STUDIA UBB BIOETHICA, LXIV, 1-2, 2019 (p. 81-90)
(RECOMMENDED CITATION)
doi:10.24193/subbbioethica.2019.07

USING AN ETHICAL LENS TO ANALYZE HOW THE BENEFITS OF A MODERATE WINE CONSUMPTION ARE PRESENTED IN THE SCIENTIFIC LITERATURE

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ABSTRACT. The scientific literature on the benefits of wine consumption is full of controversy. Many of the ethical issues related to these researches were broken and caused results to be doubted. Wine, one of the oldest alcoholic beverages known, has sparked quite a controversy regarding its negative side effects (because of its alcohol concentration). However, wine, unlike other alcoholic drinks, does have its positive side-effects, that are commonly overlooked. In various medical, behavioural, nutritional and psychological studies, the beneficial traits of a moderate wine consumption are underlined. This study wants to gather data that explain, from an interdisciplinary point of view, why wine can serve as social, psychological, medical but also cultural and traditional aid in human development.

Keywords: *ethics, health, alcohol consumption, research, medicine, psychology*

REZUMAT. ***O privire etică a analizei beneficiilor consumului moderat de vin prezentate în literatura ştiinţifică.*** Literatura ştiintifică cu privire la beneficiile consumului de vin este plină de controverse. Multe dintre aspectele etice legate de aceste cercetări au fost încălcate şi au determinat ca rezultatele să fie privite cu neîncredere. Vinul, una dintre cele mai vechi băuturi alcoolice, a stârnit o controversă cu privire la efectele sale negative (din cauza concentraţiei sale de alcool). Cu toate acestea, vinul, spre deosebire de alte băuturi alcoolice, are şi efecte pozitive, care sunt adesea trecute cu vederea. În diferite studii medicale, comportamentale, nutriţionale şi psihologice, sunt subliniate trăsăturile benefice ale

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unui consum moderat de vin. Acest studiu dorește să adune date care explică, din punct de vedere interdisciplinar, de ce vinul poate servi drept ajutor social, psihologic, medical, dar și cultural și tradițional în dezvoltarea umană.

Cuvinte cheie: *etică, sănătate, consum de alcool, cercetare, medicină, psihologie*

Alcohol consumption and medical studies

Alcohol is a complex component of the diet and appears to have multiple effects on appetite *(Yeomans et al., 2003)*, increasing adiponectin and ghrelin. The scientific interest in investigating the beneficial effects of moderate alcohol consumption on health was born at the end of 1950 in the Seven Countries Study and since then, numerous epidemiological studies have confirmed the inverse relationship between moderate alcohol intake and risk of cardiovascular morbidity and mortality *(Romeo et al., 2007).* Moreover, many studies have identified that drinking moderate amounts of alcohol as compared to abstinence has benefits for better health and longer life expectancy. Several epidemiological studies have shown an association between moderate alcohol intake and reduced risk of BCV and ischemic stroke, these cardio protective effects being observed not only in healthy people, but also in patients who have suffered from myocardial infarction, stroke or hypertensive risk. Also, even though alcohol is a known carcinogen, the results of other studies suggest that alcohol can reduce the risk of cancers, such as rectal cancer and renal cell carcinoma *(Nova et al., 2012).*

In particular, epidemiological and experimental studies have shown that moderate wine consumption, especially red wine, mitigates cardiovascular, cerebrovascular and peripheral vascular risks, these cardio protective effects being attributed to both components of the wine: the alcoholic portion and, more importantly, the non-alcoholic portion containing antioxidants (including resveratrol, catechin, epicatechins and proanthocyanidins). Recent studies have shown that resveratrol and proanthocyanidins are the main compounds present in grapes and wines, both of which play a crucial role in cardio protection and more than that, wine can increase the lifespan by inducing gene longevity (*Bertelli & Das, 2009*).

About wine and nutrition benefits

Wine is a traditional alcoholic beverage obtained by fermenting the grape must, the quality of the wine thus being linked to the composition and variety of grapes. In general, the average concentrations of the major components

of the wine are water - 86%, ethanol-12%, glycerol, polysaccharides or other trace elements-1%, different types of acids - 0.5% and volatile compounds-0.5%. Based on the amount of sugar, the content of alcohol and carbon dioxide, the color, the grape variety, the degree of fermentation, the ripening process and the geographical origin, the wines can be classified as red, white and rosé wines.

