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## INSTRUMENTS RELATED TO DRUG USE IN ADOLESCENTS: AN INTEGRATED REVIEW

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### ABSTRACT

**Objective:** to identify validated instruments and related to drug use among adolescents.

**Method:** an integrative review that included studies on elaborating and validating or evaluating the psychometric properties of instruments for analysing drug use by adolescents in Portuguese, English and Spanish. The search was performed in the following databases: MEDLINE, LILACS, SCOPUS, CINAHL, COCHRANE and Web of Science. For this, the descriptors "Validation Studies", "Validation studies as subject", "adolescent" and "disorders related to the use of psychoactive substances" were crossed, resulting in 743 articles retrieved, with a total of 11 composing this review after the selection process and analysis of methodological rigor were performed. The data collection was performed using a validated instrument and the results were categorized based on the objectives of the tests.

**Results:** ten instruments were identified: five questionnaires, one inventory and four scales. The instruments addressed the risk, use/abuse of psychoactive substances and treatment issues. Two showed greater reliability: ASTEQ-COUNSELOR and the DCI-A-SF.

**Conclusion:** information on ten validated instruments was summarized focused on adolescent drug use. These instruments enable measuring and identifying drug use and treatment-related aspects for problems arising from using these substances. Two instruments were considered to be the most reliable because they presented better alpha values for the items individually and together; the ASTEQ-COUNSELOR and the DCI-A-SF. The availability of reliable measurement instruments assists nursing research and praxis.

**DESCRIPTORS:** Mental health. Substance-related disorders. Adolescent. Behavioral assessment scale. Validation studies.

## INSTRUMENTOS RELACIONADOS AO CONSUMO DE DROGAS EM ADOLESCENTES: REVISÃO INTEGRATIVA

### RESUMO

**Objetivo:** identificar os instrumentos validados e relacionados ao o consumo de drogas em adolescentes.

**Método:** revisão integrativa que incluiu estudos sobre a elaboração e validação ou avaliação das propriedades psicométricas de instrumentos para a análise do consumo de drogas por adolescentes nas línguas portuguesa, inglesa e espanhola. Busca realizada nas bases de dados: MEDLINE, LILACS, SCOPUS, CINAHL, COCHRANE e *Web of Science*. Para tal, cruzaram-se os descritores "Estudos de Validação", "Estudos de validação como assunto", "adolescente" e "transtornos relacionados ao uso de substâncias psicoativas". Foram resgatados 743 artigos e após o processo de seleção e análise do rigor metodológico, um total de 11 compuseram esta revisão. A coleta de dados foi realizada com auxílio de instrumento validado e os resultados foram categorizados com base nos objetivos dos testes.

**Resultados:** identificaram-se dez instrumentos: cinco questionários, um inventário e quatro escalas. Os instrumentos abordaram o risco, uso/abuso de substâncias psicoativas e questões relativas ao tratamento. Dois apresentaram maior confiabilidade: ASTEQ-COUNSELOR e o DCI-A-SF.

**Conclusão:** foram sumarizadas informações sobre dez instrumentos validados e voltados para o consumo de drogas em adolescentes. Estes permitem a mensuração e a identificação do consumo de drogas e de aspectos relacionados ao tratamento para problemas decorrentes do uso dessas substâncias. Duas ferramentas foram tidas como as mais confiáveis por apresentaram melhores valores de alfa para os itens individualmente e em conjunto, ASTEQ-COUNSELOR e o DCI-A-SF. Dispor de instrumentos de mensuração confiáveis auxilia a pesquisa e a práxis do enfermeiro.

**DESCRIPTORES:** Saúde mental. Transtornos relacionados ao uso de substâncias. Adolescente. Escala de avaliação comportamental. Estudos de validação.

# INSTRUMENTOS RELACIONADOS CON EL CONSUMO DE DROGAS EN LOS ADOLESCENTES: REVISIÓN INTEGRATIVA

## RESUMEN

**Objetivo:** identificar los instrumentos validados y relacionados con el consumo de drogas en los adolescentes.

**Método:** revisión integrativa que incluyó estudios sobre la elaboración y validación o evaluación de las propiedades psicométricas de instrumentos para el análisis del consumo de drogas por adolescentes, en las lenguas portuguesa, inglesa y española. Búsqueda realizada en las bases de datos MEDLINE, LILACS, SCOPUS, CINAHL, COCHRANE y Web of Science. Para eso, se cruzaron los descriptores "Estudios de Validación", "Estudios de validación como asunto", "adolescente" y "trastornos relacionados con el uso de sustancias psicoactivas". Se rescataron 743 artículos y después del proceso de selección y análisis del rigor metodológico se llegó a un total de 11 artículos para esta revisión. La obtención de datos fue realizada con la ayuda del instrumento validado y los resultados fueron categorizados en base a los objetivos de los testes.

