Correlation between anxiety and alcohol consumption among college students

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Abstract: Anxiety is a disorder that affects a lot college students and it is often associated with alcohol abuse. The aim of the study was to evaluate the correlation between anxiety, alcohol consumption pattern and its consequences among college students, before and after a brief intervention. Students changed to a low-risk alcohol pattern and decreased the consequences associated with alcohol consumption after the intervention, but anxiety levels remained similar. The results suggest that alcohol consumption and its consequences are correlated with anxiety. However, the intervention did not promote changes in anxiety levels, as the correlation was not maintained after the intervention. Thus, it is also important to develop specific preventive interventions for anxiety in university services to support college students.

Keywords: Students; anxiety; alcohol consumption; prevention; university.

CORRELAÇÃO ENTRE ANSIEDADE E CONSUMO DE ÁLCOOL EM ESTUDANTES UNIVERSITÁRIOS

Resumo: A ansiedade é um transtorno que afeta consideravelmente os estudantes universitários e que muitas vezes está associada ao consumo abusivo de álcool. O objetivo do estudo foi avaliar a correlação entre a ansiedade, o padrão de consumo de álcool e suas consequências entre estudantes universitários, antes e após uma intervenção breve. Os estudantes passaram para um padrão de consumo de álcool de baixo risco, e houve uma redução das consequências associadas ao uso após a intervenção, mas os níveis de ansiedade se mantiveram semelhantes. Os resultados sugerem que o consumo de álcool e suas consequências estão correlacionados com a ansiedade. No entanto, a intervenção não promoveu alteração nos níveis de ansiedade, assim como a correlação não foi mantida após a intervenção. Dessa maneira, é também importante o desenvolvimento de intervenções preventivas específicas para a ansiedade nos serviços de apoio aos estudantes universitários.

Palavras-chave: estudantes; ansiedade; consumo de álcool; prevenção; universidade.

CORRELACIÓN ENTRE ANSIEDAD Y ECONSUMO DE ALCOHOL EN ESTUDIANTES UNIVERSITÁRIOS

Resumen: La ansiedad es un trastorno que afecta en gran medida a los estudiantes universitarios y con frecuencia se asocia con el abuso del alcohol. El objetivo del estudio

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fue evaluar la correlación entre ansiedad, el patrón de consumo de alcohol y sus conse-cuencias entre estudiantes universitarios, antes y después de una intervención breve. Los estudiantes pasaron a un patrón de consumo de alcohol de bajo riesgo y disminuye-ron las consecuencias asociadas a ese consumo después de la intervención, pero los niveles de ansiedad se mantuvieron similares. Los resultados sugieren que el consumo de alcohol y sus consecuencias están correlacionados con la ansiedad. Sin embargo, la intervención no promovió cambios en los niveles de ansiedad, así como la correlación no se mantuvo después de la intervención. De esta manera, es también importante el desarrollo de intervenciones preventivas específicas para la ansiedad en los servicios de apoyo a los estudiantes universitarios.

Palabras clave: estudiantes; ansiedad; consumo de alcohol; prevención; universidad.

Introduction

The prevalence of anxiety disorders has increased in recent decades, due to major changes in the economic, social and cultural spheres, which, added to those in modern society, make current life increasingly competitive. Moreover, to get access to the University represents a new phase in students' lives, which implies changes and the need for adaptation and integration in this new context, generating higher levels of anxiety (Pereira & Lourenço, 2012).

Anxiety is a disorder that affects, considerably, the population of college students. During academic qualification, students must deal with various situations that involve greater responsibility, pressure, demands and social interaction, which can contribute significantly to increasing the level of anxiety that often comes associated with feelings of inferiority, inability and impotence. Several studies indicate that chronic and pro-longed stress can be a risk factor for the development of psychopathological disorders, such as anxiety (Morais, Mascarenhas, & Ribeiro, 2010). Schmidt, Dantas, & Marziale (2011) explain that, although stress and anxiety have their own and different con-cepts, there are understandings that claim a complex and close relationship between them, because before a stressful situation, the individual's confrontation response may not be effective to the point of removing the stressor or solving the stressful situa-tion, provoking a frequent and intense physiological activation, which can trigger anxiety or mental disorders.

