

Impacts of Alcoholism in Public Health, a Systematic Review

REVIEW

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Abstract

Background: Alcoholism is one of the main public health problems in the world. Thereby, there are important consequences related to this issue.

Objective: It was realized a systematic review of articles on the vulnerability factors for alcoholism, as well as possible treatments for this disorder.

Methods: It was made a systematic review of SCOPUS database's articles from January 1, 2010 to August 7, 2014. Search terms were "Alcoholism" (medical subject headings [MeSH]) and "Public Health" (MeSH). The search was restricted to the five journals with more publications on the subject in the last five years. 37 met the eligibility criteria.

Results: Alcoholism is associated with several factors that impact the public health. Studies covered most of these factors, such as The Youth Alcohol Abuse, Socioeconomic Impacts, Alcohol and Other Drugs, Alcohol and Psychological Disorders, Personal causes and consequences of alcohol abuse, the physiological effects of alcohol abuse and also Treatment of Alcoholism.

Conclusion: It is important to diagnose the main factors related to the alcoholism as well as viable ways of treating it, in order to avoid its consequences.

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Keywords

Alcoholism, Public Health,
Other Drugs.

Introduction

Alcohol is a psychoactive substance with dependence-producing properties. It has been part of a multitude of cultures since many centuries. For this moment, around 2 billion people worldwide consume alcoholic beverages. More than 76 million people suffer from alcohol use disorders (AUD)[1]. These data turn the alcohol consumption in the one of the most important global risk factors for the burden of disease [2, 3, 4, 49]. Because of its important prevalence in different countries and its potential harmful effects, several studies have confirmed innumerable individual and social damages, such as those that burden the public health.

There have been several efforts to estimate alcohol-attributable deaths and years of life lost due to premature mortality [5, 6, 7, 8, 49]. As example of individual damages, there is the exacerbating or contributing to a multitude of health and social problems, including physical and psychological illness; interpersonal conflicts; violence and legal problems; unemployment; poverty; deleterious reproductive outcomes; disability; and premature death [9]. This was ratified by Rehm et al, 2013, who found that Alcohol Use Disorders (AUD) were shown to be responsible for a sizable portion of mortality and the burden of disease in the United States, a finding similar to recent European studies with slightly different methodology [10, 11, 49].

In front of these expressive data that require a comprehensive prevention strategy, this study is based on the question: how far does alcohol consumption impacts the public health? To answer that, it was performed a systematic review aiming to analyze the influence of possible individual vulnerability factors - such as age, gender and socioeconomic status - and societal vulnerability factors - culture and drinking context, for example - in morbidity and mortality of the phenomenon of alcohol consumption and abuse, besides

of the importance of some pharmacological or not pharmacological treatment, such as psychological assistance [12] or electroacupuncture [13].

Methods

It was performed a qualitative systematic review of articles about alcoholism and its aspects about public health. It was conducted a search in the literature through the online Scopus database, by limiting itself to articles published between 2010 to 2014. The reason to limit the search between 2010 and 2014 was because the last five years most countries were more watchful for those problems collaterally to the alcohol abuse. It was also limited to the 5 journals with more publications on the subject. The following descriptors were used, in English, for searching in Scopus: (1) "Alcoholism" (Medical Subject Headings [MESH, in English]); (2) "Public Health" (MESH term).

The analysis of the article followed eligibility criterion previously determined. It was adopted the following inclusion criterions: (1) Original articles with accessibility to the full text online; (2) Studies pertaining how alcoholism affects the public health; (3) Articles written in english. The exclusion criterions were: (1) Not about alcoholism and public health; (2) Case report; (3) Review; (4) Meta-analysis; (5) Note; (6) Abstract or full text not available; (7) No relevance.

Each article was read in its entirety, and the information was entered in a spreadsheet that included authors, year of publication, the study sample description, main findings, and databases. To better analyze the data, the next stage was divided into classes according to the topic addressed in each article. It is noteworthy that an article can be in more than one class, depending on the perspective of its author. The classes were: The Youth Alcohol Abuse, Socioeconomics impacts of use of alcohol, The evolution of alcohol abuse, Alcohol and other drugs, The Physiological effects

of Alcohol Abuse, Treatment of Alcoholism and Alcohol and psychological disorders.

Results

Included studies

In this review, we included 37 studies involving 7 subjects that are correlated with alcohol and public health. Each one of the topics used a different number of articles already published, which a few of them were included in more than only one topic. They are The Youth Alcohol Abuse, with articles: 17, 37, 46, 40, 144, 78, 146, 47; Socioeconomics Impacts of Use of Alcohol with: 49, 70, 40, 1, 50, 143, 76, 78,

82, 145, 22, 53, 142, 71, 48, 39; Personal Causes and Consequences of Alcohol Abuse with: 88, 89, 53, 71, 9, 90; Alcohol and Other Drugs with: 98, 46, 40, 146; The Physiological Effects of Alcohol Abuse with: 102, 103, 13, 135, 108; Treatment of Alcoholism with: 139, 76, 88, 140, 13, 12; and Alcohol and Psychological Disorders with: 141, 137. There were eleven articles used in more than one topic and they are: 88, 46, 40, 76, 78, 13, 22, 146, 53, 71, 39.

Figures and Tables

The **Figure 1** illustrates the five journals that more published articles matching the descriptors "alcoholism" and "public health", since 2010.

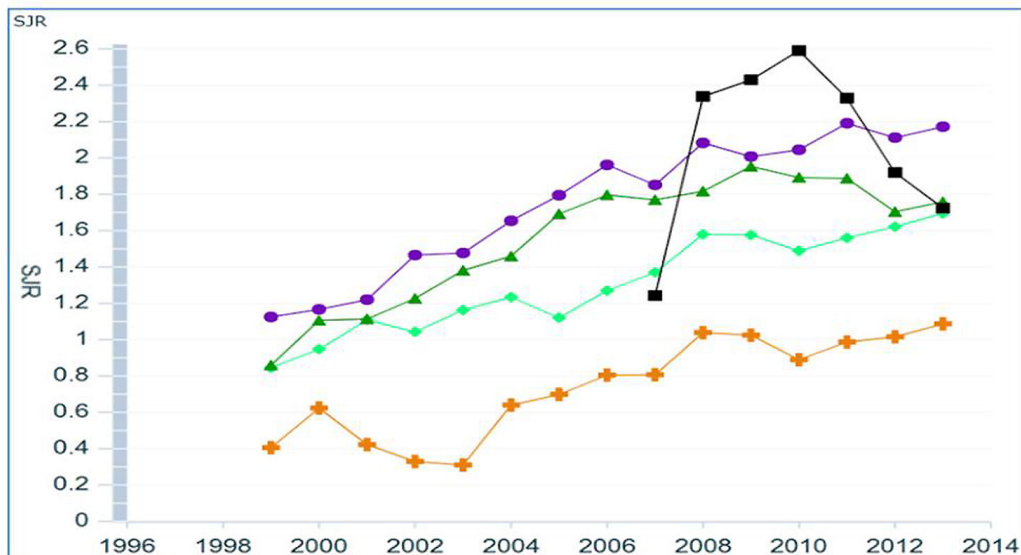
Figure 1: The five magazines used and their importance in the last 16 years.

Scopus

Print Journal Analyzer

Date of Creation: 13 Aug 2014

SCImago Journal Rank is weighted by the prestige of a journal. Subject field, quality and reputation of the journal have a direct effect on the value of a citation. SJR also normalizes for differences in citation



Note: Scopus does not have complete citation information for articles published before 1996. Calculations Last Updated: 13 Jun 2014.

Journals In Chart

- ◆ Alcoholism: Clinical and Experimental Research
- Addiction
- ▲ Drug and Alcohol Dependence
- ✚ European Journal of Public Health
- PLoS One

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Meanwhile, **Figure 2** is concerned about showing how we came up with the included studies to be part of this systematic review, besides the criteria to select them and the reasons for the other studies had been excluded.

About the two tables, **Table 1** shows details about the studies of each article that was used for this review, like the main findings of them, for example. **Table 2** shows what was the kind of each study included in this present article, getting clear if they were longitudinal or cross-sectional studies in one of the columns.

Figure 2: Flowchart to get in the final included articles for this present systematic review.