**Resultados:** se identificaron diez instrumentos: cinco cuestionarios, un inventario y cuatro escalas. Los instrumentos abordaron el riesgo, uso/abuso de sustancias psicoactivas y asuntos relativos al tratamiento. Dos de ellos presentaron una mayor confiabilidad: ASTEQ-COUNSELOR y el DCI-A-SF.

**Conclusión:** se resumieron informaciones sobre diez instrumentos validados y dirigidos para el consumo de drogas en adolescentes. Éstos permiten la mensuración e identificación del consumo de drogas y de aspectos relacionados con el tratamiento para los problemas decurrentes del uso de tales sustancias. Dos herramientas fueron consideradas como las más confiables por presentar los mejores valores de alfa para los ítems, individualmente y en conjunto, ASTEQ-COUNSELOR y el DCI-A-SF. Disponer de instrumentos de mensuración confiables ayuda en la investigación y praxis del enfermero.

**DESCRIPTORES:** Salud mental. Trastornos relacionados con el uso de sustancias. Adolescente. Escala de evaluación comportamental. Estudios de validación.

## INTRODUCTION

Drug abuse is present in a wide range of cultures and represents a serious public health problem due to its undesirable social, cultural and economic repercussions.<sup>1</sup> In Brazil, this scenario has been gaining prominence since the second half of the 20<sup>th</sup> century, and more recently has been the subject of political, legislative and health discussions.<sup>2</sup>

Drug use has occurred since the early days of mankind, is part of the civilization process and can occur in medicinal, ritualistic, experimental, recreational and abusive ways. In turn, the latter is related to the elaboration of eminent feelings/sensations of well-being. This sense of pleasure can lead to repetitive use, and consequently the individual feels an increasing need to increase the substance amount to re-enjoy the primary pleasure, thereby triggering the dependency process.<sup>2</sup>

A pattern of compulsive psychoactive substance use can have serious physical, biological, psychological and social consequences. Among the biological damage, lesions in target organs like the liver, pancreas and heart can be mentioned. The social repercussions are related to traffic accidents and violence (self-inflicted, interpersonal and collective); school and occupational losses; dysfunctional family and social processes; homicide and crime.<sup>3</sup> On the other hand, dopaminergic stimulation in the brain is capable of leading to cognitive and learning impairment, and increases the chances to develop psychiatric disorders.<sup>4</sup>

The adolescent context is a critical period in the biopsychosocial development of the individual characterized by an accentuation in the biological maturation process associated with building aspects of identity, self-concept, self-esteem, character and various factors involved in social relations, where experimental drug use is often initiated and may evolve into compulsive and harmful use.<sup>5</sup>

Worldwide, it is estimated that one in 20 people aged 15-64 have used at least one kind of drug in their life.<sup>6</sup> In the Brazilian context, the precocity for using these substances is also evident. Data from the 2<sup>nd</sup> National Survey of Alcohol and Drugs show that 22% of Brazilian adults experienced alcohol before age 15.<sup>7</sup> It is estimated that 73.0% of adolescent students aged 16 to 17 years have consumed at least one alcoholic beverage in their life, and 17% have tried illicit drugs;<sup>8</sup> of these, marijuana is the most consumed substance among the Brazilian youth population, with 4.3% use in the age group of 14 to 17 years, and cocaine with 2.3%.<sup>7</sup>

The precocity of exposure to psychoactive substances is worrying and can cause harm that affects individuals and society as a whole, and above all predisposes a young person to become an addicted adult.<sup>9</sup> Thus, the use of psychoactive substances by the adolescent public in different social classes encourages studies on its impact on health and contemporary society.<sup>4</sup>

One of the main challenges for developing studies with this population is implementing instru-

ments aimed at drug use among adolescents with acceptable psychometric properties.

The availability of a measuring instrument to understand the phenomenon of drugs among adolescents is important for teaching, research, extension and praxis of nurses who attend to the adolescent population. Implementing reliable and accurate instruments guides Nursing care, since it enables knowledge of adolescents' real needs, their involvement with drugs, motivations for use and the repercussions of risk and/or abuse in using can cause to the family, social, school and occupational relationships. Knowledge of this scenario will subsidize nurses' choice for interventions that respond to the concrete demands of adolescents.

In view of the above, the purpose of this article is to identify validated instruments and related to drug use among adolescents. It is believed that the results of this research will guide nurses who work in this area and with this population on the best instrument(s) to be used in clinical practice.

