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## REVIEW ARTICLE

**A REVIEW STUDY ON TRAMADOL ABUSE AMONG EGYPTIAN UNIVERSITY STUDENTS****Lysher Tan Shu Phing<sup>1</sup>** , **Muhammad Shahzad Aslam<sup>2\*</sup>** <sup>1</sup>Department of Journalism, Xiamen University Malaysia, Sepang, 43900, Malaysia<sup>2</sup>School of Traditional Chinese Medicine, Xiamen University Malaysia, Sepang, 43900, Malaysia**ABSTRACT**

Tramadol, which is a medication used for moderate and severe pains, has caused drug abuse and addiction to the Egyptian community. This study aimed to observe the prevalence of tramadol abuse among Egyptian university students. By following the PRISMA reporting guideline, a systematic review of evidence was conducted. Search strategy was conducted through PubMed-NCBI to yield appropriate published literature between 2014-2019, as well as performed literature screening, eligibility criteria, and data extraction. The process of selection yielded a total number of 2 studies to be eligible for the review inclusion criteria. The characteristics evaluated that correlate to tramadol were classified into four groups: gender, smoking, alcohol consumption, and failure in exams before. In general, tramadol showed positively associated with other prevalence characteristics. Tramadol is the second most commonly abused drug among university students in Egypt. The review shows that the use of tramadol has become an apparent phenomenon among Egyptian university students, which requires adequate attention. Future research is recommended to determine the causal effects of tramadol abuse and its role as a potential addiction drug.

**Keywords:** Analgesics, drug abuse, Egypt, substance-related disorders, tramadol.

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**INTRODUCTION**

Tramadol (Tr) is a synthetic opioid drug of the aminocyclohexanol group that is commonly employed in clinical practice to treat mild to acute pain<sup>1</sup>. Generally, it has been used in the field of trauma care and chronic pain, and as pain reliever for cancer pain. The statistics from Intercontinental Marketing Services (IMS) Kilochem show that the worldwide use of tramadol has increased from 290 tons to 420 tons, increased by 42%<sup>2</sup>. There is growing evidence from recent clinical study that the use of tramadol in non-medical situations are vastly underrated in regard to oral administration, given that parenteral dosing were employed in previous clinical studies<sup>3</sup>. Furthermore, a 2013 annual record from the International Narcotics Control Board (INCB) verified that about 42% of respondents across 33 countries were associated with the abuse and non-medical use of this opioid painkiller prescription<sup>4</sup>. This displays a massively increase in the consumption of tramadol. It is found that 69 in 1000 individuals are accounted for tramadol abuse incidence every year. A higher dose (200–400 mg) of orally administered tramadol, even at therapeutic doses

(100–300 ng/ml), has the potential to build physical dependence, facilitate the effects and result in opioid-related withdrawal syndromes<sup>5</sup>. For this reason, the Drug Enforcement Administration (DEA) has converted tramadol to controlled substance in 2014<sup>6</sup>. Supplanting heroin and cannabis, Tramadol has been extensively used and is becoming increasingly popular among Egyptians. People have been seeking help from tramadol in order to gain energy and increase work performance. The Egyptian government are alarmed and concerned about the public health issues panned by abuse of tramadol in recent years<sup>7</sup>. Results from the national survey in Egypt reported that one of the most widespread use of abused drugs is tramadol<sup>8</sup>. The report stated that about 20% to 40% of adults<sup>10</sup> and 83% of adolescents<sup>8</sup> who suffered from drug use disorders had a tendency to use tramadol. In a study that detects the prevalence of opioid dependence among university students in Egypt, it was found that 88 out of 100 students used tramadol<sup>11</sup>. The drug dependence of tramadol was higher than dependence of heroin among university students. According to the World Health Organisation (WHO), 71.1% of people

develop an addiction to tramadol in 2016 as compared to 38.7% in 2011, which shows a steady increase. As a result, tramadol plays an essential role in the Egypt community and its power cannot be underestimated. The purpose of this literature review was to observe tramadol abuse among Egyptian university students.

### Rationale of the study

The topic is significant as drug problems in Egypt is no longer shocking news, but drug abuse of tramadol has skyrocketed in Egyptian university students which requires an attention to the problem. As university students have been assigned a huge role in shaping the society, therefore, this review by using cross-sectional study, sought to determine the progressive increase of tramadol abuse among university students in Egypt over a period of time. Furthermore, there has been a paucity of literature reviews published with a particular focus on the Egyptian university students. This information gap suggests little advance pertaining to the understanding of Tramadol abuse within the university students in Egypt over the years.

