

Alcohol and Health— Sorting Through

THE MYTHS, THE DANGERS, AND THE FACTS

Have your students asked you about the possible health benefits of alcohol—especially for the heart? If you have questions regarding the benefits and risks of drinking, the scientific studies being done on this subject, and the current debate concerning alcohol, this article will help equip you to discuss these topics with your classes.

Alcohol Consumption and Global Health

Alcohol consumption varies widely among countries, depending on cultural traditions. Alcohol, like tobacco, is being exported to developing countries, adding significant burdens to already struggling health systems. According to the Global Status Report on Alcohol and Health released by the World Health Organization (WHO) in Geneva during February of 2011:¹

- Fifty-five percent of adults worldwide have consumed alcohol.
- Approximately 2.5 million people die from alcohol-related causes each year.

- Four percent of all deaths are related to alcohol through injuries, cancer, cardiovascular diseases, and cirrhosis of the liver.
- Globally, 6.2 percent of male deaths and 1.1 percent of female deaths are related to alcohol.

The pattern of alcohol consumption is not static. Figures for 2001–2005 released by the WHO² revealed that each year worldwide, on average, 6.3 liters of pure alcohol were consumed per person aged 15 years or older. This amount appeared to be stable in the Americas and the European, Eastern Mediterranean, and Western Pacific regions; however, marked increases were noted in Africa and Southeast Asia. Health risk increases even more with binge drinking, which is defined as five consecutive drinks over a short period of time for a male, four for a female, resulting in intoxication. Binge drinking is increasing in many parts of the world, mainly among youth, but all age groups are affected.³

Globally, the effect of alcohol consumption on young people is brought into frighteningly sharp relief by the following statistic: 320,000 young people between the age of 15 and 29 die

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from alcohol-related causes each year. This represents nine percent of all deaths in this age group.⁴ It is the world's third-largest risk factor for disease, but ranked as the leading risk factor in the Western Pacific and the Americas, and second-largest risk factor in Europe.⁵ Alcohol has become one of the leading causes of preventable death in many parts of the world. In fact, it is the third leading cause of preventable death in the United States!⁶ A 2010 ranking of drugs by the United Kingdom's Independent Scientific Committee, based on nine criteria of harm to self and to others, concluded that alcohol was the world's most dangerous drug.⁷ In the United States, the American Medical Association noted that underage drinking is a major factor in about half of all teen automobile crashes and is the leading cause of death among teens.

Alcohol—A Burden on Families

Alcohol consumption creates significant hardships for families.⁸ A report by the Schneider Institute for Health Policy notes that 20 percent of men and 25 percent of women indicate that drinking is a cause of family conflict and a major cause of divorce. Domestic violence and child abuse are more prevalent in homes with a problem drinker. Alcohol is also a major financial drain on many families. Children from alcoholic families are more likely to have emotional and adjustment problems that include aggressive behavior, difficulties with their peers, inappropriate conduct, hyperactivity, and poor adjustment to school. Additionally, they are more likely to miss days from school, suffer from more illnesses and injuries, and to become problem drinkers as adults. As the Schneider Institute report notes, the risk of becoming a problem drinker is especially high for boys.

Societal Costs of Alcohol

The societal costs of alcohol are very high.⁹ In the U.S., at least half of the persons convicted of violent crimes were under the influence of alcohol or drugs at the time the offense was committed. In one-half to two-thirds of homicides and serious assaults, alcohol is present in the offender, the victim, or both. The health-insurance costs for employees with alcohol problems are nearly double those of other employees. Another major issue with alcohol use is lost productivity. Problem drinkers miss work due to hangovers and illness; some even go to work while under the influence of alcohol. In the United States, the annual estimated economic costs for alcohol-related social, legal, and health problems are more than \$185 billion.¹⁰ These sobering statistics demand careful examination and scrutiny of the hypotheses that moderate alcohol consumption is beneficial to health.

Moderate Alcohol Consumption and Health

A large body of scientific evidence drawn from studies that follow individuals over time suggests that persons who drink moderately (typically defined as one drink per day for women and two drinks per day for men) have a lower rate of overall mortality and coronary heart disease (CHD) mortality than heavy drinkers and non-drinkers. More than a hundred of these types of studies have identified this relationship between alcohol and coronary heart disease mortality.¹¹ (The lowest rate of CHD mortality has been observed to occur with moderate levels of alcohol consumption.) However, additional research has identified mechanisms that could be responsible for the protective effect of moderate alcohol consumption¹²: increases



in good HDL (high-density lipoprotein) cholesterol, and lower levels of systemic inflammatory markers (C-reactive protein, fibrinogen plasma viscosity, and white-blood-cell count). Alcohol has also been shown to affect platelet function, coagulation, and fibrinolysis (dissolving of clots) in ways that protect against bleeding and clot formation. The identification of such potential explanatory mechanisms has lent credence to the observational findings that moderate alcohol consumption appears to reduce the risk of CHD.