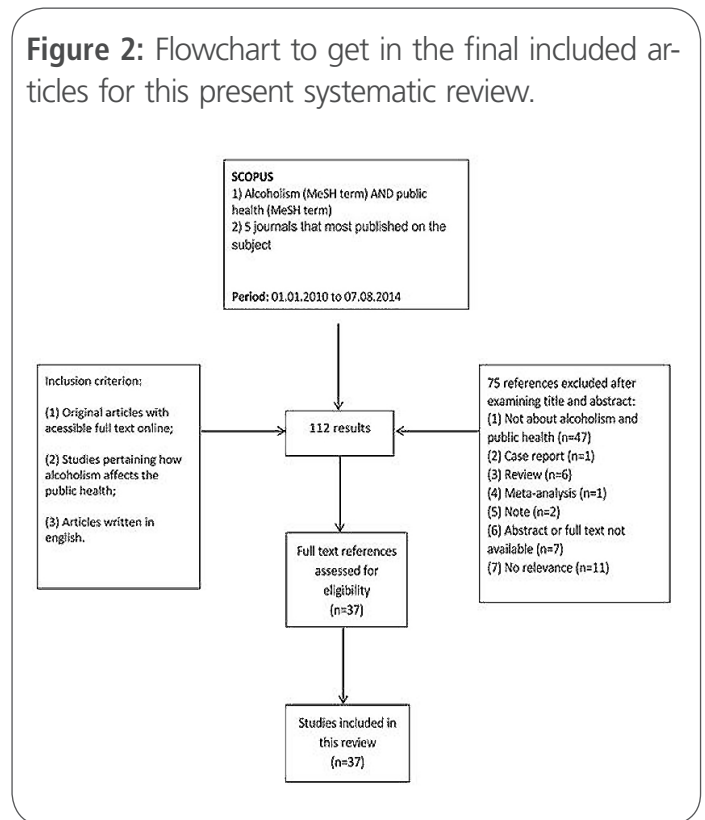


Table 1. Each included article and the main findings of them.

No	Authors	Journal	Sample	Main findings
[2014] [98]	Coste, J et al	PLoS One	7525 men and 8486 women, aged 25-64 year	Subjects with alcohol dependence were more often daily smokers. Many associations observed in the mental dimensions of SF-36 were found to be confounded by depression and also by alcohol dependence.
[2014] [88]	Lapham, GT et al	Alcohol Clin Exp Res	344,994 outpatients of Veterans Health Administration with a pair of annual alcohol screens in which the initial screen was negative for alcohol misuse	5.4% of women and 6.0% of men screened positive a year later. In both women and men, the probability of converting to a positive subsequent was highest in the youngest women (11,2%) and men (17,2%).
[2014] [49]	Rehm, J et al	Alcohol Clin Exp Res	The Wave 1 NESARC, conducted in 2001 to 2002, surveyed a representative sample (n = 43,093, response rate = 81.0%) of the adult (18 years of age and older) population of the United States.	In the United States in 2005, 65,000 deaths, 1,152,000 years of life lost due to premature mortality, 2,443,000 years of life lost due to disability, and 3,595,000 disability-adjusted life years lost were associated with AUD.
[2014] [89]	Holahan, CJ et al	Alcohol Clin Exp Res	446 adults aged 55 to 65 (74 moderate drinkers who engaged in episodic heavy drinking and 372 regular moderate drinkers).	Moderate drinkers who engaged in episodic heavy drinking had more than 2 times higher odds of 20-year mortality in comparison with regular moderate drinkers.

No	Authors	Journal	Sample	Main findings
[2014] [17]	Schindler, AG et al	Alcohol Clin Exp Res	Male Sprague Dawley rats (Charles River, Hollister, CA) aged postnatal day (PND) 27 or PND 77 at the start of experiments	Unlike animals exposed to EtOH during adolescence, animals exposed to alcohol during adulthood did not display differences in risk preference compared to controls.
[2014] [37]	Teeters, JB et al	Alcohol Clin Exp Res	207 college students who reported at least 1 heavy drinking episode (4/5 or more drinks in 1 occasion for a woman/man) in the past month.	Age, ethnicity, and gender were also significantly associated with driving after drinking; men, Caucasians, and older students were more likely to report driving after drinking. Sensation seeking was not associated with driving after drinking.
[2014] [46]	Flotta, D et al	Alcohol Clin Exp Res	870 adolescents aged 15 to 19 years who were recruited from a random sample of public secondary schools in the geographic area of the Calabria Region, in the South of Italy	Multivariate analysis showed that the factors independently associated with the consumption of alcohol-mixed energy drinks (AmEDs) were the increasing number of sexual partners, being a current smoker, being male, riding with a driver who had been drinking alcohol, and having used marijuana
[2013] [40]	Terry-McElrath, YM et al	Drug Alcohol Depend	Yearly sample election included approximately 15,000 high school seniors from about 130 schools.	A sizable proportion of US high school seniors reported Simultaneous Alcohol and Marijuana (SAM) use, and it appeared to occur frequently in social use situations that could impact both the public as well as youth drug users.
[2013] [102]	Howell, NA et al	PLoS One	19 binge drinkers and 19 healthy volunteers were analyzed using voxel-based morphometry. Participants were included if they were greater than 18 years old, had no history of regular or current use of other substances, and were free from any major psychiatric disorders.	Binge drinkers had significantly larger ventral striatal grey matter volumes compared to controls. There were no between group differences in hippocampal or amygdala volume.
[2013] [1]	Lin, C et al	Alcohol Clin Exp Res	Data on 430,388 men and 34,874 women aged 15 or above who had an admission due to an (alcohol-attributed diseases) AAD were collected.	Alcohol taxation in response to international trade liberalization has resulted in an immediate reduction of (alcohol-attributed diseases) AADs in Taiwan. The policy of increasing alcohol tax rates may have favorable influences on the time trend for the rate of AADs.
[2013] [50]	Guérin, S et al	Eur J Public Health	A representative sample of 20 178 French individuals aged 15+ were interviewed on their alcohol drinking habits in 2002–03 by the National Institute of Statistics and Economic Studies	A total of 36 500 deaths in men are attributable to alcohol in France in 2009 (13% of total mortality) versus 12 500 in women (5% of total mortality).Alcohol is detrimental even at a low dose of 13 g per day, causing 1100 deaths.

No	Authors	Journal	Sample	Main findings
[2013] [143]	Grittner, U et al	Eur J Public Health	Data on 101 525 men and women collected by cross-sectional surveys in 33 countries of the GENACIS study were used. The age range was restricted to 25–69 years.	For the most part, findings regarding Socio-Economic Status (SES) and drinking in higher income countries were as expected. However, women of higher SES in low and middle income countries appear at higher risk of engaging in RSOD.
[2013] [139]	Mojtabai, R; Crum, RM	Drug Alcohol Depend	We examined the association of perceived need and barriers to SUD treatments in waves 1 of NESARC (2001-2002; n= 43,093) with the subsequent use of these treatments in the follow-up wave 2 (2004-2005; n= 34,625). Research with participants 18 years of age and older.	The findings suggest the need for a two-pronged approach to improving treatment seeking for Substance Use Disorder (SUD) in community settings: one focusing on enhancing recognition of these disorders, the other focusing on educating potential consumers regarding the benefits of SUD treatments.
[2012] [144]	Romelsjö, A, Daniel-sson, AK	Eur J Public Health	A total of 7288 alcohol-consuming adolescents aged 13-17 years were examined. Study A contains data from a study, conducted from 2001 to 2006, directed to all 18 schools and 79 classes in 6 central districts (out of 18) in Stockholm, Sweden. The study population included seventh grade students (n= 1923) in 2001 (age 13 years). In 2001, 84% (n= 1610) participated. Study B, from 2008, includes data from two surveys, each comprising over 3000 pupils, of nationally representative, and randomly selected samples of school classes from the whole of Sweden of adolescents aged 15 years and 17 years.	Mean alcohol consumption, number of problems and proportion of Heavy Episode Drinking (HED) all increased with age. Boys reported higher alcohol consumption and HED to a greater extent than girls, except at age 13 years (Table 1), while girls reported a significantly higher average number of alcohol-related problems, except at age 15 years where the gender difference was insignificant.
[2012] [76]	Mundt, MP et al	Drug Alcohol Depend	The study enrolled 419 adolescents, 13–18-year olds, seeking treatment at one of the four Chemical Dependency Recovery Programs (CDRPs) between March 2000 and May 2002. The sample represented 64% of those who had an alcohol and other drugs (AOD) treatment intake appointment, and 83% of those who started treatment.	Twelve-step participants were more likely to be male than non-participants. They had higher AOD severity at baseline, and also were more likely to use tobacco and to have been diagnosed with ADHD. The average length of stay for the index AOD treatment was more than twice as long (109 days) for 12-step participants than it was for non-participants (41 days). Females and subjects who had a diagnosis of depression used relatively more health care services than other study respondents.

