Biopsychosocial impacts of alcohol abuse: Integrative review

Aline Souto Ribeiro[1], Beatriz Majella Binato[2], Danielle Galdino de Paula[3] and Raisa Duarte da Silva Ribeiro[4]

ABSTRACT

Based on the premise that alcohol use is a complex, multifactorial issue of great relevance to society, it is understood that there is no simple and universal answer that can account for all the problems involved in drug use and arising from it. To identify and analyze biopsychosocial factors in alcohol users, an integrative review was carried out based on articles available in the VHL online search portals, being listed: PubMed and Scielo. The initial search identified 202 publications on the subject, and 18 articles that met the objectives of the study were listed, based on the inclusion criteria. The lexical analyses, carried out with the Iramuteq® program, highlighted the proximity between words and classes, evidencing a significant distribution in the textual corpus, revealing two groups: Group 1: Biopsychosocial factors and alcohol consumption: behaviors associated with gender and age group and; Group 2: Early alcohol consumption: early approach x long-term consequences. The reviewed studies demonstrate a greater association with risk behavior and psychological disorders in women who use alcohol and; abusive consumption of alcohol experienced by children and adolescents, with this problem having a direct relationship with culture and social context.

Keywords: Adult, Alcohol Consumption, Alcohol Abuse Disorder, Biopsychosocial Models, Alcohol Use Disorders.

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[1] Highest degree: Undergraduate student in nutrition
Academic institution: Federal University of the State of Rio de Janeiro - UNIRIO
[2] Highest degree: Undergraduate student in nutrition
Academic institution: Federal University of the State of Rio de Janeiro - UNIRIO
[3] Highest degree: Doctor of Nursing.
Academic institution: Federal University of the State of Rio de Janeiro - UNIRIO
[4] Highest degree: Doctor in Contemporary Legal Theories
Academic institution: Federal University of the State of Rio de Janeiro - UNIRIO

INTRODUCTION

In recent years, a growing number of studies on the challenges and care related to individuals who use alcohol and other drugs have resulted in a greater understanding of the health care needs of these population groups and the challenges they face in achieving/maintaining good health and access to care. However, many gaps in knowledge remain, particularly related to the biopsychosocial impacts on alcohol users   (Khamis et al., 2022)

As it is a substance allowed in Brazil, a challenge for health professionals is to be able to define the boundaries between habitual and problematic consumption, since the intake of alcoholic beverages is a complementary part of social life. Thus, to study the topic of alcohol is also to present a context about society, since the act of drinking is a social act. This is because human beings have always sought, over time, ways to increase their pleasure and reduce their suffering.   (BASTOS et al.   , 2017)   (Borges; Lyra; Diniz, 2019)

There are two universal systems used to define problematic conditions in relation to alcohol use. The International Classification of Diseases (ICD-11), made by the World Health Organization (WHO), differentiates 'episode of harmful use of alcohol', 'pattern of harmful use of alcohol' and 'alcohol dependence', and, in this order, represent an increasing progression of alcohol intake. (WHO, 2024)

Alcohol and other drug abuse has adverse consequences, including physical and mental health problems. Adherence to treatment can be hampered by personal resistance and inadequate support from health services. Despite the socialization character, the consumption of alcoholic beverages, when abusive, can generate social problems. Thus, more than the proposition of prescriptive strategies, it is necessary to develop protection, prevention and welcoming mechanisms that support users in a situation of dependence through interventions that encourage healthy and quality life choices, demystifying the false idea of autonomy provided by psychoactive substances (de Faria et al., 2024)   (Moura et al., 2018)

It can be said that the biopsychosocial impacts on the life of alcohol users is a complex subject that is not yet fully understood. Therefore, this study aims to identify and analyze biopsychosocial factors in alcohol users through an integrative review, so that, later, the authors can assist in the search for existing gaps in scientific knowledge.

METHODOLOGY

The present study is an integrative literature review carried out in six stages. This type of review allows for a broad understanding of the subject, with the objective of gathering and synthesizing scientific information in a systematic way on a given topic   (Mendes; Scott; Galvão, 2008)

The review protocol is registered in the OSF Registries under link DOI 10.17605/OSF. IO/XM76Q.

