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المجلة الصحية لشرق المتوسط

هى المجلة الرسمية التى تصدر عن المكتب الإقليمى لشرق المتوسط بمنظمة الصحة العالمية. وهى منبر لتقديم السياسات والمبادرات الجديدة فى الخدمات الصحية والترويج لها، ولتبادل الآراء والمفاهيم والمعطيات الوبائية ونتائج الأبحاث وغير ذلك من المعلومات، وخاصة ما يتعلق منها بإقليم شرق المتوسط. وهى موجهة إلى كل أعضاء المهن الصحية، والكليات الطبية وسائر المعاهد التعليمية، وكذا المنظمات غير الحكومية المعنية، والمراكز المتعاونة مع منظمة الصحة العالمية والأفراد المهتمين بالصحة فى الإقليم وخارجه.

EASTERN MEDITERRANEAN HEALTH JOURNAL

IS the official health journal published by the Eastern Mediterranean Regional Office of the World Health Organization. It is a forum for the presentation and promotion of new policies and initiatives in health services; and for the exchange of ideas, concepts, epidemiological data, research findings and other information, with special reference to the Eastern Mediterranean Region. It addresses all members of the health profession, medical and other health educational institutes, interested NGOs, WHO Collaborating Centres and individuals within and outside the Region.

LA REVUE DE SANTÉ DE LA MÉDITERRANÉE ORIENTALE

EST une revue de santé officielle publiée par le Bureau régional de l'Organisation mondiale de la Santé pour la Méditerranée orientale. Elle offre une tribune pour la présentation et la promotion de nouvelles politiques et initiatives dans le domaine des ser-vices de santé ainsi qu'à l'échange d'idées, de concepts, de données épidémiologiques, de résultats de recherches et d'autres informations, se rapportant plus particulièrement à la Région de la Méditerranée orientale. Elle s'adresse à tous les professionnels de la santé, aux membres des instituts médicaux et autres instituts de formation médico-sanitaire, aux ONG, Centres collaborateurs de l'OMS et personnes concernés au sein et hors de la Région.

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Editorial

A regional framework for action on substance use and public health

Khalid Saeed [1] and Mahshid Taj [2]

Substance use is a public health problem worldwide. According to United Nations Office on Drugs and Crime (UNODC) estimates, there has been an increase of more than 10% over recent years in cannabis use in 9 countries in the Region; while the prevalence of opiate use in Afghanistan, the Islamic Republic of Iran and Pakistan is among the highest in the world. The estimated prevalence for drug dependence in the North Africa and Middle East region is 0.29%, which is 1.3 times higher than the global prevalence (*1*). Emergencies and civil unrest are known as important factors in the exacerbation of the situation (*2*).

At an international level increasing attention is being paid to adopting a more public health-oriented approach. This was highlighted in the outcome document of the United Nations General Assembly Special Session on Drugs (UNGASS) in 2016, which called for a balanced approach between law enforcement and the health sector to counter the world drug problem and inclusion of substance use targets under the health goal of the 2015 Sustainable Development Goals (SDGs) agenda (*3,4*).

The Eastern Mediterranean Region (EMR) faces particular challenges in implementing the operational recommendations of the UNGASS 2016 outcome document and reporting on the SDG targets. It comprises 22 economically diverse countries, with their own cultures and characteristics. A substantial number of these countries are experiencing insecurity, war and humanitarian crisis. In complex humanitarian situations, there is attrition in the capacity of the health and social systems to respond to the increased needs and demands. Since different countries in the Region are at varying stages of development, including the development of their mental health systems, WHO Regional office for the Eastern Mediterranean (EMRO) has devised a classification of countries into three groups that are similar in terms of their population health outcomes, health system performance and level of health expenditure. This facilitates a more meaningful comparison between countries, and for recommendations appropriate to countries' current levels of health system and socio-economic development (*5*).

The Substance Use Atlas 2015 is designed to collect information and report on the agreed upon indicators and targets (*6*). The current iteration of the Atlas includes contributions from all countries of the Region and provides data on the status of substance use services and will serve as a benchmark to monitor progress. The key findings from the Substance Use Atlas as pertains to EMR countries indicate that (*5*):

- The estimated prevalence of opioid use varies greatly, but some countries have the highest rates in the world.
- More than 60% of the countries have a legislative provision for offering voluntary treatment for drug use disorders as an alternative or in addition to criminal sanctions.
- Government financing is the most common financing method for treatment services for substance use disorders.
- 60% of countries have specialized treatment facilities for substance use disorders, but the regional median number of beds reserved for the treatment of substance use disorders is 0.7 per 100 000 population.
- Cannabis and opioids are the main substances reported as the primary drugs at treatment entry; pharmacotherapies for opioid dependence are available in less than 25% of countries; needle/syringe exchange programmes are available in one-third of the countries.
- Most countries have not implemented screening and brief interventions for substance use in primary health care.
- More than half of countries do not have an epidemiological data collection system for substance use; 45% of countries do not have a system of data collection based on health services delivery for substance use.

In order to implement the operational recommendations of the outcome document of the UNGASS 2016 Health Action Plan within the Region, EMRO has developed a framework to operationalise the proposed actions by converting them into practical and concrete recommendations for intervention. The principles guiding the development of the proposed Regional Framework are evidence-informed, specific, relevant, feasible and internally consistent. It also

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incorporates a set of SMART indicators that will be used to monitor and evaluate progress.

In order to inform and support the Framework for Implementation, EMRO commissioned teams of international experts to develop evidence briefs on key issues in strengthening the public health response to drug use problems. The remit of these briefs is to review and summarize national and international evidence relevant to countries in the Region, and suggest strategic interventions for ministries of health that are affordable, cost effective and feasible to strengthen the public health response to the substance use problem in countries of the Region. These briefs, which are brought together in this theme issue along with the Framework for Implementation, represent the current best evidence for strengthening the public health response to the drug use problem.

The key recommendations include:

- Integration of screening and brief interventions for substance use problems in primary health care interventions packages.
- Ensuring availability of essential medicines for management of substance use disorders while strengthening regulatory systems to minimize misuse of prescription medicines.
- Building up the capacity of the workforce in the health and social welfare sectors to provide evidence-informed care for substance use disorders.
- Allocating a specific budget within the health and welfare sector to address substance use disorders.
- Revising policies, plans and legislations conforming to international standards and conventions.
- Assessing national resource needs and corresponding prioritization of budgetary allocations; taking care to protect people from potentially catastrophic costs of treatment.
- Implementing specified "best buy" interventions for promotion and prevention programmes.
- Routine collection and reporting on resources, service availability, and coverage for substance use disorders, and developing systems for monitoring drug-related deaths and communicable diseases prevalence associated with substance use.
- Enhancing capacities to carry out priority research to inform policy and service development.

WHO will continue to provide systematic support to the Member States in order to strengthen the public health response to the drug use problem. It will be coordinating our support with relevant national and international organizations and entities to achieve the targets set out in the 2015 Sustainable Development Agenda.

References

1. United Nations Office on Drugs and Crime (UNODC). World Drug Report 2016. New York: United Nations; 2016 (https://www.unodc.org/doc/wdr2016/WORLD_DRUG_REPORT_2016_web.pdf, accessed 8 March 2017).
2. Hanna FB. Alcohol and substance use in humanitarian and post-conflict situations. East Mediterr Health J. 2017; 23(3): 233–37.
3. United Nations Office on Drugs and Crime (UNODC). Outcome document of the 2016 United Nations General Assembly Special Session on the world drug problem. New York: United Nations; 19–21 April 2016 (https://www.unodc.org/documents/postungass2016//outcome/V1603301-E.pdf, accessed 8 March 2017).
4. United Nations General Assembly. Transforming our world: the 2030 agenda for sustainable development (70/1). New York: United Nations; 2015 (http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1, accessed 8 March 2017).
5. WHO Regional Office for the Eastern Mediterranean. Health systems strengthening in countries of the Eastern Mediterranean Region: challenges, priorities and options for future action (EM/RC59/Tech.Disc.1). Cairo: 59th Session Regional Committee for the Eastern Mediterranean; 2012 (http://applications.emro.who.int/docs/RC_Resolutions_2012_3_14693_EN.pdf?ua=1, accessed 12 March 2017).
6. WHO Regional Office for the Eastern Mediterrnean. Atlas: substance use in the Eastern Mediterranean Region 2015. Cairo: Regional Offie for the Eastern Mediterranean; 2017 (http://apps.who.int/iris/bitstream/10665/254675/1/emropub_2017_19560.pdf, accessed 8 March 2017).

Report

Situational analysis: regional review of the substance use Atlas 2015

Elise Gehring [1] and Khalid Saeed [2]

تحليل حالة: العرض الإقليمي لأطلس تعاطي مواد الإدمان 2015

إيليس جيهرنج، خالد سعيد

الخلاصة: إن أطلس تعاطي مواد الإدمان هو مشروع عالمي لمنظمة الصحة العالمية يهدف إلى جمع البيانات بشأن الموارد المتاحة للوقاية والعلاج من الاضطرابات الناجمة عن تعاطي مواد الإدمان ونشرها. وقد نُشرت معلومات عن الموارد المتاحة في إقليم شرق المتوسط لمنظمة الصحة العالمية لأول مرة في عام 2012. وحُدِّثَ الاستبيان الخاص بالأطلس في عام 2014 وجُمِعَت البيانات من جميع الدول الأعضاء في منظمة الصحة العالمية. وقد قدمت جميع بلدان الإقليم الاستبيان الخاص بالأطلس. ويعرض هذا التقرير أحدث المعلومات الرئيسية المتعلقة بالموارد المتاحة للوقاية من الاضطرابات الناجمة عن تعاطي مواد الإدمان وعلاجها في الإقليم استناداً إلى ردود البلدان على الاستبيان. وتبين التقديرات الحالية أن العبء الذي يُعْزَى إلى الاضطرابات الناجمة عن تعاطي مواد الإدمان في الإقليم هو عبء ثقيل. وتتباين موارد النظم الصحية للوقاية والمعالجة من اضطرابات تعاطي مواد الإدمان باختلاف البلدان، ولكن مازالت هذه الموارد غير كافية بصفة عامة لتوفير الرعاية والعلاج المناسبين للمصابين بهذه الاضطرابات. وتحتاج البلدان إلى تعزيز الوقاية والمعالجة من اضطرابات تعاطي مواد الإدمان، وبخاصة عن طريق زيادة التغطية بالتدخلات العلاجية.

ABSTRACT The Atlas project on substance use is a global WHO project that aims to collect and disseminate data on resources for the prevention and treatment of substance use disorders. Information on resources available in the WHO Eastern Mediterranean Region was first published in 2012. The Atlas questionnaire was updated in 2014 and data were collected in all WHO Member States. All countries of the Region submitted the Atlas questionnaire. This report presents the latest key information on resources for the prevention and treatment of substance use disorders in the Eastern Mediterranean Region based on the responses of the countries to the questionnaire. Current estimates show that the burden attributable to drug use disorders in the Region is high. Health system resources for the prevention and treatment of substance use disorders vary across countries, but are generally still insufficient to provide adequate care and treatment for people with these disorders. Countries need to strengthen prevention and treatment of substance use disorders, particularly by increasing coverage of treatment interventions.

Analyse de situation : examen régional de l'Atlas 2015 sur l'utilisation de substances psychoactives

RÉSUMÉ Le projet d'Atlas sur l'utilisation de substances psychoactives est un projet mondial de l'OMS visant à collecter et à diffuser des données sur les ressources portant sur la prévention et le traitement des troubles liés à l'utilisation de substances psychoactives. Des informations sur les ressources disponibles dans la Région OMS de la Méditerranée orientale ont été publiées pour la première fois en 2012. Le questionnaire de l'Atlas a été mis à jour en 2014 et des données ont été collectées dans tous les États Membres de l'OMS. Tous les pays de la Région ont soumis le questionnaire de l'atlas. L'article en question présente les informations essentielles les plus récentes sur la prévention et le traitement des troubles liés à l'utilisation de substances psychoactives dans la Région de la Méditerranée orientale sur la base des réponses au questionnaire fournies par les pays. Les estimations actuelles montrent que la charge attribuable aux troubles liés à l'utilisation de substances psychoactives dans la Région est élevée. Les ressources des systèmes de santé pour la prévention et le traitement de ces troubles varient d'un pays à l'autre, mais elles sont généralement insuffisantes pour assurer des soins et des traitements adéquats pour les personnes atteints de ces troubles. Les pays doivent renforcer la prévention et le traitement des troubles liés à l'utilisation de substances psychoactives, notamment en augmentant la couverture des interventions thérapeutiques..

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Introduction

The use of alcohol and other psychoactive substances alters brain functions, such as mood, perception and consciousness (*1*). It can lead to physical and psychological dependence, coercing a person to continue taking the drug despite adverse consequences. People with substance use disorders may suffer from psychological and psychosocial problems, loss of employment or legal problems (*2,3*). It is a chronic mental disorder characterized by remissions and relapses and frequently accompanied by other mental conditions, such as depression or anxiety disorder, or by physical conditions such as HIV/AIDS, hepatitis B and C and tuberculosis.

Information is limited on substance use in the countries of the Eastern Mediterranean Region of the World Health Organization, which include Afghanistan, Bahrain, Djibouti, Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

Alcohol use in the Region is among the lowest worldwide. According to the Global Status Report on Alcohol and Health 2014 (*2*), the total alcohol per capita consumption in 2010 was 0.7 L, which is almost 9 times lower than the global estimate (6.2 L). However, more than half of the alcohol consumed in the Region is unrecorded, which means it is not accounted for in official statistics on alcohol taxation or sales.

Information on the prevalence of drug use in the Region is scarce. Data from the World Drug Report 2016 are available for 6 to 13 countries depending on the drug type (*3*). Cannabis is reported as the most commonly used substance in the Region. The regional median annual prevalence of cannabis use for the population aged 15-64 years is estimated to be 3.6%. Some countries of the Region (Afghanistan, Islamic Republic of Iran and Pakistan) have among the highest annual prevalence of opioid use in the world, ranging between 2% and 3% of the population aged 15-64 (*4*). This estimate is lower (< 0.5%) for the other countries of the Region for which data are available.

As mentioned above, drug dependence is one of the consequences of drug use. Based on the findings from the Global Burden of Disease Study 2010 (*5*), the prevalence of cannabis dependence was estimated to be 0.14% in the North Africa and Middle East region, which is slightly less than the global average (0.19%). Opioid dependence is the most prevalent drug dependence in this region at 0.29%.

Given the complexity of the health and social consequences of substance use disorders, management of substance use disorders involves a range of prevention, treatment and rehabilitation approaches. In addition to specialized services for drug use disorders, a good treatment system should include non-specialized services such as primary health care services as well as social care services (*6*). A wide range of treatment methods should be available ranging from targeted prevention programmes, screening and brief interventions, to pharmacological treatment and rehabilitation.

Delivery of adequate care and treatment to people with substance use disorders requires a well-functioning prevention and treatment system. Such a health system should have 6 core components: service delivery, health workforce, health information systems, access to essential medicines, financing and leadership/governance (*7*). These building blocks represent the essential features of a functioning health system.

In 2010, the WHO launched the Atlas project on resources for the prevention and treatment of substance use disorders. The objective of this project is to collect, compile and disseminate information on resources for the prevention and treatment of substance use disorders (*8*). A first assessment was conducted in 2012 in order to map resources available in the Eastern Mediterranean Region (*9*). Fourteen countries, representing 92% of the Region's population, participated in this assessment. Scarcity of available information was one of the main challenges in developing the report. The following key findings were reported. Cannabis was the most prevalent substance used in the Region. Opioids were the main psychoactive substances reported at treatment entry. Even though a drug unit was available in most countries, few countries reported a specific budget for the prevention and treatment of substance use disorders, and out-of-pocket payment was the main financing source for treatment services for substance use disorders. Opioid substitution therapy, which is recommended by WHO as treatment for opioid dependence (*10*), was reported by 14% of the countries. Mental health care services are the main providers of treatment for substance use disorders. Of all the WHO regions, the Eastern Mediterranean Region has the lowest number of groups and agencies working in the area of substance use, as well as of screening and brief intervention programmes. With regard to information systems, only 36% of the countries of the Region had a system for collection of epidemiological data collection about substance use and substance use disorders.

Important United Nations resolutions have been adopted and published over the past 10 years, the most recent being the Special Session of the United Nations General Assembly on the World Drug Problem held in 2016. In 2009, Member States of the United Nations adopted the Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem (*11*). In 2010, the World Health Assembly endorsed the Global Strategy to Reduce the Harmful

Use of Alcohol (*12*). In view of these political changes, the WHO regularly monitors the resources available in an attempt to assess the treatment gap for substance use disorders and what is being done to address this gap. In this regard, the Atlas project on substance use was updated in 2014.

The Sustainable Development Goals that were adopted by leaders worldwide in January 2016 include a specific goal related to substance abuse. Countries around the world are all urged to "strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol". In view of this recent political engagement, information on resources available for the prevention and treatment of substance use disorders is needed. The aim of this review is to present the main findings of the Atlas project update for the Eastern Mediterranean Region. The data presented in this review represent the latest information on resources available in the Region.