Anxiety can interfere with the adaptation process of college students, which can make them lose concentration and attention and have difficulty with the acquisition of social skills and assertive behaviors, essential for a better personal and academic development (Brandtner & Bargadi, 2009). To relieve the physical and psychological anxiety symptoms, students can consume alcohol more easily due to the anxiolytic properties of this substance. This way, the literature has shown there is a relation be-tween the presence of anxiety and alcohol consumption, as anxiety is a motivating factor for the abuse of this substance (Keyes, Hatzenbuehler, & Hasin, 2011; Low, Lee, Johnson, Williams, & Harris, 2008). Specifically, regarding alcohol consumption among college students, Kerr-Corrêa, Andrade, Bassit, & Boccuto (1999) identified that 6.5% of students consume alcohol with the purpose of reducing the symptoms of anxiety. In addition, Chiapetti & Serbena (2007) also showed that one of the reasons that maintain the alcohol consumption among this population is the reduction of anxiety.

The use of focused and of short-duration techniques, called brief interventions, has become a form of care and prevention of excessive alcohol consumption and aims at the harm reduction of the use of this substance (Higgins-Biddle & Barbor, 2000). Preventive intervention has been developed among college students with this goal, with one of the best-known interventions being the Brief Alcohol Screening and Intervention for College Students (BASICS).

Dimeff and collaborators of the Addictive Behaviors Research Center at the University of Washington have developed BASICS, a brief specific intervention for college students. This intervention was developed considering the problems associated with alcohol abuse among college students and aims to reduce the alcohol consumption and the problems associated with this consumption among this population (Dimeff, Baer, Kivlahan, & Marlatt, 2002).

BASICS is based on harm reduction strategies and aims, through educational activities, to teach students to consume alcohol moderately. It is characterized as a preventive intervention for college students who exhibit a pattern of risk or harmful alcohol use, that is, students who have or may have negative consequences associated with this consumption, such as truancy, involvement in accidents or acts of violence (Dimeff et al., 2002).

The BASIC intervention was planned to help students make better decisions regarding alcohol consumption. It is not about confrontation or judgment on the consumption behavior, but the opposite, it is about understanding and empathizing through guidelines that promote the reduction of the negative effects of alcohol consumption and encourage reflection on the possibility of more healthy choices (Dimeff et al., 2002; Fachini, Aliane, Martinez, & Furtado, 2012).

Two systematic reviews of the literature that aimed to assess the effectiveness of BASICS have identified significant effectiveness in the change of students' behavior, such as reduction of alcohol consumption and of associated problems (Amaro, Reed, Rowe, Picci, Mantella, & Prado, 2010; Fachini et al., 2012). Murphy et al. (2001) in addition to assessing the effectiveness of BASICS, compared this method with an educational intervention, based on a 30-minute-long educational video with content related to academic and interpersonal consequences resulting from abusive alcohol consumption. In comparison with the educational intervention, BASICS obtained more satisfactory results in reduced consumption and its consequences in this population.

In Brazil, the first preventive work, using BASICS, started in 2000 and showed favorable results. Students who have passed through the intervention reduced both the frequency and the quantity of consumption, which influenced the reduction of negative consequences (Simão et al., 2008). However, the scientific literature still lacks studies that assess the effect of BASICS in the levels of anxiety and its relation to the pattern of alcohol consumption among college students (Lopes & Rezende, 2013). Considering the need for studies that evaluate whether specific interventions for abuse of alcohol may have an effect on the level of anxiety, this study aimed to evaluate the correlation between anxiety level, the pattern of alcohol consumption and its consequences among college students, before and after a brief intervention.