The research protocol was outlined, guided by the research question, which was built based on the mnemonic PCC, whose Population (P) = adult individuals; concept (C) = alcohol users; context (C) = biopsychosocial impact.

Based on the PCC acnemonic acmnemonic, the following research question was asked: What are the biopsychosocial impacts on alcohol users reported in scientific articles?

The search was carried out in April 2024 by two independent researchers with the descriptors defined by the PCC mnemonic, from the Health Sciences Descriptors (Decs/Mesh) portal, used in isolation and combined through Boolean operators "AND" and "OR". The searched database was carried out through the Virtual Health Library (VHL). Thus, the identified articles were compiled from the Latin American and Caribbean Literature on Health Sciences (LILACS) and Medical Literature Analysis and Retrieval System Online (MEDLINE). To obtain access to the articles, the Capes Journal Portal and the Federated Academic Community service (Capes Cafe) were used. Mendeley® software was used as a reference management tool.

In the second stage of the research, inclusion and exclusion criteria were defined. Full articles published in journals with human limit criteria, referring to the period from 2019 to 2024, in Portuguese, English, and Spanish, whose study population was composed of individuals aged 18 years or older and alcohol users, were included. Texts that are not scientific articles, review articles, prevalence articles, and studies with the child population were not included in the selection. Figure 1 shows the article selection process.

Figure 1. Flowchart of the process of identification, selection, election, and inclusion of articles, Rio de Janeiro, RJ, Brazil, 2024.
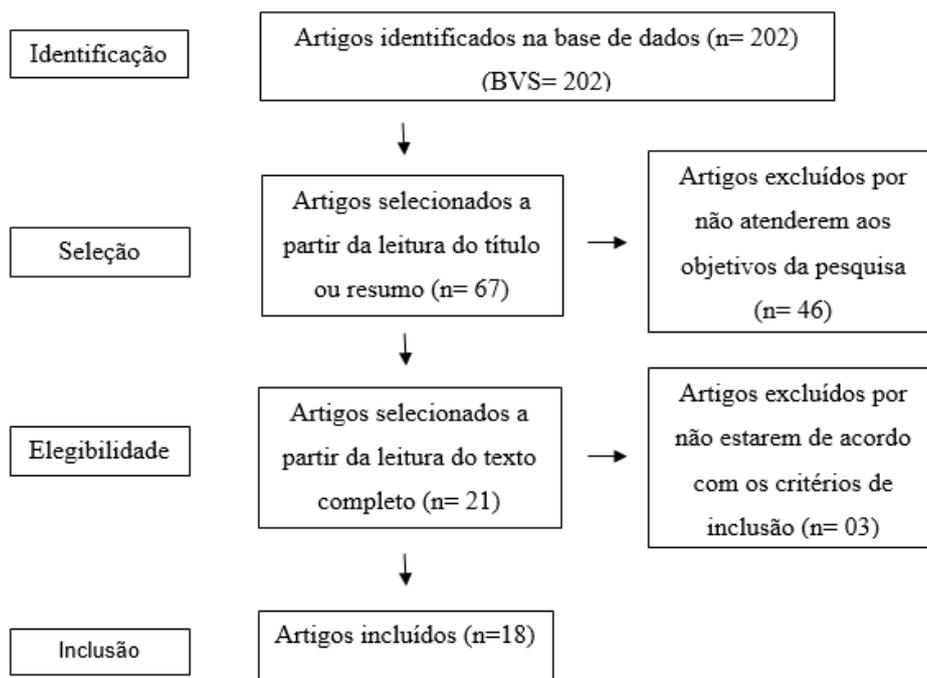
Source: authorship.

In the third stage, the authors prepared a table containing the main information of the selected articles. Thus, a database was created with the title of the article, year of publication, journal of publication, and objective of the study (Chart 1).

In the fourth stage, the level of evidence of the studies was independently assessed by three researchers. The level of evidence was defined as follows: Level I: meta-analysis/systematic review; II: randomized controlled clinical trial; III: controlled clinical trial without randomization, IV: well-designed case-control or cohort study; V: systematic review of qualitative and descriptive studies, VI: descriptive or qualitative studies, and VII: opinion of authorities or expert reports. The results of this screening are shown in Chart 1.

