VALIDATION OF THE BRIEF RESILIENT COPING SCALE (BRCS) IN A MULTIETHNIC SAMPLE OF CHILEAN OLDER PEOPLE

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SUMMARY

The aim of this study was to analyze the psychometric properties of the Brief Resilient Coping Scale (BRCS) for a multiethnic sample of Chilean older people (800). This sample has the particular feature of including non-indigenous (231) and indigenous Aymara (201) and Mapuche (368) people resident in native rural areas. It is a cross-sectional study. Descriptive statistics were calculated for socio-demographic and outcome data, covering mean, standard deviation, frequencies and percentages. For the BRCS, psychometric properties were analyzed according to the principles of Classical Test Theory. The analysis of the psychometric properties of the BRCS for three ethnic groups of older Chilean people shows that this rating scale is acceptable, reliable and valid, although the differences between groups highlight the need for culturally adapted geriatric assessment scales. The BRCS showed satisfactory psychometric characteristics for the studied samples. It is important for medical and social sciences to have ethnically sensitive instruments for the evaluation of psychosocial resources that promote successful aging.

Introduction

As with many Latin American countries, Chile has experienced a process of accelerated population aging that has not coincided with progress in social policies guaranteeing welfare for older people (Moreno *et al*., 2016). The current social crisis being experienced by the Chilean population is due to the lack of a public social protection system. Specifically, there are demands to improve and secure comprehensive healthcare, reasonable pensions and other measures that guarantee security in old age.

In this complex social context, it becomes important to analyze the psychosocial resources that promote aging with a good quality of life and enable older people to cope with the crises that arise during aging. Various studies in this regard have shown that older Latin American people are able to withstand adversity and have emphasized the resilience of this group (Cárdenas and López, 2010; Bennett *et al*., 2016). The resilience process has been defined as consisting of "the activation and interaction of protective and vulnerability factors after encountering adversity" (Bolton *et al*., 2016: 171). This means that when faced with threats, stressors and adverse elements, people overcome them, become stronger than before, and improve their coping, adaptation and wellbeing strategies (Luthar *et al*., 2015).

One may question whether resilience is an individual process or a social good. Authors in the field of psychology have proposed that resilience is a personality characteristic that moderates the negative effects of stress and promotes adaptation (Wagnild, 2003). The personal factors that promote it tend to include intelligence, self-esteem, self-confidence and self-efficacy (Sinclair and Wallston, 2004). Additionally, from an individual perspective resilience would facilitate the activation and maintenance of psychological wellbeing insofar as it would stimulate an adaptive response to cope with various complex situations (Tomás *et al*., 2012b). However, others argue that resilience is the outcome of social and environmental interactions (Kok *et al*., 2018) and is even linked to available social support networks (Hayman *et al*., 2017). Along these lines, Lavretsky (2014) maintains that cultural context determines how we construct our cosmovision, perception and understanding of ideas, morality and preferences; as such, culture also impacts how we cope with trauma and adverse situations.

In the specific case of Latin Americans, it has been argued that they are highly resilient due to their cultural and moral values, which are associated with family, strong social networks and religious beliefs (Markides and Eschbach, 2005; Gallo *et al*., 2009). Lavretsky (2014) adds that values focused on family ties and friendships, as well as respect, trust, care, hope and faith, lead this cultural group to highly value collectivism and interdependence. As

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VALIDACIÓN DE LA ESCALA BREVE DE AFRONTAMIENTO RESILIENTE (BRCS) UNA MUESTRA MULTIÉTNICA DE PERSONAS MAYORES CHILENAS
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RESUMEN

