

Association between bullying victimization and substance use among college students in Spain

Asociación entre victimización por bullying y consumo de sustancias entre la población universitaria de España

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Abstract

The purpose of this study is to analyze the prevalence and association between victimization and substance use among the university population in the southeast of Spain in a sample of 543 randomly selected college students (405 females and 138 males with an average age of 22.6 years). As a cross-sectional study, data was collected through an anonymous survey to assess victimization and drug use over the last 12 months. Results indicated that 62.2% of college students reported bullying victimization and 82.9% consumed some type of psychoactive substance, and found a statistically significant association between both variables measured. Additionally, logistic regression analysis confirmed the association between psychoactive substance use and different types of victimization. Our findings confirm the need for prevention to prevent this relation between victimization and substance use.

Keywords: bullying, cyberbullying, substance use, cross-sectional study, college students.

Resumen

Este estudio tiene como objetivo analizar la prevalencia y la asociación entre victimización y consumo de sustancias psicoactivas entre la población universitaria en el sureste de España en una muestra de 543 estudiantes universitarios seleccionados aleatoriamente (405 mujeres y 138 hombres con una media de edad de 22,6 años). Estudio transversal analítico, la recogida de los datos se llevó a cabo por medio de una encuesta anónima que recogía información acerca de victimización y consumo de drogas durante los últimos 12 meses. Los resultados muestran que un 62,2% de los estudiantes había sufrido algún tipo de victimización y un 82,9% había consumido alguna sustancia psicoactiva, con una asociación estadísticamente significativa entre ambas variables analizadas. Además, el análisis de regresión logística mostró que el consumo de sustancias psicoactivas se relacionaba con diferentes tipos de victimización. Nuestros hallazgos confirman la necesidad de implementar programas para prevenir la relación entre victimización y consumo de sustancias.

Palabras clave: bullying, ciberbullying, consumo de sustancias, estudio transversal analítico, estudiantes universitarios.

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In societies where alcohol use and abuse is an integral part of social life and is largely unregulated by law it is especially important to understand the patterns linked of drinking and consumers behaviour (WHO, 2005). According to WHO (2011) 4.5% worldwide of the global burden of disease and injury can be attributable to alcohol and drug use. In the year 2013, approximately a quarter (22.3%) of college students were illicit drug users (Substance Abuse & Mental Health Services Administration, 2013) with higher rates of alcohol and drug use among male college students than among female (26% vs. 19%, respectively). These results are high despite the fact that previous studies have shown the detrimental effects on health among college population of alcohol and drug use and abuse (Hartzler & Fromme, 2003; Knight et al., 2002).

According to the most recent data from *Monitoring the Future*, in 2013 approximately a quarter of (25.1%) college students had used cannabis in the past year (Johnston, O'Malley, Bachman & Schulenberg, 2010). Another representative research conducted by McCabe and colleagues (2007) with a sample of approximately 5.000 college students in the United States found differences in drug use and abuse depending on gender and degree, and showed how male students were generally more likely to report drug use and abuse than female students. Previous investigations have also documented the prevalence of drug use among college students (Mohler-Kuo, Lee & Wechsler, 2003; O'Malley & Johnston, 2002). Indeed, during the last decade the illicit use of prescription drugs has become one of the most common causes of drug use among this collective (Johnston et al., 2010). Regarding this, also associations between illicit drugs were founded (McCabe, Knight, Teter & Wechsler, 2005; Teter, McCabe, Cranford, Boyd & Guthrie, 2005).

Bullying and Cyberbullying among college population

Bullying is defined as a form of aggressive behavior experienced in schools or colleges that is defined as repeated exposure to negative actions carried by one or more students (Olweus & Limber, 2010). Bullying can be produced through the following forms: physical (punching or kicking, seizing or damaging other people's belongings); verbal (ridiculing, insulting, repeatedly mocking at someone, saying racist remarks); relational (leaving people out of groups) and indirect (spreading rumours or gossip about a student). Bullying is one of the most significant health problems among adolescents, with the international prevalence ranging from 9% to 54% (Nansel, Overpech, Pilla, Ruan & Simons-Morton, 2001; Kim, Koh & Leventhal, 2004). In a representative study (Wang, Iannotti & Luk, 2012) conducted among approximately 7.500 U.S. adolescents students approximately 29% reported suffering verbal and/or social bullying. Moreover, a cross-national study conducted

in 40 countries estimated frequencies of bullying ranging from 8.6 % to 45.2 % among boys, and from 4.8 % to 35.8 % among girls (Craig et al., 2009). A victimization survey developed in two universities in the East Midlands (United Kingdom) conducted by Barberet and colleagues (2004) examined the incidence of student victimization during the previous twelve months, finding that 31% of them had been the victim of a crime, stolen some personal property (27%). A recent research (Zhou et al., 2015) has shown that approximately 5.9% of college students in China have been victims of bullying.

