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ORIGINAL ARTICLE

Transcultural adaptation and validation of a satisfaction with life scale for chilean adolescents

Estudio de adaptación y validación transcultural de una escala de satisfacción con la vida para adolescentes

Carola A. Álvarez[a], Ana M. Briceño[a], Karla Álvarez[b], Marcela Abufhele[c], Iris Delgado[d]

[a]MD, Child and Adolescent Psychiatrist, School of Medicine Clínica Alemana-Universidad del Desarrollo, Santiago, Chile & School of Government Universidad del Desarrollo, Santiago, Chile
[b]Clinical Psychologist, School of Medicine, University of Chile, Santiago, Chile
[c]MD, MPH, Child and Adolescent Psychiatrist, Department of Pediatrics, Clinica Alemana de Santiago, School of Medicine Clínica Alemana-Universidad del Desarrollo, Santiago, Chile
[d]Math Professor, School of Medicine Clínica Alemana-Universidad del Desarrollo, Santiago, Chile

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Abstract

Background: In recent years, there has been an increasing interest in the determinants of subjective well-being and happiness. In that context, life satisfaction is one of the measures used to assess subjective well-being, with emphasis in adult population. **Objective:** Adapt and validate (culturally and linguistically) the Canadian "Satisfaction with Life adapted for Children" (SWLS-C) in Chilean adolescents, in order to assess their global judgement about their own lives. **Patients and Methods:** Cross-sectional study, with adolescents between 10 to 18 years old, of both sexes and three socioeconomic levels in the Metropolitan region of Chile. After a process of translation and back translation, the scale SWLS-C was applied in 3 groups: cognitive interviews (n = 23) to evaluate semantics, content, reliability and construct validity, a second group was used as pretest (n = 24) and a third for the validation of the test (n = 200). Factor analysis was performed and measurement of convergent and divergent validity. **Results:** The internal consistency of the scale through Cronbach's alpha was 0.815, with item-total correlations between 0.51 and 0.7. The correlation between scale items varies between 0.390 and 0.607. In the main component analysis, all items met the requirement of a factor greater than 0.3. The inverse correlation between SWLS-C and CDI was significant, with a linear R^2 of 0.465. **Conclusions:** The Chilean version of the SWLS-C shows adequate psychometric properties, construct validity, confirming its unidimensional character and the need to keep each item of the Canadian version. SWLS-C, in its Chilean version, is suitable to be self-applied in adolescent population. Further studies are needed to provide further evidence.

Keywords:
Satisfaction, adolescent, children, scale

Correspondence:
Carola Álvarez
carolaalvarezq@hotmail.com

Introduction

Over the last years, the study of subjective well-being (SWB) has gained more interest from different disciplines. The United Nations incorporates it as an objective to evaluate human development. From a health perspective, the SWB provides a multidimensional approach, understanding health as something more than illness absence.

The literature uses diverse concepts related – but not equivalent – to SWB such as Quality of Life (QOL), Health-Related Quality of Life (HRQOL), Satisfaction With Life (SWL), and Happiness. David, Boniwell and Ayeres[2] propose an integrating vision of these concepts.

For this study, it was considered the concept of SWL as "the overall judgment that people make regarding their own life"[3], which is part of SWB in its cognitive aspect. The relevance of studying SWL in children and adolescents is underpinned by the fact that it constitutes an SWB indicator and it has been established as an internalizing and externalizing symptoms predictor, in one or two years[4], and also it shows a negative association with psychosocial risk behaviors[5,6]. Recent longitudinal studies have shown a strong bidirectional causality association between SWL and mental pathologies[7].

Due to the fact that study of SWL has been initially directed towards adults, the measuring instruments correspond to this age group. It has been mainly assessed with the Satisfaction with Life Scale-SWLS of Diener[3] which has been validated in Chile. The interest in knowing the judgment that children and adolescent themselves make about their own life has gradually increased, despite the evolutionary elements involved[9,10].

