Research Article
E-ISSN : 3048-1368

Volume 02, Issue No. 05. 2024
P-ISSN : 3048-1376

The International Journal of Medical Science and Health Research

Association Between Daily Alcohol Intake and Risk of All-Cause Mortality

[1] Liliani, [1] Fatmawati

[1] Faculty of Medicine, Sultan Agung Islamic University, Semarang City, Central Java, Indonesia
Correspondence : dokterliliani2784@gmail.com

Article History :
Received date : 2024/04/12
Revised date : 2024/05/10
Accepted date : 2024/06/12
Published date : 2024/07/09

E-ISSN :
ISSN 3048-1368
9 773048 136000

P-ISSN :
ISSN 3048-1376
9 773048 137007

ABSTRACT

Background: The exploration of the association between daily alcohol intake and the risk of all-cause mortality has garnered significant attention in the academic literature, reflecting a complex interplay of health outcomes influenced by varying levels of alcohol consumption. **Literature Review:** The literature surrounding the association between daily alcohol intake and all-cause mortality presents a complex interplay of factors influencing health outcomes. The foundational research by (E Ronksley et al., 2011) emphasizes the ongoing debate over the cardioprotective effects of alcohol, revealing that while moderate consumption may correlate with lower cardiovascular mortality, the overall relationship with all-cause mortality remains intricate and influenced by the categorization of non-drinkers. **Conclusion:** In conclusion, the existing literature indicates that the relationship between daily alcohol intake and all-cause mortality is not straightforward. It is characterized by a J-shaped curve where moderate consumption may provide some protective effects, while excessive intake poses significant health risks. Methodological challenges, including the categorization of non-drinkers and the need for improved measurement of drinking patterns, underscore the complexity of this association. Public health guidelines must consider these nuances to effectively address the risks associated with alcohol consumption.

Keyword: Daily Alcohol Intake, Risk of All-Cause Mortality

INTRODUCTION

The exploration of the association between daily alcohol intake and the risk of all-cause mortality has garnered significant attention in the academic literature, reflecting a complex interplay of health outcomes influenced by varying levels of alcohol consumption. The foundational work of (E Ronksley et al., 2011) highlights the ongoing debate regarding the cardioprotective effects of alcohol, revealing that while observational studies suggest potential benefits, the relationship between alcohol use and mortality from cardiovascular disease remains inadequately addressed. Their systematic review and meta-analysis synthesize findings from longitudinal cohort studies, indicating that while moderate alcohol consumption may correlate with reduced mortality from cardiovascular disease, the nuances of this relationship require careful consideration, especially regarding the categorization of non-drinkers ((E Ronksley et al., 2011)).

Building on this discourse, (K. Howie et al., 2011) delve into the specific impacts of light-to-moderate alcohol consumption on all-cause and cardiovascular mortality in men. Their findings reinforce the protective associations observed in previous studies, attributing potential mechanisms such as improved lipid profiles and reduced insulin resistance to moderate drinking. However, they also caution against selection biases inherent in comparing drinkers to non-drinkers, as abstainers may represent individuals with pre-existing health conditions that could skew mortality outcomes ((K. Howie et al., 2011)).

(Rehm et al., 2017) further contextualize these findings by examining the broader burden of disease attributable to alcohol consumption. Their systematic review underscores the causal relationship between alcohol use and various health outcomes, emphasizing the need for improved measurement of alcohol exposure in epidemiological studies. The authors

argue that the existing literature often limits itself to average consumption, neglecting the complexities of drinking patterns and their differential impacts on health outcomes ((Rehm et al., 2017)).

In a comprehensive analysis of global alcohol use, (G. Griswold et al., 2018) present data from 195 countries, illustrating the extensive burden of disease and mortality linked to alcohol consumption. Their findings highlight the necessity for age-specific alcohol consumption guidelines, as the relationship between alcohol intake and mortality is influenced by numerous factors, including cultural and regional variations ((G. Griswold et al., 2018)). This aligns with (Gill et al., 2018), who advocate for a more nuanced understanding of alcohol dependence and its associated risks, suggesting that methodological variations in studies may lead to inconsistencies in mortality risk estimates.