The Atlas project refers to specific treatment services for substance use disorders that are defined as follows. Detoxification refers to a relatively short-term treatment aimed at withdrawing an individual from the effects of psychoactive substance use. Treatment refers to the different treatment methods beyond detoxification that are implemented on an outpatient/ambulatory basis (i.e. without formal hospital admission), or on an inpatient basis. Rehabilitation is defined as a longer-term process aimed at enabling people with substance use disorders to achieve an optimal state of health, psychological functioning and social well-being through a combination of approaches. Opioid agonist maintenance therapy refers to the administration of thoroughly evaluated opioid agonist for the management of opioid dependence (*10*).

The information provided in this review may assist countries to assess their current resources and to compare them with countries with a similar situation as well as to assist in developing evidence-based policies, plans and programmes to effectively address the issues of substance use and related problems.

Methods

The Atlas project on resources for the prevention and treatment of substance use disorders was launched in 2010 by WHO in order to map resources available for the prevention and treatment of substance use disorders. To update this information, the project was conducted again in 2014 and the questionnaire updated based on the response rate and quality of the initial questionnaire. The final questionnaire contained information on the following areas: policy, legislation and financing, human resources and training, services and interventions, and health information systems. In particular, the list of indicators included governance structure, financing sources, number of beds, availability of training for professionals, availability of medications, treatment coverage for substance dependence, and availability of treatment services for women or children and adolescents.

The Eastern Mediterranean Regional Office collaborated with the responsible ministries in the countries to nominate a focal point for completion of the questionnaire. The focal point was encouraged to consult with experts and gather relevant information to answer the questions. The questionnaire was made available through an online platform as well as in a Word document upon request. Technical support was provided by WHO during the submission period.

Once a filled questionnaire was received, it was screened for incomplete and inconsistent answers. To ensure high quality data, respondents were contacted again and asked to respond to requests for clarification and to correct their responses. Data were analysed on a regional basis based on the number of countries that provided a response to a specific item.

Results

All of the 22 countries of the Eastern Mediterranean Region submitted the questionnaire. However, the response rate varied between the questions. Results are presented below by area.

Leadership and governance

Countries were asked about the presence of a government unit or focal person responsible for a policy regarding substance use prevention and treatment. The majority of countries (18/22, 82%) have a government unit responsible for prevention policies, and for the majority this unit is responsible for both alcohol and drug use. The majority of countries also had a government unit responsible for a policy on the treatment of substance use disorders (18/20, 90%). Figure 1 shows the countries' responses regarding the government unit or focal person responsible for prevention of substance use and treatment of substance use disorders. The different response options for prevention were: i) 1 unit responsible for the prevention of both alcohol and drug use, ii) 2 separate units for the prevention of alcohol and drug use, or iii) 1 unit responsible for the prevention of drug use only. Similarly, the different response options for treatment were: i) 1 unit responsible for the treatment of alcohol and drug use disorders or ii) 1 unit responsible for the treatment of drug use disorders only.

In most of the countries the unit or focal person is responsible for policies covering other areas. In 12 of 15 countries (80%), the unit responsible for treatment policy is also responsible for mental health policy. A few countries (3/15, 20%) reported that this unit is responsible for criminal justice. Prevention is under the same unit as mental health in most of the countries (10/14,

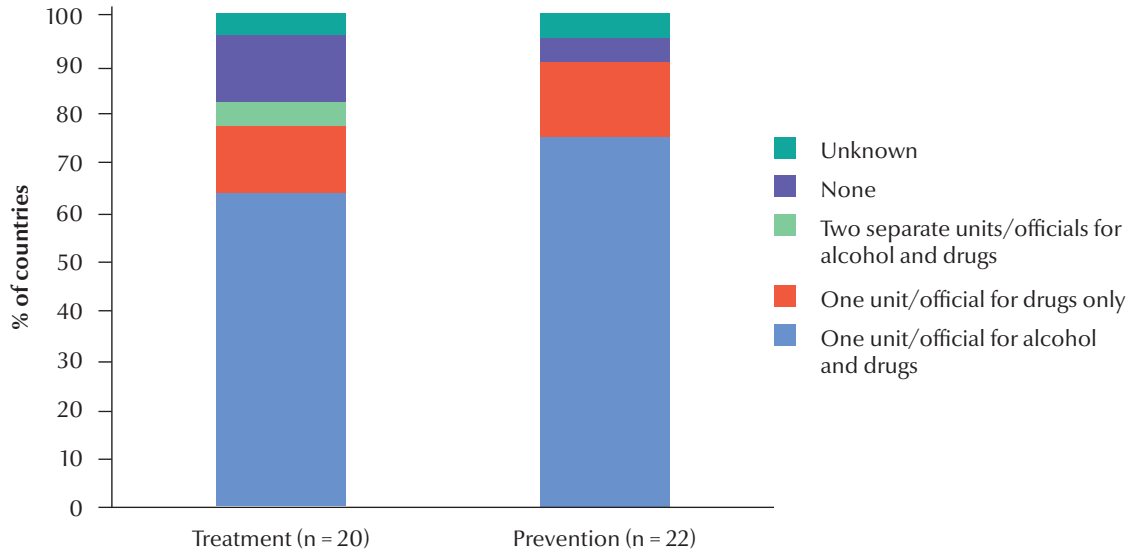

Figure 1 Government unit/focal person responsible for prevention and treatment of substance use disorders in countries of the Eastern Mediterranean Region

71%) and under health promotion in just over a third (5/14, 36%).

The Atlas questionnaire asked about the ministry primarily responsible for prevention of substance use and treatment of substance use disorders. For the majority of countries (17/19, 89%), the ministry of health is responsible for prevention of substance use. The ministries of interior (11/19, 58%), social welfare (7/19, 37%) and education (7/19, 37%) were also reported to be responsible for prevention in some countries. Regarding treatment, again the ministry of health was the responsible ministry in most countries (19/20, 95%), followed by the ministry of interior (6/19, 30%).

Financing

Fourteen out of 21 (67%) countries have a specific budget at the ministry of health for prevention of substance use, and 15/19 (79%) countries report a specific budget at the ministry of health for the treatment of substance use disorders. Almost half of the countries have a budget line for prevention at the ministry of social welfare and a third at the ministry of criminal justice. On the other hand, 4 countries (Jordan, Lebanon, Somalia and Palestine) have no specific budget for prevention and 2 (Jordan and Palestine) have no specific budget for treatment.

Financing of treatment for substance use disorders can come from different sources, such as government, employers, households or through external financing such as nongovernmental organizations (NGOs). In most countries of the Region, the government is the main financing source for treatment, while 3-4 countries (depending on the treatment type) report that households are the main source of funding. The different treatment services provided are shown in Figure 2.

Service organization and delivery

Treatment sectors and providers

Treatment services for substance use disorders are provided by the public health sector in the majority of the countries (between 50% and 77% depending on the treatment service). The private health sector is reported to be the main sector for outpatient detoxification by just over a quarter of the countries (4/14, 28%). One country (Sudan) reported that the criminal justice sector is the main sector providing treatment for substance use disorders and 2 countries (Pakistan and Egypt) reported that NGOs are the main providers of rehabilitation services.

Of the 22 countries, 7 (32%) have specialized treatment facilities available in all different areas of the country (in major cities as well as in other urban and rural areas), 5 (23%) have such facilities in the capital city only, 3 (14%) have facilities in the capital city and other major cities and 1 (4%) has only in rural areas. However, 6 countries (27%) reported having no specialized treatment facilities for substance use disorders, whether integrated with other health care facilities or stand-alone:

In terms of the most important providers of treatment services, stand-alone specialized treatment services were reported to be the main providers in 8 countries (45%), while 7 (39%) reported mental health care facilities as the main providers.

Legislative provisions for treatment

The Atlas questionnaire asked about the existence of a law that protects the confidentiality of people in treatment for substance use disorders. Six countries (Iraq, Lebanon, Libya Pakistan, Sudan,

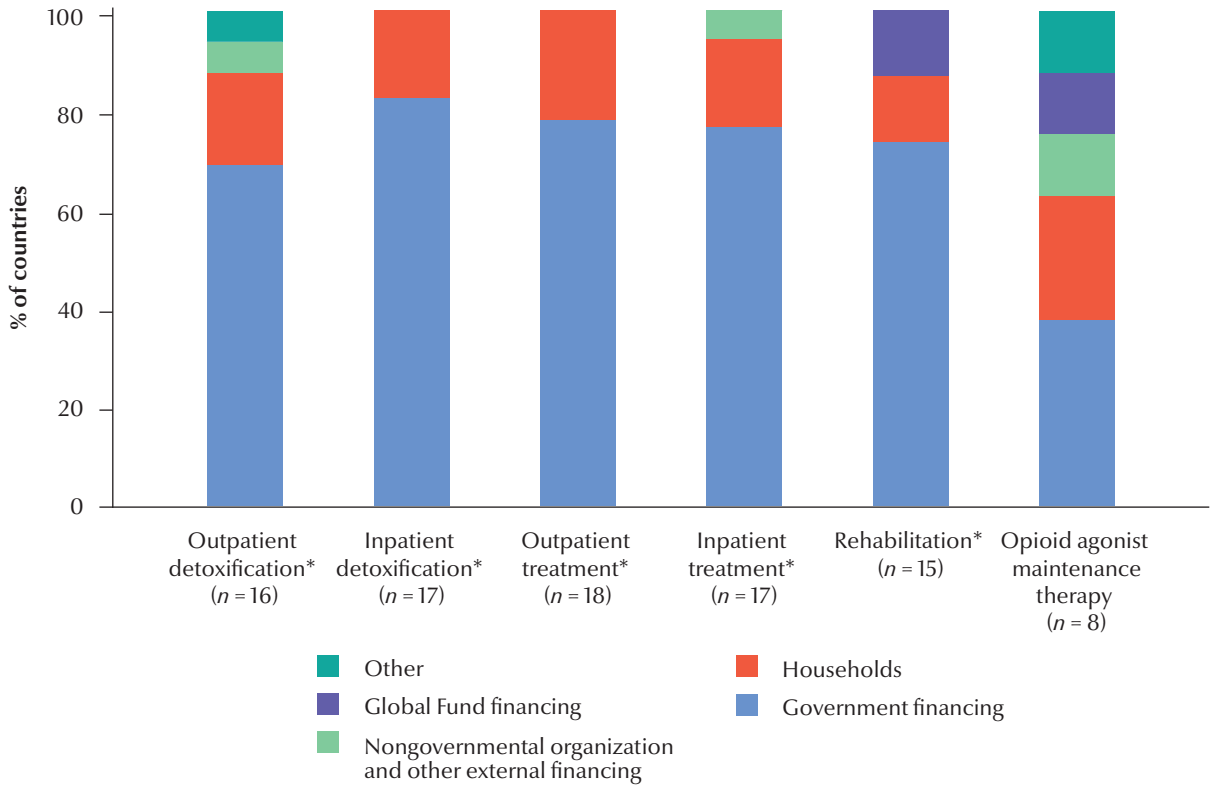

Figure 2 Main financing sources for treatment services for substance use disorders

Palestine) reported that they did not have such a law.

People in treatment for substance use disorders may have entered under their own volition or through formal or informal coercion. More than half of the countries have legislative or administrative provisions to offer voluntary treatment to people who come into contact with the criminal justice system, either as an alternative (13/20, 65%) or in addition (11/18, 61%) to criminal penalties. Mechanisms for compulsory treatment as an alternative or in addition to criminal penalties were reported less often than legislation for voluntary treatment: 9 out of 20 countries (45%) reported having such mechanisms in place as an alternative to criminal penalties and 10 out of 19 countries (53%) had compulsory treatment in addition to criminal sanctions.

Main substance of concern

The Atlas questionnaire asked about the main substances that resulted in entry into treatment. Opioids and cannabis were both reported by just over a quarter of the countries (6/22, 27%) as the main substances responsible for treatment entry. In addition, 5/22 countries (22%) reported them as the second most used substances. Four countries (Jordan, Qatar, Somalia and Sudan) reported alcohol as the main substance that led to treatment entry. Sedatives, anxiolytics and sleeping pills were reported as the third most used substances that led to treatment entry by 45% of the countries.

Service coverage, capacity and utilization

Treatment coverage is defined here as the proportion of the estimated number of people with drug dependence that are currently receiving treatment. It is a key indicator to assess service gaps. Most countries (13/22) could not provide information on treatment coverage as the data were not available. Out of the 9 countries that provided data, 4 (Bahrain, Islamic Republic of Iran, Saudi Arabia and the United Arab Emirates) reported treatment coverage of greater than 20%. Regarding cannabis dependence, 3 countries (Bahrain, Oman and Saudi Arabia) reported treatment coverage of more than 20%.

In addition to treatment coverage, countries were requested to provide information on the proportion of people who seek treatment for substance dependence who actually receive such treatment; this reflects access to treatment. Of the 11 countries who provided data for opioid dependence, 4 (Jordan, Kuwait, Oman and Qatar) reported that more than half of the people who sought treatment for opioid dependence received it. Of the 10 countries that provided data for cannabis dependence, 3 (Kuwait, Oman and Qatar) reported that more than half of those who sought treatment for cannabis dependence received treatment.

Service availability can be assessed by the number of beds available for the treatment of substance use disorders, bearing in mind that not all treatment of substance use disorders requires hospitalization. Thirteen countries provided data on the number of beds. The median number of beds for treatment of substance use disorders in the Region was 0.73 per 100 000 population (Table 1). It ranged from 0.05 (in Iraq) to 7.88 (in Kuwait) per 100 000 population.

In terms of service utilization, the Atlas questionnaire asked about the annual number of treatment episodes for substance use disorders. In this context, treatment episodes refers to the total number of annual treatment admissions to inpatient and outpatient specialized treatment facilities, including the repeated treatment admissions for the same person during the year. Seven countries provided data on the number of outpatient treatment episodes in public sector specialized treatment facilities. The regional median was 32 annual treatment episodes per 100 000 population, ranging from 2.4 (in Jordan) to 663 (in Bahrain) per 100 000 population. For inpatient treatment episodes, the median was 9 annual treatment episodes per 100 000 population with a low of 1.5 (in the United Arab Emirates) and a high of 57.5 (in Afghanistan).

Pharmacological treatment

Countries were asked about the availability of different medications in publicly funded treatment services. More than half of the countries (14/22, 63%) have at least 1 medication for detoxification treatment available from among the following: methadone, buprenorphine, buprenorphine/naloxone, clonidine and lofexidine, the most commonly reported being methadone and clonidine.

Almost half of the countries (10/22, 45%) reported the availability of at least 1 medication for maintenance treatment, which can be either methadone, buprenorphine or buprenorphine/naloxone. With regard to opiate overdose, 11/19 (58%) countries reported that naloxone was available for opioid overdose. National guidelines on pharmacological treatment of substance use disorders are available in half of the countries (11/22).

Prevention

Countries were asked whether specific groups and agencies such as religious groups, schools, NGOs, law enforcement agencies or international organizations were involved in prevention activities related to drug use. NGOs were reported by 17 out of 19 (89%) countries, followed by schools (16/19, 84%) and religious groups (15/19, 79%). International organizations were reported by just over half of the countries (10/19, 53%).

Prevention programmes exist in different settings in the Region. School-based prevention programmes for drug use are available in 14 of the 22 countries (64%), with 3 reporting a high coverage. Fewer countries (50%) reported community-based prevention programmes; 3 of them report a high coverage. Three countries (Lebanon, Somalia and Sudan) have no prevention programmes for drug use.

Substance use prevention programmes are available for different population groups; for young adults and prisoners in 14 out of 18 countries (78%) and for people living with HIV/AIDS in 11 countries (61%). We considered prevention programmes for people living with HIV/AIDS different from harm reduction programmes as they likely target people with HIV/AIDS who do not use substances. Less than a quarter of the countries (4/18) have specific drug use prevention programmes for people with mental disorders.

Screening and brief interventions for harmful and hazardous drug use in primary health care services and antenatal services are rare: 14% (3/21) of the countries reported that screening and brief interventions are implemented in 1-10% of primary health care services and antenatal services.

Special programmes and services

Harm reduction programmes are not widely available in the Region. A third of the countries (7/21) have needle/syringe exchange programmes and 7/22 have condom distribution programmes. Outreach services for injecting drug users are available in a quarter of the countries (5/20), 3/20 countries have drop-in services and 2/19 have naloxone distribution services.

Treatment programmes specifically allocated to women with drug use disorders are available in a third of the

Table 1 Bed availability for inpatient treatment of substance use disorders in the Eastern Mediterranean Region

Facility	Median number of beds (per 100 000 population) for treatment of substance use disorders
Public general health care facilities (*n* = 2)	1.11
Public mental health care facilities (*n* = 3)	0.17
Private mental health care facilities (*n* = 1)	0.92
Public specialized health care facilities[1] (*n* = 10)	0.80
Private specialized health care facilities[1] (*n* = 2)	0.70
Other public health care facilities (*n* = 2)	1.33
Total (*n* = 13)	0.73

[1]*Includes specialized health care facilities for substance use disorders only and does not include specialized mental health care facilities that offer specialized treatment for substance use disorders*

countries (7/21); they are mainly located in the capital city or other major cities. Children and adolescents also represent a population group with specific needs; 4/19 (21%) countries reported having special treatment programmes for children and adolescents with drug use disorders.

