# Prevention of problems associated with alcohol abuse in adolescents

Prevenção dos problemas associados ao abuso de álcool em adolescentes

Prevención de los problemas asociados con el abuso de alcohol en adolescentes

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**Abstract**
Objectives: To identify strategies to prevent problems associated with alcohol abuse in adolescents and to explore nursing interventions to prevent harm associated with alcohol abuse. Methodology: Integrative Literature Review (ILR), based on primary, quantitative, and observational studies obtained through search engines PubMed, B-On, and databases Medline and CINAHL. We used the PICOD method for the research, selecting seven articles published between 2019 and 2023. Results: The studies analyzed the effectiveness of different interventions in reducing alcohol consumption among adolescents, highlighting the importance of implementing evidence-based prevention programs in schools. Such programs address specific risk factors and use context-appropriate strategies. Selective prevention targeted at personality, such as the PreVenture program, demonstrated long-term effects in reducing alcohol-related harm over several years. These results underscore the continuous need to invest in preventive initiatives to reduce the negative impacts of alcohol consumption among youth. Conclusion: It is pertinent to address the issue of alcohol abuse in adolescence early through effective prevention strategies. It is crucial to involve not only adolescents but also their families, educators, and the entire educational community for a more significant impact.
**Keywords:** Adolescent; Alcoholism; Nursing care; School nursing.

**Resumo**
Objetivos: Identificar estratégias para prevenir os problemas associados ao abuso de álcool em adolescentes, e explorar quais as intervenções de enfermagem para a prevenção dos danos associados ao abuso de álcool. Metodologia: Revisão Integrativa da Literatura (RIL), baseada em estudos primários, quantitativos e observacionais, obtidos através dos motores de busca PubMed, B-On, e das bases de dados Medline e CINAHL. Para a realização da pesquisa utilizámos o método PICOD, selecionamos sete artigos publicados entre 2019 e 2023. Resultados: Os estudos analisaram a eficácia de diferentes intervenções na redução do consumo de álcool entre adolescentes, destacando a importância de implementar programas de prevenção baseados em evidências nas escolas. Tais programas abordam fatores de risco específicos e utilizam estratégias adequadas ao contexto. A prevenção seletiva direcionada à personalidade, como o programa PreVenture, demonstrou efeitos duradouros na redução dos danos relacionados ao consumo de álcool ao longo de vários anos. Esses resultados sublinham a necessidade contínua de investir em iniciativas preventivas para reduzir os impactos negativos do consumo de álcool entre os jovens. Conclusão: É pertinente abordar precocemente o tema do abuso de álcool na adolescência, através de estratégias de prevenção eficazes. É crucial envolver não apenas os adolescentes, mas também as suas famílias, encarregados de educação e toda a comunidade educativa para um maior impacto significativo.
**Palavras-chave:** Adolescente; Alcoolismo; Cuidados de enfermagem; Serviço de enfermagem escolar.

**Resumen**
Objetivos: Identificar estrategias para prevenir los problemas asociados con el abuso de alcohol en adolescentes y explorar las intervenciones de enfermería para prevenir los daños asociados con el abuso de alcohol. Metodología: Revisión Integrativa de la Literatura (RIL), basada en estudios primarios, cuantitativos y observacionales, obtenidos a través de los motores de búsqueda PubMed, B-On y de las bases de datos Medline y CINAHL. Utilizamos el método PICOD para la investigación, seleccionando siete artículos publicados entre 2019 y 2023. Resultados: Los estudios analizaron la eficacia de diferentes intervenciones para reducir el consumo de alcohol entre adolescentes, destacando la importancia de implementar programas de prevención basados en evidencia en las escuelas. Dichos programas abordan factores de riesgo específicos y utilizan estrategias adecuadas al contexto. La prevención selectiva dirigida a la personalidad, como el programa PreVenture, demostró efectos duraderos en la reducción del daño relacionado con el consumo de alcohol a lo largo de varios años. Estos resultados subrayan la necesidad continua de invertir en iniciativas preventivas para reducir los impactos negativos del consumo de alcohol entre los jóvenes. Conclusión: Es pertinente abordar el tema del abuso de alcohol en la adolescencia temprano, a través de estrategias de prevención efectivas. Es crucial involucrar no solo a los adolescentes, sino también a sus familias, educadores y toda la comunidad educativa para un impacto más significativo.
**Palabras clave:** Adolescente; Alcoholismo; Atención de enfermeira; Servicios de enfermería escolar.

## 1. Introduction

Adolescence is a transitional phase marked by physical, hormonal, psychological, emotional, cognitive, and social changes (WHO, 2018). During this period, adolescents develop knowledge and skills, learn to manage emotions, relationships, and responsibilities, and prepare for adult life. According to Eisenstein (2005), this phase is characterized by physical, mental, emotional, sexual, and social development, as well as the individual's efforts to achieve society's cultural goals.

During this phase, young people face difficulties in coping with transformations, and relationships with parents undergo fundamental changes essential for identity construction and autonomy acquisition. Relationships with friends become particularly important (Machado, 2015). This phase is marked by doubts, discoveries, and a complex process of growth and development, involving reflections, decision-making, and risky behaviors.

