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Review

Behrang Shadloo[1], Masoumeh Amin-Esmaeili[1], Minoo Haft-Baradaran[2], Alireza Noroozi[1,3], Reza Ghorban-Jahromi[1]

and Afarin Rahimi-Movaghar[1]

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ABSTRACT Amphetamine-type stimulants (ATS) are the second most commonly used illicit drugs in the world, after cannabis. The production of ATS has increased worldwide, including in the Middle East. This review aims to assess ATS use in the Islamic Republic of Iran. PubMed, Scientific Information Database (a national database) and Iranian Center for Addiction Studies were searched. The review included studies on the general population, university and high school students, other specific populations, and drug users. The result show that self-reported methamphetamine and ecstasy use in 2016 was

Consommation de stimulants de type amphétamines en République islamique d’Iran, 2004-2005 : analyse

RÉSUMÉ Les stimulants de type amphétamines représentent les drogues illicites les plus répandues dans le monde après le cannabis. La production de stimulants de ce type a augmenté dans le monde entier, ainsi qu’au Moyen-Orient. La présente étude a pour objectif d’évaluer la situation de la consommation de stimulants de type amphétamines en République islamique d’Iran. Pubmed, la Base de données sur les informations scientifiques (une base de données nationale) et le Centre iranien d'études sur les addictions ont servi de base aux recherches. Cette évaluation inclut des études réalisées dans la population générale, auprès d'étudiants des universités et du secondaire, ainsi que dans d'autres populations spécifiques et auprès de consommateurs de drogues. Les résultats indiquent que la consommation auto-déclarée de methamphétamine et d’ectasie en 2016 était inférieure à 1 % dans la population générale et parmi les étudiants en universités et les élèves du secondaire, mais que la prévalence des stimulants de type amphétamines était plus élevée parmi certains groupes. Il y avait aussi une augmentation de la proportion de consommateurs de stimulants de type amphétamines parmi les patients des centres de traitement des toxicomanies. Les résultats de cette analyse révèlent le besoin en études épidémiologiques de haute qualité et la nécessité d’un suivi plus rapproché de la consommation de stimulants dans différentes populations.

[1]Iranian National Center for Addiction Studies (INCAS), Tehran University of Medical Sciences, Tehran, Islamic Republic of Iran (Correspondence to: Afarin Rahimi-Movaghar: rahimia@tums.ac.ir). [2]Isfahan University of Medical Sciences, Isfahan, Islamic Republic of Iran. [3]School of Advanced Technologies in Medicine (SATiM), Tehran University of Medical Sciences, Tehran, Islamic Republic of Iran.

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Introduction

Drugs with abuse potential commonly have sedative/narcotic properties or act as a stimulant or have a combination of these two. Amphetamine-type stimulants (ATS) are one of the main forms of stimulant drugs. Most ATS are chemical compounds synthesized from ephedrine or pseudoephedrine. Amphetamine, methamphetamine and medications such as dextroamphetamine (Adderal) and methylphenidate (Ritalin) are the most commonly used drugs in this group.

After cannabis, ATS are the second most commonly used illicit drug across the world. According to the United Nations Office on Drugs and Crime, 247 million individuals have used an illicit drug (cannabis, opioids, cocaine, ecstasy or ATS) in the past year (1). In addition, around 34.4 million people (0.7% of the world population aged 15 to 64) have used ATS and 18.8 million people (0.4%) have used ecstasy in the past year (2). There are several reasons why people use stimulants: young people may use them for pleasure, students use them to enhance their concentration, athletes want to increase their energy and performance, long-distance drivers use them to increase their alertness and military personnel may use them to raise their spirit and combat abilities.

In the past few years, there has been a large increase in the ATS market in the Middle East. The Islamic Republic of Iran, Jordan, Lebanon, Saudi Arabia and the Syrian Arab Republic have reported increasing amounts of ATS seizure (3). In some Middle East countries, Captagon (methcathinone) is the main stimulant being used. In Saudi Arabia, amphetamine users are the largest group among those seeking drug treatment (3).

The Islamic Republic of Iran has also faced an increase in the production and trafficking of ATS in the past 10 years. ATS traffic has been reported from the Islamic Republic of Iran to the Far and Middle East and even Europe (3). Seizure of methamphetamine was more than 3 tons a year in 2010 and 2011 and there was a 66% increase in seizures from 2012 to 2013 (4). During 2010-2013, 959 methamphetamine production laboratories were found and dismantled in the Islamic Republic of Iran.

Data regarding the epidemiology of ATS use in the Islamic Republic of Iran are fragmented but unofficial reports indicate an increase in ATS use in the country, especially among young people. Developing primary prevention strategies and raising public awareness about the harms of ATS have therefore been a priority of stakeholders and policy-makers.

