

Research Article

Addiction and Psychological Distress among University Students in Lebanon: The Moderating Effect of Gender

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Abstract

Introduction: Psychological distress and addictive behaviors are both common in Lebanon. Although girls are more subject to distress, boys are known to be more prone to addictive behaviors. The objective of the article was to assess the relationship between psychological distress and addictive behaviors, looking particularly at differences between boys and girls among university students.

Methods: A cross-sectional study was conducted among university students from all universities in Lebanon. Addiction to alcohol, cigarettes, and tranquilizers were evaluated according to the ASSIST total scale and subscales, while waterpipe dependence, cigarette dependence and psychological distress were measured using the Lebanese Waterpipe Dependence Scale (LWDS11), Young Adult Cigarette Dependence (YACD) scale and the Beirut Distress Scale (BDS22), respectively. The moderating effect of gender was particularly analyzed.

Results: While boys were statistically more likely than girls to present substance addiction and dependence ($p < 0.001$), a higher psychological distress was associated with higher risk to present these disorders ($p < 0.001$), among both boys and girls and in both bivariate and multivariate analyses. Sex was not considered to be a moderator of the association between psychological distress and addiction. One exception was waterpipe dependence that was not associated with psychological distress ($p > 0.05$) in multivariate analysis.

Conclusion: University students of both sexes with psychological distress should be considered a high risk group for addiction and dependence; public health efforts should be particularly directed towards this subgroup to decrease their health risk behaviors and prevent further deleterious consequences.

INTRODUCTION

Psychological distress is highly prevalent among university students in Lebanon [1]; it has also long been known to be associated with physical and mental health problems [2], and even to high mortality rates [3]. According to Massé et al, psychological distress may be manifested by changes from a stable emotional state to anxiety, depression, demotivation,

irritability, aggressiveness and self depreciation [4,5].

Moreover, in other regions of the world, psychological distress was shown to be associated with substance addiction and all its deleterious consequences, including alcohol and other substances [6-9]. Furthermore, stress has been shown to increase craving in substance abusers [10], while co-morbidity and co-treatment of both psychiatric and substance abuse disorders are

well known and recommended, respectively [11,12].

Although the relative morbidity associated with mental, neurological and substance abuse disorders is increasing in low and middle income countries [13], the association between psychological distress and addictive behaviors has not been evaluated in Lebanon. Furthermore, although girls in Lebanon generally declare high psychological distress than boys [1], they often demonstrate lower addiction behaviors and dependence towards smoking and alcohol [14]. The objective of this analysis was to evaluate the relationship between declared psychological distress and addictive behaviors, focusing on differences between boys and girls.

METHODS

Population and sampling

A cross-sectional study was carried out; using a proportionate cluster sample of Lebanese students in public and private universities. A list of universities in Lebanon, provided by the Center for Pedagogic Researches, was used to adjust the sample size [15]. A sample size of at least 3000 individuals was targeted to allow for adequate power for bivariate and multivariate analysis to be carried out.

Although ethical approval was granted by all Internal Review Boards of respective institutions where the study was conducted, most universities' administrative offices in Lebanon that we approached did not allow drawing a random sample of their enrolled students to participate in the study: they did not provide us with the lists of students and permission was not granted to enter classrooms and search for students nominatively. Thus our research group had to work with a nonrandom sample of students outside their classes. Students were approached on campus during break times between courses by a field worker.

The latter explained the study objectives to the student; and after obtaining oral consent, the student was handed the anonymous and self-administered questionnaire. On average, the questionnaire was completed by participants within approximately 20 minutes. At the end of the process, the completed questionnaires were placed in closed boxes and sent for data entry. During the data collection process, the anonymity of the students was guaranteed. Out of 4900 distributed questionnaires, 3384 (69.1%) were returned to the field worker. Further methodological details are presented in more details elsewhere [16].

Questionnaires

The questionnaire used in this study was composed of several parts, including the socio-demographic part, a detailed active and passive smoking and substance use history, and sports frequency. Socioeconomic status was evaluated using the ratio of mean income per household over the number of persons in the family. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) scale, initially developed by the World Health Organization, was used to evaluate addiction to substances [17].

Current cigarette and waterpipe consumption were evaluated. For cigarette dependence, we assessed the Young Adults Cigarette Dependence (YACD) scale: [18], and for

waterpipe dependence, the LWDS-11 [19], both of which were developed by our team for the Lebanese population. The YACD was developed for university students; it is composed of sixteen items, loading over six factors: nicotine dependence, craving intensity; positive reinforcement and negative reinforcement [20]. Moreover, psychological distress was measured using the Beirut Distress Scale-22 (BDS22) [1].