Risky behaviors compromise the physical and mental health of adolescents. It is crucial to create protective measures against these risks and strategies to promote healthy behaviors, preventing health problems in adulthood (WHO, 2018). The consumption of harmful substances, such as alcohol, often begins in adolescence, usually in unsupervised social settings. Binge drinking during this phase is considered high-risk, characterized by the consumption of large quantities in a short period (Barroso, 2012). Adolescents who engage in binge drinking are more prone to accidents, violence, poor academic performance, and unprotected sexual activity, increasing the risk of sexually transmitted infections (Valim et al., 2017).

The biological systems of young people are not sufficiently developed to metabolize alcohol, resulting in brain damage and neurocognitive deficits that negatively impact intellectual development (Moutinho, 2018). The initiation of alcohol consumption in adolescence increases the likelihood of developing abusive drinking patterns by 7.5 times and the risk of developing mental illnesses by 15% (Barreto et al., 2017).

The family plays a crucial role in the education and care of adolescents, promoting physical, psychological, social, affective, and moral well-being. However, families often condone alcohol consumption by young people, justifying it with cultural reasons, such as celebrations and family traditions (Moutinho, 2018).

According to Global Status Report on Alcohol and Health 2018 (WHO, 2018), more than a quarter of young people aged 15 to 19 are current alcohol consumers worldwide. In Europe, this percentage is even higher (44%) compared to other regions such as the Americas (38%) and the Western Pacific (38%). In Portugal, alcohol consumption typically begins between the ages of 13 and 15, below the legal drinking age, and is seen by young people as a natural and expected experience (SICAD, 2014), raising concerns in the school environment.

Alcohol is the most consumed substance among young people, with the age of initiation decreasing, increasing the risk of future dependence (Pechansky et al., 2004). Considering that excessive alcohol consumption is a modifiable risk factor with a significant impact on non-communicable chronic diseases, it is crucial to develop interventions that promote modifications in risky behaviors associated with alcohol consumption, focusing on environmental and behavioral factors to encourage the adoption of a healthy lifestyle (Ministry of Health (PT), 2018).

Molina et al. (2014) highlight that the initiation of alcohol consumption in adolescence is influenced by multiple psychosocial factors. Individual aspects, such as personality traits, along with family factors and socio-environmental influences, play a significant role in this process. Therefore, addressing alcohol consumption requires a comprehensive approach that considers these diverse factors.

The recognition of the issues associated with early alcohol consumption has been highlighted by studies on children's and adolescents' health behaviors and lifestyles. This phenomenon assumes complex and concerning contours due to the crucial phase of development and biological, psychological, and social vulnerability of adolescents. The proportion of adolescents with harmful and dangerous drinking patterns has increased in the past decade. European studies indicate that 9 out of 10 adolescents aged 15 to 16 have consumed alcohol, with an average initiation age of 12.5 years (Barroso et al., 2013).

Community Nursing Intervention in a School Context, guided by the National School Health Plan (NSHP), establishes six strategic axes: capacity building, school environment and health, health conditions, quality and innovation, training and research in school health, and partnerships. School Health (SH) is recognized for its fundamental role in promoting health and preventing diseases in the school environment (DGS, 2015).

Schools should educate on values, promote health, and encourage students' civic participation, developing competencies that support lifelong learning and promote autonomy. A health-promoting school involves the community, including parents, volunteers, businesses, and health services (DGS, 2015). Nurses play a proactive role in identifying the population's needs and promoting and educating in various areas. In the school context, the health professional plays an important role in aiming at the prevention and protection of health during adolescence (Assunção et al., 2020).

Hingson et al. (2010) investigated the risk and protective factors associated with alcohol abuse in adolescence, highlighting the influence of individual and contextual variables. The author emphasized the importance of preventive approaches that address these factors to promote healthy behaviors and reduce alcohol abuse.

Thus, the prevention of problems associated with alcohol abuse in adolescents is crucial due to the negative consequences that excessive consumption can have. It is essential to implement effective prevention strategies that address specific risk and protective factors, involving adolescents, parents, schools, health professionals, and the community.

Given the complexity and relevance of this topic, we have formulated the following research question: "How to prevent problems associated with alcohol abuse in adolescents?". The objectives are to identify strategies to prevent problems associated with alcohol abuse in adolescents and explore nursing interventions to prevent harm associated with alcohol abuse.

We intend to involve the school community and health professionals in prevention efforts to reduce the negative consequences of alcohol consumption on school life. We used the PICOD mnemonic to select articles, extract data, and map evidence.

## 2. Methodology

The research methodology adopted in this study was the Integrative Literature Review (ILR), an essential method for synthesizing and understanding empirical or theoretical literature on a specific phenomenon. ILR facilitates Evidence-Based Practice (EBP), allowing for the compilation and analysis of data to formulate conclusions that guide decisions and improve

clinical practices. This method involves defining a problem, reviewing the literature, critically evaluating selected studies, and synthesizing the results (Sousa et al., 2017).

To guide the research, the PICOD mnemonic was used to formulate the research question: "How to prevent problems associated with alcohol abuse in adolescents?". The PICOD structure ensures clarity in defining the question and contributes to a comprehensive and relevant search in the scientific literature, where P - Population: *adolescents*; I - Implemented interventions: *nursing interventions*; C - Comparison: *not applicable*; O - Outcomes: *prevention of problems associated with alcohol abuse*; and D - Study design: *only experimental and quasi-experimental studies were included*.