## METHOD

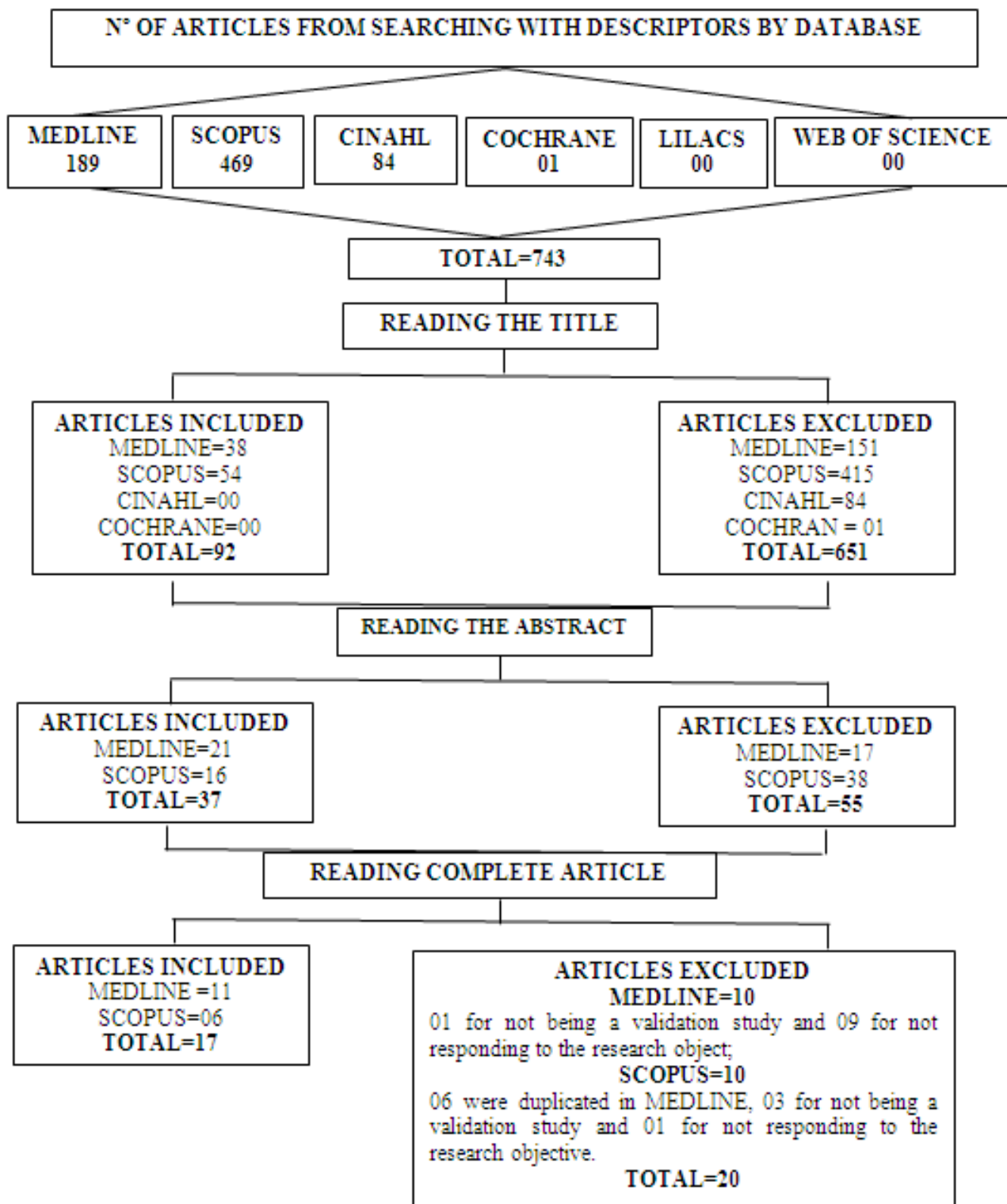
This study constitutes an integrative review elaborated from six stages.<sup>10</sup> In the first stage, we established the problem and elaborated the following research question: What are the validated instruments related to drug use among adolescents? Next, descriptors and search strategies were established. Three combinations of descriptors were used, one for each language. In Portuguese: ("*Estudos de validação*" OR "*Estudos de validação com assunto*") AND *Adolescente* AND "*Transtornos Relacionados ao Uso de Substâncias*"; In English: ("Validation Studies" OR "Validation Studies as Topic") AND Adoles-

cent AND "Substance-Related Disorders"; and in Spanish: ("*Estudios de Validación*" OR "*Estudios de Validación como assunto*") AND "*Adolescente*" AND "*Transtornos Relacionados com Sustancias*". All the descriptors were defined in the Descriptors in Health Sciences (DeCS) platform and in Medical Subject Headings (MeSH).