El objetivo de este estudio fue analizar las propiedades psicométricas de la Escala Breve de Afrontamiento Resiliente (BRCS) para una muestra multiétnica de 800 personas mayores chilenas. Esta muestra tiene la particularidad de incluir personas no indígenas (231) e indígenas aymaras (201) y mapuche (368) residentes en áreas rurales nativas. Se llevó a cabo un estudio transversal. Se realizaron análisis descriptivos para las variables sociodemográficos, tales como media, desviación estándar (DE), frecuencias y porcentajes. Para BRCS, las propiedades psicométricas se analizaron de acuerdo con los principios de la Teoría Clásica de las Pruebas. Los análisis de las propiedades psicométricas de BRCS para los tres grupos étnicos de personas mayores chilenas muestran que esta escala es aceptable, confiable y válida, aunque las diferencias entre los grupos resaltan la necesidad de que las escalas de evaluación geriátrica sean adaptadas culturalmente. BRCS mostró características psicométricas satisfactorias para las muestras estudiadas. Es importante para las ciencias médicas y sociales contar con instrumentos étnicamente sensibles para la evaluación de los recursos psicosociales que promueven un envejecimiento exitoso.

VALIDAÇÃO DA ESCALA BREVE DO COMPORTAMENTO RESILIENTE (BRCS) UMA AMOSTRA MULTIÉTNICA DE IDOSOS CHILENOS
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RESUMO

O objetivo deste estudo foi analisar as propriedades psicométricas da Escala Breve do Comportamento Resiliente (BRCS) para uma amostra multiétnica de 800 idosos chilenos. Esta amostra tem a particularidade de incluir pessoas não indígenas (231), Aimarás (201) e Mapuche (368) residentes em áreas rurais nativas. Foi realizado um estudo transversal. Foram realizadas análises descritivas para as variáveis sociodemográficas, como média, desvio padrão (DP), frequências e percentuais. Para a BRCS, as propriedades psicométricas foram analisadas segundo os princípios da Teoria Clássica dos Testes. As análises das propriedades psicométricas da BRCS para os três grupos étnicos de idosos chilenos mostram que esta escala é aceitável, confiável e válida, embora as diferenças entre os grupos destacam a necessidade de adaptação cultural das escalas de avaliação geriátrica. BRCS mostrou características psicométricas satisfatórias para as amostras estudadas. É importante para as ciências médicas e sociais contar com instrumentos etnicamente sensíveis para a avaliação dos recursos psicossociais que promovem o envelhecimento bem-sucedido.

such, resilience in indigenous Latin American communities is also based on strong collectivist values, but with more of a focus on community than on family. One of the cultural elements that determine resilience in indigenous communities is how health is understood, with wellbeing conceived as involving harmony among the physical, mental and spiritual aspects of a person. This harmony encompasses environmental, sociocultural and natural aspects.

The concept of resilience is closely related to the process of successful aging (Jeste *et al*., 2013; Pruchno and Carr, 2017; Stewart *et al*., 2018), considering that resilience is an ability to use psychological resources in order to accept the physical, social, psychological and financial changes experienced in aging (Jiménez, 2011). Numerous studies include resilience as a variable (Cohen *et al*., 2016; Mayordomo *et al*., 2016) and various scales have been developed to evaluate it (Ahern *et al*., 2006; Wister *et al*., 2018). One of the scales most commonly applied among Spanish-speaking older people is the Brief Resilient Coping Scale (BRCS) (Tomás *et al*., 2012a; Moret-Tatay *et al*., 2015; Caycho-Rodríguez *et al*., 2018).

The BRCS was developed by Sinclair and Wallston (2004) based on Polk's model (1997:6); it "discloses resilience as a characteristic approach to situations or stressors and is manifested as cognitive skills problem-solving ability, and attributes that indicate a capacity for action in facing a situation." It is based on the premise that resilient people have realistic goal-setting skills, are able to evaluate the consequences of their actions and are pro-active in solving problems (being flexible, perseverant and ingenious). The authors created a self-reported nine-item scale, which was later shortened to only four items. The four items evaluate the ability to be creative, to have self-control, to grow after a crisis and to seek replacement alternatives to cope with adverse situations.