Scientific evidence also suggests that moderate alcohol intake may have a beneficial effect on other health problems. A recent review concluded that moderate alcohol consumption was associated with reduced risk of myocardial infarction mortality (death from heart attack), heart failure, diabetes, ischemic stroke, vascular dementia, and osteoporosis.¹³ Some researchers report that there may be mental-health benefits associated with moderate drinking.¹⁴ However, it is unclear from these studies whether moderate drinking encourages better mental health or whether mentally healthy people are more likely to drink moderately.

Scientific evidence makes it clear that the benefits of alcohol use are clearly related to the pattern of use and the amount of alcohol consumed. Peele and Brodsky explain that “Having two drinks per day is associated with more benefits and fewer problems than having fourteen drinks over a weekend.”¹⁵ Similarly, the U.S. National Institutes of Health (NIH) “White Paper” on moderate alcohol consumption also emphasized that the protective effect of moderate alcohol was more a function of the frequency of use. In other words, binge drinking once or twice per week is more harmful than drinking the same amount, but spreading out the consumption over the entire week.¹⁶ This has been confirmed in numerous studies around the world, which show that consumption of large amounts of alcohol during a short period of time (i.e., binge drinking) and heavy drinking, even in the context of overall low use of alcohol, are associated with increased health risks.

There currently is little direct evidence to support the hypothesis that moderate drinkers differ from others in their personality characteristics. Some limited data suggest that among both abstainers and drinkers, persons scoring high on self-regulation have higher life expectancy and fewer chronic illnesses than persons scoring low on self-regulation.

Methodological Limitations in Assessing Benefits of Moderate Alcohol Consumption

The NIH “White Paper” on health risks and potential benefits of moderate alcohol consumption listed several complicating factors that influence data interpretation. These include the time over which the alcohol is consumed, interactions with individual genetic vulnerability, and compounding by lifestyle factors.¹⁷ Additionally, the authors highlighted significant variations in alcohol metabolism, as well as markedly different behavioral responses to alcohol consumption.

We will now provide a brief overview of several methodological limitations identified in the scientific literature:

1. Failure to record variations in alcohol intake over time. This can affect the association between moderate alcohol use and health. Most prospective studies have used a single baseline measure of alcohol consumption to predict a health outcome several years later. This method may overestimate the health benefits of moderate drinking.

2. Duration of follow-up. Some evidence indicates that the apparent protective effect of moderate alcohol consumption on all causes of death and on coronary heart disease mortality becomes less apparent with prolonged follow-up.¹⁸ In addition, the evidence for the negative effects of high alcohol consumption on cancer mortality increases with prolonged follow-up.

3. Potential confounding. This is a serious methodological limitation. Confounding occurs when the apparent benefits of some exposure (in this case, alcohol) on health are distorted because other factor(s) related to both alcohol and health account for some or all of the apparent relationship between the two. Unmeasured characteristics such as genetics, psychological variables, reaction to stress, and context of alcohol use, all of which are linked to health and related to moderate alcohol consumption, could lead to a distortion of the conclusions regarding the association between alcohol and health.

It is important to note that studies on the effects of alcohol on human health have been observational, rather than randomized. The randomization process tends to largely eliminate the confounders. Because of the dangerous properties of alcohol, especially its addictive propensity, it would be unethical to conduct randomized studies.

There is considerable evidence that high levels of residual confounding may occur in studies that seek to measure the relationship between moderate alcohol consumption and health. A study of 2,910 adults based on two national surveys of the general population of the United States documented that moderate drinkers had about twice the income level of non-drinkers, light drinkers, episodic drinkers, and heavy drinkers.¹⁹ Moderate drinkers in this study had an overall healthy profile that included regular exercise, low levels of cigarette use, and high consumption of fruits and vegetables.

Similarly, the NIH report on moderate alcohol consumption indicated that compared to moderate drinkers, abstainers were more likely to be older and poorer,²⁰ in bad health, overweight, disabled, depressed, and physically and socially inactive. They also included fewer servings of vegetables in their diets and consumed more fat. Moreover, moderate drinkers were more likely than the other groups to monitor their health through blood-pressure screening, preventive dental care, and mammograms.

