

WINE AND LONGEVITY, A COMPARATIVE DOCUMENTARY RESEARCH ON HEALTH BENEFITS

Gabriela Teodorescu

Valahia University of Targoviste, 13, Sinaia Alley, Targoviste, Romania

E-mail: theo_0200@yahoo.com

Abstract

Over the past two decades, numerous epidemiological investigations have examined the relationship between alcohol intake and various health outcomes, including overall mortality, arteriosclerotic vascular diseases, hypertension, cancer, and age-related macular degeneration. These studies have commonly assessed health outcomes across different levels of alcohol consumption, comparing moderate consumers to total abstainers. Many such studies have demonstrated a relatively reduced risk for certain conditions among moderate drinkers, thereby supporting the notion that low-to-moderate alcohol intake, especially in the form of wine - may confer health advantages. Wine, particularly red wine, is notably rich in phenolic compounds such as resveratrol and flavonoids. These bioactive constituents positively modulate key biochemical systems: they enhance levels of high-density lipoprotein (HDL) cholesterol, exhibit antioxidant activity, reduce platelet aggregation and endothelial adhesion, and may inhibit the proliferation of cancer cells. The present study employed the method of documentary research, grounded in a critical analysis of pertinent scientific literature within the fields of medicine, nutrition, and public health. Although compounds in wine, such as resveratrol, exhibit anti-cancer properties in laboratory settings, these findings do not justify increased wine consumption for preventive purposes.

Keywords: wine; health; longevity, constituents

1. INTRODUCTION

The interplay between wine consumption and health has long attracted scholarly interest, with extensive international research forming the basis of contemporary scientific understanding.

The present study endeavors to construct a sound argumentative framework by drawing upon authoritative scientific sources, physiological mechanisms, and the documented therapeutic properties of wine.

Over the past two decades, numerous epidemiological investigations have examined the relationship between alcohol intake and various health outcomes, including overall mortality, arteriosclerotic vascular diseases, hypertension, cancer, and age-related macular degeneration. These studies have commonly assessed health outcomes across different levels of alcohol consumption, comparing moderate consumers to total abstainers.

Many such studies have demonstrated a relatively reduced risk for certain conditions among moderate drinkers, thereby supporting the notion that low-to-moderate alcohol intake, especially in the form of wine - may confer health advantages.

Wine, particularly red wine, is notably rich in phenolic compounds such as resveratrol and flavonoids. These bioactive constituents positively modulate key biochemical systems: they enhance levels of high-density lipoprotein (HDL) cholesterol, exhibit antioxidant activity, reduce platelet aggregation and endothelial adhesion, and may inhibit the proliferation of cancer cells. Nevertheless, recent research into the health effects of alcohol has produced divergent conclusions.

On one hand, multiple studies suggest that moderate consumption of wine, especially red wine, is associated with cardiovascular protection and increased longevity.

On the other hand, an opposing body of evidence highlights alcohol itself, as a substance, regardless of form or origin, as a potential health risk.

Against this backdrop, the current study applies a documentary research methodology to critically assess whether wine offers superior health and longevity benefits in comparison to other alcoholic beverages.

The core research question that this paper seeks to address is as follows: *Does wine offer greater health benefits than other alcoholic drinks?*

While a significant number of studies argue in favor of wine's superior protective effects relative to beer or spirits, others maintain that any form of alcohol is harmful, irrespective of type or source.

Considering these divergent perspectives, this study proposes the following specific objectives:

1. To identify the frequency and type of alcoholic beverages consumed.
2. To evaluate individual perceptions of wine's effects on health.
3. To explore correlations between wine consumption and self-reported indicators of physical, mental, and social well-being.
4. To compare data between consumers of wine, beer, and spirits.

The working hypotheses guiding the research are:

- Moderate wine consumption is positively associated with individuals' perceptions of their own health status.
- Individuals who consume wine moderately report healthier lifestyle patterns, including diet, physical activity, and lower perceived stress.
- Compared to beer or spirits drinkers, those who prefer wine report a higher perceived quality of life.

2. MATERIALS AND METHODS

The present study employed the method of documentary research, grounded in a critical analysis of pertinent scientific literature within the fields of medicine, nutrition, and public health. This approach is particularly recommended during the exploration phase of investigating a complex subject, when the aim is to synthesize existing findings and draw coherent conclusions based on academically validated sources.

