



REVIEW ARTICLE

# Factors related to the association of social anxiety disorder and alcohol use among adolescents: a systematic review<sup>☆</sup>



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## KEYWORDS

Phobic disorders;  
Adolescent;  
Behavior;  
Ethanol;  
Risk factors

## Abstract

**Objective:** To identify the risk factors related to the association between social anxiety disorder and alcohol use in adolescents.

**Source of data:** The PICO research strategy was used to perform a systematic review in Medline, LILACS, Pubmed, IBSCS and Cochrane Library databases. DeCS/MeSH: Phobic Disorders, Adolescent, Behavior, Ethanol, Risk Factors, and the Boolean operator "AND" were used. Inclusion criteria were: cross-sectional, prospective/retrospective cohort, and case-control studies, carried out in adolescents (10–19 years), original articles on social anxiety disorder and alcohol use published between 2010 and 2015. Studies that did not report the terms "anxiety disorder" and "alcohol use" in the title and abstract were excluded.

**Synthesis of data:** 409 articles were retrieved; after the exclusion of 277 repeated articles, the following were eligible: 94 in MEDLINE, 68 in Pubmed, 12 in IBSCS, and three in LILACS. Titles and abstracts were independently read by two examiners, which resulted in the selection of eight articles for the analysis. Risk factors associated to the two disorders were female gender, age, peer approval and affective problems for alcohol use, confrontation situations and/or compliance reasons, frequency of alcohol use, and secondary comorbidities, such as depression and generalized anxiety.

**Conclusions:** It is necessary to assess the period of social anxiety disorders first symptom onset, as well as the risks for alcohol use in order to establish corrective intervention guidelines, especially for socially anxious students.

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**PALAVRAS-CHAVE**

Transtornos fóbicos;  
Adolescente;  
Comportamento;  
Etanol;  
Fatores de risco

## Fatores relacionados à associação de transtorno de ansiedade social e uso de álcool entre adolescentes: uma revisão sistemática

**Resumo**

**Objetivo:** Identificar os fatores de risco relacionados a associação entre o transtorno de ansiedade social e uso de álcool entre adolescentes.

**Fontes dos dados:** Utilizou-se a estratégia de pesquisa PICO para realizar a revisão sistemática nas bases Medline, LILACS, Pubmed, IBECs e Biblioteca Cochrane. Foi utilizado os DeCS/MeSH: Transtornos Fóbicos, Adolescente, Comportamento, Etanol, Fatores de Risco e o operador booleano "AND". Os critérios de inclusão foram: estudo transversal, coorte prospectiva/retrospectiva e caso-controle, realizados em adolescentes (10 a 19 anos), artigos originais sobre transtorno de ansiedade social e uso de álcool publicado entre 2010 a 2015. Excluíram-se os estudos que não referiam transtorno de ansiedade e uso de álcool no título e no resumo.

**Síntese dos dados:** 409 artigos foram identificados e após exclusão repetidos 277 estudos foram elegíveis: 94 no MEDLINE, 68 em Pubmed, 12 IBECs e 3 LILACS. Foi realizada a leitura dos títulos e resumos de forma independente por dois examinadores, que resultou na seleção de 8 artigos para análise. Fatores de riscos associados aos dois transtornos: predominância do gênero feminino, idade, aprovações pelos pares e problemas afetivos para o uso de álcool, situações de enfrentamentos e/ou motivos de conformidades, frequência de uso do álcool e comorbidades secundárias como depressão e ansiedade generalizada.

**Conclusões:** É necessário avaliar o período de surgimento dos primeiros sintomas de transtorno de ansiedade social e dos riscos para o uso de álcool e instituir normas corretivas de intervenções, principalmente para os alunos socialmente ansiosos.

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**Introduction**

Social anxiety disorder (SAD) is a condition that starts in childhood/adolescence and is characterized by excessive fear or intense anxiety when the individual is faced with social exposure situations in public or meeting new people. It is estimated that between 5% and 13% of the population have this problem. It is considered as a chronic pathology, capable of incapacitating the individual and promoting the development of high rates of psychiatric comorbidities, such as depression, generalized anxiety disorder, and agoraphobia, being the most common anxiety disorder and the third most frequent psychiatric disorder.<sup>1-4</sup>

These individuals have difficulties in interpersonal relationships (family and social interactions), low self-esteem, low school performance, school dropout, and impairment in memory, perception, and thinking processes. It is noteworthy that SAD usually precedes abuse and dependence of alcohol and other illicit substances, which aggravates symptoms.<sup>5</sup>

Considered a public health problem, alcohol experimentation typically begins in adolescence, between the ages of 12 and 15 years, regardless of social context; individuals with early onset of SAD are at risk for developing depression or alcoholism.<sup>2,6,7</sup> This diagnosis occurs shortly before or concurrently with the onset of substance use, which suggests an association between these two health problems and that, even in the face of this evidence, this type of disorder in adolescence has shown a conflicting association with the use of alcohol.

