

Validity and reliability of the Alcohol Use Disorders Identification Test (AUDIT) in students of a Brazilian university

Validade e confiabilidade do Alcohol Use Disorders Identification Test (AUDIT) em estudantes de uma universidade brasileira

Validez y confiabilidad del *Alcohol Use Disorders Identification Test* (AUDIT) en estudiantes de una universidad brasileña

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Abstract: The objective of this research was to assess the psychometric properties (validity and precision) of the Alcohol Use Disorders Identification Test (AUDIT) in students of a Brazilian public university. A total of 406 university students participated, with an average age of 23.31 years ($SD=5.73$), most of them were women (68.2%), single (58.4%), with low risk alcohol consumption (74.4%), who answered the AUDIT test and sociodemographic questions. Descriptive analyzes, confirmatory factor (CFA) and internal consistency analyzes were performed. The results indicated a better fit of the three-factor model [$\chi^2(32)=0.89$, $p<.001$; TLI= 0.99; CFI = 0.99; RSMEA= 0.036 (CI90%= 0.012 - 0.056); ECVI= 0.30] and adequate internal consistency ($\alpha= .85$; $\Omega= .89$). It is concluded that the instrument proved to be theoretically and metrically suitable, and it can be used in research aimed at assessing alcohol consumption patterns in samples similar to the one considered here.

Keywords: AUDIT; alcohol consumption; precision; validity

Resumo: Esta pesquisa objetivou avaliar as propriedades psicométricas (validade e precisão) do *Alcohol Use Disorders Identification Test* (AUDIT) em estudantes de uma universidade pública brasileira. Participaram 406 estudantes universitários, com idade média de 23,31 anos ($DP=5,73$), a maioria do sexo feminino (68,2%), solteiros (58,4%), com padrões de consumo de álcool de baixo risco (74,4%), que responderam o AUDIT e questões sociodemográficas. Realizou-se análises descritivas, análises fatoriais confirmatórias (AFC) e de consistência interna. Os resultados indicaram melhor ajuste do modelo trifatorial [$\chi^2(32) = 0,89$, $p<,001$; TLI= ,99; CFI= ,99; RSMEA = 0,036 (IC90%= 0,012 - 0,056); ECVI = 0,30] e adequada consistência interna ($\alpha= ,85$; $\Omega= ,89$). Conclui-se que o instrumento demonstrou-se adequado teórica e metricamente, podendo ser utilizado em pesquisas que objetivam medir padrões de consumo de álcool em amostras semelhantes a aqui considerada.

Palavras-chave: AUDIT; consumo de álcool; preciação; validade



Resumen: Esta investigación analizó las propiedades psicométricas (validez y precisión) del *Alcohol Use Disorders Identification Test* (AUDIT) en estudiantes de una universidad pública brasileña. Participaron 406 estudiantes universitarios, con una edad promedio de 23.31 años ($DE = 5.73$), la mayoría mujeres (68.2%), solteras (58,4%), con patrones de consumo de alcohol de bajo riesgo (74.4%), que respondieron el AUDIT y un cuestionario sociodemográfico. Se realizaron análisis descriptivos, análisis factoriales confirmatorios (AFC) y de consistencia interna. Los resultados indicaron mejor ajuste del modelo trifactorial [$\chi^2(32) = 0.89, p < .001$; TLI = .99; CFI = .99; RSMEA = 0.036 (IC90% = 0.012 - 0.056); ECVI = 0,30] y adecuada consistencia interna ($\alpha = .85$; $\Omega = .89$). Se concluye que el instrumento se demostró adecuado teórica y métricamente, pudiendo ser utilizado en investigaciones que busquen medir patrones de consumo de alcohol en muestras semejantes a la aquí considerada.

Palabras clave: AUDIT; consumo de alcohol; precisión; validez

Received: 06/01/2019

Accepted: 20/07/2020

How to cite:

Sousa, K.P.A., Medeiros, E.D., & Bezerra de Medeiros, P.C. (2020). Validity and reliability of the Alcohol Use Disorders Identification Test (AUDIT) in students of a Brazilian university. *Ciencias Psicológicas*, 14(2), e-2230. doi: <https://doi.org/10.22235/cp.v14i2.2230>

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Introduction

Alcohol consumption is a cultural practice encouraged in different societies around the world (Silva et al., 2015). Its use permeates people's lives from an early age, linking itself as a kind of tradition, custom, code, or morality (Cabral, Farate, & Duarte, 2007), expressed by symbolic virtues marked by myths disseminated in concepts that are responsible for maintaining its consumption culture (Pinto, 1999).

