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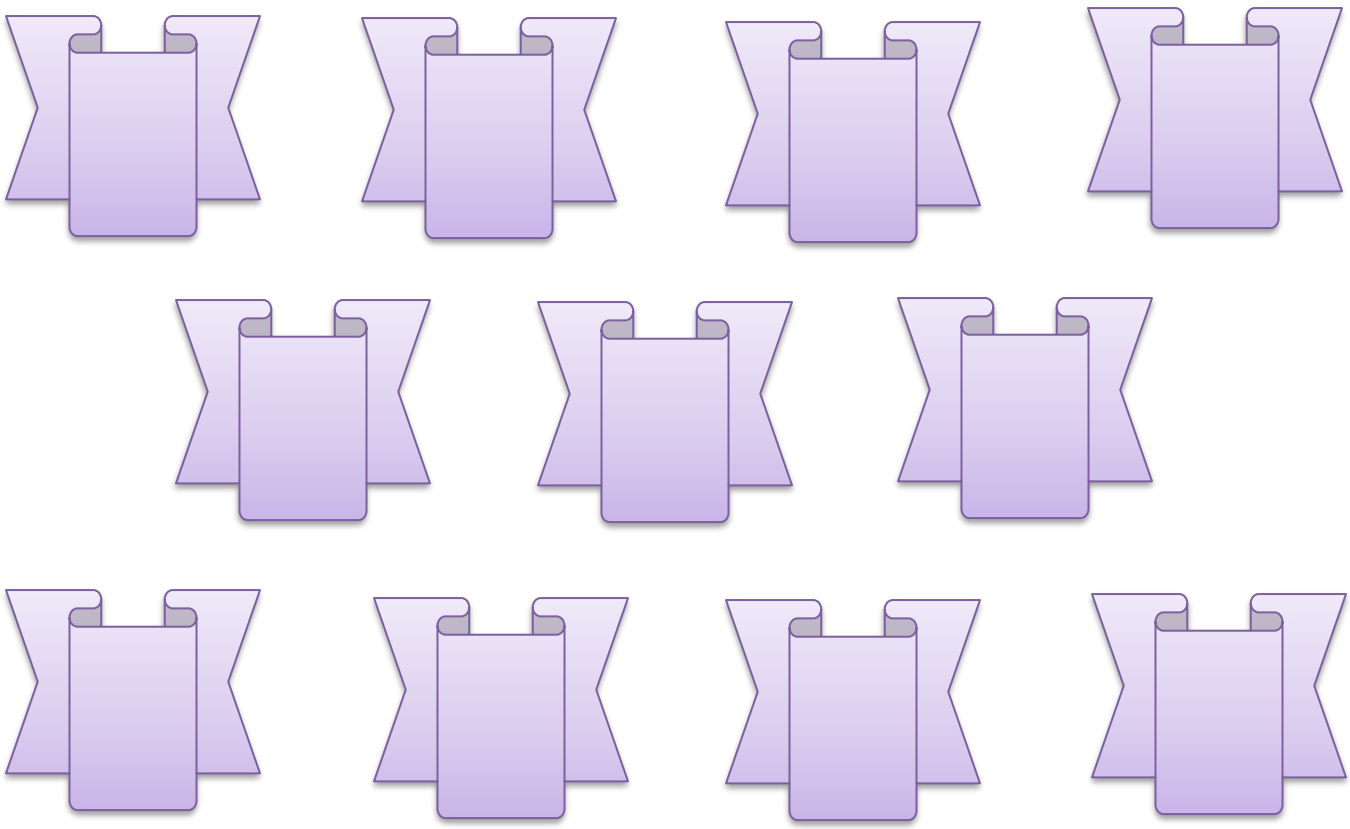

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Original Article

Prevalence of Substance Abuse among Teenagers in Damietta Governorate

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ABSTRACT

Background: Substance misuse among teenagers has increased dramatically in recent years, and drug abuse amongst younger people has also steadily increased, with more youngsters beginning to use substances at a young age.

The Aim of the work: The purpose of this study is to provide insight into the prevalence of teenage substance misuse and its trends in the toxicology and psychiatry departments of Al-Azhar University Hospital [New Damietta] between December 2020 and December 2022.

Methods: In order to determine the prevalence of substance usage, a total of 140 abused adolescents were involved, along with 30 healthy participants serving as a control group. Within sixty minutes after arriving at the hospital's emergency department, blood specimens were taken in tubes containing sodium fluoride [NaF]. After that, it was maintained at 4–8 °C for standard lab analyses. High-performance liquid chromatography [HPLC] was used as an additional confirmation, and radioimmunoassay strips were used as an initial test. Every health record was gathered for both the cases and the control subjects. This was conducted beside the clinical assessment, which focused on the Glasgow Coma Scale [GCS] and neurological evaluation.

