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USE OF PSYCHOACTIVE SUBSTANCES AMONG BELGRADE UNIVERSITY STUDENTS WITH DIAGNOSED SOMATIC OR MENTAL DISORDERS

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SUMMARY

Introduction/Objective The objective of this study was to examine the relationship between use of psychoactive substances among University students and diagnosed somatic or mental disorders.
Methods The cross-sectional study was conducted in a population of 2,000 students of the Belgrade University. Four faculties (Medicine, Geography, Economics, Electrical Engineering) from which the students participating in this research were chosen by the method of random choice (by computer listing), conducted in the period April - June 2010.
Results We observed that are more numerous students who used psychoactive substances among students with diagnosed somatic illnesses compared to those without them. Statistical significance was found among students who used tobacco (p=0.027), alcohol (p=0.002), sedatives (p<0.001) and cannabis (p=0.021). Mental disorders are also connected to use of psychoactive substances. The statistical significance was achieved for all psychoactive substances except for alcohol.
Conclusion Use of psychoactive substances is an important issue among University students with diagnosed somatic or mental disorder. Therefore, it is essential to recognize the symptoms and consequences of such behavior, and above all and connection thereof, the importance of prevention which may enhance better solution-seeking via proper education.

Keywords: Psychoactive substances, University students, somatic disorders, mental disorders

SRPSKI

UPOTREBA PSIHOAKTIVNIH SUPSTANCI MEĐU STUDENTIMA UNIVERZITETA U BEOGRADU, SA DIJAGNOSTIKOVANIM SOMATSKIM ILI MENTALNIM POREMEĆAJIMA

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SAŽETAK

Uvod /cilj Cilj ove studije je bio da se ispita povezanost između upotrebe psihoaktivnih supstanci među studentima Univerziteta i dijagnostikovanih somatskih i mentalnih poremećaja.
Metode Sprovedena je studija preseka u populaciji od 2 000 studenata Univerziteta u Beogradu .Četiri fakulteta (Medicinski, Geografski, Ekonomski, Elektrotehnički),čiji su studenti učestvovali u ovom istraživanju u periodu april-jun 2010. godine, bila su izabrana metodom slučajnog izbora (preko kompjuterskog listinga).
Rezultati Mi smo zapazili da je veći broj studenata koji su koristili psihoaktivne supstance bio među studentima sa dijagnostikovanim somatskim bolestima, u poređenju sa onima bez tih bolesti. Statistička značajnost je nađena među studentima koji su koristili cigarete (p = 0.027), alkohol (p = 0.002), sedative (p < 0.001) i kanabis (p = 0 .021). Mentalni poremećaji su takođe povezani sa korišćenjem psihoaktivnih
supstanci. Statistička značajnost je postignuta za sve psihoaktivne supstance izuzev alkohola.
Zaključak Upotreba psihoaktivnih supstanci je važno pitanje među studentima Univerziteta sa dijagnostikovanim somatskim ili mentalnim poremećajem. Stoga je neophodno prepoznati simptome i posledice takvog ponašanja, a pre svega i njihovu povezanost , kao i važnost prevencije koja može poboljšati bolje traženje rešenja putem odgovarajućeg obrazovanja.

Ključne reči: psihoaktivne supstance, studenti Univerziteta, somatski poremećaji, mentalni poremećaji

INTRODUCTION

Risky behaviors have negative influence on the physical health of adolescents. In connection to vulnerable populations, the effects can even be of a large-scale, such populations being patients with somatic diseases [1,2]. Unfortunately, problems associatedwith the drug abuse in the mentioned population have partly been explored in the contemporary academic resources. The same relates to the rate of substance misuse in the general population, with insufficient data [3]. Mental problems are also connected to the drug use, therefore commonly referred to as "the dual diagnosis" as a combination of severe mental disorder and substance use disorder [4,5]. As an example, a case in the USA shows that approximately 7–10 million people suffer from at least one psychiatric disorder followed by a substance use disorder [6]. There are four hypotheses on the causes for the dual diagnosis, as follows: "common factors (risk factors common to both disorders), secondary mental disorder (substance use precipitates mental disorder), secondary substance use ('self-medication hypotheses) and bidirectional (presence of either mental illness or substance use disorder can contribute to the development of the other)" [6]. Another example reveals that approximately at least 10% of the American population use prescribed psychopharmacological medications, which represent approximately 20% of all prescriptions in the USA. In addition, other substances, such as psychoactive drugs, including narcotics, psycho stimulants, and central nervous system depressants are widely used [7,8].