Method

This is a descriptive, quantitative and longitudinal study, with data collection conducted between January 2013 and May 2014.

Participants

Forty-two students of the Federal University of São Paulo – Unifesp participated in this study. The inclusion criteria in the study were: age over 18 years, both sexes and belonging to the following undergraduate courses: Biological Sciences, Environmental Sciences, Pharmacy and Biochemistry, Areas of Chemistry (Chemistry, Chemical Engineering and Industrial Chemistry), and Science Degree, from the first to the fifth year of the course. In addition, to participate in the intervention, the student should have shown a pattern of alcohol consumption characterized by risky, harmful or likely alcohol dependency. Exclusion criteria of the study were: age less than 18 years, undergraduate program other than those mentioned above in the inclusion criteria and characterization of the pattern of alcohol consumption with no risk. The sample was performed for convenience and in accordance with the students' acceptance in participating in the research.

Instruments

We used the following instruments for data collection:

Socio-Demographic Characterization Survey of Students: developed to survey the socio-demographic profile of the sample of students.

The Alcohol Use Disorders Identification Test – AUDIT: developed by the World Health Organization (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) and validated for the Brazilian population by Lima et al. (1999). With 0.81 reliability (Cronbach's alpha), AUDIT has ten questions, with scores ranging from 0 to 4. This instrument was used to identify the pattern of alcohol consumption by students, such as low-risk drinking (0 to 7 points), at-risk (8 to 15 points), harmful (16 to 19 points) or likely alcohol dependence (over 20 points). For this study, we considered low-risk consumption scores from 0 to 7 and at-risk consumption scores between 8 and 20 points (Babor et al., 2001, Lima et al., 1999).

Rutgers Alcohol Problem Index – RAPI: developed by White & Labouvie (1989). It presented 0.92 reliability (Cronbach's alpha) and was used to assess the consequences associated with the use of alcohol, being an instrument consisting of 23 items, with a Likert-type scale ranging from 0 to 4. The responses to this instrument indicate the number of times a given behavior occurred as a result of the consumption of alcoholic beverages, so the higher the score, the higher the number of times that a particular event has occurred (Dimeff et al., 2002; White & Labouvie, 1989).

Beck Anxiety Inventory – BAI: developed by Beck, Epstein, Brown, & Steer (1988) and translated and validated by Cunha (2001) for the Brazilian population. It presents

0.92 Cronbach's alpha, with evidence of content, discriminant, convergent and factorial validity (Cunha, 2001). BAI was used to measure the intensity of the anxiety symptoms. The instrument is composed of 21 statements that describe anxiety symptoms during the last week. The individual must assess, in accordance with the severity and frequency of each item, how he/she felt on a scale ranging from 0 to 3 points, knowing that the higher the total score, the higher the severity and frequency of the symptom assessed (Cunha, 2001).

Procedures

AUDIT was applied to all classrooms after authorization by the board of the university and of the faculty. AUDIT was used to screen the students with low-risk or risk consumption. In total, 1,200 students responded to AUDIT, and of these, 181 (15.1%) students were classified as having at-risk consumption and were invited via e-mail to participate in the study. Of the 181 students initially identified, 51 agreed to participate in the intervention (control group or experimental group). However, there was a withdrawal of nine students until the completion of data collection. Thus, 42 college students concluded all stages of the research. These students were randomly divided into a control or experimental group (brief intervention – BASICS) according to the order of his/her participation in the research. The first student to participate was directed to the control group, the second to the experimental group and so on.

BAI and RAPI were filled by 42 students in three moments (initial assessment, after six months and after one year). These students were also assessed by AUDIT. In addition, all signed an informed consent form authorizing their voluntary participation, free of risks or damage, and authorized an invitation to join a control or experimental group, in case they reached a minimum score that detects a risky alcohol consumption (AUDIT $\geq$ 8).

Table 1. Number of students who participated in each assessment moment of this study (initial assessment, after six months and after one year).

