Cultural adaptation, reliability and validity of the Brazilian version Independent Living Skills Survey (ILSS-BR/P) with schizophrenic patients for schizophrenia

Adaptação cultural, validade e confiabilidade da versão brasileira do Inventário de Habilidades de Vida Independente – Versão do paciente (ILSS-BR/P), na esquizofrenia

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Abstract

Background: There is a strong association between good psychosocial functioning and the ability to carry out everyday tasks in patients with schizophrenia. Valid instruments become increasingly necessary to evaluate the performance of these patients in independent living activities. **Objective:** To adapt and assess the psychometric properties of the Brazilian version of the Independent Living Skills Survey (ILSS-BR/P) in patients with schizophrenia. **Methods:** Reliability was assessed with test-retest, interrater and internal consistency. Furthermore, construct, discriminant and concurrent validity were assessed. **Results:** Fifty patients were included in the interrater study, with an agreement of 64.4% between responses and an Intraclass Correlation (ICC) ranged from 0.80-0.99. Forty-six patients participated in the test-retest, with an ICC ranged from 0.84-0.94 and an agreement of 44.3%. The internal consistency was good (0.23-0.98). Hundred and sixty patients participated in the validation. Regarding to the discriminant validity, female patients presented a higher performance in the overall score and five subscales compared with men. The concurrent validity confirmed the specificity of the dimensions of the scale, comparing the ILSS with the PANSS, Calgary, CGI, GAF, WHOQOL and the Rosenberg Self-Esteem. **Discussion:** The ILSS-BR/P is a valid and reliable research instrument to assess social functioning in patients with schizophrenia.

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Keywords: ILSS, validity, reliability, schizophrenia, independent living.

Resumo

Contexto: Existe uma forte associação entre um bom funcionamento psicossocial e a habilidade de realizar tarefas diárias em pacientes com esquizofrenia. Instrumentos válidos tornam-se cada vez mais necessários para avaliar o desempenho desses pacientes nas atividades de vida independente. **Objetivo:** Avaliar as propriedades psicométricas do Inventário de Habilidades de Vida Independente – versão do paciente (ILSS-BR/P) em portadores de esquizofrenia. **Métodos:** Confiabilidade foi avaliada pelo teste-reteste, entre observadores e consistência interna. Além disso, a validade de constructo, discriminante e concorrente, foi avaliada. **Resultados:** Cinquenta pacientes foram incluídos no estudo entre observadores, com 64,4% de concordância entre as respostas e uma variação de 0,80-0,99 do Coeficiente de Correlação Intraclasses (ICC). Quarenta e seis pacientes participaram do teste-reteste, e o ICC variou de 0,84-0,94, com 44,3% de concordância. A consistência interna apresentou bom resultado (0,23-0,98). Cento e sessenta pacientes participaram da validação. Na validade discriminante, as mulheres apresentaram desempenho superior no escore global e em cinco subescalas quando comparadas aos homens. A validade concorrente confirmou a especificidade das dimensões da escala, comparando a ILSS com a PANSS, Calgary, CGI, GAF, WHOQOL e Autoestima de Rosemberg. **Conclusão:** A ILSS-BR/P é um instrumento de pesquisa válido e confiável para avaliar o funcionamento social desses pacientes.

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Palavras-chave: ILSS, validade, confiabilidade, esquizofrenia, vida independente.

Introduction

There is a direct connection between good psychosocial functioning and the ability to carry out everyday tasks[1,2], preserve cognitive aspects and perform consistently well in the community[3]. Cognitive functions in patients with schizophrenia are usually impaired, possibly leading to a significant impact on many areas[4], such as their work, social and love life, interpersonal relationships, personal care, leisure, learning process, studying, and independent living[5-7]. Just as the cognitive impairments, functional losses are also observed in both the onset of the disease, with significant impact on the activities of daily living[8].

Despite the increase in the number of interventions focusing on independent living issues, most patients with schizophrenia still show significant limitations in this area[9]. The way a patient carries out everyday self-care activities may be what differentiates his status from clinical remission to functional recovery, in other words, he is not just symptomatically stable, but also functionally stable[10]. The clinical aspect is an important measurement of the clinical outcome to be evaluated in different treatment strategies[11], therefore, valid instruments that allow for good reproducibility are needed when assessing individuals while they perform daily living activities. To choose the most appropriate instrument is important to assess the concepts of reliability and validity and the methods used for evaluation. Reliability is related to the reproducibility using the correlation between multiple measurements of the same instrument. To assess the reliability the internal consistency, test-retest and interrater are used. The validity of an instrument is its ability to actually measure what it purports to measure[12]. There are several ways to determine the validity of an instrument through quantitative and qualitative measures. Construct validity is an assessment of how well you translated your ideas or theories

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into actual measures, concurrent validity is used to measure the variable of interest and discriminant validity can discriminate response patterns in different subgroups[13].

