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A validation study of the Personal Health Scale in Argentina and Venezuela

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Introduction. International reports have shown that the majority of patients with a psychiatric disorder are most often seen in non-psychiatric services and are not effectively diagnosed. The objectives of this study, conducted in Argentina and Venezuela, was to validate the Personal Health Scale (PHS), a 10-item instrument developed for the detection of possible cases of mental disorders.

Method. A total of 227 subjects were recruited in both countries. The PHS's ease of use and the time required for completion was rated. Its internal consistency (calculating the Cronbach's alpha) and factorial structures was analyzed. Mean total scores of psychiatric patients (n=127) and control subjects without psychiatric illness (n=100) were compared to determine its discriminant validity.

Results. Mean time for completion was less than 3 minutes and the majority of subjects judged it as easy to use. The Cronbach's alpha was 0.77 in both countries and the factorial analysis (extraction limited to one factor) showed that 8 (Venezuela) or 9 (Argentina) of the 10 items were represented in that factor; the variance explained by that factor was of 34%. A significant statistical difference ($p<0.05$) was found for the mean total scores between the psychiatric patients and controls. The best cut-off score to discriminate between groups was 6/7.

Conclusions. The results suggest that the PHS is efficient, easy to use, has a high internal consistency, adequate factorial structure and ability to discriminate between samples of psychiatric patients and controls. We propose its use in primary care settings, clinical and epidemiological studies in Latin American countries.

Key words:

Validation. Personal Health Scale, Mental health.

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Estudio de validación de la Escala de Salud Personal en Argentina y Venezuela

Introducción. Estudios internacionales demuestran que la mayoría de pacientes con algún trastorno mental son frecuentemente vistos en servicios no-psiquiátricos y no son adecuadamente diagnosticados. El objetivo de este estudio realizado en Argentina y Venezuela es validar la Escala de Salud Personal (ESP), un instrumento de 10 ítems diseñado para detectar probables casos de trastorno mental.

Método. Se reclutó un total de 227 sujetos en ambos países. Se evaluó la facilidad de uso de la ESP y cuantificó el tiempo utilizado. Se evaluó su consistencia interna (calculando el alfa de Cronbach) y su estructura factorial. Puntajes medios de pacientes psiquiátricos (n=127) e individuos sin patología psiquiátrica (controles, n=100) fueron comparados para determinar la validez discriminativa.

Resultados. El tiempo medio para completar la ESP fue menos de 3 minutos y la mayoría de sujetos lo calificó como fácil de usar. El alfa de Cronbach fue 0,77 en ambos países y el análisis factorial (extracción limitada a un factor) mostró que 8 (Venezuela) o 9 (Argentina) de los 10 ítems se representan en ese factor con una varianza explicada de 34%. Se encontró diferencia estadísticamente significativa ($p< 0,05$) para los puntajes medios entre pacientes psiquiátricos y controles, siendo 6/7 el mejor punto de corte para discriminar entre grupos.

Conclusiones. Los resultados sugieren que la ESP es eficiente, fácil de usar, tiene alta consistencia interna, adecuada estructura factorial y capacidad de discriminar entre muestras de pacientes psiquiátricos y controles. Se propone su uso en atención primaria, investigación clínica y epidemiológica en países latinoamericanos.

Palabras clave:

Validación. Escala de Salud Personal, salud mental.

INTRODUCTION

According to reports of the World Health Organization, mental disorders account for approximately 12% of the overall disease burden and it is estimated that it will represent 15% of the disability-adjusted life year (DALY) in the year 2020¹. Studies in recent decades have shown that one out of every 4 patients attending health care services have at least one mental, neurological or behavioral problem, but most of these disorders are not diagnosed or treated².