Alcoholic beverages have been widely used, both for being classified as a legal drug and for their psychoactive characteristics that promote sociability and integration among people, and its use is encouraged on different occasions (Damacena et al., 2016). However, although alcohol consumption is accepted and encouraged, the substance has often been linked to several psychosocial damages, such as diseases (World Health Organization [WHO], 2014), criminal behaviors (Feijão et al., 2012) and traffic accidents (Mello Jorge & Adura, 2013), causing economic losses worldwide (Rathod, Nadkarni, Bhana, & Shidhaye, 2015).

With regard specifically to the academic context, alcohol is identified as the main public health problem among university populations (Davoren, Dahly, Shiely, & Perry, 2017). In previous studies, a higher prevalence of alcohol use has been documented by this public, compared to the general population or even among students of other educational levels (Baumgarten, Gomes, & Fonseca, 2012). University students are more susceptible because they develop typical patterns of use, implying problematic drinking, a form of consumption that causes individual and social damage, which is reinforced by specific actions among this group (Peuker, Fogaça, & Bizarro, 2006).

In the literature, excessive consumption of alcoholic beverages by university students is associated with impulsive actions, involvement in fights, vehicular driving under the influence of alcohol, low performance in academic tests, etc. (Cardoso, Barbosa, Costa, Vieira, & Caldeira, 2015). Bearing this in mind, the pattern of alcohol use among these young individuals has deserved special attention in scientific investigations on the topic, since the costs and consequences of this practice are considerable in different aspects: social, economic, and individual (Baumgarten et al., 2012; Rocha, Lopes, Martelli, Lima, & Martelli, 2011).

Given the different patterns of alcohol intake among university students, the need to have a valid measurement instrument that makes it possible to detect them early is evident, focusing on the development of preventive measures aimed at this audience. Among the tests used in the literature to measure the construct, the Alcohol Use Disorder Identification Test (AUDIT) has deserved special attention.

The AUDIT test was developed by the WHO in the late 1980s, designed for use in the Primary Health Care (PHC) context, from a project involving an international group of researchers who started a transnational study in six countries -Norway, Australia, Kenya, Bulgaria, Mexico, and the United States of America- (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), with the objective of making the instrument suitable for use in different socio-cultural and economic realities (Méndez, 1999). Currently, it is the most used test worldwide to screen for alcohol use (García, Novalbos, Martínez, & O'Ferrall, 2016) and has, as an advantage over other instruments that measure the same construct, the fact that it allows the tracking of different consumption patterns, not just focusing on addiction (Babor et al., 2001).

For more than two decades, the instrument was built and assessed proving to be an accurate measure for the assessment of problems arising from alcohol use. However, despite having presented adequate psychometric qualities, attesting it as a measure of a cross-cultural nature, after its publication, its creators pointed out the need for further research to validate the test (Babor et al., 2001).

Previous studies that assessed its factor structure, using exploratory and confirmatory factor analysis techniques, identified models of one (Noorbakhsh et al., 2018), two (Von-der-Pahlen et al., 2008) and three factors (García et al., 2016). However, according to Meneses-Gaya (2011), although there is documentation in studies of structures with items saturating in a single factor, these are less frequent, when compared to two- and three-factor models.

According to the aforementioned author, at the moment, there is a greater number of studies supporting a bifactorial model (Meneses-Gaya, 2011). In fact, investigations into the dimensionality of the AUDIT test, both internationally (Campos-Arias, Villamil-Vargas, & Herazo, 2013; Seguel Palma, Santander Manríquez, & Alexandre Barriga, 2013) and in the Brazilian context (Lima et al., 2005), have mostly supported, based on statistical analysis, a two-factor instrument.