The present systematic review aimed to identify the risk factors related to the association between SAD and alcohol use among adolescents.

**Method**

A systematic review of the literature was carried out based on a search in the Medical Literature Analyses and Retrieval Online (Medline), Latin American and Caribbean Literature in Health Sciences (LILACS), PubMed, Índice Bibliográfico Español de Ciencias de la Salud (IBECs), and the Cochrane Library databases.

For each research portal, a specific strategy was developed for crossing Descriptors in Health Sciences (DeCS, a Brazilian database of medical keywords) or Medical Subject Headings (MeSH). The keywords used for the study selection were: Phobic Disorders, Adolescents, Behavior, Ethanol, Risk Factors, and the corresponding terms in Portuguese. The Boolean operator "AND" was used to combine keywords and terms for searches. The selection was limited to studies published in Portuguese, English, or Spanish between 2010 and 2015.

After the articles were identified, eligibility, selection, and exclusion criteria were applied. Original articles that had alcohol use as a risk factor for SADs were considered eligible. The Population, Intervention, Comparison, Outcome, Study Design (PICO) research strategy was used to construct the research question, in order to carry out the search for clinical evidence of the association between social phobia and alcohol use.<sup>8,9</sup> The following were selected: cross-sectional, prospective/retrospective,

and case-control studies, carried out in humans aged 10–19 years<sup>10</sup>; original studies; with alcoholism as a risk factor for phobic disorders. Studies that did not mention alcoholism and phobic disorders in the article title were excluded, as well as those with a population of young adults aged 20–24 years.

Article selection was carried out in three steps, following the Transparent Reporting of Systematic Reviews and Meta-Analyses (PRISMA) method.<sup>11</sup> In the first step, two independent researchers read the titles without knowledge of the authors and the journal where they were published. After the exclusion of the repeated articles, the second step began, in which the abstracts of the selected studies were read and, likewise, those that did not meet the inclusion criteria were excluded. Disagreements were resolved by consensus. In the third step, all studies not excluded in the previous steps were read in full to select those that would be included in this review (Fig. 1).

## Results

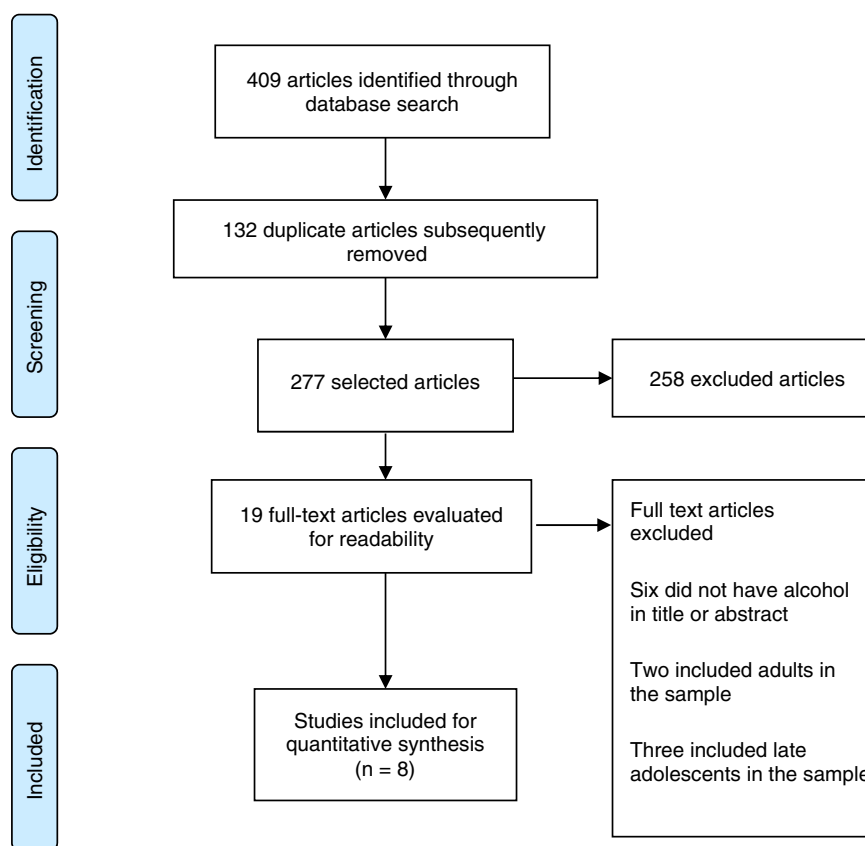
After exclusion of the repeated articles, 277 studies were eligible: 94 in MEDLINE, 68 in Pubmed, 12 in IBCS, and three in LILACS. The titles and abstracts were independently read by two examiners, totaling eight articles for analysis in this review.