Two versions of the Independent Living Skills Survey (ILSS) were developed, adapted and tested by Wallace[14] to assess functioning of patients with schizophrenia from two standpoints: the informant (ILSS-I), to be administered to relatives or careers; and the patient (ILSS-SR), defined as a self-report, but which the author himself suggests should be administered by an interviewer.

The validation of the original version included measurements of internal consistency, temporal stability scoring, interrater reliability and concurrent and predictive validity of the questionnaire. Results showed that both versions of the scale have acceptable psychometric characteristics. The ILSS-SR reliability and validity study was conducted with 448 patients presenting severe mental illnesses who were part of three different projects: *Veterans Affairs* (VA) – Los Angeles, *Santa Barbara* (SB) – California and *Social Security Administration* (SSA). Internal consistency results showed a Cronbach alpha variation between 0.43 for the Transportation subscale and 0.90 for the Work subscale. The test-retest stability variation was 0.42-0.90 for the Leisure subscale and 0.90 for the Work subscale. The validation study used the ILSS-SR scale correlation with the Brief Psychiatric Rating Scale (BPRS), Profile of Adaptation to Life – Change version and Global Assessment of Functioning (GAF) scales. The correlation between the overall BPRS and ILSS-SR scores was -0.318, which indicates an inverse relationship between the number of symptoms and independent living skills. The correlation between GAF and ILSS overall scores was 0.375, a moderate positive correlation[14,15].

In a study conducted by Cyr *et al.*[16] the ILSS-SR scale was validated for the French language. The study included 145 patients diagnosed with mental illnesses from the community and assessed internal consistency, test-retest, discriminant and concurrent validity. Results revealed satisfactory internal consistency, where Cronbach's alpha varied between 0.47 and 0.93. The temporal stability sample presented a 0.48 to 0.85 variation and a 0.67 average for all scales. Discriminant validity was verified by comparing four groups of patients according to their participation in community living, diagnosis and gender. The ANOVA analysis of variance was used to compare the data and it revealed a non-significant difference between patients grouped according to their diagnosis. Patients with schizophrenia performed worse than others in terms of personal appearance, food preparation, money and the overall score. In terms of gender, the analysis of variance showed significant difference in four subscales and in the overall score (personal hygiene, appearance and clothing, care of personal possessions and food preparation), indicating that women have more skills in food preparation, personal care, hygiene and the home. A sixty-patient subsample was used in the scale's concurrent validation study, comparing the ILSS-SR with the Nurses' Observation Scale for Inpatient Evaluation (NOSIE-30). Results revealed a significant correlation between the ILSS and the NOSIE-30 in personal appearance and personal care (0.16), personal appearance and social competence (0.41), personal hygiene and positive factors (0.47) and personal appearance and positive factors (0.41).

In another study, Wallace[14] used the ILSS scale to compare 57 senior citizens with severe mental illnesses and a control group with 40 healthy individuals. Cronbach's alpha results varied 0.48 for transportation and 0.90 for work. Individuals with mental illnesses had poorer results than individuals in the control group in eight of the ten items included in the scale. Spearman's correlation coefficient was used to analyze the relationship between the ILSS-SR overall score and that of the Positive and Negative Syndrome Scale (PANSS). Results showed that the Food Preparation subscale had a negative correlation with PANSS' positive symptoms (r = -0.497, p < 0.01).

The ILSS-BR scale was validated for the Portuguese language by Lima *et al.*[17]. The study assessed 530 patients living in a psychiatric institution and who had been admitted, on average, for 36.9 years. The trans-cultural validation was conducted in two different stages: translation and adaptation of the scale, and a study of the psychometric characteristics through internal consistency analysis and construct and discriminant validity. Results revealed that the validity and legitimacy psychometric characteristics of the scale were satisfactory for the discriminant validity, construct validity and internal consistency of the subscales. Cronbach's alpha varied from 0.75 to 0.96. In order to validate the scale's construct validity, Pearson's correlations among the nine subscales were calculated (the ILSS-I does not include the sustained employment subscale), as well as their respective correlations with the overall score. The nine subscales presented significant correlations among themselves, indicating that, despite each subscale's different correlations, they all share an adjacent construct. Patients from six hospital units, grouped according to their level of independence, were compared in order to verify the discriminant validity. Variance analysis (ANOVA) was used to compare the data and results showed that the groups of patients from the six units presented statistically significant differences among themselves and in the overall score, for all subscales.