The strategy for article research and the inclusion and exclusion criteria are crucial in ILR to select relevant articles and ensure the internal validity of the analysis. Establishing these criteria allows for the generalization of conclusions to a broader population (Sousa et al., 2017).

The criteria were established to ensure the inclusion of studies addressing the prevention of alcohol abuse among adolescents. To be considered, studies had to involve adolescents aged 12 to 19 in a school context, focus on nursing interventions related to the prevention of problems associated with alcohol abuse, be published between 2019 and 2023, be available in full text, be primary studies with open access, and be written in Portuguese, English, or Spanish. Studies that did not address interventions related to alcohol abuse, were systematic reviews, or were duplicate articles were excluded from the analysis.

The following DeCS/MeSH descriptors were used: "alcoholism," "nursing care," and "adolescent," combined through the Boolean operators "AND" and "OR." For scientific research, two databases were used: CINAHL and Medline, accessed through the search engines PubMed and B-on. On the B-on search engine, among the available databases, the search expression used was:

(S1): "(adolescents OR teenagers) AND (nurse interventions OR nursing interventions) AND (alcohol abuse OR alcoholism OR alcohol addiction) AND ("prevention" OR "intervention")".

On the PubMed search engine, on the CINAHL database, the search expression was:

(S2): "(("teen*"[Title/Abstract] OR "adolescent*"[Title/Abstract] OR "adolescent"[MeSH Terms]) AND ("alcohol abuse"[Title/Abstract] OR "alcohol addiction"[Title/Abstract] OR "alcoholism"[Title/Abstract] OR "nursing care"[Title/Abstract] OR "alcoholism"[MeSH Terms]) AND ("prevent*"[Title/Abstract] OR "avoidance"[Title/Abstract])) AND (2019:2023[pdat])".

Figure 1 below presents the selection process of the articles found on the B-on and PubMed databases. After applying the inclusion and exclusion criteria, removal of duplicates and analysis and discussion by the authors, seven articles were included.

**Figure 1** – PRISMA Flow Diagram, representing the selection process of articles included in the study.
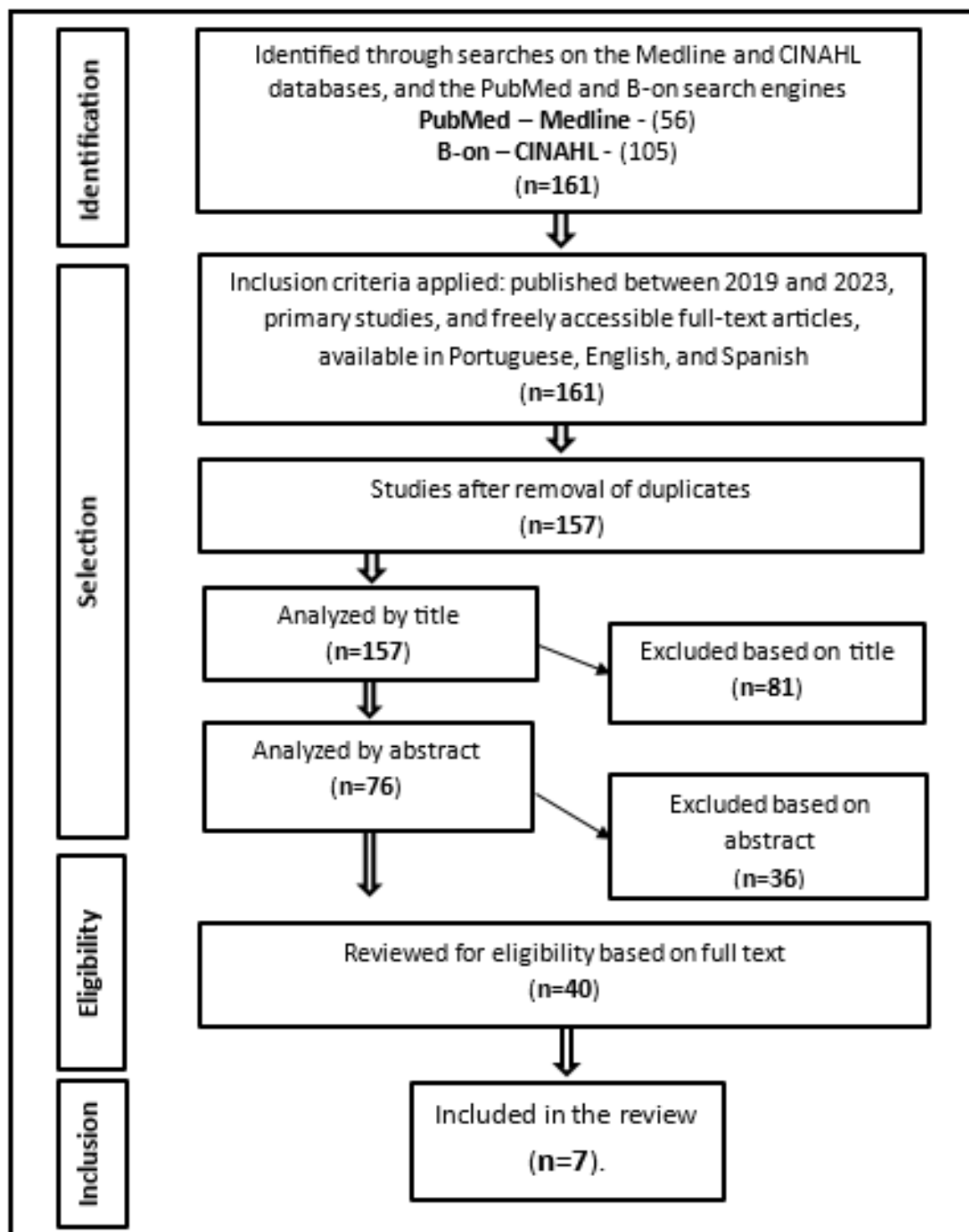


Source: Authors (2024).