The aim of this study is to analyze the psychometric properties of the BRCS for a multiethnic sample of Chilean older people. This sample has the particular feature of including indigenous Aymara and Mapuche older people resident in native rural areas, a group that has been transformed into an ethnic minority in its original geographical environment.

Method

Participants

A national, cross-sectional study was conducted entitled 'Aging in context: the influence of the residential environmental and ethnic belonging on successful aging among older Aymara and Mapuche Chilean adults'. The sample was made up of 800 older adults living in the north and south of Chile. Although sampling was not random, a sample was used with

set proportions of sex, ethnicity and place of residence (municipal or rural areas) in order to draw valid inferences about the population. The sample selection criteria were: being aged 60 years or over, not having cognitive impairment and being resident in rural areas. The general sample characteristics were as follows: 51% male, 43% aged between 60 and 69 years, 54% married or with partner (cohabiting) and 54% with an incomplete basic education (illiterate people were included in this category, amounting to 23% of the sample).

Recruitment

Participants were contacted via two procedures. When possible, the research team made first contact directly and arranged an appointment to perform the interview. The rural enclaves have low population density, meaning that contact with the older adult population was relatively straightforward. Some members of the research team (especially social workers) had enjoyed previous access to some communities from which participants were recruited, which enabled the technical team to obtain access without problems. When first contact entailed greater difficulty, it was made via key social agents, including council personnel (mainly social workers) and key local and neighborhood leaders. These agents carried out an initial selection of participants based on the inclusion criteria. The experience and knowledge of the community of social agents contributed to a recruitment process that facilitated the identification of persons with dementia (excluded from eligibility), for example. The interviewer attended the place indicated for the interview in both cases.

Procedure

A face-to-face interview method was used to collect data. The questionnaire, comprising various scales, as described in the following section, was read aloud to interviewees. Qualified social work and psychology professionals administered the questionnaire, taking ~45min to do so. Interviewers learned to administer the questionnaire in a short training workshop; specifically, they received instructions on how to address potential difficulties in understanding questions, for which purpose examples and even the linguistic meaning of some terms were provided. The main language used for the scales was Spanish. The original authors of the scale (Sinclair and Wallston, 2004) were contacted for purposes of applying the BRCS. They authorized its use supplied instructions in English. However, the Spanish-language adapted version developed by Tomás el al. (2012a) was applied; these authors produced the first adaptation and validation of the BRCS in Spanish.

The Ethics Committee of Tarapacá University and the National Council for Science and Technology of Chile approved and monitored the ethical aspects of the study. All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its amendments or comparable ethical standards. The data were processed confidentially and anonymously, having first obtained the informed consent of participants.

Measures

Resilience. The BRCS (Sinclair and Wallston, 2004) is composed of four items ranging from 1 (does not describe me at all) to 5 (describes me very well). The total score ranges between 4 and 20. A total score ≤13 indicates low resilience, while scores ≥17 indicate high resilience.

Loneliness. The six-item version of the De Jong Gierveld Loneliness Scale (DJGLS-6) was used (De Jong Gierveld and Van Tilburg, 2006). The items are scored on a scale from 0 to 2, and then recoded as dichotomous (0 or 1). The final score ranges from 0 (no loneliness) to 6 (extreme loneliness), with two categories: no loneliness (scores: 0-1) and loneliness (score equal to or higher than 2).

Depression. The Geriatric Depression Scale (GDS) of Brink *et al.* (1982) was used. It is a 15-item scale using yes/no response options. A score ≥5 indicates depression, with the following ranges indicative of severity: 5-9 points for mild and 10-15 for moderate-to-severe depression.

Quality of life. The WHOQOL-OLD (Power *et al*., 2005) is a questionnaire used to assess quality of life among older adults across six facets: sensory abilities; autonomy; past, present and future activities; social participation; death and dying; and intimacy. It comprises 24 items, with four for each facet, each scored on a range from 1 to 5. The total score for the scale hence ranges from 24 to 120 points, with higher scores representing better quality of life.