Results: Tramadol was the most often abused medication among adolescents, closely followed by cannabis. Tramadol and cannabis were the most often abused medications in the control group, then combined use and anti-psychotic medications, antihistamines, benzodiazepines and cough suppressants, amphetamine, and antidepressants. When comparing the study group to the controls, there was a notable variation in the way that tramadol, cannabis, cough suppressants, and pharmacological combinations were administered.

Conclusion: The most commonly misused drug among teenagers is tramadol, which is followed by cannabis, combined use and anti-psychotic medications, benzodiazepines, antihistamines, amphetamine, cough suppressants, and anti-depressants, respectively.

Keywords: Substance abuse; Tramadol; Cannabis; Amphetamine; Antidepressants.

INTRODUCTION

When substance misuse happens over an extended length of time, it can lead to medical, psychological, and social issues, which is a serious public health concern [1].

It was dealing with a startling surge in drug misuse among children. In the past few years, there has been a continuous upsurge in drug usage among younger people, with more kids beginning to take drugs at a young age. Moreover, criminal behavior is observed in all socioeconomic strata, including cities, tiny communities, and rural locations. Additionally, new and numerous substances use disorders have been identified [2].

Young people are suffering from stress for their survival due to rapid industrial expansion and lifestyle shifts, which have forced many of them to seek refuge in the shadowy realm of drug misuse [3].

Early start with drug abuse is likely to cause disruptions not only for the child but also for family members and the community overall. Consequently, this issue is significant and of national interest. Cognitive and body development and maturation are hallmarks of this stage of life, which may impact how the body reacts to medications and medical interventions. According to World Health Organization [WHO] projections, 25–90% of kids and teenagers worldwide have used at least one drug of misuse [4].

The largest prevalence of substance addiction is among young men. In recent years, there has been a global surge in the usage of synthetic cannabinoids [SCs], which has resulted in a rise of unanticipated problems and symptoms [5].

Many medical professionals are ignorant of the frequency and intensity of psychological and physical side effects, as well as the potentially dangerous effects of using SCs [6]. Substance misuse is on the rise, and more significantly, the age at which people begin abusing substances is declining [7]. Considering the most recent publication, a rise in misuse of drugs will result in a surge in hospital stays and residential care [8].

We believe there are more additional cases of substance addiction going undetected. To reduce this worry, we screen suspected patients for drugs in their urine samples [9].

The purpose of this study is to provide insight into the prevalence of teenage substance misuse and its trends in the toxicology and psychiatry departments of Al-Azhar University Hospital [New Damietta].

PATIENTS AND METHODS

In order to determine the incidence of substance misuse among teenagers and its pattern, 140 adolescents were suspected of abusing drugs in toxicology unit and psychiatric department in Al-Azhar University Hospital [New Damietta] from the 1st of December 2020 to 1st of December 2022 along with 30 healthy individuals who served as controls.

Every participant in the study was referred to the following:

I. Full history: Each participant provided an extensive medical record, including data on age, sex, smoking, behaviors [which included theft, aggressiveness, and substance misuse throughout the preceding month], and temperamental issues [which include things like irritability, bad compliance, and provocativeness] [10].

II. Laboratory investigation: After arriving at the hospital's emergency department, blood specimens were taken in tubes containing sodium fluoride [NaF] within an hour. After that, it was stored between 4 and 8 °C for the next test, which used high-performance liquid chromatography [HPLC] for confirmation and radioimmunoassay strips for initial analysis. Precisely the exact moment as the drug abuse screening, the status of electrolytes, hemoglobin level [Hb], test for kidney function [blood urea nitrogen and serum creatinine concentration], tests for liver function [serum alanine transaminase, or ALT and aspartate transaminase, or AST], and alkaline phosphatase level were assessed [11].

III. Clinical evaluation paying particular attention to Glasgow Coma Scale and neurological signs [12].

Statistical analysis: Using SPSS 13.0 software, the gathered data was arranged, calculated, and statistically examined. All values in quantitative data were reported as mean + standard deviation. The student's [t] test was employed to compare both groups. Count and percentage distributions were computed for qualitative data, and the chi-square test was

utilized to compare the two arms of data. A significant level of P<0.05 is regarded as being achieved.

