Translation, adaptation and validation of "Community Integration Questionnaire"

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Abstract *Objective: To translate, adapt, and validate the "Community Integration Questionnaire (CIQ)," a tool that evaluates community integration after traumatic brain injury (TBI). Methods: A study of 61 TBI survivors was carried out. The appraisal of the measurement equivalence was based on a reliability assessment by estimating inter-rater agreement, item-scale correlation and internal consistency of CIQ scales, concurrent validity, and construct validity. Results: Inter-rater agreement ranged from substantial to almost perfect. The item-scale correlations were generally higher between the items and their respective domains, whereas the intra-class correlation coefficients were high for both the overall scale and the CIQ domains. The correlation between the CIQ and Disability Rating Scale (DRS), the Extended Glasgow Outcome Scale (GOSE), and the Rancho Los Amigos Level of Cognitive Functioning Scale (RLA) reached values considered satisfactory. However, the factor analysis generated four factors (dimensions) that did not correspond with the dimensional structure of the original tool. Conclusion: The resulting tool herein may be useful in globally assessing community integration after TBI in the Brazilian context, at least until new CIQ psychometric assessment studies are developed with larger samples.*

Key words *Traumatic brain injury, Community integration, Questionnaires, Validity*

Introduction

Traumatic brain injury (TBI) has been appointed as a serious public health problem, not only because of its magnitude, but also for reaching predominantly young individuals in their economically productive phase of life. Even mild classifications of TBI, including concussions, may affect one's ability to perform activities of daily living (ADL) and to resume former functions[1-3]. It may also cause temporary or permanent emotional and behavioral disorders, a partial or total disability, and psychosocial maladjustment[1]. In addition to determining death and disability, such trauma can permanently change the abilities and perspectives of the patient[2]. It is considered a major cause of death and disability worldwide[3]. In Brazil, it stands out as the most significant cause of disability among young people, and the most common neurological cause of morbidity and mortality, especially in the cities of São Paulo, Rio de Janeiro, Brasilia, and Salvador[4-6].

According to Rintala et al.[7], the increased life expectancy of people with disabilities, the global trend toward independent living, and the need to justify high rehabilitation costs explain the great interest in the development of long-term health impact assessment tools. The interest in respect to the social integration of people with various types of disabilities has grown, as well as the need for appropriate tools to assess this construct. In this sense, the Community Integration Questionnaire (CIQ) instrument was specifically designed by Willer et al. to assess community integration of TBI victims[8]. It is considered the most studied and validated scale to assess integration in this scope, including both the perception of the subject in question as much as the objective indicators that can represent distinct results from the rehabilitation process[9].

The importance of obtaining information relating to community integration as a functional recovery indicator of individuals who have suffered TBI, and the unavailability of a validated instrument in Portuguese to assess the domains related to this construct, justify the translation endeavor and adaption of instruments developed in another language. However, the aspects related to the concept of community integration, particularly after TBI, depend on social values and perceptions related to health, which may vary among cultures. In order for community integration measurements, offered by instruments developed in other socio-cultural contexts, be relevant in our country, it is necessary to ensure a cross-cultural equivalence between the different versions of the tool[10]. This paper describes the results of the translation and cultural adaptation of the CIQ, in order to assess the relevance of its use in the local socio-cultural context.

Methods

This study was conducted with a group of TBI survivors linked to a cohort study (TCESSA)[11], designed to assess factors associated with the restoration of functional capacity and productive activities, 6 and 12 months after the trauma. It included male individuals, 15 to 65 years of age, whose trauma was caused by accidents or violence that occurred in the Metropolitan Region of Salvador/BA, Northeastern Brazil, and were treated at the main emergency department in the city. However, in order to be included in this cohort study, these individuals had to present not only a suspected diagnosis of TBI, but also neurological signs and symptoms of head trauma and a confirmed diagnosis by neuroimaging. Hence, the patients recruited had cognitive impairment that was classified less than or equal to 14 on the Glasgow Coma Scale (GCS) with neurological signs and symptoms, and classified as victims of moderate or severe TBI, or mild TBI with medium or high risk. Those with a history of the following were excluded: intracranial tumor, stroke, multiple sclerosis, epilepsy, Parkinson's disease, meningitis, Alzheimer's disease, encephalopathy due to HIV/AIDS, arteriovenous malformation, and brain abscesses. Homeless people were also excluded because of the difficulty to obtain follow-up information.