As a complement to the ILSS-BR reliability study, Bandeira *et al.*[18] conducted a study with a sample of 49 patients using the test-retest stability for each subscale and overall score. Survey results showed that the scale had significant correlation coefficients between the test and retest scores, varying from 0.51 to 0.91 of Pearson's correlation coefficient for all subscales and 0.89 for the overall score.

The purpose of this survey was to accomplish cultural adaptation and assess the reliability and validity of the Brazilian version of the ILSS-SR, through internal consistency analysis, temporal stability and interrater agreement, construct validity, and concurrent and discriminant validity, when applied to a sample including patients with schizophrenia.

Methods

Sample

Two convenience samples were selected. Patients diagnosed with schizophrenia were recruited for two different studies: inter-observer reliability and internal consistency (n = 50); and temporal stability (n = 46).

In order to validate the scale, the survey was included in a clinical trial to assess the effectiveness of an intervention for weight gain prevention[19]. Hundred and sixty patients diagnosed with schizophrenia, or schizophrenia spectrum disorders, according to DSM IV, aged 18 to 65 and available to come to the service centers for two consecutive weeks were included in the study. Patients who agreed to take part in the study signed a consent form approved by the Ethics Committee from Universidade Federal de São Paulo (Unifesp).

ILSS-SR

To develop the original version of the scale ILSS-SR[14], 51 items of the ILSS-I version were selected to assess dialing living activities. Ten complementary items were added to different areas and further nine items were inserted to address the impression of the interviewer on hygiene and appearance of the patient, totaling up 70 items grouped into 10 domains: Appearance and Clothing (9 items), personal hygiene (12 items), care of personal possessions (6 items), food preparation (7 items), Health Maintenance (7 items), Money Management (5 items), Transportation (5 items), Leisure (12 items), Job Seeking (4 items) and Job Maintenance (3 items). Two types of information were collected: a) the ability to perform tasks in the previous 30 days; and b) the observations of the interviewers on performance of the patient to carry them out. The items were scored as positive (1), negative (0) or not applicable. For the global score, the non-applicable items were excluded and a proportion between positive answers and valid items was calculated. The result is a percentage score, where the higher the score the better ability for an independent life.

Adjusting the instrument

The scale was translated into Portuguese and proofread by the team who conducted the study with a view to making any adjustments needed to adapt it to the Brazilian context. The document was back-translated by a bilingual translator and subjected to the approval of the author of the original version before it could be used. All the items were maintained and some semantic modifications were required.

The domain appearance and care of clothing had to be adjusted in two items. The question about the ability to dry clothes in the drier and to hang clothes in the washing line was summarized as putting clothes to dry (item 2). And the item asking if dirty clothes are stored separate from clean ones was altered to separating dirty from clean clothes (item 4).

The item 5 of the domain health asks if the patient knows about welfare benefits in the United States (Medi-Cal); it was modified to assess if the patient can ask for assistance from appropriate public services, such as the National Welfare System (INSS, acronym in Portuguese), fire brigade and police, among others.

The Portuguese version replaced the American terms paycheck and SSI check (money management-4) with a question on whether the patient receives social security benefits from the Brazilian government, and so was the strictly American term "Veterans of Foreign Wars" (leisure-6), which was replaced with the terms "community meetings and celebration parties".

Procedures

Interviews were standardized using practical examples. A manual, which had been proposed to identify non-applicable questions, included a script requesting that all answers be given in a non-detailed fashion and questioning if the patient had failed to perform a certain task either because that particular task was not applicable to his/her routine or for lack of ability.

Patients were invited to participate in the study and underwent a questionnaire to obtain clinical and socio-demographic data. Patients able to come for two consecutive weeks were allocated to the test-retest study and the remaining were included in the study of internal consistency and inter-rater.

Psychiatrists, nurses, occupational therapists and psychologists participated in the study as evaluators. The test-retest in the reliability study was conducted by the same evaluator in two different occasions and the inter-observer agreement study was conducted by pairs of professionals who filled out the survey simultaneously; one of them would conduct the interview while the other did the rating separately. In order to validate the tool, physicians used symptom and functionality assessment scales (Positive and Negative Syndrome Scale — PANSS, Calgary Depression Scale, Global Clinical Impression — GCI, Global Assessment of Functioning — GAF and the ILSS) and occupational therapists, nurses and psychologists administered the self-report versions of the The World Health Organization Quality of Life — WHOQOL[20] and the Rosemberg's Self Esteem Scale[21].

