

# Spanish Version of the Nottingham Health Profile: Translation and Preliminary Validity

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**Abstract:** We report the transfer into Spanish of a multi-dimensional measure of perceived health originally developed in Great Britain, the Nottingham Health Profile (NHP), and an assessment of the preliminary validity of the version is presented.

Translation of the questionnaire was obtained from experts and from a Spanish monolingual lay group. Construct validity of the version was assessed in two studies: testing relationship of NHP scores to other self-reported measures of health in a general population survey; and comparing NHP scores for a group of frequent users and for a group of non-users of primary health services.

Mean scores of NHP dimensions were higher for people with poorer self-reported health and higher for the frequent health services users than for the non-users.

Findings suggest that the Spanish version of the NHP is culturally equivalent to the original questionnaire, and has a similar level of construct validity. Nevertheless, further research on reliability and on the weighting system is required to establish the equivalence of the Spanish version definitively. (*Am J Public Health* 1990; 80:704-708.)

## Introduction

The impetus to produce reliable and valid measures of health has grown dramatically as the need for better evaluation of health services has increased. In the last two decades a number of questionnaires have been designed which measure the physical, mental, and social aspects of health.<sup>1</sup> Although most of these measures have been developed and tested in English-speaking cultures, mainly in the United States, they are widely used in different countries and in non-English-speaking cultures.

The content of health status measures as well as the wording and the form of administration are very dependent on cultural values.<sup>2,3</sup> Transferring a validated instrument to a different culture is an efficient strategy, since developing a new measure is a complex and time-consuming task, requiring much expertise. However, this process should follow a methodology that ensures a similar level of validity, reliability, and cultural meaning for the new version.<sup>4,5</sup> This methodology includes several steps: translation (ensuring conceptual rather than linguistic equivalence), and testing for feasibility, validity, and reliability. Furthermore, measures containing scaled items usually include specific weights for each item, thus making it necessary to validate the weights for the adapted version as well, in order to assure that scores obtained in the original and adapted version have similar meaning.<sup>6,7</sup>

In past work<sup>8</sup> we identified the need for a measure to adequately monitor health status of the population and equity in health services utilization. We have focused our work on adapting a validated measure rather than on developing a new one. We selected the Nottingham Health Profile (NHP), a validated measure of perceived distress developed in Great Britain,<sup>9-12</sup> and previously adapted in Sweden<sup>7</sup> and France.<sup>13</sup>

The NHP is a self-administered questionnaire containing a first part with 38 statements belonging to six dimensions of health (Energy, Pain, Emotional Reactions, Sleep, Social Isolation, and Physical Mobility). The respondent answers

“yes” if the statement adequately reflects his/her current status or feeling, or “no,” otherwise.<sup>9</sup> British researchers weighted each item in a dimension using Thurstone's paired comparisons method.<sup>14</sup> Part II contains questions on seven areas of daily life.

For transferring the NHP into Spanish, the following strategy was designed: first, a conceptually equivalent translation; second, a preliminary assessment of the validity of the version obtained; and finally develop Spanish weights, contingent upon the establishment of the validity of the unweighted version.

## Methods

### Translation Process

Ideally, a panel of bilingual people should be used to obtain translations and blind back-translations.<sup>15</sup> Because it was difficult to find a satisfactorily representative panel of bilinguals (same fluency in Spanish as in English, middle/lower socioeconomic class, and experiencing chronic illnesses), a specific methodology for adapting the NHP into Spanish was designed by one of the NHP authors (S. Hunt).<sup>16</sup> After complete explanations by Dr. Hunt, translations of each item were obtained by two of us (JMA and JA). These translations were back-translated into English and discussed again. A list containing translated items and alternative translations was made. Close agreement was reached in most items and they were graded as A “satisfactory agreement” (32 out of 45, 71 percent), B “almost satisfactory but one or two words uncertain” (nine items, 20 percent), and C “doubtful translation” (four items, 9 percent).

In order to overcome these disagreements, a group of 10 Spanish unskilled workers listened to anecdotes that reflected all the items on the questionnaire and described them freely in their own words. These words were added to the list of alternative translations. This list was later presented to the same group in order to point out the expressions they found odd and to select those that would conform to their language usage. The final version included the most popular expressions for items B and C (see Appendix). A pre-test of this version was carried out with a group of cardiology and rheumatology hospital outpatients who were asked to complete the questionnaire and to identify the statements difficult to understand, those that were acceptable, and those easily understood.

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Having obtained a Spanish version of the NHP, a translation into Catalan (language of romanic origin similar to Spanish, spoken by some eight million people mainly in the northeastern part of Spain) was also made. Seven Catalan-Spanish bilinguals, who were easy to convene, were used to obtain translations and back-translations and also to decide the exact final wording. The close agreement between both Catalan and Spanish versions led us to include both versions in further studies of the Spanish NHP.