Similar to the definitions of traditional bullying, cyberbullying is defined as the behavior followed by an offender in an aggressive way with the intention of causing harm to the victims (Kiriakidis & Kavoura, 2010). According to Tokunaga (2010), cyberbullying should be defined as a clearly intentional aggression or maybe as a hostile or harmful act carried out through an electronic device repeatedly over time. This behaviour establishes an imbalance of powers between the aggressor and the victim. Furthermore, recently several authors identify cyberbullying exclusively with cyber-aggression (Calvete, Orue, Estévez, Villardón & Padilla, 2010) or with cyber victimization (Müller, Pfetsch & Ittel, 2014), without giving attention to the dynamic existing between these roles. Also, criteria of intentionality, repetition and imbalance of powers takes place between victim and aggressor and sometimes are forgotten (Olweus, 2013). Cyberbullying might occur in several ways (Tokunaga, 2010), and specific features that may intensify its effects are the potential audience or the ability to attack at any time and place that internet has. Previous studies have found rates of cyberbullying victimization, ranging from 4% to 72% among young population (Juvonen & Gross, 2008; Yang & Salmivalli, 2013; Ybarra & Mitchell, 2004). Nevertheless, schools and colleges lack of information about the effects and consequences of these attacks not distinguishing such cases from traditional bullying cases.

Association between substance use and bullying victimization

Previous research have shown that bullying victims are more likely to have externalizing behaviours, such as substance use and violent behaviours (Niemelä et al., 2011; Stein, Dukes & Warren, 2007), however few studies have already distinguished between different subtypes of bullying behaviors. On one hand, research demonstrates that bullying victimization at school is a significant predictor of alcohol and other substances use among adolescents (Radliff, Wheaton, Robinson & Morris, 2012). In a study conducted by Mustaine and Tewksbury (1998) in 1500 students, using a survey as the main research instrument, found that alcohol use is a risk factor to become a victim of verbal and physical aggression. In fact, alcohol use and abuse has been associ-

ated with sexual victimization in previous studies in the college population (Testa, Vanzile-Tamsen & Livingston, 2007).

The European Monitoring Centre for Drugs and Drug addiction in a research about sexual assaults facilitated by drugs or alcohol (Olszewski, 2009) argued that most of the drugs implicated in cases of sexual victimization were central nervous system depressants, alcohol and benzodiazepines. This result has also been defended by other authors (Resnick et al., 2012; Resnick, Walsh, Schumacher, Kilpatrick & Acierno, 2013), adding marijuana use as another risk factor (Gilreath, Astor, Estrada, Benbenishty & Unger, 2014; Golder & Logan, 2014; Nowotny & Graves, 2013; Resnick, Acierno, Amstadter, Self-Brown & Kilpatrick, 2007). On the other hand, previous studies conducted among young, adolescents (Begle et al., 2011; McCart., 2011) and general population (Vaughn et al., 2010) suggested that individuals with history of victimization are at heightened risk for falling in substance use and abuse as a consequence of victimization.

Therefore, further investigation of the association between bullying victimization and substance use and abuse should be developed.

Gaps in the Literature and purpose of the Current Study

This study is designed to address several limitations of previous research. Firstly, most of the research on substance use and college population victimization has been conducted in the United States. So that, there is very short information in other western countries, and especially in Spain. Thus, it is interesting to test whether co-occurrence of different subtypes of bullying is related to substance use. Secondly, although a positive association between substance use and victimization has been documented in recent researches (Dehart & Moran, 2015; Huebner, Thoma & Neilands, 2014; Redondo Rodriguez & Graña Gómez, 2015; Zinzow & Thompson, 2015) they are not usually focused on college population. College student substance use and victimization are two relevant problems that might further interfere with the learning environment in the campus, and for this reason were included in the present research.