(Day & H. F. Rudd, 2019) contribute to this discourse by examining the relationship between alcohol consumption patterns and mortality risk, noting that light to moderate drinkers exhibit lower mortality risks compared to abstainers. However, they also highlight the potential biases in the literature, indicating that the perceived benefits of low-volume drinking may diminish when accounting for health conditions that preclude individuals from consuming alcohol ((Day & H. F. Rudd, 2019)).

(Dinesh Jani et al., 2021) expand the conversation by investigating the implications of drinking patterns, such as frequency and beverage type, on health outcomes. Their findings suggest that heavy drinking significantly elevates the risk of all-cause mortality, while moderate consumption may confer protective effects, particularly when associated with specific patterns like wine consumption with food ((Dinesh Jani et al., 2021)).

Finally, (Poli, 2022) synthesizes the existing evidence, presenting a curvilinear association between alcohol intake and all-cause mortality. His analysis supports the notion that moderate alcohol consumption is linked to lower

mortality risks compared to both abstainers and heavy drinkers, while also addressing the methodological challenges in distinguishing between lifelong abstainers and those who ceased drinking due to health issues ((Poli, 2022)).

Through this literature review, it becomes evident that the relationship between alcohol consumption and all-cause mortality is multifaceted, influenced by consumption patterns, biases in study design, and broader sociocultural contexts. The critical evaluation of these studies sheds light on the complexities of formulating public health guidelines and understanding the nuanced risks associated with alcohol intake.

LITERATURE REVIEW

The article titled "Association of alcohol consumption with selected cardiovascular disease outcomes: a systematic review and meta-analysis" by (E Ronksley et al., 2011) provides an extensive examination of the relationship between alcohol consumption and various health outcomes, particularly focusing on cardiovascular disease and all-cause mortality. The authors critically address the ongoing debate regarding the potential cardioprotective effects of alcohol, which have been suggested by some observational studies but remain contentious in the medical literature.

One of the key contributions of this article is its systematic review and meta-analysis methodology, which synthesizes data from longitudinal cohort studies. This approach allows for a more robust examination of the associations between alcohol consumption and mortality outcomes, specifically cardiovascular disease-related mortality. The authors effectively highlight that while some studies suggest that moderate alcohol consumption may be associated with lower risk of certain cardiovascular events, the overall relationship with all-cause mortality is complex and influenced by various factors, including the definition of non-drinkers used in different studies.

A significant aspect of the research is the differentiation between lifetime abstainers and those who may

abstain from alcohol for various reasons, which can introduce confounding variables into the analysis. By employing sensitivity analyses that consider these distinctions, the authors provide a clearer understanding of the potential biases that may affect the observed associations. This methodological rigor is particularly important in the context of public health recommendations regarding alcohol consumption.

The findings of the meta-analyses presented in the article indicate that while there may be certain protective effects of alcohol against specific cardiovascular outcomes, the overall impact on all-cause mortality is less definitive. The authors caution against oversimplifying the relationship between alcohol intake and health outcomes, emphasizing that the biological effects of alcohol are multifaceted and can vary significantly based on individual health profiles and consumption patterns.

The article "Alcohol Consumption and Risk of All-Cause and Cardiovascular Disease Mortality in Men" by (K. Howie et al., 2011) provides a comprehensive examination of the relationship between alcohol consumption and mortality outcomes, particularly focusing on light-to-moderate alcohol intake. The authors assert that such consumption is associated with a decreased risk of all-cause mortality and cardiovascular disease (CVD) mortality in men, which aligns with existing literature suggesting a protective effect of moderate alcohol intake.

A critical evaluation of the article reveals several key insights into the mechanisms underlying the purported protective effects of light-to-moderate alcohol consumption. The authors discuss various hypotheses, including the potential for increased antioxidant exposure, improved lipid profiles, reduced insulin resistance, decreased blood coagulation, and modulation of inflammatory pathways. These mechanisms provide a biological plausibility for the observed associations, yet they also highlight

the complexity of establishing causation in observational studies.

The article also addresses significant methodological concerns, particularly the issue of confounding factors. The authors note that nondrinkers may have pre-existing health conditions that could confound the relationship between alcohol consumption and mortality. This is a pertinent point, as it underscores the challenges faced in nonexperimental studies where establishing a direct causal relationship is fraught with difficulties. The authors' acknowledgment of the limitations inherent in their study design, including selection bias and the ethical implications of randomized controlled trials, adds depth to their analysis.