Referring to chronic illnesses, a closer correlation can also be found between health status and quality of life with psychosocial factors than physical disease severity [9]. Moreover, a strong relationship between chronic somatic diseases and mental disorders were established [10-12]. In spite the notion that a variety of patients with chronic somatic diseases have experienced mental disorders, the exact extent of such correlation and the increased risk thereof cannot yet be determined [10]. In the USA, anxiety disorders and mood disorders are the most common mental disorders [13].

METHODS

The cross-sectional study was conducted in a population of 2,000 students of the Belgrade University, in the period April - June 2010. Four faculties (Medicine, Geography, Economics, Electrical Engineering) from which the students participating in this research were chosen by the method of random choice (by computer listing). From each of the faculties an equal number of students per academic year was examined who have received practical training on test day. Students filled out voluntarily an anonymous self-administered questionnaire designed at the Institute of Epidemiology, Faculty of Medicine in Belgrade and has been used in similar studies [14, 15]. The questionnaire included questions related to demographics (gender, age, faculty and year of study, place of residence), social (education and occupation of parents, social status) and behavioral (reasons for starting practising this habit, attitudes related to knowledge of its harmfulness) characteristics. A second part of the questionnaire included questions about whether or not (yes/no) students have diagnosed somatic (diabetes, hypertension, heart disease, chronic bronchitis, bronchial asthma, neurological diseases, gastric or duodenal ulcer, skin diseases) and mental diseases. The third part of the questionnaire included questions about whether or not (yes/no) students have ever used the following psychoactive substances: tobacco, alcohol, sedatives, tramadol, methadone, marijuana, hashish, amphetamine, ecstasy, LSD, cocaine and heroin. Researcher was in charge to provide the questionnaires to respondents in person.

For the evaluation of depression and anxiety the Hamilton Rating Scale for evaluation of depression (HAMD) [16] and Hamilton Anxiety Rating Scale (HAMA) [17] were used and assessed by psychiatrist.

The Institutional review Board approved the study. Informed consent forms were assigned by all students who agreed to participate.

Statistical analysis was performed using descriptive statistics and Chi-square test, Fisher exact test and Student t-test to test group differences. For testing association between variables the Spearman rank correlation coefficient was calculated. The collected data were analyzed using SPSS Statistics Software 24.0 for Windows.

RESULTS

Data were collected from 2,000 students of University of Belgrade, 860 (43%) males and 1,140 (57%) females. The average age of the participants was 21.5 years. From each of the faculties an equal number of students (500) per academic year was examined. Response rate was 99.8%.

Out of 2,000 students, 270 of them (13.7%) have somatic disease. Among them, 123 (14.6%) are males and 147 (13.1%) are females.

There are 20 (1%) students with diagnosed mental disorder.

The distribution of psychoactive substances in relation to diagnosed somatic diseases is shown in table 1. We observed that are more numerous students who used psychoactive substances among students with diagnosed somatic illnesses compared to those without them. Statistical significance was found among students who used tobacco (p=0.027), alcohol (p=0.002), sedatives (p<0.001) and cannabis (p=0.021). According to Fisher's exact test, p-value did not quite achieve the conventional levels of significance for tramadol (p=0.056) and for methadone where was close to being statistically significant (p=0.051).

The distribution of psychoactive substances in relation to the diagnosed somatic diseases is shown in table 2. Our data revealed that students with diagnosed diabetes mellitus used more psychoactive substances compared to students without this illness with significant difference for smoking (p=0.004). For cannabis, according to Fisher's exact test, p-value did not quite reach acceptable levels of statistical significance (p=0.051). Regarding hypertension no significant difference was found. When it comes to heart disease, just for alcohol, LSD, amphetamine and heroin was not found significant difference. For lung diseases no statistical difference was found. Regarding neurological diseases the significant difference was found for smoking (p=0.037), sedatives (p<0.001), tramadol (p<0.001), cannabis (p=0.006), amphetamine (p=0.039), LSD (p<0.001) and heroin (p=0.002).