Some of the most impressive proof of the differences between moderate drinkers and non-drinkers came from the large robust study by Naimi, et al.²¹ Compared to moderate drinkers, non-drinkers were older, more likely to be widowed or never married, more likely to be non-white and to have lower incomes and less education. They were more likely to be physically inactive and overweight and to have higher rates of chronic diseases. In fact, this study found that 90 percent (27 of 30) of cardiovascular disease (CVD)-associated risk factors were more common in non-drinkers than in moderate drinkers.²² The researchers concluded that moderate drinkers and abstainers comprised two very different populations and that alcohol use was unlikely to be the cause of most of these differences.

Thus, at least some of the reported protective effects of moderate drinking are likely due to residual confounding from dietary practices, levels of exercise, age, and poverty. It has become clear that a substantial proportion of the positive effects of moderate alcohol consumption found in the published scientific research are not due to alcohol but to unmeasured factors linked to the higher socioeconomic status and better health practices of moderate drinkers compared to non-drinkers. When Fillmore, et al. adjusted for a broad range of psychosocial factors including education, income, employment, smoking, race, and religious attendance, the odds of death were similar for the two groups.²³ Factors other than moderate alcohol consumption are at work here.

4. Misclassifications of drinking categories. Some evidence indicates that in much of the research on alcohol consumption and health, the abstainer category contains some previously high-risk drinkers.

First, there is the former drinker misclassification error. As

noted earlier, most prospective studies of moderate alcohol consumption do not inquire about changes in alcohol consumption over time. Many older people reduce or terminate drinking due to increased illness, disability, frailty, or potential interactions with needed medications. Second, people who drink infrequently are often inaccurately classified as non-drinkers. Both of these biases exaggerate or inflate the health risks of abstainers.

Fillmore and associates conducted a meta-analysis of 54 all-cause mortality studies and 35 CHD mortality studies to examine the effect of misclassifying. They found that many people classified as abstainers had recently reduced or stopped drinking.²⁴ Importantly, studies that took into consideration both classification errors concluded that there was no protective effect from moderate alcohol consumption.

Presumed Benefits of Alcohol Are Not Universal

The scientific evidence of the beneficial effects of moderate alcohol consumption clearly indicates that they do not apply to everyone.

- **Age Variation.** The studies uniformly indicate that the potential health benefits of moderate alcohol use are not evident among individuals aged 35 years or younger. This is important, as binge drinking and alcohol experimentation are surging among young people and will have long-term consequences on their health. Any potential benefits of alcohol should not be assumed to apply to all ages.

- **Racial/Ethnic Variation.** Some evidence suggests that the potential benefits of moderate alcohol consumption do not occur in all racial/ethnic groups. For example, a review of research studies of the association between moderate alcohol consumption and mental health noted that although moderate drinkers reported better mental health than most non-drinkers, this relationship was not seen in Mexican-Americans.²⁵ Other studies have confirmed that blacks (African-Americans) have a greater susceptibility than other ethnic groups to liver damage from alcohol. In fact, blacks have higher levels of common biomarkers of liver damage at every level of alcohol consumption.²⁶ Studies on CHD and all-cause mortality have confirmed different outcomes between black and Caucasian subjects, with poorer outcomes for black men and women.²⁷

Similarly, research on cardiovascular disease (CVD) risk that examined racial differences in the effects of moderate alcohol consumption has found that, unlike the positive effects observed for whites, moderate alcohol consumption adversely influences health outcomes for blacks.²⁸ Alcohol consumption equivalent to one drink a day was associated with an increased risk of CHD in black men, but a reduced risk in white men. Studies further found that consumption of low levels of alcohol was associated with an increased risk of hypertension or increases in blood-pressure levels in black men. A similar association was not found in whites.²⁹

When one examines the evidence regarding cardio-protective properties of alcohol, the findings of the CARDIA study highlight more questions.³⁰ In this study, a random sample of 3,037 participants aged 33 to 45 years was followed for 15 years to determine whether there was a connection between alcohol

consumption, binge drinking, and early coronary artery calcifications (CAC). A direct association between alcohol consumption and CAC was found. This was the first study to demonstrate an association between binge drinking and atherosclerosis of the coronary arteries as revealed by CAC. An important result of this study was the linear association between any alcohol consumption and CAC, a pattern that was strongest for black men. In addition, the study did not find evidence of a protective effect against atherosclerosis among light to moderate regular users of alcohol. One possible explanation for the findings is the relatively young age of this cohort, confirming the findings that there are no health benefits of alcohol consumption for young people. Another important implication of the study is that if there are in fact protective effects of alcohol on coronary artery disease, they are unlikely to be due to any effect of alcohol in modifying the course of atherosclerosis and arterial disease in general.