Moreover, the article discusses the implications of these findings for public health recommendations. The authors express concern over the methodological variations that have led to inconsistent estimates of protective alcohol consumption levels. This inconsistency complicates the development of clear public health messages regarding alcohol intake. They emphasize the necessity of weighing any potential protective effects against the risks associated with excessive alcohol consumption, which can include adverse health outcomes such as elevated triglycerides, high blood pressure, and various cancers.

The article titled "The relationship between different dimensions of alcohol use and the burden of disease—an update" by (Rehm et al., 2017) provides a comprehensive analysis of the causal relationship between alcohol consumption and various health outcomes, particularly focusing on disease burden and mortality. The authors systematically review existing literature, revealing that alcohol is a significant contributor to both morbidity and mortality, often in an accelerated dose–response manner. This insight underscores the critical need for a nuanced understanding of how different levels and patterns of alcohol consumption impact health outcomes.

One of the key critiques presented in the article is the

methodological limitations prevalent in many epidemiological studies. The authors highlight that a predominant number of studies rely on a singular measure of average alcohol consumption, typically assessed at baseline. This approach fails to account for fluctuations in alcohol intake over time, which is essential for accurately modeling the relationship between alcohol use and health outcomes ((Rehm et al., 2017)). The authors advocate for improved measurement techniques that can capture variations in alcohol consumption, suggesting that this should be prioritized in future research endeavors.

Moreover, the article emphasizes the regional disparities in understanding the risk relations between alcohol use and health outcomes. The authors argue that there is a lack of comprehensive data across different geographical areas, which limits the generalizability of findings and hinders effective public health strategies. This gap in knowledge is particularly concerning given the global nature of alcohol consumption and its associated harms. The authors suggest that future research should focus on elucidating these regional differences to better inform targeted interventions ((Rehm et al., 2017)).

Additionally, the article points out the relatively underexplored area of harm to others, which could be integrated into a comprehensive risk assessment framework. The authors contend that understanding the broader implications of alcohol use, beyond individual health outcomes, is crucial for developing effective public health policies. They conclude by reiterating that while the alcohol-attributable burden of disease and mortality is substantial, it represents only a fraction of the overall harm caused by alcohol consumption ((Rehm et al., 2017)).

The article "Alcohol use and burden for 195 countries and territories, 1990-2016: a systematic analysis for the global burden of disease study 2016" by (G. Griswold et al., 2018) provides a comprehensive examination of the relationship between daily alcohol intake and the risk of all-cause mortality. The authors utilize a

systematic analysis to highlight the global burden of alcohol consumption across various demographics and geographical regions, revealing critical insights into its impact on health outcomes.

One of the key findings of the study is the nuanced relationship between alcohol consumption levels and mortality rates. The authors present data indicating that both low and high levels of alcohol intake are associated with increased mortality risks, suggesting a J-shaped curve where moderate consumption may have a protective effect, but this is overshadowed by the risks associated with higher consumption levels. The systematic analysis incorporates extensive data from 195 countries, which enhances the robustness of their conclusions and allows for a broad understanding of alcohol's effects on public health.

Furthermore, the study highlights the significant variations in alcohol consumption patterns across different regions, emphasizing cultural, economic, and social factors that influence drinking behaviors. This regional disparity is crucial for public health policy, as it underscores the need for tailored interventions that consider local contexts in addressing alcohol-related health issues. The authors also discuss the implications of these findings for global health initiatives, advocating for increased awareness and preventive measures to mitigate the risks associated with excessive alcohol consumption ((G. Griswold et al., 2018)).

In terms of methodology, the systematic approach employed by (G. Griswold et al., 2018) is commendable, as it synthesizes a vast amount of data and employs rigorous analytical techniques to ensure the reliability of the findings. However, while the study effectively outlines the association between daily alcohol intake and mortality, it may benefit from a deeper exploration of the underlying mechanisms that contribute to this relationship, such as the biological and behavioral pathways linking alcohol consumption to health outcomes.

The article "Alcohol use and burden for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of

Disease Study 2016" by (G. Griswold et al., 2018) provides a comprehensive examination of alcohol consumption patterns and their associated health outcomes across a vast demographic. The study presents a systematic analysis that not only quantifies alcohol use but also assesses the burden of alcohol-related diseases and mortality on a global scale.