In Chile, it has also been observed a growing interest in studying welfare issues in children and adolescents. For this purpose, instruments such as KIDSCREEN-27[11], KIDSCREEN-52[12], How I Feel about Things[13] and Subjective Happiness Scale[14] have been validated.

Particularly in SWL, the International Survey of Children's Well-Being (ISCWeB) validated in Chile the scales SLSS, PWI-SC, BMLSS and OLS[15,16]. However, these scales are not easily equivalent to SWLS of Diener[3] in adults, the most widely used.

The adaptation work of SWLS for the child and adolescent population of Gaderman et al., 2009[17-19], provides an instrument called Satisfaction with Life adapted for Children (SWLS-C) that will allow studying the continuum of SWB from childhood-adolescence to adulthood. Its simple application and low cost favors its use in the clinical research and providing information for creating public policies.

The objective of this research was to adapt and contribute to the validation of this scale in Chilean adolescents between the ages of 10 and 18.

Patients and Method

The transcultural adaptation and validation process of the SWLS-C scale in Chilean adolescents was performed with a convenience sample of schools and the randomization of classes and participants within each class. The process was carried out with seven educational institutions in the Metropolitan Region, belonging to the three types of administration of Chilean education: 2 public schools, 2 private subsidized ones, 2 fee-paying private ones and 1 rural private subsidized school. The inclusion criterion was the age (to be between the ages of 10 and 18), without exclusion criteria.

Within the process, cognitive interviews (CI) were performed with the first group of 23 adolescents (11 female and 12 male). Then, a pilot application was performed on 24 adolescents (12 male and 12 female), and finally, the instrument to be validated was applied to 200 adolescents (115 female and 85 male).

The attendance at a particular educational institution was considered an approximation to the socioeconomic status (SES) of the adolescent. It was also constructed a variable SES based on ADIMARK methodology[20]. This methodology considers the self-reported information provided by the parents of the education level of the head of household and the family property.

The average age was 13.9 years $\pm$ 2.2 SD. Data were analyzed according to the type of administration that is defined by the Ministry of Education of Chile. Table 1 shows the sample characteristics according to gender, SES, and type of school.

The Ethics Committee of Clínica Alemana-School of Medicine, Universidad del Desarrollo approved this study. Parents informed consent and the adolescent's assent were obtained for the three stages of the study.

Scale adaptation and validation process

The process carried out was in accordance with Beaton[21] and ITF[22] guidelines following the SWLS-C validation process in Canada[17-19] (figure 1).

Two independent translations were performed by native translators, which were then harmonized, and this version was back-translated to the original language by a third translator. Subsequently, it was sent to a committee of experts, made up of five child and adolescent psychiatrists and psychologists with experience in validation of instruments, resulting in a second version that modified 4 out of 5 items. Two child and adolescent psychiatrists, previously trained, conducted CI to 23 adolescents through a protocol that combines the technique of think-aloud about the instrument

Table 1. Demographic distribution of the sample and results of scales

		Nº (%) o Average + SD. n = 200
Gender	Female (F) Male (M)	115 (57.5) 85 (42.5)
Age	Average total	13.9 ± 2.2
Age & Gender, categories	10-12 years old 13-15 years old 16-18 years old	40 M 43 F Total: 83 26 M 44 F Total: 70 19 M 28 F Total: 47
SWLS-C[a] score by gender	Female[b] Male Total	19.6 ± 4.7* 20.9 ± 3.0 20.2 ± 4.1 p ≤ 0.05*
SWLS-C score by age category	10-12 years old: 83 (41,5%) 13-15 years oldc: 70 (35%) 16-18 years old: 47 (23,5%)	21.1 ± 4.4 19.9 ± 4.0 18.9 ± 3.4 p ≤ 0.01**
SWLS-C score by type of school (administration of education)	Public Schools: 90 (45%) Private Subsidized: 43 (21,5%) Private: 67 (33,5%)	19.9 ± 4.3 20.0 ± 3.8 20.6 ± 4.1 p = 0.531
SWLS-C score by SES[d]	ABC1: 43,5% C2: 27,5% C3: 25% D: 5%	20.8 ± 3.7 19.5 ± 4.8 20.2 ± 3.8 18.0 ± 4.3
CDI[e] score by gender	Female Male Total	12.9 ± 5.6 14.2 ± 6.9 13.7 ± 6.4
CDI[e] score by age category	10-12 years old 13-15 years old 16-18 years old	11.8 ± 6.1 14.0 ± 6.6 16.4 ± 6.4 p ≤ 0.01**