The literature reviewed was selected from well-established scientific databases such as PubMed, Scopus, and Web of Science, as well as from high-impact academic journals. This methodological orientation enables the identification of current scientific trends, the comparison of outcomes across studies, and the delineation of areas of academic controversy. The documentary research process involved a systematic, selective, and critical review of the existing body of scholarly literature concerning the health and longevity outcomes associated with wine consumption, in comparison to other categories of alcoholic beverages. This method is deemed appropriate for substantiating the theoretical premise that moderate wine intake, within the framework of a healthy lifestyle, may offer superior health benefits compared to beer or spirits. Its use is further justified by the absence of a primary sample and the current impracticality of conducting an empirical investigation. The review exclusively included peer-reviewed scientific studies, as well as official reports published by authoritative institutions such as the World Health Organization (WHO), the European Food Safety Authority (EFSA), and the National Institutes of Health (NIH). The selected literature encompasses clinical trials, meta-analyses, systematic reviews, and observational studies; publications comparing the effects of wine with those of other alcoholic beverages; research examining wine composition and its antioxidant and anti-inflammatory properties; and studies exploring the impact of moderate consumption on cardiovascular, neurological, and metabolic health.

Despite its academic merit, the documentary research method presents several limitations:

- It does not permit the establishment of direct causal relationships, relying instead on observed associations.
- The findings may reflect methodological disparities or cultural variations across the studies reviewed.
- The absence of a primary dataset restricts the potential for testing original hypotheses.

3. RESULTS

Wine and Health: What Science Says - The French Paradox.

The term was popularized by Serge Renaud in 1992, who observed that the French have a relatively low rate of

cardiovascular diseases despite a diet rich in saturated fats.

He explained this phenomenon by the daily consumption of red wine. This result can be attributed to the active compounds in wine:

- **Resveratrol:** A polyphenol with antioxidant, anti-inflammatory, and anticancer properties. Baur & Sinclair (2006) demonstrated that resveratrol activates the SIRT1 gene, which is involved in longevity processes and cellular protection (Nature Reviews Drug Discovery, 2006).

- **Flavonoids and Tannins:** These substances reduce the oxidation of LDL cholesterol and contribute to the protection of the vascular endothelium (Goldberg et al., 1995).

- **Polyphenols:** Studies show that red wine has superior antioxidant activity compared to beer and spirits (Frankel et al., 1993, Lancet).

Wine and the Gut Microbiome: Queipo-Ortuño et al. (2012) showed that polyphenols in wine stimulate the growth of beneficial bacteria, such as Lactobacillus and Bifidobacterium, improving digestion and reducing intestinal inflammation (American Journal of Clinical Nutrition).

Cardiovascular Protection: Moderate consumption of red wine has been associated with a significant reduction in the risk of cardiovascular diseases. Antioxidants like resveratrol and proanthocyanidins contribute to lowering blood pressure, improving lipid profiles, and preventing atherosclerosis.

Wine and Longevity - Studies on Longevity Populations: In Sardinia, regular and moderate wine consumption (Cannonau, rich in polyphenols) is associated with high life expectancy and a low incidence of degenerative diseases (Buettner, 2008).

Activation of Longevity Genes: Resveratrol activates the SIRT1 and SIRT2 genes, involved in anti-aging processes, according to research conducted by Sinclair (Harvard Medical School).

Additionally, experiments on *Drosophila melanogaster* (fruit flies) demonstrated that adding red wine to the diet significantly increased average lifespan, supporting the idea that certain components of wine can have beneficial effects on longevity.

Moderate Wine Consumption and Reduced Mortality: A longitudinal study conducted in the Netherlands (Zutphen Study) followed 1,373 men over 40 years and found that daily consumption of less than half a glass of wine was associated with a significant reduction in cardiovascular mortality risk (HR 0.68) and an increase in life expectancy by about 5 years compared to abstainers.

Wine Consumption and Breast Cancer Risk: The relationship between alcohol consumption and breast cancer risk is complex and has been extensively studied in recent decades.

Although there is scientific consensus that alcohol, regardless of type, is a risk factor for breast cancer development, some studies have specifically explored whether wine, particularly red wine, behaves differently due to its polyphenol content.

Red Wine – A Possible Exception? Some experimental research has hypothesized that resveratrol and other polyphenols in red wine may counteract the estrogenic effects of alcohol and reduce the proliferation of breast cells: Singletary & Jung (2001) showed in cell studies that resveratrol inhibits the proliferation of ER⁺ breast cancer cells through anti-estrogenic mechanisms.