The present study attempts to solve the gap in the literature about substance use and victimization problems among college students in Spain. Using data from a questionnaire survey, the present study aims to: 1) estimate the prevalence of substance use during the previous twelve months to the study; 2) estimate the prevalence of some types of victimization during the previous twelve months; 3) analyse the association between substance use a victimization (and *viceversa*) among college population in Spain. Based on the previous literature, it is expected that substance use participants show higher levels of victimization, compared to non-users.

Method

Participants

College students from the University of Murcia (Spain) studying Grades 2 to 6 were the target population of the survey. It contained questions about substance use and victimization referred to the previous twelve months. Thus, the students who were at first year of college were excluded from the research. The University of Murcia had approximately 25.000 full-time (65% women and 35% men) students and 5.000 part-time students (68% women and 32% men) during the 2013-2014 course. We performed a cross sectional study for the students by means of simple random sampling with a margin of error of $\pm 5\%$ and 95% confidence level. The student response rate was 88.7%, for a total of 617 college students. 70 selected students refused to participate in the research for the following reasons: "there is nothing to be gained from the survey" (8.3%) and "I am leaving the University soon" (3%). Finally, 547 students aged 18 to 45 years, being 74.2% female students (with a mean age of 22.1) and 25.8% male students (with a mean age of 22.7) agreed to participate in the current study. Complete demographic descriptive data and college related characteristics of participants for the whole sample and separated by consumers and non-consumers are presented in Table 1.

Procedure

Data were collected through anonymous self-report questionnaires distributed in the classroom. The study protocol was reviewed and approved by the University of Murcia's Research Ethics Board. Information was collected throughout the university year 2013-2014, except during July and August (Spanish summer holidays). College students and teachers were notified in advance via email and given the opportunity to view the survey. Students were advised by the teachers about the day to be surveyed and those who did not want to participate were excused from going to the lesson. Research staff (3 interviewers), were trained at a central location and sent to the different faculties, to supervise the filling of the anonymous self-report questionnaire by the participants. An interviewer (from the Research staff of University of Murcia) remained in the classroom while college students responded to the survey to address questionnaire-related issues. If participants did not understand a specific question, the interviewer would re-read the question in order to make it more clear without leading them in any particular direction. An informed consent to the procedure according to the laws in force at the time was attached. Only anonymous data were used and the questionnaires were completed on a voluntary basis. No compensation was paid to participants for their participation in current research.

Measures

Demographic measures. Including age, gender, nationality, dating status, work situation and membership to a sports

club. At the end of demographics characteristics, and after adapting questions from previous research (Glaser, Van Horn, Arthur, Hawkins & Catalano, 2005) family economic situations were measured, specifically through the question: "Currently, does have your family economic difficulties?". Responses included "Yes" or "No".

Substance Use. Substance use in the previous 12 months was measured using four yes/ no questions adapted from the European School Survey Project on Alcohol and Other Drugs 1995, 1999, and 2003 (Hibell et al., 2004) and were also used another surveys such as Monitoring the Future Study (Johnston et al., 2010) showing a high degree of reliability a necessary condition for validity (O'Malley, Bachman & Johnston, 1983). Substance use was indicated with an affirmative answer to the following questions: "Have you consumed alcohol during the previous 12 months?", "Have you consumed tobacco during the previous 12 months?", "Have you consumed cannabis during the previous twelve months?" and "Have you consumed cocaine during the previous 12 months?". If a participant answered "Yes", information on frequency of use was obtained. The frequency choices for these items were (1) less than once a month, (2) 1 to 3 days a month, (3) 1 to 2 days a week, (4) 3 to 5 days a week, and (5) 6 to 7 days a week. However, in the current study, respondents who answered affirmatively were considered as consumers in the past twelve months, without differences according to the frequency of consumption. In the current study, the Cronbach's alpha estimate of internal consistency was 0.84 for the scores in the five items about substance use during the previous twelve months.