Negative Effects of Moderate Alcohol Consumption

A comprehensive evaluation of the impact of moderate alcohol consumption on health must consider the strong evidence that moderate alcohol consumption is linked to a broad range of negative outcomes and dangers.

- **Risk of Progression.** Stanbridge, et al.³¹ indicate that there “is a substantially unpredictable risk of progression to problem drinking.” Of the 113 million current drinkers in the United States, 24 percent of men and five percent of women meet DSM-IV criteria for alcohol dependence. Similarly, the NIH position paper on the risks of alcohol indicates that a “low estimate” is that five to seven percent of current abstainers and/or infrequent drinkers will develop diagnosable problems linked to alcohol use if they began to use alcohol moderately. This percentage is similar to the risk of the overall population. Alcohol dependence tends to occur within five to 10 years of the first regular use of this substance.

- **Risk of Addiction.** Alcohol is a known addictive substance. The likelihood of becoming a problem drinker (alcoholic) depends on numerous factors. In the overall population, there is a likelihood that 13 of every 100 people who regularly drink alcohol will become alcoholics. If the person has a first-degree relative (father, mother, uncle, aunt, or grandparent) who suffered from alcohol dependence, this percentage doubles. If alcohol consumption begins earlier than the age of 14, the percentage chance of dependence increases to 40 percent plus.³² This demonstrates the importance of alcohol-prevention education from an early age, focusing on parental bonding, adult mentoring, spirituality, and life skills that have been shown to relate to abstinence. This social support develops resilience, enabling youth to cope with difficult decisions and choices despite peer pressure.³³ An additional and vital layer of protection from at-risk behavior for young and old is commitment to a set of positive values, i.e. the principles of the Bible and faith in God.

- **Binge Drinking.** Research reveals that the level of binge drinking is very high among moderate users. Naimi and colleagues documented that binge-drinking episodes per person per year in the U.S. increased by 17 percent between 1993 and 2001. About 30 percent of male moderate drinkers admitted to



binge drinking in the past 30 days and, in fact, had the same rate of binge drinking as heavy drinkers.³⁴ Although three-quarters of binge drinkers are classified as moderate drinkers, they are 14 times more likely than non-binge drinkers to report that they have engaged in alcohol-impaired driving. Naime and colleagues also document that binge drinking is significantly related to violence, all types of accidents, and alcohol abuse in general.

The Preventive Paradox

Researchers have shown that although more heavy drinkers report problems related to their drinking, greater absolute numbers of moderate drinkers have alcohol-related problems.³⁵ The data cited above on binge drinking illuminate this phenomenon. This paradox makes it clear that preventive strategies that seek to reduce alcohol-related problems must be targeted at the *entire* range of drinkers. Other research emphasizes that even low levels of alcohol consumption are problematic and that there is no safe level of alcohol use.³⁶ Even with very low consumption (one or fewer drinks of alcohol per day, when averaged over a weekly or monthly period), there is an increased risk for work problems, alcohol dependence, and especially drunk driving.

Alcohol Fatalities

Moderate alcohol consumption is associated with fatal out-

comes. Voas and colleagues found that the risk of being in a fatal crash is lower for drivers who are moderate drinkers than for those who are heavy drinkers. Nevertheless, moderate drinkers account for fully 50 percent of all drinking drivers in fatal crashes.³⁷

Alcohol and Young People

As noted earlier, the negative consequences of alcohol use are especially severe among young adults. The increasing risks of accident, violence, and suicide linked to alcohol use are heavily concentrated among this group.³⁸ And, as noted earlier, the apparent cardiovascular benefits of alcohol are found only in middle-aged and older populations. There are no data supporting any benefit for young people from drinking alcohol. Young drinkers in the United States (18- to 25-year-olds) have the highest rates of binge drinking, and alcohol is a factor in all of the four leading causes of death for young people between the ages of 10 and 24: motor vehicle accidents, unintended injuries, homicide, and suicide.³⁹ It should come as no surprise that the alcoholic beverage industry targets young people because they are more likely to become heavy consumers of alcohol over their lifetime and contribute to the profitability of the industry. A study by Engels, et al. shows a causal relationship between alcohol commercials and the consumption of alcohol.⁴⁰