The searched databases were: the Medical Literature Analysis and Retrieval System Online (MEDLINE), the *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS), SCOPUS, Cumulative Index to Nursing and Allied Health Literature (CINAHL), COCHRANE, and Web of science.

In the second stage, inclusion and exclusion criteria were defined for selecting the studies. We included: studies on the elaboration and validation or evaluation of instruments' psychometric properties for analysing adolescent drug use in English, Portuguese and Spanish, without time limitation; while the following were excluded: course completion papers, specialization monographs, dissertations and theses, review studies, books, book chapters, government publications or newsletters, as well as research that did not exclusively address adolescents and which only described the instrument development, without presenting an evaluation of the psychometric properties.

The database search occurred in August 2016 and initially retrieved 743 studies. The titles of these articles were read and those which met the inclusion criteria were selected for reading the abstracts (92). These were then evaluated according to the previously cited criteria, so that a total of 37 articles were selected to be read in their entirety. Figure 1 shows the selection flowchart in detail.



**Figure 1 - Flowchart of the article selection process from the databases**

In the third step regarding study categorization, the information was collected using a validated instrument that incorporates aspects related to identification, methodological characteristics and

classifying the results.<sup>11</sup> The instrument had to be adapted since it did not originally cover methodological studies and validation. The data collection led to a search for the following information: title, periodical, language, country of development, publication year and authorship. Regarding the methodological characteristics, we identified objectives,



sample data, information regarding the instrument submitted to validation, its analysis, results and implications.

Regarding the fourth stage (evaluating the studies), the articles were analysed for methodological rigor by means of an instrument adapted by the author from the 'Critical Appraisal Skills Programme' (CASP).<sup>12</sup> It has ten scored items and a 3-point scale: 01 point for "yes"; 0.5 point for "in part" and 0 points for "no". A negative response to one of the first two items automatically excluded the article. Positive answers to the first two questions ensure that the evaluation continued. When a score was higher than 06, the studies were rated "A" and those that scored lower than this were classified as "B". Six of the 17 studies were eliminated by this instrument because they did not attend one of the first two CASP questions. All the others received scores that varied between 6.5-10 points and obtained classification of "A". Thus, 11 articles were included.

A critical analysis of the results obtained in the selected studies was carried out based on the evaluation of the psychometric properties (validity and reliability measures) of the instruments.

Validity is understood as the ability of an instrument to accurately measure what it intends to measure.<sup>13</sup> Thus, the results from the validity of content, criterion and construct were verified for evaluating this property.<sup>14-15</sup>

Reliability refers to the degree of repeatability and reproducibility of the measurement's result. It is usually investigated by means of stability, internal consistency (Cronbach's alpha) and inter-rater agreement (intraclass correlation coefficient).<sup>13</sup>

An instrument can be considered reliable when the coefficient of internal consistency is at least 0.70.<sup>16</sup> Cronbach states that values above 0.80

show high internal consistency.<sup>17</sup> In this review, the value of 0.70 was considered to define the instrument's reliability.

In the fifth stage, the results were categorized according to the objective of each identified instrument and according to the psychometric properties described in the articles. Next, there was a comparison between theoretical knowledge and the identification of conclusions. Finally, the obtained results were synthesized in the sixth stage.

## RESULTS

Eleven articles were selected<sup>18-28</sup> which evaluated ten instruments, of which five are questionnaires, one is an inventory and four are scales, named: Brief Screener for Tobacco Alcohol and other drugs (BSTAD);<sup>18</sup> Problem Oriented Screening Instrument for Teenagers (POSIT);<sup>19</sup> Car, Relax, Alone, Forget, Family/Friends, Trouble (CRAFFT);<sup>19-22</sup> Relax, Alone, Friends, Family, Trouble (RAFFT);<sup>23</sup> Self-administered questionnaire on substance use and abuse among school adolescents (*Questionário autoaplicável sobre o uso e abuso de substâncias entre adolescentes escolares*);<sup>24</sup> Drug Use Screening Inventory (DUSI);<sup>25</sup> Adolescent substance treatment engagement questionnaire-teen (ASTEQ-TEEN);<sup>26</sup> Adolescent substance treatment engagement questionnaire-Counselor (ASTEQ-Counselor);<sup>26</sup> Teen Addiction Severity Index (T-ASI);<sup>27</sup> Dimensions of Change Instrument-Adolescent (DCI-A-SF).<sup>28</sup>

The instruments were categorized according to their objectives and psychometric properties. Regarding the first criterion, we observed the presence of two approaches: risk measurement, substance use/abuse and evaluation of treatment issues. Tables 1 and 2 present these instruments in detail.