Bullying victimization items. Involvement in traditional bullying behaviors was measured using the Revised Olweus Bully/Victim Questionnaire (OBVQ) (Olweus, 1996). Prior studies showed that the OBVQ had satisfactory construct validity and reliability (Kyriakides, Kaloyirou & Lindsay, 2006) as well as its adapted version in Spanish (Ruiz, 1992) used among young Spanish population with adequate psychometric properties (Cronbach's alpha = 0.87) (Ruiz, López, Pérez & Ochoa, 2009). Students were asked about bullying and cyberbullying victimization in the previous twelve months. A definition of both ways of victimization was first provided. Thefts, verbal bullying, physical bullying, sexually bullying and cyber were included in the current study as different variables. Thefts were measured by the next item: "Have you been stolen any personal belongings?". Verbal bullying was measured by the next two items: "Have you been verbally abused?" and "Have you been threatened?". Physical bullying was measured by the next three items: "Have you been beaten kicked, or pushed?". Students who responded affirmatively to any one of the 3 questions were considered victims of physical victimization. The questions regarding sexual bullying victimization were adapted from the National Violence Against Women and Men Survey (Tjaden & Thoennes, 2000). Sexually bullying was measured by the next three items: "Have you ever been touched, felt, or grabbed in a way that you felt

sexually threatened?". For the previous victimization questions if a participant answered positively, information on frequency of use was obtained: (1) less than once a month, (2) 1 to 3 days a month, (3) 1 to 2 days a week, (4) 3 to 5 days a week, and (5) 6 to 7 days a week. No frequency information was used in the present study, thus all the positive data was recoded in the same variable "yes". In the current study, the Cronbach's alpha estimate of internal consistency was 0.85 for scores of the items measuring bullying prevalence in the previous twelve months.

Cyber bullying. Finally, with the same response options and time frame, two items measuring cyber bullying were included: "How many times has someone used the Internet, a phone, or other electronic communications to bully, tease, or threaten you in the past twelve months?". Data treatment was similar to that previously used in the item for substance use and bullying victimization. Cronbach's alpha in this study was 0.83 for the question referring to cyber bullying in the previous twelve months.

Data analysis

Statistical analyses were conducted on college students with no missing values for any of the variables studied. From a sample of 547 students, 543 (99.2% of the sample) were included in the analyses. With-and-without analyses showed that excluded missing data from the analyses did not have significant impact on the results. All the data analyses were conducted using the Statistical Package for the Social Sciences v.20 (SPSS, 2011).

The study was conducted in four steps. Firstly, descriptive statistics on socio-demographic characteristics were calculated and stratified by consumers and non-consumers in the previous twelve months. Chi-square tests of significance were used to identify bivariate relationships between these characteristics and reports of consumers. Secondly, univariate and bivariate analyses (whole sample and by gender) were conducted to know substance use characteristics in the previous twelve months, 95% confidence interval (CI) are presented. Thirdly, univariate and bivariate analyses (whole sample, consumers and no consumers and by gender) were conducted on every type of victimization in the previous twelve months, 95% confidence interval (CI) and are presented in table 3. Chi-square tests of significance were used to identify bivariate relationships between consumers and every type of victimization. Finally, we explored whether there were statistically significant associations between substance use and victimization. Thus, sequential logistic regression analysis was completed with every substance analyzed (alcohol, tobacco, cannabis and cocaine) and each of the five specific types of victimization (theft, verbal, physical victimization, sexual victimization and cyber) for the whole sample and by gender in the previous twelve months using Odds ratios (OR). Non-consumers in the previous twelve months were the reference group.

Results

Demographic characteristics by consumers

As shown in Table 1, the socio-demographic characteristics of the sample were examined to define the differences between consumers and non-consumers. Mean age of participants in the current sample was 22.6 years (SD = 6.12); consisting 25.4% of the sample of men. Regarding to nationality, 8.1% was foreigners, and finally over half of participants were currently in a relationship (53%). The associations between socio-demographic characteristics and substance use during the previous 12 months were examined using a chi-square test. The results identified a statistically significant association between nationality and substance use ($p < 0.001$) and between being a member of a sports club and substance use ($p = 0.032$).

Prevalence of substance use by gender

The prevalence of substance use among participants in the overlapping twelve months is shown in Table 2 by gender for the whole sample. During the twelve months reflection period, 82.9% (IC95%: 79.2-86.0) of participants indicated to use some type of substance use. Alcohol was the most common substance for both genders. No statistically significant association was found between gender and any substance use in the past twelve months ($p = 0.669$). There was a statistically significant association between cannabis use and gender ($p = 0.002$) with twice more men using cannabis than women (24.6%; CI 95%: 17.2-32.6 vs. 13.3%; CI 95%: 10.2-17.0, respectively).