Statistical analysis

The data were analyzed using the statistical package SPSS for Windows version 14.0. The median, frequencies and standard deviations were calculated for sociodemographic data and clinical variables. For internal consistency, the Cronbach´s alpha coefficient was calculated for each domain and global score. For the test-retest and inter-rater, the intra-class correlation coefficient (ICC) was used for each domains and global score since they are continuous variables. Kappa was calculated for all items of the scale. The Cohen classification[22] was employed to assess the percentage agreement for test and retest and for inter-rater: 1) < 0: no agreement; 2) 0,0-0,20: slight agreement; 3) 0,21-0,40: fair agreement; 4) 0,41-0,60: moderate agreement; 5) 0,61-0,80: substantial agreement e 6) 0,81-1,00: almost perfect agreement.

The ANOVA variance analysis was used in the validation study to assess the discriminant validity by comparing the performances of males and females. Pearson's correlation was used in the construct validity, comparing each subscale's score to the overall score. In order to validate the concurrent validity, overall ILSS-BR/P scores were correlated with overall PANSS, Calgary, GAF, GCI, WHOQOL and Rosemberg's Self Esteem Scales.

Results

Cultural adaptation

The scale was translated into Portuguese and proofread by the team who conducted the study with a view to making any adjustments needed to adapt it to the Brazilian context. The document was back--translated by a bilingual translator and subjected to the approval of the author of the original version before it could be used. All the items were maintained and some semantic modifications were required.

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Reliability

Fifty patients were included the inter-rater study and 46 patients able to come for two consecutive weeks were allocated to the test--retest study.

Test-retest

Forty six patients participated in the study, with a mean age of 36.9 years (SD: 9.1); 65.2% were males; 89.1% were single; 47.8% had completed high school and 47.8% were unemployed. The temporal stability measures were considered strong, and ICC varied from 0.84 to 0.94 and Kappa between -0.02 and 1.00. An average of 44.3% was found for agreement among answers, considering a seven-day interval between applications (Table 1).

Internal consistency and interrater

Fifty patients were included, with a mean age of 38.4 years (SD: 10,9); 70% were males, 84% were single; 60% had completed high school and 49% were unemployed. Inter-rater results were considered strong, with the ICC ranged between 0.80 and 0.99 and Kappa from -0.03 to 1.00. The average percentage agreement among investigators was 64.4% (Table 1).

Cronbach´s alpha was 0.80 for the total score of the scale, varying from 0.23 to 0.98 for the domains: personal hygiene 0.58; appearance and care of clothing 0.55; care of personal possessions 0.70; food preparation 0.66; health management 0.40; money management 0.54; transportation 0.23; leisure 0.47; job seeking 0.98 and job maintenance 0.81.

The average time for the application of the scale was thirty minutes.

Table 1. The Kappa and Intra-Class Correlation Coefficients (ICC) for the inter-rater and test-retest designs

