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Risk and protective factors for alcohol use among school-going adolescents in Montevideo (Uruguay)

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Abstract

Purpose – The purpose of this paper is to explore risk and protective factors for alcohol use among school-going adolescents in Montevideo (Uruguay).

Design/methodology/approach – A self-report survey was administered to 331 school-going adolescents in Montevideo (Uruguay) ($M_{age} = 13$; $SD = 0.05$), using the alcohol screening instrument of the Uruguayan National Drug Board to assess adolescents' alcohol use (yes/no), a screening instrument for psychopathology and resilience (the adolescent self-report) and a socio-demographic questionnaire.

Findings – Logistic regression analyses identified antisocial behaviour, substance use and negative emotionality (F2), disruptive and dysregulated behaviour (F8), higher age and recent death of a close relative as risk factors, while the number of close friends was identified as a protective factor for past year alcohol use (yes/no). No straightforward relationship was found between schools and the risk for the past year alcohol use. In addition, age, F2, F8 and recent death of a close relative appeared to be the most robust predictors.

Research limitations/implications – The study was the first in Uruguay to relate adolescents' alcohol use to risk and protective factors. Given the cross-sectional nature of the study, causal relationships could not be determined.

Originality/value – The study provides preliminary recommendations for policy makers and other stakeholders involved in youth affairs on core elements to focus on school-, community- and family-based alcohol prevention programmes for adolescents.

Keywords Adolescents, Uruguay, Risk factors, Psychopathology, Alcohol use, Protective factors

Paper type Research paper

1. Purpose

Alcohol is one of the most frequently consumed substances by adolescents worldwide. In Latin-America, Uruguay is the country with the highest lifetime prevalence of alcohol consumption among 15-65 years old, and with the lowest risk perception (Naciones Unidas. Oficina contra la Droga y el Delito (ONUDD), 2009; OEA, 2015). Over the past years, the age of onset for alcohol use has decreased accompanied by an increased incidence in binge drinking (Junta Nacional de Drogas, Observatorio Uruguayo de Drogas (JND, OUD), 2011; Junta Nacional de Drogas, 2012). In Uruguay the legal age restriction for buying alcohol is 18 years old. As a first exploration of adolescent alcohol use in Uruguay, the current study focusses on alcohol use among school-going adolescents, including age of onset, lifetime, last year and last month prevalence (yes/no), but no indicators of problem use or addictive behaviour.

Several studies have focussed on the negative impact of early and frequent alcohol use on adolescents' mental health, social situation and academic performance (Fergusson *et al.*, 2013; Hemphill *et al.*, 2014; Liang and Chikritzhs, 2015). Early onset of alcohol use has repeatedly been identified as a predictor for the development of future problematic substance use (Liang and Chikritzhs, 2015), as well as other mental health problems. In addition, it appeared to impact

youngsters' social situation negatively (e.g. family relationships, school performance, giving up leisure activities). Moreover, early adolescent alcohol use, frequent use of alcohol and heavy episodic drinking have been shown to have negative effects on youngsters' school performance (e.g. dropout, truancy, school suspension, low commitment, academic failure; Hemphill *et al.*, 2014).

Peer-related variables (e.g. peer deviance, peer alcohol use, peer influence (experienced) peer norms and peer popularity) appear to be prominent factors in explaining drinking intentions and occasions and alcohol use (Beullens and Schepers, 2013; Jones and Magee, 2014; Liu *et al.*, 2014; Cooke *et al.*, 2015; Lee *et al.*, 2015; Tomczyk *et al.*, 2015). For example, adolescents, who believe that a higher number of friends use alcohol and that alcohol use is socially acceptable (normative beliefs), demonstrate increased intentions to drink (Beullens and Schepers, 2013). The particular importance of peers is related with the developmental period of adolescence, when peers (compared to parents) become increasingly important and influential (Berk, 2006). Also, poor school performance, lack of commitment at school, low risk perception, previous delinquent behaviour and family history of problem behaviour and substance use have been identified as important risk factors of problematic alcohol use among adolescents (Birhanu and Bisetengn, 2014; Wongtongkam *et al.*, 2014). A 21-year follow-up study by Salom *et al.* (2014) showed that several aspects of early socio-economic disadvantage (low family income, low maternal education, family unemployment) are associated with alcohol use and mental health disorders in young people. Moreover, epidemiological studies indicate a high concurrent prevalence of externalizing and internalizing mental health problems in adolescence (Miettunen *et al.*, 2013; Birhanu and Bisetengn, 2014; Liang and Chikritzhs, 2015). High comorbidity between substance use and other psychiatric disorders is reported in adults as well as adolescents (Goodman, 2010; Fergusson *et al.*, 2013).