Table 1. Summary of the articles listed according to title, journal of publication, year of publication and level of evidence, Rio de Janeiro, RJ, Brazil, 2024.

Article Title	Journal and year of publication	Objective of the study	Level of evidence
The Course of Cognitive Performance during Inpatient Treatment in Patients with Alcohol Use Disorder with No, Mild or Major Neurocognitive Disorders (Bruijnen et al., 2021)	Alcohol and Alcoholism, 2021	OBJECTIVE: To investigate the course of cognitive performance and everyday cognitive functioning in patients with alcohol use disorder (AUD) who were admitted to a specialized center.	VI
Longitudinal changes in alcohol use and binge-drinking among young-adult	Addictive Behaviors,	highlight the importance of longitudinal research on	IV

college students: Analyses of predictors across system levels (Haardörfer et al., 2021)		alcohol use behaviors among young college adults, emphasizing the need to identify risk factors and guide interventions to reduce binge drinking.	
Latent Profile Analysis of Heavy Episodic Drinking in Emerging Adults: A Reinforcer Pathology Approach (Minhas et al., 2020)	Volume 112,	To focus the study on heavy episodic alcohol consumption (HED) in emerging adults (18 to 25 years), investigating its diversity in concomitant use of other substances and psychopathology.	VI
Use of alcohol and other psychoactive substances by university psychology students (Pires et al., 2020)	2021	to evaluate the pattern of use of alcohol and other psychoactive substances (SPAs) in university students.	VI
Adverse Childhood Experiences are Associated with High-Intensity Binge Drinking Behavior in Adulthood and Mediated by Psychiatric Disorders (Jung et al., 2020)		to investigate the relationship between adverse childhood experiences (ACEs) and high-intensity alcohol abuse (HIBD), with results suggesting an association between ACEs and HIBD, possibly mediated by psychiatric disorders.	VI
Sleep-related functional impairment as a moderator of risky drinking and subsequent negative drinking consequences in college students (Goodhines et al., 2019)		Investigating sleep impairment affects the relationship between risky drinking and negative consequences, highlighting the importance of considering sleep in research and interventions related to alcohol consumption in college students.	VI
Binge drinking in adolescence predicts an atypical cortisol stress response in young adulthood (Hagan et al., 2019)	Alcoholism: Clinical and Experimental Research, 2020	To examine the prospective effects of alcohol abuse during the adolescence on stress reactivity, as measured by cortisol, in young adulthood, especially in individuals who experienced parental divorce in childhood.	VI
Ethnicity in Substance Abuse Journal (Chomsri et al., 2019) **3.**	Psychology, Science and Profession, 2020	explore the prevalence of substance use, the level of risk, and psychosocial and behavioral factors, especially related to binge drinking.	VI
Differences in the relation of binge drinking and prescription drug misuse to suicide ideation and attempts between college-aged adults and adults above the age of 25: Findings from the 2015–2019 National Survey on Drug	Alcohol and Alcoholism, 2020	Clarify the role of age in the risk associated with drug misuse and excessive alcohol consumption.	IV