A total of seven articles were selected: four articles in the B-On search engine, coded as B1, B2, B3, and B4, and three articles in the PubMed search engine, coded as P1, P2, and P3. Coding was performed to facilitate the presentation of the articles.

Table 1 presents the articles selected for the preparation of this ILR in chronological ascending order.

**Table 1** - Articles selected for the ILR.

| Article / Title | Year / Country /Authors | Journal / Type of Study |
|---|---|---|
| **B1** *"High alcohol use and misuse in a representative sample of in-school adolescents in the Seychelles"* | *2019 / Spain / Supa Pengpid & Karl Peltzer* | *Journal of Psychology in Africa / Cross-sectional study* |
| **B2** *"Alcohol Use and Misuse Among School-Going Adolescents in Thailand: Results of a National Survey in 2015"* | *2019 / Thailand / Supa Pengpid & Karl Peltzer* | *International Journal of Environmental Research and Public Health / Cross-sectional study* |
| **P1** *"Brief interventions to prevent excessive alcohol use in adolescents at low-risk presenting to Emergency Departments: Three-arm, randomized trial of effectiveness and cost-effectiveness"* | *2021 / England / Deluca et al.* | *International Journal of Drug Policy / Randomized controlled trial* |
| **B3** *"Nursing Intervention Through Peers for self-efficacy and Alcohol consumption in adolescents"* | *2022 / Mexico / Hernández-Martínez et al.* | *Health and addictions - Salud y Drogas / Quasi-experimental whith pre-test-pos-test follow-up* |
| **B4** *"Cost-effectiveness and cost-utility analyses of a web-based computer-tailored intervention for prevention of binge drinking among Spanish adolescent"* | *2022 / Spain / Vargas-Martínez et al.* | *Wiley Periodicals LLC / A randomized controlled trial* |
| **P2** *"Efficacy of the Virtual Reality Intervention VR FestLab on Alcohol Refusal Self-Efficacy: A Cluster-Randomized Controlled Trial"* | *2022 / Denmark / Guldager et al.* | *International Journal of Environmental Research and Public Health / A randomized controlled trial* |
| **P3** *"Effect of Selective Personality-Targetet Alcohol Use Prevention on 7-Year Alcohol-Related Outcomes Among High-risk Adolescents"* | *2022 / Australia / Newton et al.* | *JAMA Psychiatry (Journal of the American Medical Association Psychiatry) / Randomized controlled trial* |

Source: Authors (2024).

## 3. Results

To simplify the presentation of the results, tables numbered 2 to 8 were created, summarizing each study with their respective objectives, methodology, and main results and conclusions.

**Table 2** – Summary of Study B1.

| | |
|---|---|
| **Objectives** | Determine the effect of nursing intervention through "interconnected" peers on self-efficacy and alcohol consumption among adolescents. |
| **Methodology** | **Type of study**: Cross-sectional study.<br>**Sample**: 2540 adolescents. |
| **Results and Conclusions** | Nearly half of the students (47.6%) reported current alcohol consumption, with similar proportions between males and females. A significant portion of the students had experienced alcohol intoxication (42.6%), were heavy drinkers (23.1%), and faced alcohol-related problems (15.7%). The main sources of access to alcohol were family, friends, and store purchases. An association was observed between alcohol consumption and factors such as older age, parental tobacco use, school absenteeism behaviors, injuries, and lack of parental support. Older age was associated with greater opportunities for alcohol abuse, including intoxication, heavy drinking, and related problems. No significant differences were found between genders in terms of alcohol use and abuse. Other factors associated with alcohol consumption included tobacco use, amphetamine use, school absenteeism behaviors, injuries, risky sexual behaviors, and low parental support. These associations highlight the complexity of factors influencing alcohol consumption patterns among students. |

Source: Authors (2024).

**Table 3** – Summary of Study B2.

| Objectives | Assess the prevalence of alcohol consumption and abuse and identify associated factors among school-going adolescents. |
|---|---|
| Methodology | **Type of study**: Two-stage cluster study.<br>**Sample**: 5994 school-going adolescents. |
| Results and Conclusions | Among the participants, 22.2% currently consumed alcohol, with 27.0% of males and 17.9% of females reporting alcohol consumption. Additionally, 24.3% of participants had been intoxicated, 12.1% consumed two or more alcoholic drinks per day in the past 30 days, and 10.8% reported alcohol-related problems. Poisson regression analyses revealed that older age, psychological distress, current tobacco use, daily soda consumption, school absenteeism, involvement in physical fights, and severe injuries were associated with current alcohol consumption. These factors also increased the chances of alcohol abuse, excessive consumption, and alcohol-related problems. No significant differences were found between genders regarding alcohol consumption indicators. Moreover, parental tobacco use was associated with alcohol intoxication and alcohol-related problems, cannabis use was associated with alcohol-related problems, and parental support was found to be protective against alcohol-related issues. |

Source: Authors (2024).