The aim of this study therefore was to review studies related to the use of ATS (including

methamphetamine, ecstasy and methylphenidate) in the Islamic Republic of Iran, with a focus on the general population and students, in order to provide a comprehensive report on the problem in the country.

Methods

This study is a narrative review of the available literature on stimulant use in the Islamic Republic of Iran. For this purpose, PubMed and the Scientific Information Database – SID (a national database) were searched using keywords related to stimulant drugs including methamphetamine, ATS, ecstasy and stimulant drugs. For PubMed, the data retrieved were filtered by including the MeSH term “Iran” and text word searching of large cities and the name of the universities in the country. We also contacted well known investigators in the field of addiction and authorities at the Ministry of Health and Medical Education to find additional published and unpublished documents. Furthermore, the library of the Iranian National Center for Addiction Studies and personal archives of the authors were also hand-searched. The data were extracted by the authors regarding prevalence of stimulant use in the studied population.

Results

Prevalence of ATS use in the general population

Opioids, especially opium, have been the most commonly used drug throughout the Islamic Republic of Iran for decades. Up to the year 2000, there was no reported use of ATS. The first study of drug use among the general population in the country was conducted in 2001; the sample included users of medical emergency service. However, methamphetamine and ecstasy were not included in this study (5). In the past 10 years, methamphetamine, ecstasy and methylphenidate use has emerged.

The only national household population-based study to assess abuse and dependence for different drugs is the Iranian Mental Health Survey (IranMHS). This cross-sectional study on a representative sample of 15 to 64-year-olds was conducted in 2011 and used the Composite International Diagnostic Interview (CIDI v2.1) (6,7). The results of this study indicated that the prevalence of any illicit drug use disorder (including opioids, stimulants, cannabis, hallucinogens and inhalants but excluding alcohol), as defined by to the Diagnostic Statistical Manual for Mental Disorders (DSM-5) (8), in the past 12 months was 2.44% (approximately 1.3 million people) (9). The prevalence of stimulant use disorders (methamphetamine and Ritalin) was 0.39% (208 000 people) and hallucinogen use disorders [ecstasy and LSD (lysergic acid diethylamide)] was 0.11% (59 000 people) (9).

In the IranMHS, in addition to the Composite International Diagnostic Interview, which is a

structured face-to-face interview, a self-administered questionnaire was anonymously collected from a random sample of half of the participants. The results from this questionnaire indicate that 6.2% of 15 to 64-year-olds had used an illicit drug in the past year. The corresponding rate for stimulants (methamphetamine, ecstasy and Ritalin) was 1.0% (533 000 people) (10). For methamphetamine, 0.7% reported use in the past year, 0.3% reported the use of ecstasy and 0.2% the use of Ritalin. The study also indicated that methamphetamine use was significantly higher in men in the age groups 20 to 29 and > 40. Methamphetamine use was also higher in those of middle socioeconomic status (compared with high and low socioeconomic status) and those from urban areas (compared to rural); however, these differences were not statistically significant.

Another national study in 2013 used a network scale-up method in order to estimate the number of substance users (11). This study suggested that 440 000 (0.59%) people had used methamphetamine and 224 000 (0.3%) had used other types of synthetic drugs (amphetamine, ecstasy and LSD) at least once during the previous year. However, there were some ambiguities in questions regarding methamphetamine use; the estimate of 0.59% refers to the street name of methamphetamine (shisheh) and the 0.3% included the generic name of the drug.

Another study was a repeated survey, in the village of Dashtkhak in Kerman, carried out in 2000 and 2012 (12). The results of this study showed that in 2012, 0.6% of the adolescent and adult population had used methamphetamine in the past month. Because stimulant use was believed not to exist in the village in 2002, it was not assessed at that time.

Prevalence of stimulant use in specific populations

Most of the epidemiological studies on illicit drugs, including stimulants, have been conducted on students. There have also been studies on athletes in gyms and customers in coffee shops. However, different types of stimulants and/or patterns of use have been assessed in each study.

University students

The results of studies on stimulant use among university students, conducted from 1997 to 2003, were summarized in a review in 2006 (13). Only 3 studies had assessed amphetamine use in university students. One study reported a 0.4% prevalence of lifetime amphetamine use in female students (13). Another study in Mashhad reported a 1.4% prevalence of lifetime use and 0.2% prevalence of daily use. The third study was conducted in 15 cities and found a prevalence of lifetime amphetamine of 0.4% (13).

