

Religiosity as a possible protective factor against “binge drinking” among 12-year-old students: a population-based study

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Abstract *Associated with positive impacts on health, religiosity has presented itself as a possible protection factor against alcohol consumption by teenagers. This study evaluated the prevalence of binge drinking and its association with religiosity among 12-year-old students, from Diamantina, State of Minas Gerais. Statistical analyses involved chi-square Pearson ($p < 0,05$) and Poisson regression with robust variance. The sample included a census of 588 students. Participation in religious activities was associated with no binge drinking (PR = 0,823; 95% CI: 0,717 – 0,945); and consumption of alcoholic beverages by the best friend was associated with binge drinking (PR = 1.554; 95% CI: 1,411- 1,711). It was concluded that religiosity was associated with no consumption of alcoholic beverages in binge drinking sessions.*

Key words *Binge drinking, Religiosity, Adolescents*

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Introduction

Over the centuries in different cultures, alcohol has been a psychoactive substance that could lead addiction^{1,2}. In 2012, its consumption was responsible for approximately 3.3 million deaths worldwide. In addition to deaths, the Disability-Adjusted Life Years (DALYs) arrived at 139 million, or 5% of the total attributed to all diseases³.

The consumption of five doses of alcoholic beverages on a single occasion is defined as “binge drinking”⁴. High rates of binge drinking in late adolescence and the early onset during this period of life may confer greater vulnerability to intoxication, leading to decreased motor coordination, awareness and cognition, as well as other consequences such as dependence, depression and eating disorders⁵⁻⁷.

Alcohol has been the main substance consumed abusively among adolescents^{1,2,8,9}. While consumption of such beverages in Brazil is legally permitted only after the age of 18 (Law no. 9294, July 15, 1996)¹⁰, approximately 41.3% of Brazilian adolescents aged 13-15 reported alcohol consumption, according to the Household Survey on the Use of Psychotropic Drugs carried out in 2010¹¹.

The average age at which Brazilian adolescents start to drink is 10 years^{12,13}. The very early habit has been pointed out in several studies as an important predictor for abusive consumption and dependence in adulthood¹⁴⁻¹⁷. Hingson *et al.*¹⁸ reported that adolescents who had started drinking at the age of 14 were 1.78 times more likely to develop dependence compared to those who had started drinking at 21. Thirteen-year-olds who reported having consumed alcoholic beverages until the stage of intoxication were three times more likely to develop addiction when compared to those who were intoxicated at the age of 19 or over, according to the same authors. Alcohol consumption by parents and friends, as well as sociodemographic factors related to maternal schooling and sociodemographic status would also be positively associated with adolescent binge drinking¹⁹⁻²².

In view of this situation, some research has been developed with a view to identifying factors that may be associated with the protection of the individual against the consumption of alcohol and other drugs²³⁻²⁶. Among these, religiosity has been indicated as one of the main factors²⁶⁻²⁸. Epidemiological studies have shown that a high level of religiosity is associated with a lower prevalence

of binge drinking^{23,29}. However, these studies are still incipient and require further studies to seek a better sedimentation and elucidation of these associations. Therefore, this study seeks to investigate the prevalence of binge drinking among 12-year-olds in the city of Diamantina (MG) and their association with religiosity, as well as socio-demographic factors and alcohol consumption by parents and best friends.

Methods

This cross-sectional epidemiological study was carried out between February and April 2013, in Diamantina, a municipality with approximately 46,372 inhabitants located in the north of the state of Minas Gerais, southeastern Brazil. The study was a census of 633 12-year-olds enrolled in eleven public and two private schools. A list of the names, school addresses and the total number of students elected for the research was obtained from the Municipal Education Secretariat. Data was collected in schools on a previously scheduled day.

Ethical considerations

This study was submitted for analysis and approval by the Human Research Ethics Committee of the Federal University of Minas Gerais (Brazil), according to recommendations of the Declaration of Helsinki. After school management's consent, participants and their parents/guardians signed an informed consent form, assuring confidentiality and anonymity of their answers.