**Table 4** – Summary of Study P1.

| Objectives | Assess the effectiveness of PFBA and eBI interventions compared to screening only in reducing alcohol consumption, measured by AUDIT-C, and examine the cost-effectiveness and impact on reducing alcohol-related problems among adolescents. |
|---|---|
| Methodology | **Type of study**: Randomized clinical trial with three parallel groups. Participants were randomized into three groups: screening only, Face-to-Face Personal Feedback and Brief Counseling (PFBA), or Electronic Brief Intervention (eBI). Eligible participants were approached in ten Emergency Departments (EDs), underwent initial screening using AUDIT-C, and completed initial questionnaires. They received the designated intervention and were followed up after 6 and 12 months. Randomization was performed by software, and follow-up researchers were blinded to the allocated interventions.<br>**Sample**: Adolescents attending the emergency department during the study period. |
| Results and Conclusions | Demographic and outcome variables were similar across the three groups at baseline. The average age of participants was 15.1 years; 51% were female, and 62% identified as White. The average age at first alcohol consumption was 13.8 years, and the average weekly alcohol consumption was 0.14 units. Most participants visited the ED for injuries or accidents (59.2%), infections (7.6%), or gastrointestinal complaints (6.1%). Factors such as initial alcohol consumption, age at first use, current age, female gender, positive alcohol expectations, and alcohol-related problems influenced alcohol consumption at 12 months. No significant relationship was found between greater engagement with the intervention and alcohol consumption in the eBI group at 12 months. |

Source: Authors (2024).

**Table 5** – Summary of Study B3.

| Objectives | Determine the effect of nursing intervention through "interconnected" peers on self-efficacy and alcohol consumption among adolescents. |
|---|---|
| Methodology | **Type of study**: Quasi-experimental with pre-test/post-test follow-up, with intervention and control groups using intact groups.<br>**Sample**: 20 secondary schools in Saltillo, Coahuila, two institutions selected as intervention and control groups. The sample consisted of 32 participants in each group, totaling 64 participants. |
| Results and Conclusions | The intervention significantly increased participants' self-efficacy to refuse alcohol consumption. The approach was effective in reducing and maintaining responsible alcohol consumption for 12-, 24-, and 36-weeks post-intervention. The "interconnected" program was beneficial for adolescent health and helped reduce social problems such as family disintegration, violence, and bullying. The active participation of nurses in the educational process provided innovative and creative health education, promoting self-efficacy and reducing alcohol consumption. The face-to-face and recreational sessions provided protective resources against alcohol consumption. The intervention had a long-term positive impact, increasing adolescents' self-efficacy to refuse alcohol consumption and contributing to the reduction and maintenance of this refusal. |

Source: Authors (2024).

**Table 6** – Summary of Study B4.

| Objectives | Evaluate the effectiveness of the Alerta Álcool program, a web-based and computer-tailored intervention, in preventing excessive alcohol consumption among adolescents aged 15 to 19 years in Andalusia, Spain. The program was compared with no intervention. |
|---|---|
| Methodology | **Type of study**: Two-arm cluster randomized controlled trial.<br>**Sample**: 1247 adolescents from 15 public high schools, initially assessed and followed up for 4 months. The cost-effectiveness analysis compared the costs and benefits of the program. |
| Results and Conclusions | The intervention reduced excessive alcohol consumption and improved quality of life, especially among girls and older adolescents. There was a reduction in direct health costs, such as hospitalizations, and in non-health costs, such as traffic accidents. |

Source: Authors (2024).

**Table 7** – Summary of Study P2.

| Objectives | Evaluate the effectiveness of the VR FestLab game in improving adolescents' (aged 15-18 years) ability to refuse alcohol consumption in the face of social pressures, as well as to verify whether the game influenced adolescents' responsible behavior in party situations. |
|---|---|
| Methodology | **Type of study:** Two-arm Cluster Randomized Controlled Trial. VR FestLab was developed as a free smartphone application in Denmark, involving young people and other stakeholders in its co-creation. Behavior change functions from the Behavior Change Wheel were adopted to analyze the expected changes in intermediate factors of capability, opportunity, and motivation.<br>**Sample:** 13 public/internship schools in the Region of Southern Denmark. These schools were divided into two groups: the intervention group and the active control group. Through school principals and/or teachers, participants were recruited from students aged 15 to 18 years. Students and parents received an information leaflet about the study and were asked to indicate their willingness to participate within two weeks. |
| Results and Conclusions | Self-efficacy to refuse alcohol consumption increased in both the intervention and control groups over time, but no significant differences were found between the groups. Other outcomes, such as communication skills and social support, remained unchanged. Most participants did not report adverse effects from participating in the study. |

Source: Authors (2024).