Table 1 shows the characteristics of the eight studies and the type of protocols used; one study was carried out in Finland and seven in the United States. A total of 4579 adolescents, aged 10–19 years, who had symptoms of SAD and who consumed alcohol were investigated. In 62.5% of the studies, the female gender predominated, accounting for 54% of the total sample.

The association between social anxiety symptoms and alcohol use was confirmed in six studies, two of which were carried out in a group of adolescents with mean age between 10 and 11 years, whereas the others evaluated adolescents older than 15 years. The risk factors attributed by the studies for this association were female gender, peer acceptance, and affective problems for alcohol use, as well as the presence of secondary comorbidities, such as depression, generalized anxiety, agoraphobia, separation anxiety, and obsessive-compulsive disorder. Other factors such as cultural aspects, frequency of alcohol use, and frequency of intoxication investigated by the studies did not appear to be related to this association (Table 2).

## Discussion

The findings show that the evaluated association is still unclear, due to the small number of studies retrieved; however, 75% of the studies showed positive evidence between the association of SAD and alcohol use.



**Figure 1** Flowchart representing the selection steps of articles about social anxiety disorder and alcohol abuse in adolescents. Source: "Prisma: Transparent Reporting of Systematic Reviews and Meta-Analyses".

**Table 1** Characteristics of the studies and types of protocols used.

Authors, year, and impact factor (IF)	Country	Study duration and sample	Gender and age	Type of study	Research tool
Fröjd et al. (2011) IF: 1.09	Finland	48 months Sample: 2070	Boys: 903 Girls: 1167 Mean age: 17.6 (SD = 0.41)	Longitudinal study	Social Phobia Inventory (SPIN)
Terlecki et al. (2012) IF: 1.36	USA	Sample: 52	Boys: 35 Girls: 17 Mean age: 20.38 (SD = 1.46)	Longitudinal study	Alcohol Use Disorder Identification Test (AUDIT) Brief Alcohol Screening and Intervention for College Students (BASICS) Quantity/Frequency/Peak Index (QFI) Drinking Norms Rating Form (DNRF) Social Phobia Scale (SPS) and the Social Interaction Anxiety Scale (SIAS) Spielberger Trait Anxiety Inventory
Dahne et al. (2014) IF: 1.41	USA	48 months Sample: 277	Boys: 156 Girls: 121 Mean age de 11 (SD = 0.81)	Longitudinal study	Generalized estimating equations (GEE) The Revised Child Anxiety and Depression Scale (RCADS) Youth Risk Behavior Surveillance System
Zehe et al. (2013) IF: 1.4	USA	12 months Sample: 387	Boys: 174 Girls: 213 Mean age: 12.1	Longitudinal study	Social Anxiety Scale For Children – Revised (SASC-R) Youth Self-Report Survey (YSR)
Terlecki and Buckner (2015) IF: 1.4	USA	Sample: 232	Boys: 71 Girls: 161 Mean age: 19.32 (SD = 1.34)	Cross-sectional study	Social Phobia Scale (SPS) Social Interaction Anxiety Scale (SIAS) Drinking Motives Questionnaire Revised (DMQR) Drinking Context Scale-Revised (DCS-R)
Blumenthal et al. (2010) IF: 1.36	USA	Sample: 50	Boys: 24 Girls: 26 Mean age 16.35 (SD = 1.10)	Cross-sectional study	Adolescent Alcohol and Drug Involvement Scale (AADIS) Youth Self Report (YSR) Drinking Motives Questionnaire Revised (DMQ-R) Revised Child Anxiety and Depression Scale – Social phobia subscale (RCADS5P)
Wu et al. (2010) IF: 1.47	USA	Sample: 781	Boys: 412 Girls: 369 Mean age: 15	Cross-sectional study	Diagnostic Interview Schedule for Children (DISC)