Items/Subescales	Inter-rater n = 50		Test-Retest n = 46	
	Kappa	Cohen**	Kappa	Cohen**
1. Properly wash your clothes when necessary?	0.75	5	0.60	4
2. Put the clothes to dry?	0.89	6	0.60	4
3. Fold, hang and put away your clothes?	0.93	6	0.47	4
4. Sort out the dirty clothes and clean ones?	1.00	6	0.99	6
5. Change your underwear at least twice a week?	1.00	6	1.00	6
6. Buy your own clothes whenever necessary?	0.56	4	0.49	4
7. IO - Wear appropriate and clean clothes?	0.49	4	0.99	6
8. IO - Wear clothes which were adequate for the season?	0.99	6	-0.02	1
9. IO - Wear clothes whose colors and style matched?	0.48	4	1.00	6
Appearance and clothing subscale	0.84*	6	0.85*	6
10. Take a shower using soap at least twice a week?	1.00	6	0.99	6
11. Wash your hair at least twice a week?	0.73	5	0.99	6
12. Wear deodorant every day?	0.91	6	0.55	4
13. Brush or comb your hair daily?	0.89	6	0.46	4
14. Brush your teeth or false teeth using toothpaste?	1.00	6	0.79	5
15. Clean your fingernails regularly?	1.00	6	0.66	5
16. IO - Take the time to keep yourself clean?	-0.03	1	0.99	6
17. IO - Take the time to keep your hair clean?	0.31	3	1.00	6
18. IO - Take the time to properly comb or brush your hair?	0.62	5	0.99	6
19. IO - Take the time have your hair properly cut?	0.30	3	1.00	6
20. IO - Take the care of being not smelly?	0.85	6	0.66	5
21. IO - Take the time to clean your fingernails?	0.99	6	0.99	6
Personal Hygiene subscale	0.90*	6	0.84*	6
22. Make the bed every day?	0.95	6	0.77	5
23. Keep your room or personal space clean?	0.77	5	0.99	6
24. Tidy up your 'mess' and put your things in their place?	0.84	6	0.99	6
25. Clean spilt liquids?	0.48	4	1.00	6
26. Vacuum (in case you have carpet) or clean the floor?	0.86	6	0.75	5
27. Dust the furniture?	0.83	6	0.76	5
Care of Personal Possessions subscale	0.92*	6	0.94*	6
28. Prepare simple meals? (sandwiches, salads or cereals)	0.77	5	0.99	6
29. Prepare and cook simple meals? (fried eggs, pasta)	0.83	6	0.99	6
30. Identify or throw away spoiled food?	0.86	6	0.54	4
31. Wash and dry kitchen items such as mugs, dishes etc.?	0.80	5	0.72	5
32. Put the kitchen items in the proper place	0.83	6	0.99	6
33. Make healthy choices regarding food?	0.87	6	0.37	3
34. Buy your own food? (more than sandwiches or snacks)	0.75	5	0.53	4
Food Preparation subscale	0.93*	6	0.91*	6
35. Take medication without supervision?	0.99	6	0.88	6
36. Did you cooperate with the person who administered the medication?	0.51	4	0.84	6
37. Go to the doctor to renew the medication prescription?	0.17	2	0.69	5
38. Take care of yourself the last time you were slightly sick?	0.82	6	0.50	4
39. Get any assistance from appropriate public services	0.99	6	0.56	4
40. Smoke safely?	0.20	2	0.76	5
41. Take your medication in the way it was prescribed?	0.88	6	0.97	
Health Maintenance subscale	0.80*	5	0.94*	6
42. Pay your own bills such as the rent or electricity?	0.71	5	0.71	5
43. Make deposits or withdraw money from the bank?	0.89	6	0.65	5
44. Manage your budget properly?	0.80	5	0.46	4
45. Receive benefit from the Social Security?	0.98	6	0.98	6
46. Buy essential items before superfluous?	0.81	6	0.59	4
Money management subscale	0.94*	6	0.89*	6
47. Drive with a valid driver's license?	0.98	6	0.86	6
48. Ride on a bus, train or subway?	0.70	5	0.99	6
49. Ask for information regarding how to reach a particular destination the last time you went to an unfamiliar place?	0.84	6	0.66	5

Items/Subescales	Inter-rater n = 50		Test-Retest n = 46	
	Kappa	Cohen**	Kappa	Cohen**
50. Read the bus itinerary the last time you needed?	0.78	5	0.53	4
51. Possess and drive your own car?	0.99	6	0.55	4
Transportation subscale		0.94*	6	0.84*
52. Regularly enjoy some leisurely activity?	1.00	6	0.38	3
53. Attend any religious meeting?	0.99	6	0.69	5
54. Write letters or visit friends or relatives?	0.96	6	0.31	3
55. Go to the movies or theater?	1.00	6	0.73	5
56. Read newspapers, books or magazines?	-0.90	6	0.41	4
57. Did you go to any meeting? (for example: June festival)	0.92	6	0.50	4
58. Listen to the radio or television?	0.99	6	0.99	6
59. Take care of the garden or the backyard?	0.94	6	0.70	5
60. Watch sports activities?	0.96	6	0.53	4
61. Practice any kind of physical activity?	0.96	6	0.75	5
62. Play cards or any other table game?	0.96	6	0.42	4
63. Have an elector's card?	1.00	6	0.99	6
Leisure subscale	0.98*	6	0.86*	6
64. Read classified ads in an attempt to find a job?	0.65	5	0.89	6
65. Get in touch with potential employers?	0.60	4	0.92	6
66. Get in contact with friends and job agencies in order to obtain information on jobs?	0.64	5	0.89	6
67. Participate of job interviews in order to get a job?	0.66	5	0.88	6
Job seeking subscale	0.97*	6	0.91*	6
68. Is/Was the work relationship with your workmates good?	0.95	6	0.81	6
69. Is/Was your relationship with your supervisors good?	0.96	6	0.79	5
70. Are you always on time for work and respect the lunch time hour?	1.00	6	0.84	6
Job maintenance subscale	0.99*	6	0.88*	6
ILSS Global Score	0.96*	6	0.95*	6