Assessment studies of the consequences of TBI, in which the researchers used the CIQ, reported satisfactory evidence of validity and reliability[9,12-17]. It is an instrument that was developed to assess disability, regarded as a limitation, resulting from the impairment or inability to perform appropriate roles based on the person's age, gender, and culture[18]. It assesses the individuals' level of integration at home and in the community. There are 15 questions and the total score ranges from 0 to 29, with higher scores indicating greater integration. Three subscales allow for the analysis of integration in specific domains of everyday life: (1) in the home; (2) in the social environment; and (3) in productive activities such as work, school, and volunteer activities.

To assess "integration in the home," five questions are utilized, the score for each question

ranges from 0 to 2, and the total sum ranges from 0 to 10. For "integration in the social environment," six questions are presented and the score for each question ranges from 0 to 2, and the total sum ranges from 0 to 12. Finally, for the domain "integration in productive activities," four questions are utilized. The first is scored from 0 to 2, and the last three generate a single score ranging from 0 to 5, with the total sum of domain points ranging from 0 to 7.

Contact was initially established with the main author of the CIQ[8], to communicate interest and request authorization for its translation and cultural adaptation. After consent, the CIQ was independently translated by two sworn translators, whose mother tongue is Portuguese, yielding two versions of the instrument. Later on, they were unified, and the final version was sent to two other Anglophone sworn translators to perform the back-translation[19]. At the end, a consensual version in Portuguese was sent to the authors of the CIQ, who suggested other changes that were adopted. The pre-test was conducted using this version of the instrument, and it proved to be poorly suited for the local social context. As an outcome, a workshop was held with experts, and the subsequent version was applied in this study.

The appraisal of the measurement equivalence was based on a reliability assessment by estimating inter-rater agreement, item-total correlation and internal consistency of CIQ scales, concurrent validity, and construct validity. The inter-rater reliability was estimated by comparing the application results of the instrument from two interviewers to 61 patients. In four situations, the interval between applications was up to one week. The weighted *kappa* with quadratic weights was used to assess agreement among the questionnaire items, considering that each of the items is scored from 0 to 2, setting an ordinal scale, and the intra-class correlation coefficient for the CIQ subscales and total score. These indicators were interpreted using the classification proposed by Landis and Koch[20]: poor (<0.1); slight (0.11 to 0.20); fair (0.21 to 0.40); moderate (0.41 to 0.60); substantial (0.61 to 0.80); and almost perfect (>0.80).

The correlation estimates between the responses of the items and the subscale (item-scale correlation) scores were produced using the Kendall (*Tau-b*) coefficient for ordinal data. The result of >0.4 was considered a satisfactory correlation. The expectation is that the observed correlation be greater between the items and the subscale to which they belong, than their correlations with other subscales[19]. Internal consistency was assessed by Cronbach's alpha coefficient for the scale as a whole, for each subscale as a whole, and for each subscale – excluding each of the items belonging to it. The point of > 0.7 was considered adequate, and an increase of 0.1 for the value of Cronbach's alpha when an item was deleted – to indicate that this item negatively contributed to the internal consistency of the subscale[19].

We evaluated the convergent validity of the CIQ by estimating the Spearman correlation coefficient (r) between the overall scores and the subscales of the CIQ with three validated scales and widely used to assess different dimensions of the acquisition of functional and cognitive skills. The Extended Glasgow Outcome Scale (GOSE) was the first scale used, to asses the overall functional capacity after head trauma. It classifies individuals into eight categories with a total score ranging from 1 for death to 8 points for full recovery[21]. The second scale used was the Rancho Los Amigos Level of Cognitive Functioning Scale (RLA). It is an assessment system of cognitive function that was developed to plan treatment, to monitor recovery, and to classify the level of patient outcomes who were victims of TBI. The RLA consists of eight levels that describe patterns or typical recovery stages seen after trauma, ranging from 1 for no response to 8 points for a purposeful and appropriate response[12-15]. Finally, we used the Disability Rating Scale (DRS). A 30-point scale that measures the general functional *status*, composed of eight items corresponding to motor responses; level of cognitive ability for feeding, hygiene, and grooming; overall level of independence; and employability, including paid employment, school, or domestic activities. Each functioning area is classified on a scale from 0 to 3, or 5. A higher score represents a higher level of disability, or lower level of functioning. The scores for each item are added up to produce a total score from 0 to 29, with 29 representing the highest level of disability[1].