Use and Health (NSDUH) (Porter; Carrasquillo; Ashrafioun, 2024)			
Exploring the associations between serious psychological distress and the quantity or frequency of tobacco, alcohol, and cannabis use among pregnant women in the United States . (David et al., 2023)	Addictive behaviors, 2019	To examine the relationship between severe psychological distress and the amount or frequency of substance use among pregnant women in the United States.	IV
Mental health, substance use, and risky sexual behaviors among women living with HIV (Deaterly et al., 2023)	Psychoneuroend ocrinology, 2019	To analyze a cohort of women living with HIV in Florida on the aspects of sexual behaviors, substance use, and mental health symptoms.	IV
Alcohol Misuse, Binge Drinking, and their Associations with Psychosocial Factors during COVID-19 among Harlem Residents in New York City . (Vu et al., 2023)	Journal of Ethnicity in Substance Abuse, 2019	To examine the prevalence of alcohol misuse and binge drinking and their associations with psychosocial factors such as substance use, severity of depression symptoms, and perception of community policing during COVID-19.	VI
Age- and Sex-Varying Associations Between Depressive Symptoms and Substance Use from Modal Ages 35 to 55 in a National Sample of U.S. Adults (Patrick et al., 2023)	Journal of Psychiatric Research, 2024	To examine associations between depressive symptoms and alcohol, cigarette, and marijuana use in US adults aged 35 to 55 years, overall and by sex.	IV
Past-month binge drinking and cannabis use among middle-aged and older adults in the United States, 2015–2019 (Kepner et al., 2023)	Preventive Medicine, 2023	To estimate national trends among older adults reporting binge drinking and cannabis use in the past month and to examine their correlations.	IV
Person-centered patterns of substance use during the COVID-19 pandemic and their associations with COVID-related impacts on health and personal finances in young Black and White women . (Chung et al., 2022)	Journal of nursing scholarship, 2023.	Identify subgroups with respect to substance use patterns before and during the COVID-19 pandemic and establish possible associations.	IV
Alcohol use associated with mental disorders in adult men (Molina et al., 2022)	Journal of Urban Health, 2023	To identify alcohol use in adult men and verify its association with socioeconomic and demographic factors and mental disorders	VI
Correlates of mild, moderate, and severe Alcohol Use Disorder among adults with problem substance use: Validity implications for DSM-55 (Mannes et al., 2021)	Prevention science, 2023	To examine clinical and functional characteristics as predictors (validators) of mild, moderate, and severe severity levels for alcohol use disorder, based on the DSM-5.	IV
Binge drinking among Hispanic older adults: 2015-2019 (Yockey, 2021)	Alcohol, 2023	To examine correlations with binge drinking among a national sample of older Hispanics.	IV

Source: authorship.

The fifth stage consisted of interpreting the results. Initially, a database was created with the methodology and the main results of the articles selected to run in the Iramuteq® program, which provided important tools for subsequent analysis.

Finally, in the sixth stage, the results were presented.

RESULTS

18 articles were selected, 16 articles (88.89%) in English and 2 articles (11.11%) in Portuguese. Of these, the publications are in 2023 (n=5, 27.78%), followed by 2021 (n=4, 22.22%), 2020 (n=3, 16.66%), 2019 (n=3, 16.66%), 2022 (n=2, 11.11%) and, finally, 2024 (n=1, 5.55%). Regarding the countries where the studies were published, there were 2 (11.11%) in Brazil, 1 (5.55%) in the Netherlands, 1 (5.55%) in Thailand and the remaining 14 (77.77%) in the United States, and 1 of these articles was also carried out in Canada.

Regarding the methodology used in the studies, 9 articles (50%) used the well-designed case-control or cohort method, 9 articles (50%) used the descriptive and qualitative methods. Regarding the level of evidence, it was noted the frequency of 9 articles at level IV: well-designed case-control or cohort study (n=9, 50%), 9 articles at level VI: descriptive or qualitative studies (n=9, 50%). Based on the studies listed, the Iramuteq® software was used to assist in the grouping of data. The general corpus consisted of 439 texts, separated into 18 text segments (TS) with a success rate of 58.89 ST (70.62%). In the present study, the corpus was divided into two *subcorpuses*. In the first, class 1 and 4 were obtained, which corresponded to 20% and 28% of the ECU, respectively. A second division into two *subcorpus* was constituted by classes 2 and 3 with 24% and 28% of the ECUs of the total corpus.

The CHD analysis of the active words produced four lexical classes divided into two large groups. Group A is formed by classes 1 and 4 and Group B was represented by classes 2 and 3. This result is demonstrated in the dendrogram, which also contains the list of the main active words by class. For each class, a list of words generated from the chi-square test ($\chi 2$) was computed. The words that had statistical significance (p_valor< 0.0001) were: "cigarette use", "marijuana use", as shown in figure 2.