A study with 1000 university students from two campuses located in the city of Bogotá, Colombia, analyzed the psychometric properties (construct validity and reliability) of the AUDIT test, through confirmatory factor analysis, identifying a two-dimensional structure (Castañeda, Munévar, Lara, & Villa, 2016). In another study, carried out with 173 adolescents, the researchers examined the original structure of three domains for a modified version of the AUDIT test. The results showed that the two-month structure (consumption and dependence/consequences) provided the best fit to the data (Chung, Colby, Barnett, & Monti, 2002).

In Brazil, studies carried out in the southeast and northeast regions of the country supported the two-factor structure of the AUDIT test. The first was carried out with a sample of 530 patients from an Emergency Room and a Psychosocial Care Center for Alcohol and Drugs, in the state of São Paulo. After performing an exploratory factor analysis (EFA), two factors were found. Factor 1, related to the pattern of alcohol consumption, was composed of items one, two, three, and ten;

factor 2, associated with the problems and consequences caused by alcohol consumption, included items four to nine (Meneses-Gaya, 2011).

In the second study, carried out in in the city of Fortaleza, in the state of Ceará, 547 university students participated, using an exploratory factor analysis technique. The two-factor model proved to be adequate, with the first factor being called Frequency and adverse consequences of consumption, consisting of seven items (one, two, three, seven, eight, nine, and ten), and the second factor, called Dependence, gathering the items: four, five, and six (Santos et al., 2012).

These findings support a two-factor model that contradicts the original three-dimensional design of the AUDIT test, as a screening tool in relation to alcohol consumption, proposed by the WHO (Babor et al., 2001). However, it is necessary to consider, as Meneses-Gaya, Zuardi, Loureiro and Crippa (2009) point out, that the factor analyzes carried out with data from the instrument can be affected by different aspects, as in the sample used.

Despite the relevance of these studies, we agree with Altman and Bland (1994) that an instrument is only valid in the context in which it is validated. Thus, considering that Brazil is a country with continental dimensions, with different cultural contexts (Maciel, 2017), further studies are recommended, in order to assess the validity and dimensionality of the AUDIT test, especially considering that different samples can produce different results, for example, from the original model (Allen, Litten, Fertig, & Babor, 1997).

In addition, further research on the instrument is relevant because it allows comparison with the findings of other studies, contributing to the advancement of science. Based on the above, and considering the lack of validation studies of AUDIT in a university sample in the state of Piauí, it is sought to carry out the assessment of the psychometric properties of this instrument for the aforementioned context.

Method

Participants

A total of 406 university students from a public Higher Education Institution (HEI), located in the state of Piauí, Brazil, most of whom belonged to the biological sciences (27.6%), aged 18 to 58 years ($M= 23.31$; $SD= 5.73$), female (68.2%), single (58.4%), with an average income of BRL 2.054,84, equivalent to USD 384.44, and Catholic (73.4%). Of all participants, 41.4% still lived with their parents.

Regarding the alcohol consumption patterns of the sample selected from the AUDIT scores, it was found that 74.4% of the participants are in Zone I (low risk consumption), 20.7% in Zone II (risky consumption), 3.7% in Zone III (harmful consumption) and 1.2% in Zone IV (probable alcohol dependence). It was a non-probabilistic (accidental) sample, comprising university students, of legal age (≥ 18 years), duly enrolled in a higher education course and who voluntarily accepted to collaborate with the study.

Instruments

Alcohol Use Disorders Identification Test (AUDIT): this instrument was developed by the WHO to assess alcohol consumption patterns (Babor et al., 2001; Noorbakhsh et al., 2018), having been validated for Brazilian Portuguese by Figlie et al. (1997). This test consists of ten items with scores ranging from 0 to 4, thus allowing results from 0 to 40. Based on the participant's score, on this measurement scale, it is possible to classify it in four consumption zones (patterns): low risk - 0 to 7 points; risky consumption - 8 to 15 points; harmful consumption - 16 to 19; and probable alcohol dependence - 20 to 40 points (Silva & Tucci, 2014).

Sociodemographic questionnaire: composed of questions such as age, sex, marital status, income, and others, aiming to characterize the sample.