**Table 1 - Description of instruments related to drug risk/use/abuse**

Instrument (type)	Instrument objective	Item description
BSTAD <sup>18</sup> (Scale)	Identify the problematic use of alcohol, tobacco and other drugs in the last 30, 90 and 365 days.	11 items dealing with the use of drugs by friends and personal use.
POSIT <sup>19</sup> (Scale)	Identify substance abuse, related problems and potential need for treatment in ten areas.	139 items that address drug use and abuse, physical health, mental health, family relationships, peer relationships, educational status, occupational status, social skills, leisure/recreation, and aggressive behaviour/delinquency.

CRAFFT <sup>19-22</sup> (Questionnaire)	Evaluate the risk of problematic use of alcohol and other drugs, abuse or addiction.	six items related to: driving by someone under the influence of alcohol or other drugs; use to relax; I always use alone; use to forget situations that occurred during use; and occurrence of problems during use.
RAFFT <sup>23</sup> (Questionnaire)	Screen the problematic use of alcohol and other drugs.	five items that deal with self-esteem, evaluation of pressure, stress, family problems, and consequences of drug use.
Self-administered questionnaire on substance use and abuse among school adolescents - <i>Questionário autoaplicável sobre o uso e abuso de substâncias entre adolescentes escolares</i> <sup>24</sup> (Questionnaire)	Identify the use of psychoactive substances, inappropriate user-related behaviours, adolescents' relationship with school and their parents, and the media's approach to drug use.	93 items on basic sociodemographic information, substance use, behaviour, relationship with school and parents, and opinions the media and media campaigns to prevent tobacco, alcohol, and cannabis use.
DUSI <sup>25</sup> (adapted) (Inventory)	Predict the experimental and regular use of alcohol and drugs in a community, to be used within behavioural genetics or other epidemiological research.	68 items that deal with behaviour problems/hyperactivity, low self-esteem/neuroticism, social withdrawal, and school problems.

BSTAD: Brief Screener for Tobacco, Alcohol and other drugs; CRAFFT: Car, Relax, Alone, Forget, Family/Friends, Trouble; DUSI: Drug Use Screening Inventory; POSIT: Problem Oriented Screening Instrument for Teenagers; and RAFFT: Relax, Alone, Friends, Family, Trouble.

It was observed that an inventory, two scales and three questionnaires addressed drug use and the pattern of such use (risk or abusive). In addition, there was high variability in the quantity of items (05 to 139). In general, the instruments deal with individual aspects (physical and mental health), social, family, occupational, psychosocial and school problems.

The treatment for drug abuse was the objective of two scales and two questionnaires. Motivation for change, engagement in treatment, social and family relationships, as well as school and occupational aspects were dimensions addressed by these instruments. Further information is contained in Table 2.

**Table 2 - Description of instruments related to the treatment of drug use**

Instrument (type)	Instrument objective	Item description
ASTEQ-TEEN <sup>26</sup> (Questionnaire)	Measure the engagement of incarcerated adolescents with regard to treatment for drug abuse.	29 items dealing with receptivity to change in substance use, discontinuing treatment, and choice to participate in treatment.
ASTEQ-COUNSELOR <sup>26</sup> (Questionnaire)	Measure the engagement of incarcerated adolescents with regard to treatment for drug abuse.	20 items on receptivity to change and discontinuing treatment.
T-ASI <sup>27</sup> (Scale)	Evaluate the use of alcohol and other drugs and the need for treatment.	153 items on substance use, school status, employment status, family function, peer relationships, legal status, and psychiatric status.
DCI-A-SF <sup>28</sup> (Scale)	Evaluate the treatment process in therapeutic communities.	seven items that portray motivation in treatment, personal development, problem recognition, family relationships, and social network.

Legend: ASTEQ-TEEN: Adolescent Substance Treatment Engagement Questionnaire-Teen; ASTEQ-Counselor: Adolescent Substance Treatment Engagement Questionnaire-Counselor; DCI-A-SF: Dimensions of Change Instrument - Adolescent; T-ASI: Teen Addiction Severity Index.

For the psychometric properties of the instruments (Tables 3 and 4), it was evidenced that not all reliability and validity parameters were investigated

in a single study, therefore not all psychometric properties could be presented.