Housing and employment services for people with drug use disorders were reported by 3 countries (Islamic Republic of Iran, Saudi Arabia and the United Arab Emirates). Open access interventions such as telephone helplines, web-based or mobile phone based interventions are available in a small number of countries (7/20). Mutual support/self-help groups are available in 8/22 (36%) countries and mostly located in the capital city and other major cities of the country.

Workforce

A relatively wide range of professionals provide treatment and care for the management of substance use disorders. Psychiatrists were reported by all 22 countries in the Region, and psychologists by 20. Psychiatric nurses and social workers were reported by 14 and 16 countries respectively. Addiction specialists were less frequently reported (in 5 countries).

National standards of care were common for psychiatrists (in 16/18 countries, 88%) and psychologists (in 11/18 countries, 61%). Half of the countries (9/18) have standards of care for social workers, but they were less frequently reported for other professional categories (Figure 3).

Education in prevention and treatment of substance use disorders such as short-cycle tertiary education (i.e. vocational, academic and professional education), and graduate and postgraduate degrees are available in less than half of the countries in the Region. When education programmes are available, short-cycle tertiary education in prevention of substance use was the most common and was reported by 9 of 22 (40%) countries. A third of the countries (7/21) have no training programmes for substance abuse. Similarly, 9 (41%) countries have no specific postgraduate training programmes for professionals. The highest availability of postgraduate training programmes is for psychiatrists (11/22) (Figure 4). Continuing professional education for substance use prevention and treatment is available in 15/21 (70%) countries, with programmes for psychiatrists being the most common (available in 14 countries).

Information systems

Data collection is a key element of a functioning health system and is the basis to inform relevant stakeholders. Only 8 of 20 (40%) countries in the Region have a system that collects epidemiological data on substance abuse. These data incorporate results of regular epidemiological studies on the prevalence of substance use and substance use disorders, as well as patterns of

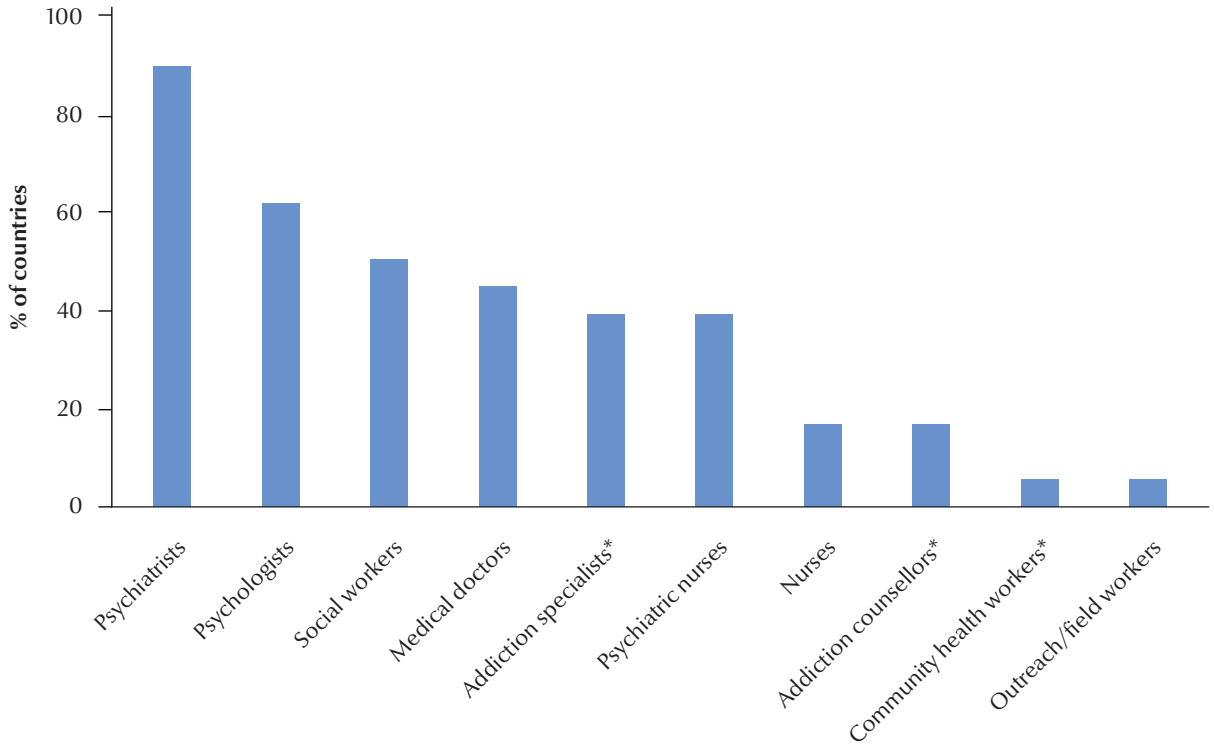

Figure 3 National standards of care for professionals providing treatment for substance use disorders (N=18)

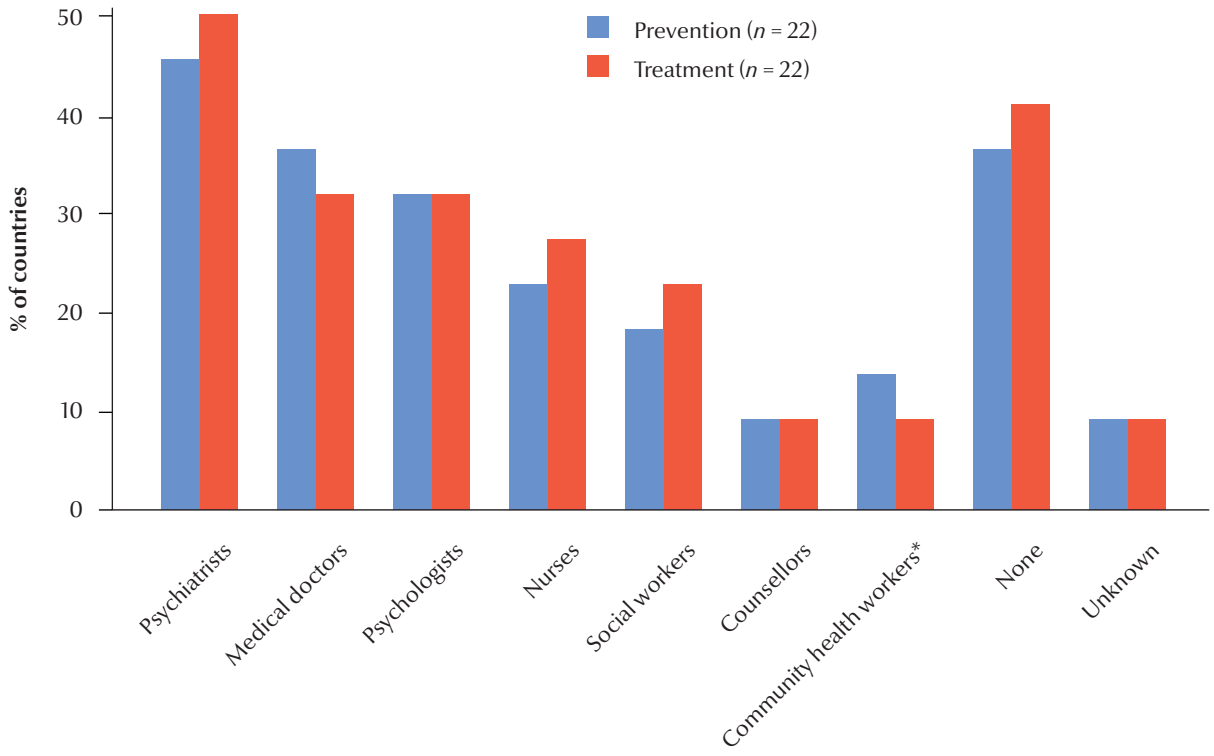

Figure 4 **Availability of postgraduate training programmes in prevention and treatment of substance use disorders for different professionals**

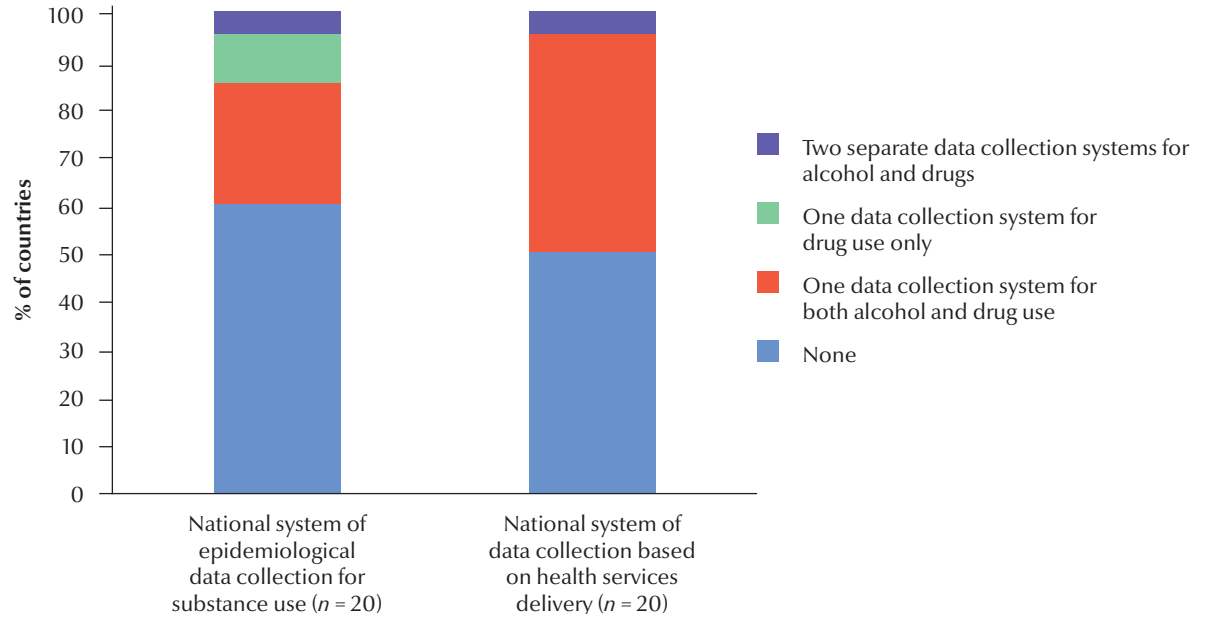

Figure 5 **Existence of data collection systems for epidemiological data and data based on health services delivery for substance use and substance use disorders**

Table 2 Summary of the key results by country

Country	Income group	Government unit/focal person responsible for prevention of substance use	Government unit/focal person responsible for treatment of substance use disorders	Budget at the MOH for the prevention of substance use	Budget at the MOH for the treatment of substance use disorders	Law protecting confidentiality of people in treatment for drug use disorders	Treatment coverage for opioid dependence	Treatment coverage for alcohol dependence	Needle or syringe exchange programmes	Systems for epidemiological data collection
Afghanistan	Low	For drugs only	For drugs only	Yes	Yes	Yes	Very limited (1-10%)	Very limited (1-10%)	Yes	None
Bahrain	High	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	High (> 40%)	Substantial (21-40%)	No	None
Djibouti	Low middle	2 separate units/ focal persons for alcohol and drugs	No response	None	No response	Yes	No response	Unknown	No response	None
Egypt	Low middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Limited (1-20%)	Very limited (1-10%)	Yes	For alcohol and drugs
Islamic Republic of Iran	High middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	High (> 40%)	Unknown	Yes	For drugs only
Iraq	High middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	No	Unknown	Unknown	No	None
Jordan	High middle	For alcohol and drugs	For alcohol and drugs	None	None	Yes	Unknown	Unknown	No	None
Kuwait	High	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Unknown	Unknown	No	For alcohol and drugs
Lebanon	High middle	None	For drugs only	None	Yes	No	Unknown	Unknown	No	None
Libya	High middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	No	Close to none	Close to none	No	None
Morocco	Low middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Limited (1-20%)	Very limited (1-10%)	Yes	For alcohol and drugs
Oman	High	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	No response	High (> 40%)	Unknown	For drugs only
Pakistan	Low middle	None	None	None	None	No	Very limited (1-10%)	Very limited (1-10%)	Yes	For alcohol and drugs
Qatar	High	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Unknown	Unknown	No	Unknown
Saudi Arabia	High	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Substantial (21-40%)	Substantial (21-40%)	No	For alcohol and drugs
Somalia	Low	None	No response	None	No response	No response	No response	No response	No	None

Table 2 Summary of the key results by country *(concluded)*

Country	Income group	Government unit/focal person responsible for prevention of substance use	Government unit/focal person responsible for treatment of substance use disorders	Budget at the MOH for the prevention of substance use	Budget at the MOH for the treatment of substance use disorders	Law protecting confidentiality of people in treatment for drug use disorders	Treatment coverage for opioid dependence	Treatment coverage for alcohol dependence	Needle or syringe exchange programmes	Systems for epidemiological data collection
Sudan	Low middle	For drugs only	For alcohol and drugs	None	None	No	Unknown	Unknown	No	None
Syrian Arab Republic	Low middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Unknown	Unknown	No	None
Tunisia	High middle	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Unknown	Very limited (1-10%)	Yes	2 separate systems for alcohol and drug use
United Arab Emirates	High	For alcohol and drugs	For alcohol and drugs	Yes	Yes	Yes	Substantial (21-40%)	Very limited (1-10%)	No	None
Palestine	Low middle	For drugs only	For drugs only	None	None	No	No response	No response	Yes	None
Yemen	Low middle	Unknown	Unknown	No response	No response	Unknown	Unknown	Unknown	Unknown	Unknown

MOH = Ministry of Health

substance use. Half of the countries (10/20) have a data collection system for health services delivery (Figure 5). Data on health services delivery typically include admission and discharge information as well the number of outpatient contacts. Half of the countries have reported data on substance use in the past 5 years.

Information on mortality and morbidity related to substance use can be collected by monitoring deaths related to substance use in forensic pathology. Just over a fifth of the countries (5/22) report such systems in forensic examinations or toxicology units. Table 2 gives a summary of the responses by the countries of the Region.

Discussion

This review presents the latest information on the resources available for the prevention and treatment of substance use disorders in the Eastern Mediterranean Region. All 22 of the countries of the Region submitted the Atlas questionnaire. Compared with the previous Atlas exercise, in which 14 countries participated, this increase may indicate a stronger political involvement in this public health issue. However, the lack of responses on some indicators should be kept in mind when looking at the results. The results show the paucity of information available as well as the lack of resources at the country level.

The areas covered in this review represent the 6 building blocks of a functioning health system. The leadership/governance and health information systems are the basis for the whole system. The financing and workforce components are at the core of the system, and the service delivery, including the availability of medications, represents the output of the health system (*13*). Our results show that more than 80% of the countries have a government unit or focal person responsible for the prevention and treatment of substance use disorders. However, only 40% have an epidemiological data collection system for substance use. The availability of data is essential to inform policy-makers and guide the development of treatment and prevention programmes. Resources should therefore be allocated to improve and develop the health information system in countries of the Region.

Regarding the financing aspect of the health system, the proportion of the countries (67%) reporting having specific budgets allocated to the

prevention of substance use is almost the same as the global average (69%). A slightly higher proportion of countries in the Region had budgets allocated for the treatment of substance use disorders compared with the global average (79% and 72% respectively). Budgets are structured differently in the Region as budgets for substance use are integrated with mental health and not with health promotion or noncommunicable diseases as is the case in other Regions.

The availability of human resources and training in the Region is similar to global averages. A lack of training for professionals is commonly reported, particularly in lower income countries.

Although there is a lack of recent epidemiological data on the extent of drug use, nonetheless the prevalence of drug use in the Region appears to be comparable with the global estimates, but the overall availability of services is low. Medications for maintenance treatment of opioid dependence are available in only half of the countries despite their benefits and the affordability of methadone, for instance. Open access interventions such as telephone help-lines or web-based interventions are half the global average. Needle/syringe exchange programmes are one of the harm reduction interventions recommended by the WHO (*14*) to reduce the overall burden attributable to drugs. However, such interventions are available in only a third of the countries of the Region. Similarly, naloxone distribution programmes were reported by only 2 countries; recent WHO guidelines recommend the use of naloxone in emergency management of suspected opioid overdose (*15*). Compared with other WHO regions, the Eastern Mediterranean Region has the lowest proportion of countries implementing screening and brief intervention programmes. Globally, 23% of countries report that screening and brief interventions are implemented in 1-10% of primary health care services and antenatal services, while 14% of countries in the Region reported these interventions were implemented. Such programmes have been shown to be effective in addressing harmful alcohol use in primary health care settings (*16*).

The economic context varies across the countries in the Region. According to the World Bank classification, 5 are high income countries, 6 are high-middle income, 8 as low-middle income and 2 as low income countries (Table 2). Some indicators reported in this review seem to be related to the income group. For instance, all high income countries reported having a government unit/focal person as well as a budget line at the ministry of health. Among the high middle income countries, 2 reported having no budget line at the ministry of health for prevention of substance use (Jordan and Lebanon). Treatment coverage also seems to correlate with the income category. Countries that reported treatment coverage for opioid dependence of more than 20% were all high income countries, with the exception of the Islamic Republic of Iran. Harm reduction measures, such as the availability of needle/syringe exchange programmes, however, do not appear to be related to income group. Apart from the Islamic Republic of Iran and Tunisia, which are high middle income countries, needle/syringe exchange programmes are available in low and low middle income settings (Afghanistan, Egypt, Morocco, Pakistan and Palestine).