Figure 2. Dendrogram with the percentage of ECU in each class and words with greater chi-square (χ2) provided by the Iramuteq® software, Rio de Janeiro, Brazil, 2024.
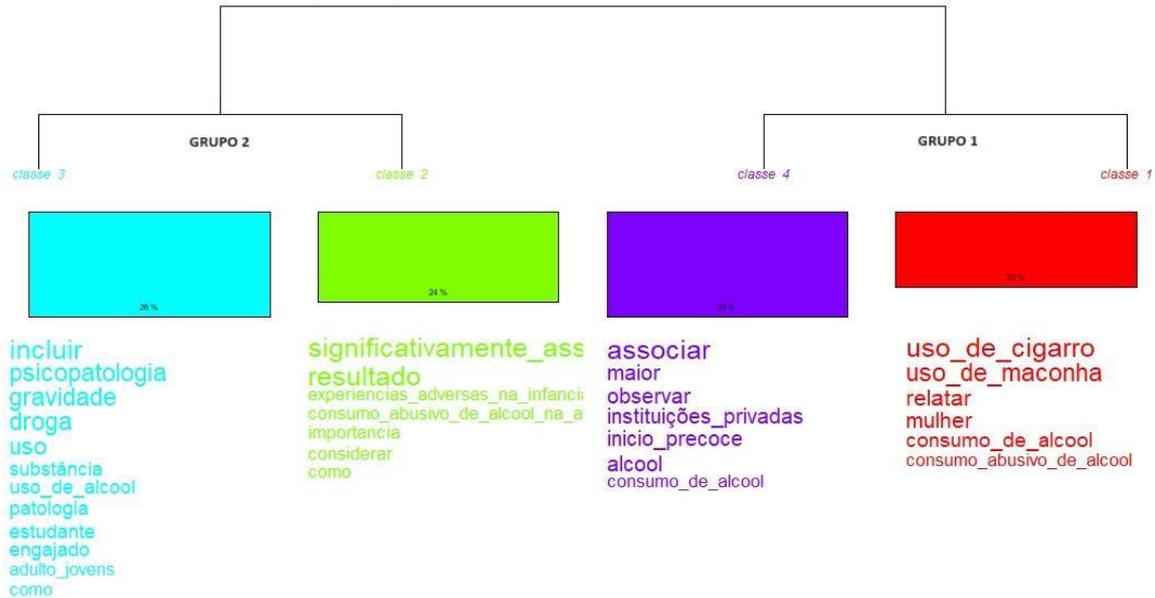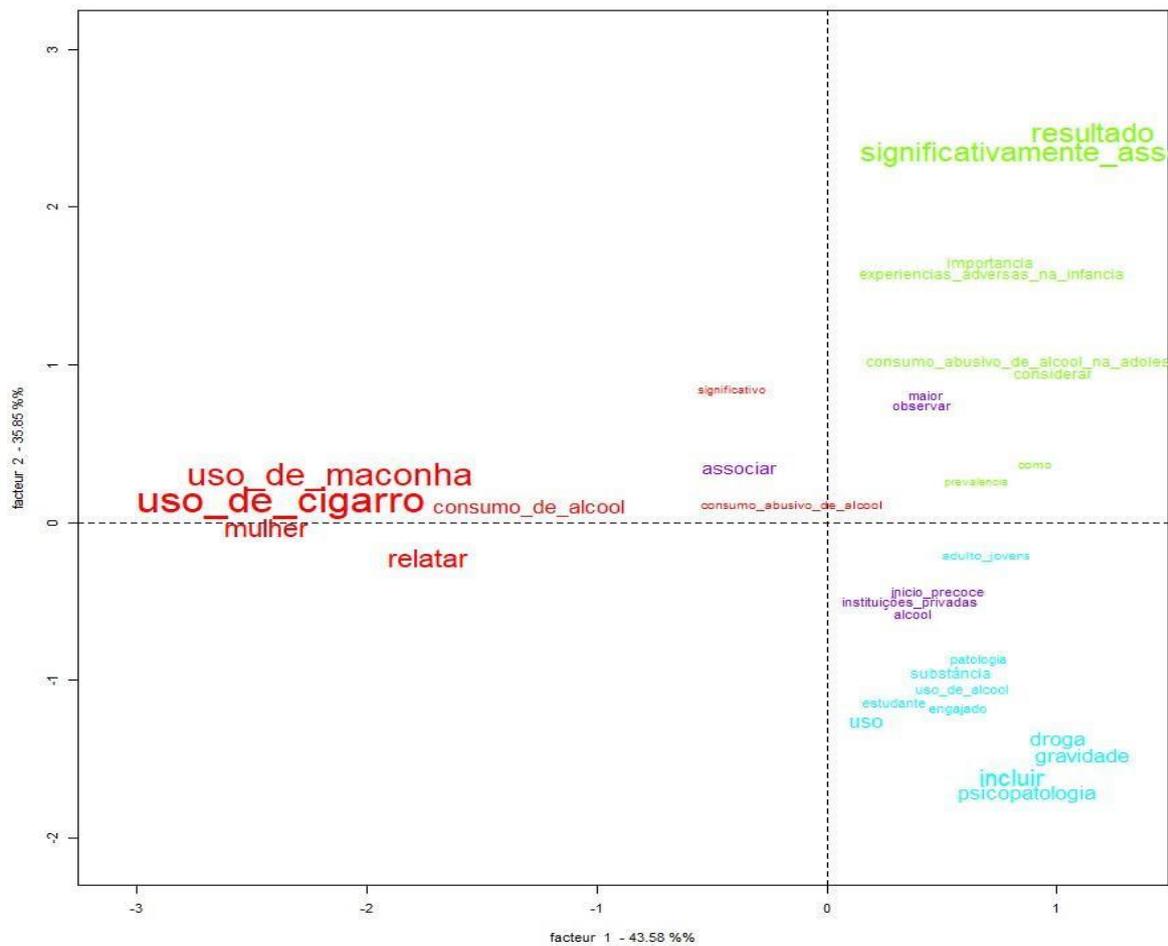