	Initial assessment	After six months	After one year
	N	N	N
Students	51	48	42

Source: The authors.

Table 1 presents the number of students who participated in each assessment moment of this study (initial assessment, after six months and after one year), being possible to identify a loss of three students after six months past the intervention and nine students after a year, totalizing 42 students who were evaluated in the three moments of the study.

Brief intervention

The brief intervention used in this study was the Brief Alcohol Screening and Intervention for College Students – BASICS. This intervention is characterized by two meetings of up to 50 minutes, spaced by an interval of 15 days when specific information about the student's alcohol consumption is collected and feedback is provided with guidelines about how to drink in a moderate and not harmful way.

Brief intervention – BASICS – was applied only to the students of the experimental group, and the intervention was offered to the participants in the control group after the assessment of the participants in the experimental group during the last follow-up (one year after the intervention. During this period, the participants in the control group did not suffer any intervention that could modify their behavior in relation to alcohol consumption and its consequences.

Data analysis

The tabulation of data was performed using the R statistical program, version 3.0.1 (R CORE TEAM, 2013). The descriptive analysis of the socio-demographic characterization variable included absolute frequency (N) and relative frequency (%); and the variables, pattern of alcohol consumption, consequences associated with this consumption and anxiety level, covered mean and standard error. For comparisons between the three assessment moments (initial, after six months and after one year) the model with repeated measures analysis of variance (ANOVA) and, subsequently, Bonferroni's method of multiple comparisons was used. This analysis was performed with the total sample of the participants of this study since no significant differences between the experimental and control groups were detected after the intervention in the variables studied. Thus, the data were analysed together for these variables. To verify the correlation between the pattern of alcohol consumption, consequences of this consumption and the level of anxiety, the Pearson's linear correlation coefficient was used. This correlation analysis was also performed with the total sample of the participants of this study since there were no significant differences between the experimental and control groups after the intervention. Thus, all data were analysed with the total number of students for the variables studied. The significance level adopted was $p < 0.05$.

Ethical considerations

This study followed the Regulatory Guidelines and Norms for Research Involving Human Beings (Resolution, 1996) and was approved by the Research Ethics Committee of the Federal University of São Paulo – Unifesp (CAAE n. 08723112.8.0000.5505).

Results

The analysis of the results did not identify a statistical difference between the profile of students in the experimental and control groups in terms of socio-demographic

variables. Both groups showed similar characteristics and, therefore, were presented in groups. Thus, Table 2 shows the descriptive analysis of socio-demographic characteristics of the sample of college students (42), which was composed mostly of women (52.4%), aged from 18 to 24 years (78.6%), single people (95.2%) and with an average age of 22.69 (SD = 3.72). In addition, 97.6% did not have children, 52.8% declared not having a religious preference, and 58.5% lived with the family, 47.6% was part of the socioeconomic class B (B1 and B2) and 38.1% of the class C (C1 and C2). Regarding the course, 9.5% studied Biological Sciences, 16.7% Environmental Sciences, 14.3% Science Degree, 16.7% studied Pharmacy and Biochemistry, and 42.8% was part of the Areas of Chemistry (Chemical Engineering, Chemistry and Industrial Chemistry), and of these, 57.2% of the students studied full-time, 9.5% in the afternoon, and 33.3% at night. In addition, 45.2% of students did not practice physical activity and most of them, 90.2% of the students, did not have the habit of smoking.

Table 2. Socio-demographic characteristics of the sample of college students.

Socio-demographic variables		N (%)
Sex	Female	22 (52.4%)
	Male	20 (47.6%)
Age group	18-24	33 (78.6%)
	Over 24	9 (21.4%)
Marital status	Single	40 (95.2%)
	With partner	2 (4.8%)
Children	No	41 (97.6%)
	Yes	1 (2.4%)
Live with	Family (parent/partner)	24 (58.5%)
	Alone	1 (2.5%)
	With friends	16 (39%)
Religious preference	No	23 (54.8%)
	Yes	19 (45.2%)
Socioeconomic class	A*	5 (11.9%)
	B**	20 (47.6%)
	C***	16 (38.1%)
	D/E	1 (2.4%)
Work or internship	No	26 (61.9%)
	Work	4 (9.5%)
	Internship	12 (28.6%)

* A = A1 +A2; ** B = B1 + B2; *** C = C1 + C2.