For gastric and duodenal ulcer, the significant difference was found for sedatives (p=0.014), tramadol (p<0.001), methadone (p<0.001), amphetamine (p=0.027), LSD (p=0.002), cocaine (p=0.009) and heroin (p=0.001). Concerning skin diseases the significant difference was found just for sedatives (p<0.001).

Degrees of depression among students with and without somatic disease are shown in Table 3. Students with diagnosed somatic disease are more depressed compared to students without it, but no significant difference was found.

Degrees of anxiety among students with and without somatic disease are shown in Table 3. Our data revealed that the percentage of students with somatic disease and mild or moderate anxiety is higher than percentage of students without somatic disease, but the percentage of students with expressed anxiety is higher among students without somatic disease with significant difference (p=0.012).

The distribution of psychoactive substances in relation to the diagnosed mental disorders is shown in table 4. The statistical significance was achieved for all psychoactive substances except for alcohol.

Table 1. The distribution of psychoactive substances in relation to diagnosed somatic diseases

Psychoactive substances	Somatic Disease Yes	Somatic Disease No	*P*
Smoking	74 (27.8)	366 (21.7)	0.027
Alcohol	231 (87.8)	1336 (79.8)	0.002
Sedatives	53 (19.6)	175 (10.3)	<0.001
Tramadol	5 (1.9)	11 (0.7)	0.056*
Methadone	2 (0.8)	1 (0.1)	0.051*
Cannabis	49 (18.1)	220 (12.9)	0.021
-Marijuana	48 (18.3)	217 (13.2)	0.026
-Hashish	13 (4.9)	52 (3.2)	0.308*
Amphetamine	8 (3.0)	24 (1.5)	0.071*
Ecstasy	9 (3.4)	35 (2.1)	0.192
LSD	3 (1.1)	15 (0.9)	0.727*
Cocaine	5 (1.9)	20 (1.2)	0.375*
Heroin	5 (1.9)	12 (0.7)	0.071*

p - According to $\chi 2$ test

*According to Fisher's exact test

Table 2. The distribution of psychoactive substances in relation to the next diagnosed somatic diseases