Pilot Study

The pilot study was conducted in a region near the city of Diamantina to test the methodology of the research. Schools were selected by convenience. One hundred and one 12-year-olds from two public and one private school participated in the study. The pilot was conducted one year prior to the main study, so students who participated in it were not part of the main study. No changes in methodology were required after the results of the pilot study.

Variables

Assessment of binge drinking

The dependent variable analyzed was binge drinking. We used the short version of the tool

to identify alcohol use-related problems (AUDIT-C). The AUDIT-C test was validated in Brazil³⁰ in order to identify the frequency of alcohol consumption and “binge” consumption³¹. The AUDIT-C applied consisted of three questions about alcohol “binge” frequency and consumption: 1- How often did you drink alcohol in the last year? (response options: never, once a month or less, 2-4 times a month, 2-3 times a week, 4 or more times a week); 2- How many doses of alcohol do you consume on a normal day? (response options: 1, 2 or 3, 4 or 5, 6 or 7, 8 or more times) and 3- How often do you consume five or more doses on a single occasion? (response options: Never, less than once a month, once a month, once a week, daily or almost every day). Alcohol consumption was obtained from Question 1 and dichotomized as 0 (never) or 1 (for monthly to 4 or more times per week). Binge drinking was obtained from question 3 and defined as consumption of five doses on a single occasion³². To identify the onset of alcohol consumption, the following question was added: How old were you when you first tried alcoholic beverages?³³ The frequency of alcohol consumption by parents and friends was also included in the study from the questions: 1-Does your father drink alcoholic beverages? (answer options: 0-No or 1-yes) Does your mother drink alcoholic beverages? (answer options: 0-no or 1-yes); Does your best friend drink alcoholic beverages? (answer options: 0-no or 1-yes)^{34,35}.

Religiosity and socioeconomic condition

The main independent variable analyzed was religiosity. Thus, the following questions used in the literature were asked: Did you participate in religious activities in the last six months? (response options: never, less than once, once a month, once a week, daily or almost every day); Did you pray in the last six months? (response options: never, less than once a month, once a week, daily or almost every day); and How important is religion in your life? (response options: not important, a little, neither little nor very important or very important)³⁶⁻³⁸. The socioeconomic condition was evaluated through the following variables: household income (number of minimum wages), school type (public or private) and maternal schooling (years of study)²⁰⁻²². Household income was determined based on the sum of all salaries received by the economically active residents of the household and classified based on the minimum wage in force in Brazil;

the threshold was the mean response. Maternal schooling was defined as the number of years of study, and seven years of study was used as the cutoff point; the threshold was the mean response. The family’s monthly income and maternal schooling were considered as indicators of the individual’s socioeconomic status due to their association with binge drinking by adolescents, reported in several studies^{11,20,39}. The socioeconomic variables were collected through a form completed by parents/guardians, along with the informed consent form. The type of school was also used as a socioeconomic indicator, although this variable only allows a superficial evaluation; most Brazilian public schools are known to have smaller educational resources when compared to private schools. Thus, the richest adolescents in Brazil are enrolled in private schools⁴⁰. The students completed the questionnaire in the classroom, with teacher’s prior consent. In each classroom, all questions were read aloud, which was justified by the age of subjects who, while literate, could evidence difficulties of interpretation or understanding. The advantage of all filling out the questionnaire simultaneously, preventing responses from being influenced and, at the end of the reading, all students completing the questionnaire together was also associated. Privacy and confidentiality were assured to the participants⁴¹.

Statistical analysis

Data was analyzed with Statistical Package for Social Sciences (SPSS) version 19.0, for Windows, which included frequency distribution and association tests. The statistical significance for the association between binge drinking and independent variables (gender, household income, maternal schooling, school type, alcohol consumption by parents and best friends, importance of religion, participation in religious activities and prayers in the last 6 months) in the bivariate analysis was determined using the chi-square test with $p < 0.05$.