Procedure

Initially, contact was made with the direction of the HEI, where the research was carried out, to obtain authorization for the application of questionnaires with students who voluntarily agreed to collaborate. After the authorization of the board of directors of the institution, and with the approval of the project by the Research Ethics Committee (REC) of the *Universidade Federal do Piauí* (UFPI, Federal University of Piauí), Opinion no. 2.400.755/2017, data collection started.

The data were collected in a collective classroom environment, with the consent of the professors, and previously scheduled. Although the instruments were applied collectively, each participant answered the questionnaires individually. Initially, the objectives of the study were presented, providing additional clarifications regarding the anonymity, secrecy, and confidentiality of the data. It was also emphasized that participation in the study was voluntary, the participants could quit at any time without any consequences. Individuals who agreed to participate in the study signed the Consent Form (CF).

The application of the research instruments was carried out by the researcher who was responsible for it and by duly trained collaborators, who were present throughout the collection process, to instruct the participants on how to complete the instruments and resolve possible doubts. It took an average of 10 minutes to complete the questionnaires. It is noteworthy that all ethical recommendations were respected in relation to research with human beings, according to Resolution no. 466/12 and 510/2016 of the National Health Council.

Data analysis

The data were analyzed using the SPSS Software, version 21, and the R software, version 3.5.1. With the former one, descriptive statistics (measures of central tendency and dispersion) were performed, aiming to characterize the sample. With the latter, Confirmatory Factor Analyzes (CFA) were carried out, aiming to investigate the adequacy of the theoretical model to the empirical data, that is, evidence of validity. For this, the Lavaan statistical package and Psych were used to calculate internal consistency (Cronbach's Alpha and McDonald's Omega), whose values above 0.70, for both alpha and omega, were considered acceptable (Gadermann, Guhn, & Zumbo, 2012). For the assessment of the tested models, with one, two, and three factors, the following adjustment indicators were taken into account (Hair, Black, Babin, Anderson, & Tatham, 2009; Tabachnick & Fidell, 2013):

(1) χ^2 (Chi-square). Indicates the likelihood that the model will fit the data, with low values being recommended. Considering that this indicator is sensitive to the sample size, it is suggested to use its ratio in relation to the degrees of freedom (χ^2 / DF) of the model, where values between 2 and 3 indicate a good fit, ranging until 5 .

(2) Comparative Fit Index (CFI). It is an additional model adjustment index, which is used to compare with alternative models. Values range from 0 to 1 (perfect fit), with values greater than 0.90 being accepted as indicative of an adjusted model.

(3) Tucker-Lewis Index (TLI). This index serves as a comparison of the estimated model with a null theoretical model, proposing to establish whether all indicators are associated with a single latent factor. Values greater than 0.95 are indicative of a robust adjustment.

(4) Root-Mean-Square Error of Approximation (RMSEA). The indicator, with a 90% confidence interval (CI90%), serves to assess how much the theoretical model fits the empirical data. Higher values indicate a maladjusted model. Thus, values close to or less than 0.05 and 0.08 are recommended, admitting up to 0.10 as an acceptable model.

To compare the alternative models and the reference models (three factors), the difference test between the chi-squares (χ^2) and the degrees of freedom (DF) of each one of them [$\Delta\chi^2$ (DF)], considering the most adjusted model the one with the lowest χ^2 value, the Consistent Akaike information Criterion (CAIC) and the Expected Cross Validation Index (ECVI). In relation to these, lower values suggest a more suitable model.

Results

To gather psychometric evidence about the AUDIT test in the state of Piauí, we sought to verify the adequacy of the three-factor model proposed by the WHO. For this, a confirmatory factor analysis (CFA) was performed, using the R software and the Lavaan package, adopting the WLSMV estimator (weighted least squares adjusted by mean and variance). The following results were found for the adjustment indicators of this model: $\chi^2(32)= 0.89$, $p < .001$; TLI= 0.99; CFI= 0.99; RSMEA= 0.036 (CI90%= 0.012 - 0.056); ECVI= 0.30.