Alcohol and Cancer

Alcohol is a known carcinogen (cancer-causing agent) whose use is associated with breast, colorectal, and liver cancers. As with other deleterious effects of alcohol, there is a dose-response relationship; that is, the more alcohol consumed, the higher the level of ill health. The World Cancer Research Fund Report of 2007 confirmed that the consumption of alcoholic drinks is one cause of premenopausal and postmenopausal breast cancer. No safe level of alcohol intake has been identified that would not be carcinogenic. The risk for breast cancer showed an increase of 10 percent per 10 grams of ethanol per day (regardless of type of beverage). It is important to note that this dosage is within the range considered protective against cardiovascular disease.⁴¹

Similarly, the 2011 World Cancer Research Fund report showed a causal relationship between alcohol intake and colorectal cancer, calling the evidence convincing. The relationship is robust in men and probably likewise in women.⁴²

A recent publication in the *American Journal of Public Health* showed that even modest but regular alcohol consumption contributes to U.S. cancer deaths.⁴³ Overall, the study found that alcohol use accounted for 3.5 percent of U.S. cancer deaths in 2009. This represents approximately 19,500 deaths and 18 years of potential life lost for each alcohol-related cancer death. Between 48 percent and 60 percent of the alcohol-related victims consumed on average three or more drinks per day, and approximately one-third of the deaths (30 percent) occurred in people who had fewer than 1.5 drinks daily. The authors concluded that reducing alcohol consumption is an important and underemphasized cancer-prevention strategy. This observation highlights the negative effects of alcohol on health, which counterbalance any purported health benefits of alcohol.

Alcohol and Impaired Thinking and Behavior

Research indicates that even moderate intake of alcohol adversely affects driving and motor coordination. For example, one study found that with a blood-alcohol content higher than zero but less than .05 percent, both men and women took longer to detect driving hazards, responded to hazards more abruptly, and perceived situations as less dangerous than they actually were.⁴⁴

Research also reveals that alcohol, even at moderate levels, has a disinhibiting effect. It creates a relaxed and less-inhibited state that reduces awareness, consciousness, comprehension, memory, and understanding.⁴⁵ Studies on the impact of alcohol on sexuality indicates that alcohol, especially at low levels of use, lessens restraints on psychological sexual arousal and increases sexual aggression, whereas heavy use of alcohol suppresses physiological sexual response.⁴⁶

Alcohol Use and Cognitive Impairment

The experimental research by Fogarty and Vogel-Sprott⁴⁷ on the cognitive impairment that occurs even at low levels of alcohol use has significant implications for Christians. Cognitive impairment often results in life-destroying moral choices. Research shows a consistent statistical correlation between alcohol use and deviant behavior—ranging from domestic violence to date rape and other forms of aggressive behavior. Alcohol use is correlated with poor decision making in almost nearly every type of situation. Bushman and Cooper⁴⁸ found that in controlled laboratory situations, there was a complex but consistent relationship between alcohol consumption and willingness to engage in aggressive behavior. Further, laboratory studies using Kohlberg's moral development framework by Denton and Krebs⁴⁹ concluded that the ingestion of alcohol moves individuals from a conventional or post-conventional to a pre-conventional stage of moral development. Thus, alcohol ingestion increases the chance that in making decisions, people will be less likely to utilize societal or religious norms or pay attention to the interests or needs of others, choosing rather to gratify their own immediate perceived needs. Other research suggests that alcohol impairs the function of neurotransmitters that affect mood (making individuals more aggressive) and interferes with the accurate transmission of information.⁵⁰ Regardless of exactly how alcohol impairs moral thinking, clearly it very often does

so; even at low levels of use. *There is simply no safe level of alcohol use.* Human beings have enough difficulty making wise, moral decisions in a complex world. Even small levels of impairment will likely result in poor moral judgments and behavioral decisions.

KEY POINTS TO REMEMBER

- Worldwide, alcohol is the most widely used recreational drug, surpassing tobacco, marijuana, and other chemicals.
- Alcohol is the world's third-largest risk factor for disease.
- Alcohol consumption has a significantly negative effect on families. It frequently places a strain on finances and has a strong association with domestic violence, child abuse, and fetal-alcohol syndrome.
- Drinking alcohol can lead to alcoholism.
- Alcohol use negatively affects society through associated crime and violence of all types, and large numbers of innocent victims in accidents.
- Moderate alcohol use has a complex relationship with cardiovascular health.
- The purported health benefits of moderate alcohol consumption do not apply across age, ethnic, and gender variations.
- There is no benefit of alcohol use for young people (below age 35).
- Even moderate drinking is associated with many negative effects such as aggressive behavior and poor moral choices.
- Alcohol is a known carcinogen, even when consumed at very low levels.