**Table 3 - Psychometric properties of instruments related to drug risk/use/abuse**

Instrument	Purpose of the study included in the review	Psychometric properties
BSTAD	Examine concurrent validity and self-administration by iPad <sup>20</sup>	CRV (concurrent) → sensitivity: 0.80-0.96; specificity: 0.85-0.97; CM: CIDI-2 SAM
CRAFFT	Evaluate the validity of the Spanish version <sup>17</sup> Examine psychometric properties <sup>18</sup> Determine criterion validity <sup>19</sup> Compare the criterion validity of 04 instruments (including CRAFFT) <sup>15</sup>	Reliability (Homogeneity) → $\alpha$ : 0.64; CRV (concurrent) → sensitivity: 0.59; specificity: 0.88; (predictive) → PPV: 0.74; NPV: 0.78; CM: CRAFFT and POSIT Reliability (Homogeneity) → Kuder-Richardson: 0.67; CRV (concurrent) → sensitivity: 0.813-0.859; specificity: 0.618-0.722; CM:04 self-reported; COV (CFA) → 01 factor Reliability (Homogeneity) → $\alpha$ : 0.68; CRV (concurrent) → sensitivity: 0.76-0.92; specificity: 0.80-0.94; (predictive) → PPV: 0.25-0.83; NPV: 0.91-0.99; CM: POSIT and ADI CRV (concurrent) → sensitivity: 0.88-0.96; specificity: 0.59-0.69; CM: AUDIT, POSIT, CAGE
RAFFT	Measure sensitivity and specificity <sup>22</sup>	CRV (concurrent) → sensitivity: 0.89; specificity: 0.69; CM: Groups with and without SUD
POSIT	Compare the criterion validity of four instruments (including POSIT) <sup>15</sup>	CRV (concurrent) → sensitivity: 0.79-0.90; specificity: 0.86-0.92; CM: AUDIT, CAGE, CRAFFT
Self-administered questionnaire on substance use and abuse among school adolescents - <i>Questionário autoaplicável sobre o uso e abuso de substâncias</i>	Analyse the reliability of the questionnaire <sup>24</sup>	Reliability (Homogeneity) → $\alpha$ : 0.35-1; (stability) → ICC: 0.44-0.94; Kappa: 0.43-0.83
DUSI (adapted)	Obtain the factorial structure and a set of subscales that can predict the experimental and regular use of alcohol and drugs in a community. <sup>23</sup>	Reliability (Homogeneity) → $\alpha$ : 0.66-0.80; COV (EFA) → 04 factors; FV (Face validity) → 06 subscales.

Legend: CRV: Criterion validity; COV: Construct Validity; CTV: Content Validity; CM: Criterion Measure; CFA: Confirmatory Factor Analysis; EFA: Exploratory Factorial Analysis; PPV: Positive Predictive Value; NPV: Negative Predictive Value;  $\alpha$ : Cronbach alpha; ICC: Intraclass correlation coefficient; SUD: Substance Use Disorders; CIDI-2 SAM: Composite International Diagnostic Interview-2 Substance Abuse Module; ADI: Adolescent Diagnostic Interview; AUDIT: Alcohol Use Disorders Identification Test.

**Table 4 - Psychometric properties of treatment-related instruments**

Instrument	Purpose of the study included in the review	Psychometric properties
ASTEQ-TEEN <sup>16</sup>	Describe the development and validation of ASTEQ (adolescent and counselor versions) <sup>16</sup>	Reliability (Homogeneity) → $\alpha$ : 0.62-0.87; CRV (Concurrent) → D1 (+) alcohol and marijuana dependence. (Predictive) → D1 (-) percentage of adolescents who drank after 3 months of release, who used marijuana (03 and 06 months after) and were arrested (06 months later); D2 correlated with the percentage of days of alcohol and marijuana use (03 months after release) and imprisonment (03 months after). CM: Initial evaluation; COV (Discriminating) → Not related to age, gender, race, and number of times incarcerated (except D2); D1 (+) motivation steps for alcohol and marijuana and (-) disadvantages of treatment; D4 (+) disadvantages in treatment and (-) motivation steps for alcohol and marijuana; D2 (-) motivation steps for alcohol and marijuana; D3 (-) motivation step for alcohol.

ASTEQ-COUNSELOR <sup>16</sup>	Describe the development and validation of ASTEQ (adolescent and counselor versions) <sup>16</sup>	Reliability (Homogeneity) → $\alpha$ : 0.90-0.94; CRV (Predictive) → Disengagement in treatment (+) percentage of days of alcohol and marijuana use after 03 months of release; D1 (-) percentage of days of alcohol use 03 and 06 months and of marijuana use 06 months after release; Both scales related to prison (or not) after 06 months; CM: Results of adolescents; COV (Discriminating) → Not related to age, gender, race or number of times incarcerated (except D1); D1 (+) quality and quantity of participation and clinical status and (-) Number of disruptive behaviours during treatment and disadvantages of this; Disengagement in treatment (+) Number of disruptive behaviours during treatment and (-) quality and quantity of participation and clinical status.
T-ASI <sup>25</sup>	Evaluate internal consistency and validate the area of substance use <sup>25</sup>	Reliability (Homogeneity) → $\alpha$ (total): 0.18-0.89; $\alpha$ (substance use): 0.89; CRV (Concurrent) → $r$ : 0.73 ( $p < 0.0001$ ); CM: Groups with and without SUD.
DCI-A-SF <sup>21</sup>	Derive the one-dimensional abbreviated form <sup>21</sup>	Reliability (Homogeneity) → $\alpha$ : 0.73-0.84; COV (CFA) → 01 factor.