Psychoactive substances	Diabetes Yes - N (%) No - N (%) *p*	Hypertension Yes - N (%) No - N (%) *p*	Heart disease Yes - N (%) No - N (%) *p*	Chronic bronchitis Yes - N (%) No - N (%) *p*	Bronchial asthma Yes - N (%) No - N (%) *p*	Neurological diseases Yes - N (%) No - N (%) *p*	Gastric or duodenal ulcer Yes - N (%) No - N (%) *p*	Skin diseases Yes - N (%) No - N (%) *p*
Smoking	7(63.6) 434(22.3) 0.004*	16(26.2) 425(22.4) 0.483	13(40.6) 428(22.2) 0.014	19(30.6) 422(22.3) 0.120	15(18.3) 426(22.7) 0.346	5(50.0) 436(22.4) 0.037	4(44.4) 436(22.4) 0.114	15(27.3) 426(22.4) 0.395
Alcohol	11(100) 1560(80.8) 0.138*	53(86.9) 1519(80.7) 0.224	26(86.7) 1545(80.8) 0.415	54(90.0) 1518(80.6) 0.068	70(87.5) 1501(80.6) 0.123	7(87.5) 1564(80.8) 0.632	7(87.5) 1564(80.8) 0.632	45(84.9) 1527(80.8) 0.453
Sedatives	3(27.3) 225(11.5) 0.125*	11(17.5) 217(11.3) 0.134	10(31.3) 218(11.2) 0.002*	9(14.3) 219(11.4) 0.487	9(10.8) 219(11.6) 0.840	6(60.0) 222(11.3) 0.000*	4(44.4) 224(11.4) 0.014*	15(26.8) 213(11.1) <0.001
Tramadol	0(0.0) 16(0.8) 1.000*	0(0.0) 16(0.9) 1.000*	2(6.5) 14(0.7) 0.026*	0(0.0) 16(0.9) 1.000*	0(0.0) 16(0.9) 1.000*	3(30.0) 13(0.7) <0.001	2(22.2) 14(0.7) <0.001	0(0.0) 16(0.9) 0.503
Methadone	0(0.0) 3(0.2) 1.000*	0(0.0) 3(0.2) 1.000*	1(3.2) 2(0.1) 0.048*	0(0.0) 3(0.2) 1.000*	0(0.0) 3(0.2) 1.000*	0(0.0) 3(0.2) 0.900	1(11.1) 2(0.1) <0.001	0(0.0) 3(0.2) 0.772
Cannabis	4(36.4) 266(13.5) 0.051*	12(19.0) 258(13.5) 0.205	10(31.3) 259(13.3) 0.008*	7(11.1) 263(13.7) 0.550	15(18.1) 255(13.5) 0.232	5(50.0) 265(13.5) 0.006*	3(33.3) 267(13.6) 0.113*	8(14.3) 262(13.7) 0.892
Marijuana	4(36.4) 262(13.8) 0.054*	11(17.5) 255(13.8) 0.405	10(32.3) 255(13.5) 0.007*	7(11.3) 259(14.0) 0.547	15(18.8) 251(13.7) 0.200	5(50.0) 261(13.7) 0.001	3(33.3) 263(13.8) 0.091	8(15.4) 258(13.9) 0.755
Hashish	1(9.1) 64(3.4) 0.577*	5(7.9)/ 60(3.2) 0.126*	4(12.9) 61(3.2) 0.013*	0(0.0) 65(3.5) 0.319*	3(3.8) 62(3.4) 0.963*	0(0.0) 65(3.4) 0.836	1(11.1) 64(3.4) 0.439	2(3.8) 63(3.4) 0.974
Amphetamine	0(0.0) 32(1.7) 1.000*	3(4.8) 29(1.6) 0.085*	2(6.5) 30(1.6) 0.093*	0(0.0) 32(1.7) 0.623*	1(1.2) 31(1.7) 1.000*	1(10.0) 31(1.6) 0.039	1(11.1) 31(1.6) 0.027	2(3.8) 30(1.6) 0.225
Ecstasy	1(9.1) 43(2.3) 0.226	3(4.8) 41(2.2) 0.173*	3(9.7) 41(2.2) 0.032*	0(0.0) 44(2.4) 0.399*	0(0.0) 44(2.4) 0.258*	1(10.0) 43(2.3) 0.103	1(11.1) 43(2.3) 0.077	1(1.9) 43(2.3) 0.840
LSD	0(0.0) 18(0.9) 1.000*	0(0.0) 18(1.0) 1.000*	0(0.0) 18(1) 1.000*	0(0.0) 18(1.0) 1.000*	0(0.0) 18(1.0) 0.374	2(20) 16(0.8) 0.000	1(11.1) 17(0.9) 0.002	0(0.0) 18(1.0) 0.476
Cocaine	0(0.0) 25(1.3) 1.000*	2(3.2) 23(1.2) 0.197*	3(9.7) 22(1.2) 0.007*	0(0.0) 25(1.3) 1.000*	1(1.2) 24(1.3) 0.965	0(0.0) 25(1.3) 0.716	1(11.1) 24(1.3) 0.009	0(0.0) 25(1.3) 0.401
Heroin	1(9.1) 16(0.8) 0.094*	1(1.6) 16(0.9) 0.435*	1(3.2) 16(0.8) 0.243*	0(0.0) 17(0.9) 1.000*	0(0.0) 17(0.9) 0.390	1(10.0) 16 (0.8) 0.002	1(11.1) 16(0.8) 0.001	0(0.0) 17(0.9) 0.489
Alcohol and drugs	2(50.0) 112(25.3) 0.270*	4(26.7) 110(25.4) 1.000*	2(18.2) 112(25.7) 0. 737*	1(7.7) 113(26.0) 0.199*	5(26.3) 109(25.4) 0.929	1(20.0) 113(25.5) 0.779	1(25) 113(25.5) 0.984	3(33.3) 111(25.3) 0.583