#### Validation Studies

Achieving conceptual and linguistic equivalence when transferring a questionnaire from one culture to another does not entirely guarantee that the validity of the original version stands in the new culture. Although the method used to translate the NHP into Spanish followed prescribed procedures, the results of this translation were further tested to determine whether it performed in a manner similar to the British NHP.

In order to make an assessment of the validity of the Spanish version of the NHP, construct validity was tested in two studies. First, the relationship of NHP scores to other self-reported measures of health was tested; second, NHP scores for a group of frequent users and for a group of non-users of primary health services were compared.

In the first study, 1,220 participants ages 41 years and over completed the NHP (75 percent Spanish version and 25 percent Catalan version) as part of a random sample health survey of the city of Barcelona.<sup>17</sup> They also provided information about self-rated health (SRH), chronic conditions selected from a list of 34 conditions, chronic limitation of activity due to health problems, and restricted activity in the two weeks before the interview. These variables had been used in previous studies in Spain.<sup>18,19</sup> Social class was assigned to the respondents based on the occupation of the head of the household, following an adaptation<sup>20</sup> of the British Registrar's Social Classification.<sup>21</sup>

In the second study, clinical records of individuals ages 20 and over were sampled systematically from the registry of the Health Center of Barañain (Navarra). Following the criteria of a previous validity study of the British NHP,<sup>11</sup> people were classified as "non-users" if no medical visits were registered in the last six months, and as "frequent users" if three or more visits were made by individuals less

than 50 years old, or five or more visits for individuals age 50 and over. As illness was the construct of interest, routine medical examinations were not included. In total, 396 people were considered eligible for the study (195 "non-users" and 201 "frequent users"). They were asked to complete the Spanish version of the NHP and to give information on self-rated health and chronic conditions. Complete responses were obtained from 338 individuals (85.3 percent of the eligible). Following the previous British study,<sup>11</sup> influence of age and sex in the analysis was eliminated by randomly selecting from the respondents a subsample of 276 people containing equal numbers of "non-users" and "frequent users" in each age and sex group. Four age ranges were categorized by 10-year intervals (20-29, 30-39, 40-49, and 50 and over).

We calculated scores for each NHP dimension in these studies by adding all the answers to the items in the dimension, giving the value of 0 for answers of "no" and 1 for answers of "yes". To obtain a final score in each dimension, and to overcome the fact of having a different number of items in some of the dimensions, each sum was multiplied by 100 and divided by the number of items in the dimension. Possible scores ranged from 0 (all answers of "no" in the dimension, denoting absence of distress) to 100 (all answers of "yes", denoting maximal distress). Statistical significance was assessed using nonparametric tests (one-tailed Wilcoxon-Mann-Whitney, and Kruskal Wallis tests at a 5 percent level of significance<sup>22</sup>) because NHP responses do not follow a normal distribution.<sup>9</sup>

Mean scores of the NHP for the general population ages 41 and over of the city of Barcelona are presented in Table 1. Highest mean scores corresponded to Sleep and to Emotional Reactions (23.2 and 20.8, respectively), while the lowest was that of Social Isolation (7.2). Women scored considerably higher than men in all the dimensions. Mean scores were higher for social classes IV-V (manual workers) than for social classes I-II (directors, professionals and others).

People rating their health as "very good" scored 2.9 in Energy, 3.7 in Pain, and 4.9 in Social Isolation, as compared with those with "poor" or "very poor" health, scoring 64.3, 58.0, and 21.4, respectively (Table 2). People with at least one of the 34 chronic conditions listed scored significantly higher than those not reporting any condition, the score being higher as the number of conditions increased. Similar differences in

TABLE 1—Mean Scores for each Dimension of the Spanish Version of the NHP in the General Population Ages 41 and over of Barcelona.

	Energy	Pain	Emotional Reactions	Sleep	Social Isolation	Mobility (n)
Total	14.1	15.6	20.8	23.2	7.2	14.9 (1,220)
Sex						
Male	8.5	9.1	16.1	17.6	5.7	10.6 (578)
Female	19.0	21.5	25.0	28.2	8.6	18.8 (642)
Age group						
41-49	8.9	10.7	19.8	16.7	4.4	9.0 (320)
50-59	12.6	14.4	20.9	20.7	7.0	11.5 (405)
60-69	15.4	18.4	18.7	27.1	7.8	17.5 (292)
70+	23.3	21.8	25.0	32.8	11.5	27.3 (203)
Social Class (age-adjusted scores)*						
I-II	10.3	8.0	15.7	16.2	4.3	11.2 (256)
III	10.5	11.5	15.1	18.0	5.5	12.9 (299)
IV-V	17.0	20.8	25.5	27.1	8.9	17.4 (606)

\*59 individuals not classified.