Table 1. Demographic characteristics of college students (whole sample and consumers and non-consumers).

	Consumers (N = 450)	Non-Consumers (N = 93)	Whole sample (N = 543)	Consumers vs. non-consumers
	Mean (SD)	Mean (SD)	Mean (SD)	
Age	22.2 (5.54)	24.5 (8.14)	22.6 (6.12)	p-value 0.325
	n (%)	n (%)	n (%)	
Gender				0.669
Male	116 (25.8)	22 (23.7)	138 (25.4)	
Female	334 (74.2)	71 (76.3)	405 (74.6)	
Nationality				0.001
Spanish	424 (94.2)	75 (80.6)	499 (91.9)	
Non-Spanish	26 (5.8)	18 (19.4)	44 (8.1)	
With partner				0.543
Yes	247 (54.9)	41 (44.1)	288 (53.0)	
No	203 (45.1)	52 (55.9)	255 (47.0)	
Work situation				0.346
Working	43 (9.6)	6 (6.5)	49 (9.0)	
Notworking	407 (90.4)	87 (93.5)	494 (91.0)	
Member of sports club				0.002
Yes	100 (22.2)	15 (16.1)	115 (21.2)	
No	350 (77.8)	77 (83.9)	428 (78.8)	
Economic problems				0.126
Yes	158 (35.1)	25 (26.9)	183 (33.7)	
No	292 (64.9)	68 (73.1)	360 (66.3)	

Note. CI = Confidence interval

Table 2. Prevalence of drug use in the past 12 months (whole sample and by gender)

Substances used	Boys (N = 138)	Girls (N = 405)	Whole sample (N = 543)	p-value
	% (95% CI)	% (95% CI)	% (95% CI)	
None used	15.9 (9.7-22.6)	17.5 (14.1-21.5)	17.1 (14.0-20.8)	0.669
Any substance use	84.1 (77.4-90.3)	82.5 (78.5-85.9)	82.9 (79.2-86.0)	
Alcohol	80.4 (72.9-86.9)	80.7 (76.8-84.3)	80.7 (77.0-84.0)	0.937
Tobacco	23.9 (16.8-30.9)	26.9 (22.5-31.6)	26.2 (22.5-30.2)	0.488
Cannabis	24.6 (17.2-32.6)	13.3 (10.2-17.0)	16.2 (13.3-19.3)	0.002
Cocaine	5.1 (1.6-9.19)	3.7 (2.0-5.6)	4.1 (2.4-5.7)	0.481

Note. CI = Confidence interval

Prevalence of victimization by gender

The percentages of each type of victimization in the previous year for the whole sample and for consumers and non-consumers are presented in Table 3. For all participants, cyber bullying victimization was the more common type of victimization (52.7%; CI 95%: 48.4-56.9) in contrast sexual victimization was the less common (3.9%; CI 95%: 2.2-5.5). No statistically significant associations were found between consumers and non-consumers participants in terms of victimization in the last twelve months. Among boys, during the twelve-month reflection period, 47.1% (CI 95%: 39.0-55.8) indicated to have suffered cyber bullying victimization with a larger proportion of men consumers compared to non-consumers (72.7% vs. 42.2%, respectively). There were no victims of sexual victimization among boys participants. Among girls, compared to their non-consumers counterparts, consumers participants were twice more likely to report sexual victimization (5.6%; CI 95%: 1.3-11.1 vs. 12.9%; CI 95%: 5.9-16.5, respectively).