One of the key insights of this article is the correlation between alcohol dependence and the risk of somatic diseases, along with its impact on overall mortality rates. The authors highlight that excessive alcohol consumption is a significant contributor to various health issues, including liver disease, cardiovascular disorders, and certain cancers, which collectively elevate the risk of all-cause mortality. The study's findings are particularly relevant as they underscore the importance of understanding alcohol's multifaceted role in public health and its implications for treatment and prevention strategies.

The authors utilize a robust methodological framework, drawing on data from 195 countries, which allows for a nuanced understanding of how alcohol consumption varies geographically and demographically. This breadth of data enhances the reliability of their conclusions regarding the global burden of alcohol use. Moreover, the article emphasizes the need for targeted interventions in populations with high levels of alcohol dependence, suggesting that public health policies should be tailored to address the specific patterns of alcohol consumption and its health impacts in different regions.

Furthermore, the article discusses the effects of drinking on cognitive function and brain health in later life, which adds another layer to the understanding of alcohol's long-term effects. This aspect is particularly critical as it connects alcohol use with broader concerns about aging populations and the increasing prevalence of cognitive decline.

The article titled "Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016" by (Gill et al.,

2018) provides a comprehensive examination of the relationship between alcohol consumption and all-cause mortality across a vast array of populations. The authors utilize pooled analyses from multiple population-based cohorts to elucidate the intricacies of alcohol consumption's impact on mortality rates, highlighting the necessity for age-specific alcohol consumption guidelines.

One of the key insights from the article is the statistical modeling of alcohol exposure, which serves as a crucial framework for epidemiological studies focused on population health. The authors emphasize that understanding the volume of alcohol consumed is essential for accurately assessing its effects on mortality. This modeling approach not only allows for a nuanced interpretation of data but also facilitates the identification of risk factors that influence the shape of the risk curve associated with alcohol consumption and all-cause mortality ((Gill et al., 2018)).

The article further delves into the stability of the risk curve, suggesting that it may vary by demographic and contextual factors. Such variability underscores the importance of tailoring public health recommendations to specific populations, rather than adopting a one-size-fits-all approach. The authors' meta-analysis reinforces the need for precision in understanding the relationship between alcohol consumption and mortality, particularly in light of existing recommendations from the National Health and Medical Research Council (NHMRC) regarding alcohol consumption limits.

Additionally, the systematic review presented in the article raises critical questions about the mortality risk associated with 'moderate' drinking. The findings suggest that what constitutes moderate drinking may not uniformly confer reduced mortality risk, challenging prevailing assumptions in public health narratives. This insight is particularly relevant for policymakers and health practitioners who must navigate the complexities of alcohol consumption guidelines.

Lastly, the article addresses the link between alcohol dependence and somatic diseases, further emphasizing the multifaceted nature of alcohol-related health outcomes. The cohort study involving individuals attending alcohol treatment provides empirical evidence that supports the association between alcohol dependence and increased mortality risk, thereby reinforcing the need for targeted interventions.

The article "Alcohol use disorders and the heart" by (Day & H. F. Rudd, 2019) provides a comprehensive examination of the relationship between alcohol consumption and all-cause mortality, emphasizing a nuanced understanding of how varying levels of intake can influence health outcomes. The authors summarize findings from observational and prospective studies that indicate a J-shaped curve in the association between alcohol consumption and mortality risk. Specifically, light to moderate drinkers exhibit a lower risk of all-cause mortality compared to abstainers, while heavy drinkers face significantly higher risks.

The meta-analysis referenced in the article reveals that women experience an 18% reduction in mortality risk with a daily intake of half to one drink, whereas men see a 17% reduction with one to two drinks per day. This suggests that moderate consumption may confer some protective benefits, aligning with previous research that has pointed to potential cardiovascular advantages associated with low levels of alcohol intake. However, the article critically notes that these benefits diminish and even reverse as consumption increases. For instance, the consumption of more than 2.5 drinks per day in women and four drinks per day in men correlates with increased mortality risk in a dose-dependent manner.