- IO: Interviewer's observations.
- The descriptions of the items were taken from the back translation of the scale.
* Intraclass Correlation Coefficient (ICC).
** Cohen's Classification: 1) < 0: no agreement; 2) 0.0-0.20: slight agreement; 3) 0.21-0.40: fair agreement; 4) 0.41-0.60: moderate agreement; 5) 0.61-0.80: substantial agreement; 6) 0.81-1.00: almost perfect agreement.

Validity

One hundred and sixty patients who took part in the initial evaluation of the clinical trial were included in the study. Their average age was 37.29 (DP: 10.33), 96 (60%) were males, 126 (78.8%) were single, 67 (41.9) had finished High School and 85 (53.5%) were unemployed.

Construct validity

All subscale correlations and the overall score were significant: Appearance and Clothing (r = 0.639, p = 0.000), Personal Hygiene (r = 0.559, p = 0.000), Care of Personal Possessions (r = 0.649, p = 0.000), Food (r = 0.591, p = 0.000), Health (r = 0.479, p = 0.000), Money (r = 0.502, p = 0.000), Transportation (r = 0.437, p = 0.000), Leisure (r = 0.581, p = 0.000), Employment (r = 0.390, p = 0.000)

and Sustained Employment (r = 0.189, p = 0.034); In the correlation analysis among the ten subscales, there were positive results among most pairs. Appearance and Clothing had significant correlations with most of the other subscales: Personal Hygiene, Care of Personal Possessions, Food, Health, Money and Leisure; Personal Hygiene had significant correlations with the following subscales: Care of Personal Possessions, Food, Health and Leisure; Care of Personal Possessions had significant results for: Food, Health, Money and Leisure; The subscale Food had significant correlations with Health, Money, Transportation and Leisure; Health had significant correlations with all other subscales, with the exception of Sustained Employment; Money, had significant correlations with Transportation and Employment; Transportation had positive correlations with most other subscales, except for Money and Sustained Employment; Leisure had a significant correlation with subscale Employment (Table 2).

Table 2. Pearson's correlation between subscales and global score

	1	2	3	4	5	6	7	8	9	10
1	1									
2	.419(**)	1								
3	.471(**)	.421(**)	1							
4	.473(**)	.381(**)	.378(**)	1						
5	.330(**)	.161(*)	.206(**)	.208(**)	1					
6	.264(**)	.088	.224(**)	.247(**)	.285(**)	1				
7	.124	.057	.118	.167(*)	.343(**)	.229(**)	1			
8	.174(*)	.209(**)	.272(**)	.237(**)	.177(*)	.132	.302(**)	1		
9	.132	.111	.068	.138	.252(**)	.196(*)	.232(*)	.243(*)	1	
10	.023	.032	-.004	.058	-.042	.092	.058	-.032	.124	1
11	.639(**)	.559(**)	.649(**)	.591(**)	.479(**)	.502(**)	.437(**)	.581(**)	.390(**)	.189(*)

1: Appearance and clothing; 2: Personal Hygiene; 3: Care of Personal Possessions; 4: Food Preparation; 5: Health Maintenance; 6: Money management; 7: Transportation; 8: Leisure; 9: Job seeking; 10: Job maintenance; 11: Global score.
** p < 0.001; * p < 0.05.

Discriminant validity

The discriminant validity of the scale was verified by comparing male and female performances in the overall scale score. Females had higher scores in six subscales and in the overall score. Five of the ten subscales made a statistically significant distinction between males and females: Appearance and Clothing (F = 6.243; df = 158; p = 0.014), Personal Hygiene (F = 10.273; df = 158; p = 0.002), Care of Personal Possessions (F = 12.732; df = 158; p = 0.000), Food (F = 8.784; df = 157; p = 0.004) and Transportation (F = 4.613; df = 157; p = 0.033) (Table 3).

Concurrent validity

The concurrent validity was verified through a comparison of the overall score and the ILSS-BR/P subscales with PANSS, Calgary, GAF, GCI, WHOQOL and Rosemberg's Self Esteem scales.