The data presented in this review are based on the Atlas project and were reported by the focal points at the ministry of health or other responsible ministry. Focal points were strongly encouraged to consult with experts in the country but external data verification was not part of the process, and this should be borne in mind when considering the findings. As already mentioned, the lack of information reported for some indicators makes it difficult to assess the treatment gaps and properly inform decisions. A few components that are essential for a comprehensive treatment package for substance use disorders, namely structured psychosocial interventions, were not surveyed in the Atlas and therefore the relevant data could not be presented in the current review.

Conclusion

The current estimates show that the burden attributable to drug use disorders in the Region is high, which highlights the importance of considering substance use and substance use disorders in health policy. Health system resources for the prevention and treatment of substance use disorders vary across countries, but remain overall insufficient to provide adequate care and treatment for people with these disorders.

Social supports, such as government benefits, housing or employment services, are rarely available for people with substance use disorders. Interventions that have proved efficient, such as pharmacotherapy or screening and brief interventions, are only available in a small number of the countries of the Region. Such services should be scaled up to be available in all parts of the country and not limited to the major cities. Information systems should be strengthened and data collected in a systematic way in order to provide the information needed for planning services and resources. More importantly, to successfully implement the Sustainable Development Goals, countries are urged to strengthen the prevention and treatment of substance use disorders, particularly by increasing the coverage of treatment interventions for substance use disorders.

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References

1. World Health Oganization. Neuroscience of psychoactive substance use and dependence. Geneva: World Health Organization; 2004.
2. World Health Organization. Global status report on alcohol and health – 2014 ed. Geneva: World Health Organization; 2014.
3. World drug report 2016. Vienna: United Nations Office on Drugs and Crime; 2016.
4. World Health Organization. Atlas: substance use in the Eastern Mediterranean Region 2015. Cairo: WHO Regional Office for the Eastern Mediterranean; 2015.
5. Degenhardt L, Whiteford HA, Ferrari AJ, Baxter AJ, Charlson FJ, Hall WD, et al. Global burden of disease attributable to illicit drug use and dependence: findings from the Global Burden of Disease Study 2010. Lancet. 2013;382(9904):1564–74.
6. Babor T, Stenius K, Romelsjo A. Alcohol and drug treatment systems in public health perspective: mediators and moderators of population effects. Int J Methods Psychiatr Res. 2008;17 Suppl 1:S50-9.
7. World Health Organization. Everybody's business. Strengthening health systems to improve health outcomes: WHO's framework for action. Geneva: World Health Organization; 2007.
8. World Health Organization. Atlas on substance use 2010: resources for the prevention and treatment of substance use disorders. Geneva: World Health Organization; 2010.
9. World Health Organization. Atlas: substance use in the Eastern Mediterranean Region 2012. Cairo: World Health Organization Regional Office for the Eastern Mediterranean; 2013.
10. World Health Organization. Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence. Geneva: World Health Organization; 2009.
11. United Nations Office on Drugs and Crime (UNODC). Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem. Vienna: UNODC; 2009.
12. World Health Organization. Global strategy to reduce the harmful use of alcohol. Geneva: World Health Organization; 2010.
13. World Health Organization. Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies. Geneva: World Health Organization; 2010.
14. World Health Organization. Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations. Geneva: World Health Organization; 2014.
15. World Health Organization. Community management of opioid overdose. Geneva: World Health Organization; 2014.
16. O'Donnell A, Anderson P, Newbury-Birch D, Schulte B, Schmidt C, Reimer J, et al. The impact of brief alcohol interventions in primary healthcare: A systematic review of reviews. Alcohol Alcohol. 2014;49(1):66–78.

Report

International drug control system and the United Nations General Assembly Special Session (UNGASS) on the world drug problem: an overview

Kamran Niaz [1]

نظام المراقبة الدولية للمخدرات والدورة الاستثنائية للجمعية العامة بشأن مشكلة المخدرات العالمية – لمحة عامة

كامران نياز

الخلاصة: يُعدّ نظام المراقبة الدولية للمخدرات أحد أقدم النظم المتعددة الأطراف القائمة على أساس توافق الآراء. ويوفّر هذا النظام الأساس للمجتمع الدولي والدول الأعضاء لتطبيق آليات فعّالة من أجل التصدي لمشكلة إنتاج المخدرات والإتجار بها وتعاطي مواد الإدمان غير المشروعة على مختلف المستويات. وفي الوقت الحالي، أوشكت كل دول العالم تقريباً على الانضمام إلى اتفاقيات مكافحة المخدرات الدولية، حيث بلغ عدد الدول الأطراف في اتفاقيات مكافحة المخدرات الدولية الثلاثة ما يزيد على 180 دولة. ويعدّ هذا المستوى من توافق الآراء مثيراً للإعجاب نظراً لما يتسم به الموضوع من طابع خلافي للغاية. ونظراً لأن حالة المخدرات العالمية لا تزال ديناميكية للغاية، فإن النظام المتعدد الأطراف بإمكانه التكيف والتجاوب مع تغير الحال بمرور السنين. ويلخص هذا التقرير لمديري الرعاية الصحية بعضاً من تلك التطورات وآثارها عقب الدورة الاستثنائية للجمعية العامة فيما يتعلق بوضع السياسات وتحديد التحديات والأولويات التي تسترشد بها عمليات الاستجابة الرامية إلى التصدي لحالة المخدرات وتحقيق الغايات المحددة لعام 2019 وبلوغ خطة التنمية المستدامة لعام 2030.

ABSTRACT The international drug control system is one of the oldest consensus-based multilateral systems in existence. It provides the basis for the international community and the individual Member States to effectively put in place the mechanisms to address the problem of drug production trafficking and use of illicit substances at different levels. Currently, the international drug control conventions enjoy near universal adherence, with over 180 states party to the three international drug control conventions. This level of consensus is impressive given the highly contentious nature of the subject matter. Since the global drug situation remains very dynamic, the multilateral system has the ability to adjust and respond to the changing situation over the years. This report summarizes for healthcare managers those developments and their implications post UNGASS for the development of policies and in identifying the challenges and priorities for their responses to address the drug situation in order to achieve the targets set for 2019 and the 2030 agenda for sustainable development.

Système international de contrôle des drogues et session extraordinaire de l'Assemblée générale des Nations Unies sur le problème mondial de la drogue : présentation générale

RÉSUMÉ Le système international de contrôle des drogues est l'un des plus anciens systèmes reposant sur un consensus multilatéral. Il constitue la base qui permet à la communauté internationale et aux États Membres à titre individuel d'établir des mécanismes efficaces pour s'attaquer au problème de la production et du trafic de drogue, ainsi que de la consommation de substances illicites à différents niveaux. Actuellement, les conventions internationales sur le contrôle des drogues jouissent d'une adhésion quasi universelle, avec plus de 180 états parties aux trois conventions internationales sur le contrôle des drogues. Le degré de consensus est considérable eu égard au caractère grandement controversé de la question. La situation mondiale de la question de la drogue subissant des changements perpétuels, le système multilatéral permet d'opérer des ajustements et de s'adapter à cette situation en rapide évolution au fil des années. Le présent article synthéthise, à l'intention des gestionnaires des soins de santé, ces évolutions et les implications qu'elles auront pour la période succédant la session extraordinaire de l'Assemblée générale des Nations Unies en termes d'élaboration de politiques futures ainsi que pour identifier les défis et les priorités dans leurs interventions pour faire face à la situation de la drogue sur la voie de la réalisation des cibles établies pour 2019 et du programme des objectifs de développement durable pour 2030.

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Introduction

It has been over a century since the first international gathering to take stock of the global drug situation, emanating at that time from misuse of opium in China and its implications on other countries. Since then the world community have adopted different conventions that provide the legislative and normative framework for the control of the production, trafficking and misuse of the substances of concern while ensuring that these are available for medical and scientific purposes. Through intergovernmental processes under the aegis of the United Nations the international community has also developed consensus-based measures that are based on the principles of shared responsibility, in developing policies and responses to address the global drug problem, and in protecting the health of people. This report aims to provide for healthcare managers an objective overview of international developments in order to enable them to reflect and objectively review their own national policies and programmes in light of these international measures.

Historical Development

The Shanghai Opium Commission, 1909

The first international conference to discuss the world's narcotics problem was convened in February 1909 in Shanghai, China. The Shanghai conference was convened as a result of the concerns shown by the opium epidemic in China and the import of opium from British India. The conference was attended by 13 states which for the first time discussed international drug control measures. This forum became known as the Opium Commission and it laid down the ground work for the elaboration of the first international drug treaty, the International Opium Convention of The Hague, which was held in 1912 (*1*).

The Hague Convention

The recommendations that were made in Shanghai were enshrined in the first legally binding, multilateral treaty in January 1912 – the International Opium Convention that was signed in The Hague. Parties to the Hague Convention agreed to control the production and distribution of opium and to impose limits on the manufacture and distribution of morphine, heroin, cocaine and the derivatives of these substances. The Convention also imposed a mandatory system of record keeping of the production and distribution of controlled substances on the Parties that had signed the Convention. The principle of allowing the use of drugs for medical and scientific purposes was enshrined in the international law for the first time. Since it required that all signatory states should ratify the convention, it eventually came into force after seven years as "the 1919 Treaty of Versailles" (*1*).

Conventions between 1920–1960

In 1920 the international drug control came under the auspices of the League of Nations, and in the pursuing years further international drug control treaties were enacted under its auspices. These include:

- The International Opium Convention that was signed in Geneva in 1925 and included measures such as the furnishing of statistics on the production and stocks of opium and coca leaf; and the system of import certificates and export authorizations for licit international trade in controlled drugs and controls over "Indian hemp"; as cannabis was referred to at that time (*1*).
- The Convention for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs was signed in Geneva in 1931. This convention limited the world manufacture of narcotics drugs to the amounts needed for medical and scientific purposes by introducing a mandatory system of estimates.
- The Convention of 1936 for the Suppression of the Illicit Traffic in Dangerous Drugs signed in Geneva became the first international instrument to make certain drug offences international crimes.
- The Protocol for "Limiting and Regulating the Cultivation of the Poppy Plant, the Production of, International and Wholesale Trade in, and Use of Opium" was signed in New York in 1953 under the auspices of the United Nations and introduced strict provisions on the consumption of opium for non-medical purposes, the production, export and stockpiling of raw opium.

Single Convention on Narcotic Drugs, 1961, as amended by the 1972 Protocol

The 1961 Convention merged all existing multilateral treaties in the drugs field, in order to streamline the mechanisms of drug control and to extend the existing control system to the cultivation of plants grown as the raw material for narcotic drugs. Under the Single Convention control was exercised over 119 narcotic drugs, mainly natural products, such as opium and its derivatives, morphine, codeine and heroin, but also synthetic drugs such as methadone and pethidine, as well as cannabis and coca leaf. Its aim, as with the previous treaties, was to ensure the provision of adequate supplies of narcotic drugs for medical and scientific purposes, to prohibit all non-medical consumption of such drugs, and to prevent the diversion of such drugs into the illicit market. The 1972 Protocol that amended the Single Convention on Narcotic Drugs of 1961 included provisions for increased efforts to prevent the illicit production of, traffic in and use of narcotic drugs and to provide treatment and rehabilitation services for drug users. In accordance with the provisions of the Convention, the production and

distribution of controlled substances had to be licensed and supervised, and governments are required to provide estimates and statistical returns to the International Narcotics Control Board (INCB) on the quantities of drugs required, manufactured and utilized and the quantities seized by police and customs officers (*1,2*).

Convention on Psychotropic Substances, 1971

The 1971 Convention established an international control system for psychotropic substances such as central nervous stimulants, sedative-hypnotics and hallucinogens, the misuse of which had resulted in public health and social problems in countries. The 1971 convention came into effect in response to the diversification and expansion in the spectrum of drugs used for abuse due to the number of synthetic substances.

By implementing the provisions of the Convention, parties to the 1971 Convention comply with the dual aim of 1) limiting the use of psychotropic substances to medical and scientific purposes, and 2) ensuring their availability for those purposes. The number of substances placed under control continues to increase; as of January 2017, 130 psychotropic substances are controlled under the 1971 Convention (*3*). Substances included in the Schedule I of the convention are to be made available only for scientific and limited medical purposes by duly authorized persons, while schedule 2 substances have little to moderate therapeutic usefulness and whose liability to abuse constitutes a substantial risk to public health. Substances placed in Schedule III are those whose liability to abuse constitute a substantial risk to public health and have moderate to great therapeutic usefulness. Finally, substances under Schedule IV are those whose liability to abuse constitutes a smaller but still significant risk to public health and which have a therapeutic usefulness from little to great (*4*). Under the 1971 conventions governments must provide statistical returns on manufacture, imports and exports of these psychotropic substances within the four schedules to INCB. Essentially, under the 1961 Convention narcotic drugs were considered hazardous until it was proved otherwise; psychotropic drugs remained uncontrolled unless WHO through the work of its Expert Committee on Drug Dependence (ECDD) advised there was "substantial evidence" that they were liable to abuse or constituted a public health and social problem that would warrant their placement under international control. However, under article 2 of the 1971 Convention, the final decision to place them under international control is taken within the Commission on Narcotics Drugs (CND) (*4*).

United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988

The 1961 and the 1971 Conventions had not addressed the issues of the growing threat and involvement of transnational organized crime, drug trafficking and money laundering. The aims of the 1988 Convention therefore were to harmonize the definition and scope of drug offences at the global level; to improve and strengthen international cooperation and coordination among the relevant authorities; and to provide them with the legal means to interdict international drug trafficking more effectively. Compared with the other two conventions, the 1988 Convention is a more practical, "hands-on" legal instrument, with specific recommendations on the use of law enforcement techniques (*5*).

Key provisions of the current international drug control conventions and implications for national policies and laws

This section addresses some of the key provisions of the three international drug conventions. In particular, it indicates how these provisions need to be reflected in the national policy and responses in ensuring the availability of narcotic drugs and psychotropic substances for scientific and medical purposes, while ensuring their misuse and diversion (*6*).

Drug control system protecting the health of people

To reiterate, the Conventions had envisioned protecting public health by providing a legislative and normative framework that addresses the use of controlled narcotics drugs and psychotropic substances within qualified clinical interventions; i.e., the controlled substances should be used under the responsibility of medical doctors or licensed health professionals to avoid substantial health and security challenges to individuals and communities.

Ensure availability of controlled drugs for medical purposes

The preamble to the Conventions stipulates the availability of and access to essential drugs for the people in need as the primary aim of the international drug control system (*5*). Thus the Conventions call for and guarantee the availability of essential drugs for medical interventions as "indispensable" tools for the treatment of a variety of medical conditions, particularly pain management and many psychiatric and neurological conditions. While the countries aiming at protecting the health and welfare of the people, prevent the misuse

of substances that is not for medical or scientific purposes, they should not create barriers to their appropriate clinical utilization (*7*).

As also stated by WHO, the rational use of controlled medicines – i.e. medicines controlled under the international drug treaties – is crucial to health. Their appropriate medical prescription and administration are essential aspects of good medical practice for pain treatment and other clinical interventions (*6,8*).

Drug users are not criminals who require punishment

Drug use disorder is considered by science to be a multi-factorial chronic disease affecting the brain. The repeated exposure to drugs, genetic predispositions and adverse live experiences contribute to the changes in brain function and constitute the neurobiological basis for the development of addictive behaviours (*9*).

The Conventions aim to protect the human rights of people including that of children and adolescents and other vulnerable populations from the dangerous effects of controlled substances, and from the health and social consequences of drug use disorders. The Conventions therefore repeatedly call for social cohesion and the reintegration of drug users, and do not treat people who use drugs and those suffering from drug use disorders as criminals to be marginalized. The treaties recognize the right to health as essential and that those affected by use of drugs, in particular people with drug use disorders, do not need punishment but social protection, health care and social reintegration.

The 1961 Convention (Article 36 para. 1.b) clearly states that, "… when abusers of drugs have committed such offences, the Parties may provide, either as an alternative to conviction or punishment or in addition to conviction or punishment, that such abusers shall undergo measures of treatment, education, aftercare, rehabilitation and social reintegration." A similar provision is included in the 1971 Convention (Article 22 para. 1b). Therefore, the Conventions do not absolutely require the punishment of possession, purchase or cultivation for personal use. Similarly, treatment as an alternative to prison and punishment is mentioned in many provisions of the Conventions, clearly indicating that such people suffering from drug use disorders need not be punished criminally and be provided science-based interventions.

Requires implementation of qualified interventions for prevention of drug use and treatment of drug dependence

The Conventions emphasize that prevention of illicit drug use and treatment of drug use disorders cannot rely on spontaneous and unqualified initiatives and recognize the necessity to train qualified professionals in these fields. The interventions must be based upon appropriate scientific methods, evidence-based, cost-effective, and to be delivered by well-trained health and social professionals (*10*).

The lack of measurable results or the impossibility to compare results because of unqualified and spontaneous initiatives have reduced the confidence of politicians and policy-makers in drug demand reduction activities, in turn negatively affecting the resources made available by and for the countries in this area.