Legend: CRV: Criterion validity; COV: Construct Validity; CTV: Content Validity; CM: Criterion Measure; CFA: Confirmatory Factor Analysis; EFA: Exploratory Factorial Analysis; PPV: Positive Predictive Value; NPV: Negative Predictive Value;  $\alpha$ : Cronbach alpha; SUD: Substance Use Disorders; (+): Positively Correlated; (-): Negatively Correlated; D1: Receptivity of change for substance use; D2: interruption of treatment/release; D3: choice of participation; D4: quit participating.

Regarding validity, we observed the predominance of criterion validity, specifically concurrent.<sup>18-23,26-27</sup> In turn, the construct validity was the second most evidenced, with four instruments evaluated in this question by the techniques of exploratory factor analysis, confirmatory factor analysis<sup>19,21</sup> and discriminating analysis.<sup>26</sup> From these analyses, it was observed that the instruments have both one-dimensional and multidimensional characteristics. Content validity was observed in only one study.<sup>25</sup> It is noteworthy that ASTEQ (Teen and Counselor) instruments presented results of both criterion and construct validity in a single study.

Next, the reliability parameter was investigated in nine of the eleven selected studies. This analysis was predominantly performed by the homogeneity check using Cronbach's alpha ( $\alpha$ ) coefficient of internal consistency. The ASTEQ version for counselors achieved the best result regarding homogeneity, with  $\alpha$  varying between 0.90 and 0.94.<sup>26</sup> At the other extreme, CRAFFT had values that were lower than 0.70 in all studies that assessed this parameter.<sup>19-22</sup> The test-retest stability was only measured in analysing the self-administered questionnaire for school adolescents.<sup>24</sup> Intraclass correlation coefficient (ICC) values ranged from moderate (0.44) to high (0.94), as proposed by Bland and Altman (1986).<sup>29</sup> Moreover, the Kappa coefficient was 0.43 to 0.83. Kappa values range from -1 (complete discordance) to 1 (complete agreement).<sup>30</sup> Therefore, agreement was also moderate to high.

## DISCUSSION

It was possible to observe that methodological and validation studies became more frequent in 2014<sup>18,28</sup> and 2015,<sup>20,26</sup> and that the United States is highlighted in this production,<sup>19,21-25,27</sup> followed by Brazil,<sup>24,27</sup> Argentina<sup>16</sup> and Norway.<sup>21</sup>

Although psychometry is not a recent science (started by Galton around 1880),<sup>14</sup> this review did not identify studies that might be considered outdated. This fact may be probable evidence that investments in studies directed to measuring drug problems in the adolescent population have been a concern in recent decades. This evidence shows a positive impact for the care of this most vulnerable population due to their generally impulsive behaviour and the biological and psychological transformations that occur during this period. Thus, validated and specific instruments are important for this specific phase of life in which first contacts with alcohol and other drugs usually occur.<sup>31</sup>

A predominance of instruments aimed at measuring drug consumption, whether abusive or not, was evidenced. One identified gap is the apparent lack of questionnaires/scales for preventive purposes, despite the importance of preventing drug use. This may be a likely justification for the reoccurring CRAFFT assessment, which is unique in covering the preventive setting and has validity and reliability analyses described in the studies.<sup>19-22</sup> In detecting the increased risk of abuse, CRAFFT suggests further assessment on substances, determining whether counselling will need to be maintained, or



whether more specific interventions are needed.<sup>20</sup> With a CRAFFT-like goal, RAFFT may be a good instrument for initiating a routine survey with adolescents, but it is still inadequately studied.<sup>32</sup>

Treatment and recovery from chemical dependence has its complexities and identifying instruments with this approach can aid in the care process. The component items of the instruments described in this review cover intrinsic and extrinsic factors of the individual that are strongly related to treatment adherence.<sup>33</sup>

The complexity of drug use among adolescents is also reflected in the varying number of items in the scales/questionnaires, since the more complex the construct, the greater the number of items needed to cover it.<sup>14</sup> However, tests that are too long can be time-consuming, tiring, prone to mistakes, and less reliable.<sup>34</sup>

It should be noted that a high number of items does not necessarily indicate greater precision and accuracy to measure a particular phenomenon. These items are evaluated from the psychometric properties.