Association between substance use and victimization by gender

No statistically significant association was found between consumers of any substance and the types of victimization analyzed in the previous year (Table 4). Alcohol consumers were more likely to be physically victimized (for all: OR 2.52;

95%: CI 1.12–5.68; and for girls only; OR 2.80; CI 95%: 1.07–8.05) and to suffer verbal aggressions for boys only (OR 2.39; CI 95% 1.11–5.63). Tobacco consumers were more likely to be stolen (for all: OR 2.47; CI 95: 1.65–3.68; for boys only; OR 3.55; CI 95: 1.55–8.13; and for girls only; OR 2.19; CI 95: 1.39–3.47) and to suffer cyber bullying victimization (for all: OR 2.22; CI 95: 1.49–3.31; and for girls only; OR 2.69; CI 95%: 1.67–4.32). For the whole sample, cannabis consumers were more likely to be physically (OR 2.00; CI 95%: 1.12–3.58) and sexually (OR 2.72; CI 95%: 1.06–6.95) victimized compared to non-consumers of cannabis. Finally, cocaine consumers were more likely to suffer oral aggressions (for boys only: OR 2.57; CI 95% 1.37–3.83), to be physically victimized (for boys only: OR 6.26; CI 95% 1.31–29.88) and to suffer cyber bullying victimization (for all: OR 1.15; CI 95%: 1.21–2.83; and for girls only; OR 1.89; CI 95% 1.72–2.07).

Discussion

In the current study, we found high rates of substance use (legal and illegal) and bullying victimization (and cyber bullying) among University students of Spain. Our results are in agreement with the results of previous studies that show how substance use among college population is a widespread phenomenon (Caldeira et al., 2009; Mohler-Kuo et al., 2003; McCabe et al., 2007) but also it is traditional bul-

Table 3. Prevalence of every type of victimization among sample during the past 12 months (whole sample and consumers and by consumers)

Variables	Consumers (N = 450) % (95% CI)	Non-Consumers (N = 93) % (95% CI)	Whole sample (N = 543) % (95% CI)	Consumers vs. non-consumers p-value
All (N = 543)				
Theft	30.4 (26.1-34.6)	29.0 (19.5-38.6)	30.2 (26.2-34.4)	0.787
Verbal	53.1 (48.3-57.4)	44.1 (34.7-54.0)	51.6 (47.5-55.6)	0.223
Physical	14.4 (11.4-17.7)	9.7 (4.2-16.8)	13.6 (10.9-16.8)	0.113
Sexual	4.0 (2.2-5.9)	3.2 (0.3-7.0)	3.9 (2.2-5.5)	0.724
Cyber	52.2 (48.4-56.9)	54.8 (44.0-65.5)	52.7 (48.4-56.9)	0.645
Boys (N = 138)				
Theft	31.8 (11.8-52.6)	26.7 (18.8-35.1)	27.5 (20.0-35.3)	0.624
Verbal	54.5 (33.3-75.0)	58.6 (49.6-67.0)	58.0 (49.4-66.0)	0.683
Physical	22.7 (5.9-42.9)	19.0 (12.1-26.9)	19.6 (13.4-27.0)	0.723
Sexual	-	-	-	-
Cyber	72.7 (54.2-91.3)	42.2 (33.3-51.3)	47.1 (39.0-55.8)	0.009
Girls (N = 405)				
Theft	31.7 (26.9-37.0)	28.2 (18.2-39.8)	31.1 (26.7-35.7)	0.555
Verbal	51.2 (46.0-56.4)	40.8 (29.2-52.0)	49.4 (44.5-54.2)	0.084
Physical	12.9 (9.5-16.5)	5.6 (1.3-11.1)	11.6 (8.6-15.1)	0.113
Sexual	5.4 (3.2-8.0)	4.2 (0.7-9.2)	5.2 (3.1-7.5)	0.688
Cyber	55.7 (50.6-61.2)	49.3(37.0-61.0)	54.6 (49.8-59.4)	0.326

Note. CI = Confidence interval

Table 4. Summary of regression analyses examining substances use and types of victimization during the past 12 months (whole sample and consumers and by gender)