RESULTS

The study group's mean age ±SD was 12.8 ± 2.6, whereas the controls was 13.1 ± 3.1. These two groups' mean ages were comparable. Among both groups, there was no substantial age disparity. In the controls, there were 80% men and 20% women, while 84% of the study group's members were men and 16% were women. Regarding the investigated and control groups, we found no substantial variation in the distribution of sexes. In the study group, 75% of smokers were compared to 30% in the control group. The study groups differed significantly from one another. In the study group, there were behavioral alterations in three areas: theft [35%], violence [55%], and prior exposure to substance misuse [90%]. The theft was zero percent, aggressiveness was ten percent, and earlier substance usage exposure was seven percent in the controls. The study groups differed significantly from one another.

Regarding challenging temperament, 51% of the study group was moody, 60% showed poor compliance, and 91% was provocative. Mood swings were 7%, poor compliance was 3%, and provocativeness was 3% in the controls. Among both groups, there was no substantial disparity [Table 1].

The study groups' neurotoxic symptoms included fatigue [30%], vertigo [74%], headaches [44%], difficulties with focus [89%], disorientation [80%], memory problems [84%], needing to take notes [46%], trouble comprehending meaning [86%], irritability [31%], heart palpitations [41%], difficulty sleeping [49], headaches [44%], nausea, and vomiting [73%]. In controls, there was no fatigue, 7% dizziness, 13% memory problems, 10% need to take notes, 7% sleep difficulties, 7% headache, and 10% nausea and vomiting. The study groups differed significantly from one another [Table 2].

Neurotoxic symptoms in the groups under study included depression [33%], lack of coordination [10%], reduced strength of the legs [4%], reduced strength of the arms [4%], numbness in fingers [4%], numbness in toes [4%], sweating [30%], rash [20%], dry skin [20%], and 73% of students attending class regularly. The controls had a 7% depression rate, 0% rash, 7% dry skin, 0% sweat, and 13% regular school attendance. The study groups differed significantly from one another [Table 2].

Regarding GCS, there was a significantly substantial disparity between the groups of the study [P=0.02] [Table 2].

Regarding the findings of laboratory testing in terms of disturbed serum electrolytes, Hb level, and elevated renal function tests, we found a substantial variation between the study groups. Similarly, the two groups substantially varied regarding liver function tests and elevated serum alkaline phosphatase levels [Table 3].

We found a substantial variation between the study groups in serum potassium, hemoglobin [Hb] level, and renal function tests when comparing laboratory results. Additionally, there was a considerable variation between the two groups in serum [sodium, chloride, and bicarbonate], liver function tests, and serum alkaline phosphatase levels [Table 4].

When it comes to the study group's positive substance use outcomes, tramadol ranked highest at 89%, followed by cannabis at 53%, substances combined administration at 51%, anti-psychotic drugs at 39%, benzodiazepines at 21%, amphetamine at 13%, cough suppressants at 7%, and anti-depressants at 6%. The most often abused drugs in the controls were both tramadol and cannabis [27%] and combined administration and anti-psychotic drugs [17%]. Antihistamines [10%], cough suppressants and benzodiazepines [3%], amphetamines, and antidepressants [0% for each] were following them.

Comparing the study group to the controls revealed an extremely substantial disparity in the administration of anti-psychotic medicines, benzodiazepines, amphetamines, antihistamines, antidepressants, and cannabis [Table 5].

Table [1]: Comparison of demographic information between the patients and controls

Parameters		Study group [n=140]	Control group [n=30]	P value
Age [mean ± SD] in years		12.8 ± 2.6	13.1 ± 3.1	> 0. 05
Sex	Male Female	118 [84%] 22 [16%]	24 [80%] 6 [20%]	> 0. 05
Smoking [No., %]		105 [75%]	9 [30%]	**0.002**
Behaviors	Stealing Aggression Previous substance abuse	49 [35%] 77 [55%] 126 [90%]	0 [0%] 3 [10%] 2 [7%]	**0.05**
Difficult temperament	Moodiness Poor compliance Provocativeness	72 [51%] 84 [60%] 132 [94%]	2 [7%] 1 [3%] 1 [3%]	> 0. 05