p - According to $\chi 2$ test

* According to Fisher's exact test

Table 3. Degrees of depression among students with and without somatic disease

Degrees of depression	Somatic disease		Total	*P*
	Yes - N (%)	No - N (%)		
No	131 (50.4)	916 (56.8)	1047 (55.9)	0.196
Mild	89 (34.2)	502 (31.1)	591 (31.6)	
Moderate	23 (8.8)	122 (7.6)	145 (7.7)	
Expressed	17 (6.5)	73 (4.5)	90 (4.8)	
Total	1613 (100)	260 (100)	1873 (100)	
Degrees of anxiety	Somatic disease		Total	*P*
	Yes - N (%)	No - N (%)		
No	215 (86.0)	1459 (92.0)	1674 (91.2)	0.012
Mild	32 (12.8)	118 (7.4)	150 (8.2)	
Moderate	3 (1.2)	7 (0.4)	10 (0.5)	
Expressed	0 (0.0)	2 (0.1)	2 (0.1)	
Total	250 (100)	1586 (100)	1836 (100)	

p - According to $\chi 2$ test

Table 4. The distribution of psychoactive substances in relation to the diagnosed mental disorders

Psychoactive substances	Mental disorders		*p*
	Yes - N (%)	No - N (%)	
Tobacco	9 (45)	432 (22.3)	0.016
Alcohol	14 (77.8)	1556 (80.9)	0.740
Sedatives	11 (55.0)	217 (11.1)	<0.001*
Tramadol	5 (26.3)	11 (0.6)	<0.001
Methadone	2 (10.5)	1 (0.1)	<0.001
Cannabis	11 (55.0)	259 (13.2)	<0.001*
Marijuana	10 (52.6)	256 (13.5)	<0.001
Hashish	5 (26.3)	60 (3.2)	<0.001
Amphetamine	5 (26.3)	27 (1.4)	<0.001
Ecstasy	4 (21.1)	40 (2.1)	<0.001
LSD	3 (15.8)	15 (0.8)	<0.001
Cocaine	4 (21.1)	21 (1.1)	<0.001
Heroin	4 (21.1)	13 (0.7)	<0.001
Alcohol and drugs	7 (63.6)	107 (24.5)	0.003

p - According to $\chi 2$ test
*According to Fisher's exact test

DISCUSSION

There is little research about how drugs affect young people with somatic diseases [18]. In the current study presented results are for University students. According to our survey, among Belgrade University students, even 100% of them with the diagnoze of diabetes reported drinking alcohol, since in one research conducted on the population of adolescents with diabetes mellitus in USA, 39% of the sample reported a drinking episode [2]. In comparison with that research, our students with diabetes reported higher rate of tobacco (34%:64%) and marijuana use (11%:36%) [2]. In the same study 10% of adolescents reported drug use [2], since in our study, among students with diagnosed diabetes, about 9% of them used hashish, and the same number used heroin and ecstasy.

An example from the UK shows that twenty-nine percent of diabetic patients – respondents have admitted that they were using street drugs [18]. In our survey, the reported lifetime prevalence of cannabis use in persons with diabetes mellitus was around 36% and it is the highest one in comparison to other studies in USA: 11% [2], 13% [19], 10% [20], in Chile almost 10% [1], in UK 28% [18]. In research in USA the reported lifetime prevalence for cocaine in patients with diabetes mellitus was 1% [19]. In another research, rates for cocaine were 5% [20], in Chile almost 3% [1], in UK 12% [18], since our subjects with diabetes mellitus didnot use cocaine at all.In research in USA the reported lifetime prevalence of amphetamine in persons with diabetes was 6% [19], in Chile around 3% [1], in UK 8% [18], since our students with diabetes didnot have experience with this psychoactive substance. In research on the population of adolescents in Chile, around 1% used Ecstasy [1], in UK 5% [18], since in our study rates for ecstasy were 9%. In UK among young patients with diabetes mellitus, reported rates for LSD were 2% [18]. As distinct from, in the current study, our students with the same disease didnot use this drug at all. In the same study in UK, 15% of patients reported poly-drug use [18], while in our research that percentage was 50%. In the current study our respondents didnot use cocaine and amphetamine at all, but they reported prevalence rates for heroin and ecstasy of 9%.

Surveys conducted in 19 countries showed that alcohol consumption was significantly associated with heart disease onset [21].In our survey, among subjects with hypertension the rates of using psychoactive substances were less than in the study in USA(18%:23% for marijuana; 3%:7% for cocaine; 5%:9% for amphetamines; 2%:4% for heroin) except the rates for psychedelics (5%:3%) [22].