[a]SWLS-C: Satisfacttion with Life Scale-Children version. [b]Statistical significant difference in SWLS-C score by sex (p = 0,029; gl 199; F: 4,840). [c]Statistical significant difference in SWLS-C score by age category (p ≤ 0,01; gl 199; F: 4,755; p = 0,01). [d]No statistical difference in SWLS-C score by SES (socioeconomic status). [e]CDI: Children Depression Inventory. Source: Own elaboration based on the study of Adaptation and Transcultural Validation of the Satisfaction with Life Scale.

and semi-structured interview[23]. The interview was individual with an average duration of 30 minutes. From this process, it was obtained the third version with the partial modification of two items, which was applied in the pretest (n=24) without requiring new modifications.

The test was applied collectively and assisted, under the supervision of a team member. It had an average duration of 40 minutes, including the application of the three instruments mentioned below, in order to assess convergent validity (with Piers-Harris Children's Self-Concept Scale) and divergent validity (with Children's Depression Inventory).

Without transgressing statistical confidentiality, it was observed that the parents of adolescents with suggestive scores of depression were confidentially informed, and a professional evaluation was recommended.

The final version changed the first item from "In most ways, my life is close to my ideal" to "My life is like the life I would like to have"; the second one was changed from "My life is excellent" to "My life is good". Item 3 had not changed. Item 4 changed from

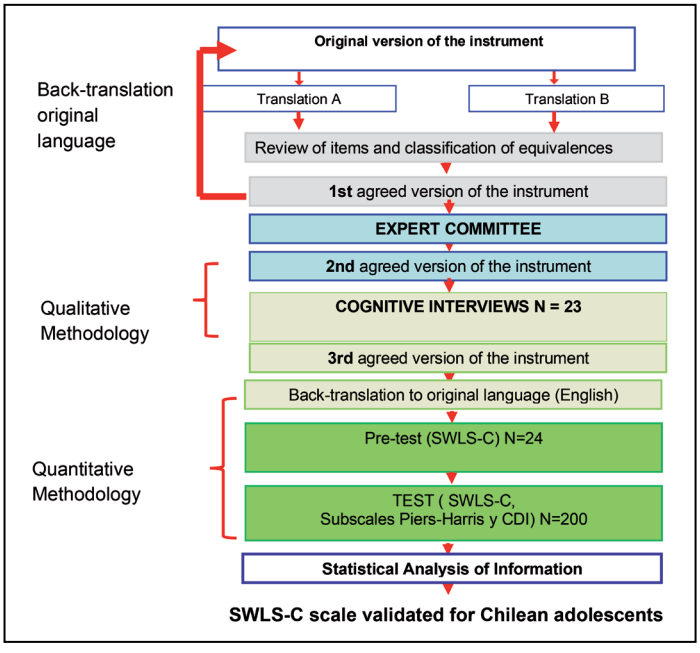

Figure 1. Flowchart of the process of adaptation and cross-cultural validation of SWLS-C.

"So far I have gotten the important things I want in my life" to "I have accomplished the important things that I have wanted in my life", and item 5 changed from "If I could live my life over, I would live it exactly the same way" to "If I could live my life over, I would live it much the same way".