From 2003 to 2013, there were several quantitative and one qualitative study which assessed the prevalence of amphetamine use. The qualitative study was conducted among students at Tehran University of Medical Sciences and reported a prevalence of ecstasy use of 10% in males and 5% in females (14). The characteristics of the quantitative studies among high-school and university students and other young populations are summarized in Table 1 (language of the article, year of study, place of study, sample size, response rate, settings/participants, age of participants, sampling,). The sample size of the studies ranged from 254 to 4000. The participants in the majority of the studies were students of medical universities. In 6 studies, the method of data collection was not clear; one used face-to-face interviews and the rest used anonymous self-administered questionnaires (Table 1).

Table 2 shows the prevalence of stimulant use reported in the studies. The highest prevalence of simulant use was reported by Barati et al. in a study among university students in Hamadan; the prevalence of lifetime use of methamphetamine, ecstasy and LSD were 18%, 8.5% and 4.8% respectively (15). However, in 3 other studies that reported methamphetamine and/or amphetamine use, the prevalence of lifetime use was less than 1% in the total sample (16–18). Two studies reported the prevalence of lifetime use by sex: 0.8 and 1.6% in boys, and 0.1 and 0.6% in girls (16,18). The prevalence of use in the previous year was reported to be 0.2% and 1.1% in 2 studies (18,19).

Ten studies assessed ecstasy use; excluding the Barati et al. study, lifetime ecstasy use ranged from 0.3% to 6.0% in the total sample. In 6 studies, lifetime ecstasy use ranged from 0.8% to 11.7% in males and 0.1% to 3.6% in females (16,18,20–23). The prevalence of use in the previous year was reported in 3 studies: 0.2%, 1.4% and 6.5% in the total sample (15,18,22). The prevalence of use in the previous month ranged from 0.2% to 0.7% in the 3 studies and was 4.5% in the fourth (15,18,22,24). One study reported a 0.1% prevalence of continuous ecstasy use (22).

Ritalin use was reported in 4 studies. The prevalence of lifetime use ranged from 2% to 5% in the total sample (16–18). The prevalence of use in the previous year was reported in 2 studies: 2.5% and 3.7% (18,19). There was a significantly higher prevalence in males than females.

The only study that assessed the trend of stimulant use in university students was a repeated survey from 2006 to 2009 among students of Tehran University of Medical Sciences (25). In addition to a direct question to the students on their own drug use, an indirect estimation was also made (Figure 1). Assessment of the correlation between self-reported use and the indirect

estimate gave a correction coefficient of 2.54 for males and 2.71 for females for self-reported lifetime ATS use.

High-school students

There were fewer studies on illicit drug use among high-school students; we found 5 studies that examined stimulant use from 2003 to 2012. Four were carried out in different cities and 1 had a national representative sample from 10 provinces in 2005/06 (26). Sample sizes ranged from 447 to 2 680. All of them had used a self-administered questionnaire, 3 were anonymous and the other 2 did not say. The characteristics of high-school studies are shown in Table 1 and the results are summarized in Table 3 .

Methamphetamine use was assessed in 3 studies (26–28). The reported lifetime amphetamine use ranged from 0.4% to 2.1% in males and 0% to 0.2% in females (26). The prevalence of lifetime ecstasy use among males ranged from 0.0% to 3.9%; the corresponding rate for females was 0.0% to 0.6%. The national study in 2005/06 indicated the prevalence of lifetime and previous year ecstasy use was 1.5% and 1.0% in males respectively and 0.2% and 0.2% in females respectively (26).

Other groups

A few studies have been conducted among specific populations and these are summarized in Table 1
. A study on 1 903 was conducted on coffee shop customers, aged 15–25 years in Tehran in 2004—coffee shops in the Islamic Republic of Iran are considered youth clubs or places for socialization. According to this study, the prevalence of lifetime use of ecstasy was 18.5% (26.1% in men and 11.7% in women) (29). Another study on 834 male athletes in 103 gyms in 2007/08 reported a prevalence of lifetime use of amphetamines of 13.3% (30).

Stimulant use among people with drug dependence

Several studies assessed ATS use among people with drug dependence. Most of these studies were carried out in drug treatment centres and looked at the pattern and/or the main drug of use among clients. There were 3 national studies conducted in 1998, 2004 and 2007 on people with drug dependence, recruited from drug treatment centres, prisons and public places. Figure 2 shows the results of these studies. In the first study, no ATS use was reported (31). In the second study, ecstasy was the most common type of stimulant and the prevalence of current use among the participants was 3.9% (32). In the third study, methamphetamine was the most common type of stimulant and its current use was reported in 5.2% of respondents (33). In this study, among the 401 individuals who used methamphetamine, 14.2% said injecting the drug was their main route of administration (33).

However, recent reports indicate higher rates of methamphetamine use among those with opioid dependence and an increase in demand for treatment for ATS-related disorders (34). Concurrent use of ATS and opioids might negatively affect treatment outcomes and prognosis. A recent report by the Iranian National Center for Addiction Studies on 1 171 admissions to its drug treatment clinic over 5 years indicates an increase in the total number and proportion of ATS-dependent individuals seeking treatment (Figure 3) (unpublished internal report by the Iranian National Center for Addiction Studies, 2015).