No	Authors	Journal	Sample	Main findings
[2012] [140]	Cunningham, JA et al	PLoS ONE	Briefly, households in a large metropolitan city were contacted as part of a random digit dialing survey. The interviewer asked to speak to the person (19 years or older – legal drinking age) in the household with the next birthday who also drank alcohol at least once per month. We followed the convention that studies should be designed to have a statistical power of at least 80%, and that hypotheses be tested at the 05 level of significance. These specifications resulted in a final sample (required after attrition) of N = 390 in each condition (N = 1170 total).	Bivariate comparisons found no differences in demographic and baseline drinking characteristics between experimental conditions. The Evaluate Your Drinking pamphlet is a very brief, self-administered, paper version of the personalized feedback intervention. The pamphlet can be distributed widely and at low cost – important hallmarks when considering the utility of public health interventions. It is encouraging to see any impact of the pamphlet at all, even if on only one of the three outcome variables and just in comparison to participants from the no intervention condition.
[2012] [103]	Huang, C. et al	Alcohol Clin Exp Res	A younger and an older group of C57BL/6J mice (P25 and 180 at the beginning of ethanol treatment). All mice were acquired from the Jackson Laboratory (Bar Harbor, ME). All mice were housed 3 to a cage in the University of Missouri-Kansas City (UMKC) laboratory animal center and maintained on standard lab chow with a 6 AM to 6 PM light cycle.	Here we have additionally determined that the patterns of peri-adolescent body weight gain remained strongly gender-specific in a statistically significant manner for both control and ethanol-treated mice.
[2012] [78]	Wolfson, M. et al	Alcohol Clin Exp Res	All 4-year, liberal arts colleges and universities in North Carolina with 2,500 or more full-time undergraduates, and with at least 20% of students living on-campus, were considered for inclusion. Military schools, single-gender schools, and seminaries or “Bible” schools were excluded.	We found significant decreases in the Intervention group compared with the Comparison group in severe consequences due to students' own drinking and alcohol-related injuries caused to others.
[2012] [82]	Li, Q. et al	Alcohol Clin Exp Res	In this sample of 3,046 low-income pregnant women in the second trimester of pregnancy in Jefferson County, Alabama, 86.5% used Medicaid, 5.1% (156 women) reported prenatal alcohol use in the past 3 months, and 16.2% smoked in the past 3 months. Study participants were predominantly young (aged 21.9 ± 4.6 years), African-American (81.6%), and unmarried (85.0%). Mean education was 11.5 (± 1.6 years) years. Mean self-esteem score was 26.8 (± 3.4). Mean mastery score was 14.5 (± 4.0). More than one-quarter (27.8%) used welfare.	The study findings indicate that prenatal alcohol use is a public health issue among low-income pregnant women in Jefferson County, Alabama. The screening for alcohol use in the second trimester by 3 simple questions about frequency and quantity was feasible for research nurses in the prenatal care settings.

No	Authors	Journal	Sample	Main findings
[2012] [13]	Li, J. et al.	PLoS One	Adult Sprague-Dawley (S-D) rats (250–350 g, at the start of the experiments, Taconic Farm, NY) were individually housed in ventilated cages, in a climate-controlled room (20–22°C), kept on a 12-h light/dark cycle (lights off at 6 p.m.). The animals were first acclimatized to the home environment for one week, and were trained to voluntarily drink ethanol under the intermittent access two-bottle choice drinking procedure.	This study demonstrates that six-day 100 Hz electroacupuncture treatment effectively reduces ethanol consumption and preference in rats that chronically drink excessive amount of ethanol.
[2012] [145]	Cunradi, CB et al.	Alcohol Clin Exp Res	Counts of IPV-related ED visits were computed from public data available from the California Office of Statewide Health Planning and Development. Three types of retail alcohol outlets were measured within the state of California. These included off-premise establishments (license type 20 and 21), restaurants (license type 41 and 47), and bars/pubs (license types 23, 40, 42, 48, 61, and 75). Estimates of annual intercensal zip code-level demographic data were collected from the America Sourcebook (CACI Marketing systems and ESRI BIS).	Density of bars was positively associated with intimate partner violence (IPV)-related emergency department (ED) visits. Density of off-premise outlets was negatively associated with IPV-related ED visits; this association was weaker and smaller than the bar association.
[2012] [22]	Popovici, I. et al.	Alcohol Clin Exp Res	We analyze data from Add Health, a nationally representative survey of adolescents in grades 7 to 12 starting at Wave 1. Four waves of Add Health data are currently available. The first wave was initiated in 1994 and included 134 middle and high schools. Wave 2 included only those Wave 1 respondents who were still attending school in 1995 to 1996 (N = 14,738 or 71% of the Wave 1 sample). Wave 3 was collected in 2001 and 2002 and included 15,190 respondents (all original Wave 1 respondents who could be contacted and re-interviewed) between 18 and 26 years of age. The fourth in-home interview was conducted in 2007 and 2008.	Our findings strongly suggest that, ceteris paribus, consuming more alcohol is associated with higher odds of engaging in criminal activity and being the victim of a predatory crime, all of which result in staggering costs to society.
[2011] 12	Blonigen, DM et al.	Addiction	628 individuals (47% women) with AUDs who had an initial contact with the alcohol intervention system recruited based on no previous history of substance abuse treatment. Individuals were assessed at baseline, and 1, 8 and 16 years later.	Controlling for changes in drinking pattern, decreases in impulsivity were associated with fewer alcohol use problems, better coping and greater social support and self-efficacy at year 1, and better coping and greater social support at year 8. Decreases in impulsivity statistically mediated associations between longer AA duration and improvements on all year 1 outcomes and indirect effects were moderated by participant age (significant only for individuals 25 years of age or younger). Decreased impulsivity appears to mediate reductions in alcohol-related problems over 8 years in people attending Alcoholics Anonymous.

No	Authors	Journal	Sample	Main findings
[2011] [146]	Arria, AM et al.	Drug Alcohol Depend	The analytic sample comprised 1194 individuals (47.7% male, 72.8% white) who participated in at least one assessment in Years 2 through 4, and were ages 19–22 at the time of those assessments. Year 1 data were not used due to overlap with high school experiences. Most (80.3%) were still enrolled at the same university by Year 4.	One in six (17% wt) 19-year-olds with access to a car drove drugged in the past year; prevalence remained stable through age 22. Drugged driving was more prevalent among males ($p < .001$) and whites ($p < .01$). Riding with a drugged driver varied by race and sex (overall prevalence 28% wt at age 19), was stable from age 19 to 21, and decreased by age 22 ($p < .05$). Annually, half of drugged drivers also drove drunk (ranges between 47% and 60%). Both drugged and drunk driving were independently associated with increased risk for alcohol dependence, holding constant age, sex, and race.
[2011] [141]	Cranford, J.A. et al	Drug Alcohol Depend	The civilian noninstitutionalized population participating of National Epidemiologic Survey, 18 years of age and older, living in the United States and the District of Columbia. For Wave 1 (W1) of the NESARC, face-to-face interviews were conducted with 43,093 participants . The final sample was 52.1% female; with respect to age, 21.8% of the participants were 18–20 years old, 30.9% were 30–44 years old, 31.1% were 45–64 years old, and 16.2% were 65 years or older; with respect to race/ethnicity, 70.9% of the participants were White, 11.1% were Black, 11.6% were Hispanic, 4.4% were Asian or Pacific Islander; and 2.1% were Native American.	Prevalence of past 12-month co-occurring alcohol use disorders (AUD - abuse or dependence) and major depressive episode (MDE) was 1.2%, corresponding to about 2.4 million adults ages 18 and older. Among males with alcohol dependence, comorbid MDE was associated with a greater number of days drinking at home alone. Among females and males with alcohol abuse and dependence, comorbid MDE was associated with higher prevalence of drinking to enhance depressed mood. Comorbid MDE was also associated with lower levels of some drinking behaviors among those with alcohol abuse.
[2011] [47]	Beenstock, J. et al	Eur J Public Health	Participants were 322 undergraduate university students in two faculties at a university in Northern England, UK.	Hazardous alcohol consumption was reported by 264 (82%) respondents. After controlling for potential confounding by sociodemographic variables, greater consideration of future consequences was associated with lower odds of reporting hazardous drinking [odds ratio=0.28; 95% confidence interval 0.15–0.54]. Interventions aimed at increasing future orientated time perspective may be effective in decreasing hazardous alcohol consumption in students
[2011] [142]	Engdahl, B., Ramstedt, M.	Eur J Public Health	Participants were 1500 Swedes commissioned by SoRAD, Stockholm university, through a monthly telephone survey. This article has analysed the temporal relationship between alcohol consumption and alcohol-related hospitalizations in Sweden during the period 2002–07.	Changes in alcohol consumption in Sweden was associated with changes in male and female alcohol-related hospitalizations also in analyses based on gender-specific consumption measures. There was no clear evidence that the population level association between alcohol and harm differed between men and women.