The overall ILSS-BR/P score presented statistically significant correlations with all scales: PANSS positive (r = -0.285, p = 0.000), PANSS negative (r = -0.252, p = 0.001), PANSS general (r = -0.262, p = 0.001) PANSS overall (r = -0.317; p = 0.000), Calgary (r = -0.185; p = 0.010), GAF (r = 0.477; p = 0.000), GCI (r = -0.409; p = 0.000), WHOQOL (r = 0.216; p = 0.006), and Rosemberg's Self Esteem (r = 0.275; p = 0.000).

The following significant subscale correlations were found:
PANSS overall: Appearance and clothing (r = -0.178; p = 0.025), Care of Personal Possessions (r = -0.174; p = 0.028), Health Maintenance (r = -0.289; p = 0.000), Money management (r = -0.232; p = 0.003), Transportation (r = -0.263; p = 0.001), Leisure (r = -0.228; p = 0.004) and Job seeking (r = -0.202; p = 0.037). PANSS positive: Care of Personal Possessions (r = -0.196; p = 0.013), Food Preparation (r = -0.164; p = 0.038), Health Maintenance (r = -0.263; p = 0.001), Transportation (r = -0.240; p = 0.002) and Leisure (r = -0.198; p = 0.001); PANSS negative: Appearance and clothing (r = -0.187; p = 0.018), Health Maintenance (r = -0.261; p = 0.001), Money management (r = -0.186; p = 0.019), Transportation (r = -0.254; p = 0.001) and Job seeking (r = -0.272; p = 0.005); PANSS general: Health Maintenance (r = -0.203; p = 0.010), Money management (r = -0.217; p = 0.006), Transportation (r = -0.174; p = 0.029) and Leisure (r = -0.234; p = 0.003).

Calgary: Personal Hygiene (r = -0.157; p = 0.048) and Leisure (r = -0.261; p = 0.001).

GAF: Appearance and clothing (r = 0.314; p < 0.001), Personal Hygiene (r = 0.225; p = 0.004), Care of Personal Possessions (r = 0.227; p = 0.004), Food Preparation (r = 0.260; p = 0.001), Health Maintenance (r = 0.303; p < 0.001), Money management (r = 0.285; p < 0.001), Transportation (r = 0.359; p < 0.001), Leisure (r = 0.303; p < 0.001) and Job seeking (r = 0.367; p < 0.001).

CGI: Appearance and clothing (r = -0.261; p = 0.001), Personal Hygiene (r = -0.176; p = 0.027), Care of Personal Possessions (r = -0.196; p = 0.013), Food Preparation (r = -0.222; p = 0.005), Health Maintenance (r = -0.302; p = 0.000), Money management (r = -0.302;

p = 0.015), Transportation (r = -0.337; p = 0.000), Leisure (r = -0.312; p = 0.000) and Job seeking (r = -0.297; p = 0.002).

WHOQOL: Personal Hygiene (r = 0.226; p = 0.004), Care of Personal Possessions (r = 0.176; p = 0.026) and Leisure (r = 0.359; p = 0.012).

Rosemberg's Self Esteem: Care of Personal Possessions (r = 0.193; p = 0.015), Leisure (r = 0.359; p = 0.000) and Job maintenance (r = 0.390; p = 0.000).

Discussion

The paper presents the cultural adaptation and reliability and validity of the Portuguese version of Independent Living Skills Survey (ILSS--BR/P) study, using two designs. The scale has adequate psychometric characteristics for internal consistency, inter-observer agreement and temporal stability, as well as for construct validity, discriminant validity and concurrent validity.

The test-retest results demonstrated good temporal stability, i.e., the Cohen classification showed a high percentage of perfect agreement between the two interval applications. However, the item assessing if the patient wears appropriate clothes for the season (item 8) presented low agreement for being an item that takes into account the opinion of the rater. Another factor that may lead to bias in the study was the change in behavior triggered the first application, as the case with items that assessed whether the patient looks healthy options for food (item 33), if you have any leisure activity (item 52) and visit friends or relatives (item 54). It is noteworthy, that agreement levels showed here were overall higher than those described in previous studies[14,16,18]. The stability of answers after a seven day interval goes to show that the survey can be used with the studied population, even considering issues associated to cognitive damages resulting from the disease[10].

Internal consistency results were poorer than those described by Wallace[14] in the original version of the scale, as well as those found in the French version[16]. Transportation and Health were the subscales with the poorest results. Many of the health-related items are not applicable to this specific sample, since patients are part of a reference service scheme for the treatment of schizophrenia in which appointments are booked and medication is administered and managed by team members from the service centers. As for the item Transportation, most of the patients in the sample do not own a car or have a driver's license. Moreover, due to difficulties inherent to the disease, patients hardly ever take new routes, therefore, most of the items under the Transportation subscale are not applicable to this population.