The Need for Caution and Reassessment

A growing number of voices in the scientific literature are expressing concern about the widespread perception that moderate alcohol use is beneficial to health. This article has examined the research and attempted to arrive at an evidence-based consensus. Although many papers and studies support the cardio-protective effect of alcohol (moderate drinking), we, along with others, have concluded that this hypothesis is by no means definitive. Marchand and colleagues emphasize the many problems of alcohol

use that have been discussed in this article which include confounding, risk of abuse and dependence, methodological issues relating to assessing dosage, level and duration of use over one's lifetime and non-representativeness of study populations in reaching this conclusion.⁵¹ The diversity of nondrinkers only adds to the confounding and should receive greater analysis. A recent critique of the evidence showing beneficial effects for moderate alcohol consumption concluded that "the evidence for the harmful effects of alcohol is undoubtedly stronger than the evidence for beneficial effects."⁵²

Moral Implications

The Bible unequivocally teaches that the body is the dwelling place of the Holy Spirit. The Apostle Paul repeatedly refers to the human body as the temple of God and says that His Spirit lives in that temple. In addition, the Holy Spirit communicates with us through our conscious and reasoning mind. There is no safe level of alcohol intake that does not affect cognitive function, judgment, and reasoning. For optimal physical health and to keep the channels of communication between our minds and Heaven clear and open, alcohol should be avoided. Additionally, in keeping with God's command to "love your neighbor as yourself" (Leviticus 19:18, NIV)⁵³; given the widespread effects alcohol may have on the user, his or her family, friends, and community regarding trauma, domestic violence, accidents, highway fatalities, sexual immorality and spread of sexually transmitted diseases, the moral imperative for abstaining becomes even more pressing.

On the cross at Calvary, Jesus redeemed us with His own blood. Therefore, Paul concluded, "You are not your own; you were bought at a price. Therefore honor God with your body" (1 Corinthians 6:19, 20, NIV). These words summarize the most compelling argument in favor of abstinence. The science confirms the conclusion.

Conclusion

Considering the significant risks related to alcohol use, it does not make sense to promote its use for the sake of an unproven heart health benefit. This is especially so when there are proven ways to prevent and treat disease, including exercise, a healthful diet, and non-addictive, tested medications where needed that do not have significant negative health or behavioral consequences.

Certain lifestyle choices and measures offer protection against the problems alcohol inevitably brings in its wake: informed choices, exercise, rest, healthful eating, fresh air, sunshine, pure water (internally and externally), a trusting relationship with God, social support, a good dose of optimism, and of course, temperance, which encourages us to use wisely those things that are healthful and good, and to dispense entirely with all things harmful. Temperance, achieved through the enabling power of our Lord Jesus Christ, serves as a foundation for a Spirit-filled experience that can celebrate life free from alcohol and its attendant ills.

So, should people who don't drink alcohol start to use it? Based on the evidence, definitely not! Should those who currently drink alcohol quit? Based on the same evidence, un-

equivocally Yes! In the struggle to overcome, human beings may claim divine help, remembering that Paul states so clearly: "I can do all things through Christ who strengthens me" (Philippians 4:13, NKJV).⁵⁴



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NOTES AND REFERENCES

1. World Health Organization, "Global Status Report on Alcohol and Health" (2011): http://www.who.int/substance_abuse/publications/global_alcohol_report/en. Unless otherwise indicated, all Websites in the endnotes were accessed in April 2013.
2. Ibid.
3. Ibid.
4. World Health Organization, Media Centre, "Alcohol Fact Sheet" (February 2011): <http://www.who.int/mediacentre/factsheets/fs349/en>.
5. Ibid.
6. Centers for Disease Control and Prevention (hereafter abbreviated CDC), "Addressing a Leading Risk for Death, Chronic Disease, and Injury at a Glance, 2011": <http://www.cdc.gov/chronicdisease/resources/publications/aag/alcohol.htm>.