Recently, the role of protective factors in preventing substance use has received increased attention (Nargiso *et al.*, 2015; Wongtongkam *et al.*, 2014). Protective factors can be defined as "characteristics or conditions within the individual, family, school or community that increase the likelihood of positive health behaviours or outcomes, or moderate and discourage behaviours that might lead to negative health outcomes" (Birhanu and Bisetengn, 2014, p. 3). Protective factors refer to adolescents' subjective perception of well-being and quality of life, and resilience; the extent to which they perceive their life as favourable and satisfying (McPhee *et al.*, 2015). Protective factors that have been associated with alcohol use in adolescents are social and communication skills, positive self-concept, moral beliefs, positive peer and parenting role models, participation in religious activities, good school performance, social involvement and high educational level of parents (Birhanu and Bisetengn, 2014; Wongtongkam *et al.*, 2014). Some of the abovementioned peer-related variables (e.g. peer norms and peer influence) appear to have a protective function towards drinking intentions and alcohol use (Liu *et al.*, 2014; Lee *et al.*, 2015).

In Latin-American countries, particularly in developing countries like Uruguay, there are few studies on adolescent alcohol use in relation to mental health status and risk and protective factors (ONUDD, 2009; OEA, 2015). The few studies including data from developing countries in South America and the Caribbean highlight the relationship between child and adolescent maltreatment and increased risk of alcohol use (Longman *et al.*, 2011, 2013). Other studies in South Africa and a review including 11 developing countries stress the importance of research on personal and family factors related to alcohol use in adolescents in developing countries (Atilola *et al.*, 2014), and on the association between psychopathology and alcohol use (Saban and Flisher, 2010).

The current study was designed to contribute to by exploring age of onset, lifetime, past year and past month prevalence (yes/no) of alcohol use; and risk and protective factors of past year alcohol use (yes/no) in a sample of school-going adolescents in Montevideo (Uruguay).

2. Design

The sample (not probabilistic) was recruited in six private high schools, located at the outskirts of Montevideo (Uruguay) between September and October 2013, including boys and girls between 12 and 15 years old from different socio-economic strata. In order to be eligible for this study, students had to meet the following criteria: good Spanish language skills; and basic reading comprehension to understand and complete the questionnaires. The sample consisted of 331 adolescents, 61.4 per cent girls and 38.6 per cent boys (see Table I); 80.8 per cent belonged to

Table 1 Socio-demographic characteristics of the study

Variables	<i>n</i>	%
<i>Gender</i>		
Male	128	38.6
Female	203	61.4
<i>Frequency of age</i>		
12	63	19.1
13	124	37.7
14	89	27.1
15	53	16.1
<i>Socio-economic status</i>		
High	28	8.6
Medium	268	80.8
Low	35	10.6
<i>Household income</i>		
1 person	49	14.8
2 persons	213	64.3
3 persons	50	15.1
<i>Mean age</i>	13	
Note: <i>n</i> = 331		

the middle class, while 10.6 per cent came from lower social classes and 8.6 per cent from upper class families (according to the socio-economic multi-criteria index, INSE; Llambí and Piñero, 2012). Uruguay has the largest proportion of middle class in the region. Since 2012, the middle class has grown and now comprises 80 per cent of the population (Carbajal and Rovner, 2014). The proportion of sample participants from middle class background is proportionate to the last study of the United Nations Programme (PNUD) (80 per cent) by Carbajal and Rovner (2014), which using data from the national household surveys, taking into account per capita and per household income, educational level and labour market and housing conditions. About two-thirds of the sample (64.3 per cent) lived in households in which two persons receive an income, 14.8 per cent came from a household where only one person has an income and 15.1 per cent was from a household with three people receive an income (see Table I).

2.1 Procedure

Respondents completed the questionnaire using paper and pencil in one single session at the schools; teachers were not present during administration. The design of the study, as well as the informed consent forms and instruments, was approved by the Ethical Board of the Catholic University of Uruguay. All participants provided written informed consent, in addition to the formal consent given by the school and by parents. The questionnaires were anonymised and kept confidential in sealed envelopes in a locked cupboard. Neither the participants nor the schools received any kind of monetary compensation.