Table [2]: Comparison of neurotoxic symptom between patients and controls

Symptoms		Study group [n=140]	Control group [n=30]	P value
Tiredness		42 [30%]	0 [0%]	< 0.05
Dizziness		104 [74%]	2 [7%]	
Lack of concentration		124 [89%]	2 [7%]	
Confusion		112 [80%]	0 [0%]	
Memory troubles		118 [84%]	4 [13%]	
Have to make notes		64[46%]	3 [10%]	
Difficulty in understanding meaning		120 [86%]	0 [0%]	
Irritability		44 [31%]	1 [3%]	
Palpitations		58[41%]	0 [0%]	
Sleep troubles		68 [49%]	2 [7%]	
Headache		62 [44%]	2 [7%]	
Nausea and vomiting		102 [73%]	3 [10%]	
Depression		46 [33%]	2 [7%]	< 0.05
Incoordination		14 [10%]	0 [0%]	
Decreased leg strength		6 [4%]	0 [0%]	
Decreased arm strength		6 [4%]	0 [0%]	
Numbness in fingers		6 [4%]	1 [3%]	< 0.05
Numbness in toes		6 [4%]	1 [3%]	
Sweating		42 [30%]	0 [0%]	
Rash		28 [20%]	0 [0%]	
Dryness of skin		28 [20%]	2 [7%]	
Regularity in school		102 [73%]	4 [13%]	0.02
[GCS]	Mild	40 [29%]	0 [0%]	0.02
	Moderate	14[10%]	0 [0%]	
	Severe	4 [3%]	0 [0%]	

Table [3]: Comparison of standard laboratory results among study groups

Tests		Study group [n=140]		Control group [n=30]		P value
		no	**%**	**no**	**%**	
Disturbed [elevated and decreased] serum electrolytes levels	Sodium	10	[10.0%]	0	[0%]	< 0.05
	Potassium	4	[5.0%]	0	[0%]	
	Chloride	2	[2.0%]	0	[0%]	
	Bicarbonate	2	[2.0%]	0	[0%]	
Abnormal Hb levels		98	[70%]	14	[47%]	< 0.05
Elevated liver function tests	Serum AST	64	[46%]	2	[7%]	< 0.001
	Serum ALT	56	[40%]	4	[13%]	
Elevated serum alkaline phosphatase level		26	[19%]	0	[0%]	< 0.05
Elevated renal function tests	Blood urea nitrogen [BUN]	4	[3%]	0	[0%]	< 0.05
	Serum creatinine levels	8	[6%]	0	[0%]	

Table [4]: Comparison between the study group and the controls regular laboratory results

Tests		Study group [n=140]		Control group [n=30]		P
		Mean	± SD	Mean	± SD	
Serum electrolytes	Sodium [mmol/L]	145.3	6.1	132	5.2	**< 0.001**
	Potassium [mmol/L]	5.8	2.01	3.3	.2	**< 0.05**
	Chloride [mmol/L].	108.1	5.1	98.5	4.6	**< 0.001**
	Bicarbonate [mmol/L]	19.2	1.01	23.5	2.2	**< 0.001**
Hb levels [mg/dl]		10.1	3.01	12.1	1.1	**< 0.05**
liver function tests	AST [U/L]	52	10.8	22.1	2.2	**< 0.001**
	ALT [U/L]	57	8.28	23.4	1.8	
Serum alkaline phosphatase level [U/L]		255	100.3	153	7.7	**<0.05**
Renal function tests [mg/dl]		1.7	.5	.85	0.1	**< 0.05**

Table [5]: The laboratory data's findings [on drug misuse]

Groups	Study group [n=140]	Control group [n=30]	P value
Tramadol	124 [89%]	8 [27%]	**< 0.05**
Cannabis	74 [53%]	8 [27%]	
Cough suppressants	10 [7%]	1 [3%]	
Drugs- co-administration	72 [51%]	5 [17%]	
Anti-psychotic drugs	54 [39%]	5 [17%]	**< 0.05**
Benzodiazepines	30[21%]	1 [3%]	
Antihistamines	24 [17%]	3 [10%]	
Amphetamines	18[13%]	0 [0%]	
Antidepressants	8 [6%]	0 [0%]	

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DISCUSSION

Teenage substance misuse is associated with an increased risk of depression, pregnancy, criminality, and poor academic performance [13].

The study group's average age in years was [13 ± 2.8] while the controls was [13,1 ± 3.1]. These results pointed to a concerning pattern in the occurrence of drug misuse at this age. A comparable outcome was found in other investigations [14, 15], which stated that early childhood years are associated with hazards for the occurrence of an externalized condition.

In the study group, there were 84% males and 16% females, whereas in the controls, there were 80% males and 20% females. Because men were more likely to disclose using psychoactive substances yet continue to find acceptance in society, men accounted for the majority of instances [16]. However, the strong stigma associated with drug-dependent women is ascribed to the societal perception of drug-dependent women as morally and sexually degraded; that is, actions that men accept are viewed as shameful in women [17]. **Amin and Ahmad** [18], also noted that drug addiction was more common among men. 30% of the controls and 75% of the study group also had smoking evidence. Every study group's smoking behavior differed significantly from the controls. Similar findings were obtained by another two reports [19, 20].