7. David J. Nutt, Leslie A. King, and Lawrence D. Phillips, "Drug Harms in the UK: A Multicriteria Decision Analysis," *The Lancet* 376:9752 (November 6, 2010):1558-1565.
8. Schneider Institute for Health Policy, *Substance Abuse: The Nation's Number One Health Problem* (Princeton, New Jersey: Robert Wood Johnson Foundation, 2001).
9. Ibid.
10. CDC, "Addressing a Leading Risk for Death, Chronic Disease, and Injury at a Glance," op. cit.
11. Joseph A. Hill, "In Vino Veritas: Alcohol and Heart Disease," *The American Journal of the Medical Sciences* 329:3 (March 2005):124-135.
12. Armin Imhof, et al., "Overall Alcohol Intake, Beer, Wine and Systemic Markers of Inflammation in Western Europe: Results From Three MONICA Samples (Augsburg, Glasgow, Lille)," *European Heart Journal* 25:23 (2004):2092-2100; Augusto DiCastelnuovo, Licia Iacoviello, and Giovanni de Gaetano, "Alcohol and Coronary Heart Disease" [Letter], *New England Journal of Medicine* 348:17 (2003): 1720, 1721.
13. John B. Standridge, Robert G. Zylstra, and Stephen M. Adams, "Alcohol Consumption: An Overview of Benefits and Risks," *Southern Medical Journal* 97:7 (July 2004): 664-672.
14. Stanton Peele and Archie Brodsky, "Exploring Psychological Benefits Associated With Moderate Alcohol Use: A Necessary Corrective to Assessments of Drinking Outcomes?" *Drug and Alcohol Dependence* 60:3 (November 2000):221-247; R. M. Pinder and M. Sandier, "Alcohol, Wine and Mental Health: Focus on Dementia and Stroke," *Journal of Psychopharmacology* 18:4 (2004):449-456.
15. Peele and Brodsky, "Exploring Psychological Benefits Associated With Moderate Alcohol Use," ibid.
16. Lorraine Gunzerath, et al., "National Institute on Alcohol Abuse and Alcoholism Report on Moderate Drinking," *Alcoholism: Clinical and Experimental Research* 28:6 (June 2004):829-884.
17. Ibid.
18. Naja Rod Nielsen, et al., "Is the Effect of Alcohol on Risk of Stroke Confined to Highly Stressed Persons?" *Neuroepidemiology* 25 (2005):105-113.
19. Michael D. Slater, Michael A. Basil, and Edward W. Maibach, "A Cluster Analysis of Alcohol-Related Attitudes and Behaviors in the General Population," *Journal of Studies on Alcohol and Drugs* 60:5 (1999):667-674.
20. Gunzerath, et al., "National Institute on Alcohol Abuse and Alcoholism Report on Moderate Drinking," op. cit.
21. Timothy S. Naimi, et al., "Cardiovascular Risk Factors and Confounders Among Nondrinking and Moderate-Drinking U.S. Adults," *American Journal of Preventive Medicine* 28:4 (2005):369-373.
22. Ibid.
23. Kaye M. Fillmore, et al., "Alcohol Consumption and Mortality III. Studies of Female Populations," *Addiction* 93:2 (February 1998):219-229.
24. _____, et al., "Moderate Alcohol Use and Reduced Mortality Risk: Systematic Error in Prospective Studies," *Journal of Studies on Alcohol and Drugs* 63:4 (July 2006):404-411.
25. Volker Arndt, et al., "Age, Alcohol Consumption, and All-Cause Mortality," *Annals of Epidemiology* 14:10 (2004):750-753.
26. Stanton Peele and Archie Brodsky, "Exploring Psychological Benefits Associated With Moderate Alcohol Use: A Necessary Corrective to Assessments of Drinking Outcomes?" *Drug and Alcohol Dependence* 60:3 (November 10, 2000):221-247.
27. Christopher T. Sempos, et al., "Average Volume of Alcohol Consumption and All-Case Mortality in African Americans: The NHEFS Cohort," *Alcoholism Clinical and Experimental Research* 27:1 (January 2003):88-91.
28. Flávio D. Fuchs, et al., "Association Between Alcoholic Beverage Consumption and Incidence of Coronary Heart Disease in Whites and Blacks—The Atherosclerosis Risk in Communities Study," *American Journal of Epidemiology* 160:5 (2004):466-474.
29. _____, et al., "Alcohol Consumption, and the Incidence of Hypertension: The Atherosclerosis Risk in Communities Study," *Hypertension* 37:5 (2002):1242-1250.
30. Mark J. Pletcher, et al., "Alcohol Consumption, Binge Drinking, and Early Coronary Calcification: Findings From the Coronary Artery Risk Development in Young Adults (CARDIA) Study," *American Journal of Epidemiology* 161:5 (March 1, 2005):423-433.