Wang et al. (2010) observed in in vivo studies that resveratrol could reduce breast cancer incidence in mice treated with carcinogens, suggesting a potential protective role.

However, these protective effects are observed at much higher concentrations than can be achieved through normal wine consumption.

A meta-analysis by Scocianti et al. (2014) for the World Cancer Research Fund (WCRF) concluded that there is insufficient evidence to support significant protection from breast cancer by wine compared to other types of alcohol. On the contrary, limiting alcohol consumption to a minimum is recommended for women wishing to reduce their risk.

In a study published in *Nutrition and Cancer* (2001) by Singletary and Jung, researchers investigated the effects of resveratrol on human breast cancer cell lines, including MCF-7 (ER-positive) and MDA-MB-231 (ER-negative). The results showed that resveratrol inhibits the proliferation of these cancer cells by inducing apoptosis, evidenced by increased expression of pro-apoptotic proteins Bax and Bak, decreased expression of Bcl-xL, and activation of caspase-3.

Moreover, resveratrol countered the effects of linoleic acid, a strong stimulator of breast cancer cell growth, suggesting a potential protective role against dietary pro-carcinogenic factors.

These findings indicate that resveratrol, a polyphenolic compound found in red wine, may have beneficial effects in inhibiting the growth of breast cancer cells both by inducing apoptosis and modulating responses to pro-carcinogenic dietary stimuli. It is important to note that these results are based on in vitro studies, and the effects of resveratrol in the human body may be influenced by factors such as its bioavailability and metabolism. Therefore, further research is needed to determine the clinical relevance of these findings.

The Mediterranean Diet Context: Moderate wine consumption is a traditional component of the Mediterranean diet, which has been associated with a reduced risk of chronic diseases and increased longevity. This diet includes, in addition to wine, a high intake of fruits, vegetables, whole grains, and healthy fats.

Nutritional Perspectives on Wine Consumption: Nutritionists and experts in metabolic health have extensively explored the positive effects of moderate wine consumption, particularly red wine, within the context of a balanced diet and Mediterranean lifestyle.

The Mediterranean diet, promoted by nutritionists and health organizations, includes moderate red wine consumption with meals.

This dietary model has been associated with a reduced risk of cardiovascular diseases, type 2 diabetes, metabolic syndrome, and some forms of cancer.

The PREDIMED study (Estruch et al., 2013), one of the largest clinical studies on the Mediterranean diet, showed that participants who consumed moderate red wine (1-2 glasses/day for men, 1 glass/day for women) had a significant reduction in major cardiovascular events.

The Academy of Nutrition and Dietetics in the U.S. recommends moderate alcohol consumption only for healthy adults and defines it as:

- For men: max. 2 servings/day
- For women: max. 1 serving/day
- One serving = 150 ml of 12% vol. alcohol wine.

Nutritional Benefits of Wine: Nutritionists emphasize that red wine provides metabolic and antioxidant benefits, particularly due to its bioactive compound content.

Comparison of Wine – Beer – Spirits Consumption: Comparative studies: Gronbaek et al. (2000) analyzed data from the Copenhagen City Heart Study and showed that people who consume wine moderately had a 34% lower mortality rate than abstainers, whereas beer and spirit drinkers did not experience similar benefits. Mukamal et al. (2003) demonstrated that wine reduces the incidence of myocardial infarction among healthy men more effectively than other alcoholic beverages (New England Journal of Medicine).

Spirits and Beer: These contain negligible amounts of polyphenols and do not offer the same antioxidant benefits. Moreover, excessive consumption is more frequently associated with spirit drinkers (Rehm et al., 2010).

Risks and Limits of Consumption: Alcohol Risks: According to the Global Burden of Disease study (Lancet, 2018), any amount of alcohol carries risk, but moderate consumption (1-2 glasses/day) presents a lower risk compared to complete abstinence or excessive consumption.

The Importance of Context: The benefits of wine are maximized when consumed as part of a healthy diet, such as the Mediterranean diet, and in a balanced social context.

4. DISCUSSIONS

The findings of the documentary research suggest a positive relationship between moderate wine consumption and longevity, supported by multiple physiological mechanisms and long-term observational studies. In particular, red wine appears to be associated with the greatest benefits, owing to its high polyphenol content, especially resveratrol, which acts as an antioxidant, anti-inflammatory agent, and cardiovascular protector.