**TABLE 2—Mean Scores for Each Dimension of the Spanish Version of the NHP by Level of Self-reported Health Variables (convergent validity variables), General Population Ages 41 and over of Barcelona**

Characteristics	Energy	Pain	Emotional Reactions	Sleep	Social Isolation	Mobility (n)
<b>Self-Rated Health*</b>						
Very good	2.9	3.7	12.1	12.0	4.9	7.0 (119)
Good	6.1	7.8	14.8	17.2	4.9	9.0 (692)
Fair	25.5	28.1	30.6	34.2	10.6	23.8 (350)
Poor or very poor	64.3	58.0	47.4	56.1	21.4	49.3 (59)
<b>Chronic Conditions**</b>						
No	3.4	3.5	11.4	10.6	2.6	4.3 (245)
Yes	16.8	18.7	23.2	26.4	8.4	17.7 (975)
<b>Number of Chronic Conditions*</b>						
0	3.4	3.5	11.4	10.6	2.6	4.3 (245)
1	5.5	7.4	16.8	17.4	5.7	9.3 (278)
2	12.3	13.9	19.6	24.0	7.5	13.9 (237)
3	18.1	21.6	24.3	23.3	8.3	18.9 (161)
4	19.0	24.0	26.9	31.6	9.2	21.5 (129)
5+	38.5	37.2	35.0	43.3	14.3	32.1 (170)
<b>Chronic Limitation of Activity**</b>						
No	10.7	12.5	19.0	21.0	6.6	12.5 (1,086)
Yes	42.0	41.0	35.0	42.1	12.6	35.1 (134)
<b>Restricted Activity Days (in the past two weeks)**</b>						
No	11.9	13.8	19.7	22.1	6.8	13.4 (1,133)
Yes	41.8	39.6	33.5	37.3	12.3	33.4 (87)

\*Kruskal-Wallis test:  $p < 0.0001$ , for all dimensions.\*\*Wilcoxon-Mann-Whitney one-tailed test:  $p < 0.0001$ , for all dimensions.

size and direction were found for chronic limitation of activity and for restricted activity days (Table 2). Logistic regression analysis showed that NHP scores remained significantly associated with the construct validity variables, when age, sex, and social class were taken into account.

As shown in Table 3, the mean scores in each of the NHP dimensions were higher for the "frequent users" than for the "non-users." The most important relative differences corresponded to Pain and Energy dimensions (50 percent or more increase). Also, people reporting better health scored lower than those reporting worse health. NHP scores showed an ascending gradient related to reported number of chronic conditions (Table 3).

### Discussion

Accurate translation is a first requirement in the process of transferring a health measure from the culture of origin to another culture.<sup>2,5,15,23</sup> However, it is a common practice that researchers themselves directly translate health questionnaires using technical and/or uncommon expressions which can affect validity, reliability, and comparability of results.

The translation methodology used for transferring the NHP into Spanish ensured a conceptually equivalent version.<sup>24</sup> The high level of agreement achieved in most back-translated items supports this equivalence. The participation of the monolingual lay panel in the translation ensured that statements of the new version were based on lay

**TABLE 3—Mean Scores for each Dimension of the Spanish Version of the NHP by "Non-users" and "Frequent Users" and by other Convergent Validity Variables: Study of the Health Center of Barañain (Pamplona) (n = 276)**

Characteristics	Energy	Pain	Emotional Reactions	Sleep	Social Isolation	Mobility (n)
<b>Use of Health Services**</b>						
Non-users	8.7	8.3	16.9	16.7	6.4	10.2 (138)
Frequent users	13.0	13.8	23.9	23.8	8.8	13.8 (138)
<b>Self-Rated Health*</b>						
Very good	0.0	2.1	7.7	7.8	2.1	3.6 (38)
Good	4.5	6.6	15.4	14.1	6.2	7.1 (158)
Fair	25.1	21.9	35.2	39.1	10.3	25.0 (69)
Poor or very poor	57.6	37.5	50.6	24.0	30.9	33.7 (11)
<b>Number of Chronic Conditions*</b>						
0	5.3	1.0	10.2	8.4	3.1	3.9 (38)
1	7.1	5.8	12.8	13.8	3.1	8.2 (66)
2	10.8	11.2	20.8	17.4	8.2	11.5 (78)
3	12.6	11.3	27.3	21.4	13.6	15.6 (45)
4	14.1	25.0	28.5	36.4	11.5	20.6 (26)
5+	24.4	27.2	35.5	52.4	10.0	25.6 (23)

\*Kruskal-Wallis test:  $p < 0.01$ , for all dimensions.\*\*Wilcoxon-Mann-Whitney one-tailed test:  $p < 0.05$ , for all dimensions.

expressions of health perceptions, as the original instrument. The fact that similar expressions had been obtained for other European versions of the NHP, further suggests that NHP items address aspects of health perceptions that have conceptual equivalence for these cultures.<sup>7,13</sup>

As mentioned above, the strategy for transferring the NHP into Spanish included the assessment of validity of the version before obtaining the weights of the items. As there is no gold standard against which validity of complex health status measures could be evaluated,<sup>1,25,26</sup> construct validity rather than criterion validity of the Spanish version has been assessed.