Declaration on the Guiding Principles of Drug Demand Reduction

Having adopted the legislative and normative framework of the drug control systems, the need was felt to adopt some principles that would guide the development of national strategies with regard to drug demand reduction and other measures to address the global drug problem. At the 20th special session of the UN General Assembly in June 1988 the Member States for the first time discussed the issue and as a result adopted the Political Declaration on countering the world drug problem.

In contrast to the Conventions, the Declaration provided States with the principles on which to design their national strategies with regard to demand reduction (*11*). Most importantly the declaration stipulated that while observing cultural and gender sensitivities a balanced approach between demand reduction and supply reduction strategies was needed.

Paragraph 5 of the Declaration stipulated that "drug demand reduction" programmes should be part of a comprehensive strategy and integrated to promote cooperation among all concerned (stakeholders), should include a wide variety of appropriate interventions, promote health and social well-being among individuals, families and communities and reduce the adverse consequences of drug abuse of the individual and for the society as a whole."

In Paragraph 7 of the Declaration, the Member States "Pledge a sustained political, social health and educational commitment to investing in demand reduction programmes that will contribute towards reducing public health problems, improving individual health and well-being, promoting social and economic integration, reinforcing family systems and making communities safer."

Political declaration and plan of action 2009

At the high-level segment of the 52nd session of the CND, held in March 2009, Member States evaluated the progress made since 1998 towards meeting the goals and targets established at the 20th special session of the General Assembly. They also identified future

priorities and areas requiring further action and established goals and targets for drug control beyond 2009. This was expressed in the Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem (*12*).

In the 2009 Political Declaration the Member States reaffirmed "the Political Declaration adopted by the General Assembly at its twentieth special session" and further reiterated the commitment of Member States, in full conformity with the purposes and principles of the United Nations Charter "to promote, develop, review or strengthen effective, comprehensive, integrated drug demand reduction programmes, based on scientific evidence and covering a range of measures, including primary prevention, early intervention, treatment, care, rehabilitation, social reintegration and related support services, aimed at promoting health and social well-being among individuals, families and communities and reducing the adverse consequences of drug abuse for individuals and society as a whole."

The Plan of Action identified the following 8 areas for the Member States to focus their attention while planning for drug demand reduction policy and programmes:

1. Address human rights, dignity and fundamental freedoms in the context of drug demand reduction
2. Develop demand reduction measures based on scientific evidence and a multidisciplinary approach
3. Ensure availability and accessibility of demand reduction services
4. Mainstream community involvement and participation in demand reduction programmes
5. Target vulnerable groups and conditions (e.g. children, adolescents, vulnerable youth, women including pregnant women, people with medical and psychiatric comorbidities, ethnic minorities, and socially marginalised individuals)
6. Address issues of drug use disorders in the criminal justice system through either alternatives to prosecution or imprisonment and provision of drug dependence treatment and care services within the criminal justice systems.
7. Address issues of quality standards and adequate training of staff for delivery of services.
8. Ensure data collection to understand the changing nature and the extent of drug use and monitoring and evaluation of the implemented programmes.

Furthermore the Plan of Action encouraged Member States to develop treatment systems offering a wide range of integrated and evidence informed pharmacological interventions such as opioid agonist and antagonist treatment and psychosocial interventions such as counselling, cognitive behavioural therapy and social support (*12*).

Considering the HIV epidemic among people who inject drugs, the Plan of Action also called for addressing the adverse consequences of drug abuse for individuals and society as a whole, taking into consideration not only the prevention of related infectious diseases, such as HIV, hepatitis B and C and tuberculosis, but also all other health consequences, such as overdose, workplace and traffic accidents, somatic and psychiatric disorders, and social consequences such as family problems, the effects of drug markets in communities and the resulting crimes (*12*).

The Plan of Action also emphasized the need to develop a broad range of science-based interventions that would serve to address the needs and challenges faced by vulnerable groups. Considering the new challenges posed by new psychoactive substances, the Plan also emphasized the need to deepen knowledge on identification, the trends and possible health consequences and other impacts of the new psychoactive substances.

Midterm Review of the Plan of Action and preparations for UNGASS 2016

In March 2014, the Commission on Narcotics Drugs in its 57th Session conducted a high-level review of the implementation of the Political Declaration and Plan of Action 2009 and adopted a Joint Ministerial Statement on the mid-term review of the implementation by Member States of the Political Declaration and Plan of Action. The Statement determines the progress achieved and challenges faced in its implementation (*6*).

In the Statement the Member States recognized that drug use disorder is a health problem and while many Member States had adopted such measures, it encouraged other countries to adopt national drug strategies with drug demand reduction components that include the main elements of demand reduction identified earlier. Most importantly, realizing the disparity in availability and access of controlled substances for medical purposes in most parts of the world, the Statement also called for the countries to address that situation of low to nonexistent availability of internationally controlled drugs for medical and scientific purposes, particularly for the relief of pain and for palliative care.

In its 58th session in March 2015, the CND conducted a special segment on the preparations for the special session of the General Assembly on the world drug problem to be held in 2016. The deliberations outlined the five thematic areas for interactive discussions during the United Nations General Assembly Special Session (UNGASS) 2016 on drugs that would be devoted to demand and supply reduction, cross-cutting issues and new challenges as well as new developments. CND also

produced a substantive, concise and action-oriented document comprising a set of operational recommendations termed as the "Outcome Document" for adoption of the UNGASS plenary in 2016.

Sustainable Development Goals

In September 2015, the world leaders also adopted the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development. The SDGs recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection (*13*). Within these, Goal 3 aims to ensure healthy lives and promote well-being for all at all ages. Target 3.5 of the Goal aims to "Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol". Thus, for the first time addressing the prevention of substance use and treatment of substance use disorders has been recognized as an integral component of health for all within the aims of promoting sustainable development.

United Nations General Assembly Special Session 2016

In April 2016, the Member States convened another special session of the General Assembly to review the progress made in implementing the Political Declaration and the Plan of Action and adopted the outcome document entitled, "Our joint commitment to effectively addressing and countering the world drug problem". The global leaders reaffirmed their commitment to the goals and objectives of the three international drug convention including the health and welfare of humankind as well as the determination to prevent and treat the abuse of substances. The global leaders also resolved to reinforce national and international efforts and further increase international cooperation to face the challenges faced in addressing the world drug problem (*9*).

The outcome document through operational recommendations outlines the essential elements of the interventions to address different aspects of the world drug problem. For prevention of drug use, among others, the outcome document calls for the need for scientific evidence-based prevention measures and tools that target the relevant age and risk groups in multiple settings as also outlined in the International Prevention Standards (*10*). With regard to treatment of drug use disorders and health consequences, the Member States expressed the need to promote the International Standards for Treatment (*9*). They also reiterated the need to develop and implement treatment systems, giving special attention to the specific needs of women, children and youth, and ensure the access to a range of interventions including psychosocial, behavioural and medication-assisted treatment, as well as to rehabilitation, social reintegration and recovery-support programmes, including access to such services in prisons and after imprisonment. The operational recommendations also reiterate minimizing the adverse public health and social consequences of drug use, including appropriate medication-assisted therapy programmes, injecting equipment programmes, as well as antiretroviral therapy and other relevant interventions that prevent the transmission of HIV, viral hepatitis and other blood-borne diseases associated with drug use.

With regard to ensuring the availability of and access to controlled substances for medical and scientific purposes, the Member States called for addressing the existing barriers including those related to legislation, regulatory systems, health-care systems, affordability, the training of health-care professionals, education, awareness-raising, estimates, assessment and reporting, benchmarks for consumption of substances under control, while preventing their diversion, abuse and trafficking. Finally it encourages member states to promote and improve the systematic collection and sharing of information on reliable and comparable data on drug use and epidemiology including on social, economic and other risk factors (*14*).

Conclusions

The International Drug Control Conventions and the multilateral processes under the auspices of United Nations and its affiliates have served the basis of providing the framework for rights and health based approach to countering the world drug problem. An approach that ensures science and evidence informed interventions are available and accessible to population in need of those interventions as well as ensuring the availability and accessibility of controlled medicines for pain management and palliative care. The UNGASS 2016 has further provided the opportunity to take stock of the situation and determine the priority actions to address the world drug situation to be reviewed again in 2019. In order for these intergovernmental processes to have the intended impact, it is imperative that policy makers and health managers at national levels ensure that the key elements of a balanced and a health based approach that have been outlined in these processes are adopted and implemented.

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References

1. United Nations Office on Drugs and Crime (UNODC). A century of international drug control. Vienna: UNODC; 2010 (https://www.unodc.org/documents/data-and-analysis/Studies/100_Years_of_Drug_Control.pdf, accessed 4 April 2017).
2. United Nations. Single convention on narcotic drugs, 1961. New York: United Nations; 1961 (https://www.unodc.org/pdf/convention_1961_en.pdf, accessed 4 April 2017).
3. International Narcotics Control Board. Psychotropic substances (INCB). Vienna: INCB; 2017 (https://www.incb.org/incb/en/psychotropic-substances/index.html, accessed 4 April 2017).
4. United Nations. Convention on psychotropic substances, 1971. New York: United Nations; 1971 (https://www.unodc.org/pdf/convention_1971_en.pdf, accessed 4 April 2017).
5. United Nations Office on Drugs and Crime (UNODC). The international drug control conventions. Vienna: UNODC; 2013 (https://www.unodc.org/documents/commissions/CND/Int_Drug_Control_Conventions/Ebook/The_International_Drug_Control_Conventions_E.pdf, accessed 4 April 2017).
6. United Nations Office on Drugs and Crime (UNODC). Drug policy provisions from the international drug control conventions. Vienna: UNODC; 2014 (https://www.unodc.org/documents/commissions/CND/CND_Sessions/CND_57/E-CN7-2014-CRP05_V1400819_E.pdf, accessed 4 April 2017).
7. International Narcotics Control Board. Report of the International Narcotics Control Board on the availability of internationally controlled drugs: ensuring adequate access for medical and scientific purposes. Vienna: INCB; 2010 (https://www.unodc.org/documents/lpo-brazil/noticias/2011/03-marco/Jife/Report_of_the_Board_on_the_availability_of_controlled_substances.pdf, accessed 4 April 2017).
8. World Health Organization. Ensuring balance in national policies on controlled substances: guidance for availability and accessibility of controlled medicines. Geneva: World Health Organization; 2011 (http://www.who.int/medicines/areas/quality_safety/guide_nocp_sanend/en/, accessed 4 April 2017).
9. United Nations Office on Drugs and Crime (UNODC). International standards for the treatment of drug use disorders. Vienna: UNODC; 2016 (https://www.unodc.org/documents/commissions/CND/CND_Sessions/CND_59/ECN72016_CRP4_V1601463.pdf, accessed 4 April 2017).
10. United Nations Office on Drugs and Crime (UNODC). International standards on drug use prevention. Vienna: UNODC; 2015 (https://www.unodc.org/documents/prevention/UNODC_2013_2015_international_standards_on_drug_use_prevention_E.pdf, accessed 4 April 2017).
11. United Nations. Political Declaration. New York: United Nations; 1988 (http://www.unodc.org/documents/commissions/CND/Political_Declaration/Political_Declaration_1998/1998-Political-Declaration_A-RES-S-20-2.pdf, accessed 4 April 2017).
12. United Nations Office on Drugs and Crime (UNODC). Political declaration and plan of action on international cooperation towards an integrated and balanced strategy to counter the world drug problem. Vienna: UNODC; 2009 (https://www.unodc.org/documents/ungass2016/V0984963-English.pdf, accessed 4 April 2017).
13. United Nations. The sustainable development agenda. New York: United Nations; 2016 (http://www.un.org/sustainabledevelopment/development-agenda/, accessed 4 April 2017).
14. International Narcotics Control Board. Availability of internationally controlled drugs: ensuring adequate access for medical and scientific purposes. Vienna: INCB; 2016 (http://www.incb.org/documents/Publications/AnnualReports/AR2015/English/Supplement-AR15_availability_English.pdf, accessed 4 April 2017).

Out-of-pocket cost of drug abuse consequences: results from Iranian National Mental Health Survey

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التكلفة الشخصية للعواقب الناجمة عن تعاطي المخدرات: نتائج مسح الصحة النفسية الوطني الإيراني

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الخلاصة: ينطوي تعاطي المخدرات على تكلفة كبيرة للفرد والأسرة والمجتمع. تهدف الدراسة الحالية إلى تقييم التكاليف الشخصية الناجمة عن الاضطراب الناجم عن تعاطي المخدرات. واستُمدت البيانات من مسح الصحة النفسية الإيراني عن طريق إجراء مقابلات مباشرة مع 7841 مستجيب للمسح، تراوحت أعمارهم بين 15 و64 عاماً. واستخدمنا أسلوب حساب تصاعدي لتكلفة المرض لأغراض التحليل الاقتصادي. وتم تقييم التكاليف الشخصية لعلاج المشكلات النفسية ومشكلات المخدرات، وتكلفة علاج الأمراض، إلى جانب تكاليف الجرائم. ولقد بلغ متوسط إجمالي المصروفات السنوية 2120.6 دولاراً أمريكياً للمصابين باضطراب ناجم عن تعاطي المخدرات، ما مثّل 23.5٪ من الدخل السنوي للأسرة الإيرانية العادية في عام 2011. كما بلغ متوسط إجمالي التكلفة الشخصية 674.6 دولاراً أمريكياً لمن يعانون من اضطرابات عقلية أخرى و421.9 دولاراً أمريكياً لمن لا يعانون من اضطراب عقلي. وأُبلغ عن صرف مبالغ لمواجهة الكوارث في 47.6٪ من حالات المرضى الذين يعانون من اضطراب ناجم عن تعاطي المخدرات و14.4٪ ممن يعانون من اضطرابات عقلية أخرى. وبذلك، تُنفق مبالغ كبيرة من موارد الأسرة على العواقب الناجمة عن تعاطي المخدرات.

ABSTRACT Drug abuse has significant cost to the individual, the family and the society. This study aimed to assess out of-pocket costs of consequences of drug use disorder. Data were drawn from the Iranian Mental Health Survey (IranMHS) through face-to-face interviews with 7841 respondents aged 15–64 years. We used a bottom-up cost-of-illness method for economic analysis. Out-of-pocket costs for treatment of mental and drug problems, treatment of medical illnesses, as well as costs of crimes were assessed. The average of total annual expense was US$ 2120.6 for those with drug use disorder, which was 23.5% of annual income of an average Iranian family in the year 2011. The average of total out-of-pocket cost was US$ 674.6 for those with other mental disorder and US$ 421.9 for those with no mental disorder. Catastrophic payment was reported in 47.6% of the patients with drug use disorder and 14.4% of those with other mental disorder. Thus, considerable amount of family resources are spent on the consequences of drug use.

Coût des paiements directs engendrés par l'abus de substances psychoactives : résultats de l'enquête nationale iranienne sur la santé mentale

RÉSUMÉ L'abus de substances psychoactives entraîne un coût important pour les individus, les familles et la société. La présente étude avait pour objectif d'évaluer le coût des paiements directs engendrés par les troubles liés à l'utilisation de substances psychoactives. Les données ont été extraites de l'enquête nationale iranienne sur la santé mentale au moyen d'entretiens en face à face avec 7841 participants âgés de 15 à 64 ans. Nous avons utilisé une méthode du coût de la maladie de type ascendant pour l'analyse économique. Les coûts des paiements directs pour le traitement des troubles mentaux ou des problèmes de drogue, le traitement des maladies, ainsi que les coûts engendrés par les crimes ont été évalués. La moyenne des dépenses annuelles totales était de 2120,6 dollars US pour les personnes atteintes de troubles liés à l'utilisation de substances psychoactives, soit 23,5 % du revenu annuel d'une famille iranienne moyenne pour l'année 2011. Le coût total moyen des paiements directs était de 674,6 dollars US pour ceux souffrant de troubles mentaux, et de 421,9 dollars US pour ceux exempts de troubles mentaux. Des dépenses catastrophiques ont été rapportées pour 47,6 % des patients souffrant de troubles liés à l'utilisation de substances psychoactives, et pour 14,4 % de ceux souffrant d'autres types de troubles mentaux. Une part considérable des ressources des familles est donc dépensée du fait de l'utilisation de substances psychoactives.

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Introduction

In the Islamic Republic of Iran, prevalence of drug use disorder (DUD) is higher than the global average. It is mainly because of opioids being the most common drug of use in the Islamic Republic of Iran (*1*) in comparison to most other countries where cannabis is the most commonly used drug (*2*). In the past 15 years, drug use, mainly injecting drug use has contributed significantly to infectious diseases like HIV infection and viral hepatitis (*3–5*). Drug abuse is also associated with other psychiatric comorbidity, criminal behaviour and violence (*1*). There is evidence that the burden of DUD has increased during recent decades in the Islamic Republic of Iran (*6*).

Drug abuse imposes significant costs on the individual, families and society. These include costs of illness, injury, crime, loss of productivity and early death. Costs of drug abuse consequences can be classified into several categories (*7–9*): 1) direct costs that include costs of treatment (i.e., drug costs, costs of treatment of other mental health comorbidity, and costs of other medical diseases and social costs (i.e., crime-related costs, and costs for compensating impairment in usual roles and functions); and 2) indirect cost of premature mortality and work absenteeism. There might be other costs, such as intangible costs, which are not included in these categories. These costs might be covered by those with DUD and their families, government, insurance companies, charities and other sectors.