	All (N = 543)		Boys (N = 138)		Girls (N = 405)	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Consumers vs. non-consumers						
Theft	1.07 (0.65-1.74)	0.787	0.78 (0.29-2.09)	0.624	1.18 (0.65-2.08)	0.555
Verbal	1.43 (0.91-2.25)	0.113	1.18 (0.47-2.95)	0.723	1.51 (0.90-2.55)	0.113
Physical	1.57 (0.75-3.28)	0.223	0.79 (0.26-2.39)	0.683	1.43 (0.91-2.25)	0.084
Sexual	1.25 (0.36-4.33)	0.723	-	-	1.29 (0.37-4.50)	0.688
Cyber	0.90 (0.57-1.40)	0.645	0.27 (0.10-0.75)	0.009	1.29 (0.77-2.15)	0.326
Alcohol consumer vs. non-consumer						
Theft	1.23 (0.76-1.99)	0.380	1.86 (0.65-5.33)	0.242	1.10 (0.64-1.88)	0.073
Verbal	1.47 (0.95-2.25)	0.077	2.39 (1.11-5.63)	0.021	1.25 (0.76-2.05)	0.375
Physical	2.52 (1.12-5.68)	0.021	2.20 (0.61-7.95)	0.217	2.80 (1.07-8.05)	0.047
Sexual	1.45 (0.42-5.04)	0.550	-	-	1.45 (0.41-5.07)	0.553
Cyber	1.01 (0.66-1.55)	0.947	0.65 (0.28-1.52)	0.326	1.17 (0.71-1.93)	0.517
Tobacco consumer vs. non-consumer						
Theft	2.47 (1.65-3.68)	0.001	3.55 (1.55-8.13)	0.002	2.19 (1.39-3.47)	0.001
Verbal	1.57 (1.06-2.32)	0.021	0.83 (0.37-1.83)	0.648	1.95 (1.24-3.06)	0.003
Physical	1.64 (0.97-2.77)	0.058	2.25 (0.91-5.56)	0.075	1.47 (0.76-2.81)	0.241
Sexual	0.87 (0.31-2.44)	0.803	-	-	0.84 (0.30-2.35)	0.742
Cyber	2.22 (1.49-3.31)	0.000	1.26 (0.57-2.76)	0.056	2.69 (1.67-4.32)	0.000
Cannabis consumer vs. non-consumer						
Theft	1.31 (0.81-2.13)	0.262	1.95 (0.85-4.46)	0.108	1.12 (0.61-2.06)	0.705
Verbal	0.83 (0.52-1.31)	0.431	0.65 (0.29-1.41)	0.278	0.86 (0.48-1.54)	0.262
Physical	2.00 (1.12-3.58)	0.017	1.72 (0.68-4.29)	0.242	1.92 (0.89-4.15)	0.088
Sexual	2.72 (1.06-6.95)	0.030	-	-	3.58 (1.37-9.33)	0.006
Cyber	0.70 (0.44-1.12)	0.139	0.99 (0.45-2.16)	0.995	0.62 (0.35-1.11)	0.109
Cocaine consumer vs. non-consumer						
Theft	1.63 (0.68-3.90)	0.264	2.57 (1.37-3.83)	0.020	0.54 (0.15-1.95)	0.344
Verbal	0.52 (0.21-1.26)	0.145	1.86 (0.34-9.97)	0.459	0.24 (0.06-0.88)	0.020
Physical	1.95 (1.18-3.78)	0.204	6.26 (1.31-29.88)	0.010	0.53 (0.06-4.15)	0.543
Sexual	1.04 (1.02-1.06)	0.337	-	-	1.05 (1.03-1.08)	0.356
Cyber	1.15 (1.21-2.83)	0.001	1.08 (0.15-7.18)	0.936	1.89 (1.72-2.07)	0.000

Note. CI = Confidence interval. OR = odds ratio.

lying (Barberet et al., 2004; Wang et al., 2012;) and cyber bullying (Juvonen et al., 2008; Ybarra et al., 2004).

The results of this study show substance use differences depending on the gender of the student. These results agree with previous research (McCabe et al., 2007), which found higher rates of substance use among boys students. For example, we found a higher rate of cannabis use in male than in female students (24.4% vs. 13.3%) which is supported by previous work (Gledhill-Hoyt, Lee, Strote & Wechsler, 2000; Johnston et al., 2010). In the current research, the more common substance use was alcohol for both genders, finding a high proportion of consumers during the previous 12 months in the college, in consonance with previous studies (Gebreslassie, Feleke & Melese, 2013; Knight et al.,

2002) that also reports the huge prevalence of alcohol use and abuse among college students.

Bullying reported prevalence in the current study was high; almost 62% of participants reported at least some kind of bullying victimization during the previous year. Several individual demographic and background characteristics emerged as significant related to the prevalence of bullying victimization as other authors showed previously. Gender differences in bullying prevalence might be partly explained because of the existence of differences in the types of bullying (e.g. sexual and physical victimization) to which girls and boys are exposed. Compared to boys (0%), a significant proportion of girls (5.4%) had been sexually victimized. However, similar to earlier research (Wang et al., 2012)

physical victimization is almost twice more present among boys than among girls (22.7% vs. 12.9%, respectively).