Statistical analysis

Data was entered and analyzed using SPSS, version 18.0. Means and standard deviations were used for continuous variables, while percentages were used for qualitative variables. The Student T-test was used to compare means between two groups, while the Chi square test was used to compare percentages. Subgroup analysis was performed for girls and for boys, separately, allowing for evaluation of the moderating effect of gender on the relationship between psychological distress and different types of addiction. Missing values were not replaced due to their low percentage (<10%) for all variables.

Afterwards, multivariate analyses were performed using stepwise descendent multiple regressions for continuous dependent variables (scales of substance addiction and dependence). The psychological distress was considered as the major independent variable, while socio-demographic and other baseline characteristics (such as private university, sex, marital status, living in Beirut, socioeconomic status, health studies, age, declared good health, frequency of sports per week, having at least one smoker at work, and having at least one smoker at work) were used as potential confounders. Adequacy conditions were confirmed before retaining the respective final models (non collinearity; linearity of the relationship; sample adequacy to the model; residuals normality).

RESULTS

Sample description

Among 3384 university students, there were significantly more bachelor boys (98.1%) than girls (95.1%). Girls were more likely to pursue health studies, humanities and laws, while boys were more likely to study in the fields of business, sciences and computer ($p<0.001$). There were more boys in private universities (63%) than girls (43.9%); boys were also more likely to come from higher socioeconomic levels ($p<0.001$). There was no significant difference in their region of living, whilst there was a statistically significant difference with respect to age, boys being slightly older than girls (20.83 versus 20.53; $p<0.001$) (Table 1).

Psychological distress, substance addiction and dependence among ever users

There were significant differences between boys and girls for all type of addiction and dependence ($p<0.001$), except for waterpipe dependence ($p=0.11$): boys were more likely to demonstrate all types of substance addiction and dependence, except for waterpipe that was equally found among boys and girls (Table 2).

Association between psychological distress and addiction types

Among total users, there was a consistent relationship

Table 1: Socio-demographic characteristics of the study sample.

Characteristic	Boys n=1399(41.3%)	Girls n=1980(58.5%)	p-value	Total n=3384(100%)
Marital status				
Married/widow/divorced	27(2.0%)	96(4.9%)	<0.001	123
Bachelor	1368(98.1%)	1874(95.1%)		3242
Field of studies				
Sciences & computer	257(18.6%)	253(12.8%)	<0.001	510
Health sciences	169(12.2%)	583(29.5%)		752
Humanities & Laws	173(12.5%)	552(28.0%)		725
Business & Economy	475(34.3%)	403(20.4%)		878
Engineering	218(15.8%)	56(2.8%)		274
Arts	92(6.6%)	126(6.4%)		218
Public University	518(37.0%)	1111(56.1%)	<0.001	1629
Private Universities	881(63.0%)	869(43.9%)		1750
Lives outside Beirut	1164(83.2%)	1691(85.4%)	0.082	2855
Lives in Beirut	235(16.8%)	289(14.6%)		524
Socioeconomic status quartile				
Quartile one	272(21.1%)	646(35.6%)	<0.001	918
Quartile two	255(19.8%)	383(21.1%)		638
Quartile three	392(30.5%)	461(25.4%)		853
Quartile four	368(28.6%)	323(17.8%)		691
Age in years M(SD)	20.83(2.01)	20.53(1.85)	<0.001	3384

Table 2: Psychological distress, substance addiction and dependence among ever users.

Characteristic N; Mean (SD)	Boys n=1399(41.3%)	Girls n=1980(58.5%)	p-value	Total n=3384
Psychological Distress (BDS22)	1141; 16.34(12.97)	1694; 19.48(14.27)	<0.001	2837; 18.21(13.84)
Waterpipe dependence (LWDS11)	394; 10.42(6.24)	397; 9.73(5.83)	0.110	791; 10.07(6.04)
Cigarette dependence (YACD)	443; 14.22(5.95)	162; 12.72(5.98)	0.006	605; 13.82(5.99)
Total ASSIST score	484; 3.75(9.29)	674; 1.14(2.87)	<0.001	1159; 2.23(6.52)
Tranquilizers ASSIST	866; 1.04(4.80)	1305; 0.58(3.09)	0.007	2173; 0.77(3.87)
Smoking ASSIST	1202; 12.57(11.56)	1560; 5.77(8.95)	<0.001	2766; 8.72(10.71)
Alcohol ASSIST	1241; 8.67(8.61)	1731; 3.75(5.80)	<0.001	2975; 5.80(7.51)

between psychological distress and addiction types; individuals with psychological distress were significantly more likely to show all kinds of substance addiction and dependence ($p < 0.001$). The same applies to boys, while among girls, this relationship was not found concerning smoking addiction measured via ASSIST smoking subscale ($p = 0.20$). An interaction of psychological with sex was thus suspected for association with smoking addiction (Table 3).