Then, to identify the model that was best adjusted to the data, two other structures found in the literature were tested. Initially, a CFA was carried out for the two-factor model, which grouped the domains “Frequency and adverse consequences of consumption” and “Dependence”. The model was slightly less adjusted than the one previously tested, and its adjustment indicators were: $\chi^2(25)= 2.13$, $p < .001$; TLI= 0.98; CFI= 0.99; RSMEA= 0.064 (CI90% = 0.048 - 0.080); ECVI= 0.36. After testing the two-factor model, the analysis of the single-factor structure was carried out, composed of a single dimension, which presented the following results: $\chi^2(35) = 2.01$, $p < .001$; TLI= 0.98; CFI= 0.98; RSMEA= 0.069 (CI90%= 0.054 - 0.085); ECVI= 0.39.

The results obtained from the CFAs performed with the different models are summarized in Table 1. Furthermore, we sought to understand to what extent the models differ statistically from each other. For this purpose, the difference between the chi-square delta and the degrees of freedom [$\Delta\chi^2$ (DF)] of the proposed models was calculated. This allowed us to assess statistically significant differences ($p \leq .05$) between them.

Table 1
Adjustment indicators of tested models

Model	χ^2	DF	TLI	CFI	RSMEA (CI90%)	ECVI	$\Delta\chi^2$ /(DF)
One	70.60	35	0.98	0.98	0.069 (0.054 – 0.085)	0.39	-
Two	53.2	25	0.98	0.99	0.064 (0.048 – 0.080)	0.36	17.4 (10)*
Three	28.57	32	0.99	0.99	0.036 (0.012 – 0.056)	0.30	24.63 (7)*

Note: $N(406)$; χ^2 = chi-square; DF = Degrees of Freedom; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; RMSEA = Root-Mean-Square Error Approximation, CI 90% = 90% Confidence Interval; ECVI = Expected Cross-Validation Index, CAIC = Consistent Akaike Information Criterion; and $\Delta\chi^2$ (DF) = difference between the chi-square values; * $p < .01$.

Considering the results previously summarized in Table 1, it can be seen that the three- and two-factor models were the ones that presented better adjustment indices in comparison to the one-factor structure. However, considering the adjustment indicators, it is observed that the three-factor model was more adjusted (χ^2 /DF= 0.89; TLI= 0.99; CFI= 0.99; RSMEA= 0.036). In addition, the value of ECVI, in the three-factor structure, is lower than that presented in the others, indicating that it is a more parsimonious model. It should also be noted that all lambdas (λ), of all models,

were statistically significant and different from zero ($\lambda \neq 0$; $z > 1.96$, $p < .05$). The structural representation of this model, together with the lambdas (λ), is shown in figure 1.

