



Short communication

Psychometric properties of the Spanish version of the Cannabis Use Problems Identification Test among Chilean university students: A validation study



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ABSTRACT

Background: In Chile, concerns mount about escalating cannabis use. Thus, it is important to have tools for early identification of at-risk users. The Cannabis Use Problems Identification Test (CUPIT) is a useful screening tool, and the aim of this study was to examine the psychometric properties of its Spanish version among Chilean university students.

Methods: The CUPIT was translated into Spanish, pre-tested in a focus group (n=8), and then tested through an online survey (n=3798, 28% response rate). Of the 1061 respondents, 578 reported 12-month cannabis use. Internal reliability, internal structure, and concurrent validity (using the Cannabis Abuse Screening Test [CAST]) were obtained. Test–retest reliability was calculated (n=150) at 3–4 weeks (30% of attrition rate). Discriminative validity was evaluated comparing CUPIT subscales and four DSM-IV diagnostic groups. Receiving operator characteristic (ROC) curve analysis assessed sensitivity and specificity.

Results: Test–retest Pearson correlation between total CUPIT scores of 0.90 (p<0.001), and highly significant Kendall Tau-b coefficients for individual items (p<0.001) indicated excellent reliability. Concordance between the CUPIT and CAST (Pearson correlation 0.73, p<0.001) indicated good concurrent validity. ANOVA revealed significant differences in CUPIT scores between the four DSM-IV diagnostic groups (p<0.001), indicative of good discriminative validity. ROC analysis (gold standard: DSM-IV abuse/dependence) yielded an AUC value of 0.72, indicating acceptable discriminative capability.

Conclusions: The Spanish CUPIT is reliable, valid, and accepted by the university population studied, and, thus, a potentially useful tool for identifying both problematic and at-risk users.

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1. Introduction

In Europe last year, 16.6 million (13.3%) young adults aged 15–34 years reported cannabis use (EMCDDA, 2016). Recent Chilean surveys show consistently dramatic increases in 12-month cannabis use from 19.5% in 2011 to 30.6% in 2013 by secondary students (SENDA, 2013). Last year, cannabis use also increased in the general population, from 5.3% in 2010 to 13.5% in 2014 among 12–18-year-

olds, and from 12.3% in 2010 to 24% in 2014 for 19–25-year-olds (SENDA, 2015).

Surveys among students of Pontificia Universidad Católica de Chile (UC) showed that past-year cannabis use increased from 28% in 2011 to 46% in 2013. Perception of risks involved simultaneously decreased from 53.5% to 39.5% during that period (DAE, 2011, 2013)

There is much scientific evidence of the negative effects of cannabis use (Meier et al., 2012; Volkow et al., 2014, 2016; Hall, 2015; Hall and Lynskey, 2016; Arria et al., 2016; Auer et al., 2016), especially in young people, who presented low risk perception (SENDA, 2013; DAE, 2013) and a low rate of seeking help (Caldeira et al., 2009). However, if not all users run the same risk, a screening instrument can facilitate timely targeted interventions to arrest progression to more serious physical and mental harm.

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A small assortment of cannabis-specific screening instruments has been developed worldwide. These include the Cannabis Use Disorders Identification Test (CUDIT; [Annaheim et al., 2008](#); [Piontek et al., 2008](#)) and its revised version, CUDIT-R ([Adamson et al., 2010](#)); the Cannabis Screening Inventory (MSI-X; [Alexander and Leung, 2004](#)) in the United States; the Problematic Cannabis Use Test (PUM; [Piontek et al., 2008](#)) in Poland; and the Adolescent Cannabis Problems Questionnaire (CPQ-A; [Martin et al., 2006](#)) and its version validated in Spain ([Fernández-Artamendi et al., 2012](#)). In Chile, the CAST ([Legleye et al., 2015](#)) has been used successfully to screen secondary students with past-year cannabis use for the risk of meeting criteria for cannabis use disorder ([SENDA, 2013](#)).