Multivariate analyses of addiction and dependence types

Higher psychological distress positively increased all types of substances addiction and dependence, except for waterpipe dependence that was not shown to be associated with psychological distress in multivariate analysis (Table 4). Moreover, performing separate multivariate analyses for boys and girls regarding smoking addiction using the ASSIST smoking subscale showed similar results: psychological distress increased the risk of smoking addiction for both boys and girls, with similar

effect of confounding variables. Thus, psychological distress is considered a consistent associate of all types of substances addiction and dependence, except for waterpipe dependence.

Moreover, when further analyzing the subscales of waterpipe dependence and their relationship with psychological distress, we found that psychological distress was neither associated with physiological nicotine dependence related to waterpipe smoking, nor with psychological craving, nor with its positive reinforcement; as expected, a small but significant relationship was found (adjusted beta=0.02; $p = 0.001$) with waterpipe related negative reinforcement (results not shown).

DISCUSSION

In this study, we found consistent relationships between psychological distress and all types of addictions and dependences, except for waterpipe dependence: while boys were statistically more likely than girls to present substance addiction and dependence ($p < 0.001$), a higher psychological distress was associated with higher risk to present these disorders ($p < 0.001$),

Table 3: Association between psychological distress and addiction and dependence types.

Addiction and dependence type - Mean(SD)	Psychological distress	No psychological distress	p-value
Total users			
Waterpipe dependence (LWDS11)	10.99(5.96)	9.14(5.71)	<0.001
Cigarette dependence (YACD)	15.33(5.81)	12.70(6.02)	<0.001
Total ASSIST score	2.90(7.73)	1.52(4.29)	<0.001
Tranquilizers ASSIST	1.31(4.99)	0.20(2.17)	<0.001
Smoking ASSIST	9.19(10.81)	7.60(9.84)	<0.001
Alcohol ASSIST	6.42(7.95)	5.21(6.82)	<0.001
Boys			
Waterpipe dependence (LWDS11)	11.55(6.21)	9.59(6.04)	0.004
Cigarette dependence (YACD)	15.86(5.38)	13.32(6.26)	<0.001
Total ASSIST score	5.63(11.55)	2.23(5.73)	<0.001
Tranquilizers ASSIST	2.06(6.58)	0.22(2.37)	<0.001
Smoking ASSIST	14.87(11.60)	10.36(10.60)	<0.001
Alcohol ASSIST	10.56(9.07)	7.50(7.67)	<0.001
Girls			
Waterpipe dependence (LWDS11)	10.51(5.71)	8.54(5.22)	0.002
Cigarette dependence (YACD)	14.13(6.53)	10.50(4.47)	0.001
Total ASSIST score	1.35(3.39)	0.86(2.07)	0.032
Tranquilizers ASSIST	0.89(3.78)	0.20(1.99)	<0.001
Smoking ASSIST	5.71(8.62)	5.12(8.37)	0.202
Alcohol ASSIST	4.02(6.05)	3.23(5.24)	0.007

Table 4: Multivariate analyses of addiction and dependence types.