Most of the individuals affected by mental disorder are seen for the first time in general health services. It has frequently been found that the nonpsychiatric physicians do not correctly recognized the mental problems, particularly when they are associated to somatic symptoms³⁻⁶. In addition, it has been recognized that there is a complex and reciprocal relationship between physical and mental disorders; mental disorders can lead to a deficient somatic health condition and, like wise, chronic somatic conditions have an elevated likelihood of developing mental disorder such as depression¹.

For this reason, the development of instruments to detect mental health cases continues to be an objective of interest in primary care. This study presents the results of the validation of a new instrument developed for the detection of possible cases of mental conditions, the Personal Health Scale (PHS) in two Latin American cities, Buenos Aires-Argentina and Caracas-Venezuela.

The structure of the PHS, validation methodology and data on its ease of application and time required, internal structure and discriminant validity are presented in this report.

The Personal Health Scale (PHS)

The PHS is a brief instrument composed of 10 items that include: 6 questions on somatic and psychological complaints, 3 on adaptive functioning and one self-evaluation on the recognition of the presence of emotional problems and need for professional help⁷. The first six items (somatic and psychological symptoms) were obtained from the correlational analyses of a database generated with the use of the Self-Reporting Questionnaire (SRQ) in Nicaragua⁸⁻⁹, the items that correlated highly with the presence of mental disease were selected. The three items on adaptive functioning evaluate key areas of occupational, family and social functioning in general, derived from an observational study on functioning as a discriminant factor between individuals with and without mental disease¹⁰. The final item, self-evaluation, is consistent with theories that give importance to the individual's self-perception on the presence of problems and need for care^{11, 12}. The items are scored according to their frequency of presentation during

the last month: 0= Never, 1= Sometimes and 2= Always. The total score can range from 0 to 20.

The Spanish version of PHS was first validated in Leon-Nicaragua⁷ and then in Lima-Peru¹³. Four language versions, including English, Spanish, Chinese and Korean, were studied in New York, USA¹⁴⁻¹⁷. Additionally, a version in Portuguese was studied in Brazil¹⁸.

MATERIAL AND METHODS

Subjects

Patients were enrolled in two Latin American cities: Buena Aires-Argentina, between January and December 2004, and Caracas-Venezuela, between February 2004 and February 2005. These subjects were enrolled after obtaining approval of the local institutions to carry out the study, and the international ethical guidelines for research in human subjects were followed during the conduction of the study.

In both cities, a search was made for similar samples of psychiatric patients who met diagnostic criteria for axis I disorders of the DSM IV multiaxial diagnoses and individuals without known psychiatric condition (controls) composed of students and/or health care professionals. The general inclusion criteria were the following: subjects between 18 and 60 years of age, both genders, and who were capable of signing the informed consent developed for participation in this study. Those individuals not capable of providing consent due to extreme mental condition, cognitive deficiencies or being illiterate were excluded from the study.

In Argentina, the sample of psychiatric patients was collected in the outpatient services of the Institute of Asistencia Psicopatológica Integral (API), in collaboration with the professional staff and students of the University of Belgrano, and it included outpatient psychiatric subjects, recruited by the principal author in his private practice and in the outpatient clinic of the API (n=50, Mean age = 42.40 years, Standard Deviation (SD)=14.22; 64% women). The control sample included a subgroup of advanced medical students of the University of Belgrano and mental health care professionals working in the outpatient clinic of the API (n=50, Mean age = 33.66 years, SD = 9.94; 72% women).

