



Cross-sectional Study

Prevalence estimates of drug addiction among high-school students and its association with violence, and school behaviors: A cross-sectional study from Jordan

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ARTICLE INFO

Keywords:

Drug addiction
School behavior
Violence
Jordan

ABSTRACT

Introduction: This study aims to estimate the prevalence of drug addiction among high-school students and its association with violence and school behavior. The present study provides baseline data focusing specifically on the extent of drug addiction and violence.

Methods: A cross-sectional study design was used. The questionnaire covered students' demographic profiles, including age, gender, and academic branch, and statements related to violent behaviors and school-related factors. A urine sample was collected from each participant to test for drugs and was analyzed by Multi-Drug Rapid Test Cup.

Results: Out of 440 students, a total of 414 were included in this study. Positive drug use via urine sample was confirmed in 70 students (16.9%), with 80% being males. Violent behaviors were common, including used to write on the walls (118, 28.5%), had problems with teachers (107, 25.9%) or peers (267, 64.5%), or using abusive language with school staff (63, 15.2%). There were no significant associations between drug addiction and these violent behaviors ($p > 0.05$). Students who had no respect for the teachers were significantly more in the addicted group (31.4%) than the non-addicted group (14%) ($p = 0.004$).

Conclusion: High school should be identified as a critical period at risk for drug use and violent actions. This study points to the importance of early detection of drug addiction among vulnerable young people, enabling the development of educational programs to prevent abuse and dependence on substances.

1. Introduction

Adolescent violence and drug addiction are increasingly recognized as paramount public health concerns [1]. Although the origin of both issues remains unclear, evidence-based research has consistently shown

that violence and drug addiction are related to each other. Unidirectional (i.e., drug use predicts violence) and bidirectional (i.e., reciprocal, in that each behavior reinforces, rather than predicts, the other) associations between the two behaviors were reported [2,3]. Previous studies indicated that higher levels of violence were strongly related to

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<https://doi.org/10.1016/j.amsu.2021.102490>

Received 23 April 2021; Received in revised form 3 June 2021; Accepted 5 June 2021

Available online 9 June 2021

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higher drug use levels, such as cigarettes, alcohol, and marijuana [2,3]. Some of the studies have predicted drug-induced aggression [4,5], while others have found reciprocal relationships between aggression and drug addiction [6,7] or were unable to predict the association [8]. These incongruent findings suggested that the causal relationship between aggression and drug use is still unclear.

Physical aggression causes harm through direct physical damage or threat of physical damage to another person and includes behaviors such as physical attacks and threats of physical attacks [9]. On the other hand, relational violence entails enacting harm to a peer through purposeful manipulation or damage to relationships, such as mocking a peer, purposefully eliminating a peer from social plans, or lying about a peer [10].

A previous study found that boys are more blatantly aggressive than girls [11]. A prospective study measuring physical and relational violence found that early aggression in fourth grade predicted lifetime cigarette and alcohol use, but not marijuana use, in sixth grade; however, there was no interaction of gender or aggression (i.e., physical or relational) [12]. It is important to note that aggression, typically associated with boys, predicts later drug use [13]. Age is an essential predictor in introducing alcohol use and its effects on school bonding, perceived harmfulness, and proactive parenting at age 17–18 years [14–18].

Increased drug abuse is linked to violent behavior among the general population, such as young adults. Jordan has one of the youngest populations globally, with 63% of its population under 30 years, increasing the risk of drug use [19–21]. Previous reports have indicated an increase in substance and tobacco use in the Jordanian population [20,22–25]. Al-Husseini et al. reported excessive use for medicine use (anti-Parkinson's drugs, benzodiazepine sedative-hypnotics, and anticholinergics) in community pharmacies since 2006 [25]. A previous study conducted by Al-Zboon et al. indicated childhood abuse experiences at five Jordanian universities among pre-service special education teachers [26].

According to Alzyoud et al., school violence is a substantial public health crisis that calls for immediate attention [27]. Based on a national survey conducted in the United States of America in 2010, 11% of high-school students reported being in fistfights with others, followed by 8% reported being threatened or injured with a weapon on school property, and 6% reported carrying a weapon on school property [28]. Goyette et al. have claimed an association between higher dropout rates and disruptive classroom behavior, which leads to substance abuse, poverty, unemployment in adulthood, and academic failure [29].

Given the devastating effects of teenage substance misuse on physical and mental health, there is a need to focus on the relationship between drug addiction, violence, and school behavior among high-school students. In Jordan, there is a dearth of evidence about such issues. So, this needs to be explored through extensive studies to facilitate the development of proper interventional programs. This study aims to estimate the prevalence of drug addiction among high-school students and its association with violence and school behavior. The present study will provide baseline data about the levels of drug addiction and violence among high-school students, focusing specifically on the extent of the problem.