2.2 Instruments

Socio-demographic characteristics. A socio-demographic survey was used consisting of 41 items regarding individual, family, school and environmental characteristics.

Psychopathology and resilience. The adolescent self-report (ADA) (Daset *et al.*, 2015) consists of 118 items and is scored using a five-point Likert scale. Positive factors and resilience include strengths, life planning, coping skills and social desirability. Psychopathological symptoms include emotional and behavioural problems. The ADA is the first screening instrument that integrates psychopathological aspects, and protective factors, designed for youngsters considering local expressions and culture. It is based on the empirical taxonomies and studies of Achenbach and Edelbrock (1978), Lemos *et al.* (1992) and López-Soler *et al.* (1998).

Factor analyses have indicated the following clusters of items, resulting from the ADA (Daset *et al.*, 2015):

- *F1* problems to fit in (six items; e.g. “I am a lonely person, and this does not affect me”);
- *F2* antisocial behaviour, substance use and negative emotionality (eight items; e.g. “I’ve stolen things or money outside my home”);
- *F3* obsessive-compulsive symptoms (14 items; e.g. “I repeat certain actions very often (touch my hair, wash my hands) because this makes me feel at ease”);
- *F4* resilience (18 items; e.g. “I think that good things will happen to me”);
- *F5* depression, self-harm and somatic complaints (20 items; e.g. “I think about taking my life”);
- *F6* social desirability (five items; e.g. “If I commit a mistake I am willing to accept it”);
- *F7* fear and harassment (nine items; e.g. “I receive insults and jokes from peers, and I cannot take more”); and
- *F8* disruptive and dysregulated behaviour (12 items; e.g. “If I start insulting I cannot stop”).

Alcohol use. The survey (JND, OUD, 2011) assessed lifetime prevalence of alcohol use (yes/no), prevalence of alcohol use during the last 12 months (yes/no), prevalence of alcohol use during the last 30 days (yes/no) and the age of first alcohol use. We conceptualized alcohol use as the first use of alcohol in any context, not considering the number of drinks. A lower percentage of lifetime prevalence of alcohol use was observed compared to past year prevalence. This is explained because more students answered the question regarding substance use in the “last 12 months” than the question regarding “lifetime use”. In other words, many students who answered affirmative the question “last 12 months” did not answer the “lifetime” question. Based on the limited available information from the survey and as a first exploration, the present paper focusses on adolescents’ alcohol use, not on problematic use or addictive behaviour.

2.3 Statistical analysis

Descriptive statistics regarding demographic characteristics, risk and protective factors and the prevalence of alcohol use were calculated. We performed a binary logistic regression analysis to predict the probability of alcohol consumption in the last 12 months. The independent variables included: age (as dummies), sex, socio-economic status (SES), school institution (as dummies), number of close friends, academic performance, loss of a close relative (due to death), and the ADA psychopathology and resilience factors. As a robustness check of the previous model, we performed a binary logistic regression analysis excluding the dummy variables representing school institutions and including age as a continuous variable. We wanted to check if the results were robust (same sign and significance as in the previous model) to these changes in the model. Again, the dependent variable was alcohol use in the last 12 months. As independent variables, we only included the two ADA factors that were the most robust in the first regression model (i.e. *F2*: antisocial behaviour, substance use and negative emotionality, and *F8*: disruptive and dysregulated behaviour), as well as gender, SES, age (as a continuous variable), number of close friends and loss of a close relative (due to death). In both logistic regression analyses, all independent variables were included simultaneously. To explore the direction and size of the significant effects, we considered the odds ratios. For the second model, the pseudo R^2 was stated, indicating the amount of variance in the dependent variable that could be explained by the predictors in the model. Statistical analyses were performed using Statistical Package for the Social Sciences 20. A p -value of 0.05 was used in all analyses, as the standard for statistical significance.

3. Findings

Table II shows the prevalence of alcohol use in boys and girls from 12 to 15 years old. The prevalence of alcohol use in the last 12 months was 71 per cent. The highest proportion of first use is observed in the age category of 12-13 years old (60 per cent). The average age of first alcohol use is 12.8 years old.