### METHODOLOGY

This systematic review was done with computerised search of PubMed-NCBI database following PRISMA(Preferred Reporting Items for Systematic Reviews and Meta-Analyses)guidelines<sup>12</sup> to find journal articles in pertaining to tramadol abuse among Egyptian university students. The journal articles searched were conducted during April and May of 2019 and limited to English language articles only. The identification of relevant published studies in PubMed were conducted based on title, keywords, and study designs. The search terms used were formulated in Table 1.

**Table 1: Search Strategy**

PubMed Central	
("tramadol"[MeSH Terms] OR "tramadol"[All Fields]) AND ("substance-related disorders"[MeSH Terms] OR ("substance-related"[All Fields] AND "disorders"[All Fields]) OR "substance-related disorders"[All Fields] OR "abuse"[All Fields]) AND ("egypt"[MeSH Terms] OR "egypt"[All Fields]) AND ("universities"[MeSH Terms] OR "universities"[All Fields] OR "university"[All Fields] AND ("students"[MeSH Terms] OR "students"[All Fields] AND egyptian[All Fields])	("analgesics, opioid"[Pharmacological Action] OR "analgesics, opioid"[MeSH Terms] OR ("analgesics"[All Fields] AND "opioid"[All Fields]) OR "opioid analgesics"[All Fields] OR "opioid"[All Fields] AND ("tramadol"[MeSH Terms] OR "tramadol"[All Fields]) AND ("egypt"[MeSH Terms] OR "egypt"[All Fields]) AND ("universities"[MeSH Terms] OR "universities"[All Fields] OR "university"[All Fields] AND ("students"[MeSH Terms] OR "students"[All Fields])

### Literature Screening

In the initial stage of screening, a total number of 76 articles were yielded from the PubMed database search. Twelve of these articles were eliminated as a result of duplication, and yielded 53 non-overlapping articles. Because most of the search yielded articles were prohibited to access, thus 45 were removed for consideration, bringing the total number of qualified full content of articles to eight for further screening. After reviewing the remaining articles, only two articles were eligible and identified as reliable to the

review addressing the prevalence of tramadol abuse. The six articles were disqualified for several reasons: irrelevant study to data extraction (n=3), study focused on clinical studies (n=1), controlled group study (n=1), and study focused on male participants only (n=1).

### Inclusion and Exclusion

The inclusion criteria of this review included

1. Cross-sectional, observational, and descriptive articles,
2. University students as participants between ages 17 to 24,
3. Population of Egypt, and
4. Selection of participants were from technician institutes, theoretical colleges and practical colleges. For the exclusionary criteria, irrelevant articles, prospective studies, older data, editorials, and articles in languages other than English were therefore excluded from this review.

Besides, studies were also excluded for review if the participants were (1) under the age of 17, (2) elderly, (3) clinical trial patients, (4) adults above age 25, (5) and participants have no history of medical disorders. The Table 2 showed the inclusion and exclusion criteria for this systematic review.

**Table 2: Inclusion and Exclusion Criteria**

	Inclusion Criteria	Exclusion Criteria
Study Design	Cross-sectional, observational, descriptive studies	Not pertinent articles, prospective studies, older data, editorials, languages other than English
Participants	University students under the age of 24	Children ≤ 17, elderly, clinical trial patients, adults ≥ 25, no history of medical disorders
Country	Egypt	
Population		
Recruitment Method	Selected from technician institutes, theoretical colleges and practical colleges	

### Data Extraction

A data extraction was developed as captured in the Table 3 including the following details: author's name, year of publication, type of study, age, randomisation, drug names tested, total sample size, and methodological approach.

### RESULTS

Altogether, there were two identified studies that met the inclusion criteria and were included in the systematic review. Refer to Figure 1 for the flow diagram. The results of the two published studies relating to the prevalence of tramadol abuse are presented in Table 4. With the review of extant literature, only two articles met the criteria for understanding the phenomenon of tramadol abuse were included. One study reported significant changes with the rate of tramadol abuse was tremendously higher in males (3.05%) against females (0.42%)<sup>13</sup>.