In this paper we present the first national estimates of out-of pocket costs of drug abuse consequences for all the above categories, using the data from Iranian National Mental Health Survey (IranMHS). IranMHS was a household survey that included a national representative sample of those with DUD, those with other mental disorder (MD) and those with no MD. Out-of pocket costs of several main consequences of DUD over the past 12 months were assessed in the survey using a bottom-up cost-of-illness study method. The results were compared in the three groups.

Methods

IranMHS was a cross-sectional household survey with a representative sample of the Iranian population aged 15–64 years. It was conducted to assess the 12-month prevalence and severity of psychiatric disorders in the Iranian adult population and to determine the pattern of healthcare utilization and cost of services.

Sample

The participants were selected from a 3-stage clustered sample of non-institutionalized household residents. Those who were unable to understand Farsi (the official and widely used language in the Islamic Republic of Iran) or people with severe medical or psychiatric illness, which made them unable to respond to the questions, and those with non-Iranian nationalities, were excluded.

Field procedures

The data collection was carried out by a cohort of 232 trained interviewers. Interviewers had a minimum of BA in psychology and some clinical experience and were familiar with the culture and language of the geographical area. They underwent intensive training specifically on administration of Composite International Diagnosis Interview (CIDI) using a standard protocol developed by the World Health Organization, and on the other subjects including general interview techniques, proper administration of the other questionnaires, ethical considerations, sampling and field work. The field work was carried out between January and June 2011 through a face-to-face interview and a total of 7886 individuals completed the interview. Almost all data were collected through a face-to-face interview with the selected participants except data on cost of the services, which was provided by the most informed member of the household. Strict quality control procedures were applied at all stages of the field work and data entry, as described previously (*10*).

Measures

Mental disorders

To assess psychiatric disorders including drug and alcohol use disorders, we applied CIDI version 2.1. It is a fully structured diagnostic interview based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and International Classification of Diseases – 10th Revision (ICD-10). The Persian version of the paper and pencil interview form (PAPI) of CIDI 2.1 had been validated and had shown adequate psychometric properties in a clinical setting (*11*) and in the Iranian general population (*10,12*).

Twelve-month substance use disorders including abuse or dependence to alcohol, cannabis, opioids, amphetamine-type stimulants, hallucinogens, inhalants and other drugs such as cocaine were examined by CIDI 2.1. Other psychiatric disorders consisted of mood disorders including major depressive disorder, dysthymia, bipolar I disorder; anxiety disorders including panic disorder (with and without agoraphobia), agoraphobia without panic, obsessive–compulsive disorder, social phobia, and post-traumatic stress disorder were also assessed by the same instrument. Due to inadequate psychometric properties of CIDI 2.1 for assessing psychotic disorders, a 2-stage procedure was used for detection of any psychotic disorders: screening using the G section of the CIDI 2.1 and then interview by a psychiatrist using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I). The Persian translation of SCID had shown acceptable to good reliability and validity indices (*13,14*).

Details of the procedure applied for assessing psychotic disorders and dealing with non-response and missing data were published elsewhere (*10,15*).

Service utilization

We developed a questionnaire for assessing service utilization, mainly based on 2 other instruments: Services section of the World Mental Health Survey, and the questionnaire used in the Health Services Utilization Study of Iran. Next, it was modified culturally and tailored according to the existing mental healthcare services in the Islamic Republic of Iran. It consisted of an inventory, which included the following items.

(1) Service use due to mental and drug problems in the past 12 months:

- Health care: inpatient (hospitalization and short-term stay for residential treatment) and outpatient services, pharmacies, and harm reduction services from drop-in centres; by type of health care setting, including drug treatment facility and by provider;
- Non-health care: self-help groups and traditional services.

(2) Healthcare service use due to medical problems:

- inpatient services in past 12 months
- outpatient services in past 2 weeks

Face and content validity and inter-rater reliability of the service use questionnaire were evaluated in the preliminary phase of the IranMHS and described elsewhere (*10*).

Out-of-pocket costs and economic analysis

We used a bottom-up cost-of-illness method for economic analysis. In this method, cost data are collected by people with a certain disease, assessing their individual cost by interview or review of their medical records. Next, the mean cost per person is multiplied by the number of persons to estimate the total cost (*16*). For assessing out-of-pocket cost of services, a series of questions according to the type of service was added to the end part of the questionnaire on service utilization. The costs assessed in this study included costs for treatment, social costs and indirect costs.

(1) Out-of-pocket costs for treatment.

- Health costs of inpatient care: the payments for all events of inpatient treatment for mental and drug use problems and the last hospitalization for medical reasons were measured, if it was in the past 12 months. Then, in order to calculate the 12-month costs of all hospitalizations for medical reasons, the payment for each hospitalization was multiplied by the number of hospitalizations of each individual in the last 12 months. The payments for inpatient care included the bills for the centres, as well as any separate bill paid for the physicians, medications or medical supplies during the hospitalization period.
- Health costs of outpatient care: a list of items was provided to those who had used the service and the respondents were asked to report the exact payment for the item. The items included payment for a therapist's visit, medication, counselling and psychotherapy, psychometric tests, and the costs of any referrals by the therapist for laboratory tests; electroencephalography; evoked potential, body and brain scans; radiology; sonography; electrocardiography and other cardiac diagnostic tests; gastrointestinal examinations; outpatient electroconvulsive therapy; and other costs. Healthcare cost for mental and medical problems were gathered by questioning the payments for using the services in the past 3 months, and past 2 weeks, respectively; then the payments were multiplied by 4 or 26 to calculate the 12-month costs, respectively.
- Other health costs: this included costs of medication when the individual attended a pharmacy, or any cost for receiving harm reduction services from drop-in centres.
- Non-health costs of using any of the above health services: the costs included costs of transportation, as well as accommodation of the family, if the location of service was out of the city/village of the individual.
- Non-health care costs: it included costs of self-help groups and traditional services, as well as transportation and accommodation.

(2) Out-of-pocket social costs: social costs in the past 12 months included payment of fines set by courts, and costs related to the police and prisons.

(3) Indirect costs have been defined as the value of the days of work lost due to absenteeism in the past 12 months. They were assessed by asking the individuals about the number of days out of work due to mental problems and their average wage for 1 day.

Data on costs were collected and calculated in Iranian rial and are presented in the text and tables in US$ (2011). All currency conversions were conducted post-analysis based on the average official exchange rates for 2010, which was 10 290 Iranian rial for each US$1.00 (*17*).

Catastrophic payment: with a series of questions we assessed the financial burden of the mental disorder imposed on the respondent or the family. This indicator was assessed for 2 situations: 1) psychiatric hospitalization in the past 12 months; and 2) general financial burden of the mental disorder in the past 12 months. When the person/family spent their savings, sold their assets or borrowed money for treatment/compensation of the disease it was defined as catastrophic payment.

Statistical analysis

Survey weights were used in all analyses. The consolidated weights were the joint product of inverse probability of unit selection into the sample (w1), non-response weights (w2) and post-stratification weights (w3). w1 included weighting by the number of eligible individuals in each household and w3

was calculated by dividing the proportion of individuals in each stratum in the 2006 National Census by the proportion of the same group in the sample. Based on 5-year age groups, sex and urbanicity status in each of 31 country provinces, 1240 post-stratification weights were generated. All the results are based on complex sample survey analysis, in which, provinces are considered as strata and blocks as clusters. Principle component analysis of household asset data was applied to create a socioeconomic status indicator for each household, which was categorized into 3 levels with approximately equal numbers of individuals: low, middle and high. Analyses were conducted using STATA version 12 (STATA Corporation, College Station, TX, USA). All findings presented in this paper, including percentages and costs are weighted and are provided for the DUD, other MD and no MD groups.

Ethical considerations

The research protocol was approved by the Ethics Committee of Tehran University of Medical Sciences in Iran (No. IR.TUMS.REC.1394.1900). Informed consent was obtained from all participants. They could refuse to respond to any question. The interviews had to be held in privacy. Data processing and analysis were done anonymously.

Results

A total of 9150 individuals were approached by interviewers and 7886 (86.2%) agreed to participate. These included 3387 (42.9%) men and 4499 (57.1%) women. Characteristics of the study sample have been described elsewhere (*15*). A total of 7841 individuals (85.7%) completed the drug section of CIDI, of whom, 2.1% met the DSM-IV criteria for 12-month DUD and 21.4% met the criteria for other MD. Those with DUD were more likely to be unemployed and be from lower socioeconomic groups and less likely to have a supplementary health insurance than those with other or no MD (Table 1).

Service utilization

One hundred (67.3%) of those with DUD and 914 (50.4%) of those with other MD had used any kind of health or non-health services for mental or drug problems in the past 12 months. Receiving inpatient care and attending self-help groups were higher in those with DUD than those with other MD (14.9% vs 1.2% and 30.1% vs 1%), respectively. Using pharmacies and traditional services was also more common in those with DUD (40.7% vs 23.5% and 40.5% vs 24.7%), respectively. However, utilizing outpatient service for mental/drug problems was almost equal in the two groups (29% and 29.4%) (Table 2).

Hospitalization for medical reasons in the past 12 months was higher in those with DUD (14.3%) and other MD (10.2%) than in those with no MD (7%). Outpatient service use for medical reasons was higher in those with DUD (28.4%) and other MD (28.9%) than those with no MD (20%) (Table 2).

Out-of-pocket cost for treatment

Costs for mental health care in the past 12 months, including health and non-health costs, were assessed separately, and both for those who had used the specific service and the average for those who have used any services (Table 3). Mean total cost for mental health care for the 100 patients who had used any services and were diagnosed with DUD was US$ 439.6, while it was US$ 144.7 for 914 with other MD. Health and non-health costs of inpatient, outpatient and traditional service use for mental/drug problems were higher in those with DUD than in the other 2 groups. Catastrophic payment in the past 12 months for hospitalization for mental and drug problems was reported by 26.4% of those with DUD and by 25.6% of those with other MD. Out-of-pocket costs of medical care in the past 12 months were significantly higher in those with DUD (US$ 427.4) than those with other MD (US$ 267.2) and no MD (US$ 238.7), which was mainly due to the higher payments for inpatient care (Table 4).

Social costs

Illegal acts resulting in fines and incarceration were more common in those with DUD (8.5%) than those with other MD (1.1%) and no MD (0.5%) (Table 5). Payments for those convicted for illegal acts were also higher in patients with DUD. The average last 12-month

Table 1 Characteristics of individuals with DUD, other MD and no MD

	DUD Weighted %	Other MD Weighted %	No MD Weighted %
Unemployed [a]	24.9 (17.0–32.8)	12.1 (10.3–14.1)	8.3 (7.5–9.2)
Low socioeconomic status	43.0 (33.7–52.4)	25.4 (22.8–28.0)	20.8 (19.4–22.3)
Having health insurance	69.5 (60.7–78.2)	76.4 (73.8–78.9)	81.5 (80.1–82.8)
Having supplementary health insurance	5.2 (0.7–9.7)	16.7 (14.4–19.0)	17.6 (16.2–19.0)

[a]Those who had not worked in the past week and could not be categorized as housewife, student, soldier and retired were categorized as unemployed. DUD = drug use disorder; MD = mental disorder.

Table 2 Service use for mental/drug and medical problems in the past 12 months in individuals with DUD, other MD and no MD

Types of services	DUD (*n* = 151)		Other MD (*n* = 1729)		No MD (*n* = 5961)	
	N	Weighted %	N	Weighted %	N	Weighted %
Health care for mental/drug problems						
Inpatient care	23	14.9 (8.1–21.6)	22	1.2 (0.7–1.8)	11	0.2 (0.05–0.3)
Outpatient care	42	29.0 (20.1–37.8)	560	29.4 (26.7–32.1)	534	8.3 (7.4–9.1)
Pharmacy	57	40.7 (31.2–50.2)	416	23.5 (21.2–25.9)	345	5.8 (5.0–6.5)
Drop-in centres	1	0.6 (0–1.8)	0	0	1	0.03 (0–0.08)
Non-health care for mental/drug problems						
Services for self-help group	41	30.1 (21.0–39.2)	18	1.0 (0.5–1.6)	29	0.5 (0.3–0.7)
Traditional services	61	40.5 (31.3–49.8)	458	24.7 (22.1–27.2)	379	6.2 (5.5–7.0)
Health care for medical illness						
Medical hospitalization	23	14.3 (7.5–21.0)	188	10.2 (8.5–11.8)	432	7.0 (6.2–7.8)
Outpatient service for medical illness [a]	39	28.4 (19.5–37.3)	498	28.9 (26.4–31.5)	1209	20.0 (18.7–21.3)

[a]*Outpatient service for medical illness was determined only for the past 2 weeks. DUD = drug use disorder; MD = mental disorder.*

social costs for a patient with DUD was US$655.6, which was higher than for the other groups (US29.1 for other MD and US$9.7 for no MD).

Indirect costs

Number of days out of work due to mental/drug problems during the past 12 months was ascertained from those who were employed. The mean (95% confidence interval) was 44.3 (29.2–59.5), 18.3 (13.0–23.6) and 5.8 (3.9–7.6) days in those with DUD, other MD and no MD, respectively. Daily income was also reported by the three employed groups to be US$ 17.6, US$ 16.5 and US$ 19.6, respectively. Therefore, the weighted average of indirect cost due to the work absenteeism in the past 12 months is calculated as 598 (364.1–831.9) in those with DUD, 233.6 (146.8–320.5) in those with other MD and 93.6 (51.0–136.2) in those with no MD.

Total costs

The total last 12-month costs of the 3 groups for 2011 are shown in Figure 1. The expenses were US$ 2120.6 for individuals with DUD and US$ 674.6 for those with other MD. For those with DUD, receiving care for mental/drug problems and medical problems accounted for 20.7% and 20.2% of the total expenses, respectively. These costs were 21.4% and 39.6% of the total costs in those with other MD. For the

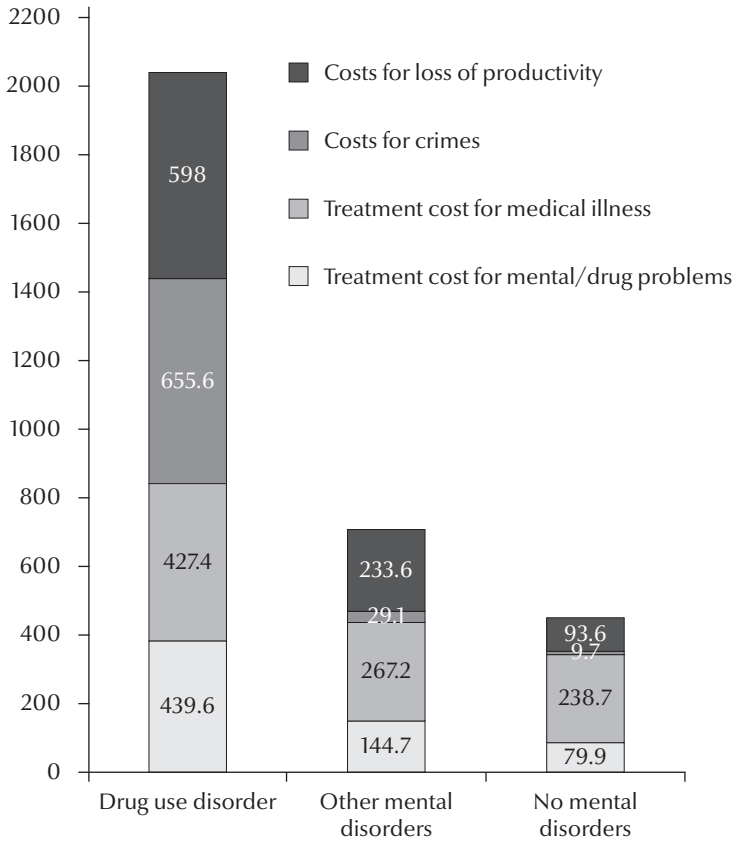

Figure 1 Total out-of-pocket costs (US$) in individuals with DUD, other MD and no MD in 2011. DUD = drug use disorder; MD = mental disorder.