The CUPIT is a screening tool empirically developed by researchers from New Zealand ([Bashford et al., 2010](#)) for testing among users aged from 13 years. It identifies the frequency and intensity of cannabis use in the past year and in the past 3 months, cannabis-induced problems, the current risk of harm within the next 12 months, and a current disorder ([Bashford et al., 2010](#)). What distinguishes this instrument from other cannabis screening tests is its capability to classify both currently diagnosable and potentially problematic cannabis use ([Bashford et al., 2010](#)).

This instrument can be used as part of prevalence studies of drug use in university populations, where the identification of level of risk would enable preventive institutional interventions ([Yap et al., 2012](#)), such as: social norms campaigns ([Dejong et al., 2006](#)), aiming to reduce misperceptions about cannabis use and its associated risks ([Turner et al., 2008](#)), for targeted preventive interventions, using the instrument via online websites along with the delivery of personalized feedback ([Larimer and Cronce, 2007](#); [Palfai et al., 2014](#); [Cronce and Larimer, 2011](#)), and for the screening of non-consultant students, using brief motivational interventions ([McCambridge et al., 2011](#)) by trained professionals ([Larimer and Cronce, 2007](#); [Cronce and Larimer, 2011](#)).

The validated CUPIT can make a valuable contribution because, besides CAST, no other cannabis screening instruments are validated nor available for use in Chile.

To have a Spanish version of this rapid and reliable tool for the identification of problematic and risky cannabis use, a validation project for the CUPIT was developed in 2013 at UC.

2. Methods

2.1. Procedure

First, permission to use the CUPIT was sought and given by the principal CUPIT developer (Dr. Bashford), who also agreed to collaborate.

The CUPIT comprises 16 questions in a Likert-type response format measure to identify three dimensions according to DSM-IV questions ([APA, 2010](#)) and ICD-10 ([WHO, 2010](#)) classifications: hazardous use (questions 1 and 2), using behavior/compulsive use/dependence (questions 3–10), and health and social problems (questions 11–16) ([Bashford et al., 2010](#)). Possible scores range from 1 (non-problematic use) to 82 (severely dependent/problematic use).

The CUPIT was adapted to the Chilean population by translating it from English to Spanish and then reversely translated by a native English speaker. The translated version of CUPIT was pre-tested among eight students who voluntarily participated in a focus group. The questions that were not clearly drafted were discussed. Small adjustments were then made to the instrument to ensure clarity.

Ethical approval for this study was granted by the Ethics Committee, Institute of Sociology, UC. The validation of the CUPIT Spanish version was conducted entirely online. Volunteer students consented to take part in the study through an online form.

2.2. Participants

Sample size was determined using feasibility criteria, with 10 subjects for each survey question ([Streiner and Norman, 1995a,b](#)); hence, the minimum sample size was 160. Participants were volunteer students from 13 academic units of UC with higher prevalence of cannabis use ([DAE, 2011](#)). Thirty percent of this universe was randomly selected to receive an electronic invitation to participate ($n=3798$), using the [Survey Analytics tool](#) (<https://www.surveyanalytics.com/>); the response rate was 28% (1061 students).

To validate the CUPIT, we considered a subsample of 578 students who reported past-year cannabis use. All of them completed the survey, which included demographic information; cannabis use (past 30 days, past year); onset age; cannabis risk perception; perceived availability of cannabis; and Spanish CUPIT, CAST, and DSM-IV questions. The power of the sample was 99.5% with a confidence level of 99% and Cronbach's alpha of 0.7 ([Donner and Eliasziw, 1987](#); [Kirkwood and Sterne, 2003](#)).

2.3. Validation analysis

The CUPIT factorial structure, internal reliability, and concurrent validity, using the CAST scale ([Legleye et al., 2007, 2015](#)), were examined. Discriminative validity using four diagnostic DSM-IV groups, as described by Caldeira ([Caldeira et al., 2008](#)), was also evaluated. ROC curve analysis assessed the sensitivity and specificity of the Spanish CUPIT. The Stata 12 statistical package was used for all analyses. A level of statistical significance was assumed at $p < 0.05$.

A random subsample of 125 (confidence level of 99%, correlation of 0.2, and power of 80%; [Donner and Eliasziw, 1987](#); [Kirkwood and Sterne, 2003](#)) past-year cannabis users received the re-test survey 3–4 weeks after the initial survey, of whom 90 (72%) responded. The Kendall Tau-b statistic, recommended for measuring correlation between ordinal data ([Kirkwood and Sterne, 2003](#)), was used to assess concordance between responses to each of the 16 CUPIT items; the percentage of agreement between responses to the first and second surveys was calculated.