Wellbeing. The Personal Wellbeing Index (PWI) (Cummins *et al*., 2003; Rodriguez-Blazquez *et al*., 2011) is a seven-item scale related to satisfaction with various aspects of life: standard of living, personal health, achieving in life, relationships, personal safety, community-connectedness, and future security, and an additional optional item on spirituality/religion. Items are scored from 0 (no satisfaction at all) to 10 (completely satisfied). The overall value for the scale is obtained by adding together the items and then transforming the result into a score from 0 to 100.

Social support. The Perceived Social Support Questionnaire (PSSQ) (Gracia *et al*., 2002) is a scale made up of nine items evaluating the functional dimensions of support (emotional, advice and assistance) and reciprocity of support from each source of social support. It also offers a total score for functional support and reciprocity of support, as well as the number of components of the network, and separate scores for the different sources. The present study included social support from spouse/partner, children, relatives (grandchildren, siblings, etc.) and friends.

All scales were applied in their Spanish-adapted versions.

Data analysis

Descriptive statistics were calculated for socio-demographic and outcome data, covering mean, standard deviation (SD), frequencies and percentages. For the BRCS, the below-listed psychometric properties were analyzed, according to the principles of Classical Test Theory (CTT):

Data quality and acceptability (McHorney and Tarlov, 1995), considering the percentage of missing data (criterion: <10%), score distribution, skewness (criterion: -1 to +1), and floor and ceiling effects (criterion: <15% for both) for BRCS items.

Internal consistency (McHorney and Tarlov, 1995), calculating item-total corrected correlation (criterion: >0.40), Cronbach's alpha coefficient (standard criterion: >0.70), inter-item correlation coefficients and item homogeneity (criterion >0.30).

Construct validity, for which convergent and known-group validity were determined. Convergent validity was calculated using the Spearman's rank correlation coefficients of BRCS total score with the other rating scales. Based on the literature (Juniper *et al*., 1996), a moderate correlation was hypothesized between BRCS and depression and quality of life scales (r_S= 0.30-0.50). Known-group validity was explored by calculating the differences in BRCS scores in the sample grouped by variables of interest: sex, age group (60-69, 70-79, and ≥80 years), perceived health status (good and bad), severity of depression (cut-off points of GDS) and ethnic group.

The Rasch model is based into the assumption that the probability of a given response is a faction of the person's ability (or level of resilience, in this case) and the item's difficulty (or the degree of resilience measured by the item), expressed in logits (Rash, 1980). For Rasch analysis, a random sample of 300 was used. This sample size is sufficient to get stable estimates independently of the scale targeting, and it avoids the problem of finding statistically significant deviations from the Rasch model that are actually very small and could result in unnecessary modifications (Linacre, 1994).

Fit to the Rasch model is indicated by a non-significant goodness of fit chi-square values, with Bonferroni adjustment by number of items, for items, and person-item interaction. In addition, the distribution of person and item fit residuals should be close to normality, with a mean (M) value close to 0 and standard deviation (SD) close to 1. The Person Separating Index (PSI) measures reliability and is interpreted similarly to the Cronbach's alpha. In addition, the following measurement parameter were also analyzed: unidimensionality, item local independency, adequacy of the response categories (threshold ordering), and differential item functioning (DIF) by age, sex and ethic group. In case of a significant DIF, a top-down purification procedure compared the location of items with and without DIF (Lange *et al*., 2010). More information and tutorials about Rasch analysis may be found elsewhere (Pallant and Tennant, 2007; Tennant and Conaghan, 2007; Martinez-Martin and Forjaz, 2012).

All analyses were carried out separately for each ethnic group. The IBM SPSS Statistics 22 statistical software was used. For Rasch analysis, we used the software RUMM2030 (Andrich *et al*., 2010).

