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# Differential Item Functioning of WHOQOL-BREF in nine Iberoamerican countries



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### KEYWORDS

Quality of life;  
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populations

**Abstract** WHOQOL-BREF measures the individual's perception on their personal situation in contrast to their expectations, goals, standards and concerns. Previous results did not support the original factor structure in a sample of 9 Iberoamerican countries. However, Differential Item Functioning (DIF) has yet to be thoroughly addressed in these populations. Therefore, the main purpose of this study was to analyze DIF in Iberoamerican countries. WHOQOL-BREF was administered to a sample of 1972 individuals from nine Spanish-speaking countries and ages between 17 and 34 years (mean = 21.21, SD = 3.40, 62.5% women). In order to assess the DIF, each item was modeled through a proportional odds logistic regression with nationality in the linear predictor. All models were statistically non-equivalent to the null models and the proportion of correct classification of the models ranging from 0.336 to 0.473, which leads us to conclude that the nationality of the participants plays a relevant role on the response in the items of WHOQOL-BREF. In spite of a common language, differences in cultural, historical, and social variables across these nine countries could be influencing the individual's perception of quality of life. In order to minimize those differences, specific adaptations of the Spanish-version of WHOQOL-BREF for each country should be considered.

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### PALABRAS CLAVE

Calidad de vida;  
Funcionamiento  
Diferencial de los  
Ítems;

### Funcionamiento diferencial de los ítems de WHOQOL-BREF en nueve países Iberoamericanos

**Resumen** WHOQOL-BREF mide la percepción del individuo de su situación personal en relación con sus expectativas, metas, estándares y preocupaciones. Los resultados publicados

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anteriormente en una muestra de 9 países iberoamericanos no avalan la estructura factorial original. Sin embargo, el funcionamiento diferencial de los ítems aún debe ser abordado a fondo en estas poblaciones. Por lo tanto, el objetivo principal de este estudio fue analizar el funcionamiento diferencial de los ítems en los países iberoamericanos. Se administró el WHOQOL-BREF a una muestra de 1.972 personas de 9 países de habla hispana y edades entre los 17 y los 34 años (media = 21,21, DE = 3,40, 62,5% mujeres). Con el fin de evaluar el funcionamiento diferencial de los ítems cada uno de estos fue modelado a través de una regresión logística de probabilidades proporcionales con la nacionalidad en el predictor lineal. Todos los modelos fueron estadísticamente no equivalentes a los modelos nulos, con porcentajes de clasificación correcta entre 0,336 y 0,473, lo que nos lleva a la conclusión de que la nacionalidad de los participantes juega un papel relevante en la respuesta de los elementos de WHOQOL BREF. A pesar de utilizar un lenguaje común, las diferencias en las variables culturales, históricas y sociales en estos 9 países podrían estar influyendo en la percepción del individuo sobre la calidad de vida. Con el fin de minimizar esas diferencias se debe considerar realizar adaptaciones de la versión española del WHOQOL-BREF específicas para cada país.

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In 1995, the World Health Organization workgroup on quality of life (QOL) defined QOL as an individual's perception of their position in life in the context of the culture and value systems in which they live in relation to their expectations, goals, standards and concerns (The World Health Organization Quality of Life Group [WHOQOL], 1995). It is implicit in this definition that quality of life is a subjective assessment about the relevant aspects in people's lives, also included in a social and cultural context. Taking into account this definition, the WHOQOL group developed an instrument to assess QOL, the World Health Organization Quality Of Life (WHOQOL-100) (WHOQOL Group, 1998). This questionnaire has 100 items on 25 facets, organized into 6 domains, showing acceptable psychometric properties (WHOQOL Group, 1998). The WHOQOL group itself created yet another instrument, the abbreviated version of the WHOQOL-100, called WHOQOL-BREF. It is a short version of the original questionnaire, intended for limited-time situations.

Both instruments could be used cross-culturally in non-Spanish speaking populations because of the psychometric studies results (Saxena, Carlson, Billington, & Orley, 2001). The questionnaire has been validated in different countries and languages, but even so there are only a few studies about the Spanish version of the WHOQOL-BREF (Benitez-Borrego, Guàrdia-Olmos, & Urzúa-Morales, 2014; Espinoza, Osorio, & Torrejón, 2011; Lucas-Carrasco, 2012; Lucas-Carrasco, Laidlaw, & Power, 2011). More specifically, Benitez-Borrego et al. (2014) found an alternative structure for the WHOQOL-BREF through an Exploratory Structural Equation Modeling analysis (ESEM). The authors conducted the ESEM analysis with a 1972-student sample from 9 Spanish-speaking countries: Costa Rica, Peru, Mexico, Cuba, Paraguay, Argentina, Colombia, Spain and Chile, and they set up an alternative four-factor structure.

These results led these authors to complete the analysis by conducting a multi-group analysis of structural invariance of the WHOQOL-BREF (Benitez-Borrego, Guàrdia-Olmos, Urzúa-Morales, & Peró-Cebollero, in preparation) through an Exploratory Structural Equation Model. Although

the results provided evidence regarding the invariance of factor loadings, the new findings do not support the invariance of the intercepts. In this sense, it is reasonable to think that differences in responses to items between these nine countries cannot be explained in terms of differences of latent factors. If so, it would be possible to find Differential Item Functioning (DIF) in this instrument.

DIF exists when groups of individuals do not have the same probability of answering an item in the same way (Ferne & Rupp, 2007). It examines the relationship between item response and another variable (a group variable, like gender or nationality). These grouping variables have influence in the score obtained in the underlying construct, such as quality of life. The research question posed in DIF analyses is whether, showing the same value in the measured latent trait, the response to an item is different depending on the group pertinence (Teresi & Fleishman, 2007). In our study, this control was conducted in the previous study (Benitez-Borrego et al., 2014).

Several approaches for DIF analysis have been proposed. These include tests in three-way contingency tables, a logistic regression, and methods based on the item-response theory (Scott et al., 2009). Examples of procedures based on contingency tables are the Mantel Chi-square procedure and the Mantel-Haenszel method. Regarding the methods based on the item-response theory, one choice is the 1-parameter Rasch model. This model is built on the premise that it is possible to formulate a mathematical function that adequately describes the probability of respondents, at different levels of the dimension, to endorse a response option in a rating scale (Cameron, Scott, Adler, & Reid, 2014).

Several studies addressed DIF in cross-cultural investigations. For instance, Ryan, Horvath, Ployhart, Schmitt, and Slade (2000) applied DIF analysis in a Global Employee opinion survey across 36 countries, and they found evidence of greater DIF for 3 items of the survey. Recently, some investigation groups performed DIF analyses in different psychological tests and questionnaires. For example, it has been found that between 40% and 50% of NEO-PI's items

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