**Table 8** – Summary of Study P3.

| Objectives | Evaluate the effects of the selective alcohol use prevention program, PreVenture, on high-risk adolescents. Investigate the long-term durability of the program effects, with assessments conducted after 5.5 and 7 years. |
|---|---|
| Methodology | **Type of study**: Cluster Randomized Controlled Trial in Australian schools, where four study groups were randomly assigned in two waves. Schools were randomly assigned to the intervention or control group by a statistician not involved in the study.<br>**Sample**: 438 - 8th grade students (average age 13.4 years) attending schools in Australia in 2012. This sample was part of a larger clinical trial involving 2190 students from 26 schools. The study focused on students with high levels of any of the 4 personality traits (anxiety sensitivity, negative thinking, impulsivity, and sensation seeking) in schools designated to receive the PreVenture intervention (n = 7) or the active control group (n = 7). Participants were asked about gender identity, with options for male, female, non-binary/gender fluid, or other. Data on race and ethnicity were not specifically collected, although participants were asked about their country of birth. |
| Results and Conclusions | The study showed that the PreVenture intervention was associated with a sustained reduction in the likelihood of experiencing any alcohol-related harm over the 7-year follow-up. Additionally, compared to the control group, PreVenture was associated with a greater reduction in the average frequency of alcohol-related harms over the 7 years. Sensitivity analyses also confirmed the effectiveness of PreVenture in reducing excessive alcohol consumption and harmful alcohol use in an assessment conducted after 5.5 years. |

Source: Authors (2024).

The selected articles were chosen according to inclusion and exclusion criteria defined during the research. These articles are primary and follow a quantitative methodological approach. Among them, studies B1, B2, and B4 are classified as cross-sectional observational studies, while P1, B4, P2, and P3 are randomized clinical trials. Additionally, study B3 is

characterized as a quasi-experimental study. Regarding the context, the studies were conducted in schools, involving students aged 12 to 19 years attending these institutions. The sample size of participants ranged from 64 to 5994, and the sample size of schools ranged from 13 to 26.

The articles cover various geographic areas, including Spain, Thailand, Mexico, England, Denmark, and Australia. This diversity allows for the analysis of information related to the topic in countries with different cultures and values.

The analysis of the selected studies reveals several correlations and common themes that interconnect, providing a more comprehensive view of alcohol consumption among adolescents and interventions to mitigate it. Here are some correlations and general insights extracted from the results:

**Prevalence of Alcohol Consumption**

**High Prevalence:** Studies B1 (Seychelles) and B2 (Thailand) show that a significant proportion of adolescents consume alcohol. In Seychelles, almost half of the students reported alcohol consumption (47.6%), while in Thailand, 22.2% of adolescents currently consumed alcohol.

**Risk Factors:** Factors such as older age, tobacco use, lack of parental support, and risky behavior are consistently associated with alcohol consumption in both studies. These risk factors are reinforced in other studies, such as P3 (PreVenture) and P2 (VR FestLab).

**Effectiveness of Interventions**

**Direct Interventions:** Nursing interventions through peers (B3) and virtual reality programs (P2) showed effectiveness in reducing alcohol consumption and promoting self-efficacy to refuse alcohol. However, the sustainability of the effects varied, with some positive effects not maintained in the long term (P2).

**Web-Based Interventions:** Study B4 demonstrated that web-based interventions, like the Alerta Álcool program, are cost-effective and effective, especially for specific subgroups such as girls and older adolescents.

**Personalized Interventions:** Study P3 (PreVenture) indicated that interventions targeting specific personality traits could have long-lasting effects, highlighting the importance of personalized strategies for high-risk adolescents.

**Limitations and Methodological Considerations**

**Cross-Sectional Nature:** Many studies (B1, B2, B4) are cross-sectional, which prevents determining causal relationships. This is a significant limitation, as it is not possible to assert whether the identified risk factors cause alcohol consumption or are consequences of it.

**Self-Report Bias:** Several studies rely on anonymous self-reporting (B1, B2, P1), which can introduce bias in underreporting or overreporting alcohol consumption behaviors.

**Cultural Diversity:** The geographic diversity of the studies (Spain, Thailand, Mexico, England, Denmark, Australia) allows for observing how cultural and contextual factors influence alcohol consumption patterns and the effectiveness of interventions. However, this diversity may also limit the generalization of the results.

**Public Health Implications**

**Importance of Parental Support:** The lack of parental support is a recurring risk factor (B1, B2), underscoring the need to include parents and guardians into prevention interventions.

**Combination of Approaches:** The results suggest that combining different types of interventions (technology-based programs with personal support and social norm interventions) may be more effective in addressing the various factors influencing alcohol consumption among adolescents (P2, P3).

**Sustainable Interventions:** For interventions to have a long-term impact, continuous follow-up and a multifaceted approach that includes education, psychological support, and behavioral changes are necessary.

The study results reveal a complexity of factors associated with alcohol consumption among adolescents, emphasizing the need for diversified and comprehensive interventions to address this public health issue. The selected studies indicate a high prevalence of alcohol consumption among adolescents, varying significantly across different geographic and cultural contexts.

For instance, study B1, conducted in Seychelles, revealed that almost half of the adolescents reported current alcohol consumption, with many experiencing alcohol intoxication and related problems. Factors such as older age, parental tobacco use, school absenteeism behaviors, and lack of parental support were strongly associated with alcohol consumption. Similarly, study B2 in Thailand found a significant prevalence of alcohol consumption, highlighting influences such as psychological distress, tobacco use, school absenteeism, and severe injuries. Both studies emphasize the need for interventions that consider multiple risk factors to be effective.