No	Authors	Journal	Sample	Main findings
[2011] [71]	McBride O; Cheng HG	Addiction	Combining data from the 2004-07 National Surveys on Drug Use and Health (NSDUH) resulted in a sample of 222 221 respondents. The study focuses on a subsample of DRs who consumed their first alcoholic beverage within 24 months of the date of assessment and drank alcohol in the last 12 months (n=15 455) - referred to herein as new-onset alcohol users (NOAUs).	There may be a period of time during the second year of alcohol use, when level of alcohol use disorder fluctuates rather than increases. Public health and safety efforts designed to target problematic alcohol use in the earliest stages of alcohol involvement could be useful in preventing the escalation of alcohol problems in this group of drinkers.
[2010] [135]	Long L et al	Alcohol Clin Exp Res	4 ethanol groups and one control group. There were 6 mice in each group (3 for morphology assessment and 3 for RT-PCR and western blotting).	In a murine model, oxidative stress appears to play an important role in ethanol-induced embryonic growth retardation. EGCG can prevent some of the embryonic injuries caused by ethanol.
[2010] [137]	Beijer, U.; Andréasson, S.	Eur J Public Health	1364 men and 340 women of homeless people were compared to a control group of 3750 men and 1250 women from the general population.	The elevated risk for mental disorders among the homeless was mainly related to substance use problems. Younger homeless women had the highest risk of mental disorder. Alcohol use disorders were equally common among homeless men and women, but women had more drug use disorders
[2010] [48]	Cortez- Pinto, H. et al.	Alcohol Clin Exp Res	107,839 deaths aged 15 or more years, using data from National Health Survey (NHS) of 2005 in Portugal.	In Portugal, 3.8% of deaths are attributable to alcohol (4,059 of 107,839). After measuring the Disability-Adjusted Life Years (DALY) generated by mortality data, the proportion of disease attributable to alcohol was 5.0%, with men having 5.6% of deaths and 6.2% of disease burden, while female figures were, respectively, 1.8 and 2.4%.
[2010] [9]	Tsai, J. et al.	Alcohol Clin Exp Res	200,587 current drinkers who participated in the 2008 Behavioral Risk Factor Surveillance System (BRFSS) survey.	Around 34.7 million adult drinkers in the United States engaged in binge drinking in 2008, including an estimated 42.2% who reported either heavy drinking or at least 4 binge-drinking episodes in a 30-day period. Binge drinking with such levels was associated with a 13-23% increased likelihood of reporting suboptimal self-rated health, when compared to the nonbinge drinkers
[2010] [39]	Beck, K.H. et al.	Alcohol Clin Exp Res	1,253 first-time first-year students attending a large, mid-Atlantic university.	At age 19, 17% of students drove while intoxicated, 42% drove after drinking any alcohol, and 38% rode with an intoxicated driver. For all 3 driving behaviors, prevalence and frequency increased significantly at age 21. Males were more likely to engage in these behaviors than females.

No	Authors	Journal	Sample	Main findings
[2010] [90]	Rona, R.J. et al.	Drug Alcohol Depend	8585 responders of a random sample of the regular United Kingdom Armed Forces	A score indicating alcohol dependence was associated with impairment, as, to a lesser extent, was alcohol related-harm. Binge drinking was not associated with impairment.
[2010] [108]	Rzepecki- Smith, C.I. et al.	Alcohol Clin Exp Res	Were tested 40, healthy, right-handed men (N = 20) and women, with a mean age of 24.75 ± 4.7 years, who were non-smokers, had good visual acuity, valid driver's licenses, drove 3 or more times weekly and were light or moderate users of alcohol (1 to 4 alcohol consumption sessions/wk and 1 to 8 drinks/session; average consumption/month, 9 times with an average of 4 drinks per occasion).	Specific disruptions of functional network connectivity between the frontal-temporal-basal ganglia and the cerebellar circuits.

Table 2. Significant information about the performance of each research included, like the type of study and its duration.

Authors	Year	Sample	Age	Duration	Design
Coste, J Et Al [98]	2014	7525 men and 8486 women, aged 25-64 year	Adult	1 year	Cross-sectional
Lapham, Gt Et Al [88]	2014	344,994 outpatients of Veterans Health Administration with a pair of annual alcohol screens in which the initial screen was negative for alcohol misuse	Adult	4 years	Retrospective cohort
Rehm, J Et Al [49]	2014	The Wave 1 Nesar, Conducted In 2001 To 2002, Surveyed A Representative Sample (N = 43,093, Response Rate = 81.0%) Of The Adult (18 Years Of Age And Older) Population Of The United States.	Adult	1 Year	Cross-Sectional
Holahan, Cj Et Al [89]	2014	446 Adults Aged 55 To 65 (74 Moderate Drinkers Who Engaged In Episodic Heavy Drinking And 372 Regular Moderate Drinkers).	Adult	3 Years	Longitudinal
Schindler, Ag Et Al [17]	2014	Male Sprague Dawley Rats (Charles River, Hollister, Ca) Aged Postnatal Day (Pnd) 27 Or Pnd 77 At The Start Of Experiments	Adolescent And Adult	20 Days	Experimental
Teeters, Jb Et Al [37]	2014	207 College Students Who Reported At Least 1 Heavy Drinking Episode (4/5 Or More Drinks In 1 Occasion For A Woman/Man) In The Past Month.	Adolescent And Adult	1 Year	Cross-Sectional

Authors	Year	Sample	Age	Duration	Design
Flotta, D Et Al [46]	2014	870 Adolescents Aged 15 To 19 Years Who Were Recruited From A Random Sample Of Public Secondary Schools In The Geographic Area Of The Calabria Region, In The South Of Italy	Adolescent	4 Months	Cross-Sectional
Hoeck, S; Van Hal, G [70]	2013	Statistical Analyses Were Restricted To Non-Institutionalized Elderly People (≥ 65 Years, N = 3954), And Proxy Interviews Were Excluded.	Adult	2 Years	Cross-Sectional
Terry-Mcelrath, Ym Et Al [40]	2013	Yearly Sample Selection Included Approximately 15,000 High School Seniors From About 130 Schools.	Adolescent And Adult	1 Year	Cross-Sectional
Howell, Na Et Al [102]	2013	19 Binge Drinkers And 19 Healthy Volunteers Were Analyzed Using Voxel-Based Morphometry. Participants Were Included If They Were Greater Than 18 Years Old, Had No History Of Regular Or Current Use Of Other Substances, And Were Free From Any Major Psychiatric Disorders.	Adult	1 Year	Cross-Sectional
Lin, C Et Al [1]	2013	Data On 430,388 Men And 34,874 Women Aged 15 Or Above Who Had An Admission Due To An (Alcohol-Attributed Diseases) Aad Were Collected.	Adolescent And Adult	15 Years	Longitudinal
Guérin, S Et Al [50]	2013	A Representative Sample Of 20 178 French Individuals Aged 15+ Were Interviewed On Their Alcohol Drinking Habits In 2002–03 By The National Institute Of Statistics And Economic Studies.	Adolescent And Adult	1 Year	Cross-Sectional
Grittner, U Et Al [143]	2013	Data On 101 525 Men And Women Collected By Cross-Sectional Surveys In 33 Countries Of The Genacis Study Were Used. The Age Range Was Restricted To 25–69 Years.	Adult	14 Years	Cross-Sectional
Mojtabai, R; Crum, Rm [139]	2013	Association Of Perceived Need And Barriers To Sud Treatments In Waves 1 Of Nesarc (2001-2002; N= 43,093) With The Subsequent Use Of These Treatments In The Follow-Up Wave 2 (2004-2005; N= 34,625). Research With Participants 18 Years Of Age And Older.	Adult	1 Year	Cross-Sectional