The current research also shares common findings with past studies, i.e. substance use was consistently associated with higher prevalence of bullying victimization (Gilreath et al., 2014; Resnick et al., 2007; Rospenda et al., 2013), as hypothesized. However, because of the cross-sectional nature of our data, we cannot determine whether substance increases the risk of bullying victimization or bullying victimization increases the use of substance as a form of self-medication. To determine causality, a longitudinal study design with qualitative interviews would be required.

In this sense, analyzing the relationship between substance use and bullying victimization, we found support for our initial hypothesis that consumers-students would have a higher risk of becoming a victim than non-consumers. In addition, we found differences in this relationship according to the type of substance and victimization: sexual victimization is more common among consumers than among non-consumers (4% vs. 3.2%) which agrees with previous studies (Golder et al., 2014; Hughes, McCabe, Wilsnack, West & Boyd 2010; Reisner, Greytak, Parsons & Ybarra, 2014). According to Olszewski (2009) substance of abuse as alcohol might cause a reduction in physical and cognitive functions making them more vulnerable to sexual victimization, especially regarding to female young population.

Implications of findings for practice and policy

Several potential implications for the prevention of different types of bullying victimization could be extracted about student experiences of bullying victimization. There are established a few bullying prevention programs such as the Olweus Bullying Prevention program (see http://www.olweus.org/public/bullying_prevention_program.page) for use in adolescent context. However, in what refers to Spain, researchers need to be better communicated with educational institutions to reduce bullying victimization and consequence substance use (and *vice versa*). Universities could play an important role in identifying young people with substance use or victimization problems and should be an excellent manner to help them to find appropriate assistance. Like this, they would remain in contact with the University being exposed to the protective factors that schools can provide to the students, in order to reduce violence and consequencely to improve the health of its population.

Strengths and limitations

This study has a certain number of strengths. It contains for the first time data collected as part of an on-going study in adolescents in Spain, with rich data about the prevalence and risk factors of suffering victimization and substance use (and *vice versa*). Therefore it provides an opportunity to examine in the future the longitudinal predictors of victimization and substance use across different adolescent contexts,

and especially among college students using a state-representative sample from Spain for substance use and bullying victimization prevalence differencing them by region of the country, type of college (e.g., public versus private), and living arrangements of students (e.g., off-campus versus on-campus).

On the other hand, interpretations of our findings should be constrained by several limitations. Firstly, it should be noted that this study only took place in a single city in Spain. If the findings could be generalized to other cities of Spain is still unknown. A second limitation is related to the type of study (cross-sectional), data on substance use patterns and victimization changes over time may provide new insights into their relationship. Thirdly, the present study was cross-sectional. Hence, the association between substance use and bullying and cyber bullying victimization could not be properly tested. For these reasons, future studies should use longitudinal designs in order to identify the time pattern, hence causality, between substance use and victimization. Given these limitations, our findings need to be replicated and refined in future studies. More longitudinal and qualitative research is necessary to examine further the direction of the link between substance use and victimization as well as to determine what protective and risk factors are provided in order to reduce drug use and violence among college population in Spain. Fourthly, the college bullying and substance use were self-reported, which may be subjectively biased or underestimate the associations between college bullying and substance use. Future studies should assess bullying behaviors using more objective measures. Finally, cyber bullying can occur at anytime and anywhere. However, in the current study we did not measure access factors that are likely to be particularly relevant to the longitudinal prediction of cyber bullying. Thus, future research should explore cyber bullying among college population in more robust ways.

Conclusions

This study is unique in Spain in examining the association between substance use and victimization among college population. Bullying among college students is a neglected public health issue. The current results underline the importance of further theoretical and conceptual development of victimization and the subtypes of victimization, and their relationship with legal and illegal substances as a complex. Demographic differences were found regarding to victimization, which may provide useful information to identify college students at risk of suffering victimization, especially among consumers. Then, this information can influence the development of prevention programs and strategies which aim to reduce victimization in Spain. These programs should have a special focus on at-risk students with substance use and abuse problems.

Conflicts of interest

The authors declare no conflict of interest concerning this article.

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