Results

The fundamental features of the sample are set forth in Table I. It is appropriate to highlight average age (72.07 years, SD= 7.81) and the fact that 71% of the sample described themselves as indigenous (35% Aymara and 65% Mapuche). The sample was therefore multiethnic and made up of two indigenous communities (369 Mapuche and 201 Aymara respondents), in addition to participants who were not members of any indigenous ethnic group.

The descriptive statistics of the applied rating scales are displayed in Table II. The BRCS reached a mean of 15.02 (SD= 3.22) in the Mapuche group, significantly higher than in the non-indigenous group (14.12, SD= 2.98, p<0.001). Applying the cut-off points, the Mapuche group showed a higher frequency of highly resilient people (26.4%), while the non-indigenous group had a higher frequency of low-resilience members (38.5%) and the Aymara group had the highest frequency of medium-resilience participants (49.3%).

In terms of data quality and acceptability (Table III), there were no missing data and all items showed the full score range. Items did not show skewness except for items 2 and 3 in the Aymara group. No

TABLE I
CHARACTERISTICS OF THE SAMPLE AND DESCRIPTIVE STATISTICS OF THE APPLIED RATING SCALES

Variable		Non-indigenous (n=231)	Aymara (n=201)	Mapuche (n=368)	p†	
Gender	Women	107 (46%) *	106 (53%)	180 (49%)	0.410	
	Men	124 (54%)	95 (47%)	188 (51%)		
Marital status	With partner (married, cohabiting)	112 (48.5%)	120 (59.7%)	202 (54.9%)	0.062	
	Without partner (widow, divorced)	119 (51.5%)	81 (40.3%)	166 (45.1%)		
Education	Primary School incomplete	56 (24.2%)	127 (63.2%) [a]	250 (67.9%) [a]	<0.001	
	Primary School	120 (51.9%)	49 (24.4%) [a]	76 (20.7%) [a]		
	Secondary or Higher education	55 (23.8%)	25 (12.4%) [a]	42 (11.4) [a]		
					p††	p†††
Age		73.13 (7.68) **	70.85 (7.81)	72.07 (7.83)	0.010	0.209
GDS-15 total score		4.72 (4.31)	2.69 (2.82)	3.81 (3.56)	<0.001	0.001
WHOQOL-OLD Total		70.07 (11.16)	76.69 (9.68)	74.27 (11.36)	<0.001	<0.001
PWI Total		62.52 (14.65)	78.52 (15.09)	72.14 (17.09)	<0.001	<0.001
Emotional loneliness		1.73 (1.05)	1.16 (0.75)	1.38 (0.88)	<0.001	0.033
Social loneliness		2.26 (1.04)	1.65 (1.31)	1.77 (1.20)	<0.001	1.000
DJGLS-6 Total		3.99 (1.71)	2.82 (1.54)	3.15 (1.67)	<0.001	0.050
PSSQ spouse/partner		3.10 (3.58)	2.94 (3.48)	3.20 (3.52)	0.503	--
PSSQ children		3.19 (3.38)	5.27 (2.85)	4.50 (3.25)	<0.001	<0.001
PSSQ relatives		1.82 (3.01)	2.27 (2.77)	3.06 (3.40)	<0.001	0.293
PSSQ friends		2.51 (3.30)	.85 (2.08)	1.24 (2.53)	<0.001	0.302
BRCS Total		14.12 (2.98)	14.54 (2.95)	15.02 (3.22)	<0.001	0.285

*N (%), **Mean (SD), †chi-squared test for the three groups, †† Kruskal-Wallis test for the three groups, ††† Dunn-Bonferroni test for Aymara-Mapuche comparisons.

GDS-15: Geriatric Depression Scale, 15 items; BRCS: Brief Resilience Coping Scale; PWI: Personal Wellbeing Index; PSSQ: Perceived Social Support Questionnaire; DJGLS-6: de Jong-Gierveld Loneliness scale, 6-item version.