Source: authorship.

The lexical classes received the following nominations: group A) class 1 and 4: Biopsychosocial influences of substance use in different demographic/age groups and; group B) class 2 and 3: Impact of alcohol and psychoactive substance consumption on behavior and mental health: risk factors and long-term consequences.

In order to assist the categorization, the Correspondence Factor Analysis was performed, which made it possible to visualize the proximity of the words and classes from the DHC, presented in figure 3.

Figure 3. Correspondence factor analysis (CFA), Rio de Janeiro, Brazil, 2024.

Source: authorship.

There is greater central positioning of class 4 on the Cartesian axis. On the X axis, representing 43.58% of the distribution in the textual corpus, are class 3 and 4 (positive X axis) and class 1 is on the negative X axis. On the Y axis, representing 35.85% of the distribution in the textual corpus, are classes 1 and 2.

The combination of the two axes (X and Y), which offers a two-dimensional view, distinguishes the textual corpus into two lexical worlds. The first, lexical world, is mainly concentrated on the Cartesian axis, showing classes 1 and 4, which corresponds to the theme "Biopsychosocial factors and alcohol consumption: behaviors associated with gender and age group"; the second, containing the coordinates with positive X axis and negative Y axis, showing classes 2 and 3, corresponding to the theme "Impacts of alcohol consumption and behavioral factors: long-term consequences".

The lexical analyses, using Iramuteq®, allowed to discriminate the predominant argumentative tendencies on the research question "What are the biopsychosocial impacts on alcohol users reported in scientific articles?" from the texts listed in the research, as well as to analyze the interrelations between them. All lexical analyses were considered robust, as they complied with the

previously established methodological requirements and helped in the discussion of the present study, developed in the discussion of the present study.

DISCUSSION
GROUP 1: BIOPSYCHOSOCIAL FACTORS AND ALCOHOL CONSUMPTION: BEHAVIORS ASSOCIATED WITH GENDER AND AGE GROUP

The discussion of the findings of Group 1, which comprises Classes 1 and 4, reveal crucial aspects about the relationship between the consumption of alcohol (and other substances) and risky sexual behaviors, as well as psychological disorders, such as depression and anxiety. Analysis of these classes offers *significant insights* into different demographic groups, especially women and older adults.

The studies highlighted in Class 1 indicate that the female population is particularly vulnerable to the adverse effects of alcohol consumption, which include risky sexual behaviors and psychological disorders. The association between alcohol use and unprotected sexual practice increases the risk of sexually transmitted infections (STIs). This finding is presented in a cohort study conducted in Florida (USA) with women living with HIV showed that excessive alcohol and marijuana consumption was associated with an increase in risky sexual behavior (Deaterly et al., 2023).