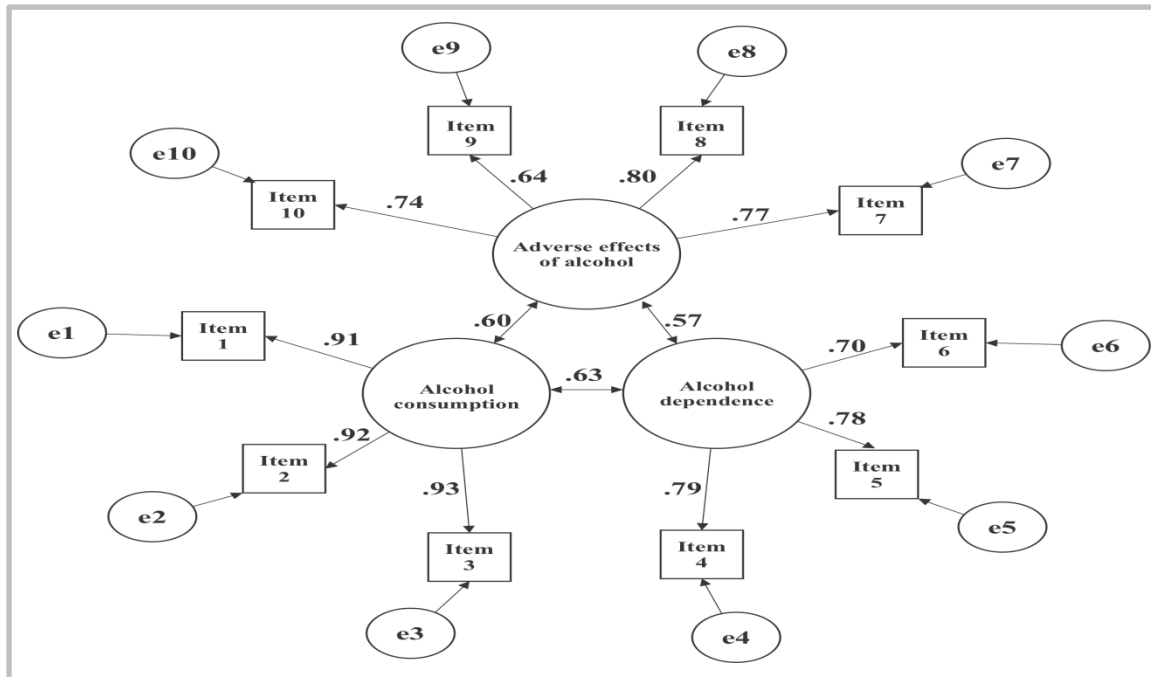


Figure 1.
AUDIT test three-factor model

With the evidences of the factorial model assured, the next step was taken, to assess the reliability of the most appropriate model. For this purpose, Cronbach's alpha (with polychoric correlations) and McDonald's omega were calculated, aiming to assess its internal consistency. The results indicate adequate internal consistency for all factors, namely: Alcohol consumption ($\alpha = .94$; $\Omega = .88$), Dependence of alcohol consumption ($\alpha = 0.81$; $\Omega = 0.68$) and Adverse consequences of alcohol consumption ($\alpha = .82$; $\Omega = .66$). Additionally, when treated as one-dimensional, the alpha and omega values were .85 and .89, respectively.

Discussion

This study investigated the adequacy of the AUDIT test in a context specific to the state of Piauí. For that, different structural models (one, two, and three factors) were tested, through confirmatory factor analyzes carried out to test the fit of these theoretical models to empirical data. In addition, the measurement precision parameter was also assessed using Cronbach's Alpha and McDonald's Omega.

Regarding the construct validity, the three-dimensional model was corroborated, with adjustment indices considered as acceptable ($\chi^2/DF = 0.89$; $TLI = 0.99$; $CFI = 0.99$; $RSMEA = 0.036$). About this, some studies show that, in samples of populations with high alcohol dependence rates, the results tend to support a one-factor model, on the other hand, in those where there is a low risk consumption, the results point to a two- and three-factor structure (Karno, Granholm, & Lin, 2000; Lima et al., 2005).

This aspect is confirmed in this article, since the data were obtained from a university sample with a low prevalence of disorders related to the consumption of alcoholic beverages (74.4% of the participants were classified in the low-risk consumption zone), resulting in a three-factor

structure corresponding to the original model developed by the WHO. This result was compatible with a study carried out in a capital of a state in the northeastern region of Brazil. In this research, involving 386 participants from the general population, the researchers tested the adequacy of the unified and multifactorial model of the AUDIT test. The analyzes indicated the adequacy of the three-dimensional structure, with adjustment indices superior to the one- and two-factor models, confirming the original structure of the instrument (Santos, Fernandes, Grangeiro, Lopes, & Sousa, 2013).

It was also consistent with research carried out in the city of Passos (MG), Brazil, where the AUDIT invariance was verified in relation to two forms of application: face-to-face and telephone interviews. A confirmatory factor analysis showed the adjustment of the three-factor model to the data, with satisfactory adjustment indices for the face-to-face ($\chi^2/DF= 1.950$; CFI= 0.928; GFI= 0.929; RMSEA= 0.078) and telephone interviews ($\chi^2/DF = 1.365$; CFI= 0.972; GFI= 0.950; RMSEA= 0.049) (Almeida, 2013).

García et al. (2016), in a study with the participation of 1309 university students, also identified a three-dimensional structure for the AUDIT test. However, the obtained factorial model did not correspond exactly to the original structure, since the first factor was formed by items 4 to 7, the second by items 1, 2, 3 and 8, and the third factor grouped items 9 and 10. According to Campo-Arias and Oviedo (2008), this variation is related to the characteristics of the sample, the structure of the questions or other variables in the context of the application of the instrument.