Source: The authors.

Considering that there was no significant difference between the experimental and control groups in relation to the studied variables, namely: alcohol consumption pattern (p = 0.721), consequences associated with alcohol consumption (p = 0.416) and anxiety level (p = 0.325), Table 3 presents these data for the total study sample.

In Table 3, it can be observed that there was a significant reduction in the overall AUDIT score, which characterizes the pattern of alcohol consumption, between the initial evaluation and after six months (p = 0.001) and between the initial evaluation and after one year (p = 0.001). With regard to RAPI, which identifies the negative consequences of alcohol consumption, the data show that there was a significant reduction between the initial time and after six months of evaluation (p = 0.002) and between the initial time and after one year (p = 0.002). On the other hand, although the anxiety level also decreased between the first, the second and third evaluation moments, no significant difference was detected between the different moments of evaluation (p = 0.077).

However, students at-risk alcohol consumption, at the three moments of assessment, were the ones that presented the most moderate and severe levels of anxiety, compared to students with low-risk consumption.

Table 3. Descriptive measures of the variables: AUDIT, RAPI and anxiety level according to the moment of evaluation of the total study sample.

	Initial assessment	After six months	After one year
	Mean (Standard deviation)	Mean (Standard deviation)	Mean (Standard deviation)
AUDIT	11.55 (3.51)	8.67 (4.04)*	8.50 (3.61)*
BAI	9.62 (6.72)	8.62 (7.75)	7.21 (9.06)
RAPI	10.71 (7.32)	5.86 (5.39)**	8.43 (8.98)**

*   Different of initial assessment, p = 0.001.

** Different of initial assessment, p = 0.002.

Source: The authors.

Table 4 shows the Pearson's linear correlation coefficient between variables AUDIT, RAPI and BAI in the three assessment moments. It is possible to observe positive correlation between alcohol consumption (AUDIT) and level of anxiety (BAI) in the first moment (r = 0.63; CI = 0.40-0.78) and, between the consequences of consumption (RAPI) and level of anxiety (BAI) in the first assessment moment (r = 0.58; CI = 0.34-0.75). We also identified positive correlation between the consequences of alcohol consumption and the level of anxiety in the second (r = 0.41; CI = 0.12-0.64) and in the third assessment moment (r = 0.33; CI = 0.03-0.58).

Table 4. Coefficient of correlation (Pearson's r) between the AUDIT, RAPI and the anxiety level of the total study sample, according to each moment of evaluation.

			Coefficient	Confidence interval	
1st moment	AUDIT	Anxiety level	0.63*	0.40	0.78
	RAPI	Anxiety level	0.58*	0.34	0.75
2nd moment	AUDIT	Anxiety level	0.18	-0.13	0.46
	RAPI	Anxiety level	0.41*	0.12	0.64
3rd moment	AUDIT	Anxiety level	0.25	-0.06	0.51
	RAPI	Anxiety level	0.33*	0.03	0.58

* Positive correlation $0.30 < r < 0.70$.

Source: The authors.

Discussion

The present study evaluated a brief intervention developed for college students to favor the reduction of alcohol consumption and its consequences and detected a significant change in the drinking pattern and the consequences manifested by the students after the intervention. However, although the level of anxiety also decreased after the intervention, this change was not significant. For this reason, it is suggested that future studies can evaluate the effects that interventions that aim to reduce anxiety can have on the consumption of alcohol among college students who present a pattern of risk of alcohol consumption to detect possible changes in consumption, its consequences, as well as in the level of anxiety, and may favor a more lasting change in relation to these behaviors and symptoms.