TABLE II
DATA QUALITY AND ACCEPTABILITY OF BRCS

Group	BRCS	Mean	SD	Skewness	Range	Floor effect (%)	Ceiling effect (%)
Non-indigenous	Item 1	3.38	0.88	-0.08	1-5	0.9	9.1
	Item 2	3.65	0.82	-0.38	1-5	0.4	12.6
	Item 3	3.65	0.85	-0.39	1-5	0.4	13.4
	Item 4	3.43	0.95	-0.50	1-5	3.9	10.4
	BRCS total	14.12	2.98	-0.24	4-20	0.4	6.1
Aymara	Item 1	3.24	1.07	-0.44	1-5	9.5	10.4
	Item 2	3.76	0.90	-1.04	1-5	4.0	16.9
	Item 3	4.02	0.77	-1.17	1-5	1.5	23.4
	Item 4	3.52	0.90	-0.55	1-5	3.0	10.9
	BRCS total	14.54	2.95	-0.69	4-20	1.0	4.5
Mapuche	Item 1	3.71	0.89	-0.75	1-5	1.9	15.2
	Item 2	3.70	0.97	-0.79	1-5	3.3	17.9
	Item 3	3.86	0.88	-0.68	1-5	1.4	22.8
	Item 4	3.76	0.92	-0.73	1-5	2.2	19.8
	BRCS total	15.02	3.22	-0.55	4-20	0.3	12.2

TABLE III
INTERNAL CONSISTENCY OF BRCS

	Non-indigenous	Aymara	Mapuche
Item-total corrected correlation coefficients	0.64-0.71	0.64-0.71	0.75-0.82
Cronbach's alpha coefficient	0.88	0.83	0.90
Item homogeneity index	0.64	0.54	0.70
Inter-item correlation coefficients	0.53-0.79	0.40-0.70	0.64-0.79

item showed a floor effect, but items 2 and 3 in the Aymara group and all items in the Mapuche group showed a ceiling effect.

Internal consistency data are shown in Table IV. Item-total corrected correlation coefficients were >0.40 for all items across the three ethnic groups. Cronbach's alpha coefficient ranged by group from 0.83 for Aymara to 0.90 for Mapuche. Item homogeneity index scores by group were 0.54 for Aymara, 0.64 for non-indigenous and 0.70 for Mapuche. Inter-item correlation was 0.53-0.71 for non-indigenous, 0.40-0.70 for Aymara and 0.64-0.79 for Mapuche.

BRCS correlated -0.29 to -0.56 with GDS, 0.41 to 0.46 with WHOQOL, 0.05 to 0.48 with PWI, and -0.29 to -0.51 with DJGLS-6, with the lowest coefficients corresponding to Aymara and the highest to the non-indigenous group (Table V).

Women had higher BRCS scores than men, although the differences were only significant in the non-indigenous group. By age group, younger participants (60-69 years old) reported higher scores than people aged ≥80, but in this case the differences were only significant in the Mapuche group. People with depression and reporting poor perceived health status scored significantly lower in the BRCS across all three ethnic groups, except in the case of BRCS scores by perceived health in the Aymara group.

The 4-item scale showed a good fit to the Rasch model, with a non-significant interaction chi-square of $\chi^2_{(16)}$= 26.29, p=0.050 with Bonferroni adjustment by number of items. Items presented a fit residual M= -0.780, SD= 1.152 and the mean person fit residual was 1.396, SD= 2.165. PSI was 0.788, the items thresholds were ordered, the scale was multidimensional, and there was item local independency. All items were free from DIF by age or sex. Concerning DIF by ethnicity, items 1 to 3 showed significant DIF, but it cancelled out when using the top-down purification method. Person-item targeting was adequate, with a person mean location of 1.389, SD= 2.165, and absence of floor or ceiling effect.