In Venezuela, the sample of psychiatric patients included adults referred for court-ordered evaluation to the Social Service of the Child and Adolescent Protection Courts, the National Unit of Child Psychiatry "Dra. Alecia Bello Peña" (UNPI) of the Instituto Venezolano of Social Security and in the Centro Integral para la Estimulación Cognitiva y Comunicativa (CIPECC), and the private practice of the principal investigator (n = 77; Mean age = 40.69

Table 1	Ease of use for the PHS, perceived by the subject and by the interviewer							
	ARGENTINA				VENEZUELA			
	Perceived by the subject		Perceived by the interviewer		Perceived by the subject		Perceived by the interviewer	
	Patients (n=50)	Controls (n=50)	Patients (n=50)	Controls (n=50)	Patients (n=50)	Controls (n=50)	Patients (n=50)	Controls (n=50)
Very easy	70%	80%	80%	78%	99%	96%	100%	100%
Somewhat easy	18%	20%	12%	22%	1%	4%	0%	0%
Somewhat difficult	12%	0%	8%	0%	0%	0%	0%	0%
Very difficult	0%	0%	0%	0%	0%	0%	0%	0%

years, SD = 11.12; 77% women). The control sample included mental health and social work professionals working in the outpatient services of the previously mentioned sites (n=50; Mean age = 35.69 years, SD = 7.88; 78% women).

Instruments

Three instruments were used: a questionnaire to gather demographic data, the PHS and a format to document the time required and to evaluate the ease/difficulty to respond to the PHS. The PHS is a self-report instrument, therefore the interviewers only acted as observer during its administration and answered the questions that the study subjects could have on the contents and scoring of the items.

Data analyses

The following parameters were analyzed and evaluated statistically:

- Time required and applicability in patients and controls.
- Internal structure: a) Internal consistency: it was analyzed using the Cronbach's α coefficient for the 10 items of the instrument in both countries. b) Factorial analyses: the factorial structure was analyzed using principal component analysis as extraction method, limiting it to a single factor,
- Discriminant validity: it was analyzed comparing the means between the scores of the patients and controls. A search was made for the best cut-off a scores to determine the probable presence of mental disorder using the area under the ROC curve and calculating the Number-Needed-to-Diagnose (NND = $1/[\text{Sensitivity} - (1 - \text{Specificity})]$)¹⁹.

All the statistical analyses were performed using the SPSS statistical program. Statistical significance was considered as $p < 0.05$.

RESULTS

Time required and ease of use

In Argentina, the average time to complete the PHS was 3.42 minutes (SD=0.98) for the patient sample, 1.87 minutes (SD=1.41) for the control sample and 2.65 minutes (SD=1.44) for the total sample. In Venezuela, the patients needed an average of 2.2 minutes (SD=0.50), the professionals 1.7 minutes (SD=0.62); 2 minutes (SD=0.61) being the average time required for the total sample.

Table 1 shows the results of the ease of use variable, perceived separately by the subjects and interviewers (as observers of the use of the instrument). In both countries, most of the subjects (88-100%) and the interviewers (92-100%), considered the PHS as "somewhat easy" or "very easy" to use.

Internal Structure

- a. Internal Consistency: It was found that the Cronbach's α for the 10 items of the PHS was 0.77 (the maximum value being 1) both for the Argentina sample (N=100) as for the Venezuela one (N=127).
- b. The factorial analysis (analysis of principal components, limiting the extraction to one factor) of the 10 items for the samples of both countries, the results of the factorial structure and percentage of variance explained by the factor are shown in table 2. It was noted that 8 or more of the 10 items in our sample had loadings of over 0.4 in the factor.

Discriminant validity

The results of the discriminant validity study of the PHS are shown in table 3. A statistically significant difference was found between the subsamples of psychiatric patients

and controls, for the measurement of total scores ($p=0.001$) in both countries. In regards to the individual items, a statistically significant difference was also found for most of them ($p<0.05$), except for items 1, 3, 4 and 7 in Argentina and items 4, 6 and 9 in Venezuela.