Human studies indicate a correlation between moderate daily consumption (1–2 glasses/day) and: Reduction in cardiovascular mortality; Lower risk of type 2 diabetes; Protection against cognitive decline; Increased life expectancy.

However, despite this promising data, several aspects remain open for discussion:

- Individual variability: The effects of alcohol are influenced by genetics, sex, lifestyle, and socio-cultural factors.

- The confusion between correlation and causality: Many studies cannot accurately isolate the effects of wine from other healthy habits (e.g., diet, physical activity).

- The risks associated with alcohol consumption: Even in small amounts, alcohol can be harmful under certain conditions (e.g., pregnancy, liver disease, medication). Therefore, conclusions should be made cautiously, promoting conscious, moderate consumption as part of a balanced lifestyle.

The results of the documentary research support the notion that wine, consumed in moderation, may have beneficial effects on human health compared to other alcoholic beverages. This beneficial effect is especially attributed to red wine, due to its high polyphenol content, particularly resveratrol, quercetin, catechins, and anthocyanins.

Differences between wine, beer, and spirits.

Several epidemiological studies have demonstrated that, among moderate consumers, wine offers a lower cardiovascular risk than beer or spirits (Renaud & de Lorgeril, 1992). These findings support the idea that it is not alcohol per se that is responsible for the cardioprotective effects, but the bioactive compounds in wine, particularly those extracted from grape skins.

Effects on cardiovascular diseases and longevity.

The Mediterranean diet model, in which wine is consumed with main meals, has been associated with a significant reduction in both cardiovascular and overall mortality. The PREDIMED study (Estruch et al., 2013) highlighted a reduction of over 30% in the risk of myocardial infarction and stroke among participants who followed the Mediterranean diet, including moderate wine consumption.

Additionally, resveratrol has been studied for its effects on the expression of longevity genes (SIRT1) and its ability to combat oxidative stress—two mechanisms relevant to slowing the aging process (Baur & Sinclair, 2006).

Oncological implications: Breast cancer. The previous section of the study presented significant findings from Singletary & Jung (2001), who demonstrated that resveratrol inhibits the proliferation of breast cancer cells by inducing apoptosis. These in vitro findings have paved the way for new therapeutic hypotheses, although clinical applicability requires validation in human studies. Furthermore, excessive alcohol consumption remains a risk factor for breast cancer, necessitating caution in recommendations regarding wine.

Nutritional perspectives. From a nutritional standpoint, wine is considered by many experts as an integral part of a healthy lifestyle when consumed moderately and within the context of a balanced diet.

Nutritionists such as Dr. David Katz and Dr. Michele Carruba assert that wine, with its natural antioxidant content, contributes to vascular protection, glucose

metabolism regulation, and the reduction of chronic low-grade inflammation.

5. CONCLUSIONS

Moderate wine consumption, particularly red wine, holds the potential to offer genuine health benefits, due to its phenolic compounds with antioxidant and anti-inflammatory effects. In comparison to beer and spirits, wine appears to provide superior protection against cardiovascular diseases and premature aging. However, these benefits are only evident under conditions of moderate and responsible consumption, integrated into a healthy lifestyle.

It cannot be definitively stated that wine is therapeutically superior to beer or spirits in all cases, but the available evidence supports its inclusion, in moderation, as part of a healthy lifestyle. To draw firm conclusions, additional longitudinal studies are necessary, which more rigorously control associated variables.

Although compounds in wine, such as resveratrol, exhibit anti-cancer properties in laboratory settings, these findings do not justify increased wine consumption for preventive purposes. Moderate consumption remains essential, and in the case of women, potential risks related to breast cancer must be carefully considered.

Based on the documentary analyses, it can be concluded that many nutritionists advocate for the rational and moderate consumption of red wine as part of a healthy lifestyle, particularly within the Mediterranean diet. Observed benefits include cardiovascular protection, antioxidant effects, glucose regulation, and the potential activation of cellular mechanisms associated with longevity. However, these positive effects disappear with excessive consumption.