TABLE IV
CONVERGENT VALIDITY OF BRCS

	Non-indigenous	Aymara	Mapuche
GDS-15 total	-0.56**	-0.29**	-0.40**
WHOQOL-OLD total	0.46**	0.41**	0.46**
DJGLS-6 Total	-0.51**	-0.29**	-0.36**
PWI	0.48**	0.05	0.44**
PSSQ spouse/partner	0.07	-0.03	0.17**
PSSQ children	0.20**	0.02	0.17**
PSSQ relatives	0.13	0.18*	0.06
PSSQ friends	-0.17**	0.03	-0.02

Spearman's rank correlation coefficients. * p<0.05; ** p<0.01.

GDS-15: Geriatric Depression Scale, 15 items; BRCS: Brief Resilience Coping Scale; PWI: Personal Wellbeing Index; PSSQ: Perceived Social Support Questionnaire; DJGLS-6: de Jong-Gierveld Loneliness scale, 6-item version.

Discussion

The analysis of the psychometric properties of the BRCS for three ethnic groups of older Chilean people shows that this rating scale is acceptable, reliable and valid, although the differences between groups highlight the need for culturally adapted geriatric assessment scales.

In general, acceptability parameters indicate that the rating scale is adequate for the target population: for total score, skewness is within the limits, the full score range is reached and there are no floor or ceiling effects. However, there is a ceiling effect among the Aymara and Mapuche groups for items 2, 3 and 4, indicating that a high percentage of respondents show high levels of resilience. The mean BRCS total score is significantly higher among older Mapuche people (15.02) than for the non-indigenous group (14.12). Moreover, more than 20% of the Aymara and Mapuche participants are highly resilient (scoring more than 18 points), in comparison with 12.6% of the non-indigenous group. DIF in Rasch analysis actually provides further information about the differences by group. Results indicate that the differences are not due to a scale bias by ethnic groups. There would be a bias when, for the same construct level (resilience), groups present significantly different responses, which was not the case.

These findings are in line with the empirical evidence reporting high levels of resilience in indigenous communities (Pace and Grenier, 2017). A capacity to fight against a

TABLE V
KNOWN-GROUPS VALIDITY OF BRCS

Variable	Categories	Non-indigenous	Aymara	Mapuche
Sex	Women	14,53 (3.17)	14,75 (3.09)	15,10 (3.24)
	Men	13,76 (2.78)	14,29 (2.78)	14,95 (2.21)
p*		0.028	0.092	0.555
Age groups	60-69	14,59 (3.05)	14,89 (2.69)	15,40 (3.25)
	70-79	13,99 (2.66)	14,44 (2.94)	15,18 (3.25)
	80+	13,57 (3.45)	13,62 (3.62)	13,90 (2.90)
p**		0.224	0.232	<0.001
Depression	No	15,23 (2.48)	15,02 (2.59)	15,78 (2.76)
	Mild	13,86 (2.70)	13,08 (3.33)	14,20 (3.40)
	Moderate-severe	10,53 (1.83)	10,50 (3.94)	11,11 (2.94)
p**		<0.001	<0.001	<0.001
Perceived	Bad	13,68 (3.10)	14,12 (3.35)	14,68 (3.27)
	Good	14,86 (2.62)	14,99 (2.38)	15,81 (2.99)
p*		0.001	0.070	0.001

Mean (SD) of BRCS in each category. * Mann-Whitney test; ** Kruskal-Wallis test.

sociopolitical context that excludes them is striking in the case of indigenous Chileans, and particularly the Mapuche community. This indigenous community has historically fought for the recognition of its ethnic-cultural identity, the return of its ancestral lands and other citizen rights that have been expropriated and denied (Boitano, 2011). In this regard, Olivi (2011: 246) argues that "the historical perspective shows a high level of resilience..., understood in this context as a capacity among indigenous communities to adapt to changes and to reformulate their reproduction strategies in dynamic and conflictive contexts."

The internal consistency of the BRCS was satisfactory for all three ethnic groups, with all indices above the standard criteria, though slightly higher for Mapuche. Rasch analysis also showed that the scale has a good reliability level for group comparisons. Previous studies have reported similar or even lower Cronbach's alpha coefficients (Sinclair and Wallston, 2004; Cosco *et al*., 2016; Rodríguez-Rey *et al*., 2016).