Table 3 Out-of-pocket costs for mental/drug health care in individuals with DUD, other MD and no MD in past 12 months

Type of costs	DUD	DUD	Other MD	Other MD	No MD	No MD
	Average cost of using the specific service for mental problems for 1 patient	Average cost of using the specific service for a patient who used any services for mental problems (*n* = 100)	Average cost of using the specific service for mental problems for 1 patient	Average cost of using the specific service for a patient who used any services for mental problems (*n* = 914)	Average cost of using the specific service for mental problems for 1 person	Average cost of using the specific service for a person who used any services for mental problems (*n* = 948)
Total cost for mental health care		***439.6 (271.3-607-9)***		***144.7 (114.5-174.9)***		***79.9 (56.2-103.5)***
Total health cost for mental illness		**198.7 (96.3-301.1)**		**73.5 (55.3-91.6)**		**37.1 (19.2-55.0)**
Inpatient care	229.5 (0-472.2)	50.8 (0-106.3)	79.2 (37.1-121.3)	1.9 (0.7-3.1)	99.6 (8.1-191.1)	1.02 (0.03-2)
Outpatient care	383.9 (28.3-739.5)	85.4 (2.8-167.8)	154.3 (109.5-199.1)	44.4 (30.0-58.7)	109.2 (29.2-189.3)	26.2 (6.0-40.7)
Pharmacy	105.9 (53.4-158.5)	60.9 (29.0-92.8)	59.0 (40.1-77.8)	27.1 (18.2-36.1)	33.8 (25.3-42.4)	12.3 (9.0-15.7)
DICs	198.3*	2.0*			233.2*	0.2*
Total non-health cost for mental health care		**240.9 (126.0-355.7)**		**71.2 (54.6-87.8)**		**42.8 (30.3-55.2)**
Accommodation & transportation for inpatient care	53.9 (12.5-95.2)	11.9 (1.8-22.0)	36.1 (4.4-67.9)	0.9 (0.1-1.7)	7.6 (1.4-13.8)	0.1 (0.01-0.2)
Accommodation & transportation for outpatient care	290.9 (39.7-542.0)	52.9 (1.2-104.6)	47.3 (24.1-70.6)	14.1 (7.0-21.3)	22.1 (3.3-40.9)	4.7 (0.7-8.8)
Accommodation & transportation for pharmacy	21.3 (0-47.1)	12.4 (0-27.5)	17.1 (7.4-26.9)	7.9 (3.4-12.5)	8.8 (6.1-11.5)	3.2 (2.2-4.3)
Accommodation & transportation for DICs	19.4*	0.2*			0.0*	
Services for self-help group	49.8 (12.8-86.8)	22.3 (5.7-38.8)	19.0 (0-72.5)	0.4 (0-0.9)	143.2 (28.6-257.9)	4.5 (06-8.4)
Accommodation & transportation for self-help group	46.7 (18.4-75.1)	20.9 (7.1-34.7)	34.5 (0-71.9)	0.7 (0-1.5)	69.0 (25.5-112.6)	2.1 (0.6-3.8)
Traditional services (Services, accommodation & transportation)	259.1 (71.6-459.6)	120.0 (26.0-214.6)	127.8 (103.6-151.9)	47.2 (37.0-57.3)	92.5 (61.0-124.0)	28.0 (18.2-37.9)

** Only one case used the service*
Costs given in US$. DIC = drop-in centre; DUD = drug use disorder; MD = mental disorder.

Table 4 Out-of-pocket costs of inpatient and outpatient care for medical illness in those with DUD, other MD and no MD in past 12 months

Types of costs	DUD Average cost of using the service for 1 patient	DUD Average cost for a patient with drug use disorder (n = 151)	Other MD Average cost of using the service for a patient	Other MD Average cost for a patient with mental disorder (n = 1729)	No MD Average cost of using the service for a patient	No MD Average cost for an individual without mental disorder (n = 5961)
Total cost of care for medical illness		***427.4 (58.5-796.4)***		***267.2 (221.1-312.2)***		***238.7 (189.4-288.1)***
Total cost of hospitalization for medical illness	**1647.9 (0-3842.5)**	**230.8 (0-560.5)**	**435.4 (289.4-581.3)**	**42.4 (26.9-57.8)**	**659.9 (463.3-856.5)**	**44.8 (30.7-59.0)**
Health care cost	835.0 (12.6-1657.4)	116.9 (0-244.5)	390.3 (257.9-532.8)	38.0 (23.3-52.7)	599.7 (463.3-856.5)	40.8 (27.4-54.2)
Accommodation & transportation	812.9 (0-2222.3)	113.9 (0-321.4)	45.3 (12.8-77.9)	4.6 (1.2-8.0)	57.8 (27.7-88.0)	4.1 (1.9-6.2)
Total cost for outpatient care for medical illness	**781.6 (405.8-1157.5)**	**196.6 (91.8-301.5)**	**788.7 (657.8-919.5)**	**244.8 (182.9-266.8)**	**990.7 (768.4-1212.9)**	**193.9 (148.2-239.5)**
Health care cost	658.7 (336.1-981.3)	165.7 (76.1-255.3)	669.7 (567.5-771.9)	187.8 (155.0-220.7)	888.0 (676.2-1099.8)	171.0 (128.5-213.6)
Accommodation & transportation	155.6 (45.6-265.6)	30.9 (7.6-54.4)	157.4 (94.1-220.6)	37.0 (21.7-52.2)	152.0 (64.7-239.4)	22.8 (9.5-36.1)

Costs given in US$. DUD = drug use disorder; MD = mental disorder.

individuals with DUD, 30.9% of the costs were due to crimes, whereas crime constituted 4.3% of the total costs of those with other MD. Work absenteeism was responsible for 28.2% of the costs of DUD and 34.6% of the costs of other MD. The ability of the individual or the family to pay the overall costs of the mental and drug problems in the past 12 months was determined. Catastrophic payment was reported in 47.6% of the patients with DUD and 14.4% of those with other MD.

Discussion

This study revealed that, in 2011, individuals with DUD spent an average of ~US$2120 for receiving care, compensating illegal acts and for work absenteeism. According to an official report [adapted from the Statistical Center of Iran (*18*)], the average earning of a family in 2011 was US$ 9033, therefore, 23.5% of annual family income is spent on the consequences of drug use. This is 3.1 times higher than similar expenses of a patient with other MD. When the respondents were asked about the overall payment of the family in the past 12 months for mental and drug problems, catastrophic payment was reported in almost half of the patients with DUD, which was 3 times higher than for those with other MD. This is in line with the findings from another Iranian national household survey that assessed the general income and health expenditure of households, and showed that expenditure for drug addiction treatment had the greatest impact on household exposure to catastrophic health expenditure (*19*).

Many cost assessments of drug abuse treatment have been conducted from the treatment-provider perspective, and less is known about the client-specific costs of attending treatment (*20*), which we used in this study in a representative sample of the general population. We found that, on average, 20.7% of the out-of-pocket expenses of those with DUD is spent on treatment and care for their mental/drug problem. The service with the highest past 12-month cost was outpatient treatment, followed by traditional services and inpatient care. Attending self-help groups was common, but was associated with the least cost.

Although the rate of outpatient use of health services for mental/drug problems was similar for those with DUD and other MD, the costs of using these services was higher in the patients with DUD. In the Islamic Republic of Iran, the majority of opioid addiction treatment is delivered in methadone maintenance programmes. Most of the facilities are privately managed and patients pay for their treatment expenses. These services also need frequent visits to the clinics and result in higher health costs, as well as non-health costs of transportation.

Drug abusers were hospitalized or stayed in short-term residential treatment settings more frequently than those

Table 5 Social problems in the past 12 months in individuals with DUD, other MD and no MD

Social problems	DUD (*n* = 151)		Other MD (*n* = 1729)		No MD (*n* = 5961)	
	n	Weighted %	*n*	Weighted %	*n*	Weighted %
Fined by court	12	8.5 (3.3–13.7)	18	1.1 (0.5–1.6)	28	0.5 (0.3–0.8)
Arrested or imprisoned	13	9.5 (3.7–15.3)	22	1.5 (0.8–2.2)	30	0.5 (0.3–0.7)

DUD = drug use disorder; MD = mental disorder.

with other MD. The out-of-pocket cost of the inpatient treatment care was also higher for each event of hospitalization. More than 25% of patients reported catastrophic payment for receiving inpatient care in the past 12 months. Longer duration of stay and more frequent hospitalization might have been the reasons for higher costs. Similar findings have been reported in other studies. Olsson et al. reported a high frequency and high cost of inpatient treatment (detoxification and short-term rehabilitation) among women with substance dependence in Sweden (*21*).

One of the main reasons behind higher out-of-pocket costs of health services for drug users is the lack of coverage of insurance for DUD. In 2011, there was no such coverage for people with any type of insurance, as well as supplementary insurance in the Islamic Republic of Iran. Insurers refused to reimburse outpatient and inpatient services when the patient was diagnosed with substance use disorder. In recent years, there have been efforts to improve the coverage and reimburse the first 6 months of methadone maintenance treatment in public drug treatment clinics; however, this regulation is still not operational. In the meantime, about one third of those with DUD are not insured and they or their family pay all health expenses. Insurance coverage for DUD is a global issue and the improvements have been slow. Even in countries with such improvements, its impact on receiving adequate levels of treatment might not happen in the short term (*22*).

Self-help groups are the most common services used for drug treatment in the Islamic Republic of Iran (*1*). The cost of using these services is lower than other services and they do not impose any burden on the government. Using these services is also associated with long-term benefits, such as reduced substance use, improved psychosocial functioning and reduced healthcare costs (*23*). Such benefits have also been reported from inside the Islamic Republic of Iran (*24*). Promoting self-help group involvement can improve outcomes while reducing the costs of long-term care (*25*).

Use of traditional services for mental/drug problems is also prevalent and is associated with considerable cost. It has long been considered that herb selling and its illegal involvement in treatment of drug abuse and mental problems are a public health issue (*26*) and need attention from health regulatory bodies. Public education in this domain is also of importance and can decrease the burden of costs imposed by using services with no evidence, which might cause more harm than benefit.

We found that hospitalization for medical purposes was more common and was associated with a higher cost in those with DUD than those with no MD. However, receiving outpatient care and its costs were almost similar in those with DUD, other MD and no MD. Overall, the costs of care for medical purposes overcome the costs of drug/mental problems. This finding might be due to the higher costs of diagnostic tests, medications and procedures needed for the management of medical illnesses.

It was also reported from the United States of America (USA) that the costs of medical care were ~2-fold higher than the costs of drug-related services (*7*). The utilization of healthcare services, including outpatient, emergency department and inpatient services and the associated costs were higher in patients with than those without substance use (*27*). There is evidence that patients with untreated substance use disorders have higher service utilization for medical and emergency problems. Rockett et al. reported that patients with unmet substance treatment need had 46% excess utilization of emergency department services and generated US$ 1568 per patient, in annual extra emergency and hospitalization charges (*27*).

In our study, the highest costs for individuals and their families were for compensation for crime, followed by work absenteeism. Similar findings have been reported from the USA and France (*7,28–30*). A person with DUD is more likely to be involved in criminal activities. This includes both drug-defined criminal activities (e.g., distribution, sales and possession of drugs) and drug-related criminal activities (e.g., participation in illegal activity to obtain money to purchase drugs, or criminal acts performed under the influence of drugs) (*31*). Our study showed that drug abusers were 8 times more likely to be fined by court and 6 times more likely to be arrested or imprisoned than a person with other MD.

One of the main aspects of cost of drug abuse consequences is the indirect

Table 6 **Out-of-pocket costs for social problems in individuals with DUD, other MD and no MD in past 12 months**

Type of costs	DUD	DUD	Other MD	Other MD	No MD	No MD
	Average cost for a patient with the experience	Average cost for a patient with DUD	Average cost for a patient with the experience	Average cost for a patient with MD (n = 1729)	Average cost for an individual without MD, with the experience	Average cost for an individual without MD (n = 5961)
Total social costs		**655.6 (0-1491.0)**		**29.1 (4.3-53.9)**		**9.7 (1.6-17.9)**
Fined by court	4145.3 (0-8630.9)	351.4 (0-756.9)	2496.7 (62.4-4930.9)	22.4 (0-45.7)	1142.8 (153.8-2131.8)	5.9 (0.5-11.3)
Law enforcement and prison	3209.3 (0-7949.6)	304.2 (0-771.6)	484.6 (133.8-835.4)	6.7 (0.9-12.4)	827.8 (0-1674.8)	3.9 (0-7.9)

Costs given in US$. DUD = drug use disorder; MD = mental disorder.

cost. It is usually considered as loss of productivity and measured by the value of the days out of work (*32*). Using this method, our study showed that an employed person with DUD is out of work for an average of 44 days a year, which is more than twice that of those with other MD. This costs US$598 for an average employed person. Drug abusers tend to have low participation in the legitimate labour force. On average, employed addicts work infrequently or in low-paid jobs because of drug intoxication or associated health problems. Others turn away from the legitimate economy to obtain income from the drug trade or other illegal activities. Lastly, others may not work while they are incarcerated for drug-related crimes (*31*). The estimations we provided by assessing the cost of work absenteeism are lower than the total costs due to loss of productivity. We only assessed the number of days out of work for those who were employed. However, the extent of loss of productivity was greater than this. This measurement did not include losses due to unemployment and disablement. We showed that the probability of being unemployed in those with DUD was 2 times higher than in those with other MD and 3 times higher than in those with no MD. In addition, reduced job performance while at work was not assessed. Decreased productivity of other family members for compensating the roles of patients when they are disabled, hospitalized or imprisoned are other sources of indirect cost that were not calculated in our measurement.

This study is significant in that it is believed to be the first attempt in the Islamic Republic of Iran and the Middle Eastern Region to investigate out-of-pocket costs of drug abuse from a nationally representative sample. We have quantified the main expenses that the patients or their families pay for the consequences of drug use. The other out-of-pocket costs not included in our study are costs of using traditional services for medical illnesses and driving penalties.

We benefited from using a bottom-up cost-of-illness study method. Gustavsson et al. have described the benefits and disadvantages of this method. Bottom-up studies are often more complete, in terms of the resources, and more accurate in selection of persons, because information on diagnosis is usually scant in the available national statistics. The disadvantage of bottom-up studies is the probability of double-counting costs when a person suffers from several disorders. It is difficult to determine which one is causing the costs. This problem is handled in most cost-of-illness studies by trying to separate and only count the specific costs due to the disorder, rather than the total cost of a patient with the disorder (*16*). We used this method and asked the person to report separately for the costs of mental/drug use problems and medical illnesses. In some cases like inpatient care, we did not separate costs for drug-related problems with costs of mental problems, therefore, we reported both costs together. We also used the approach of comparing the cost for patients with DUD with 2 control groups with other or no MD, and considered the difference to be caused by DUD. This approach was first described by Hodgson and Meiners (*33*) and was used for cost analyses thereafter.

In addition to the findings of this study, which was from the patients' perspective, there is a need to study the aggregate costs of drug use from payers' and societal perspectives. This can be examined by estimating the direct costs of the drugs, as well as costs attributable to drug use in different sectors of health, criminal justice, employment, victim costs and premature mortality. In addition, estimating intangible costs due to the lower quality of life of the person and significant others are important, but are difficult to assess. Analysis of the payers of the costs is also essential. Governments pay for most of the health

services (such as for HIV infection), criminal justice and welfare services (for lost productivity). Moreover, a large budget is spent on combating drug trafficking, including manufacture, distribution and sales, in the Islamic Republic of Iran. Charities and victims are other sources for such services. The Islamic Republic of Iran has had a drug problem for several decades. It is important to investigate the whole expenditure of the country on illicit drugs and its trends over those decades and monitor its effects on the extent of drug use and the associated consequences. Such an effort has been made for 2004, and the total expenditure of the country for drugs was calculated as US$ 11.7 billion, which was 2-fold higher than the annual income of the country through taxation. Half of the total expenditure was paid by the 2.5 million drug abusers; most of which was direct payment for buying drugs. Drug users' costs for the consequences comprised only a small proportion (*34*). However, our estimation of US$ 2120 out-of-pocket costs for several drug use consequences for an average person with DUD, or US$ 5.3 billion for the 2.5 million drug abusers is higher than the previous estimation.

In conclusion, those with DUD have lower socioeconomic status and greater probability of being unemployed or disabled, and less probability of being insured. A considerable amount of family resources are spent on the consequences of drug use. The findings suggest the necessity of greater investment in evidence-based drug prevention and treatment interventions, in order to stop the vicious cycle of loss of resources and poverty in the families of individuals with DUD.