With regard to internal consistency, the estimates in relation to the AUDIT test scores, using Cronbach's alpha and McDonald's omega, can be considered worthy, both for the general factor ($\alpha= .85$; $\Omega= .89$) and for each of the three factors (Factor 1. $\alpha= .94$; $\Omega= .88$; Factor 2. $\alpha= .81$; $\Omega= .68$; Factor 3. $\alpha= .82$; $\Omega= .66$), attesting to the adequacy of the instrument for screening problems related to alcohol consumption in the university environment. These results are consistent with what has been expressed in the specialized literature, in which alpha and omega values that are greater than 70 are considered satisfactory (McDonald, 1999; Souza, Alexandre, & Guirardello, 2017).

The reliability obtained in this study for the general factor, considering the alpha coefficient ($\alpha= .85$), is similar to that presented in a previous study carried out with a sample of men in Goa, India, in which the AUDIT test demonstrated a high internal consistency ($\alpha= .84$; Endsley, Weobong, & Nadkarni, 2017). A similar result was also found in a research carried out with freshman students of a Chilean university, whose instrument reliability was high ($\alpha= .83$) (Seguel Palma et al., 2013), in a study involving 435 patients from a university hospital in Chungang, South Korea ($\alpha= .88$; Kim et al., 2014), in a research carried out with Mexican ($\alpha= .82$; Gómez-Maqueo, Gómez, Morales, & Pérez, 2009) and Colombian students ($\alpha= .77$; Ospina-Díaz et al., 2012).

Regarding McDonald's omega, although being poorly informed in studies about the AUDIT test reliability, some articles were identified (Arias, Vargas, & Herazo, 2013; Medina et al., 2013) that, in an equivalent way, also reported this coefficient, presenting values ($\Omega= .87$ and $\Omega= .88$, respectively) very close to that obtained in this research ($\Omega= .89$), indicating that omega is also a good estimator of the AUDIT test reliability.

Final considerations

In this study, we sought to understand the psychometric properties of the AUDIT test in a specific group of the population (university students). Based on the comparison between different models (one, two, and three factors), using robust and confirmatory techniques, the three-factor structure stood out as the best adjusted one, with adjustment indicators considered acceptable and internal consistency indices above those recommended by the literature. Such aspects indicate an adequate instrument, theoretically and metric, and can be used in research aimed at measuring patterns of alcohol consumption in samples like the one considered here.

However, despite the contributions of this research, it is recognized that it has limitations. Initially, the sample bias can be pointed out, since an accidental sample was recruited, for convenience, consisting exclusively of university students from a public HEI, which implies the non-representativeness of the sample, therefore, being impossible to generalize the presented results beyond the sample of this study. Another identified limitation concerns the instrument, which, being self-reported, allows the participant to distort the answer, due to social desirability, since some of the situations presented in the items can be identified as less socially accepted, while others are seen as taboos, which can affect how the item will be endorsed by the subject (Costa & Hauck, 2017).

In view of the above, and considering the possibility of further studies, it is recommended to have more diverse samples from this population (only students from a public HEI participated in this research), in order to ensure a greater heterogeneity, making it a representative sample. This action is relevant to resolve possible doubts about the dimensionality of the AUDIT test with this target audience. It is also pertinent to have research that can try to assess psychometric evidence from other types of validity, such as convergent and discriminant validity, which could reinforce the set of evidences around its psychometric properties.

In addition, it is suggested to carry out more specific analyzes, such as ROC curves, with specific sensitivity and specificity values, presenting a more appropriate cutoff point for similar samples when compared to this research, as identified in other studies (Babor et al., 2001; Moretti-Pires & Corradi-Webster, 2011). It would still be pertinent to suggest desirability control, employing a measure of social desirability, or the development of an implicit measure, with the purpose of accessing automatic and spontaneous associations, which escape the conscious control of the subjects (Barbosa, 2015), reducing the bias of falsifying answers to the instrument.

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Authors' participation: a) Conception and design of the work; b) Data acquisition;c) Analysis and interpretation of data; d) Writing of the manuscript; e) Critical review of the manuscript.

K.P.A.S. has contributed in a, c; E.D.M. in b,e; P.C.B.M. in d.

Scientific Editor in charge: Dra. Cecilia Cracco