Variables*	Beta Adjusted	95% CI	p-value	Adjusted R ²	Standardized beta
Cigarette dependence (YACD)				0.118	
Smokers at work	3.69	2.19;5.18	<0.001		0.263
Higher psychological distress score	0.07	0.03;0.11	0.002		0.172
Weekly sport frequency	0.88	0.25;1.51	0.006		0.146
Waterpipe dependence (LWDS)				0.007	
Higher Age	0.10	0.001;0.20	0.047		0.10
Total ASSIST				0.122	
Female sex	-2.81	-3.74;-1.87	<0.001		-0.20
Higher psychological distress score	0.10	0.06;0.13	<0.001		0.19
Work smokers	1.61	0.69;2.52	0.001		0.12
Living in Beirut	2.75	1.21;4.28	<0.001		0.12
Weekly sport frequency	0.59	0.14;1.05	0.011		0.09
Higher socioeconomic level	0.45	0.05;0.84	0.028		0.07
ASSIST alcohol dependence				0.202	
Female sex	-3.90	-4.58;-3.22	<0.001		-0.26
Private university	2.24	1.56;2.93	<0.001		0.15
Work smokers	2.27	1.61;2.94	<0.001		0.15
Higher socioeconomic level	0.98	0.68;1.29	<0.001		0.15
Higher age	-0.79	-1.21;-0.38	<0.001		-0.08
Higher psychological distress score	0.03	0.01;0.06	0.004		0.06
Living in Beirut	-1.40	-2.41;-0.40	0.006		-0.06
Home smokers	0.88	0.19;1.58	0.013		0.06
ASSIST tranquilizers dependence				0.048	
Higher psychological distress score	0.04	0.03;0.05	<0.001		0.16
Higher socioeconomic level	0.28	0.12;0.44	0.001		0.09
Weekly sport frequency	0.30	0.12;0.47	0.001		0.09
Declared good health	-0.48	-0.87;-0.10	0.013		-0.07
Work smokers	0.41	0.04;0.77	0.028		0.06

ASSIST Smoking among boys				0.155	
Higher psychological distress score	0.22	0.16;0.29	<0.001		0.24
Home smokers	4.81	2.87;6.74	<0.001		0.18
Work smokers	3.96	2.05;5.86	<0.001		0.15
Higher socioeconomic level	1.35	0.53;2.17	0.001		0.12
Health studies	-3.22	-5.93;0.52	0.019		-0.09
Private university	1.76	0.01;3.52	0.049		0.08
ASSIST Smoking among girls				0.123	
Work smokers	3.05	1.94;4.17	<0.001		0.18
Private University	2.63	1.45;3.81	<0.001		0.15
Home smokers	2.90	1.73;4.08	<0.001		0.16
Higher psychological distress score	0.06	0.02;0.10	0.001		0.10
Health studies	-1.86	-3.04;-0.68	0.002		-0.10
Higher socioeconomic level	0.63	0.11;1.14	0.017		0.08

*Adjustment was made upon: private university, sex, marital status, living in Beirut, socioeconomic status, health studies, age, declared good health, frequency of sports per week, having at least one smoker at work, and having at least one smoker at work.

among both boys and girls and in both bivariate and multivariate analyses. Similar results to ours were found by other researchers in international studies: [6-8], Tavolacci MP, Hagman and Pickard. All have shown that psychologically distressed individuals were more likely to become addicted to substances, while Pickard even argued that drugs and alcohol alleviate the severe psychological distress typically experienced by patients with comorbid psychiatric disorders and associated problems [2012].

Sex was not considered to be a moderator of the association between psychological distress and addiction. However, we found that boys were more likely to be substance users, dependent and addicted [21,22], while they were less likely to declare psychological distress when compared with girls, as in other publications [23,24]. Other factors than psychological distress could thus explain different types of addiction. In fact, adjustment variables in multivariate analyses showed that social variables were of primary importance: higher socioeconomic level, studying in a private university, and living or working with other smokers increased the risk of substance dependence. This has been shown in the literature [25,26], and in analyses related to this population sample [14] or other samples of university students in Lebanon [18].

The exception was that waterpipe dependence was not associated with psychological distress ($p>0.05$) in multivariate analysis; only older age could increase the risk of waterpipe dependence. This could be explained by the recreational use of waterpipe that becomes more accessible with age, and its high acceptability and social normality [27]. This behavior was shown to be related to several factors such as positive reinforcement (smoking for pleasure and smoking to please others), physiological nicotine dependence, and psychological craving that were not related with psychological distress in our sample. Only a small but significant relationship was found between psychological distress and negative reinforcement related to waterpipe, but this was not enough to demonstrate a significant effect at the level of global waterpipe dependence in multivariate analysis. Additional insight into this relationship is necessary with future studies.

Moreover, several methodological points deserve to be discussed: our study being of cross-sectional nature, no cause effect relationships could be concluded about the relationships

we found. In addition, although our sample is drawn from all universities in Lebanon, a selection bias could not be excluded due to the sampling nature and response rate of participants. Finally, an information bias is also possible since we relied on participants' answers for substance consumption and psychological distress assessment. However, we are confident that this bias is of non differential nature, and would only drive the results towards the null. Nevertheless, additional studies would be required to confirm our results.

CONCLUSION

University students with psychological distress are considered a high risk group for addiction and dependence; public health efforts should be particularly directed towards this subgroup to decrease their health risk behaviors and prevent further deleterious consequences.

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