Table II Alcohol use prevalence among school-going adolescents in Montevideo

Variable	<i>n</i>	%
Alcohol use once in lifetime: yes (vs no)	182	55
Alcohol use last 12 months : yes (vs no)	235	71
Alcohol use last 30 days: yes (vs no)	50	15
<i>Onset of alcohol use at ages</i>		
10 years old	5	4.3
11	13	11.1
12	35	30
13	35	30
14	25	22
15	4	2.6
Mean age of first alcohol use	12.8	

Table III describes the distribution of risk and protective factors, showing the percentage of cases that are located at the extreme ends of the distribution, meaning at least two standard deviations from the mean of each ADA factor. With regard to the ADA psychopathology factors (i.e. *F1-3*, *F5* and *F7-8*), between 18 and 21 per cent of the adolescents had higher scores (i.e. more than two standard deviations above the mean). Regarding protective ADA factors (i.e. *F4* resilience and *F6* social desirability), 6 per cent of the cases scored higher (i.e. more than two standard deviations above the mean).

Table IV shows the resulting logistic regression model with alcohol consumption in the past 12 months as a dependent variable. ADA *F2* (antisocial behaviour, substance use and negative emotionality) and *F8* (disruptive and dysregulated behaviour) stand out as highly significant risk factors for alcohol use in the past year ($p < 0.01$). The recent death of a close relative also appears as a significant risk factor for alcohol use in the past year ($p < 0.01$), while having many close friends appears as an important protective factor ($p < 0.05$). Moreover, youngsters of 13-15 years old appear to be more at risk for alcohol use in comparison with 12-year-old pupils (reference category = age 12) ($p < 0.01$). Also, in schools 2 and 5, pupils were more likely to have used alcohol in the past year, compared to the reference category (institution 6) ($p < 0.01$). In the institutions 4 ($p < 0.01$) and 3 ($p < 0.05$), the risk of past year alcohol use was significantly lower compared with institution 6.

Table V presents the results from the second logistic regression analysis. Symptoms of antisocial behaviour, substance use and negative emotionality (*F2*) and disruptive and dysregulated behaviour (*F8*) were significantly associated with an increased risk of alcohol use in the past year. The odds that an adolescent consumed alcohol in the past year were 1.06 times higher for adolescents displaying disruptive and dysregulated behaviour (per increase of ADA score with 1 point) ($p < 0.01$). For every increase in antisocial behaviour, substance use and negative emotionality with one point, the odds of alcohol consumption were 1.16 times higher ($p < 0.01$). Also, every increase in having experienced a traumatic event or difficult circumstance with one

Table III Distribution of risk and protective factors

ADA 8 factors		<i>n</i>	%
<i>F1</i> problems to fit in	<i>F1</i> > mean + 2 SD	70	21.1
<i>F2</i> antisocial behaviour, substance use and negative emotionality	<i>F2</i> > mean + 2 SD	68	20.5
<i>F3</i> obsessive-compulsive	<i>F3</i> > mean + 2 SD	61	18.4
<i>F4</i> resilience	<i>F4</i> > mean + 2 SD	21	6.3
<i>F5</i> depression, self-harm, somatic complaint	<i>F5</i> > mean + 2 SD	66	19.9
<i>F6</i> social desirability	<i>F6</i> > mean + 2 SD	19	5.7
<i>F7</i> fear and harassment	<i>F7</i> > mean + 2 SD	61	18.4
<i>F8</i> disrupted and dysregulated behaviour	<i>F8</i> > mean + 2 SD	63	19.0

Note: Percentage of cases with score higher than mean plus two standard deviations for each ADA factor

Table IV Logistic regression model predicting alcohol use (last 12 months)

Variables	Coef.	dy/dx
F2 antisocial behaviour, substance use and negative emotionality	0.184 (0.0399)***	0.0304926
F8 disruptive and dysregulated behaviour	0.0521 (0.0186)***	0.0086413
Socioeconomic status	0.205 (0.149)	0.034048
Sex	0.0658 (0.147)	0.0109233
Number of close friends	-0.000792 (0.000315)**	-0.0001313
Death close relative	1.078 (0.333)***	0.1788748
Age 13	0.956 (0.342)***	0.1585222
Age 14	1.698 (0.289)***	0.2817435
Age 15	2.679 (0.863)***	0.4443862
High school 1	0.354 (0.470)	0.0588093
High school 2	0.695 (0.144)***	0.1153515
High school 3	-0.410 (0.161)**	-0.0679894
High school 4	-1.706 (0.326)***	-0.2829705
High school 5	0.729 (0.0899)***	0.1209045
Constant	-4.598 (0.772)***	
Log likelihood		-109.6

Notes: Robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table V Logistic regression model predicting alcohol use (last 12 months): robustness check