2. Materials and methods

2.1. Study design and ethical approval

A cross-sectional study was carried out from October 2019 to January 2020 on Jordanian high-school students. The study obtained ethical approval from the Institutional Review Board (IRB) of an academic university named Jordan University of Science and Technology, Irbid, Jordan. Then, a formal letter was directed to the Jordanian Ministry of Education to permit access to three randomly selected public schools located in the North of Jordan. The parents of the students were

provided with the information sheet, and written informed consent was obtained from the students' parents. After getting the approval from parents, their children were approached and explained about the study, and their independent consent to participate was also achieved.

This study was conducted following the 1975 Helsinki declaration, as revised in 2008 and its later amendments or comparable ethical standards [30]. This work has been reporting based on STROCSS 2019 guidelines (Strengthening the Reporting of cohort studies in surgery) [31]. The protocol had been registered at the Research Registry website with a unique identification number of 6764 [32].

2.2. Study instruments

Self-reported data were collected using a close-ended questionnaire consisting of 32 items. The questionnaire covered students' demographic profiles, including age, gender, and academic branch, and statements related to violent behaviors and school behaviors. The academic branch was categorized into the scientific and non-scientific branches; as in Jordan, students who go to high school have to choose to continue their study in either the scientific branch or other branches like the literary branch, computer branch, or religious branch. The responses of the questionnaires were coded (numerically) and entered into the Microsoft Excel Program. A urine sample was collected from each participant to test for drugs. Academic achievements and behavioral patterns were determined by going through the school records of each student. Moreover, before recruiting the sample, all the students had made visits to psychological counselors to confirm that they were not involved in any drug abuse. The used kit was obtained from Abon Biopharm Hangzhou Co., Ltd, China. Multi-Drug Rapid Test Cup (Urine) to assay the Amphetamine; Marijuana; Methylenedioxymethamphetamine; Morphine; Opiate; Tramadol; Barbiturates; Benzodiazepines; Tricyclic antidepressant; and Buprenorphine.

This kit is an immunoassay based on the principle of the competitive binding drug. When drugs present in a urine sample compete against their respective drugs for binding sites on their specific antibody, and the urine specimen migrates upward by capillary action. If drugs are present in the urine sample below its cut-off concentration, it will not saturate the binding site of its specific antibody coated on the particle. The antibody-coated particle is captured by immobilized drug conjugate, and a visible colored line shows up in the test line region of the specific drug strip.

2.3. Validity and reliability of questionnaire

A pilot test was carried out on 20 randomly selected high-school students (separate parents' consents were also obtained). This group was also excluded from the final sample of the study. A Cronbach's alpha coefficient was used to measure the reliability of the questionnaire, and it was 0.777.

2.4. Statistical analysis

The IBM Statistical Package for Social Sciences Software (SPSS) for Windows, version 25.0, was used to analyze the collected data. Descriptive statistics, including frequencies and percentages, were used for presenting tables. Chi-square analysis was used to present cross-tabulation between violence, drug addiction, and school-related variables. A p -value of ≤ 0.05 was considered to be significant.

3. Results

Out of 440 high-school students, five were excluded as their parents declined the study, and 21 students were excluded as they did not consent to fill the questionnaire or not provide urine samples. A total of 414 school students were included in this study and analyzed by a Multi-Drug Rapid Test Cup. The characteristics of participants are depicted in

Table 1
General characteristics of study participants.

Variable	Frequency	%
Gender		
Male	198	47.8
Female	216	52.2
Age (years)		
17 years	283	68.4
18 years	131	31.6
Academic Branch		
Scientific branch	216	52.2
Non-scientific branch	198	47.8
Drug Use (according to urine test)		
Positive	70	16.9
Negative	344	83.1

Table 1 approximately half of the students (52%) were females, 68% were 18 years old, and 52% were in the scientific branch. Drug use was evaluated from urine samples, and 70 (17%) of students were found to be positive; 56 (80%) of them were males, while 14 (20%) were females. Violent behaviors were common among students, including used to write on the walls (118, 28.5%), had problems with teachers (107, 25.9%) or peers (267, 64.5%), or were using abusive language with school staff (63, 15.2%). There were no significant associations between drug addiction and these violent behaviors as the percentages of students who were involved in violent actions were similar in drug addicted and non-addicted groups ($p > 0.05$) (**Table 2**). We also sought out the association of variables related to the school with drug addiction and found out that students who had no respect for the teachers were significantly more in the addicted group (31.4%) than the non-addicted group (14%) ($p = 0.004$) (**Table 3**).