The results of the studies presented preliminarily suggest that the unweighted Spanish version of the NHP has construct validity. Mean scores in every NHP dimension are clearly different for individuals with diverse degrees of perceived health as assessed by a variety of other construct validity variables. All differences were in the expected direction: the lower the level of the perceived health indicator the higher the NHP score. The similarity of the results from both studies, with different designs and populations, further supports the validity of the questionnaire.

A similar distribution of NHP scores across different self-rated health (SRH) categories has been observed in several studies in Britain.<sup>9,27,28</sup> SRH has been shown to be a good predictor of health outcomes, even after adjusting for a number of variables including "objective" health status.<sup>29,30</sup> The consistency and the strength of the relationship between NHP scores and SRH is evidence of the validity of the questionnaire. In both studies presented, an increase was observed in mean NHP scores as the number of chronic conditions increased. Even though the severity of the conditions included was not considered, and the fact that conditions reported may reflect both medically diagnosed and patient perceived health problems,<sup>31-33</sup> it was expected that, on the average, people reporting more health conditions would have a worse perception of their health.

The approach of the first study for assessing construct validity, i.e., to compare scores for the new measure for different levels of self-reported health variables, has been previously utilized.<sup>26,34,35</sup> Most of these studies have reported high correlations among the health measures and the construct validity variables, similar to the results presented for the Spanish NHP. However, the relationship found between NHP responses and construct validity variables may be overestimated as responses to both were obtained directly by the respondent.

Conversely, in the second study, the number of visits was obtained from clinical records, independently of the measure of the responses to NHP. Thus, mean score differences between non-users and frequent users provide further evidence of the validity of the Spanish version of the NHP. However, these differences, although statistically significant, are not very large. This seems to be due to the fact that the scores of the "frequent users" are not so high as might be expected. The most likely explanation of this could be that people in the poorest health were misclassified due to a reduced likelihood of home visits by the doctor being recorded. Another explanation can be found in the fact that many of the "non-users" are non-symptom-free. A comparison of the distribution of health problems suggests that highest differences between these two groups were for conditions which have low potential impact on NHP scores (e.g., hypertension and hearing problems).

Nevertheless, to completely assess the equivalence of

the questionnaire, similarity of the weights of the items should be established, as it has been done for other NHP European versions<sup>7,13</sup> and for the British version of the Sickness Impact Profile.<sup>6</sup> As mentioned above, the British authors of the NHP developed weights for the items in each dimension, using Thurstone's method of paired comparison;<sup>14</sup> weights being calculated by considering the proportion of times each statement was judged to be more severe than each of the other statements in the dimension by a representative group of lay people.

Developing the weights for the Spanish version would provide an important basis for definitively assessing validity of the questionnaire and for ensuring cross-cultural comparability.

## APPENDIX

### English and Spanish Versions of Selected Items of the Nottingham Health Profile (and graded agreement of back-translation)

British Item	Spanish Item	(Agreement)
<i>Energy</i>		
The days seem to drag	Los días se me hacen interminables	(A)
I'm tired all the time	Siempre estoy fatigado	(C)
<i>Pain</i>		
I have pain at night	Tengo dolor por las noches	(A)
<i>Emotional Reactions</i>		
Worry is keeping me awake at night	Las preocupaciones me desvelan por la noche	(A)
I lose my temper easily these days	Ultimamente me enfado con facilidad	(B)
Things are getting me down	Las cosas me deprimen	(C)
<i>Sleep</i>		
I take tablets to help me sleep	Tomo pastillas para dormir	(A)
I'm waking in the early hours of the morning	Me despierto antes de hora	(C)
<i>Social Isolation</i>		
I'm finding it hard to get on with people	Me cuesta llevarme bien con la gente	(A)
I'm finding it hard to make contact with people	Ultimamente me resulta difícil contactar con la gente	(C)
<i>Physical Mobility</i>		
I can only walk about indoors	Sólo puedo andar por dentro de casa	(A)
I find it hard to reach for things	Me cuesta coger las cosas	(C)

- (A) Satisfactory translation  
(B) One or two words uncertain  
(C) Doubtful translation

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