Variables	Odds ratio	Robust SE	z	$p > z$	[95% conf.interval]
F2	1.158	0.035	4.89	0.000	1.092 1.228
F8	1.057	0.019	3.08	0.002	1.020 1.095
INSE	1.042	0.165	0.26	0.793	0.764 1.422
Sex	0.841	0.255	-0.57	0.568	0.464 1.523
Number close friends	1.000	0.001	-0.28	0.779	0.999 1.001
Death close relative	3.348	0.951	4.25	0.000	1.918 5.844
Age	2.347	0.596	3.36	0.001	1.426 3.861

Note: Pseudo $R^2 = 0.2044$

point, such as the death of a close relative, increased the odds for alcohol use in the past year with 3.35 ($p < 0.01$). In addition, age was associated with an increased risk of alcohol use in the past year ($p < 0.01$).

4. Discussion

We explored the use of alcohol in a sample of school-going boys and girls in Montevideo, and its relationship with risk and protective factors. The relatively high prevalence rates of alcohol use in the last 12 months among 12-15 years old converge with the results of the most recent National Drug Survey in Uruguay (Junta Nacional de Drogas (JND), 2015). First alcohol use was likely to occur at the average age of 12.8 years. These results are in line with the findings of the national drug study, demonstrating the younger age of first alcohol use (12.8 years old) and warranting a national public health strategy on the use of this substance among adolescents from 12 to 17 years old (JND, 2015).

4.1 Risk factors associated with alcohol use in the last 12 months

Similar to previous research in Chile, Finland and South Africa (Mason-Jones and Cabieses, 2015; Miettunen *et al.*, 2013; Saban and Flisher, 2010), a significant relationship between adolescents' mental health state and alcohol use was found. Last year alcohol use appears to be significantly associated with two psychopathological patterns: ADA factors 2 (antisocial behaviour, substance

use and negative emotionality), and 8 (disruptive and dysregulated behaviour). Although our findings are based on cross-sectional and limited to alcohol use (not abuse), one recent longitudinal study indicated that externalizing behaviour and subsequent criminal behaviour are important predictors of later alcohol abuse among adolescents (Liang and Chikritzhs, 2015).

In line with prior work (Longman *et al.*, 2011, 2013), our findings show that adolescents who reported recent death of a close relative are at higher risk of using alcohol in the past 12 months. The longitudinal study by Arpawong *et al.* (2015) (which focussed on alcohol abuse) indicated that higher levels of post-traumatic growth (defined by the authors as “a positive psychosocial adjustment to a particular life altering stressor”, p. 484) were associated with lower risks of last year alcohol abuse. Providing mental health support to adolescents, who experienced traumatic events, might serve as an important way to prevent them from seeking consolation or distraction in alcohol use (Liang and Chikritzhs, 2015).

We found that 13-15 years old are at greater risk for alcohol consumption compared to 12 years old. This result converges with findings from other studies in Australia, the USA, South Africa, India and China (Freitas-Rosa *et al.*, 2015; Olumide *et al.*, 2014; Arpawong *et al.*, 2015). These findings indicate the importance of early intervention and prevention of alcohol use from young age on. Again, it should be noted that our findings are limited to alcohol use (not abuse). However, prior work indicated that early age of onset of alcohol use is associated with increased risk of problematic substance use and deviant behaviour at later age (Ryzin and Dishion, 2014). Also, other studies found that early age of onset of alcohol use was associated with later frequent substance use and problems with emotional regulation (Atirola *et al.*, 2014).

Besides prevention and early intervention, legal restrictions are important means to control and reduce substance use (Babor and Caetano, 2005). The legal age for youngsters to purchase alcohol in Uruguay is 18 years, but enforcement of the legal drinking age is weak. Also, alcohol is cheap to purchase and widely available. Consequently, prevention and early intervention initiatives should be accompanied by initiatives to restrict the availability of alcohol for youngsters (e.g. ID controls, price increases, alcohol selling restrictions) and reduce its attraction (e.g. advertisement bans, warning signs, higher taxation).

A last risk factor in relation to last year alcohol was the location of the school. In institutions 2 and 5, adolescents showed significantly higher risk of past year alcohol use than their counterparts. The longitudinal study by Wang *et al.* (2014) identified some neighbourhood factors (e.g. high risk neighbourhoods, low adult monitoring and high risk peers) that predicted young adolescents' involvement in risk behaviours. Unfortunately, we had little detailed information about the context of the educational institutions that participated in the study to explain these between school differences. Further research should include school characteristics in order to clarify which contextual factors contribute/to or refrain from substance use.