Authors	Year	Sample	Age	Duration	Design
Romelsjö, A, Danielsson, Ak [144]	2012	A Total Of 7288 Alcohol-Consuming Adolescents Aged 13-17 Years Were Examined. Study A Contains Data From A Study, Conducted From 2001 To 2006, Directed To All 18 Schools And 79 Classes In 6 Central Districts (Out Of 18) In Stockholm, Sweden. The Study Population Included Seventh Grade Students (N= 1923) In 2001 (Age 13 Years). In 2001, 84% (N= 1610) Participated. Study B, From 2008, Includes Data From Two Surveys, Each Comprising Over 3000 Pupils, Of Nationally Representative, And Randomly Selected Samples Of School Classes From The Whole Of Sweden Of Adolescents Aged 15 Years And 17 Years.	Adolescent	6 Years	Cross-Sectional
Mundt, Mp Et Al [76]	2012	The Study Enrolled 419 Adolescents, 13–18-Year Olds, Seeking Treatment At One Of The Four Chemical Dependency Recovery Programs (Cdrps) Between March 2000 And May 2002. The Sample Represented 64% Of Those Who Had An Alcohol And Other Drugs (Aod) Treatment Intake Appointment, And 83% Of Those Who Started Treatment.	Adolescent	26 Months	Longitudinal
Cunningham, Ja Et Al [140]	2012	Briefly, Households In A Large Metropolitan City Were Contacted As Part Of A Random Digit Dialing Survey. The Interviewer Asked To Speak To The Person (19 Years Or Older – Legal Drinking Age) In The Household With The Next Birthday Who Also Drank Alcohol At Least Once Per Month. We Followed The Convention That Studies Should Be Designed To Have A Statistical Power Of At Least 80%, And That Hypotheses Be Tested At The.05 Level Of Significance. These Specifications Resulted In A Final Sample (Required After Attrition) Of N = 390 In Each Condition (N = 1170 Total).	Adult	2 Years	Randomized
Huang, C. Et Al [103]	2012	A Younger And An Older Group Of C57bl/6J Mice (P25 And 180 At The Beginning Of Ethanol Treatment). All Mice Were Acquired From The Jackson Laboratory (Bar Harbor, Me). All Mice Were Housed 3 To A Cage In The University Of Missouri-Kansas City (Umkc) Laboratory Animal Center And Maintained On Standard Lab Chow With A 6 Am To 6 Pm Light Cycle.	Adolescent	45 Days	Longitudinal
Wolfson, M. Et Al [78]	2012	All 4-Year, Liberal Arts Colleges And Universities In North Carolina With 2,500 Or More Full-Time Undergraduates, And With At Least 20% Of Students Living On-Campus, Were Considered For Inclusion. Military Schools, Single-Gender Schools, And Seminaries Or “Bible” Schools Were Excluded.	-	3 Years	Randomized

Authors	Year	Sample	Age	Duration	Design
Li, Q. Et Al [82]	2012	In This Sample Of 3,046 Low-Income Pregnant Women In The Second Trimester Of Pregnancy In Jefferson County, Alabama, 86.5% Used Medicaid, 5.1% (156 Women) Reported Prenatal Alcohol Use In The Past 3 Months (Table 1), And 16.2% Smoked In The Past 3 Months. Study Participants Were Predominantly Young (Aged 21.9 ± 4.6 Years), African-American (81.6%), And Unmarried (85.0%). Mean Education Was 11.5 (± 1.6 Years) Years. Mean Self-Esteem Score Was 26.8 (± 3.4). Mean Mastery Score Was 14.5 (± 4.0). More Than One-Quarter (27.8%) Used Welfare.	Adolescent And Adult	5 Years	Cross-Sectional
Li, J. Et Al. [13]	2012	Adult Sprague-Dawley (S-D) Rats (250–350 G, At The Start Of The Experiments, Taconic Farm, Ny) Were Individually Housed In Ventilated Cages, In A Climate-Controlled Room (20–22°C), Kept On A 12-H Light/Dark Cycle (Lights Off At 6 P.M.). The Animals Were First Acclimatized To The Homecage Environment For One Week, And Were Trained To Voluntarily Drink Ethanol Under The Intermittent Access Two-Bottle Choice Drinking Procedure.	Adult	37 Days	Longitudinal
Cunradi, Cb Et Al. [145]	2012	Counts Of Ipv-Related Ed Visits Were Computed From Public Data Available From The California Office Of Statewide Health Planning And Development. Three Types Of Retail Alcohol Outlets Were Measured Within The State Of California. These Included Off-Premise Establishments (License Type 20 And 21), Restaurants (License Type 41 And 47), And Bars/Pubs (License Types 23, 40, 42, 48, 61, And 75). Estimates Of Annual (Intercensus) Zipcode-Level Demographic Data Were Collected From The America Sourcebook (Caci Marketing Systems And Esri Bis).	-	42 Months	Cross-Sectional
Blonigen, Dm Et Al. [12]	2011	628 Individuals (47% Women) With Auds Who Had An Initial Contact With The Alcohol Intervention System Recruited Based On No Previous History Of Substance Abuse Treatment. Individuals Were Assessed At Baseline, And 1, 8 And 16 Years Later.	Adult	16 Years	Longitudinal
Arria, Am Et Al. [146]	2011	The Analytic Sample Comprised 1194 Individuals (47.7% Male, 72.8% White) Who Participated In At Least One Assessment In Years 2 Through 4, And Were Ages 19–22 At The Time Of Those Assessments. Year 1 Data Were Not Used Due To Overlap With High School Experiences. Most (80.3%) Were Still Enrolled At The Same University By Year 4.	Adolescent And Adult	4 Years	Longitudinal

Authors	Year	Sample	Age	Duration	Design
Cranford, J.A. Et Al[141]	2011	The Civilian Non-Institutionalized Population Participating Of National Epidemiologic Survey, 18 Years Of Age And Older, Living In The United States And The District Of Columbia. For Wave 1 (W1) Of The Nesar, Face-To-Face Interviews Were Conducted With 43,093 Participants. The Final Sample Was 52.1% Female; With Respect To Age, 21.8% Of The Participants Were 18–20 Years Old, 30.9% Were 30–44 Years Old, 31.1% Were 45–64 Years Old, And 16.2% Were 65 Years Or Older; With Respect To Race/Ethnicity, 70.9% Of The Participants Were White, 11.1% Were Black, 11.6% Were Hispanic, 4.4% Were Asian Or Pacific Islander; And 2.1% Were Native American.	Adult	1 Year	Cross-Sectional
Beenstock, J. Et Al [47]	2011	Participants Were 322 Undergraduate University Students In Two Faculties At A University In Northern England, Uk.	Adolescent And Adult	3 Months	Cross-Sectional
Kriegbaum, M. Et Al [53]	2011	Birth-Cohort Study Of 6112 Danish Men Born In 1953 With Follow-Up In 2004 On Excessive Drinking At Age 51 Years.	Adult	1 Year	Cross-Sectional
Engdahl, B., Ramstedt, M. [142]	2011	Participants Were 1500 Swedes Commissioned By Sorad, Stockholm University, Through A Monthly Telephone Survey. This Article Has Analysed The Temporal Relationship Between Alcohol Consumption And Alcohol-Related Hospitalizations In Sweden During The Period 2002–07.	Adolescent And Adult	6 Years	Longitudinal
Mcbride O; Cheng Hg [71]	2011	Combining Data From The 2004-07 National Surveys On Drug Use And Health (Nsduh) Resulted In A Sample Of 222 221 Respondents. The Study Focuses On A Subsample Of Drs Who Consumed Their First Alcoholic Beverage Within 24 Months Of The Date Of Assessment And Drank Alcohol In The Last 12 Months (N=15 455) - Referred To Herein As New-Onset Alcohol Users (Noaus).	Adolescent And Adult	6 Years	Longitudinal
Long L Et Al [135]	2010	4 Ethanol Groups And One Control Group. There Were 6 Mice In Each Group (3 For Morphology Assessment And 3 For Rt-Pcr And Western Blotting).	Fetus	10 Days	Experimental
Beijer, U.; Andréasson, S. [137]	2010	1364 Men And 340 Women Of Homeless People Were Compared To A Control Group Of 3750 Men And 1250 Women From The General Population.	Adult	7 Years	Cross-Sectional
Cortez-Pinto, H. Et Al. [48]	2010	107,839 Deaths Aged 15 Or More Years, Using Data From National Health Survey (Nhs) Of 2005 In Portugal.	Adolescent And Adult	1 Year	Cross-Sectional