The dependent variable (binge drinking) and the independent variables (religiosity, alcohol consumption by responsible and friends, and sociodemographic condition) were first incorporated in the model of Poisson regression with robust variance. The criterion for including other independent variables in the multiple analysis model was the statistical significance with $p < 0.20$ in the bivariate analysis.

Results

Among the 633 invited students, 588 (92.9%) participated. The loss of 4.6% (28) was due to the refusal to participate by parents/guardians or the students themselves and 2.5% ($n = 17$) due to incomplete or incoherent data.

Among all students, we found that 51.4% (302) were female. Most (92.2%) were enrolled in public schools; 75.2% ($n = 442$) had a monthly family income of up to three times the national minimum wage; and most mothers had more than seven years of schooling ($n = 376$, 63.9%).

The prevalence rates of alcohol consumption in the last year and binge drinking were 45.6% ($n = 268$) and 23.1% ($n = 136$), respectively. The mean age at which students reported having consumed their first alcoholic beverage was 10.76 years, whereas for other 12-year-old students ($n = 31$; 7.6%) the first consumption of alcoholic beverages occurred between the age of 8 and 9.

When questioned about participation in religious activities in the last 6 months, the study showed that 90 (15.3%) students had not participated in such activities, while 498 (88.7%) reported having participated. When considering the importance of religion in life, 68 (11.6%) students reported that religion was not important, while 520 (88.4%) said it was little important to very important. Regarding prayer frequency in the last 6 months, 173 (29.4%) students said they had not prayed, while another 415 (70.6%) prayed once a month or daily.

Bivariate analysis showed that binge drinking was associated with males ($p = 0.012$) and those with mothers with higher education ($p = 0.017$). Students who reported not engaging in binge drinking were associated with reports of greater participation in religious activities ($p < 0.001$) as well as praying in the last 6 months ($p = 0.002$). When considering the use of drinks by parents and friends, it was verified that best friend drinking was associated with consumption and binge drinking by students ($p < 0.001$) (Table 1)

In the Poisson regression model with robust variance, participation in religious activities was associated with students' binge drinking (PR = 0,823; 95% CI: 0,717 – 0,945); and best friend alcohol consumption was associated with the binge drinking by these students (PR = 1.554; 95% CI: 1,411-1,711) (Table 2).

Discussion

Alcoholic beverages are the psychotropic substances most commonly used by adolescents⁴². Adolescent drinking is an important ritual of sociability, as well as a pleasant moment, so that this period is usually one in which one drinks more in quantity and frequency⁴³. In this study, the prevalence rate of alcohol consumption (45.6%) was similar to that found in multicenter studies conducted in Brazil in 2001 (48.5%)⁴⁴. When we analyzed binge drinking (23.1%), we observed a lower prevalence when compared to studies in Belo Horizonte, Minas Gerais (36.0%)²⁰ and in Brazil (35.0%)²⁵. However, these studies had broader age groups. In Brazil, while selling alcoholic beverages to individuals under 18 years of age is forbidden by law (Law No. 9.294, 15 July 1996)¹⁰, their consumption seems somewhat trivialized in society and is culturally associated with leisure. However, several studies show that binge drinking is a risk behavior not only due to the possibility of intoxication and death, but also because of its association with higher rates of traffic accidents⁴⁵, poor school performance and greater possibility of dependence⁴⁶.

The early use of alcohol has been pointed out as an important predictor for problematic consumption in adulthood^{14,16,17}. In their longitudinal study in the U.S., Dawson *et al.*¹⁵ found that adolescents who started drinking before the age of 15 were significantly more likely to become addicted in adult life, compared to those who had a late first consumption at the age of 18 (PR = 1.38, $p = 0.047$). In this sample, 7.6% of students reported first consumption between 8 and 9 years of age. In addition, 29.7% of those who reported binge drinking said it was done at the age of 10. The earlier the contact with alcohol, the more vulnerable individuals become to dependence, which can alter the normal development of the brain and hamper the ability to perform specific tasks for their age³⁶.