It is also important to note that an instrument developed in a country other than the target population in which it will be applied can be used as long as it is submitted to a cross-cultural adaptation. This is because it is necessary to adjust the way of measuring and interpreting the original test for the target population in order to avoid biases that restrict the validity and reliability of the instrument.<sup>13</sup> For example, adaptations of the CRAFFT for Spanish<sup>20</sup> and for the Brazilian context were evidenced.<sup>35</sup>

Still regarding this instrument, it was observed that the reliability ( $\alpha$ ) ranged from 0.59 to 0.69. This signals low internal consistency. A systematic review conducted in 2011 on the properties of CRAFFT from published studies from 1999 to 2010 showed that it presented modest to adequate internal consistency values ranging from 0.65 to 0.86 and high reliability test-retest.<sup>37</sup> In addition, the authors emphasized the need for further studies on the psychometric properties of CRAFFT in order to assess and improve generalization to other populations.<sup>37</sup> This revision reinforces this need, since the reliability values described in the studies were below ideal (0.70).

Regarding the validity measures, it was observed that although construct validity is considered the most important validity type since it verifies the legitimacy hypothesis of the behavioural representation of latent traits (constructs),<sup>14</sup> there was a predominance of criterion validity.

Criterion validity indicates the relationship between the performance degree of the research individual on the test and the actual behaviour. Two types are identified for this type of validity: concurrent and predictive.<sup>37</sup> In the first, two equivalent instruments are simultaneously applied to the same the subjects and the correlation between the test instrument and the gold standard is verified.<sup>14</sup> The second refers to the instrument's accuracy to predict a future event.<sup>37</sup> In this context, sensitivity and specificity measures are evaluated.

Sensitivity refers to the instrument's ability to correctly identify the phenomenon in individuals who have the phenomenon, while the specificity is in determining individuals who do not present it when it is indeed absent.<sup>38</sup> A test/instrument with 100% sensitivity and specificity is considered ideal, but these rarely exist in practical terms, since the attempt to improve sensitivity tends to decrease specificity.<sup>39</sup> In turn, the BSTAD is the closest in this respect when presenting adequate sensitivity values to identify tobacco use  $\geq 06$  days (sensitivity: 0.95, and specificity: 0.97), alcohol use  $\geq 02$  days (sensitivity: 0.96, and specificity: 0.85) and  $\geq 02$  days for marijuana (sensitivity: 0.80, and specificity: 0.93).<sup>18</sup>

Regarding reliability, internal consistency was the measure of choice measured in most instruments. The self-administered questionnaire on substance use and abuse among school adolescents (*questionário autoaplicável sobre o uso e abuso de substâncias entre adolescentes escolares*) presented the highest value variation for the alpha coefficient. It calculated the use of various drugs in the last month and in the last year of psychoactive substances with  $\alpha > 0.7$ , for all moments of using alcohol, tobacco and cocaine. The extreme values were identified in "use in the last year", in which the item on the use of benzodiazepines presented  $\alpha = 0.35$ , and LSD had  $\alpha = 1.0$ .<sup>24</sup>

The ASTEQ-COUNSELOR and the DCI-A-SF presented better alpha values for the items individually and together. The ASTEQ-Counselor-Receptivity to change component composed of 13 items presented  $\alpha = 0.94$ , and the Treatment interruption component composed by seven items presented  $\alpha = 0.90$ .<sup>26</sup> Lastly, the DCI-A-SF presented a high overall reliability scale ( $> 0.80$ ).<sup>28</sup>

## CONCLUSION

This review enabled summarizing information on ten validated instruments for the care of

adolescent drug users. The results showed that these tools are directed at measuring and identifying drug consumption and to the aspects related to treatment for problems resulting from the use of these substances. The ASTEQ-COUNSELOR and DCI-A-SF instruments presented better alpha values for the items individually and together, and therefore are considered the most reliable. However, it should be noted that the instruments were generally not evaluated for all their main psychometric properties. This fact limited this review regarding the presentation of the validity and reliability measures that are often verified in validation studies.

There is recent concern about the psychometric properties of instruments that measure the consumption of psychoactive substances. One shortcoming evidenced in this review was the scarcity of validated instruments that act in the preventive scope of drug use, since the only instrument identified for this presented low reliability values.

This review described instruments that can be used in nursing praxis for adolescent drug user care or in their vulnerability to use. It is crucial for nurses to use validated instruments that can subsidize clinical practice from drug use prevention to treatment and rehabilitation of users.

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