Table 2	Factorial Structure of the PHS of the samples in Argentina (N=100) and Venezuela (N=127), principal component analysis with extraction limited to 1 factor.	ARGENTINA ^A		VENEZUELA ^B	
		ITEMS		Factor 1	Factor 1
	1. Have you had difficulty falling asleep?	0.602	0.382		
	2. Have you felt frightened or alarmed?	0.339	0.522		
	3. Have you felt nervous or tense?	0.640	0.608		
	4. Have you felt sad?	0.654	0.633		
	5. Have you had trouble enjoying daily activities?	0.780	0.682		
	6. Have you felt tired?	0.505	0.308		
	7. Have you been missing or not doing well your work?	0.547	0.520		
	8. Have you had difficulty relating to your family?	0.482	0.735		
	9. Have you had difficulty relating to friends and neighbors?	0.415	0.582		
	10. Have you felt you had emotional problems and needed professional help?	0.700	0.688		
	Percentage of the variance explained by the factor	33.730 %	33.710 %		
^A KMO Measure of Sampling Adequacy: 0.752. Bartlett's Test of Sphericity: Sig.= 0.000 ^B KMO Measure of Sampling Adequacy: 0.787. Bartlett's Test of Sphericity: Sig.= 0.000					

Table 3	Discriminant validity of the PHS, comparison of the mean total scores and individual items	ARGENTINA		VENEZUELA	
		Patients (n=50)	Controls (n=50)	Patients (n=77)	Controls (n=50)
Items	1. Have you had difficulty falling asleep?	0.76*	0.62*	1.06	0.52
	2. Have you felt frightened or alarmed?	0.56	0.30	0.56	0.28
	3. Have you felt nervous or tense?	1.04*	0.94*	0.95	0.66
	4. Have you felt sad?	0.92*	0.69*	0.71*	0.60*
	5. Have you had trouble enjoying daily activities?	0.82	0.52	0.47	0.18
	6. Have you felt tired?	1.14	0.86	0.99*	1.04*
	7. Have you been missing or not doing well your work?	0.46*	0.28*	0.27	0.10
	8. Have you had difficulty relating to your family?	0.64	0.34	0.52	0.14
	9. Have you had difficulty relating to friends and neighbors?	0.66	0.26	0.25*	0.14*
	10. Have you felt you had emotional problems and needed professional help?	0.94	0.60	0.62	0.30
	Mean total scores	7.84	5.40	6.44	4.02
* No statistically significant difference was found ($p<0.05$) between patients and controls					

Table 4		Best cut-off scores for the total PHS score. Sensitivity, 1-Specificity, Number-Needed-to-Diagnose (NDD)									
ARGENTINA (n=100)				VENEZUELA (n=127)				TOTAL (N=227)			
Cutt off	Sens.	1 - Spec.	NND	Cutt off	Sens.	1 - Spec.	NND	Cutt off	Sens.	1 - Spec.	NND
0.50	0.940	0.980	-25.00	0.50	1.000	0.960	25.00	0.50	0.976	0.970	166.67
1.50	0.940	0.960	-50.00	1.50	0.974	0.880	10.64	1.50	0.961	0.920	24.39
2.50	0.880	0.800	12.50	2.50	0.857	0.780	12.99	2.50	0.866	0.790	13.16
3.50	0.820	0.700	8.33	3.50	0.766	0.580	5.38	3.50	0.787	0.640	6.80
4.50	0.800	0.560	4.17	4.50	0.649	0.360	3.46	4.50	0.709	0.460	4.02
5.50	0.700	0.440	3.85	5.50	0.506	0.240	3.76	5.50	0.583	0.340	4.12
6.50	0.620	0.320	3.33	6.50	0.390	0.080	3.23	6.50	0.480	0.200	3.57
7.50	0.560	0.260	3.33	7.50	0.325	0.040	3.51	7.50	0.417	0.150	3.75
8.50	0.420	0.140	3.57	8.50	0.273	0.040	4.29	8.50	0.331	0.090	4.15
9.50	0.320	0.100	4.55	9.50	0.234	0.020	4.67	9.50	0.268	0.060	4.81
10.50	0.260	0.040	4.55	10.50	0.143	0.020	8.13	10.50	0.189	0.030	6.29
11.50	0.180	0.020	6.25	11.50	0.104	0.020	11.91	11.50	0.134	0.020	8.77
12.50	0.140	0.020	8.33	12.50	0.065	0.000	15.39	12.50	0.094	0.010	11.91
13.50	0.120	0.020	10.00	14.00	0.039	0.000	25.64	13.50	0.071	0.010	16.39
14.50	0.060	0.020	25.00	16.00	0.026	0.000	38.46	14.50	0.047	0.010	27.03
15.50	0.040	0.020	50.00	18.00	0.013	0.000	76.92	15.50	0.031	0.010	47.62
17.00	0.020	0.000	50.00	20.00	0.000	0.000		16.50	0.024	0.000	41.67
19.00	0.000	0.000						17.50	0.016	0.000	62.50
								18.50	0.008	0.000	125.00
								20.00	0.000	0.000	

