

The biopsychosocial impacts of alcohol consumption in the female population: A systematic review

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ABSTRACT

Objective: to evaluate the biopsychosocial impacts of alcohol consumption in women. **Methodology:** Systematic Literature Review, carried out in August 2023, using the online databases, PubMed and Medline, in the last five years, following the PRISMA protocol (2020). **Result:** alcohol consumption in the female population can lead to biopsychosocial impairments, culminating in clinical conditions focused on psychological suffering and diseases of the cardiovascular, neurological and hepatic systems, depending on the pattern of daily use. **Conclusion:** there was an increase in psychiatric conditions, neurological and liver diseases, cancers and cardiovascular diseases in women, due to alcohol consumption. This increase is worrisome, from the point of view of public health, more specifically women's health, since, physiologically, women are more sensitive to the effects of alcohol, compared to men, therefore, they are more likely to have negative consequences related to alcohol consumption.

Keywords: Women, Alcohol, Mental health.

INTRODUCTION

The harmful use of alcohol results in a significant burden for society as a whole, both economically and healthily, and its consumption is a causal factor in more than 200 diseases and injuries, among them we can mention mental and behavioral disorders, non-communicable diseases, cardiovascular diseases and injuries resulting from violence or accidents. Recent studies have shown that the phenotypes of genetic variation associated with increased alcohol use are related to higher risk behaviors, as there is evidence of alcohol and the involvement of related genes in the neurotransmission of glutamatergic drugs.

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In the health sector, impacts such as hospitalizations, treatment of diseases and deaths are the highlights in the family context, aggravating violence, unemployment and indirect impacts, such as decreased productivity, absenteeism and traffic accidents. In Brazil, the rates of alcoholic beverage consumers, in the last year, aged over 15 years are 40.3%. Data released by the Ministry of Health, which monitors, in addition to risk factors associated with chronic non-communicable diseases, the abusive use of alcohol, smoking, sedentary lifestyle and unhealthy eating, pointed to an increase in alcohol consumption, especially in younger women aged 18 to 24, from 14.9% in 2010 to 23% in 2019.

This change in panorama may be due to the change in lifestyle, the overload generated by a double shift and the increase in purchasing power. This trend is worrisome, since physiologically women are more sensitive to the effect of alcohol, compared to men, because they contain lower amounts of body water and enzymes, called gastric alcohol dehydrogenase, responsible for metabolizing alcohol and its metabolites, causing them to reach higher concentrations of alcohol in the blood.

Therefore, women are more likely to have negative consequences related to alcohol consumption, such as increased chance of developing breast cancer, decreased fertility, interactions with contraceptive methods, changes in sleep pattern, memory lapses, and other brain damage.

Alcohol consumption is also used socially to increase self-confidence and lead to greater social disinhibition, facilitating affective and sexual encounters, which have as consequences a decrease in the perception of risk, a greater propensity to practice unprotected sex, increasing the risk of sexually transmitted infections and early and unwanted pregnancy, exposing women to a greater risk of vulnerability to sexual relations and other types of violence. The objective of this article was to evaluate the biopsychosocial impacts of alcohol consumption on women.

METHODOLOGY

This is a systematic review of the literature addressing and relating the themes of women, alcohol and mental health. The survey was conducted in August 2023, using the online databases PubMed and Medline, for the last five years. The search descriptors for the terms woman, alcohol and mental health were combined using the Boolean operator AND. A total of 39 articles were found and only 10 that met the inclusion criteria were selected. Cross-sectional studies and review articles were eligible, 9 articles in English and one in Portuguese. The ten articles were indexed in the PubMed database.

The eligible articles that met the inclusion criteria were studies that had a direct link with the theme, original, cross-sectional articles and literature review articles, target audience adult women and published in the last five years. The exclusion criteria established were the articles that deviated from the scope of the research and that were repeated in the databases, public men and children.