Table 1 (Continued)

Authors, year, and impact factor (IF)	Country	Study duration and sample	Gender and age	Type of study	Research tool
Clerkin. Barnett (2012) IF: 1.4	USA	12 months Sample: 730	Boys: 295 Girls: 435 Mean age 18.35 (SD = 0.47)	Cross-sectional study	Social Avoidance and Distress Scale (SADS) Drinking Motives Questionnaire – Revised The Graduated Frequency for Alcohol Questionnaire Young Adult Alcohol Problems Screening Test

### Contextualization of study location

This review identified a predominance of studies carried out in developed countries, primarily in the United States, which may be related to greater epidemiological surveillance in mental health for children and adolescents.

It is important to remember that approximately one in five adolescents in that country suffer from a mental disorder severe enough to have an impact on their activities of daily living, and these are relevant data for the increase in the investigations.<sup>12</sup>

In Brazil, population-based studies have shown that the onset of anxiety disorders occurs at the mean age of 13 years and the use of alcohol between 12 and 15 years, while substance abuse begins later, at the age of 24 years. This may be an indication that the resources available for the treatment of mental disorders in children and adolescents might be deficient, consequently increasing the rates of comorbidity in early adult life.<sup>13,14</sup> This review did not retrieve any Brazilian publication that could clarify the national reality about the association between SAD and alcohol use.

These data are important to emphasize the need to diagnose and follow-up adolescents who are predisposed to developing mental disorders and to initially establish preventive actions in schools and healthcare services, thus reducing the long-term associated burden on the individual, family, and community.

### SAD and alcohol use

Given that SAD is one of the most prevalent psychiatric conditions in the world's population, second only to depression,<sup>6</sup> and that its development precedes the onset of alcohol use disorders, it is important to carry out alcohol intervention activities,<sup>15</sup> as young individuals with SAD are five times more likely to develop alcohol dependence than those without the disorder.<sup>14,16–20</sup>

Studies that failed to show a significant association between SAD and alcohol use in adolescents,<sup>15,21</sup> still indicated the possibility of reaching different results when cultural differences were observed, such as free access to alcohol by adolescents. Another observed risk was the development of this association with depression, which may occur in late adolescence or take more than two years to develop.

It is worth emphasizing the importance of recognizing and treating anxiety disorders in childhood, especially among girls, aiming to help them prevent the development of substance use disorders and secondary comorbidities.<sup>22</sup>

According to the Differential Diagnostic Guidelines for Social Anxiety Disorder, the age of SAD onset tends to occur earlier and the distribution between the genders is more homogeneous.<sup>3</sup> When analyzing gender in association with alcohol consumption among Brazilian adolescents in the National School Health Survey (PeNSE 2012), a higher prevalence of the female gender (51.7%; 95%CI: 50.8–52.6) was observed.<sup>23</sup> When assessing the influence of gender on the association between illicit substance use and social anxiety, it was observed that women with higher levels of social anxiety had a higher number of friends who use drugs and alcohol.<sup>24</sup>

However, there are differences between the patterns observed in adolescents and the results of studies with adults, *i.e.*, the association between anxiety disorders and substance use can change from adolescence to adulthood.<sup>22</sup> What is initially used as an anxiety coping tool, attenuating inhibition and making them feel safe while alleviating the fear in social situations throughout life, can lead to embarrassing situations and dependence, as well as the persistence of phobic symptoms.<sup>25</sup>

In the study carried out at schools, libraries, and adolescent clubs in the Washington, DC, United States metropolitan area, the rates of alcohol use were relatively low; however, the results indicated that young individuals were more likely to have problems with alcohol consumption over time.<sup>26</sup>

In the study that investigated social anxiety, generalized anxiety, and substance use (cigarettes and alcohol) in the early adolescence phase, it was observed that for the female gender, social anxiety is a risk factor when alcohol use approval by peers is high (high levels of peer approval and high levels of social anxiety were associated with a high likelihood of substance use), whereas for generalized anxiety, it is considered a risk factor when the use by peers is low.<sup>27</sup>

However, gender was not significantly associated with social anxiety and alcohol use, emphasizing age, frequency of alcohol use, and affective problems.<sup>28</sup> Nevertheless, this association was associated with affective problems, as well as reasons for survival and coping, so that young individuals who had elevated symptoms of the disorder reported

