

Adaptation and Validation of the Rapid Estimate of Adult Literacy in Dentistry for Chilean Population

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Objective: To adapt and validate the Rapid Estimate of Adult Literacy in Dentistry (REALD-30) for the Chilean population.

Methods: REALD-30 was translated to Spanish, piloted, and revised by experts. Demographics, oral health status, oral health-related quality of life, and health literacy were analyzed. Summary measures, internal consistency, reliability, and convergent and predictive validity were calculated.

Results: Cronbach's alpha was 0.876, intra-class correlation coefficient was 0.789 for reliability, Pearson's and Spearman's correlations were ≥ 0.693 for convergent validity, and ≤ 0.138 for predictive validity.

Conclusion: REALD-30 is a valid and reliable instrument to measure oral health literacy in the Chilean population. [*P R Health Sci J* 2018;37:52-54]

Key words: Health literacy, Oral health, Latino, Validation studies

Many factors influence people's health status, including those related to the social context, the person, and the interaction between them (1). In dentistry one of the factors is the "the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate oral health decisions" (2), that is oral health literacy (OHL). There is extensive evidence about the impact of OHL on the oral health status (3).

There are many instruments to measure OHL. Most of them are focused in evaluate one or more of the following skills: recognition and pronunciation of medical/dental terms, reading comprehension and numeracy, and decision making, among others (4). The best known and most used OHL instrument is the Rapid Estimate of Adult Literacy in Dentistry (REALD) (5).

Nowadays, there are two OHL instruments available in Spanish. The Oral Health Literacy Assessment in Spanish (OHLA-S) was developed in the United States for the Hispanic/Latino population, and like the REALD-30, OHLA-S use recognition plus understanding (6). The Spanish Oral Health Literacy Scale (SOHLS) was developed and validated for the Mexican adult population and covers literacy skills: location, integration, generation, calculation, and return (7). Neither of these instruments had been validated for Chilean or other Spanish-speaking South American populations. The aim of this paper is to report the adaptation and validation of the REALD-30 for the adult Chilean population.

Material and Methods

Participants

The target group was patients from public and university health centers in the province of Concepcion, Chile. The study

excluded patients older than 80, those with less than a sixth grade education, those with an intellectual and/or physical deficit, foreigners, and/or those whose native language is other than Spanish. The protocol was approved by the Research and Bioethics Committee of the Universidad de Concepción School of Dentistry.

English version of the REALD

The REALD-30 was developed by Lee et al. (4,5), who selected 30 words from the *American Dental Association Glossary of Common Dental Terminology* and dental materials available in dental clinics. These words were arranged in order of increasing difficulty. Research on the development of the REALD-30 showed a Cronbach's alpha of 0.87, and the correlations with health literacy instruments were ≥ 0.64 (5).

Translation and expert revision

Two native Spanish-language professionals proficient in English (a dentist and a professional translator) translated the REALD-30 independently. Later, a consensus guided by a third bilingual professional (dentist) was performed. A final evaluation by four experts in dental public health was made.

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The author/s has/have no conflict/s of interest to disclose.

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Variables and data collection

Variables were arranged in six groups:

- Demographics: sex, age, education level, and marital status.
- Health Literacy: measured using the Short Assessment of Health Literacy for Spanish-speaking Adults (SAHLSA) (8).
- Oral health literacy: measured using the REALD-30.
- Oral health: oral hygiene (Oral Hygiene Index Simplified, OHIS), periodontal disease (Community Periodontal Index, CPI), and caries history (DFMT).
- Oral health related quality of life (OHRQoL): measured using the Oral Health Impact Profile of 49 items validated in the Chilean Population (OHIP-49sp) (9).
- Psychometric properties: internal consistency, reliability, convergent validity (correlation with SAHLSA) and predictive validity (correlations with the CPI, OHIS, DFMT, and OHIP-49sp).

Patients were recruited from four health centers. Those patients willing to participate signed the informed consent, answered the questionnaires, and received a clinical examination. A random selection of 30 patients were appointed 4 weeks later to retest the REALD-30.

Statistical analysis

Summary measures for all variables were calculated. Cronbach’s alpha was estimated for internal consistency. Intra-class correlation coefficient (ICC) and Lin concordance correlation coefficient (LCCC) were estimated for reliability. Pearson’s r and Spearman’s rho correlation coefficients were estimated for predictive and convergent validity ($p < 0.05$). STATA/SE 13 (Stata Corp., USA) and InfoStat (Universidad Nacional de Córdoba, Argentina) were used for the analysis.

Results

Four-hundred eighty-two patients from four health centers participated in the study. Characterization of the participants is shown in Table 1.