This study was exempt from ethical review because it used previously published studies, and used the PRISMA protocol (2020) to carry out the systematic review, with the formulation of the guiding question, which was elaborated through the PICO strategy (population to be studied, intervention, control and outcome of the study), elaboration of the objective, search for studies, selection and review of studies, critical evaluation of the articles by three reviewers and selection of data to conduct the systematic review.

The analysis of the selected articles was carried out from the exploratory and critical reading of the material, being carried out by the researchers, using a table for the selection and choice of eligible articles and, in case of a tie, a third evaluator decided for inclusion or exclusion of the article. This analysis sought conceptual and methodological definitions and, thus, defined the best results obtained in the articles included in our study.

RESULTS

Of the 39 articles surveyed, a sample of 10 articles was obtained, which met the inclusion criteria. The number of authors of the articles varied from one to three authors. Regarding the databases, all 10 articles included were indexed in PubMed. The articles published were written in English and Portuguese. Of the 10 articles, one was a cross-sectional study and nine were literature review articles, with different levels of evidence.

Chart 1 presents data on the selected articles regarding the main author, year of publication, type of study, objective, main results and conclusion of the study.

Regarding the main results of the studies, it was noted that alcohol consumption by women can affect biopsychosocial factors, which can lead to psychological distress and diseases of the cardiovascular, neurological and hepatic systems, depending on the pattern of daily use.

Table 1: Presentation of the articles included in the systematic review, with their respective authors, year of publication, type of study, objectives, main results, and conclusion of the study

Author/ year	Type of study	Objective	Results	Conclusion
Silvestris, E, et al., 2019	Review Article	Review how lifestyle and nutrition can interact with women's reproductive health and how nutritional support can improve fertility	Alcohol use and its toxicity negatively affect fertility, but the mechanisms involved are not well defined	Protein balance, carbohydrates, lipids, antioxidant and folate in the diet provides Benefit for optimal female reproduction and reduces the risk of infertility



Junior, F, et al., 2020	Transverse	To analyze the relationship between the use of alcohol, other drugs and mental distress among women	Women with a pattern of heavy alcohol consumption are 2.1 times more likely to have mental distress	Alcohol, tobacco, tranquilizers, and cannabis are associated with mental distress. The more intense the consumption, the more intense the mental suffering
Hendricks, H. F. J., 2020	Review Article	Associating alcohol consumption and health, both in the beneficial and harmful aspects of alcohol abuse	Chronic alcohol consumption and abuse result in physical and mental damage.	Excessive alcohol consumption is associated with increased risk of liver disease, malnutrition, cardiovascular disease, pancreatitis, cancer, brain disease, and fetal alcohol spectrum disorder
Maddur, H. and Shah, V. H. 2020	Review Article	To evaluate alcohol consumption among women and associate it with liver damage, compared to men	Alcohol consumption increased among women. Safe habits such as not drinking daily and consuming less than 14 grams of alcohol per day should be recommended	Alcohol-related liver damage it is not linked to women, however educating women about the dangers of Alcohol is critical as they are more susceptible than men to liver damage
Guinle, M. I. B. and Sinha, R. 2020	Review Article	To address the roles of stress, trauma, childhood maltreatment, negative affect, mood and anxiety disorder, and their potential central and peripheral mechanisms for alcohol consumption in women	Greater exposure to stress, trauma, victimization, negative affect, and mood and anxiety disorders in women represented a risk of onset and development of excessive alcohol consumption	Early prevention and treatment can reduce alcohol consumption rates and morbidities, and increase alcohol recovery rates among women compared to men
Mulia, N. and Bensley, K. M. 2020	Review Article	Review the disparities related to alcohol and women and the mechanisms that give rise to inequalities in alcohol consumption among women	Women of low socioeconomic status, racial, ethnic, and sexual minorities are more likely to have alcohol-related health problems	Differences between social groups and socioeconomic disadvantages are related to alcohol consumption, especially in young women. Education is a factor that can modify this alcohol use disorder and improve the health of disadvantaged people