We assessed the construct validity through factor analysis of polychoric correlations, by applying the principal components method for extracting factors, followed by a varimax rotation. An eigenvalue >1 was used as a criterion for retention factors, and the load value of 0.4 to consider that a specific item is being represented in a factor[22].

The research project was submitted and approved by the Research Ethics Committee at the

Public Health Institute of the Federal University of Bahia and by the Research Ethics Committee at the Bahia State Health Department. We sought to ensure anonymity and confidentiality of the information obtained, and consent to participate and autonomy in the study were received through an Informed Consent Form signed by a relative, as directed by Resolution 196/96[23] from the National Ethics Committee (CONEP).

Results

According to the initial severity of the trauma, estimated upon admission using the Glasgow Coma Scale (GCS), the distribution of sociodemographic and clinical variables suggests that there are proportionally more young people among those who have suffered severe trauma, emotional symptoms, and changes in *balance* – understood as the ability to maintain an appropriate relationship between the body segments, and between the body and the environment in performing the tasks – were more common in more severe patients (GCS 3-8). When compared to patients who were hospitalized with moderate and mild TBI profiles, these victims also developed greater impairment of cognitive levels (RLA), functional impairment (DRS), and global functioning (GOSE) (Table 1).

The distribution of responses per CIQ item, according to each interviewer, and the estimates of inter-interviewer agreement and respective 95% confidence interval (CI95%), are shown in Table 2. It is observed that the estimated values of the weighted *kappa* were primarily considered as substantial or almost perfect, and only one of the 13 instrument items had a value assessed as moderate. The intra-class correlation coefficients were high for both the overall scale and the CIQ domains.

The item-scale correlations were generally higher among the items and their respective domains. As for the item "looks after personal finances such as banking and paying bills," the correlation was high in two domains: integration in the home and social environment. The item "how often travels outside of the home" was the only one that did not show satisfactory correlation with any of the domains. Cronbach's alpha coefficients for each domain, excluding each of the items belonging to it, indicated that not one item negatively contributed to the internal consistency of its domain. The internal consistency estimates that the integration dimensions in the home and social environment were higher than 0.65, but too low for the productive activities domain (Table 3). The alpha coefficient for the whole scale was 0.75 (data not shown in table).

Spearman's correlation coefficients of the overall scores and CIQ domains using the DRS, GOSE and RLA scales were greater than 0.3 for GOSE and RLA, and less than -0.3 for the DRS scale, all statistically significant. The correlations were stronger for the overall CIQ score and the integration domain in the social environment (Table 4).

The factor analysis yielded four factors (dimensions) that did not correspond with the dimensional structure of the original instrument. Together, these four factors explain 75% of the variability in the data. Based on the original dimensions of the questionnaire, factor I included five items, two from home integration and three from social integration. Four items in factor II had higher loads, two in the home integration dimension and two in the social integration dimension. Three items, one from each of the three original dimensions, presented higher loads in factor III. Finally, in factor IV, a single item "productive activities" was found to be related (Table 5).

Discussion

The cross-cultural adaptation process of the CIQ reported in this study provides some elements, particularly those derived from the reliability analysis and convergent validity, which justify its use in our culture, even if the originally proposed dimensional structure has not been demonstrated in this population.

In general, it was observed that the inter-interviewer agreement varied from substantial to almost perfect for the vast majority of the scale items, especially for the overall CIQ score. Willer et al.[24] and Tepper et al.[25] described similar results for the domains and total scale. In one of the few studies of cross-cultural adaptation of the CIQ, Rintala et al.[7] developed a Spanish version and obtained test-retest reliability values generally lower than those described herein.

Table 1. Sociodemographic characteristics of TBI victims and six months after clinical evaluation, TCESSA Study, Salvador, 2010.