A qualitative study of key people among service providers as well as people with substance use disorders was conducted in 2012 (34). Key experts believed that the prevalence of ATS use disorders would rise in the following years. They also believed that the proportion of women using ATS was relatively high compared with other illicit drugs. Most of the individuals seeking treatment stated that they started to use ATS during 2005/09.

Discussion

According to the only national household survey which assessed substance use disorders, 533 000 individuals (1% of the adult population aged 15 to 64 years) reported the use of stimulants (methamphetamine, ecstasy and Ritalin) in the past 12 months. Methamphetamine and Ritalin use disorders were found in 0.39% (208 000 people) and hallucinogen (ecstasy and LSD) use disorders were found in 0.11% (59 000 people). There is consensus that the real prevalence of substance use is probably higher than found in a national household survey.

A household survey is one of the methods used to assess the prevalence of substance use disorders across the world. The limitations associated with these studies are similar across settings; therefore, the results of household surveys are comparable in different settings and different time periods. In Australia, the use amphetamines more than 5 times in the past year was in found 3.9% of the population aged 15 to 64 and ATS use disorders (abuse and dependence) were found in 0.6% (35,36). In a national survey in the United States of America (USA) using face-to-face interviews, the use of methamphetamine in the previous month was found in 0.2% of the population aged 12 years or older (37). The European report on drugs in 2015 reported that the prevalence rates of ATS and ecstasy use in the previous 12 months among the population aged 15 to 64 were 0.5% and 0.6% respectively (38). Based on these, one can conclude that the Islamic Republic of Iran has a moderate prevalence of ATS use.

The results of our review indicate that there were very few studies on stimulant use among students before 2003 and stimulant use was not recognized as a problem among this group

(13). In the past 10 years, there have been several studies on the prevalence of methamphetamine and ecstasy use among high-school and university students. According to most of these studies, the prevalence of both methamphetamine and ecstasy use in the past 12 months was less than 1.0%. Among university students, the most common type of stimulant used was Ritalin. In the USA, according to the results of the Monitoring the Future annual survey, amphetamine use in the previous year was found in 4.0% of university students and 1.0% of high-school students (39,40). A European study among students aged 15 and 16 years in 36 schools reported a lifetime use of each amphetamine and ecstasy in 3.0% of the students (41). It seems that the magnitude of stimulant use among Iranian students is lower than reported from the USA and Europe.

Our review highlighted some weaknesses in the quality of reports from studies on ATS in the Islamic Republic of Iran. First, the term “stimulant” and the type of substance being assessed were not clear. Second, the time periods of the questions should be clearer; for instance, lifetime, previous year or even previous month were not explicitly reported. It is recommended to include previous year use of drugs as one of the indicators in prevalence studies. Third, in some studies the prevalence of use was not reported separately for men and women. Because of the disproportionately higher drug use in men in the Islamic Republic of Iran, it is recommended that the gender differences in prevalence be reported in future studies. In some studies the method of data collection was not clear; for example, it was not reported whether data were collected using an anonymous self-administered questionnaires or face-to-face interviews. Finally, in some studies, the response rates were not reported.

Most studies presented in this review were based on self-reports. There is evidence that the actual number of people who use drugs might be twice the number reported in these types of study (5,25). Although stimulant use in the general population does not seem to be overly high, some studies suggest that stimulants might be quite common among certain population groups, e.g. gym athletes and students of certain universities. Moreover, there are no reports on young people who are not in school or university. Furthermore, no data exist on at-risk populations such as blue-collar labourers and those living in military barracks. Few data exist on the geographical diversity of stimulant use in the general population.

On the other hand, there has been a large increase in treatment demand for ATS. In addition to that, psychiatrists and other mental health professionals are facing a new challenge from health service users, especially among users of psychiatric emergency services. There is now a growing number of methamphetamine-associated psychoses. This observation has been reported in different studies (42,43) and might indirectly imply an increase of methamphetamine use.

Although there is consensus on the importance of these new drugs, there are far fewer studies on ATS than on opioids. A scientometric study of the national publications on substance use and addiction between 2008 and 2012 showed that only 3.4% and 3.6% of the publications studied methamphetamine and ecstasy respectively (44).

Considering the increase in the production of ATS in the Region, an increase in the prevalence of ATS use seems plausible. Therefore, longitudinal and high-quality surveys among different target populations are needed to provide a clearer picture of the extent and magnitude of the problem, both in the country and the Region. This will provide an opportunity to monitor the trends in drug use over different periods and to provide timely interventions.

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