Red wines are obtained by maceration- fermentation of the must (with skin and seeds) and white wines are produced exclusively by fermentation of the grape juice, so the red wine will contain 10 times more phenolic compounds than the white one. Although the antioxidant property of red wines is correlated with their phenol content, not a single compound sufficiently defines the total antioxidant capacity, due to the potential synergistic antioxidant effect of other compounds *(Markoski et al., 2016).*

Wine, as an alcoholic beverage, has approximately 7 calories per gram and can be considered as food because it provides energy and contributes to body maintenance. Also, studies estimate that 70-75% of the calories from alcohol can be considered to be physiologically available for body maintenance and work energy. Moreover, wine contains a small number of vitamins such as riboflavin, niacin, pyridoxine and folacin but has considerably more iron than beer, for example, and has a favorable potassium to sodium ratio (*Baum-Baicker, 1985*).

Wine and physical health

It has been estimated that the drug use of wine dates from the 2200s before Christ, making it the oldest known drug, being used as an antiseptic, painkiller and medicine for treating dermatological diseases and digestive disorders. In the early 1990s, the media release of the "French Paradox" highlighted the health benefits of red wine in the United States, prompting researchers to examine and find explanations for the new connections between wine and health *(Guilford & Pezzuto, 2011).* Also, interest in the potential benefits of wine increased when international studies showed that people in wine-consuming countries had a lower risk of mortality from coronary heart diseases than in countries where inhabitants favorite beverages were beer or liquor. Moreover, Danish studies show that wine consumers, compared to beer or another alcoholic beverage, have lower risks of total mortality, cancer and stroke and a French report indicates lower mortality from cardiovascular diseases (*Klatsky et al., 2003*).

The term "French Paradox" was invented in 1992 from the epidemiological observation that some French populations had a relatively low incidence of coronary heart disease, despite of a relatively high dietary intake of saturated fatty acids. According to the Food and Agriculture Organization of the United

Nations, overall dietary fat consumption in France in 2003 was approximately 168 g / capita / day, compared to 155 g / capita / day in United States, 134 g / capita / day in the United Kingdom and 126 g / capita / day in Sweden. Although total alcohol consumption was ~ 255 g / capita / day in France, 269 g / capita / day in the United States, 340 g / capita / day in the United Kingdom and 211 g / capita / day in Sweden, wine accounted for approximately 57% of total alcohol consumption in France, 7% in the United States, 15% in the United Kingdom and 22% in Sweden. However, according to the atlas of the global epidemic of heart disease and stroke issued by the *World Health Organization*, in 2002, the death rate from coronary heart disease in France (0.8%) was two or three times lower than in the United States (1.8%), the United Kingdom (2.1%) and Sweden (2.3%). This is consistent with the results of previous studies that reported that, despite of a high dietary intake of saturated animal fats and the highest intake of wine worldwide, France had the second lowest coronary arteries disease mortality rate in 1994. Now, more than 20 years after the publication of these results, several experimental and epidemiological studies have investigated the fascinating association between red wine consumption and cardiovascular mortality and morbidity *(Lippi et al., 2010).*

Red wine contains far more flavonoids (especially anthocyanins and proanthocyanidins) than white wine and thus has higher antioxidant activity: it inhibits platelet aggregation and relaxes blood vessels. The data suggest that a moderate intake of red wine (1-2 drinks a day) may have potential benefits for alcohol-independent health, and this requires clinical studies and epidemiological investigations (*Cao & Prior, 2000*). Scientific research has shown that the molecules present in grapes and wine alter cellular metabolism and signaling, which is mechanically identified by reducing arterial disease. Discovering the nutritional properties of wine is a difficult task that requires the biological actions and bioavailability of> 200 individual phenolic compounds to be documented and interpreted within social factors that stratify wine consumption and the numerous effects of alcohol. The health benefits of wine refer to the prevention of diseases that are slowly developing and although the benefits of polyphenols from fruits and vegetables are increasingly accepted, the consensus on wine develops slower (*German & Walzem, 2000*).

Antioxidant effects of moderate wine consumption may be one of the factors responsible for the "French Paradox", proving that red wine increases plasma antioxidant capacity, suppresses reactive oxygen species generation, increases oxygen radicals uptake and decreases DNA oxidative damage. Also, flavonoids from wine protect against LDL oxidation and procyanidins are particularly active in preventing lipid oxidation of foods in the digestive tract, indicating that consumption of red wine at meals provides the greatest

cardiovascular protection. Also, the positive effects of wine consumption on the body's immune function require more than two weeks of daily consumption of at least two glasses of wine (300 ml) for men (less for women).