4. Discussion

Illicit drug use was observed in 16.9% of high-school students, while 83% were non-drug users. Most drug users were males (80%). Conflicts, not showing respect for teachers, not showing respect for school management, and destroying properties were prevalent among students and significantly associated with drug addiction. There were no significant associations between drug addiction and violent behaviors or other school-related factors.

The current prevalence of drug use in this study was 16.9% which is concordant with the findings of a recent study conducted among high-school students in a neighboring developing country, Saudi Arabia, in which the prevalence of drug abuse was 18.94% [33]. Another study included 20,765 students from six developing African countries (Kenya, Namibia, Swaziland, Uganda, Zambia, Zimbabwe) found a prevalence of 10.5% of illicit drug use (three or more times ever) [34]. Also, the authors found that School truancy, loneliness, sleeping problems,

Table 2
The relationship between drug addiction and violent behaviors.

Variables	Drug addiction examined by urine sample test				p-value	
	Positive		Negative			
	N	%	N	%		
Previous attempts to write on walls	No	49	70	247	71.8	0.761
	Yes	21	30	97	28.2	
Previous problems with teachers	No	53	75.7	254	73.8	0.744
	Yes	17	24.3	90	26.2	
Previous problems with peers	No	24	43.3	123	35.8	0.815
	Yes	46	65.7	221	64.2	
Use of abusive language with teachers and other school staff	No	58	82.9	293	85.2	0.623
	Yes	12	17.1	51	14.8	

Table 3
The relationship between drug addiction and school-related variables.

Variable	Addiction				p-value
	Positive		Negative		
	N	%	N	%	
Do you like to go to school					
No	19	27.1	99	28.8	0.782
Yes	51	72.9	245	71.2	
Do you prepare your lessons					
No	18	25.7	63	18.3	0.15
Yes	52	74.3	281	81.7	
Do you feel annoyed with crowded class					
No	23	32.9	136	39.5	0.295
Yes	47	67.1	208	60.5	
Do you maintain the healthy environment of the class					
No	30	42.9	158	45.9	0.638
Yes	40	57.1	186	54.1	
Do you involve in school management decisions					
No	34	48.6	153	44.5	0.530
Yes	36	51.4	191	55.5	
Relation of students with teachers					
Bad	4	5.7	30	8.7	0.404
Good	66	94.3	314	91.3	
Relation of students with peers					
Bad	1	1.4	19	5.5	0.145
Good	69	98.6	325	94.9	
Bad behavior of the student					
Conflicts	32	45.7	202	58.7	0.004
Not showing respect for teachers	22	31.4	48	14	
Not showing respect for school management	8	11.4	36	10.5	
Destroying properties	8	11.4	58	16.9	
Students who are involved in more than one study programs					
No	27	38.6	101	29.4	0.129
Yes	43	61.4	243	70.6	
Do you feel burden with school duties					
No	51	72.9	231	67.2	0.350
Yes	19	27.1	113	32.8	
Worried from continuous school exams					
No	32	45.7	151	43.9	0.780
Yes	38	54.3	193	55.8	
Do you think violent behaviors (either verbal, psychological, or physical) are due to:					
Secondary conditions	11	15.7	81	23.5	0.271
Feeling of stress and uncomfortable	18	25.7	91	26.5	
Bad supervision	20	28.6	67	19.5	
Lacking non-curriculum activities	21	30	105	30.5	
Anger has negative impacts on achievements					
No	8	11.4	45	13.1	0.706
Yes	62	88.6	299	86.9	

sadness, and poverty were associated with substance use [34]. Rakić et al. investigated the prevalence of illicit drug use among 594 adolescents in Novi Sad, Serbia, and reported 10.67% (13.65% males and 8.30% females) [35]. On the other hand, higher prevalence rates of substance use were reported among students in other developing countries, such as Ethiopia (47.9%) and Sudan (31%) [36,37]. However, the latter two studies included tobacco smoking in their prevalence estimates which we did not include in our study.

Our finding of male predominance among drug users is concordant with previous studies that showed males had a higher prevalence of substance use than females [35,38,39]. Abbadi et al. investigated tobacco usage among adolescents of grades 9th to 12th in Jordan and found that approximately one-third of students were cigarette and/or waterpipe smokers, and males had higher rates of nicotine dependence than females [23]. This gender difference could be attributed to such beliefs, and social acceptability about drug use and smoking differ between males and females [40]. Smoking and drug use among females is considered undesirable in Jordanian society, and females were more likely than males to believe that society disapproves of smoking. On the other hand, males were more likely than females to believe that drug use and smoking make young men more attractive.

Bad behaviors were prevalent among students, such as conflicts, not showing respect for teachers or school management, and destroying properties and significantly associated with drug use. Other studies have shown that scientific achievement has been associated significantly with violence and drug addiction [41–43]]. Also, the use of drugs by youth as a means of consolation, rebellion, excitement, independence, belonging to a referent group, and a symbol of maturity is common [44].