Concerning behavioral alterations, there was a substantial variation between the controls and the study group. These outcomes concurred with **Belcher *et al.*** [15] and **Mohamed *et al.*** [20], who stated that the illnesses may start out with relatively minor behavioral issues before developing into more serious symptoms like substance misuse, theft, and aggressiveness. The challenging temperament of the study group and controls did not vary significantly from one another. These outcomes weren't consistent with **McMahon** [21], who stated that temperamental issues could make children's problematic behaviors worse and lead to an uneasy bond with the kid's primary carer.

When comparing some neurotoxic symptoms like fatigue, dizziness, loss of concentration, disorientation, memory problems, needing to take notes, having trouble comprehending meaning, irritability, heart palpitations, difficulty sleeping, nausea, headache, and vomiting, there was an essential distinction between the studied groups. The study group and controls were shown to vary substantially in terms of depression, inco-ordination, reduced leg and arm strength, numbness in the fingers and toes, sweating, rash,

dry skin, and frequent attendance at school. These outcomes concurred with **Mohamed *et al.*** [20].

These findings did not support **Fidler *et al.*** [22], who stated that each exposure measurement was linked to a range of distinct symptoms, such as fatigue, nausea, dizziness, and issues with arm strength. They also discovered that there were few substantial beneficial connections between exposure and the neurobehavioral assessments. Regarding GCS, there was a very noticeable distinction between the studied groups. These outcomes concurred with **Mohamed *et al.*** [20] and **Tokdemir *et al.*** [23], who stated that most of the cases they included in their investigation were moderate based on the GCS.

Regarding favorable findings of regular laboratory testing in disturbed serum electrolytes, hemoglobin [Hb] level, and elevated kidney function tests, it showed a substantial disparity between the study groups. Similarly, the two groups had a considerable variation regarding tests for liver function and elevated serum alkaline phosphatase levels. These outcomes were put out by **Hepler *et al.*** [24], who stated that while the toxicology lab has a limited role in diagnosis, it is crucial for maintaining the best possible patient treatment and follow-up. Comparing the study and controls, there was an extremely substantial disparity in the use of tramadol, cannabis, cough suppressants, anti-psychotic drugs, benzodiazepines, amphetamines, antihistamines, and antidepressants. These outcomes concurred with **Mohamed *et al.*** [20].

Woratanarat *et al.* [25] revealed that the presence of amphetamine in 16% of cases and 2% of controls elevated the crash risk by 8.9 times. The findings are lower than those found in the current study, which could be related to the disparities in drug abuse patterns between the two nations as well as the small number of participants used in the current investigation.

Both the study group and the control group had twice as many cannabis metabolites. The opposite of this was **Woratanarat *et al.*** [25], who stated that there were more cannabis samples in the controls than in the cases. The various inclusion requirements could explain this.

The study group had higher levels of benzodiazepines than the controls. That was consistent with **Engeland *et al.*** [26] **and Movig *et al.*** [27] who revealed that benzodiazepines can boost the risk of an accident by one hundredfold.

Antihistaminic was found in 10.0% of the controls and 13.0% of the cases. These outcomes concurred with **Woratanarat *et al.*** [25], who stated that 2-4% of the participants under study had antihistamines. This can be the result of low dosage, short-term use, avoidance before driving, or sporadic use.

In the cases group, the rate of drug combined administration was 50.0%, whereas in the controls, it was 20.0%. These outcomes concurred with **del Rio and Alvarez** [28], and **Movig *et al.*** [27]. Researchers have shown and confirmed a considerable increase in the prevalence of multiple substance dependence, with the majority of instances occurring either at the same time within the last year or at the same time within the same week [29].

Conclusion: According to the toxicology unit and psychiatric department of Al-Azhar University Hospital [New Damietta], Damietta Governorate, the most commonly abused drug among teenagers is tramadol. Other drugs that are widely used include cannabis, combined administration drugs, antipsychotic drugs, benzodiazepines, amphetamines, antihistamines, cough suppressants, and antidepressants, respectively. In order to minimize emergency room visits associated with the abuse of drugs, which are primarily caused by dependency, the issue of misuse of drugs between adolescents must be addressed on its own, not at the stage of personal issues but rather at the stage of social issues. Adequate education about the adverse effects of abuse of drugs must also be provided in various forms of media. Pharmacies and chemists should be subject to appropriate regulations and guidelines.

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