Instruments

Satisfaction with Life Scale adapted for Children (SWLS-C): it was adapted and validated in Canada in 2009[17-19], from Diener SWLS[3]. It contains 5 items with Likert-type responses between 1 (Strongly disagree) to 5 (Strongly agree), with a score between 5 and 25 points, the higher the score, the higher the SWL. In the original validation, the Cronbach's alpha was 0.86 and the ordinal coefficient alpha was 0.9.

Piers-Harris Children's Self-Concept Scale: This scale was designed by Piers and Harris[24] for children and adolescents, then it was adapted and validated for Chile[25]. Within this process, 3 out of 6 subscales were applied: Happiness and Satisfaction, Self-Concept and Popularity, and Intellectual Self-Concept.

Children's Depression Inventory (CDI): Created by Kovacs[26]. Its adaptation was made for Chile in 1991 by Coggiola and Guillon, who provided provisional rules of the instrument[27]. Finally, Cáceres and Collado[28] standardized it for Chile. CDI has 27 items, with scores between 0 and 54 points, and its cut-off point is over 18 points to suggest risk or suspicion of depression.

Database creation and statistical analysis

A single database was designed for the typing of information from all instruments. For the analysis, the considered patients were those that completed the three instruments of the study.

A descriptive analysis was performed for all variables through a frequency description of absolute and relative values for categorical variables. For the continuous ones, central position and dispersion statistics were included. Then, it was implemented a bivariate analysis through contingency tables for categorical data, verifying statistical significance through Fisher's exact test or chi-squared test. In the F-test, theonetailed test was used. In order to study the continuous and categorical variables, it was used the T-test or the analysis of variance (ANOVA) respectively, depending on the variable type.

To verify the association between two continuous variables, it was used the Pearson correlation coefficient. The inter-item correlation analysis and the factor analysis were performed using a polychoric correlation matrix, since an ordinal analysis was considered, given the 5 response options. Subsequently, it was used a polyserial correlation matrix to calculate the corrected item-total correlation, and the Cronbach alpha if each item was deleted. The differences were considered statistically significant with a $p \leq 0.05$. All the analysis were made with SPSS version 19.0 software.

The confirmatory factor analysis was performed using the maximum-likelihood (ML) method for ordinal variables of IBM SPSS AMOS 20 software. It was hypothesized a one-factor measurement model that assumed the existence of a latent variable referred to SWL and in which the measurement errors of each item of this scale were not related to each other. The goodness indices analyzed were: Chi-square, chi-square ratio/ degrees of freedom, Expected Cross-Validation Index (ECVI), Root Mean Square Residual (RMR), Goodness of Fit Index (GFI), Normed Fit Index (NFI), and Non-Normed Fit Index (NNFI).

In order to delve into the analysis of SWL, a dichotomous variable was created considering as "satisfied with life" to all the adolescents who had a score of 20 or higher, and as "unsatisfied with life" to those ones who had less than 20 points. The point was defined at 20, since the average value of the distribution of the SWL variable is 20.2, very close to the median (21 points). In addition, using a ROC curve analysis with the dichotomous variable of CDI, it was verified that the value of 20 is the one that delivers a combination of greater sensitivity and specificity.

Results

Table 1 shows the SWL scores by gender, age, SES, and type of school, and table 2 shows the distribution of responses. Significant differences were observed in the average of SWL by gender, with less satisfaction in women than in men. Differences were found by age, with decreasing SWL in the upper age groups. Significant differences were observed neither by SES nor type of school.

Reliability

The Cronbach alpha (Cα) which indicates the internal consistency of the instrument was 0.815, similar to the original instrument[17] (0.86), with atotal-item correlation between 0.51 and 0.7. The elimination of any of the 5 items causes the decrease of Cα value, therefore each one contributes to the reliability of the test. (table 3).