Variables	Glasgow Coma Scale (GCS)			Total Mean (SD)
	Severe injury (GCS 3- 8) Mean (SD)	Moderate injury (GCS 9- 13) Mean (SD)	Mild injury (GCS 14- 15) Mean (SD)	
Sociodemographic characteristics				
Age ***	26.2 (7.4)	33.6 (11.6)	34.3 (11.8)	31.7 (11.1)
Monthly family income	963.1 (857.6)	776.5 (512.9)	906.0 (625.9)	886.7 (668.7)
Number of persons residing in the home	2.7 (1.6)	3.4 (2.3)	2.5 (1.9)	2.8 (1.9)
	n (%)	n (%)	n (%)	n (%)
Skin Color				
Black	18 (100.0)	16 (94.1)	25 (96.2)	59 (96.7)
Not Black	0 (0.0)	1 (5.9)	1 (3.8)	2 (3.3)
Marital Status				
Single/Separate/Divorced	12 (66.7)	9 (52.9)	16 (61.5)	37 (60.7)
Married/Stable relationship	6 (33.3)	8 (47.1)	10 (38.5)	24 (39.3)
Education Level				
Low	13 (72.2)	12 (70.6)	16 (61.5)	41 (67.2)
Moderate	4 (22.2)	5 (29.4)	10 (38.5)	19 (31.2)
High	1 (5.6)	0 (0.0)	0 (0.0)	1 (1.6)
Clinical Characteristics				
Somatic symptoms				
Headaches				
No	8 (44.4)	8 (47.1)	12 (46.1)	28 (45.9)
Yes	10 (55.6)	9 (52.9)	14 (53.9)	33 (54.1)
Dizziness				
No	12 (66.7)	10 (58.8)	11 (42.3)	33 (54.1)
Yes	6 (33.6)	7 (41.2)	15 (57.7)	28 (45.9)
Cognitive symptoms				
Memory difficulties**				
No	4 (22.2)	10 (58.8)	15 (57.7)	29 (47.5)
Yes	14 (77.8)	7 (41.2)	11 (42.3)	32 (52.5)
Impaired concentration				
No	8 (50.0)	13 (76.5)	18 (69.2)	40 (65.6)
Yes	9 (50.0)	4 (23.5)	8 (30.8)	21 (34.4)
Emotional symptoms**				
Irritability				
No	3 (16.7)	11 (64.7)	13 (50.0)	27 (44.3)
Yes	15 (83.3)	6 (35.3)	13 (50.0)	34 (55.7)
Changes in balance**				
No	6 (33.3)	11 (64.7)	18 (69.2)	35 (57.4)
Yes	12 (66.7)	6 (35.3)	8 (30.8)	26 (42.6)
Cognitive Levels Rancho Los Amigos (RLA)*				
Good recovery	9 (50.0)	15 (88.2)	24 (92.3)	48 (78.7)
Moderate disability	7 (38.9)	2 (11.8)	2 (7.7)	11 (18.0)
Severe disability	2 (11.1)	0 (0.0)	0 (0.0)	2 (3.3)
Functional capacity (DRS)*				
Absent functional impairment	9 (50.0)	15 (88.2)	23 (88.5)	47 (77.1)
Moderate functional impairment	6 (33.3)	2 (11.8)	2 (11.5)	11 (18.0)
Severe functional impairment	3 (16.7)	0 (0.0)	0 (0.0)	3 (4.9)
Functional capacity (GCS)*				
Good recovery	7 (38.9)	14 (82.4)	22 (84.6)	43 (70.5)
Moderate disability	8 (44.4)	3 (17.6)	4 (15.4)	15 (24.6)
Severe disability	3 (16.7)	0 (0.0)	0 (0.0)	3 (4.9)

SD = Standard Deviation; n = Absolute frequency. * P-value < 0.05 (Fisher's exact test); ** P-value < 0.05 (Pearson's chi-squared test); *** P-value < 0.05 (Analysis of variance)

Table 2. Scores by CIQ item according to the interviewer, estimate inter-interviewer agreement, and respective 95% confidence interval (CI95%), TCESSA Study, Salvador, 2010.