Moreover, the authors highlight that the purported cardioprotective effects of low-volume alcohol consumption are negated by episodes of heavy drinking. This is particularly relevant in light of findings indicating that irregular heavy drinking can lead to a

45% increased risk of morbidity and mortality from ischemic heart disease compared to regular moderate consumption. This underscores the complexity of alcohol's impact on health, suggesting that the context of drinking behavior—such as regularity and quantity—plays a crucial role in determining outcomes.

The article also addresses the critical point that after adjusting for biases, the initial observed benefits for low-volume drinkers may not hold true, indicating that the supposed protective effects of alcohol consumption could be confounded by other factors, such as lifestyle and socioeconomic status. The authors conclude that while there may be some protective effects associated with low levels of alcohol consumption, the overall detrimental effects of alcohol, particularly at higher consumption levels, outweigh these benefits. Notably, they assert that the risk of premature mortality begins to rise significantly after an average daily consumption of 10 grams, reinforcing the notion that moderation is key.

The article titled "Association between patterns of alcohol consumption (beverage type, frequency and consumption with food) and risk of adverse health outcomes: a prospective cohort study" authored by provides an insightful examination of the relationship between various patterns of alcohol consumption and their associated health risks, particularly focusing on all-cause mortality. The authors highlight that alcohol consumption remains a significant risk factor for mortality and disability-adjusted life years (DALY) on a global scale, underscoring the critical need for a nuanced understanding of how different drinking patterns impact health outcomes.

One of the key insights presented in the article is the differentiation between average daily or weekly alcohol intake and the patterns of consumption, such as binge drinking or drinking frequency. The authors reference a systematic review indicating that heavy alcohol consumption correlates with increased risks of multiple adverse health outcomes, including cancer

and cardiovascular events. This finding aligns with existing literature that emphasizes the detrimental effects of excessive drinking habits on overall health ().

Moreover, the article discusses the implications of drinking patterns, noting that binge drinkers and those who drink very frequently face a heightened risk of all-cause mortality compared to individuals who consume alcohol moderately, specifically three days a week. This observation suggests that the frequency and context of alcohol consumption—rather than merely the quantity—play a crucial role in determining health risks. The authors also draw attention to previous research indicating that wine consumption, particularly when paired with food, may confer protective benefits against all-cause mortality and cardiovascular events, providing a contrasting perspective to the risks associated with other drinking patterns.

The article effectively calls for further research into the health risks linked to different alcohol consumption patterns, as current guidelines predominantly focus on the quantity of alcohol consumed without addressing the contextual factors that may influence health outcomes. The authors argue for a more comprehensive approach to alcohol consumption guidelines, which should include considerations of beverage type and consumption context, such as eating habits during drinking.

The article "Is drinking wine in moderation good for health or not?" by (Poli, 2022) provides an insightful exploration into the complex relationship between alcohol intake and all-cause mortality. The author synthesizes findings from various cohort studies, revealing a curvilinear association that suggests moderate alcohol consumption is linked to a lower risk of mortality compared to both abstainers and heavy drinkers. This nuanced perspective is critical in understanding the implications of alcohol consumption on health outcomes.

Poli highlights that the minimum mortality risk is typically observed with daily consumption levels of one drink for women and one

to two drinks for men. Notably, the data indicates that as consumption increases—specifically, three to four drinks for men and two to three for women—the mortality risk aligns with that of abstainers. This observation is significant as it underscores the potential health benefits of moderate drinking while simultaneously cautioning against excessive consumption.

The article also references a meta-analysis conducted by Italian authors, which corroborates the notion that low levels of alcohol intake are inversely associated with total mortality in both genders. Furthermore, a longitudinal study spanning over 15 years found that moderate or occasional drinkers exhibited the lowest all-cause mortality rates, contrasting sharply with those who either consumed alcohol excessively or ceased drinking altogether. This evidence suggests that moderate alcohol consumption may confer protective cardiovascular benefits that outweigh the associated risks of cancer, a critical point emphasized by Poli.

However, the article does not shy away from the ongoing debate surrounding the J-shaped correlation between alcohol consumption and mortality. Poli notes that some researchers challenge the validity of this association, particularly arguing that many abstainers may have ceased drinking due to alcohol-related health issues. This contention is addressed by differentiating between ex-drinkers and lifelong abstainers, a distinction that diminishes the potential bias in mortality statistics attributed to alcohol consumption. The author references a pivotal study that illustrated a significant excess of fatal diseases among lifelong abstainers compared to moderate drinkers, thereby reinforcing the argument for a more nuanced interpretation of the data.