**Table 2** Summary of studies and risk factors associated with social anxiety disorder and alcohol use in adolescents.

Authors, year and impact factor (IF)	Objective	Analyzed risk factors	Results	Conclusions
Fröjd et al. (2011) IF: 1.09	To investigate whether the association between anxiety and alcohol and other substances are already evident in the middle adolescence, and whether the general anxiety or social phobia symptoms affects the continuity of frequent use of alcohol, frequent drunkenness, and marijuana use.	Generalized anxiety Social phobia Substance use Frequency of use Drunkenness frequency Use of marijuana	Anxiety preceded the use of the substance, while no reciprocal associations were observed. Depression-mediated associations between anxiety and substance use. Symptoms of social phobia did not increase the incidence of substance use, but overall anxiety. General anxiety increased the persistence of frequent alcohol use, while co-morbid social phobia decreased its persistence.	General anxiety in adolescence puts adolescents at risk for substance use. The risk may, however, be associated with depression. Social phobia in middle adolescence may protect against substance use. Adolescents with symptoms of internalization may need guidance in coping with symptoms, even though the symptoms did not meet the criteria of mood or anxiety disorder.
Terlecki et al. (2012) IF: 1.36	To evaluate whether socially anxious students showed less change in alcohol use behavior among college students.	Social anxiety Typical drinks Rules for drinking	Among students with minor changes in rules, being a member of a group with social anxiety was associated with heavier drinking of typical drinks. Among students with major changes in rules, being a member of a social anxiety group was not significant.	Generalized anxiety in middle adolescence puts adolescents at risk for concomitant substance use and subsequently in late adolescence. The risk may, however, be associated with depression. Social anxiety and use of alcohol or substance was not observed in middle and late adolescence.
Dahne et al. (2014) IF: 1.41	To assess whether social phobia symptoms predicted increased likelihood of alcohol use over time.	Demographic data Psychopathology Alcohol use	There were correlations between the baseline predictors (child's age, child's gender, baseline alcohol use, social phobia symptoms) and waves 1–5 alcohol use. In general, the concurrent associations were low to moderate.	It highlights the importance of social phobia symptoms in predicting alcohol use over time among young adolescents. Several future directions within this line of research would be valuable, including expanding the assessed age range to younger children and adolescents/older young adults.
Zehe et al. (2013) IF: 1.4	To assess the association between social and generalized anxiety symptoms and alcohol and cigarette use in early adolescence and as a precautionary measure (perceived peer use approval) and (perceived use point) descriptive rules may moderate the association.	Peer norms Gender differences	Peer norms were moderated for the association between social anxiety symptoms, generalized anxiety, and the likelihood of alcohol and cigarette use by girls, but not for boys.	Girls with high levels of social anxiety symptoms were at risk for use when perceived peer approval of use was high, and protected from use when perceived peer approval of use was low. Profiles of anxiety symptoms and perceived peer approval of use may help identify girls who are potential targets for intervention, but the nature of these interventions is still unclear, since this study did not assess the potential risk mechanisms.



Table 2 (Continued)

Authors, year and impact factor (IF)	Objective	Analyzed risk factors	Results	Conclusions
Terlecki and Buckner (2015) IF: 1.4	Identify cognitive/motivational factors related to drinking in high-risk situations.	Demographic data Social anxiety and Reasons to drink	High social anxiety was associated with greater coping and compliance reasons. Both coping and compliance motives were mediated, the association between social anxiety to heavy alcohol consumption to negative emotional and personal/intimate contexts.	Multiple mediation analysis has indicated that to mediate anxiety situations university students drink socially, such that heavy drinking among college students with clinically elevated social anxiety can be attributed jointly to the desire to deal with negative affect and to avoid social scrutiny.
Blumenthal et al. (2010) IF: 1.36	To assess the reasons for alcohol use among young individuals as a function of social anxiety, associated variables (age, gender, frequency of alcohol use, affective problems)	Age Frequency of alcohol use Affective problems	High social anxiety was significantly associated with a high level of affective problems, as well as with coping reasons. Social anxiety was significantly associated with coping motives, so that young individuals who had high social anxiety reported greater motivation to drink for coping-related purposes.	Socially anxious young individuals endorse higher consumption motives, related to coping issues, a characteristic that may put them at risk for developing alcoholism problems. Prospective studies focused on clarifying associations between adolescent social anxiety, dealing with reasons for drinking and problematic use of alcohol, with the ultimate goal of designing prevention programs targeting young individuals at risk for social anxiety.