Authors	Year	Sample	Age	Duration	Design
Tsai, J. Et Al. [9]	2010	200,587 Current Drinkers Who Participated In The 2008 Behavioral Risk Factor Surveillance System (Bfss) Survey.	Adult	1 Year	Cross-Sectional
Beck, K.H. Et Al. [39]	2010	1,253 First-Time First-Year Students, Ages 17 To 19, Attending A Large, Public University In The Mid-Atlantic Region.	Adolescent And Adult	4 Years	Longitudinal
Rona, R.J. Et Al. [90]	2010	8585 Responders Of A Random Sample Of The Regular United Kingdom Armed Forces.	Adult	2 Years	Cross-Sectional
Rzepecki-Smith, C.I. Et Al. [108]	2010	Were Tested 40, Healthy, Right-Handed Men (N = 20) And Women, With A Mean Age Of 24.75 ± 4.7 Years, Who Were Non-Smokers, Had Good Visual Acuity, Valid Driver's Licenses, Drove 3 Or More Times Weekly And Were Light Or Moderate Users Of Alcohol (1 To 4 Alcohol Consumption Sessions/Wk And 1 To 8 Drinks/Session; Average Consumption/Month, 9 Times With An Average Of 4 Drinks Per Occasion).	Adult	10 Days	Longitudinal

Discussion

The Youth Alcohol Abuse

Despite of the fact that adolescence is characterized by maturation and synaptic remodeling of brain regions implicated in reward and decision-making processes including the limbic system, the prefrontal cortex, and the hippocampus [14, 15, 17], the youth alcohol abuse still remains as a major public health problem that underlies the third leading lifestyle-related cause of death generally preventable among adolescents in the United States [16, 46]. Due to the malleable and vulnerable nature of the adolescent brain, and specifically the mesolimbic dopamine system, alcohol may cause substantial disruption of normal development, as well as neurological damage, which may then translate into long-term negative behavioral consequences such as the increased risk-taking behavior [17]. In addition, alcohol consumption during adolescence is a strong risk factor for developing alcohol-related health problems later in life [18, 46], once studies have shown that frequent heavy episode drinking (HED) in adolescence can predict adult heavy drinking [19, 20, 144].

One of these problems is showed in a recent analysis demonstrating that adolescent alcohol intake produces enduring and maladaptive risk preference in adulthood [17], with harmful consequences like negative effects on health, social and family relations, educational attainment and employment prospects [21, 47]. Besides of this, there are findings strongly suggesting that consuming more alcohol is associated with higher odds of engaging in criminal activity and being the victim of a predatory crime [22]. As example of these injurious activities that occur in many universities campi around the US, there is those caused by other students' drinking, interruption of sleep and study, verbal harassment, being assaulted, and a general degradation of the on-campus environment [23, 24, 25, 26, 27, 78]. It is showed, too, that the probabilities of being a victim of predatory crime for females who are weekly or more frequent drinkers are higher than those for males, which could reflect the fact that females, especially those who drink frequently, are more likely to be victims of various crimes [22]. Analyses have shown that the majority of problems may occur in relation to heavy drinking occasions, and that the number of people with heavy drinking occasions

is larger among low-moderate consumers than among heavy consumers [28, 29, 30, 144].

Another major concern about the high consumption of alcohol is the increased probability to consume alcohol and to drive later, because drugged and drunk driving together accounted for 14% of US drivers/motorcyclists involved in fatal crashes in 2008 [31, 146]. Thus, national data indicate that nearly one-quarter of college students have driven while under the influence of alcohol in the past 30 days [32, 33, 39]. It is suggested that those who drive after drinking report greater demand for alcohol independent of drinking level. Theoretical and laboratory research on behavioral economics suggests that elevated/inelastic demand reflects a stronger and more persistent motivation to consume alcohol [34, 35, 36, 37]. In line with the behavioral economic framework, this results suggest that elevated demand is associated with specific decisions to drive after drinking [37]. Nevertheless, recent evidence indicates that there has been a decline in youth involvement in alcohol-related traffic fatalities [38, 39], largely attributable to declines in youthful drinking, minimum legal drinking ages, zero tolerance laws, and programs that seek to motivate youth to refrain from drinking and driving [39].

Still, the alcohol consume is associated with other substances, such as marijuana and energy drinks (EDs). Both using alcohol to increase the effects of another drug and because the respondent reported being hooked showed significantly stronger relationship with frequency use than all other alcohol use reasons [40]. In the case of EDs, the increase in its consume has raised concerns about their impact on health of consumers owing to the risk of caffeine intoxication. Research indicates that the excessive consumption of EDs may have detrimental health effects in susceptible subjects [41, 42, 43, 44, 45, 46]. Another conclusion is that alcohol-mixed energy drinks (AmED) consumption appears to be associated, to some extent, with the use of illicit drugs, and seems to indicate that AmED, as well as

ED consumption, is another expression of a high-risk behavior lifestyle[46]. For simultaneous alcohol and marijuana (SAM) use, adolescents who engage in frequent alcohol use are most likely to engage in frequent SAM use [40]. It was also found that the risk for any SAM use exhibit both "expected" risk characteristics as well as characteristics indicative of higher socioeconomic standing and socially active lifestyles (higher grades, higher evenings out). Importantly, the results from these studies also indicate that SAM use is not limited to social contexts [40].

Related to that, there is substantial evidence that addictive health behaviors, such as smoking, opiate use and alcohol dependency, are associated with time perspective [47] and, as example of this fact, in a sample of students studying at a university in Northern England, those students who had greater future time perspective, and considered the future outcomes of their actions more, were less likely to have an AUDIT (Alcohol Use Disorder Identification Test) score indicative of hazardous alcohol consumption [47]. There are, still, findings suggesting that the effect of EtOH exposure on decision making and risk preference is limited to the adolescent period. An alternative explanation is that adolescent EtOH intake accelerates a natural progression to greater risk-taking behavior in adulthood [17].

Socioeconomics impacts of use of alcohol

Alcoholic beverages have been used since the beginning of recorded history [48]. Alcohol consumption has negative effects on society because of alcohol-related mortality and morbidity [48], decreasing users' health and related people's safety and comfort. For example, the numbers of deaths associated with AUD were considerable: we estimated that approximately 53, 000 male deaths and 12, 000 female deaths in the United States in 2005 were associated with AUD [49]. In France, out of 535000 deaths in 2009, 49000 were attributable to alcohol: 36500 among men and 12500 among women, which represent 13 and 5%, respectively,

of total deaths [50]. Studies conclude that persons of higher socioeconomic status (SES) have lower mortality and morbidity as well as more favorable health behaviors than those of lower status [51, 143]. The estimation of alcohol-attributable mortality provides a useful indicator for developing national public health strategies [50]. It has been argued that the amount of alcohol consumed in a country is related to its economic development [52, 143].

The social patterning of alcohol consumption is not universal and varies by region, gender and by choice of alcohol measure [53]. Numerous studies have also show that many different forms of alcohol-related harm tend to rise as per capita consumption increase [54, 55, 56, 57, 142]. Prevalence of AUD in the U.S. population by sex and age, divided into the categories of AD and alcohol abuse based on NESARC data, showed consistent and expected patterns. Men in all age categories had a higher prevalence than women, prevalence in both sexes decreased with age, and AD was more prevalent than alcohol abuse, except in the youngest age category [49]. Important sex differences are apparent in alcohol-related traffic risk behaviors. Although the gender gap with AUD in the general population is closing [58, 59, 39] men appear more likely to drive under the influence of alcohol and drive after drinking any alcohol, while have been mixed findings on riding with an intoxicated driver (RWID) [60, 61, 62, 63, 39].