Item	Interviewer 1 (n = 61)		Interviewer 2 (n = 61)		Inter-interviewer agreement/(n = 61)
	n	**%**	**n**	**%**	**Kappa (CI95%)**
Home Integration Domain					
Shopping for food and other necessities in your household					
2 – Yourself alone	5	8.2	11	18.0	
1 – Yourself and someone else	40	65.6	30	49.2	**0.630 (0.451 - 0.776)**
0 – Someone else	16	26.2	20	32.8	
Prepares (cooks) or warms up or serves food in your household					
2 – Yourself alone	4	6.5	8	13.1	
1 – Yourself and someone else	32	52.5	24	39.3	**0.722 (0.560 - 0.861)**
0 – Someone else	25	41.0	29	47.6	
Does the everyday housework in your household					
2 – Yourself alone	3	4.9	5	8.2	
1 – Yourself and someone else	25	50.0	19	31.1	**0.785 (0.647 - 0.897)**
0 – Someone else	33	54.1	37	60.7	
Cares for the children in your home					
2 – Yourself alone	1	1.6	1	1.6	
1 – Yourself and someone else	17	27.9	18	29.5	**0.810 (0.640 - 0.931)**
0 – Someone else	43	70.5	42	68.9	
Initiates or organizes social arrangements such as get-togethers with family and friends					
2 – Yourself alone	3	4.9	4	6.5	
1 – Yourself and someone else	28	45.9	17	27.9	**0.610 (0.487 - 0.841)**
0 – Someone else*	30	49.2	40	65.6	
	n	**%**	**n**	**%**	**Kappa (CI95%)**
Social Integration Domain					
Looks after personal finances such as banking or paying bills					
2 – Yourself alone	10	16.4	15	24.6	
1 – Yourself and someone else	27	44.3	21	34.4	**0.827 (0.637 - 0.922)**
0 – Someone else	24	39.3	25	41.0	
Number of times per month you go out shopping					
2 – 5 or more times	5	8.2	7	11.5	
1 – 4 times	26	42.6	30	49.2	**0.581 (0.432 - 0.767)**
Never	30	49.2	24	39.3	
Number of times per month you participate in leisure activities outside your home					
2 – 5 or more times	34	55.7	30	49.2	
1 – 4 times	17	27.9	21	34.4	**0.755 (0.591 - 0.897)**
Never	10	16.4	10	16.4	
Number of times per month you visit friends or relatives					
2 – 5 or more times	28	45.9	21	34.4	
1 – 4 times	19	31.2	25	50.0	**0.651 (0.420 - 0.777)**
Never	14	22.9	15	24.6	
Leisure activities alone or with others					
2 – Mostly with friends who do not have head injuries / both family and friends	27	44.3	25	41.0	
1 – Mostly with friends who have head injuries / family members	23	37.7	26	42.6	**0.635 (0.489 - 0.783)**
0 – Mostly alone	11	18.0	10	16.4	
Have a best friend with whom you confide					
2 – Yes	31	50.8	29	47.5	
0 – No	30	49.2	32	52.5	**0.803 (0.654 - 0.952)**

it continues

Table 2. continuation

Item	Interviewer 1 (n = 61)		Interviewer 2 (n = 61)		Inter-interviewer agreement/(n = 61) Kappa (CI95%))
	n	%	n	%	
Productive Activities Integration Domain					
How often do you travel outside the home					
2 – Almost every day	2	3.3	4	6.6	
1 – Almost every week	-	-	-	-	**0.651 (0.206 - 1.000)**
0 – Seldom/Never. Less than once per week	59	96.7	57	93.4	
Work – School – Volunteer Activities	27	44.3	31	50.8	
0	2	3.3	2	3.3	
1	6	9.8	8	13.1	**0.673 (0.554 - 0.825)**
2	9	14.7	5	8.2	
3	15	24.6	11	18.0	
4	2	3.3	4	6.6	
5	**Mean**	**SD**	**Mean**	**SD**	**Intra-class correlation coefficient (CI95%)**
Subscales and Total CIQ					
Integration Dimension in the Home	2.85	1.92	2.72	2.20	**0.887 (0.824-0.932)**
Integration Dimension in the Social Environment	6.26	2.89	6.18	2.73	**0.878 (0.812-0.926)**
Integration Dimension in Productive Activities	1.89	1.86	1.72	1.94	**0.816 (0.721-0.888)**
CIQ	11	5.34	10.62	5.32	**0.942 (0.908-0.965)**

* It was considered as zero (0) when there were no children under 17 at home.

The internal consistency of the CIQ scale was considered adequate and similar to that found by the authors of the original version, 0.70 and 0.76, and in two studies by Willer et al.[24] and Rintala et al.[7] for a Spanish version (0.70). In the first two domains, the estimates of Cronbach's alpha were acceptable (0.69 and 0.66, respectively) and poor (0.05) for the productive activities domain. Rintala et al.[7] found values of 0.82, 0.33, and 0.42 for integration domains in the home, social environment, and productive activities, respectively. Comparing the results of this study with those of Willer et al.[24] and Rintala et al.,[7] it can be assumed that the acceptable estimates of internal consistency described here may not indicate weaknesses in the cross-cultural adaptation process of the CIQ into Portuguese, but reflect problems with the original scale.