In this study, binge drinking by participating adolescents was not statistically associated with gender. Studies indicate that drunkenness⁸, increased risk of alcohol consumption¹⁹ and regular consumption of beverages⁴⁷ are more frequent among boys. However, several studies have shown a corresponding consumption for both genders or higher in females^{8,13,48}. Currently, female behavior has been shown to be very similar to male behavior, especially in risk behavior, mainly in adolescence. This is justified by the aspiration for acceptance as an integral part of

Table 1. Distribution of the sample according to the dependent variable (“binge drinking”) and independent variables; Diamantina, Minas Gerais, Brazil, 2015 (n = 588).

	Independent variables	“Binge drinking”				p*	
		Absent		Present			
		(n)	%	(n)	%		
Sociodemographic and economic condition	Gender	Female	245	81.1	57	18.9	0.012
		Male	207	72.4	79	27.6	
	Maternal schooling						
Religiosity	8 years and over of study		301	80.1	75	19.9	0.017
	0-7 years of study		150	71.4	60	28.6	
	Prayers in the last 6 months	Yes	402	79.0	107	21.0	0.002
		No	50	63.3	29	36.7	
	Religious Activities	Participates	394	79.1	104	20.9	< 0.0001
		Does not participate	58	64.4	32	35.6	
	Importance of religion	Little important	413	79.4	107	20.6	< 0.0001
Very important		39	57.4	29	42.6		
Consumption by relatives and friends	Father	Never	135	87.1	20	12.9	< 0.0001
		Yes	317	73.2	116	26.8	
	Mother	Never	297	73.2	109	28.6	< 0.001
		Yes	155	85.2	27	14.8	
	Best friend	Never	274	94.2	17	5.8	< 0.0001
		Yes	178	59.9	119	40.1	

* p-value obtained by the chi-square test with $p < 0.05$.

Table 2. Results of the Poisson regression analysis with robust variance of the dependent variable (“binge drinking”) and independent variables among adolescents (n = 588), Diamantina/MG, Brazil, 2015.

Dependent variable	Independent variables	Crude PR	p*	Adjusted PR	p*	
“Binge drinking”	Participation in religious activities	No	1.0	0,012	1,0	< 0,0001
		Yes	0.815 (0.694- 0.956)		0,823 (0,717- 0,945)	
	Best friend	Doesn't drink	1.0	< 0,0001	1,0	< 0,0001
		Drinks	1.571 (1.425- 1.732)		1,554 (1,411- 1,711)	
	Maternal schooling	< 7 years	1.0	0,024	1,0	0,087
		> 7 years	1.121 (1.015- 1.238)		1,084 (0,988- 1,189)	
	Gender	Female	1.0	0,012	1,0	0,108
		Male	0.0892 (0.815-0.976)		0,936 (0,862- 1,015)	

PR: Prevalence ratio CI: Confidence interval *Adjusted for gender.

a group of equals, and may lead adolescents to adopt modes concerning that group⁴⁸. Historically, it has been known that, since the end of

the eighteenth century, equal rights and opportunities claimed by women have revolutionized society⁴⁹. Believing that the use of beverages is

affected by cultural definitions⁵⁰, it is observed that the contemporary female conduct of equating men even in the act of drinking has reflected a currently experienced cultural change between genders^{51,52}. Although this consumption is not a “typically male” behavior according to the results obtained in this study, we can note that society believes that alcohol abuse by men causes physical and moral deterioration of self-care and family care, while for women this consumption reveals women that “dishonestly” fail to fulfill their role of wives, workers and mothers who take care of their children and watch over home order, showing the demarcation of genders⁵³.