Convergent and Discriminant Validity

The association between SWLS-C and the Piers-Harris Children's Self-Concept Scale is positive and statistically significant ($p \leq 0.01$ (**) bilateral). The results by subscale are of 0.21 for Popularity and Self-Esteem subscale; 0.43 for the Intellectual Self-Concept one, and 0.58 in the Happiness one.

Table 2. Items of the SWLS-C, Percentage of Responses

N° Items	Item SWLS-C	Disagree a lot	Disagree a little	Don´t agree or disagree	Agree a little	Agree a lot	Total
1	My life is like the life I would like to have	2.5%	7.0%	14.6%	45.7%	30.2%	100%
2	My life is good	2.0%	3.0%	4.0%	37.5%	53.5%	100%
3	I am happy with my life	2.5%	4.5%	9.0%	27.6%	56.3%	100%
4	I have accomplished the important things that I have wanted in my life	2.5%	12.7%	12.7%	44.2%	27.9%	100%
5	If I could live my life over, I would live it much the same way	8.0%	12.1%	10.1%	28.6%	41.2%	100%

Source: Own elaboration based on the study of Adaptation and Transcultural Validation of the Satisfaction with Life Scale.

Table 3. Correlation matrix between each item of the SWLS-C

	Item 1	Item 2	Item 3	Item 4	Item	Total correlation corrected	Alfa de Cronbach if item is eliminated
Item 1	1					0.68	0.76
Item 2	0.60	1				0.62	0.78
Item 3	0.61	0.58	1			0.70	0.75
Item 4	0.45	0.41	0.41	1		0.51	0.81
Item 5	0.47	0.40	0.56	0.40	1	0.57	0.80

All correlations are statistically significant at the level of p < 0,01 (**). Source: Own elaboration based on the study of Adaptation and Transcultural Validation of the Satisfaction with Life Scale.

An inverse relationship was observed between SWLS-C and CDI analyzed through Pearson's correlation coefficient, with a linear R2 of 0.465 (figure 2).

Factor Structure Analysis

In the exploratory factor analysis, Bartlett's test of sphericity was 335.96 ($p < 0.001$), showing that the 5 items were not independent. The Kaiser- Meyer-Olkin ratio was 0.83, pointing that the correlations between pairs of items can be explained by the remaining selected items.

Cattell's screen test showed that a one-factor model was appropriated to present data. The one-factor structure taken explained a 59.2% of the total variance.

Table 3 shows the correlation between the scale items that ranges from 0.39 and 0.61, all of them are statistically significant. The correlation homogeneity indicates the test unidimensionality. In the main component matrix, all items meet the condition of a factor higher than 0.3, being 0.82 for item 1, 0.78 for item 2, and 0.83, 0.67 and 0.74 for items 3, 4 and 5 respectively.

From the confirmatory factor analysis, the adjustment of the one-factor model proposed was appropriate, as indicated by the goodness indices obtained (table 4).

Goodness of fit indices of the confirmatory factor model

According to the chi-square ratio/degrees of freedom (1.9), we observe that the value is far lower than 3 which indicates that the model has a good fit to data.

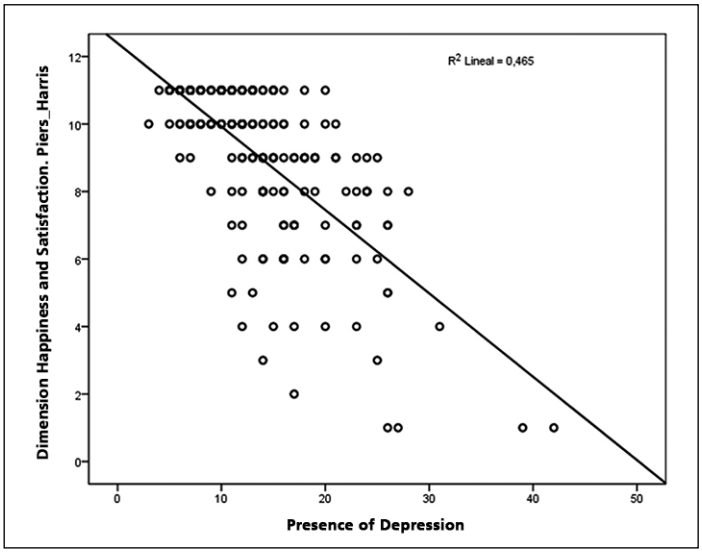

Figure 2. Pearson´s correlation coefficient.