Table 3: Data Extraction

Author	Meray M.S., Ahmed F.H., Rania A.R.	Dalia M. Amin, Samah A. Elnagdi, Samar A. Amer
Year of Publication	2016	2019
Type of Study	Cross-sectional study	Cross-sectional study
Age	17-24 years old	17-24 years old
Randomization	Simple random sampling	Stratified random sampling
Drug names tested	Tramadol	Tramadol
Total Sample Size	500	750
Methodological approach	Questionnaire sheet developed to assess students' knowledge, attitude, and drug abuse prevalence (included sociodemographic data and knowledge of the use of non-prescription drugs). Urine Dipstick Testing (ABON Multi-Drug) to detect abuse of tramadol. Only positive results confirmed. Data analysed with Statistical Package for the Social Science (SPSS) version 16 program	Self-administrated questionnaire (sociodemographic data, abused drugs types, and medication history errors) Urine Dipstick Testing (ABON Multi-Drug) for tramadol abuse detection. Only positive results confirmed. Statistical Package for the Social Science (SPSS) version 16 program for data analysis

This corresponded to another study which reported that 3.4% of males were more likely to misuse Tramadol than females (0.35%)<sup>14</sup>. This also showed a slight increase on the abuse of tramadol over the past three years as the overall rate of tramadol abuse had increased by 0.1%. Besides, the researcher noted that there was strong association between the positive urine test for tramadol and failure in the exams before. Participants who were reported the use of analgesic tramadol had an inclination for failure in university examinations (6.5%) by a study<sup>13</sup>. Interestingly, the failure rate decreased at the rate of 6.1% from total 1.8% in 2016 to 1% in 2019<sup>14</sup>. On the other hand, only one study reported the prevalence of tramadol abuse which occurred within smoking community. The study found a significant difference between smokers and non-smokers. Participants who smoke would engage in tramadol abuse at much higher rates (10.53%) overall, while non-smokers only constituted 1.08% for tramadol abuse<sup>13</sup>. In terms of alcohol consumption, in similar to the previous study, only one study reported findings of the relationship between alcohol prevalence

and misuse of tramadol. The rate of drinking alcohol users involved in tramadol abusive behaviour was substantially higher (12% compared with 1.1%) than non-drinkers who took tramadol. Moreover, findings from this study also indicated that there were 4.55% alcoholic participants who once tried tramadol<sup>13</sup>. On the other hand, tramadol had also become the most common drug used among the participants in these two studies. Generally, it could be seen that tramadol has contributed to the abusive behaviour among Egyptian university students.