In addition, studies show that frequent use of alcohol, tobacco, and cannabis in women is related to severe psychological disorders (GDP), including during pregnancy. Data from the National Survey on Drug Use and Health (NSDUH) 2015–2019 reveal that pregnant women with GPD had higher rates of substance use, highlighting the severe consequences of alcohol use during pregnancy (David et al., 2023).

The Covid-19 pandemic exacerbated these problems, with social isolation and increased alcohol use enhancing episodes of depression and anxiety. Research that took place in New York City (USA) indicates that 39% of respondents started or increased alcohol consumption during the pandemic, with a significant percentage reporting frequent use (Vu et al., 2023). This increase in consumption during periods of crisis suggests the need for specific interventions to mitigate the effects of substance abuse on women.

Class 4 discusses substance use among middle-aged and older adults, highlighting a worrying trend of increased use of alcohol, tobacco, and cannabis in this population. Study shows that individuals with depressive symptoms, especially those between the ages of 35 and 40, are more likely to consume alcohol in excess. This correlation is consistent across the ages studied, reflecting the need to address mental health in an integrated way with substance use treatment (Patrick et al., 2023).

Among adults over 50, factors such as tobacco use, mental health treatment, and belonging to non-Hispanic and Black-skinned groups are associated with higher alcohol and cannabis consumption (Kepner et al., 2023). In addition, people of Hispanic origin over 50 years of age and cardiovascular diseases demonstrate harmful habits in relation to alcohol, with a higher abusive consumption among those with a higher education degree (Yockey, 2021).

These findings suggest that the aging of the population brings new challenges related to alcohol consumption. The increase in consumption among the elderly, who may not have a history of alcohol use at other stages of life, highlights the need for specific preventive and educational actions for this age group.

The analysis of Classes 1 and 4 reveal the complexity of the relationship between alcohol consumption and its biopsychosocial impacts in different demographic groups. Women and older adults are particularly vulnerable, and the Covid-19 pandemic has exacerbated many of these problems. Public health interventions should be targeted to address the specific needs of these groups, promoting awareness of the risks associated with alcohol consumption, and offering support for mental and physical health. The integrated and personalized approach can help mitigate adverse effects and improve the quality of life of these individuals.

GROUP 2: EARLY ALCOHOL CONSUMPTION: EARLY APPROACH X LONG-TERM CONSEQUENCES

Group 2, which encompasses articles from classes 2 and 3, is interconnected by the theme of early alcohol consumption and the risk of future dependence. These studies show that early alcohol use is associated with a drop in school performance, learning difficulties, impairments in the development and structuring of cognitive-behavioral and emotional skills in young people.

Class 2 articles focus primarily on the use of alcohol and other psychoactive substances among college students and adolescents. The results reveal that alcohol is the most consumed substance, followed by marijuana and tobacco, highlighting the need for prevention programs and public policies to regulate the consumption of substances in the university environment. In addition, it is crucial to offer healthy sociability alternatives to students (Pires et al., 2020).

The relationship between excessive alcohol consumption and sensation-seeking, moderate/high risk of smoking, and low school scores is evident. Problematic alcohol consumption during adolescence can have significant effects on the neuroendocrine stress-response system, impacting subsequent stages of development. This suggests that substance use during critical periods of development may have long-lasting effects on the neuroendocrine system, increasing biological vulnerabilities and the risk of future addiction (Chomsri et al., 2019).

Professionals who deal with adolescents must be prepared to properly assess alcohol abuse or dependence in this age group. However, it is important to highlight that the diagnostic criteria for alcohol abuse and dependence, developed for adults, should be applied with caution to adolescents. Therefore, it is essential that professionals know the characteristics of adolescence and the particularities of chemical dependence at this stage.

Class 3 articles address different populations, from adolescents to older adults, identifying correlations between alcohol consumption, psychiatric disorders, suicidal ideation, and stress response. This class highlights the importance of specific interventions for different age groups.