The Pearson correlation used to assess the CUPIT reliability for the total score ([Kirkwood and Sterne, 2003](#)) for the two measurement periods was 0.90 ($p < 0.001$), indicating high test–retest reliability of total scores.

3. Results

3.1. Participants

The response rate for the survey was 28% ($n = 1061$), an acceptable rate for web surveys ([Cook et al., 2000](#)). Respondents reporting past-year cannabis use ($n = 578$) represented 54.5% of the total sample; 68.8% ($n = 398$) of these past-year cannabis users reported using in the past month. All participants were older than 17 years old (mean age = 21.3 years); 57.4% were males. The prevalence of 12-month cannabis use in this population is 46% ([DAE, 2013](#)).

3.2. Psychometric properties of the Spanish version of CUPIT

3.2.1. Factor structure and internal consistency/reliability. The factorial structure of CUPIT was analyzed using Principal Component Analysis (PCA). Varimax rotation was performed. Cronbach's alpha coefficient was used to measure the internal consistency of the dimensions (see Table S1 in Supplementary material). A benchmark of 0.80 ([Nunnally, 1978](#)) is commonly recommended.

Cronbach's alpha for the total CUPIT score was 0.80, indicating high reliability of the scale. An analysis for the two subscales defined by the original authors ([Bashford et al., 2010](#)),

was conducted. The obtained alphas for the two dimensions, “impaired control” and “problems”, were 0.80 and 0.63, respectively, reflecting high reliability for the impaired-control subscale and reasonable reliability of the problems subscale. The values obtained in the CUPIT’s original validation were 0.92 for impaired control and 0.83 for problems.

At this point, our results differed from the original instrument validation (Bashford et al., 2010) because four subscales emerged in the Spanish CUPIT. The Cronbach’s alpha for these scales was 0.82 for “frequency and intensity of use”, 0.64 for “problems”, 0.43 for “impaired control”, and 0.47 for “abstinence symptoms”.

3.2.2. Concurrent validity. Concurrent validity was examined by comparing CUPIT scores and the CAST (Legleye et al., 2015). The CAST (Legleye et al., 2015), used in other studies on the Chilean population (SENDA, 2013), is a six-item scale that addresses different dimensions of problematic cannabis use (PNSD, 2009), classifying cannabis users into groups with low or high risk of meeting criteria for cannabis use disorder.

The Pearson correlation between the CAST and CUPIT scores was 0.73 ($p < 0.001$). Most of those classified at high risk in the CAST were classified with presence of a current disorder according to the cut-point scores defined by the CUPIT’s authors (68%), with 28% classified as at risk of developing a disorder. This indicates high consistency between these tests designed to measure related phenomena.

3.2.3. Discriminative validity. Following the criteria used by Caldeira et al. (2008), four DSM-IV (APA, 2010) groups were determined: no problems (57%, mean CUPIT score 9.0 CI 8.4–9.6), abuse symptoms (14%, mean CUPIT score 14.8 CI 13.0–16.6), dependence symptoms (15%, mean CUPIT score 17.2 CI 15.5–18.9) (see Table S2 in Supplementary material), and diagnostic orphans (14%, mean CUPIT score 13.4 CI 11.6–15.2), defined as users not qualifying for an abuse disorder but satisfying two dependence criteria (Caldeira et al., 2008; Degenhardt et al., 2002). According to one-way ANOVA, significant between-group (no diagnostic group, diagnostic orphans, and abuse/dependence group) differences were found in CUPIT scores ($p < 0.001$). No significant differences were found between abuse and dependence groups.

3.2.4. Sensitivity/specificity. An ROC curve analysis was carried out for the Spanish version of CUPIT scores (Metz, 1978). ROC curve graphs all pairs of sensitivity/specificity for the observed results (see Fig. 1). In this study, the area under the curve (ROC AUC) value was 0.72, indicating an acceptable discrimination capability of the Spanish version of CUPIT (Hanley and McNeil, 1982).

