP-EE-14 was 9.7 ± 11.4 , and the median value was five.

Regarding number of teeth, the overall OHIP-EE-14 score was higher in persons with 1–9 teeth (15.1 ± 13.5) than in those edentulous (4.3 ± 7.2), those with 10–19 teeth (10.5 ± 11.6) and those with 20–28 teeth (6.5 ± 8.7) ($\chi^2 = 12.4$, $p = 0.006$). Consistently higher significant scores were also found in the 1–9 teeth group in the functional limitation, physical disability and psychological disability dimensions.

Persons who perceived the need for dental treatment had higher OHIP-EE-14 scores (12.7 ± 12.8) than those who did not (3.4 ± 5.3) ($K-W = 669$, $p < 0.001$). Scores were also higher in the functional limitation, physical pain, physical disability, psychological disability and handicap dimensions.

The score of the OHIP-EE-14 showed no significant differences with presence or absence of coronal caries, dental plaque, root caries and use of removable prostheses.

Table 2 Distribution of scores by dimension and for the total OHIP-EE-14 (Oral Health Impact Profile in Spanish).

| Dimension | Min | Maximum | | Mean | SD | Median |
|--------------------------|-----|----------|----------|------|------|--------|
| | | possible | observed | | | |
| Functional limitation | 0 | 8 | 8 | 2.63 | 2.7 | 2 |
| Physical pain | 0 | 8 | 8 | 1.32 | 1.7 | 0.5 |
| Psychological discomfort | 0 | 8 | 8 | 1.77 | 2.4 | 0 |
| Physical disability | 0 | 8 | 8 | 1.20 | 2.0 | 0 |
| Psychological disability | 0 | 8 | 8 | 1.32 | 2.0 | 0 |
| Social disability | 0 | 8 | 8 | 0.63 | 1.5 | 0 |
| Handicap | 0 | 8 | 8 | 0.79 | 1.7 | 0 |
| OHIP-EE-14 | 0 | 56 | 48 | 9.7 | 11.4 | 5 |

Table 3 Internal consistency and repeatability [intraclass correlation coefficient (ICC)] by dimension and total OHIP-EE-14 (Oral Health Impact Profile in Spanish). México, 2008.

| Dimension | α | 95% CI | | ICC | 95% CI | |
|--------------------------|----------|--------|-------|-------|--------|-------|
| | | LI | UI | | LI | UI |
| Functional limitation | 0.727 | 0.612 | 0.808 | 0.718 | 0.534 | 0.830 |
| Physical pain | 0.403 | 0.152 | 0.579 | 0.754 | 0.594 | 0.851 |
| Psychological discomfort | 0.753 | 0.649 | 0.826 | 0.504 | 0.181 | 0.700 |
| Physical disability | 0.697 | 0.569 | 0.786 | 0.674 | 0.461 | 0.803 |
| Psychological disability | 0.665 | 0.524 | 0.764 | 0.811 | 0.688 | 0.886 |
| Social disability | 0.812 | 0.733 | 0.868 | 0.505 | 0.182 | 0.701 |
| Handicap | 0.588 | 0.414 | 0.710 | 0.849 | 0.750 | 0.908 |
| OHIP-EE-14 | 0.918 | 0.895 | 0.938 | 0.825 | 0.711 | 0.894 |

The linear regression analysis showed that the OHIP-EE-14 explains 0.933 (adjusted R^2) of the variance of the OHIP-Mx-49 ($F = 1760$, $p < 0.001$). The residuals showed normal distribution (K-S test = 0.074, $p = 0.082$).

Discussion

The purpose of this study was to construct a valid short version of the OHIP-Mx-49. The importance of new short versions of the OHIP-49 has been discussed, mainly because, generally, content validity is not achieved and because different populations and objectives require different combinations of items.

One limitation was that the sample selected for this study was not representative of the elderly living in the south of Mexico City. A heterogeneous sample was selected because it helps to increase reliability of the measurements and the probability of including subjects with all degrees of dental problems. However, regarding the prevalence of dental problems, the prevalence of edentulism was similar to that reported in other studies in Mexico¹⁰.

In this study, we selected the questions to be included in the OHIP-EE-14 based on the association that each one had with the dental variables, meaning that the complete version and the short version showed association with the same clinical variables, and with one self-perception variable. Other studies have based the selection on the questions that were more frequently responded to in every domain⁸. It is necessary to point out that it is not advisable to interpret the scores individually by dimension because they are represented by only two questions, reducing the number of questions in an instrument may adversely affect the properties of the measurement¹¹.

It is recommended to derive the questions in accordance with the population where the instrument is going to be used⁵. In this study, no attempt was made to test the questions selected by Slade; however, four of the questions were included in this abbreviated version in Spanish.

Conclusions

The internal consistency and repeatability were high for the total OHIP-EE-14, indicating that it is a reliable instrument. The dental variables with higher OHIP-EE-14 scores were number of teeth (1–9 teeth) and the self-perceived need for dental treatment. The OHIP-EE-14 can be used carefully as a substitute for the OHIP-Mx-49 in persons aged 60 years and over in Mexico City.

Acknowledgements

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Correspondence to:

Socorro A. Borges-Yáñez, Coordinación de Salud Pública Bucal, División de Estudios de Posgrado e Investigación, Facultad de Odontología, Universidad Nacional Autónoma de México, Circuito Exterior S/N, Ciudad Universitaria, Delegación Coyoacán CP 04510, Distrito Federal, México.
E-mail: aborges@servidor.unam.mx