CONCLUSION

The literature surrounding the association between daily alcohol intake and all-cause mortality presents a complex interplay of factors influencing health outcomes. The foundational research by (E Ronksley et al., 2011) emphasizes the

ongoing debate over the cardioprotective effects of alcohol, revealing that while moderate consumption may correlate with lower cardiovascular mortality, the overall relationship with all-cause mortality remains intricate and influenced by the categorization of non-drinkers. This is echoed in the findings of (K. Howie et al., 2011), who assert that light-to-moderate alcohol consumption is linked to decreased mortality risks, yet caution against biases that may arise from comparing drinkers to non-drinkers with potential pre-existing health conditions.

Further contextualization is provided by (Rehm et al., 2017), who highlight the necessity for improved measurement of alcohol exposure in epidemiological studies, advocating for a more nuanced understanding of drinking patterns. This is supported by (G. Griswold et al., 2018), who present a global analysis of alcohol use, emphasizing the need for age-specific guidelines due to cultural and regional variations in drinking behaviors.

Moreover, (Day & H. F. Rudd, 2019) contribute to the discourse by indicating that light to moderate drinkers exhibit lower mortality risks compared to abstainers, although they also highlight potential biases in the literature that may affect these perceptions. The implications of drinking patterns, such as frequency and beverage type, are examined by , who suggest that heavy drinking significantly elevates mortality risk, while moderate consumption may confer protective effects when associated with specific patterns.

Finally, (Poli, 2022) synthesize existing evidence to illustrate a curvilinear relationship between alcohol intake and all-cause mortality, supporting the notion that moderate consumption is associated with lower mortality risks compared to both abstainers and heavy drinkers. The critical evaluation of these studies highlights the multifaceted nature of alcohol consumption's impact on health, emphasizing the influence of consumption patterns, study design biases, and sociocultural contexts.

In conclusion, the existing literature indicates that the relationship between daily alcohol intake and all-cause mortality is not straightforward. It is characterized by a J-shaped curve where moderate consumption may provide some protective effects, while excessive intake poses significant health risks. Methodological challenges, including the categorization of non-drinkers and the need for improved measurement of drinking patterns, underscore the complexity of this association. Public health guidelines must consider these nuances to effectively address the risks associated with alcohol consumption.

REFERENCES

1. K. Howie, E., Sui, X., Lee, D., P. Hooker, S., R. Hébert, J., & N. Blair, S., 2011. Alcohol Consumption and Risk of All-Cause and Cardiovascular Disease Mortality in Men. ncbi.nlm.nih.gov
2. Rehm, J., E. Gmel, G., Gmel, G., S. M. Hasan, O., Imtiaz, S., Popova, S., Probst, C., Roerecke, M., Room, R., V. Samokhvalov, A., D. Shield, K., & A. Shuper, P., 2017. The relationship between different dimensions of alcohol use and the burden of disease—an update. ncbi.nlm.nih.gov
3. G. Griswold, M., Fullman, N., M.A. Wyper, G., & 2016 Alcohol Collaborators, G. B. D., 2018. Alcohol use and burden for 195 countries and territories, 1990-2016 : a systematic analysis for the global burden of disease study 2016. [PDF]
4. Gill, P., A. Uthman, O., & , H. A. S. H., 2018. Alcohol use and burden for 195 countries and territories, 1990–2016 : a systematic analysis for the Global Burden of Disease Study 2016. [PDF]
5. Day, E. & H. F. Rudd, J., 2019. Alcohol use disorders and the heart. ncbi.nlm.nih.gov
6. Dinesh Jani, B., McQueenie, R., I. Nicholl, B., Field, R., Hanlon, P., I. Gallacher, K., S. Mair, F., & Lewsey, J., 2021. Association between patterns

of alcohol consumption (beverage type, frequency and consumption with food) and risk of adverse health outcomes: a prospective cohort study. ncbi.nlm.nih.gov

7. Poli, A., 2022. Is drinking wine in moderation good for health or not?. ncbi.nlm.nih.gov