## DISCUSSION

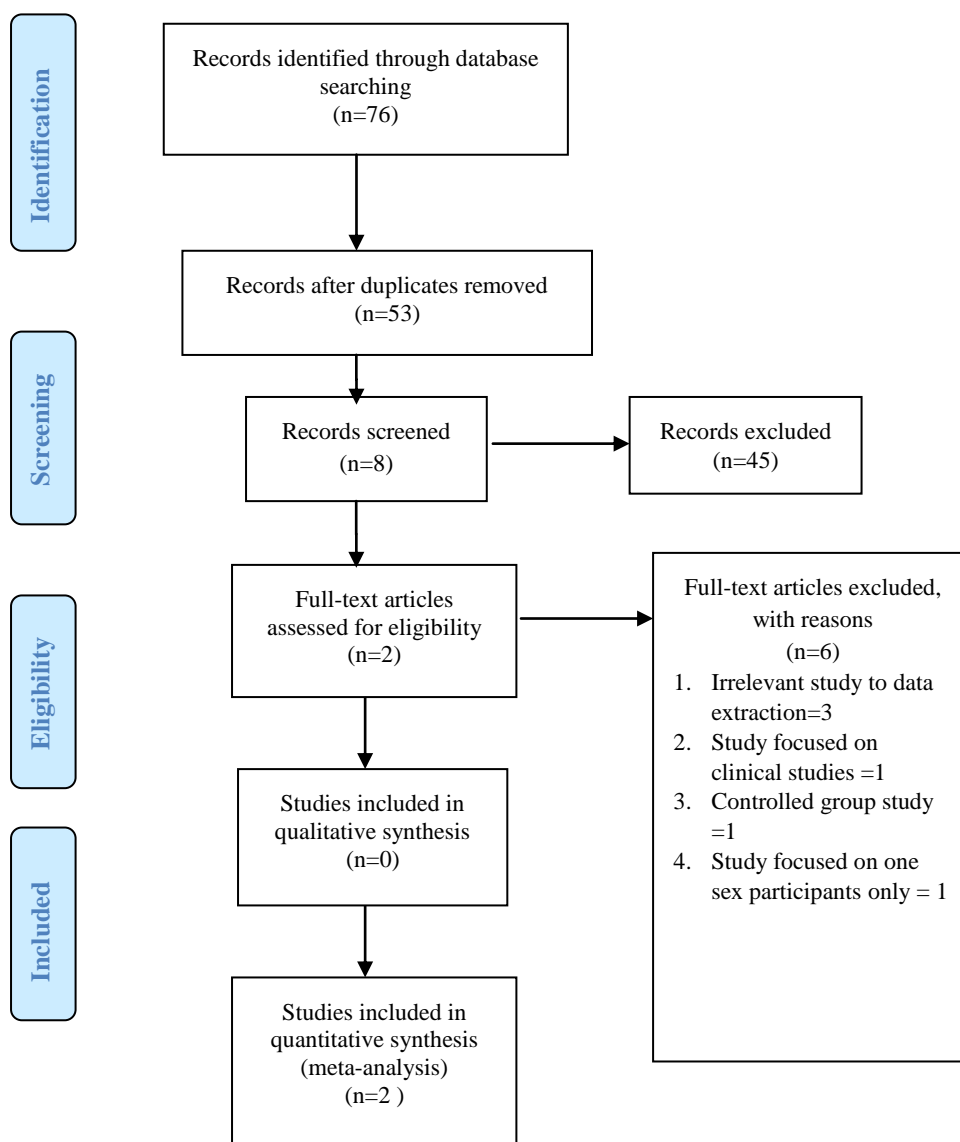
All pertinent English language published studies that identified the abuse of tramadol among Egyptian university students were reviewed in this systematic review. This study provides a general review of the information about the prevalence of tramadol abuse among university students in the available literature. One of the studies conducted in Sohag city showed that the prevalence is 5% of total students with the most abused drugs in the following order: Tetrahydrocannabinol (2.8%), tramadol (1.8%), benzodiazepines (0.6%), and opium and barbiturates (0.4%) each. Similarly, the study conducted in Zagazig University showed the percentages of drug abuse prevalence were: tetrahydrocannabinol (3.9%), tramadol (1.9%), Benzodiazepine (0.67%), opium and barbiturate (0.47%) each. This demonstrated that tramadol was the second most popular drug group used within university students. These results can be explained by the fact that the pill is cheap and generally affordable by every family<sup>13</sup>. The cross-sectional prevalence of tramadol use in Sohag city study showed that males in Egypt were three times more likely to illicit drugs use, which was consistent with the Zagazig study findings. Hence, it could be seen that there is a robust association between gender and drug abuse. This suggested that males are more likely to fall prey to drugs abuse while drug abuse phenomenon are socially unacceptable among females<sup>13</sup>. Besides, one study found that tramadol use was positively associated with smoking prevalence. This congruent with the findings conducted at faculties of Assiut University. It was noted that more than half students sample consumed tramadol as their first choice of drug after taking tobacco smoke. Nearly six percent of students in both studies agreed that tramadol consumption was part of the reason to their academic failure before. Based on that, this elucidated that tramadol abuse caused a low academic performance, supported a study in Colombia<sup>14</sup>.

## CONCLUSION

The incidence of tramadol abuse has increased drastically over the years in Egypt which requires a high degree of attention from different aspects of authorities. Tramadol, though is a widely used prescription drug, long-term use of tramadol may on tribute to adverse outcomes.

**Table 4: Overview of characteristics associated between positive urine screen test results and tramadol (N= 500)**

Author, Year	Gender			Smoking			Alcohol Consumption			Failure in Exam			Polydrug User	
	Male (%)	Female (%)	Total (%)	Smoker (%)	Non-Smoker (%)	Total (%)	Alcoholic User (%)	Non-alcoholic User (%)	Once User (%)	Total (%)	Yes (%)	No (%)	Total (%)	Tramadol as Most Commonly Used Drug
Meray <i>et al.</i> (2016)	3.05	0.42	1.8	10.53	1.08	1.8	12	1.1	4.55	1.8	6.58	0.94	1.8	Yes
Amin <i>et al.</i> (2019)	3.4	0.35	1.9	-	-	-	-	-	-	-	6.1	0.94	1	Yes

**Figure 1: PRISMA 2009 Flow Diagram of articles selection**

After analyzing this systematic review with available published literature, it is noted that university students tend to take tramadol more frequently than female students. Besides, university student smokers are positively associated with tramadol abuse. Moreover, students engage in alcohol consumption are often associated with tramadol use. Lastly, students who take tramadol recreationally have failed their exams before. The current situation needs to conduct longitudinal studies to understand the impact of tramadol misuse among Egyptian university students

and to find practical solutions to reduce its negative effects on students. In addition, studies on tramadol as a potential gateway drug are recommended to see how it plays a role in the Egypt community with regards to the development of substance abuse and dependence.

#### AUTHOR'S CONTRIBUTION

All authors have worked equally for this work.

#### CONFLICT OF INTEREST

No conflict of interest associated with this work.

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