The literature shows conflicting results while considering binge drinking and family socioeconomic status. Some researchers point out that binge drinking is positively associated with higher socioeconomic status^{54,55}, while others point out a higher prevalence of consumption when the status is lower^{11,56}. Our results indicate that there was no statistically significant association between maternal schooling and binge drinking by her children. Factors such as culture and religiosity may be associated with variables income and schooling, influencing in a complex way the profile of alcohol consumption in a population. The evaluation of the influence of these socioeconomic factors on behaviors in developing countries such as Brazil becomes more complex, since increased years of schooling can have a minimal effect on increased income⁵⁷. The association between binge drinking and socioeconomic status is still contradictory, and it is important to point out the existence of studies that do not indicate such association^{58,59}.

Although adolescence is the period associated with the onset of alcohol consumption⁸, several so-called “protective factors” may contribute to the non-involvement of individuals. According to a survey by Hanson²⁴, the main protective factors are: family, due to the construction of affective bonds and monitoring of friendships and activities, strong involvement with school and/or religious activities and availability of information. Religiosity has become an object of increasing interest to research. Studies investigating the relationship between religious involvement and binge drinking indicate a positive association between greater involvement in religious activities and lower consumption^{23,29,60}. In addition, it is associated with a lower risk of depression and suicide, reduced mortality rate and a better quality of life⁶¹. Participation in religious activities is strongly connected with health care. In our study,

we observed that this action was negatively associated to binge drinking. Adolescents involved in religious activities fill in their time and begin to receive teachings about conduct and moral concepts that discourage the use of alcoholic beverages and increase faith²⁵. Some authors suggest that religious teachings work as a protective factor by exerting a direct influence on the family, individual personality or bringing values related to life sanctity^{28,62,63}. The perceived personal responsibility for the physical and mental care that religiosity brings cooperates so that practitioners implement self-control regarding the use of alcohol and other drugs^{23,64}.

When we analyze the fundamental role that friends play in individual behavior, it is known that these are great influencers for consumption⁶⁵. Living with friends who consume alcohol is a predisposing factor. Through multiple analysis, we observed that alcohol consumption by the best friend was statistically associated with binge drinking among students. Often, the first alcoholic consumption occurs at parties, where drinks ingested are offered by friends and used as a socializing means⁴⁸. In this perspective, studies by Sanchez *et al.*²⁵ and Zarzar *et al.*²⁰ have shown that friendships developed in religious environments with people who habitually do not engage in binge drinking favor a lower risk lifestyle. Through networks of friends healthy behaviors can be shared. In schools, the environment of common rules, goals and values that aims life, can also reduce the risk of high alcohol consumption⁶⁵. However, Zarzar *et al.*²⁰ emphasize that the best friendships, when developed within the church, works as a protective factor against binge drinking.

The limitations of this study include its cross-sectional design, which does not allow the establishment of a cause-and-effect direction, but facilitates the identification of associations between the analyzed variables. The use of questionnaires enables the omission of information, but since they are anonymous, they leave the participant with more freedom to answer personal questions. Students who were in the classroom and who agreed to participate in the study were evaluated. Thus, the results may not reflect what happens to those who missed or evaded school and those not enrolled.

Longitudinal works that study religiosity and other factors that may act as a protective factor for risk behaviors are extremely relevant so that new strategies are elaborated and discussed for adolescent health promotion.

Conclusion

There was a high prevalence of binge drinking among 12-year-olds participating in this study. The participation of adolescents of this study in religious activities appeared as a possible protective factor for binge drinking. The consumption of alcoholic beverages by the best friend was identified as a possible risk factor for binge drinking by adolescents.

Collaborations

PCP Paiva, EF Ferreira and PMPA Zarzar contributed to the work's design. PCP Paiva and HN Paiva contributed to data acquisition. PMPA Zarzar, PCP Paiva and HN Paiva were involved in data analysis and interpretation. MO Guimarães, PCP Paiva and PMPA Zarzar were responsible for the elaboration of the paper. MO Guimarães, PCP Paiva, JA Lamounier and PMPA Zarzar were responsible for the critical review and approval of the final version. All authors had full access to data and assume responsibility for the integrity and precision of the analyses.

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