The gold standard used in the ROC analyses was the DSM-IV diagnostic categories. Those who presented abuse or dependence according to the DSM-IV criteria were identified as positive cases. Negative cases were those who did not present abuse or dependence according to the DSM IV criteria.

According to the sensitivity, specificity, and percent of cases correctly classified in each cut of value, we concluded that the cut-off defined for those individuals with risk of disorder (12 points; Bashford et al., 2010) was adequate in this sample. This cut-off point correctly classifies the 66.42% of the sample (specificity 66.42%, sensitivity 67.66%). This point has the best specificity/sensitivity ratio. Regarding the cut-off point established for the individuals with current cannabis use disorder, if priority to the specificity and the percent of cases correctly classified is given, the same cut-off point as Bashford (20 points) (Bashford et al., 2010) is reached.

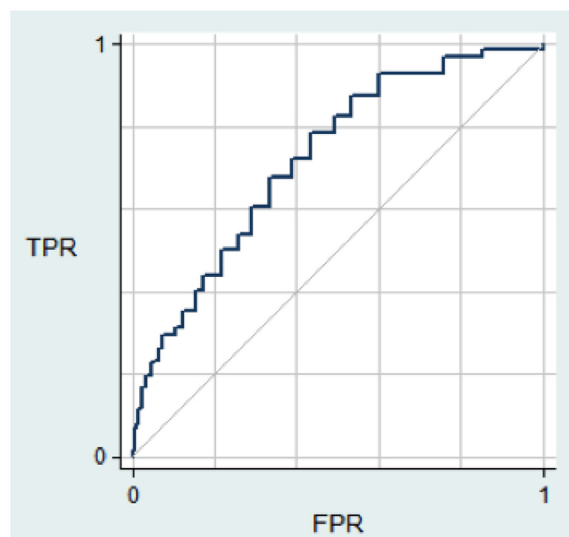


Fig. 1. ROC curve for the Spanish version of the CUPIT.

4. Discussion

The statistically significant association between all questions and for the risk categories provides evidence of the high reliability of the Spanish CUPIT. Concordance between the CUPIT and CAST indicated good concurrent validity. A significant difference in CUPIT scores between the four DSM-IV diagnostic groups was indicative of good discriminative validity.

According to the ROC analysis, the validated CUPIT has a good negative predictive value (NPV) of 74%, important for a screening instrument, although its positive predictive value is only acceptable (56%). Hence, the validated CUPIT shows an acceptable discriminative capability.

Four, rather than two, subscales were found: “frequency and intensity of use”, “problems”, “impaired control”, and “abstinence symptoms”. This differed from the original instrument and may be explained by the sample used. The original scale validation was conducted among a relatively highly disordered group (72% were cannabis-dependent), whereas the present validation was conducted among a non-consultant group of students: only 14% presented with cannabis dependence according to DSM-IV questions (APA, 2010).

Some questions and limitations arise from this study. The entirely online validation of this study presents a limitation by not having triangulated online assessments with clinical psychiatric interviews for concurrent and discriminative validity; however, the use of this type of online validation is rapidly growing because of its ready access, cost, and acceptability (Mulvaney et al., 2014). Some questions are the possible influence (in the instrument validity) of certain aspects not considered in the questionnaire; for example, presence of other drug use, psychiatric comorbidity, and so on.

Future research should ascertain different performances and the most reliable/valid delivery modes and the differences in psychometric properties that may arise from diverse instrument administration, for example, self-online administration, self-administration with professional support, or by a professional in a clinical context.

Challenges for the future include extending and evaluating the Spanish CUPIT version in other populations.

The Spanish CUPIT screener is reliable, valid, and accepted by the university population studied and can be a useful tool for identifying users at risk or with problematic cannabis use.

Author disclosures

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Authors' contributions

Vanessa Cantillano: research concept, design and redaction of the first paper draft.

Lorena Contreras: review and comments on the first paper draft

Daniel Martínez contribution on the discussion section and comments on the first paper draft

Claudia Ramírez Literature review for the Introduction section

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Conflict of interest

The authors affirm that they have no conflict of interest.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.drugalcdep.2016.10.032>.

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