Table 4. Confirmatory factor analysis of the Chilean version of SWLS-C

Index	Model
CHI	9,28
Df	5
P	0,01
CHI/gl	1,856
ECVI	0,147
RMR	0,03
GFI	0,98
NFI (delta)	0,97
NNFI (ro)	0,95

CHI = Chi-squared; df = degrees of freedom; p = level of significance; CHI/dF = quotient Chi-squared/degrees of freedom; ECVI = expected cross-validation index; RMR = Root Mean Square Residual; GFI = Goodness of fit index; NFI = normed fit index; NNFI = non-normed fit index.

In addition, the average of residual squares is 0.03, far lower than the critical value of 0.10, which shows that the discrepancies between the reproduced and the observed matrix are not relevant, which means the model fits well. The GFI also shows a good fit due to its proximity to value 1, as are the non-normative adjustment indices (or Tucker-Lewis Index) and NFI (delta).

All the items saturations were significant ($p < 0,001$), between 0.55 and 0.78; being item 4 "I have accomplished the important things that I have wanted in my life" the lowest, and the highest with the same value of 0.78 for item 1 "My life is like the life I would like to have" and item 3 "I am happy with my life".

Discussion

From this study, it is obtained the Life Satisfaction Scale for Children (SWLS-C) adapted and validated linguistically and culturally for the Chilean adolescent population, with adequate psychometric properties.

The scale reliability, assessed through the internal consistency analysis, seems to be very good, comparable to the Canadian version (Cα=0.86)[17]. Elimination of any item does not increase consistency, which is consistent with the studies of Gaderman[17-19] and Atienza[29]. It is observed that the item with the highest reliability is the number 3 and the one with the lowest reliability is the number 4, which coincides with the three comparative studies.

Noteworthy is the benefit of using mixed methodology (quantitative and qualitative) as a way of enriching this process. In this study, the CI was decisive in making items modifications of SWLS-C.

In the studied group, most adolescents present high satisfaction with life (SWL), in particular, male adolescents and those under the age of 14, matching results with literature[30-33]. in relation to the type of school and SES, no significant differences were found.

Results show a strong inverse correlation between SWL and risk of depression, which coincides with previous studies[30,34]. The positive association between SWL and self-esteem shows a weak correlation, as shown in the literature[35].

It considers the need for new applications of SWLS-C in order to establish the sensitivity to changes (test-retest procedure), which was not performed in this study.

The scale characteristics in terms of being brief, easy to understand and apply, make it a contribution to the repertoire of instruments available in Chile for inclusion in research, clinical practice and public health. The ease of use and cost reduction stand out when compared to much more extensive instruments, such as the KIDSCREEN (27 or 52 items) and allows comparison of SWL with other life cycle stages.

Future applications of SWLS-C in representative samples of adolescents would allow the generation of resources for the implementation and evaluation of public policies aimed at this age group. On the other hand, and because of its predictive potential in mental health, SWLS-C could be incorporated as a new screening tool in at-risk populations.

Finally, SWLS-C has provided an opportunity to access to the subjective perceptions of the adolescents about their own lives. This creates new challenges in terms of meeting their interests and needs, which must be considered by the disciplines and institutions linked to the well-being and development of children and adolescents.

Ethical responsibilities

Human Beings and animals protection: Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

Data confidentiality: The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

Rights to privacy and informed consent: The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

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Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

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