When it comes to subjects with respiratory illnesses, in research in USA, among subjects with asthma, 8% of them reported substance use [23], since in Canada 4% with asthma and 8% with bronchitis reported the same [24]. In that country among respondents with no respiratory condition, 2.8% of them used substances [24] and in our research is the opposite, among students without chronic bronchitis, the number of users was higher, but no significant difference was found.

In our investigation 18% of students with asthma reported cannabis use, about 1% reported amphetamine use and the same number cocaine use. In Canada, in the research among study subjects with respiratory illnesses, among patients with asthma, about 4% used substances, almost 8% among patients with chronic bronchitis [24]. In our survey students with chronic bronchitis used next substances: about 11% used cannabis, about 31% smoked cigarettes, 90% used alcohol, and around 14% used sedatives. In the study from 19 of the World Mental Health surveys alcohol abuse had specific associations with respiratory diseases. That investigation found similar prevalence rates of 1.7 % of alcohol use among persons with respiratory disease and without them (1.7%:1.6%) [25]. Regarding alcohol, in the research in Canada, the prevalence rates were higher (almost 4%:2.5%) [26]. In the present study alcohol users were much more numerous, about 88% of students with diagnosed respiratory disease used alcohol, compared to almost 81% without it.

Data from general population surveys over 17 countries showed significant relationship between neurological disease and alcohol [27]. In our study, data revealed that subjects with a history of neurological diseases had high rates of alcohol use (87.5%) as those without it (80.8%) what is consistent with one Canadian survey [28]. Another Canadian survey doesnot corroborate this association [29].

There is a strong relationship between gastrointestinal symptoms and alcohol consumption, as our survey observed [30, 31]. In our study population, among respondents who had diagnosed ulcer, almost 88% of them drank alcohol.

Alcohol consumption seems to be greater in patients with skin diseases than in the general population [32]. Our research corroborates this association.

People with mental disorders are more likely to smoke than people without it [33, 34]. In the USA, 68% of schizofrenia patients were smokers compared to 35% of age matched controls [33]. Persons with mental illness are about twice as likely to smoke as other persons [35] what is consistent with our study (45% of students with mental disorders were smokers, compared to 22% without it with statistically significant difference). Some authors have suggested that such persons use cigarettes as a means of self-medication of psychiatric symptoms [35]. However, in our research, students with diabetes and neurological disease reported a higher rate of tobacco use in comparison with students with mental disorders (67%:55%:45%).

When it comes to anxiety and depression, our survey is in line with other researches. Our respondents with somatic disease diagnoses are more depressed compared to healthy respondents, but no significant difference was found. The explanation may be found in a small number of respondents with medical illness given the subject of the study is a student population with expected low prevalence of chronic health disorders. In Canada, among diabetic patients, depression has been shown to be a common co-morbidity [36], affecting 10% to 30% of the diabetic population [37]. Regarding anxiety, opinions are polarized. Some researchers showed that anxiety is higher among these patients [38], but the others think the opposite [39]. Interesting data from our research showed that subjects with mild and moderate anxiety were more numerous among somatic patients, while subjects without this illness were expressed anxious with statistical significance. In Canadian and Italian researches, somatic diseases were associated with both depression and anxiety [27,28,40].

Our study has several limitations. First, the cross-sectional nature of the study precludes any causal inferences. Second, the study is based on self-reported data without access to medical records. Third, even the students were asked to fill in the questionnaire independently, mutual influences among respondents cannot be fully excluded. Fourth, information bias should be taken into consideration, because students with substance use disorders often face the challenges of stigma [15]. Fifth, even with a large sample of 2,000 students and comparative groups from different faculties, the somatic and mental disorders were confirmed only with a small number of them. Despite the presented limitations, the findings of the study have suggested substantive correlation between somatic or mental disorders and the use of psychoactive substances, which may properly be treated by introducing the prevention education.

CONCLUSION

Use of psychoactive substances is an important issue among University students with diagnosed somatic or mental disorder. Both psychiatrist and somatic doctors who work with student population should bear in mind that young people explore and experiment with different life styles regardless of whether they are healthy or sick. Even the student's determined diagnosis does not constitute a guarantee that they will stop using psychoactive substances. Therefore, it is essential to recognize the symptoms and consequences of such behavior, and above all and connection thereof, the importance of prevention which may enhance better solution-seeking via proper education.

Competing interests: All authors have completed the Unified Competing Interest form and declare they have no competing interests to report.

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