Rasch analysis also supported the measurement properties of the BRCS, showing that the scale is unidimentional and sustaining that its 4 items represent a single construct and can therefore be summed to obtain a total score. Results were similar to the ones obtained in a previous study in patients with systemic lupus erythematosus (López-Pina *et al*., 2016), with the item local independency, and adequacy of response categories (threshold ordering). As hypothesized, the BRCS correlated moderately with GDS-15, WHOQOL-OLD and PWI, and also with the DJGLS-6 for the non-indigenous and Mapuche groups. For the Aymara group, the correlation coefficients were lower in this latter case.

People with moderate or severe depression reported significantly lower scores for the BRCS. A relationship between resilience and depression has been described in studies in different populations (Ávila *et al*., 2017; Poole *et al*., 2017; Zhao *et al*., 2018). Resilience is a protective factor for depression, moderating the effect of stressful or adverse events such as childhood abuse or loneliness. Some psychological therapies have hence been aimed at promoting resilience as a way of preventing depression in older people (Zhao *et al*., 2018). In the same way, resilience can moderate the impact of stressors on quality of life (Cosco *et al*., 2017). Understanding resilience in older people could lead to better approaches for promoting successful and healthy aging (Huisman *et al*., 2017).

Across the three ethnic groups studied, women tended to show greater resilience than men, which is not due to a bias by gender, as indicated by the absence of DIF. A previous study also reported no DIF by gender (López-Pina *et al*., 2016). The difference in resilience level by gender groups was significant only among non-indigenous participants. Previous studies have reported similar levels of resilience between men and women, although it has different impacts for each sex (Phillips *et al*., 2016). For example, resilience protects against suicidal behavior in men but not in women (You and Park, 2017). It is hence important to bear these gender differences in mind when assessing and building individual resilience in older people.

Another finding of this study concerns the results observed according to age. It was confirmed that older participants had a diminishing capacity to be resilient. These data are certainly complex, taking into account that at more advanced ages there is more likelihood of a person facing problems with health, dependence, loss of social networks and other negative changes. These data require development through subsequent research with older Chilean adults, and they also indicate a need to incorporate building the capacity to be resilient into social programs. In particular, intervention programs that are intended to promote wellbeing among older people must take into account that resilience plays a strategic role in keeping people active in their search for personal growth and purpose in life (Tomás *et al*., 2012b).

Resilience is also associated with self-reported health, acting as a moderator of the effects of adverse events on health status (Lau *et al*., 2018). In the present study, older non-indigenous and Mapuche people reporting poor health status had significantly lower BRCS scores than those reporting good health.

Resilience is a multidimensional construct that is developed after experiencing adverse situations, which people cope with by resorting to a range of psychosocial qualities. It enables people to prosper despite stressful events (Schure *et al*., 2013). Both of the indigenous communities participating in this study remain in their native territories in the face of constant battles relating to territory and natural resources involving large foreign and Chilean corporations, who are attempting to loot and expropriate natural resources including water, minerals and forest resources (Agosto and Briones, 2007). Moreover, these indigenous communities are trying to maintain their cultural practices and indigenous governance despite the cultural assimilation processes of the Chilean State (Boccara and Seguel-Boccara, 1999). Given all of this, we have two indigenous communities that are characterized by their resilience.

This study has some limitations that should be acknowledged. First, some psychometric properties (such as criterion and face validity) were not assessed as this was not the main objective of the study. Second, the study design does not allow for inferring of causality, hindering the generalizability of results.

In conclusion, the BRCS is a feasible, acceptable, reliable, unidimensional and valid questionnaire, with good measurement properties, for assessing resilience among older Chilean adults. It would be helpful to develop further knowledge of the associated aspects of active and healthy aging. The differences found between ethnic groups also suggest a need for scales that are culturally adapted for indigenous ethnic minorities.

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