An epidemiological study conducted on several European sites found that moderate daily consumption of wine was associated with lower levels of systemic inflammatory markers compared to individuals who do not use alcohol or, on the contrary, are dependent on alcohol. Moderate wine consumption is also associated with a low risk of cardiovascular disease (by increasing HDL cholesterol levels, inhibiting platelet aggregation), type 2 diabetes and many cancers. The polyphenols present in wine independently provide antioxidant protection and also act through a variety of mechanisms to prevent and attenuate inflammatory responses, thus serving as cardio protective, neuroprotective and chemo preventive agents *(Guilford & Pezzuto, 2011)*. The beneficial effect of moderate wine consumption on all-cause mortality risk was observed in people with high blood pressure. These findings may have important implications for middle-aged and elderly hypertensive patients, who are already consuming moderate wine because it may lower the risk of death of these patients, which has not improved for recent antihypertensive drugs *(Renaud et al., 2004).*

The Department of Health and Human Services *Dietary Guidelines for Americans* defines moderate alcohol use as having no more than one drink per day for women and no more than two drinks per day for men. When analyzing the benefits of moderate alcohol use on longevity, it is important to consider the effects of other factors on health: diet, education and income level, health habits (smoking and exercise), social involvement and age because many of the studies described above have found that although wine consumers often have lower mortality rates than non-drinkers, their lifestyle is also healthier overall, so it is hard to say which are the factors that have the great beneficial effect and so we can say that the healthful effects of wine may be enhanced by a healthy diet. In Denmark, for example, wine consumers tend to consume a healthy Mediterranean-style diet (rich in fresh fruits and vegetables, fish and olive oil, and poor in meat and dairy products) and have a higher socio-economic status. Moreover, studies have found an association between moderate alcohol consumption and lower levels of depression, anxiety and perceived stress (*Rudis, 2010*).

As mentioned, there appear to be more health benefits associated with red wine than white, and certain polyphenols, such as resveratrol, offer an abundance of health benefits, but resveratrol itself has low bioavailability, indicating that resveratrol metabolites are the real key players. However, most medical professionals, as well as the American Heart Association, agree that alcohol addicts or non-alcoholic drinkers should not be encouraged to drink wine for health reasons. Wine consumption should not replace a healthy lifestyle, but light to moderate wine consumers, without any medical complications, can be sure that their wine consumption is a healthy habit *(Guilford & Pezzuto, 2011)*.

Several studies examining the association between intake of different types of alcoholic drinks such as beer, spirit and wine and all-cause mortality showed that wine intake was the most beneficial. To confirm this hypothesis, a study compared the acute protective effects of red wine, beer and vodka against the oxidative stress induced by hyperoxia and the associated increase in arterial rigidity. Results showed that all types of alcoholic beverages prevented the increased of arterial rigidity induced by hyperoxemia, but only the red wine diminished the oxidative stress after hyperoxemia *(Krnic et al., 2011*). Another study shows that the frequency of wine consumption, but not of other alcoholic beverages (such as beer or liquor), was independently linked to lower mortality risk, especially for coronary heart disease and respiratory deaths. This protection may be associated with health patterns among wine consumers (such as diet, physical activity, etc.) and / or may be a specific benefit from wine (*Klatsky et al., 2003*). Also, another study showed that both clinical and experimental evidences suggest that red wine does indeed offer greater health protection than other alcoholic beverages, protection attributed to antioxidant polyphenolic compounds derived from grapes and which are found especially in red wine *(Burns et al., 2001).*

Health risks of high wine consumption

Although the positive effects of wine on health are many, three or more drinks a day can increase the risk of neurodegeneration, depressive disorders, obesity, bone loss, hypertriglyceridemia, heart disease, high blood pressure, stroke, breast cancer, suicide and injury *(Guilford & Pezzuto, 2011)*. High alcohol consumption can lead to lipid peroxidation, alteration of the level of metals in the body, contributing to the production of reactive oxygen species. In tissues, the generation of exacerbated ROS triggers an inflammatory cascade response, which affects homeostasis and culminates in tissue injury and disease establishment. In this context, alcohol has negative effects, causing severe alcohol-related liver disease *(Markoski et al., 2016).* Also, the consumption of wine in any quantity is contraindicated in pregnant women, children and patients with liver disease and in combination with certain medicines *(Guilford & Pezzuto, 2011)*.

Drinking behavior of young adults

Wine is said to be one of the most consumed alcoholic beverages among young adults, so few studies analyzed the relationship between different types of alcohol during adolescent and body weight. Some found a direct association between high alcohol consumption and high self-reported weight gain, while

others found that adolescents with high alcohol intake were at smaller risk to become obese in adulthood than adolescents with low intake of alcohol *(Poudel et al., 2019).*

Most young Chinese adults lack even the most basic knowledge about wine. In general, they drink rare wine. Most Chinese young adults prefer red wine (92%), and most of them (60%) like to drink wine at home, followed by hotels (21%) and restaurants (15%). Also, more than half of young Chinese adults drink wine for social communication, while 27% of them drink for health reasons, existing strong correlations between consumers' knowledge of wine and the frequency and likelihood of future wine consumption (*Li et al., 2011*). In general, the drinking behavior of young adults in any country or culture is related to the drinking behavior of the entire population. However, a study of young adults in Portugal, aged 18-26, found that participants generally did not consume much wine. Young adults said they consume wine for alcohol content, on special occasions and parties with friends where the main motivation is disinhibition and facilitating socialization and fun. Regarding the reason for choosing the wine, the price is the main attribute, which is considered to have a direct connection with the quality. The taste of wine is mentioned as the key attribute that differentiates between consumers and non-consumers, as it is also identified as the main reason for the non-consumption by the participants (*Silva et al., 2014*).