31. John B. Standridge, Robert G. Zylstra, and Stephen M. Adams, "Alcohol Consumption: An Overview of Benefits and Risks," *Southern Medical Journal* 97:7 (2004):664-672.
32. Richard K. Ries, et al., *Principles of Addiction Medicine* (Philadelphia: Wolters Kluwer/Lippincott & Wilkins, 2009), fourth edition.
33. Michelle Dumont and Marc A. Provost, "Resiliency in Adolescent: Protective Role of Social Support Coping Strategies, Self-Esteem, and Social Activities on Experience of Stress and Depression," *Journal of Youth and Adolescence* 28:3 (January 1999):343-363.
34. Timothy S. Naimi, et al., "Binge Drinking Among U.S. Adults," *Journal of the American Medical Association* (JAMA) 289:1 (January 1, 2003):70-75.
35. Norman Kreitman, "Alcohol Consumption and the Preventive Paradox," *British Journal of Addiction*: 81:3 (1986):353-363.
36. Lorraine T. Midanik, et al., "Risk Functions for Alcohol-Related Problems in a 1988 U.S. National Sample," *Addiction* 91:10 (1996):1427-1437.
37. Robert B. Voas, et al., "Drinking Status and Fatal Crashes: Which Drinkers Contribute Most to the Problem?" *Journal of Studies on Alcohol* 67:5 (2006):722-729.
38. Jennifer N. Fogarty and Muriel Vogel-Sprott, "Cognitive Processes and Motor Skills Differ in Sensitivity to Alcohol Impairment," *Journal of Studies on Alcohol* 63:4 (July 2002):404-411.
39. Center for Science in the Public Interest, "Alcohol-Beverage Industry Needs Young Drinkers": <http://www.cspinet.org/booze/FactSheets/031125IndustryYouth.pdf> (Posted November 2003). Accessed September 20, 2013.
40. C. Rutger Engels, et al., "Alcohol Portrayal on Television Affects Actual Drinking Behavior," *Oxford Journal* 44:3 (2009):244-249.
41. "Continuous Update Project Breast Cancer 2010 Report": http://www.dietandcancerreport.org/cancer_resource_center/downloads/cu/breast-cancer-2010-report.pdf, pp. 8-10.
42. World Cancer Research Fund, "Colorectal Cancer": http://www.dietandcancerreport.org/cup/current_progress/colorectal_cancer.php.
43. David E. Nelson, et al., "Alcohol Attributable Cancer Deaths and Years of Potential Life Lost in the United States," *American Journal of Public Health* 103:4 (April 2013):641-648.
44. Hamish A. Deery and Anthony W. Love, "The Effect of a Moderate Dose of Alcohol on the Traffic Hazard Perception Profile of Young Drunk-Drivers," *Addiction* 91:6 (June 1996):815-827.
45. Haken Kallmen and Roland Gustafson, "Alcohol and Disinhibition," *European Addiction Research* 4:4 (December 1998):150-162.
46. Leif C. Crowe and William H. George, "Alcohol and Human Sexuality: Review and Integration," *Psychological Bulletin* 105:3 (1989):374-386.
47. Jennifer N. Fogarty and Muriel Vogel-Sprott, "Cognitive Processes and Motor Skills Differ in Sensitivity to Alcohol Impairment," *Journal of Studies on Alcohol and Drugs* 63:4 (July 2002):722-729.
48. Brad J. Bushman and Harris M. Cooper, "Effects of Alcohol on Human Aggression: An Integrative Research Review," *Psychological Bulletin* 107:3 (June 1990):341-354.
49. Kathy Denton and Dennis Krebs, "The Effect of Alcohol and Social Context on Moral Judgment," *Journal of Personality and Social Psychology* 59:2 (August 1990):242-248.
50. Menahem Krakowski, "Violence and Serotonin: Influence of Impulse Control, Affect Regulation, and Social Functioning," *The Journal of Neuropsychiatry and Clinical Neurosciences*, 15:3 (August 2003):294-305; Mario Carta, Manuel Mameli, and C. Fernando Valenzuela, "Alcohol Potently Modulates Climbing Fiber Purkinje Neuron Synapses: Role of Metabotropic Glutamate Receptors," *The Journal of Neuroscience* 26:7 (March 2004):1906-1912.
51. Alain Marchand, et al., "The Moderating Effect of Alcohol Intake on the Relationship Between Work Strains and Psychological Distress," *Journal of Studies on Alcohol and Drugs* 64 (May 2003):419-427.
52. Hans Olav Fekjaer, "Alcohol—A Universal Preventive Agent? A Critical Analysis," *Addiction* (March 1, 2013): <http://onlinelibrary.wiley.com/doi/10.1111/add.12104/abstract>. Accessed October 13, 2013.
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