Table 1. Characterization of the participants

Variable	Male (n=138)	Female (n=344)	General (n=482)
Age (SD)	40.9 (15.5)	42.0 (14.3)	41.7 (14.6)
Education attainment			
At least primary	96.4%	89.2%	91.3%
At least secondary	76.1%	67.4%	69.9%
Tertiary	26.1%	25.3%	25.5%
Marital status			
Single	50.4%	43.9%	45.7%
Married	46.0%	45.6%	45.7%
Other	3.6%	10.5%	8.6%

The DFMT average was 13.4 ± 6.6 . The CPI codes distribution was: 2.7% were 0, 19.0% were 1, 46.4% were 2, 25.5% were 3, and 6.3% were 4. The average OHIS was 0.71 ± 0.76 . The average OHIP-49sp was 17.3 ± 11.3 .

The final list of words was: *azúcar, fumar, seda dental, cepillo, brackets, pulpa, prótesis, esmalte, sellante, genética, caries, restauración, fluoruro, placa, extracción, periodontal, fistula, celulitis, absceso, incipiente, halitosis, maloclusión, encía, dentición, bruxismo, hiperemia, analgesia, hipoplasia, apicectomía and temporomandibular.*

The Cronbach’s alpha was 0.876. ICC reliability was 0.789 (CI 95% 0.546-0.910), and LCCC reliability was 0.788, 20 patients assisted to the retest. Convergent and predictive validity is shown in Table 2.

Table 2. Validity of the rapid estimate of adult literacy in dentistry for Chilean population.

Psychometric property	Pearson’s r and Spearman’s rho	p-value
Convergent validity SAHLSA	r = 0.719; rho = 0.693	<0.01
Predictive validity		
CPI	r = -0.250; rho = -0.252	
OHIS	r = -0.138; rho = -0.141	<0.01
DFMT	r = -0.279; rho = -0.270	
OHIP-49sp	r = -0.171; rho = -0.170	

Discussion

The present validation study has demonstrated that the REALD-30 has adequate psychometric properties. Internal consistency was very similar to previous validation studies of the REALD-30 (4,5) and other OHL instruments (4-7). In the case of reliability, the ICC values of the REALD-30 was almost the same as that of the SOHLS (7).

For the convergent validity, we used a health literacy instrument because there is no OHL instrument validated for the Chilean population. We used the SAHLSA, which has been used previously with the Chilean population (10). The ICC and LCCC reliabilities were very similar to previous studies (5), showing a high correlation with the SAHLSA.

The predictive validity was evaluated by the correlation with oral health outcomes because there is ample evidence about the influence of OHL in the prevalence and severity of oral diseases (3). The correlation was lower when compared to the SAHLSA but this is not surprising because there are other factors that determine health outcomes (1).

Several criticisms have arisen recently about recognition-pronunciation instruments; critics have been encouraging the development and use of comprehension instruments (4). But the REALD-30 has clear advantages over these instruments because it is simpler, quicker, cheaper, and appropriate for clinical use (5).

Another criticism of the use of recognition-pronunciation instruments in Spanish arises because the regular phonetic structure of this language implies that a Spanish speaker can pronounce a word correctly without understanding it. But the REALD-30 tests recognition, a very complex process in which vocabulary knowledge is associated with better recognition performance (11,12). This means that higher REALD-30 scores would be associated with better dental vocabulary knowledge. It is important to note that the REALD-30 is a recognition instrument, not a reading one.

Despite the criticisms, this is one of the first OHL instrument available for Spanish speaking countries in South America, addressing a longer neglected issue in Latin American dental research (13,14). Future research must focus on evaluate OHL in Chilean and other Spanish speaking populations, and assess interventions aimed to improve OHL levels and oral health status (15).

In summary, the REALD-30 has adequate psychometric properties for measuring OHL in Chilean population.

Resumen

Objetivo: Validar el instrumento Rapid Estimate of Adult Literacy in Dentistry (REALD-30) en población chilena. **Material y métodos:** El REALD-30 fue traducido, piloteado y revisado por expertos. Se analizaron variables sociodemográficas, salud bucal, alfabetismo en salud y propiedades psicométricas. **Resultados:** Participaron 482 personas. El alfa de Cronbach fue de 0,876 para consistencia interna y el coeficiente de correlación intraclase para estabilidad temporal fue de 0,789. Las correlaciones de Pearson y Spearman fueron $\geq 0,693$ ($p < 0,01$) para validez convergente y $\leq -0,138$ ($p < 0,01$) para validez predictiva. **Conclusión:** REALD-30 es un instrumento válido y confiable para medir alfabetismo en salud bucal en población chilena.

Acknowledgments

This study is funded by the Proyecto de Iniciación de la Vicerrectoría de Investigación y Desarrollo (VRID) N°

214.089.005-1.OIN, from the Vicerrectoría de Investigación y Desarrollo, Universidad de Concepción, Chile. Funders have no role in study design; collection, management, analysis, and interpretation of data; writing of the report; and the decision to submit the report for publication.

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