This study identified a positive correlation between the level of anxiety, alcohol consumption and its consequences among college students, suggesting that the level of anxiety is correlated with alcohol consumption and its consequences so that as it increases the level of anxiety, the alcohol consumption and its consequences increase or vice versa. However, the correlation between the pattern of alcohol consumption and the level of anxiety was not maintained after the intervention. Thus, while students moved to a pattern of low-risk alcohol consumption, anxiety levels remained similar to the time before the intervention. This result suggests that specific interventions for students with risky alcohol consumption pattern do not directly affect anxiety levels, and it is necessary to develop specific interventions to deal with anxiety, since it is a risk factor for a more abusive alcohol use (Chiapetti and Serbena, 2007, Kerr-Corrêa et al., 1999, Keyes et al., 2011, Low et al., 2008).

Kerr-Correa et al. (1999) and by Chiapetti and Serbena (2007) also found a relationship between anxiety and alcohol consumption among college students, identifying that alcohol is consumed to minimize the symptoms of anxiety, which reinforces the

correlation found in this study that the greater the anxiety, the greater the alcohol consumption and its consequences in the population studied.

Students with risky alcohol consumption pattern were those who showed levels of moderate and severe anxiety, considered more harmful, corroborating with the findings of other studies (Keyes et al., 2011; Low et al., 2008). The results also show that the consequences of alcohol consumption increased in the third assessment moment, indicating that the behavior of the students changed to more negative consequences associated with alcohol consumption over time. Thus, it is noteworthy that preventive ways to keep a risk-free pattern of alcohol consumption among students in a regular and systematic way are needed, because, often, the brief interventions result in temporary changes, which could result in increased consumption of alcohol over time (Dimeff et al., 2002).

The literature has been pointing out that anxiety can be triggered by stressful events and can become pathological if these events are prolonged or intense. Stress can then be understood as a risk factor for triggering anxiety in college students (Margis, Picon, Cosner & Silveira, 2003; Schmidt et al., 2011). Pereira and Lourenço (2012) claim that the presence of anxiety can hinder the healthy development of the student and compromise his/her health, well-being and quality of life, in addition to bringing damage to personal and social development. However, generally, the focus of preventive interventions on alcohol consumption aims at the consumption itself, not considering the associated factors that can trigger higher consumption of this substance. Thus, we also suggest researchers work on the factors that influence and trigger the excessive consumption of alcohol, which can bring results even more favorable to the population of college students.

It is important to think about support and guidance services for students. We assume that students are able to identify the symptoms of stress and anxiety and get help, but generally, this only occurs when symptoms worsen and personal and social losses occur, that is why support services and student guidance within the university environment are important (Brandtner & Bargadi, 2009). In addition, we reinforce the need for a welcoming reception and greater attention to the student during his/her academic qualification. This reception can assist in the prevention of distress and possible psychological problems that may worsen during the course if they do not go through effective interventions.

Conclusion

The academic environment itself can develop preventive strategies, especially those based on harm-reduction policy aimed at spreading beliefs, attitudes and behaviors that benefit the student's mental health. This study found a positive correlation between the pattern of alcohol consumption, its consequences and the level of anxiety. However, the proposed intervention, which aimed at modifying the pattern of excessive and risky alcohol consumption did not change significantly the anxiety

levels detected before and after the intervention. In addition, the correlation between the pattern of alcohol consumption and anxiety level did not maintain after the intervention. For this reason, approaches aimed at the training of skills and strategies are necessary to deal with stress factors that may trigger symptoms of anxiety during the stages of university life, which can lead to alcohol abuse in this population.

Currently, most federal universities have health professionals who can develop preventive work on these themes and, specifically, on alcohol consumption, considering that the population of college students is at risk for the most abusive consumption of this substance. This study also revealed the need to work with the students' stress and anxiety to prevent this risky alcohol consumption.

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