Finn, D. A. 2020	Review Article	To review the contribution of the endocrine system to alcohol consumption in women, focusing on the hypothalamic-pituitary-gonadal axis and the hypothalamic-pituitary-adrenal axis and their interactions	Alcohol consumption and the prevalence of alcohol use disorder in women increased, but there was a decrease in the difference between the sexes. Increased GABAergic Neurosteroids May Represent a Marker in Treatment in Both Sexes	Women consume alcohol more quickly and in higher doses compared to men, but withdrawal symptoms are lower in women than in men, which is due to the activation of sex steroids, which influence the stress response
McCrary, B. S., et al. 2020	Review Article	To describe the barriers faced to start treatment for women with alcohol consumption disorders and their characteristics	Women with alcohol use disorder face more barriers to treatment and are less likely to have access than men. The treatment exclusively for women showed better results than those made for men and women.	The mechanism of response to alcohol use disorder treatment differs between men and women and better outcomes are found in women, regarding biopsychosocial well-being, mental health, and reduced risk of contracting HIV
Fuchs, F. D. and Fuchs, S. C. 2021	Review Article	Examine the acute and chronic effects of alcohol on blood pressure and the incidence of hypertension	Men and women who consume moderate to high amount of alcohol are at higher risk of developing hypertension. Lower doses have shown protective effect on the cardiovascular system.	Acute alcohol consumption exerts a biphasic effect on blood pressure, promoting a reducing effect in the first 12 hours after ingestion and an increase after this time interval
Greaves, L., et al. 2022	Review Article	Synthesize the evidence on factors related to sex, the gender that is most affected, and the safest levels of alcohol consumption, with an emphasis on females	The female and male body responds differently to alcohol consumption, due to pharmacokinetic effects, which demonstrates large amounts of alcohol in women's blood and increased progesterone is associated with higher rates of alcohol elimination in women	Support and expand the development of guidelines on alcohol consumption and offer more differentiated and educational information for physicians and consumers, which will benefit women and girls

DISCUSSION

Alcohol consumption among women needs greater attention due to its accelerated growth, as well as its psychological, social, legal and economic consequences. Changes in lifestyle and ease of access have increased the use of the substance among women, which can make them vulnerable to situations of violence, thus favoring psychological suffering, which includes a combination of three groups of symptoms: sadness, anxiety and physical symptoms. Lifestyle factors also directly influence female



fertility, negatively affecting alcohol use and drug addiction, but the mechanisms involved are not yet well defined.

Psychosocial factors are attributed to the increased incidence of women in alcohol consumption, such as greater exposure to sexual abuse and domestic violence, increasing the likelihood of alcohol consumption to cope with these negative aspects.

Behavioral studies show that men tend to use alcohol to increase positive feelings and women in response to negative emotions. This is associated with the fact that depression and anxiety, which experience many negative symptoms, are more prevalent in women, which helps to justify the increase in alcohol consumption and abuse by this population.

Recent research suggests that the recent increase in alcohol consumption disorder among women is directly linked to stress, with acute or chronic endocrine alterations altering homeostasis, consequently affecting metabolism, reproduction and development, interfering with the ability of the female body to respond to changes in the environment and stress. These responses are mediated by the hypothalamic-pituitary-adrenal and hypothalamic-pituitary-gonadal axis. Therefore, alcohol consumption can influence the female endocrine system, as well as the existence of a reciprocal interaction between stress and reproductive axes.

Recent literature has reported higher rates of liver disease in women due to increased alcohol consumption on a regular basis. This increase is a primary concern, as women are more susceptible to the effects of alcohol-related liver damage compared to men.

According to the American Dietary Guidelines (2015–2020), moderate alcohol consumption is up to one drink for women and up to two drinks for men per day, which corresponds to 14 grams of alcohol per day on average for women and 28 grams for men.