The impact of adverse childhood experiences, such as sexual, physical and verbal abuse, neglect and domestic dysfunction, was examined, showing how traumatic events can increase the risk of psychiatric disorders and substance abuse in adolescence and youth. These adverse experiences are associated with a higher likelihood of high-intensity alcohol abuse and play a mediating role in psychiatric disorders (Jung et al., 2020).

Among the predictors of excessive alcohol consumption, greater symptoms of attention deficit hyperactivity disorder (ADHD), early substance use, alcohol use by parents, attendance at private institutions, and rurality stand out (Haardörfer et al., 2021). The impact on mental health is a common factor among Class 3 articles, with alcohol consumption being associated with psychiatric disorders, suicidal ideation, and stress response.

Suicidal ideation was more prevalent among adults over 25 years of age compared with young people aged 18 to 24 years. Using data from the national survey on drug use and health (2015-2019), it was identified that risk behaviors significantly increase the likelihood of suicidal ideation and attempts in older adults, highlighting the importance of specific interventions for this age group (Porter; Carrasquillo; Ashrafioun, 2024).

The findings reinforce that the impact on mental health is a common factor, in line with research that associates substance use with psychiatric disorders and stress. These studies offer a crucial basis for understanding the patterns and predictors of alcohol and drug use over time (Mannes et al., 2021; Porter; Carrasquillo; Ashrafioun, 2024).

Cognitive assessment of patients with a history of chronic alcohol abuse indicates that neurocognitive disorders are not uncommon. It is strongly recommended to perform an extended neuropsychological assessment after a minimum of 6 weeks of abstinence, as this period appears to be sufficient for cognitive functioning to recover to baseline (Bruijnen et al., 2021).

In light of this, such an analysis helps to identify subgroups with distinct patterns of consumption and psychopathology, providing *insights* into how different populations may need specific interventions. These findings underscore the need for personalized and integrated approaches

to prevent and treat substance abuse and its associated impacts, especially considering the specific vulnerabilities of each age group and demographic group.

CONCLUSION

Comprehensive analysis of alcohol consumption in diverse population groups and contexts reveals the complexity and multifaceted nature of its impact on biopsychosocial health. Although the prevalence of alcoholism is higher among men, the reviewed studies highlight a significant association between alcohol consumption in women and risk behaviors, as well as psychological disorders.

A particularly worrying finding is the abusive consumption of alcohol among children and adolescents, which is closely linked to culture and social context. This early consumption of alcohol is associated with several negative consequences, such as a drop in school performance, learning difficulties, and impairments in the development and structuring of young people's cognitive-behavioral and emotional skills. Substance use during critical periods of development can have long-lasting effects on the neuroendocrine system, increasing biological vulnerabilities and the risk of future dependence.

In light of these findings, it is essential to adopt integrated and multidisciplinary approaches to dealing with problematic alcohol consumption. It is crucial to understand the patterns and predictors that influence this behavior over time to develop effective interventions specific to different age groups and demographic groups. Professionals who deal with adolescents, for example, must be prepared to properly assess alcohol abuse or dependence.

Thus, prevention programs and public policies are essential to mitigate the damage caused by substance consumption. These programs should focus not only on reducing consumption, but also on promoting healthy alternatives for sociability and psychological support, especially for vulnerable populations such as adolescents and women. Specific interventions, such as those aimed at university students, may include creating social environments that do not encourage alcohol consumption and implementing policies that limit access to psychoactive substances (Pires et al., 2020).

Addressing alcohol consumption holistically, understanding the multiple factors that influence this behavior, is critical to developing more effective and comprehensive intervention strategies. This includes considering cultural, social, and psychological aspects that contribute to alcohol use. Promoting a healthier and more resilient society requires a concerted effort by educators, health professionals, policymakers, and the community at large.

In summary, this analysis highlights the urgent need for focused, evidence-based interventions to address alcohol consumption. Better understanding the risk factors and biopsychosocial impacts of alcohol makes it possible to develop more effective policies and

programs to prevent substance abuse and promote a healthier society. Education about the risks of alcohol, along with access to support and treatment services, can make a significant difference in reducing the harms associated with alcohol consumption and improving the overall health and well-being of the population.

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