Epidemiological studies have pointed out that moderate drinking is associated with reduce risk of mortality from heart disease and stroke [64, 65, 1]. Thus, higher alcohol prices or taxes could limit alcohol affordability and the potential beneficial effects of alcohol consumption related to heart disease and stroke [1]. Even at the lowest dose of 13g per day, where alcohol is associated with a reduced risk of cholelithiasis, ischemic heart disease, ischemic stroke and type 2 diabetes, the overall effect is detrimental [50]. In the other hand, education

level is negatively correlated with excessive alcohol consumption. In addition, a positive correlation between alcohol consumption and being a smoker was demonstrated [48]. Also, alcohol was involved more frequently in violent and public disorder crimes than in property crimes [22].

Furthermore, alcohol consumption is a major cause of premature death [50]. A social stress model considers prenatal alcohol use as the result of individual stress mitigated by social networks, social competencies, and psychosocial resources [66, 67, 82]. Elderly Europeans use to drink less if compared with younger adults. However, alcohol-related deaths among elderly adults have increased markedly over the past 10 years [68, 70]. The recommended 'safe' drinking limits, namely, 21 units for men and 14 units for women per week and no more than two drinks per day [69, 70], incorporated in most European countries, are not suitable for elderly people because of age-related changes in metabolism, advancing ill health and increase sensitivity to the effects of alcohol [70]. And, even if it is slow to transition from a first dose episode to an episode of AUD, studies have revealed that symptoms of these disorders may occur early in an individual's drinking career [71]. Beside this simultaneous alcohol and marijuana (SAM) use has been significantly and positively associated with social consequences, alcohol dependence and depression, binge drinking, and other health problems [72, 73, 74, 75, 40].

Adolescent alcohol and other drug (AOD) use puts a heavy economic burden on the health care system [76]. Moreover, it is known that adolescents entering AOD treatment were more than twice as likely to visit the emergency room (ER), three times as likely to have a primary care visit, and four times as likely to be hospitalized in the year prior to treatment than non-AOD using controls [77, 76]. Adolescents who engage in frequent alcohol use are most likely to engage in frequent simultaneous alcohol and marijuana use

[40]. In addition, the costs of obesity, tobacco, and alcohol and found a similar results, with the exception that the costs of obesity were far higher than either tobacco and alcohol, because of a much higher prevalence of obesity in the United States [48].

Specifically, as alcohol use progresses, clinical features of AUD may manifest, which in turn promotes sustained drinking and the transition to more frequent and persistent alcohol use [71]. High-risk drinking among college students is associated with a variety of harmful consequences [78]. These included unintentional injury resulting from drinking and driving and other causes, physical and sexual assault, health problems, unsafe and unplanned sexual activity, sexual harassment, impaired sleep and study time, and interpersonal problems [79, 80, 78].

Greater numbers of alcohol outlets in a community may be a sign of loosened normative constraints against violence, promote problem drinking among at-risk couples, and provide environments where groups of persons at risk for intimate partner violence (IPV) may form and mutually reinforce IPV-related attitudes, norms, and problem behaviours [81, 145]. Intimate partner violence, a serious indicator of unhappy and unsatisfactory partner relationships, was significantly correlated with prenatal drinking [82]. Although women are as likely as men to engage in physically aggressive behavior toward their partner, they are more likely than men to be injured as a result of IPV [83, 84, 85, 145]. Pregnant women who drink are at risk for fetal alcohol spectrum disorders (FASDs) and are targets in the prenatal care settings for selective prevention [66, 82].

In fact, alcohol problems continue to present a major challenge to medicine, social peace, and public health, in part because population-based public health approaches have been neglected in favor of approaches centered on the individual which tend to be more palliative than preventative [86, 48]. Obtaining a clear understanding of the type of clinical features that begin to emerge

soon after drinking commences, therefore, would be useful for designing strategies to help control drinking and prevent the escalation of AUD [87, 71]. Primary prevention programs for prenatal alcohol use could consider combined interventions to strengthen families and educate and empower women to respect and manage their lives [82]. The longer an individual has the opportunity to use alcohol, the more likely it is that they will be able to progress from experiencing clinical features of AUD to developing a full-blown disorder. This information may be useful for professionals who are responsible for planning early intervention strategies to reduce the escalation of alcohol-related problems among early-career drinkers [71].

Personal causes and consequences of alcohol abuse

Centers for Disease Control and Prevention (CDC) indicate that excessive drinking is responsible for approximately 79,000 deaths annually in the United States and that binge drinking accounts for more than half of these deaths [9]. New-onset alcohol users (NOAUs) - drinkers who started to drink alcohol within 24 months - frequently experienced problems relating to self-reported tolerance, spending a great deal of time recovering from the effects of alcohol and unsuccessful attempts at cutting down on drinking [71]. To better understand this event, Lapham and colleagues worked with AUDIT-C (Alcohol Use Disorders Identification Test - Consumption) to find that the probability of converting to a positive screen varied widely based on age, gender, and initial negative screen score (range 2.1 to 38.9%) [88]. In particular, older patients and those with the lowest scores on their initial negative screen were least likely to convert to a positive subsequent screen on AUDIT-C [88], despite the fact that episodic heavy drinking is frequent among middle-aged and older adults [89]. Besides, it was demonstrated that those with an AUDIT score of 20 or more are not only more likely

to have functional impairment but also that psychiatric morbidities are more common in this group [90]. Unemployment and divorce are stressful life events and alcohol is used by some individuals to reduce tension while undergoing them, and the accumulation (number of events or longer duration of exposure) may increase the risk of excessive drinking [53], indicating that these two are important events that leads to a high alcohol consume framework. A third important dependence reason for alcohol abuse was verified in many European countries, where excessive drinking in men varies by level of education and income, with the least educated and those earning lower income being at higher risk [53]. A similar outcome were found in USA, where, compared with moderate drinkers who were episodic heavy drinkers, regular moderate drinkers were significantly higher on SES (Socioeconomic Status) [89].

There is a plausible reciprocal process that connects drinking frequency and alcohol use disorders [71]. The episodes of heavy drinking concentrate alcohol's toxicity and are linked to mortality through diverse disease and behavioral pathways [91, 89]. Those men who typically consumed 6 or more bottles of beer per drinking occasion had substantially increased total mortality compared with men who typically consumed < 3 bottles of beer per drinking occasion [89] and moderate drinkers who were episodic heavy drinkers in comparison with regular moderate drinkers showed 3 times more likely to be problem drinkers at baseline and more than 2 times increase in the odds of total mortality during the 20-year period [89]. Advances in alcohol research have shown that patterns and average quantity of alcohol use may influence the outcomes of alcohol-related diseases and conditions [9].

Once alcohol is related with the exacerbating or contributing to a multitude of health and social problems, including physical and psychological illness; interpersonal conflicts; violence and legal problems; unemployment; poverty; deleterious reproductive

outcomes; disability; and premature death [9], the longer an individual has the opportunity to use alcohol, the more likely it is that they will progress from experiencing clinical features of AUD to developing a full-blown disorder [71].

Alcohol and other drugs

One of the main problems related to alcohol consumption is its use with other drugs, such as marijuana or tobacco. Available studies indicate the most common form of simultaneous drug use involves alcohol and marijuana [92, 93, 73, 74, 75, 40], whilst tobacco smoking continues, worldwide, to be the most harmful health behavior associated with premature disease and death [94, 95, 89]. Another substance highly mixed with alcohol are energy drinks, which has raised concerns about their impact on health of consumers owing to the risk of caffeine intoxication. Research indicates that the excessive consumption of EDs may have detrimental health effects in susceptible subjects [41, 42, 43, 44, 45, 46].

Epidemiological studies have shown the high frequency of the co-occurrence of alcohol use and smoking in the general population [96, 97, 98], however, Coste et al (2014), in a study that related smoking and health related quality of life (HRQoL), haven't found any significant interaction of depression and alcohol dependence with smoking status on HRQoL scores [98].

Terry-McElrath et al (2013) found that while both alcohol and marijuana use frequency positively associated with the likelihood of frequent SAM (simultaneous alcohol and marijuana) use, alcohol use frequency had a significantly stronger association than marijuana use frequency [40]. Withal, another study showed that Canadian college students who reported drinking AmEDs (alcohol-mixed energy drinks), were significantly inclined to cigarette smoking, heavy drinking, and marijuana use [99, 46], suggesting that AmED, as well as ED (energy drinks) consumption, is another expression of a high-risk

behavior lifestyle [46], such as marijuana and alcohol use.