In contrast, study P1 did not demonstrate significant benefits of brief interventions (PFBA and eBI) in reducing alcohol consumption among low-risk adolescents. However, it highlighted the importance of addressing issues such as age, initial alcohol consumption, and positive expectations related to alcohol, suggesting that more intensive or prolonged interventions may be necessary for this specific group.

Study B3, conducted in Mexico, revealed that nursing interventions through "interconnected" peers are effective in promoting self-efficacy and reducing alcohol consumption, with sustained benefits in the long term. This finding is relevant for prevention programs in school settings, highlighting the effectiveness of participatory educational strategies directly involving adolescents. Similarly, study P2 in Denmark, using virtual reality (VR FestLab) to strengthen refusal capacity for alcohol, showed positive results, although not significantly long-lasting, indicating the need to combine technology with other preventive approaches.

Additionally, the cost-effectiveness analysis of study B4 in Spain demonstrated that web-based interventions, such as the Alerta Álcool program, are not only effective but also economically viable in preventing excessive alcohol consumption. This finding has important implications for public health policies, suggesting that implementing technological programs can be an effective and efficient strategy.

Finally, study P3 in Australia highlighted those selective interventions based on personality traits, such as the PreVenture program, can have long-lasting effects in reducing alcohol-related harms among high-risk adolescents. This underscores the importance of personalized and evidence-based interventions, identifying that these approaches can have sustained positive impacts over time.

## 4. Discussion

The analysis of the presented studies reveals a complex and multifaceted landscape regarding alcohol consumption among adolescents and the various intervention approaches. The methodological diversity and distinct cultural contexts provide a comprehensive view of the factors influencing alcohol use and the prevention and mitigation strategies adopted in different regions.

Portugal ranks 8th among the highest alcohol consumers in Europe and is among the ten countries with the highest per capita consumption in the world. Alcohol consumption is the 5th leading risk factor contributing to the loss of healthy life years in Portugal (DGS, 2015). It is estimated that there are over half a million chronic alcoholics in the country, with an average daily mortality related to alcohol of 20 people (SICAD, 2019).

Research conducted in school settings indicates that in many countries, alcohol consumption begins before the age of 15, with little difference between sexes (WHO, 2018). In Portugal, the initiation of alcohol consumption primarily occurs between ages 13 and 15, below the legal minimum age, and is considered a natural and expected experience by youths, which is concerning in the school environment (SICAD, 2014).

According to the Health Behaviour in School-aged Children (HBSC/WHO) study conducted in 2018, 20.7% of adolescents had consumed alcoholic beverages for 20 days or more during their lives (Matos & Equipa Aventura Social, 2018). Alcohol abuse during adolescence can lead to brain damage and neurocognitive deficits due to the immaturity of the biological system at this stage, affecting intellectual development and youth health (Moutinho, 2018).

Alcohol consumption and abuse have significant consequences at individual, family, and social levels, making it a current public health issue, especially when associated with adolescence (Barroso, 2012). These studies also emphasize the importance of understanding different trajectories of alcohol consumption throughout adolescence.

Jackson et al. (2015) identified a relationship between alcohol consumption and adolescent age, where earlier consumption is associated with a higher risk of future abuse. Recognizing and monitoring adolescents' consumption trajectories is crucial for implementing appropriate strategies that address the specific needs of each group. Adolescence is a critical period for health promotion interventions, and investing in this area is essential, as adopting healthy lifestyles brings medium- and long-term benefits (Caldeira, 2015).

Health education in school contexts is a strategy that empowers the community, providing control and autonomy over their health, with the aim of improving it (DGE/DGS, 2017). Knowledge and awareness of the negative consequences of alcoholism are fundamental for youths to interrupt this behavior (Moutinho, 2018).

Study B1 revealed that almost half of the students from the middle school in the Seychelles are currently consuming alcohol, with a similar proportion between sexes. Additionally, a significant portion of students had been drunk, were frequent consumers, and faced alcohol-related problems. Factors such as older age among adolescents, parental tobacco use, school dropout, injuries, and lack of parental support are associated with alcohol consumption. No significant differences between sexes were found. The results emphasize the need for preventive approaches and interventions that consider multiple factors to prevent alcohol abuse among youths.

The results from article B2 align with those found in article B1, which revealed that over 20% of school-aged adolescents in Thailand have problematic alcohol consumption and related issues. Factors such as older age, psychological distress, tobacco use, daily soft drink consumption, school dropout, involvement in physical fights, and severe injuries are associated with alcohol consumption. No significant differences between sexes were found in these indicators. Parental support was shown to be protective against alcohol-related problems. These results highlight the importance of addressing these risk behaviors in an integrated manner, with a view to prevent and controll alcohol use and abuse among adolescents.

According to Paiva et al. (2015), socioeconomic conditions, assessed by family income and parental education, low social class, high frequency of alcohol consumption by friends and peers, attending public schools, and mothers with incomplete high school education, were associated with a higher probability of alcohol consumption.