4.2 Protective factors associated with alcohol use in the last 12 months

The number of close friends appeared as a protective factor for past year alcohol use. Given the direction of this association, it is likely that it concerns close relationships with prosocial peers, which is in line with prior findings that positive peer influence and prosocial peer norms buffer against drinking intentions and alcohol use (Liu *et al.*, 2014; Lee *et al.*, 2015). In addition, the study of Birhanu and Bisetengn (2014) found that adolescents with good social skills were less likely to use alcohol. These findings emphasize the importance of the development and maintenance of prosocial skills and of a stable, broad and prosocial network. Contrary to our findings, Freitas-Rosa *et al.* (2015) indicated that adolescents who were more satisfied about their intimate relationships were at increased risk of alcohol consumption. Here, it is likely that it concerned satisfaction with deviant peer relationships. Therefore, relationships with peers who display deviant behaviour may increase the pressure to follow the group norms and to be favourable towards substance use, which in turn raises the likelihood of early alcohol use (Birhanu and Bisetengn, 2014; Ryzin and Dishion, 2014; Wang *et al.*, 2014). While stimulating the development and maintenance of prosocial skills and social networks, prevention and intervention programmes need to be aware of potential negative peer interactions or detrimental influences of social networks (Freitas-Rosa *et al.*, 2015).

Adolescents in school institutions 3 and 4 were at lower risk of alcohol use. Further school characteristics should be explored to gain a better understanding of these identified differences.

The academic programme, ethos of the school, neighbourhood characteristics and parental attitudes could provide evidence on how schools can influence the relationship between substance abuse and academic performance (Andrade, 2014).

5. Clinical and policy implications and value

The present study provides useful information about risk and protective factors for alcohol use in adolescents, contributing to the scarce amount of research on this topic in developing countries. The results might be helpful to parents and teachers, and to policy and programme developers and trainers in the fields of education, psychology, substance use and public health. Findings and insights resulting from this study can be useful when planning alcohol prevention and early intervention programmes. Our results suggest that it would be useful to develop specific prevention initiatives for specific at risk groups (Mason-Jones and Cabieses, 2015).

Given the association between mental health and alcohol use in our sample, we recommend an integrated approach when dealing with adolescents who use alcohol and display problems in emotional and/or behavioural regulation (Ryzin and Dishion, 2014; Monahan *et al.*, 2014).

In line with prior work (Monahan *et al.*, 2014), our findings suggest to develop community, school and family programmes that are not exclusively focussed on risk factors (such as mental health problems), but also address protective factors for alcohol use. For example, stimulating youngsters to build a stable and prosocial network of close friends and promote better communication and bonding between adolescents and families, as well as healthy social activities among adolescents (Jones and Magee, 2014; Tomczyk *et al.*, 2015). Educational programmes that enhance academic performance and prosocial peer relationships have proven to be helpful to prevent adolescents' substance use/abuse (Andrade, 2014; Wongtongkam *et al.*, 2014; Tomczyk *et al.*, 2015).

6. Research limitations and recommendations

First, the generalizations of the study results are limited to the schools and levels examined here. Future studies should be based on probabilistic sampling methods and include schools nationwide. Second, given the cross-sectional nature of the study, we could not determine causal relationships between the variables of interest and we could not explore the evolution of risk and protective factors over time. Longitudinal research is needed to examine whether the identified risk and protective factors indeed influence youngsters' future alcohol use and how these factors change throughout adolescents' life. Third, information was obtained using self-report questionnaires. Future studies should also include information from significant others (i.e. teachers, parents). A multi-informant approach is likely to yield additional insights, as adolescents themselves may not be aware of some risks or tend to minimize specific problems. Fourth, the survey included only information about alcohol use. It is recommended for further studies to also addressing problem drinking/addiction and use of other substances. Fifth, the risk and protective factors included in the current study could only explain a relatively small part of the variance in adolescents' past year alcohol use (pseudo $R^2 = 0.2044$). Various other correlate than the ones included in this study may play an important role in adolescents' alcohol consumption. We suggest future studies to address other plausible risk and protective factors, including adolescents' religiosity (Birhanu and Bisetengn, 2014; Wongtongkam *et al.*, 2014), quality of life (De Maeyer *et al.*, 2011; Colpaert *et al.*, 2013), school-related variables and variables related to one's cultural, social and environmental context (The WHOQOL Group, 1998).

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