Using Cohen's coefficient to analyze the levels of agreement between observers, we found a high level of agreement on most items. As in the test-retest study, we found low levels of agreement for the items that are influenced by the rater's opinion, such as that about personal hygiene (item 16), if the patient´s hair had been properly washed (item 17) and cut (item 19). The items that asked if the patient went to a physician to renew his/her prescription (item 37) and if he/she smoked safely (item 40) led to different interpretations by raters,

Table 3. Mean and standard deviation of overall scores of men and women and analysis of variance ANOVA

	Women Mean (SD)	Men Mean (SD)	F	df	p
Appearance and Clothing	0.95 (0.10)	0.90 (0.13)	6.243	158	**0.013**
Personal Hygiene	0.95 (0.08)	0.88 (0.16)	10.273	158	**0.002**
Care of Personal Possessions	0.89 (0.19)	0.74 (0.28)	12.732	158	**0.000**
Food Preparation	0.90 (0.15)	0.81 (0.20)	8.784	157	**0.004**
Health Maintenance	0.89 (0.19)	0.90 (0.14)	0.027	157	0.870
Money Management	0.57 (0.35)	0.64 (0.34)	1.660	157	0.199
Transportation	0.53 (0.22)	0.60 (0.18)	4.613	157	**0.033**
Leisure	0.59 (0.20)	0.62 (0.16)	0.593	158	0.442
Job Seeking	0.16 (0.30)	0.16 (0.27)	0.007	105	0.932
Job Maintenance	0.86 (0.28)	0.79 (0.32)	1.640	125	0.203

F: Statistical analysis of variance test; df: degrees of freedom.

resulting in low agreement. Even so, these results were higher than those described by Wallace[14] Wallace *et al.*[15].

When results of the Portuguese version of the ILSS-BR/P reliability study are compared to those of with previous studies, it becomes clear that this work has made a broader contribution, since it uses three types of reliability analysis. These analyses were only included in the study described by Wallace *et al.*[15], which had poorer test-retest and inter-observer results.

The construct validity was analyzed by verifying a construct shared by the ten subscales. Results were similar to those described by Lima *et al.*[17], revealing that the correlations with the overall score were higher than those found among the subscales, which indicates that the scales share an adjacent construct.

Regarding to the discriminant validity, variance analysis results showed that females had higher scores in six items of the scale: Appearance and Clothing, Personal Hygiene, Care of Personal Possessions, Food and Transportation. These results indicate that the scale is sensitive enough to distinguish male skills from female skills, supporting the results described by Seeman[23], according to whom women with schizophrenia have less severe symptoms, are admitted less frequently into hospitals, are more likely to secure a job and have fewer legal problems, when compared to males with schizophrenia.

The results of the concurrent validation study showed a negative correlation between psychotic symptoms, the overall score and most items in the ILSS-BR/P scale. This has to do with disease-related damages caused especially in areas associated with learning, self-care, work, inter-personal relationships and independent living skills[24]. Calgary scale results showed a significant relationship with the overall score, personal hygiene and leisure; it also revealed that patients with depressive symptoms had poorer performances, especially when it came to performing socially, carrying out everyday tasks and using cognitive functions[25]. Positive correlations among most ILSS-BR/P items and the GAF scale show that the more patients function overall, the better they perform everyday activities[3,6,10]. Significant positive results were also found when correlating WHOQOL and Rosemberg measurements with the ILSS-BR/P, indicating a strong relationship between independent living skills and self-esteem and quality of life[26,27].

The main limitations of this study were the short period of time between temporal stability evaluations and the difficulty evaluators had when determining that some of the skills were non-existent or not applicable. The purpose of the seven day interval was to avoid any routine changes while the study was being conducted, since the scale assesses the last thirty days. The manual helped to minimize any difficulties found when determining questions that were not applicable.

This is a broad study of the psychometric characteristics of the ILSS scale, and the main contribution it makes is providing the opportunity to use a survey with validity and legitimacy characteristics that are apt for the Brazilian context.

Everyday functioning measurements are becoming increasingly more necessary to complement evaluations of how schizophrenia impacts different areas of life, as well as to plan actions that can help rehabilitate and reintegrate patients into different social contexts.

Acknowledgments

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