Table 2 (Continued)

Authors, year and impact factor (IF)	Objective	Analyzed risk factors	Results	Conclusions
Wu et al. (2010) IF: 1.47	To assess the use of three substance categories by adolescents (frequent smoking, frequent drinking/heavy use, and use of illicit drugs) in relation to each of the six anxiety disorders (social phobia, agoraphobia, high anxiety disorder/generalized anxiety disorder, separation anxiety, and obsessive-compulsive disorder).	Substance use Anxiety disorder Demographics and family factors Depression	Social phobia was associated with smoking only among boys. For girls, social phobia appeared to be negatively associated with drug use. For the other anxiety disorders, associations with substance use tend to be stronger among girls. There was an association between social anxiety symptoms and alcohol use only in girls. Frequent or heavy drinking was more common among boys than girls, but this difference was only marginally significant.	The differences between the patterns observed in the study sample of adolescents and the results of studies with adults regarding social phobia to some extent indicate that the association between anxiety disorders and substance use may change from adolescence to adulthood.
Clerkin and Barnett (2012) IF: 1.4	To test the separate and interactive effects of drinking motives and social anxiety symptoms in predicting drinking and drinking-related problems.	Social anxiety symptoms Reasons to drink Alcohol consumption Problems with alcohol	Increased social anxiety symptoms were significantly associated with less alcohol consumption, and there was some evidence that greater social anxiety symptoms were also associated with greater problems with alcohol.	The main effects of social anxiety symptoms and consumption motives were more influential in predicting consumption outcomes. Greater social anxiety was associated with greater endorsement of coping and compliance motives, and less endorsement of reasons for enhancement. Symptoms of social anxiety were associated to lower alcohol consumption, and also with more problems with drinking.



increased motivation to drink associated with coping purposes. This was also demonstrated in the three models used to assess the groups of people with social anxiety who used alcohol in situations of confrontation and/or compliance reasons.<sup>29</sup>

Adolescents with elevated social anxiety symptoms consume less alcohol, but show a higher association when it is related with coping endorsement and compliance motives.<sup>30</sup>

### Future perspectives

The limitations of the analyzed studies are based on sample size; on the short period of follow-up of the adolescents; on the fact that, as it was not possible to observe the students' behavior during the transition period from elementary to high school,<sup>15,26,28</sup> the results cannot be generalized for all phases of adolescence or for all regions (rural and urban areas), since each phase has different characteristics and behaviors regarding the decision-making for use of alcohol according to the place of residence<sup>27</sup>; and on the use of a combination of variables regarding the use of alcohol, cigarettes, marijuana, and other substances, which has implications for their association with anxiety, as each substance has unique properties and distinct physiological effects.<sup>21,22,27</sup>

Regarding future investigations, it is necessary to assess the individuals at the initial, middle, and late adolescence phases, as well as to expand racial and ethnic groups; to use both the descriptive analysis (perceptions of the drinking behavior) and the analysis of precautionary norms (approval/disapproval of the drinking behavior); to evaluate the treatment and its effects on the adolescent; and to assess the coping reasons for drinking and problematic use of alcohol, with the ultimate goal of developing prevention programs aimed at young individuals at risk.

### Limitations

The present systematic review study had as limitations: (a) non-use of the Web of Science and Pschynfo scientific databases, with the latter being the database specialized in behavioral and social science research; (b) scarcity of studies published in Portuguese, English, or Spanish; and (c) the small number of articles included in the analysis.

Despite the limitations, this review becomes relevant, as it allowed the identification and understanding of the main risk factors associated with SAD and alcohol use in adolescents, in addition to broadening the knowledge about the subject.

### Conclusions

The association between SAD and alcohol use in adolescents appears to be unclear, due to the few identified studies, the methodological heterogeneity, and their regionalization. Nevertheless, this review raised interesting evidence on the existence of this association and identified the main risk factors related to the association between SAD and alcohol use among adolescents, such as female gender, peer acceptance, and affective problems regarding alcohol use,

as well as the presence of secondary comorbidities, such as depression and anxiety disorders. Therefore, studies with representative samples, with an increase in the racial and ethnic groups and that contemplate the initial, middle, and late phases of adolescence are still necessary.

Some authors also suggest that prospective studies be carried out to observe students' behavior during the transition period from elementary to high school, as well as to evaluate the onset period of the first symptoms of SAD and the risks for alcohol use; assess the reasons for alcohol use; evaluate treatment and its effects on adolescents; and to implement corrective intervention guidelines for alcohol use among socially anxious students.

### Conflicts of interest

The authors declare no conflicts of interest.

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