The main concern about the AmEDs use is that most adolescents demonstrated they are not aware about the caffeine content of EDs, as Flotta et al (2014) found out that only 13% believe EDs is similar to drinking coffee - once research indicates that the excessive consumption of EDs may have detrimental health effects in susceptible subjects [41, 42, 43, 44, 45, 46]. Also, studies showed that mEDs can reduce the subjective perception of alcohol intoxication but not significantly reduced alcohol-related objective motor coordination and visual reaction time [100, 101, 46], which can relate to the fact that adolescents drinking EDs have a statistically significant involvement in substance use and behaviors that contribute to unintentional injuries [46].

One of the reasons found to the associated use of alcohol and other drug, especially marijuana, was alcohol use to increase the effects of another drug and because the respondent reported being hooked. Other aspects are that students with higher truancy records and higher substance use (especially alcohol use) have the strongest risk for frequent SAM use [40].

The Physiological effects of Alcohol Abuse

There are numerous researches studying individuals throughout the life span that have shown hippocampal anomalies associated with alcohol consumption [102]. Results from a recent longitudinal brain imaging study of male P rats (from P88 to 578) have revealed that free-choice ethanol consumption attenuated the growth and expansion of brain structures, including the corpus callosum and hippocampus [103]. In the case of the hippocampus, these changes may relate to the inhibition of neurogenesis established to take place in this structure [102]. Anatomical MRI studies in persons with more severe forms of alcoholism use disorders (AUD), such as alcohol dependence, commonly demonstrate decreased striatal, amygdala and hippocampal

volumes [104, 105, 106, 102], an effect which reverses with prolonged abstinence.

Besides of these effects in hippocampus, one study has addressed alterations in young-adult binge drinkers (BD) grey matter volume, focusing on cortical thickness. Female binge drinkers (BD) had thicker left frontal cortices whereas male binge drinkers (BD) had thinner left frontal cortices compared to gender matched controls [107, 102]. The existing literature also indicates that females often consume more ethanol and/or respond differently to ethanol than their male counterparts [103], although only small differences in mass measurements of the brain, the cerebellum, and the corpus callosum were seen either as a result of age (from P70 to 225), gender, or ethanol treatment.

Focusing on other important regions of the nervous system, previous studies have shown that chronic alcohol exposures induce the accumulation of DFosB within the subregions of the striatum and the prefrontal cortex (PFC), which involves activation of endogenous opioid systems [13]. Human imaging studies have also confirmed that alcohol induces changes in the ventral striatum. Oral administration of alcohol in humans results in robust ventral striatal blood oxygen level dependent activity, and positron emission tomography imaging shows that alcohol consumption causes endogenous dopamine and opioid release in the nucleus accumbens [102]. It was shown that chronic ethanol self-administration induced pronounced accumulation of DFosB in the NAc (Nucleus Accumbens) core and the DLS (dorsolateral stratum), but not in the NAc shell and the DMS (dorsomedial stratum). There is, still, significant decrease in connectivity between the frontal-temporal-basal ganglia and cerebellar components during the alcohol condition [108]. Such connections are consistent with our FNC findings that indicate disrupted connectivity between frontal-temporal-basal ganglia and cerebellum during alcohol intoxication [108].

Treatment of Alcoholism

Alcohol treatment usually is neglected and this fact can affect the society directly. Awhile some individuals wish for the right treatment, other ones have not money to afford it or just do not want this kind of intervention. A consistent finding from many general population epidemiological surveys in the US and other countries is that a large majority of individuals with substance use disorders (SUD) do not receive treatment for these problems [109, 110, 111, 112, 113, 139]. For many countries the importance given to this drug is not as big as expected, but the treatment must be a major factor to reduce the number of alcohol abusers.

There are some treatment that are not pharmacological. They are interesting to reduce the alcohol addiction. Attendance in Alcoholics Anonymous (AA) is associated with reduced drinking and improved psychosocial functioning in individuals with alcohol use disorders (AUDs) [114, 115, 12].

Besides, Marlon P. Mundt et al study presented a 12-step program efficacy as a psychological support. In this research, adolescents may be replacing their previous AOD-using networks [116, 117, 118, 79]. Change in social networks may positively influence adolescents' health behaviors, leading them to seek health care more quickly than they might otherwise [119, 120, 121, 76]. There is also substantial evidence that brief interventions (BIs) can have a significant impact on problem drinking [122, 140, 86, 48, 123, 140]. These BIs are control initiatives such as taxation, limiting access, and drinking and driving laws. Confirming this fact, there is extensive evidence that BIs can reduce drinking for primary care patients who screen positive [124, 125, 126, 88].

Moreover, there are innovative researches which seek to be helpful to alcohol addiction treatment. Thus, acupuncture has been regarded widely as an effective mean for some medical conditions, including nausea, pain [127, 13] and drug abuse [128, 13]. Compared with the currently available pharmacological interventions, a clear advantage of

acupuncture therapy is that it has the potential to help drug abusers stay away from drugs without major adverse side effects [13]. Previous clinical and preclinical studies have shown that acupuncture or acupuncture combined with electrical stimulation (electroacupuncture, EA) is an effective treatment for alcohol withdrawal syndrome and alcohol abuse [129, 130, 131, 132, 133, 134, 13].

Another perspective in the assistance of alcohol damage reduction is the use of vitamin E. The study of Long, L. et al have shown that vitamin E effectively prevents ethanol-induced neural death and ROS formation and blocks ethanol-induced morphological changes and cognitive damages [135].

Therefore, it is realized that actually the alcohol treatment is not only associated with pharmacological treatment, but also to psychological assistance, electroacupuncture, BIs and it is still possible to prevent neuronal damages with vitamin E.

Alcohol and psychological disorders

There is a high association between heavy-drinking (HD) and psychological disorders or HD and the exacerbation of these conditions. Some studies using clinical samples showed that the co-occurrence of alcoholism and depression (C-ALDP) is associated with worse alcohol-related outcomes, and this relationship appears to be stronger in males than females [136, 141]. However, the findings of Beijer, U. and Andréasson, S. with homeless population showed that younger homeless women (18–36-years-old at the baseline) had a higher risk for alcohol disorders than homeless men [137].

The research of Schuckit et al., 1997 about alcohol use disorders (AUD) had conclusions that among those with an AUD, comorbid depression is associated with an earlier onset of alcohol dependence, higher rates of lifetime drug dependence [138, 141]. Besides, in the same study already realized by Beijer, U. and Andréasson, S. the prevalence of schizophrenia in combination with alcohol and drug use

disorders was nearly three times higher among the homeless women than among homeless men [137].

Thus, a contrast is attested in these findings because there is not a agreement about which gender is most affected for alcohol abuse correlated with results in psychological disorders.

Conclusion

It is possible to realize the problems that alcohol causes in society, like bringing losses with the excess public spending on treatment and prevention of this drug. Besides, the studies made clear that the human being as a collective is impaired when this substance is misused. The data that showing close relationship between early youth death attributed to alcohol are worrying. In this sense, the alcohol in the youth allows higher risk behavior between teens, how risky sexual conduct and involving the criminal activities. These behaviors occur more frequently among adolescents, who are still developing judgment and decision-making skills and may be limited in their ability to accurately assess risks[22].

The findings listed in this review showed that the prevalence of the alcohol use in the population can be decreased with increase in prices of alcoholic beverages, including them high taxes aiming at to decrease accessibility to this drug. Also, the number of binge drinkers decreases by increasing the general education of a country, because as higher the truancy, bigger the number of drinkers. Education campaigns in schools and workplace, media campaigns, and efforts to enhance recognition and motivation for treatment-seeking in primary care and mental health care settings can potentially improve the perception of need for treatment among individuals with substance use disorders [139].

Therefore, if we reduce the use of this substance, the consume of others drugs, risky behaviors and psychological illness will decrease too. Unfortunately, alcohol problems continue to present a major challenge to medicine. The health sciences should

promote better adherence of states and universities to campaign against alcohol. We need more studies and more incentives to reduce the existence of the negligence.

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Conflict Of Interest

Ms Pinheiro, Ms Alencar, Mr Pimentel, Mr Grangeiro, Mr Ataliba, Ms Coelho, Ms Falcão, and Drs. Modesto, Cláudio, Maria do Socorro, Jesus, Sonia and Alberto have no conflicts of interest or financial ties to report.

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