Instruments that measure functional capacity and community integration have been used, often simultaneously in the same population, to evaluate different aspects related to the functional outcomes of post-TBI rehabilitation processes. Among these instruments, the DRS, GOSE, RLA, and CIQ scales stand out, considered as valid functional measurements and used as behavioral marker objectives that reflect the ability to perform complex activities.[12-14,26-29] In the present study, the correlations between these scales and the overall CIQ score reached values considered satisfactory, the same was not observed in relation to the CIQ domains, except for the integration subscale in the social environment. Note that the correlations, specifically between the CIQ and DRS, were negative because the DRS is scored in the opposite direction, with higher scores representing greater disadvantages. Rintala et al.[7] also found significant correlations, although generally weaker than those in the present study, between the total scores and subscales of the CIQ and CHART, an instrument developed to assess independence, mobility, occupation, social integration, and economic self-sufficiency. Considering the multidimensional construct assessed by these different scales, the results presented here suggest that there is, at least in relation to the overall scale of the CIQ, a good convergence towards the results produced by different instruments, also seeking to assess results related to the post-TBI rehabilitation process.

TBI can potentially generate temporary or permanent disabilities, as well as other mor-

Table 3. Correlation coefficients among items, respective domains, and Cronbach's alpha coefficients. TCESSA Study, Salvador, 2010.

Domain Items	Home Integration Domain	Social Integration Domain	Productive Activities Domain	Cronbach's Alpha Domain if item deleted	Domain
Home Integration Domain					
Shopping for food and other necessities in your household	**0.527**	0.326	0.086	0.665	
Prepares (cooks) or warms up or serves food in your household	**0.708** **0.651**	0.377	0.111	0.559	0.696
Does the everyday housework in your household	**0.444** **0.586**	0.424	0.077	0.599	
Cares for the children in your home		0.222	0.138	0.728	
Initiates or organizes social arrangements such as get-togethers with family and friends	**0.439**	0.418	0.269	0.651	
Social Integration Domain	0.394				
Looks after personal finances such as banking or paying bills	0.274	**0.410**	0.233	0.658	
Number of times per month you go out shopping	0.371	**0.484**	0.187	0.630	
Number of times per month you participate in leisure activities outside your home	0.318 0.226	**0.587**	0.195	0.572	0.665
Number of times per month you visit friends or relatives		**0.614**	0.195	0.562	
Leisure activities alone or with others	0.062	**0.448**	0.191	0.635	
Have a best friend with whom you confide	0.170	**0.529**	0.183	0.671	
Productive Activities Integration Domain					
How often do you travel outside the home		0.135	**0.194**	--	0.052
Work – School – Volunteer Activities		0.261	**0.978**	--	

Table 4. Spearman's correlation (r) of the Community Integration Questionnaire (CIQ) with the Rancho Los Amigos Cognitive Levels Scale (RLA), Extended Glasgow Outcome Scale (GOSE), and Disability Rating Scale (DRS). TCESSA Study, Salvador, 2010.

	RLA[*]	GOSE[**]	DRS[***]
CIQ (Scale)			
r	0.614	0.619	-0.588
p value	< 0.001	< 0.001	< 0.001
CIQ (Dimension)			
Home Integration			
r	0.409	0.384	-0.399
p value	0.001	0.002	0.001
Social Integration			
r	0.640	0.615	-0.601
p value	< 0.001	< 0.001	< 0.001
Productive Activities			
r	0.347	0.426	-0.344
p value	0.006	< 0.001	0.006

[*] RLA= Rancho de Los Amigos Cognitive Levels Scale; [**] GOSE= Glasgow Outcome Scale Extended; [***] DRS= Disability Rating Scale.

bid conditions, and provoke changes in family dynamics on different magnitudes, due to different variables such as socioeconomic status, education, demographic characteristics, among others[30-32]. It is possible that aspects related to the local population, predominantly made up of individuals with low education and income, may partially justify the discrepancies observed in the dimensional structure originally described in the CIQ scale.

One of the main differences observed relates to an abstraction in the same factor (factor I), including two items from the integration domain in the home, "does everyday housework" and "prepares meals," and three items originally belonging to the integration domain in the social environment, "visits friends or relatives," "participates in leisure activities outside of home," and "participates in leisure activities alone or with others." One possible explanation for this finding would be based on the social network structure supporting these individuals, which in our social

Table 5. Load factors related to the component items in the domains of the Community Integration Questionnaire – CIQ. TCESSA Study, Salvador, 2010.