6. REFERENCES

- [1] Beulens, J. W. J. et al. (2009). Alcohol consumption and risk of type 2 diabetes among older women. *Diabetes Care*, 32(5), 993–997. <https://doi.org/10.2337/dc08-2106>
- [2] Di Castelnuovo A., Costanzo S., Bagnardi V., Donati, M. B., Iacoviello, L., & de Gaetano, G. (2006). Alcohol dosing and total mortality in men and women: An updated meta-analysis of 34 prospective studies. *Archives of Internal Medicine*, 166(22), 2437–2445. <https://doi.org/10.1001/archinte.166.22.2437>
- [3] Goldberg, D. M., & Soleas, G. J. (2001). Wine as a biological fluid: History, production, and role in disease prevention. *Journal of Clinical Laboratory Analysis*, 15(6), 264–287. <https://doi.org/10.1002/jcla.1025>
- [4] Kesse-Guyot, E., et al. (2013). Alcoholic beverage preference and diet in a French cohort of middle-aged men and women. *Journal of the American Dietetic Association*, 113(3), 369–376. <https://doi.org/10.1016/j.jand.2012.11.012>
- [5] Mukamal, K. J., et al. (2003). Roles of drinking pattern and type of alcohol consumed in coronary heart disease in men. *The New England Journal of Medicine*, 348(2), 109–118.

- <https://doi.org/10.1056/NEJMoa022095>
- [6] Tresserra-Rimbau, A., et al. (2014). Polyphenol intake and mortality risk: A re-analysis of the PREDIMED trial. *BMC Medicine*, 12(1), 77. <https://doi.org/10.1186/1741-7015-12-77>
- [7] van de Wiel, A., et al. (2009). Light-to-moderate alcohol consumption and mortality in men: A 40-year follow-up study. *Journal of Epidemiology and Community Health*, 63(6), 534–537. <https://doi.org/10.1136/jech.2008.080333>
- [8] Visioli, F., & Galli, C. (2001). The role of antioxidants in the Mediterranean diet. *Lipids*, 36(S1), S49–S52. <https://doi.org/10.1007/s11745-001-0682-z>
- [9] Zakhari, S. (2006). Overview: How is alcohol metabolized by the body? *Alcohol Research & Health*, 29(4), 245–254. <https://pubmed.ncbi.nlm.nih.gov/17718403/>
- [10] Renaud, S., & de Lorgeril, M. (1992). Wine, alcohol, platelets, and the French paradox for coronary heart disease. *Lancet*.
- [11] Baur, J. A., & Sinclair, D. A. (2006). Therapeutic potential of resveratrol. *Nature Reviews Drug Discovery*.
- [12] Goldberg, D. M., Hahn, S. E., & Parkes, J. G. (1995). Beyond alcohol: beverage consumption and cardiovascular mortality. *Clinica Chimica Acta*.
- [13] Gronbaek, M., et al. (2000). Type of alcohol consumed and mortality from all causes. *BMJ*.
- [14] Queipo-Ortuño, M. I., et al. (2012). Influence of red wine polyphenols on the gut microbiota. *Am J Clin Nutr*.
- [15] Lancet (2018). Alcohol use and burden for 195 countries and territories, 1990–2016. *Global Burden of Disease Study*.
- [16] Smith-Warner, S. A., et al. (1998). Alcohol and breast cancer in women: A pooled analysis of cohort studies. *JAMA*, 279(7), 535–540.
- [17] Allen, N. E., et al. (2009). Moderate alcohol intake and cancer incidence in women. *Journal of the National Cancer Institute*, 101(5), 296–305.
- [18] Singletary, K. W., & Jung, K. J. (2001). Inhibition of cell proliferation and induction of apoptosis by resveratrol in human breast cancer cell lines. *Nutrition and Cancer*, 40(2), 146–153.
- [19] Wang, Y., et al. (2010). Resveratrol inhibits mammary carcinogenesis and reduces tumor multiplicity in animal models. *Cancer Research*, 70(3), 1090–1098.
- [20] Scoccianti, C., et al. (2014). European Code against Cancer 4th Edition: Alcohol drinking and cancer. *Cancer Epidemiology*, 39(1), S101–S109.
- [21] Estruch, R., et al. (2013). Primary prevention of cardiovascular disease with a Mediterranean diet. *New England Journal of Medicine*, 368(14), 1279–1290.
- [22] Academy of Nutrition and Dietetics (2022). Alcohol and Health Fact Sheet. www.eatright.org
- [23] Frankel, E. N., et al. (1993). Inhibition of human LDL oxidation by resveratrol. *The Lancet*, 341(8852), 1103–1104.