The present study results did not show significant differences between drug-addicted students and those who were not addicted in regards to violent behaviors or school-related factors except for not showing respect for teachers, which was more common among addicted students. This could be due to the direct effect of the drug in the brain, which gives pleasure and satisfaction, and the other consideration is that there is easy access for addictive material either in price or obtaining them, a matter that is not associated with violence. However, the discriminating susceptibility to risk-taking behaviors includes criminal behavior and drug use, characterized by the developmental periods of young adulthood and adolescence [18]. Drug use may lead to significant mental disorders [45,46]]. Psychological follow-up of children with drug abuse is required to prevent them from developing potential criminal behavior.

The present study has several practical and theoretical implications. Firstly, the findings of this study are supported by developmental theories, which claim that early anti-social behaviors and criminal acts are determinants of subsequent substance abuse dependence and initiation [47]]. Subsequent violent and non-violent behaviors are predicted through the initiation and increased use of drugs [48–51]]. Thereby, students were growing up with their drugs and their criminal careers intertwined. It has been argued that the abused children imitate abusers and then share what they have learned after they grow up. On the contrary, it is experienced that physical abuse does not always lead to violent or non-violent crimes [52–54]]. It is observed that not all negative childhood experiences are determinants of drug users' involvement in violence.

The results of this study offer essential directions for developing programs on drug abuse prevention for adolescents, such as high-school students. For reducing the substance abuse and violent behavior among the high-school students in Jordan, improvements need to be made in terms of treatment and counseling of the students for adopting a tailored approach. Also, different educational programs should be instigated to improve the student's awareness level about drug abuse. These programs need to focus on school settings and local public health organizations to address the developmental level and perceptions of this vulnerable population. These programs should also be initiated at both the local and national levels to maximize effects and efficiency. Given that young people constitute most of the Jordanian population today, the implications of prevention programs are significant to continue economic progress and national development. Young adults and adolescents represent the future of Jordan; a healthy today will support a healthy tomorrow.

This study has a few limitations. First, the cross-sectional design of this study limits the evaluation of the causal relationship. Second, the study used urine tests to detect drug use that can only discover recent users. Some drugs like amphetamine can only be detected in the first 24–48 hours of drug intake. Thereby, this study failed to detect drug traces among the individuals who might have taken it a week before. Third, all data were self-reported in the form of surveys completed at school. The possibility of bias is presented through self-reported data, as students might have answered what they believed was socially preferable.

5. Conclusion

Drug addiction among high-school students is not uncommon, with a prevalence estimate of 17% and male predominance. In contrast, violent behaviors were much more common. The high school level should be

identified as a critical period at risk for drug use and violent actions. This study points to the importance of early detection of drug addiction among vulnerable young people and enabling actions to prevent substance use and dependence. Prevention programs should therefore focus on male adolescents to combat the abuse of drugs. Integrated, coordinated, and multidisciplinary policies that bring together health professionals and community resources for prevention and treatment are necessary to combat the growing epidemic of substance abuse, especially to attend this risk group. Also, health promotion actions should be directed to the family, as this has an essential influence on the individual's behavior during adolescence, serving as a model. Besides, the school environment should also be a place of healthy habits, where new behaviors are encouraged, such as the non-use of tobacco and illicit drugs. Future broader studies are suggested to be conducted throughout Jordan to estimate the level of drug addiction since this phenomenon exists and is expected to increase. Moreover, we recommend finding out the prevalence estimates of each addictive substance like alcohol, heroin, and amphetamines separately to observe a more clear impact of each substance.

Ethical approval

Institutional approval was obtained from the Institutional Review Board (IRB) at Jordan University of Science and Technology, Irbid, Jordan.

Sources of funding

The Deanship of Research at Jordan University of Science and Technology funds this research with a grant research number: 20,180,011.

Author contribution

All authors contributed significantly and in agreement with the content of the article. All authors were involved in project design, data collection, analysis, statistical analysis, data interpretation and writing the manuscript. All authors presented substantial contributions to the article and participated of correction and final approval of the version to be submitted.

Conflicts of interest

The authors declare that they have no competing interests.

Consent

Written informed consents were obtained from all individual students included in this study and their parents.

Registration of research studies

UIN: researchregistry6764.

Hyperlink to the specific registration:

<https://www.researchregistry.com/register-now#user-researchregistry/registerresearchdetails/6080c779dd5a4a001e7d6e8c/>

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Provenance and peer review

Not commissioned, externally peer-reviewed.

Availability of data and materials

The datasets generated and analyzed during the current study are available with the corresponding authors on reasonable request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Acknowledgment

We gratefully acknowledge all the associated personnel who contributed to this study by any means.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2021.102490>.

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