The area under the ROC curve was calculated for the samples in each country and for the total sample, finding 0.683 in Argentina, 0.691 in Venezuela and 0.671 for the sum of the subjects in both countries. Selection of the best cut-off scores based on the lowest NND is shown in table 4, where it is observed that the best cut-off score to discriminate between possible cases of mental disorders and healthy individuals would be 6/7.

DISCUSSION

The PHS was developed considering 3 important aspects of mental health: frequent symptoms, adaptive functioning and the opinion of the individual on the presence of problems and the need for professional help⁷, in order to obtain a brief screening instrument to be used in multiple languages and in different medical care services.

Its successful use in Nicaragua⁷ and Peru¹³, as well as in samples of different ethnic groups in New York¹⁴⁻¹⁷ and

the Portuguese version in Brazil¹⁸ has been documented in previous studies. This study presents the psychometric data of the PHS in samples of two Latin American country.

The ease of use of the PHS was documented in Argentina and Venezuela. It was found that most of the subjects interviewed (88-100%) considered the instrument as "somewhat" or "very easy" to use. In addition, it was found that the average time required for completion was less than 3 minutes. Other studies have also documented its brevity, finding, in general, average completion times of less than 3 minutes in New York¹⁴⁻¹⁷ and in the Portuguese version¹⁸.

The internal structure of the PHS showed a high Cronbach α (0.77) in both countries, demonstrating the coherence of the items of the instrument around the concept of mental health. The results in the previously mentioned studies report values between 0.75 - 0.94¹⁴⁻¹⁷. Brief scales such as the 12-item version of the *General Health Questionnaire* (GHQ-12), used in diverse

populations and languages, have reported Cronbach α coefficients of 0.85 - 0.89²⁰⁻²³. The factorial analysis (principal components) of the 10 items of the PHS, limited to one factor, show that most of the items are represented in the component extracted.

In order to study the discriminant value of the PHS in both samples, a group of psychiatric patients was compared with a control group (students and health care professionals) without known mental conditions. The present study has demonstrated its ability to discriminate between both groups with different levels of mental health in each country, results are similar to those found in New York and Brazil¹⁴⁻¹⁸, in which samples of psychiatric patients and health care students/professionals were also included. In Nicaragua⁷ and Peru¹³, a similar design was used, but male workers attending an outpatient clinic and nonmedical hospital staff, respectively were used as controls, documenting in both cases similar results in regards to its discriminant ability. The analyses of the area under the ROC curve allowed the selection of the best cut-off score to discriminate between possible cases of mental disorders and healthy individuals; a score equal to or greater than 7 has an approximate Sensitivity of almost 50% and a Specificity of 80%, in the total sample.

CONCLUSIONS

The results suggest that the PHS is an efficient, easy to use, brief (less than 3 minutes to complete) instrument. It has high internal consistency, adequate internal structure, and is capable of discriminating between samples of psychiatric patients and individuals without mental disease.

The results documented in the validation of this instrument supports its proposed use in primary care settings, and for clinical and epidemiological research; its use could be relevant in other Latin American countries

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