Domains and Items	Factor 1	Factor 2	Factor 3	Factor 4
Home Integration Domain				
Shopping for food and other necessities in your household	0.341	**0.723**	0.005	-0.150
Prepares (cooks) or warms up or serves food in your household	**0.695**	0.474	0.090	-0.053
Does the everyday housework in your household	**0.803**	0.404	-0.009	-0.136
Cares for the children in your home	0.277	0.281	-0.735	0.213
Initiates or organizes social arrangements such as get-togethers with family and friends	0.339	**0.585**	0.047	0.390
Social Integration Domain				
Looks after personal finances such as banking or paying bills	0.078	**0.883**	0.042	0.179
Number of times per month you go out shopping	0.152	**0.814**	0.278	0.157
Number of times per month you participate in leisure activities outside your home	**0.637**	0.070	-0.053	0.538
Number of times per month you visit friends or relatives	**0.794**	0.064	-0.100	0.330
Leisure activities alone or with others	**0.550**	-0.009	-0.282	0.505
Have a best friend with whom you confide	0.562	0.071	**0.616**	0.118
Productive Activities Integration Domain				
How often do you travel outside the home	0.000	0.315	**0.933**	0.104
Work – School – Volunteer Activities	0.011	0.186	0.114	**0.850**
Eigenvalues before rotation	4.978	2.210	1.386	1.162
Percentage of explained variance	38	17	11	9

context, is mainly formed by the family. In this sense, the development of abilities to carry out activities in the home would be strongly influenced by the presence and functionality of this social network, which also provides essential support for integration in the social environment. This fact may be related not only to the possible sympathy expected by the family in this situation, but also due to fear that the patient, especially those victimized by violence, return alone to this adverse social environment.

Another point of disagreement concerns the agglutination in the same factor (factor II) for the items "shopping for necessities" and "organizes social arrangements," originally belonging to the home integration subscale, and the items "goes out shopping" and "looks after personal finances" in the social integration subscale. Sander et al.[33] already pointed out that the questions "shopping for necessities" and "goes out shopping" are issues that should be reviewed in the original instrument. According to these authors, these items had high loads by more than one factor, due to the equivocal wording in the questions, which does not differentiate shopping for necessities by shopping for leisure. It is also worth mentioning that the use of the term "shopping" in two items, coming from different domains, could have contributed to this aggregation – that if considered in conjunction with the item "looks after personal finances," might suggest the capture of some type of latent construct related to financial aspects.

The items "takes care of children," "a best friend with whom you confide" and "travels outside of the home" were part of a single factor (factor III), although in the original instrument, belonged to different domains. This finding seems to emphasize the need to discriminate different types of support that patients with disabilities may require in our culture. The main emergency department in the city of Salvador, regarding to the care and treatment of trauma victims, receives victims from several satellite cities. When patients are discharged from the hospital, they return to their hometowns, but need to return to the capital for reassessments or complementary treatments. Patients who develop somatic, cognitive or emotional symptoms, changes in *balance*, and functional impairments need help caring for dependents because they cannot take care of them, and traveling to consultations or treatments, therefore, having someone to trust is fundamental in these situations.

Finally, the item related to productive activities, which brings together the school, work and volunteer activities variables, was allocated separately in factor IV, suggesting that in this social context, the development of skills for returning to productive activities would be a domain relatively independent from the other variables.

A general appreciation of the cross-cultural adaptation process of the CIQ for Brazil should consider that the moderately satisfactory results presented here could be derived from inherent problems in the original version of the instrument, since these shortcomings usually cannot be corrected in a translated version. As already noted by Sander et al.[33] and Rintala et al.[7], the English version of the CIQ does not have psychometric characteristics as good as it should. Based on the literature and the evidence presented here, it is suggested that this Portuguese version only be used as an overall scale of integration, at least until new psychometric assessment studies of the CIQ are developed with larger samples.

Collaborations

HMS Fraga-Maia participated in the data collection, study design, interpretation of findings, initial drafting, and final revision. I Dourado and RCP Fernandes also collaborated in the study, interpretation of findings and final revision. G Werneck participated in the statistical analysis and interpretation of findings. LL Brito participated in the interpretation of findings, initial drafting, and final revision.

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