The absorption of alcohol begins in the stomach, and most of it is absorbed in the intestine, reaching its maximum absorption between 30 and 40 minutes after ingestion. The concentration of alcohol in the blood will depend on several factors such as the dose consumed, sex and recent intake. Women achieve a higher blood concentration rate than men due to the lower overall body water percentage and average body weight compared to men. The elimination of alcohol is normally driven by specific alcohol oxidation enzymes, the most important and specific being alcohol dehydrogenase (ADH), which converts alcohol into acetaldehyde, which is highly toxic and converted by the enzyme acetaldehyde dehydrogenase (ALDH) into acetate. Acetaldehyde in high concentrations plays an important role in the development of several types of cancer, such as esophageal cancer, and alcohol-mediated hormonal changes play a role in the etiology of breast cancer in women.

Women have reduced amount of gastric ADH compared to men and therefore impairing metabolism, which results in increased susceptibility to injury. Gender differences in alcohol metabolism



by liver enzymes, such as cytochrome P450 2E1, are also demonstrated with lower levels in women, due to the regulation of growth hormone. The role of estrogen has also been studied and it has been found that the increased release of endotoxins related to the activation of Kupffer cells resulted in liver injury and necrosis. Such statements demonstrate that women are more susceptible to liver disease with less alcohol consumption, and that they have a faster progression to cirrhosis in a shorter period compared to men.

It has been shown that Caucasian women have greater chronic exposure to alcohol use, however, studies have documented genetic variants more prevalent among black people that affect alcohol metabolism, leading to the accumulation of acetaldehyde in the bloodstream, which generates more intense responses to alcohol consumption. Finally, women with low socioeconomic status are more exposed to the negative consequences of alcohol consumption, and people with greater resources and higher status are better able to protect themselves from the negative consequences of alcohol consumption.

Chronic alcohol consumption is associated with a high incidence of hypertension in both men and women; However, in women, the risk starts with moderate alcohol consumption. The mechanisms are still unknown, however, the indicated for the treatment of arterial hypertension is the reduction or cessation of alcohol use.

Eating disorders such as bulimia and anorexia also increase the possibility of further progression of liver damage, as well as obesity and high waist-to-hip ratio, leading to a worse prognosis when associated. Such statements can be explained by the overlap of nonalcoholic fatty liver disease coexisting with alcohol-related liver disease.

Regarding the search for and search for treatment of alcohol use disorder, women tend to face more barriers than men, highlighting the perception of the need for treatment, guilt and shame, co-occurring disorders, disparities related to employment, responsibilities with child care, and fear of child protection service. Therefore, women who seek treatment have different needs than men, which can be an important barrier to access.

The treatment period of women is shorter than that of men, that is, the period from the beginning of alcohol consumption to its treatment is faster, even when they consume the same amount of alcohol as men. This is due to gender-related factors, such as causes related to alcohol metabolism and hormonal factors, social responsibility, and the role it plays in society and family.

The place where health professionals can identify and act more quickly on this issue is primary care, in this context it is necessary to screen for alcohol abuse.

The need for further studies is emphasized, as alcohol consumption is growing worldwide, in order to ensure greater levels of evidence and the consolidation of information about the manifestations in mental health and chronic diseases associated with alcohol consumption, especially among women.



The limitations of the present study were the fact that all studies were observational, and most of them were review articles, with lower levels of evidence. Another limitation was the scarcity of studies involving women, alcohol, and mental health.

FINAL CONSIDERATIONS

The present study presents important results for teaching due to information that can elucidate the increase in psychiatric conditions, neurological and liver diseases, cancers and cardiovascular diseases in women resulting from increased alcohol consumption, and can help in the creation of protocols for identification and care of patients by health service managers and professionals.

Finally, it is necessary to carry out more studies related to women, alcohol and mental health in different locations, with different populations, and with methodological rigor, that is, studies with greater scientific evidence, in order to clarify and make public all the manifestations of mental health and systemic diseases associated with alcohol consumption in women.



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