Psychological, behavioral, cultural and educational issues about wine consumption

The benefits of moderate wine consumption over cognitive functioning have been presented by international scientific literature through epidemiological results, suggesting that wine is a protective factor of brain functioning and may possibly reduce the risk of dementia. A large part of the literature explains that the identification of these benefits is not highlighted even when comparing moderate consumption with abstinence. Therefore, cognitive benefits and beneficial effects on brain health or reducing the risk of dementia are not generally supported.

Acute alcohol consumption leads to disinhibition, emotional disturbance, social problems, impaired psycho-motor activity. The consumption has more exaggerated effects when it comes to teenagers where quantity and quality of wine consumption is not well-evaluated. That is why parental control, respecting religious believes and creating healthy consumption behaviors are important at this age.

The family plays an important role in creating the wine consumption behavior. In some countries, drinking red wine at lunch or dinner is a non-infringing custom. In other communities, the restrictions imposed by religion are strictly respected, with the family playing a major role in maintaining these customs.

From a psychological point of view, the consumption of alcohol in the family has an educational role: if we see that one parent is upset or depressed and consumes alcohol, or another parent is happy and celebrates by consuming alcohol, this behavior will also be assimilated by children. Wine consumption behavior is taught in the family, behaviorists explain in this way why alcoholism is transmitted from parents to children.

Ethical concerns about wine consumption researches

Observational data around benefits of moderate alcohol consumption and heart health suggests that a light to moderate intake, in regular amounts, appears to be healthy. But results determine confusing conclusions when mathematical models have been applied to determine causation

Numerous studies have identified a correlation between moderate wine consumption (especially red) and better cardiovascular health. However, these studies mentioned the link and not the causality between moderate wine consumption and cardiovascular health. Many of them even mention comparative results between the abstinent population and the moderate consumers, concluding that, from a medical point of view, the benefits of wine consumption cannot be strictly assessed, and its consumption cannot be recommended in order to prevent cardiovascular diseases.

The consensus of epidemiologists, social scientists, and alcohol policy experts who found that moderate alcohol consumption was cardioprotective was not anymore sustained by scientific researches in the last 10 years. The studies lead for more than 3 decades were accused to be sponsored by alcohol industry in the United States, for example "In July 2017, the *New York Times* reported that the National Institute on Alcohol Abuse and Alcoholism (NIAAA) would be funding a $100 million randomized controlled trial (RCT) to examine an issue that had been the subject of scientific and public health controversy for four decades: whether moderate alcohol consumption was protective against cardiovascular disease" (*Oppenheimer et al., 2019*).

Many studies proved that moderate wine drinkers are healthier than heavy drinkers, but some epidemiologists sustained that no consistent results were proved when it comes to compare with abstinent. The inclusion of abstainers

in studies targeting the benefits of moderate alcohol consumption should also consider the fact that many of the abstinent subjects have proved to be chronic carriers, so poor health prohibited them from alcohol consumption.

So, in the last years, the skepticism about the protective role of wine has grown more and more. That is why, as a public health concern, advising wine in order to protect from cardiovascular disease is not accepted anymore and it is seen as an unethical behavior among medical doctors.

Conclusions

Despite the doubts, there is a reasonable unanimity regarding the beneficial effects of moderate wine consumption in cardiovascular disease, diabetes, osteoporosis, perhaps neurological diseases and longevity (*Artero et al., 2015*). Studies in humans have shown that phenolic compounds can have beneficial effects on health, due to their anti-inflammatory and antioxidant properties and their role in tissue repair processes. Such mechanisms help the organic systems to ensure the assistance of cellular and tissue functions *(Markoski et al., 2016)*. The excellent health associated with the Mediterranean diet, which combines moderate wine intake with a diet rich in fruits, vegetables, and whole grains, suggests that wine polyphenols have synergistic effects with compounds found in other types of foods *(Guilford & Pezzuto, 2011)*. However, despite the protective effects of these phenolic constituents, the amount of wine consumed deserves attention, as excessive chronic intake can lead to exacerbated response, oxidative stress, endothelial dysfunction and cardiovascular disease *(Markoski et al., 2016)*.

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