Therefore, it is recommended that prevention and intervention programs comprehensively address alcoholism, highlighting the importance of parental support, in addition to considering all other identified risk factors. It is necessary to address these risk behaviors collectively to prevent and control alcohol use and abuse among adolescents.

Analyzing the effectiveness of different interventions in adolescents, according to study B3, results demonstrated that the "interconnected" intervention had a positive impact on reducing alcohol consumption in adolescents, increasing self-efficacy to refuse consumption. The approach was effective both in the short and long term, maintaining effects over 36 weeks post-intervention. This strategy can be implemented in schools from the middle school, contributing to health promotion and reducing social problems associated with alcohol consumption in this age group. The active involvement of nurses in the educational process proved feasible and effective, providing adolescents with protective resources against alcohol consumption.

A study conducted in Portugal in 2010 also analyzed the influence of peers on alcohol consumption, highlighting the importance of peer perception in adolescents' alcohol use. Therefore, the study suggests that prevention programs should include correcting perceptions about peers' habitual alcohol consumption to reduce the risk of alcohol use/abuse among adolescents (Barroso et al., 2010).

Peer influence plays a significant role in youth risk behavior (André et al., 2020). Additionally, several predominant causes of alcohol use can be mentioned, such as the influence of friendships, media, be part of festive events, with curiosity being the main factor stimulating this consumption (Anjos et al., 2012).

According to Benincasa et al. (2018), Brazilian adolescents cite being with friends, seeking social acceptance, attempting to avoid or alter negative emotions, and their environment as the main reasons for alcohol consumption. The perception of high support from friends or good relationships are determinants increasing the likelihood of alcohol abuse influenced by peer groups.

These results highlight the importance of peer-based interventions and the crucial role of nurses in health promotion among adolescents. Overall, the results indicate that "interconnected" interventions can be an effective strategy to reduce alcohol consumption and promote healthy behaviors among adolescent groups.

Study B4 analyzed the effectiveness of a computer-based personalized intervention in reducing excessive alcohol consumption among adolescents. Significant differences were observed before and after the intervention concerning alcohol consumption. The analysis demonstrated that the intervention was cost-effective and advantageous in preventing episodes of excessive alcohol consumption. The intervention proved more effective for females and older adolescents.

A study conducted in Wales analyzed a computer-based online intervention for alcohol abuse and found that the online intervention was associated with significant improvements in the severity of alcohol use symptoms compared to the control group. Participants who received the intervention showed significant improvements in reducing alcohol abuse compared to the control group (Deady et al., 2016).

These results reinforce the importance of implementing personalized interventions in the technology field, such as computer-based approaches, in preventing excessive alcohol consumption among adolescents. This approach proves effective not only in reducing alcohol consumption but also in improving symptoms related to alcohol abuse. They provide valuable guidelines for developing public health policies aimed at addressing this issue. Therefore, it is crucial to invest in personalized and accessible intervention programs to help protect adolescents' health and well-being concerning alcohol consumption.

Study P2, conducted in Denmark, evaluated the effectiveness of VR FestLab, a virtual reality simulation game aimed at preventing alcohol consumption among adolescents. Virtual reality proved to be a promising tool to intervene in adolescent behavior, highlighting the importance of innovative approaches in health promotion. The VR FestLab intervention

demonstrated the value of a more interactive and engaging educational approach to involve youths and raise awareness about the risks associated with alcohol consumption.

These results suggest that virtual reality-based interventions can be a powerful tool in educating and preventing alcohol consumption among adolescents, offering an innovative and effective alternative to traditional approaches.

The reviewed studies underscore the importance of addressing alcohol consumption among adolescents in a comprehensive and integrated manner, considering individual and contextual risk factors. Innovative interventions, such as virtual reality and personalized technologies, appear promising in promoting health and reducing alcohol consumption among youths. The active participation of nurses in implementing these strategies is crucial to ensure their success and sustainability.

## 5. Conclusion

The critical analysis of the results from the selected studies in this review revealed valuable insights into the essential role of nursing interventions in preventing alcohol consumption among adolescents. It became evident that educational and interactive approaches, such as group discussions and practical activities conducted by nurses and other health and education professionals, are effective in increasing adolescents' awareness of the risks associated with alcohol and promoting healthy behaviors.

Furthermore, the active involvement of parents and families plays a crucial role in preventing alcohol consumption among adolescents. By enabling open communication and providing guidance on clear limits related to alcohol consumption, families can significantly contribute to reducing the harms associated with alcoholism in this age group.

It is also important to recognize the impact of regulations, such as laws restricting the sale of alcohol to minors, on reducing the availability and access of alcohol to adolescents. Implementing access restrictions can help reduce the risks associated with alcohol consumption among young people.

Therefore, nursing interventions, in collaboration with families, communities, and other health professionals, have the potential to mitigate the harms caused by alcohol abuse and promote adolescent health in the long term. Future studies are recommended to include more diverse and representative samples, use robust data collection methods, and conduct long-term follow-ups to assess the ongoing effectiveness of interventions.

It is also advisable to implement prevention programs starting at earlier ages and continuing throughout adolescence, considering multiple risk factors and providing comprehensive support, including the use of digital technologies as a complement to traditional approaches. These recommendations aim to maximize the impact of interventions and promote the health and well-being of adolescents on a global scale.

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