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References

1. Amin-Esmaeili M, Rahimi-Movaghar A, Sharifi V, Hajebi A, Radgoodarzi R, Mojtabai R, et al. Epidemiology of illicit drug use disorders in Iran: prevalence, correlates, comorbidity and service utilization results from the Iranian Mental Health Survey. Addiction. 2016 Oct;111(10):1836–47. PMID:27177849
2. World drug report 2015. Vienna: United Nations Office on Drugs and Crime; 2015 (https://www.unodc.org/documents/wdr2015/World_Drug_Report_2015.pdf, accessed 15 March 2017).
3. Rahimi-Movaghar A, Amin-Esmaeili M. Haghdoost AA, Sadeghirad B, Mohraz M. HIV prevalence amongst injecting drug users in Iran: a systematic review of studies conducted during the decade 1998–2007. Int J Drug Policy. 2012 Jul;23(4):271–8. PMID:22000694
4. Malekinejad M, Navadeh S, Lotfizadeh A, Rahimi-Movaghar A, Amin-Esmaeili M, Noroozi A. High hepatitis C virus prevalence among drug users in Iran: systematic review and meta-analysis of epidemiological evidence (2001–2012). Int J Infect Dis. 2015 Nov;40:116–30. PMID:26460088
5. Amin-Esmaeili M, Rahimi-Movaghar A, Haghdoost AA, Mohraz M. Evidence of HIV epidemics among non-injecting drug users in Iran: a systematic review. Addiction. 2012 Nov;107(11):1929–38. PMID:22551085
6. Naghavi M, Shahraz S, Sepanlou SG, Dicker D, Naghavi P, Pourmalek F, et al. Health transition in Iran toward chronic diseases based on results of Global Burden of Disease 2010. Arch Iran Med. 2014 May;17(5):321–35. PMID:24784861
7. Cartwright WS. Economic costs of drug abuse: financial, cost of illness, and services. J Subst Abuse Treat. 2008 Mar;34(2):224–33. PMID:17596904
8. French MT, Martin RF. The costs of drug abuse consequences: a summary of research findings. J Subst Abuse Treat. 1996 Nov-Dec;13(6):453–66. PMID:9219142
9. Rehm J, Baliunas D, Brochu S, Fischer B, Gnam W, Patra J, et al. The costs of substance abuse in Canada 2002: highlights. Ottawa: Canadian Centre on Substance Abuse; 2006 (http://www.ccsa.ca/Resource%20Library/ccsa-011332-2006.pdf, accessed 15 March 2017).
10. Rahimi-Movaghar A, Amin-Esmaeili M, Sharifi V, Hajebi A, Hefazi M, Rad Goodarzi R, et al. The Iranian Mental Health Survey: design and field procedures. Iran J Psychiatry. 2014 Apr;9(2):96–109. PMID:25632287
11. Arabgol F, Alaghband-rad J, Sharifi V, Hakim Shooshtari M, Shabaani A, Davari Ashtiani R, et al. Reliability of a Persian translation of the Composite International Diagnostic Interview (CIDI), section for substance use disorders: in a multicenter study in Iran. Adv Cogn Sci. 2005;7:38–45.
12. Alaghband Rad J. Study of the reliability, validity, and feasibility of Farsi translation of the Composite International Diagnostic Interview (CIDI). In: Ahmadi Abhari SA, Malakooti K, Nasr Esfahani M, Razzaghi EM, Sadeghi M, Yasamy MTs, editors. Mental health effects of Iraqi invasion of Kuwait in a war – torn population of Iran: an epidemiological and financial study of the consequences of the Kuwaiti oil well fire disaster in the aftermath of Iraqi invasion of Kuwait in 1991, United Nations Compensation Commission (UNCC) Monitoring and Assess-

ment Project. Tehran - Iran: Islamic Republic of Iran Ministry of Health, Committee for Assessment and follow up for Damages Resulting from the Iraq–Kuwait War; 2003.

13. Sharifi V, Assadi SM, Mohammadi MR, Amini H, Kaviani H, Semnani Y, et al. A Persian translation of the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition: psychometric properties. Compr Psychiatry. 2009 Jan-Feb;50(1):86–91. PMID:19059520
14. Hajebi A, Motevalian A, Amin-Esmaeili M, Hefazi M, Radgoodarzi R, Rahimi-Movaghar A, et al. Telephone versus face-to-face administration of the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, for diagnosis of psychotic disorders. Compr Psychiatry. 2012 Jul;53(5):579–83. PMID:21820651
15. Sharifi V, Amin-Esmaeili M, Hajebi A, Motevalian A, Radgoodarzi R, Hefazi M, et al. Twelve-month prevalence and correlates of psychiatric disorders in Iran: the Iranian Mental Health Survey, 2011. Arch Iran Med. 2015 Feb;18(2):76–84. PMID:25644794
16. Gustavsson A, Svensson M, Jacobi F, Allgulander C, Alonso J, Beghi E, et al. Cost of disorders of the brain in Europe 2010. Eur Neuropsychopharmacol. 2011 Oct;21(10):718–79. PMID:21924589
17. Central Bank of the Islamic Republic of Iran. Foreign exchange rates (http://www.cbi.ir/exrates/rates_en.aspx, accessed 15 March 2017).
18. Statistical Center of Iran. Household expenditure and income 2011 (https://www.amar.org.ir/Portals/0/Files/abstract/1389/n_h_sh89.pdf, accessed 15 March 2017) (in Persian).
19. Moghadam MN, Banshi M, Javar MA, Amiresmaili M, Ganjavi S. Iranian household financial protection against catastrophic health care expenditures. Iran J Public Health. 2012;41(9):62–70. PMID:23193508
20. McCollister KE, French MT, Pyne JM, Booth B, Rapp R, Carr C. The cost of treating addiction from the client's perspective: results from a multi-modality application of the Client DATCAP. Drug Alcohol Depend. 2009 Oct 1;104(3):241–8. PMID:19574000
21. Olsson TM, Fridell M. Women with comorbid substance dependence and psychiatric disorders in Sweden: a longitudinal study of hospital care utilization and costs. BMC Health Serv Res. 2015 Jun 6;15:224. PMID:26048811
22. Thomas CP, Hodgkin D, Levit K, Mark TL. Growth in spending on substance use disorder treatment services for the privately insured population. Drug Alcohol Depend. 2016 Mar 1;160:143–50. PMID:26781063
23. Humphreys K, Wing S, McCarty D, Chappel J, Gallant L, Haberle B, et al. Self-help organizations for alcohol and drug problems: toward evidence-based practice and policy. J Subst Abuse Treat. 2004 Apr;26(3):151–8. PMID:15063905
24. Jafari S, Rahimi-Movaghar A, Craib KJP, Baharlou S, Mathias R. A follow-up study of drug users in Southern Iran. Addict Res Theory. 2010;18(1):59–70.
25. Humphreys K, Blodgett JC, Wagner TH. Estimating the efficacy of Alcoholics Anonymous without self-selection bias: an instrumental variables re-analysis of randomized clinical trials. Alcohol Clin Exp Res. 2014 Nov;38(11):2688–94. PMID:25421504
26. Rahimi-Movaghar A. Khastoo G, Fekri M, Akhondzadeh S. Treatment of addiction by medicinal herbs sellers in Tehran. Hakim Res J. 2008;11(3):11–9 (in Persian).
27. Rockett IR, Putnam SL, Jia H, Chang CF, Smith GS. Unmet substance abuse treatment need, health services utilization, and cost: a population-based emergency department study. Ann Emerg Med. 2005 Feb;45(2):118–27. PMID:15671966
28. Fenoglio P, Parel V, Kopp P. The social cost of alcohol, tobacco and illicit drugs in France, 1997. Eur Addict Res. 2003 Jan;9(1):18–28. PMID:12566794
29. Mark TL, Woody GE, Juday T, Kleber HD. The economic costs of heroin addiction in the United States. Drug Alcohol Depend. 2001 Jan 1;61(2):195–206. PMID:11137285
30. National Institutes of Health, National Institute on Drug Abuse. The economic costs of alcohol and drug abuse in the United States - 1992 (https://archives.drugabuse.gov/Economic-Costs/Index.html, accessed 15 March 2017).
31. Harwood HJ. Societal costs of heroin addiction. In: NIH Consensus Development Conference on Effective Medical Treatment of Heroin Addiction 1997:53.
32. Chisholm D, Diehr P, Knapp M, Patrick D, Treglia M, Simon G. Depression status, medical comorbidity and resource costs. Evidence from an international study of major depression in primary care (LIDO). Br J Psychiatry. 2003 Aug;183:121–31. PMID:12893665
33. Hodgson TA, Meiners MR. Cost-of-illness methodology: a guide to current practices and procedures. Milbank Mem Fund Q Health Soc. 1982 Summer;60(3):429–62. PMID:6923138
34. Mokhtaryan H, Hashemi A. The economy of illicit drugs: an estimation of costs in Iran. Iranian J Soc Probl. 2011 Winter/Spring;1(4):151–75 (in Persian).

Level of khat dependence, use patterns, and psychosocial correlates in Yemen: a cross-sectional investigation

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مستوى إدمان القات وأنماط استخدامه وعوامل الارتباط النفسية الاجتماعية: تحقيق مقطعي

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الخلاصة: يقترن تعاطي القات المزمن بآثار صحية سلبية. إلا أنه لم تُجر أي دراسة توفر وصفاً وافياً لسمات مدمني القات. وينظر هذا الاستعراض في العوامل الاجتماعية–السكانية والنفسية–الاجتماعية المرتبطة بإدمان القات في صفوف البالغين. وأُجريت مقابلات مباشرة مع ما مجموعه 270 متعاطٍ للقات (منهم 129 امرأة) في اليمن، وقدّموا معلومات وبيانات سكانية عن أنماط تعاطي القات، والمزاج الشخصي، ونوعية النوم. واستُخدم "مقياس شدة الإدمان على القات" لتقييم مستوى الإدمان على القات. كما أُجريت سلسلة من تحليلات التباين. وثبت أن متعاطي القات يتعاطونه لمدة 5.2 ساعة يومياً في المتوسط (الانحراف المعياري = 2.3) ولمدة 5.7 يوماً في الأسبوع (الانحراف المعياري = 2.0). وأفاد الأفراد الذين أظهرت التحاليل نتائج إيجابية لإدمانهم القات بقضائهم فترات زمنية أطول في جلسات القات يومياً، وتعاطي القات بوتيرة أعلى أسبوعياً، كما أبلغوا عن مستويات أعلى من المزاج السلبي واضطرابات النوم، وكانوا أكثر ميلاً لظهور أعراض بدنية عليهم بعد التعاطي ($P < 0.05$). وينبغي أن توضح البحوث المقبلة الآليات المسؤولة عن الكشف عن أعراض إدمان القات.

ABSTRACT Chronic khat use is associated with negative health consequences. However, no study has fully characterized individuals who are khat dependent. This paper examines socio-demographic and psychosocial correlates of adult khat dependence. A total of 270 khat users (129 women) in Yemen completed face-to-face interviews and provided demographic information and data on patterns of khat use, subjective mood, and sleep quality. The Severity of Dependence Scale-Khat (SDS-khat) was used to assess level of khat dependence. A series of analysis of variance was conducted. Khat users, on average, used khat for 5.2 hours a day (SD = 2.3) for 5.7 days a week (SD = 2.0). Individuals who screened positive for khat dependence reported longer duration of khat sessions per day, higher frequency of khat use per week, greater levels of negative mood and sleep disturbances, and were more likely to endorse physical symptoms after khat use ($P < 0.05$). Future research should elucidate mechanisms responsible for khat dependence symptomatology.

Niveau de dépendance au khat, modes de consommation, et corrélats psychosociaux au Yémen : enquête transversale

RÉSUMÉ La consommation chronique de khat est associée à des conséquences néfastes sur le plan de la santé. Cependant, aucune étude n'a permis une caractérisation complète des individus dépendants au khat. Le présent article se penche sur les corrélats socio-démographiques et psychosociaux de la dépendance au khat chez l'adulte. Au total, 270 consommateurs de khat (129 femmes) au Yémen se sont soumis à des entretiens en face à face et ont fourni des informations démographiques et des données sur les modes de consommation, l'humeur subjective et la qualité du sommeil. L'Échelle de la sévérité de la dépendance pour le khat a été utilisée pour évaluer le niveau de dépendance à cette substance. Une série d'analyses de variance a été réalisée. Les utilisateurs de khat en consommaient, en moyenne, pendant 5,2 heures par jour (ET = 2,3) 5,7 jours par semaine (ET = 2,0). Les individus dépistés positifs pour la dépendance au khat signalaient des séances de consommation de khat de durée plus longue par jour, une fréquence plus élevée de consommation par semaine, des niveaux plus importants d'humeur négative et de troubles du sommeil, et étaient davantage susceptibles de ressentir des symptômes physiques après en avoir consommé ($p < 0,05$). La recherche future devrait s'efforcer de déterminer les mécanismes responsables de la symptomatologie de la dépendance au khat.

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Introduction

The burden of addiction and mental health problems continues to increase globally (*1,2*). Khat is used commonly in East Africa and the Arabian Peninsula (*3*), with reports indicating that 80–90% of East African males use khat daily and 10–60% of East African females use khat daily (*4,5*). Khat is also consumed by immigrants from these regions who reside in western countries, including the United Kingdom (UK) and the United States of America (*6*).

The primary psychostimulant component of khat is cathinone, which is released within 15–45 minutes during chewing and activates dopaminergic and noradrenergic transmission (*7*). Cathine or d-norpseudoephedrine has also been identified as a psychoactive ingredient in khat (*7*), although it has been noted to have more limited psychostimulant properties at roughly 7–10 times less potent than amphetamine (*8*). Khat ingestion produces several central nervous system effects that are similar to those of amphetamine, including increased motor stimulation, feelings of increased alertness, euphoria and a sense of excitement and energy (*3*). Following a khat session, the user may experience depressed mood, irritability, anorexia and difficulty falling to sleep (*9*). Habitual khat users and concurrent khat and tobacco users in Yemen have reported sleep problems, which were correlated with negative mood (*10*). Functional mood disturbances (anxiety and depression) have also been reported during khat sessions, but these are temporary and may disappear the next day (*11*). Evidence indicates that long-term or excessive khat use is a risk factor for progression of ongoing mental health problems (*4,12,13*).

In several countries it is reported that users of khat consume large quantities of tobacco, which may exacerbate the health burden associated with khat use (*14*), and we have observed previously that approximately 55% of all khat users are also regular smokers (*15,16*). One study reported that 65% of their sample of UK resident Yemeni subjects were regular cigarette smokers and that khat users smoked to enhance the impact of their khat chewing (*6*). Increased severity of dependence correlated positively nicotine dependence (*6*).

There is evidence of a khat withdrawal syndrome and low-level drug tolerance. Khat chewing has been found to induce increased sympathetic tone, and some degree of physiological tolerance to the sympathetic effects of khat as evidenced by increased blood pressure, increased respiratory rate, and increased body temperature in chronic khat users (*17*). Withdrawal symptoms after prolonged khat use are mild and may consist of lethargy, mild depression, slight trembling and recurrent nightmares (*3,18*). There is also evidence to indicate that khat users can develop a psychological dependence to khat (*19,20*) and a valid measure of khat dependence has been developed (*21*). Studies have found positive associations between khat dependence and khat-related biological measures (*22*), psychological and physical symptoms (*23*) and health problems (*24*). Another study found that khat dependence was higher in men than women and that a positive link between age and khat dependence in women only (*20*). This suggests that there are gender differences in the patterns of dependence symptomatology.

Associations between khat dependence and sleep disturbances or negative affect have not been examined, although this is an important question in light of studies showing insomnia (*25*) and negative mood (*11*) among khat users. This question is clinically relevant because insomnia and negative affect are related to one another (*26,27*) and both have implications for many health conditions (*28,29*). This study aimed to examine the extent to which psychological khat dependence was related to reported khat use, subjective sleep quality, and negative affect as well as determine the role of gender differences in these relationships. It was hypothesized that greater levels of khat dependence would be associated with more frequent and intense khat use, higher levels of negative affect, and poorer subjective sleep quality. We also anticipated that the link between khat dependence and psychological and behavioral measures would be more pronounced in males than in females.

Methods

Subjects and study design

Using convenience sampling and cross-sectional methods, this study was conducted in two cities in Yemen, Taiz and Sana'a, between September and November 2012. Recruitment was conducted in markets and shopping centres around the two cities. Eligibility criteria were: aged 18 years and above, Yemeni, chewing khat at least once a week over the last 12 months, able to speak Arabic or English, and free from any major medical and psychiatric conditions. Trained and culturally competent interviewers approached potential participants in the community and asked if they were interested in participating in the study. Potential participants were informed that they were free to withdraw at any point from the study without consequences, and that their responses would be kept strictly confidential. Informed written consents were obtained from all participants prior to the interviews. Upon obtaining the consent the staff conducted face-to-face interviews on the spot that lasted 30–45 minutes. The Institutional Review Board in Taiz and Sana'a Universities gave ethical approval for this study. A total of 401 individuals completed this study.

Measures

The Severity of Dependence Scale (SDS) (*30*) is a widely used scale that

was developed to assess psychological dependence in illicit drug users. The SDS consists of 5 items with each response measured on a scale between 0 and 3, giving a total possible score of 15. It focuses on loss of control over drug use and preoccupation or anxiety about drug use (*30*). Predictive validity was demonstrated in relation to the need for treatment amongst drug users (*30*). The bilingual (Arabic and English) version of the Severity of khat dependence (SDS-khat) (*21*) was used in this study, and a total score of 6 was used as a cutoff to examine differences between those who are unlikely to be psychologically dependent on khat (total SDS-khat score = 5 or lower) and those who are likely to be khat dependent (total SDS-khat score = 6 or higher) (*21*).

The Pittsburgh Sleep Quality Index (PSQI) consists of 19 questions that evaluate qualitative and quantitative dimensions of sleep disturbances (*31*). These items are calculated into 7 component scores each with a range from 0 (good quality) to 3 (poor quality). The sum of these 7 component scores yields the global PSQI score, with the highest score of 21 indicating the worst subjective sleep quality (*31*). Internal consistency reported by the original authors was 0.83 (*31*). Good PSQI test–retest reliability has been reported (*31*). With the permission of the PSQI authors, we translated the original English version into Arabic and then back-translated into English (*32*). A total score was used in the current analysis.

In addition, we used a modified version of a subjective mood questionnaire (*33*), which asked participants to describe themselves as relaxed, depressed, sad, discontented, afraid, angry, anxious, or hungry during the past week. Participants rated each of these items on a scale of 1 (not at all) to 8 (extremely). Our preliminary analysis showed that reliability was highest when only negative mood items (i.e., depressed, sad, discontented, afraid, angry, and anxious) were included (Cronbach's $\alpha = 0.79$). Therefore, mean scores of these 6 items were combined into one index, hereafter referred to as negative affect and used in the analysis. The items where subjects rated themselves as either relaxed or hungry were used in the analysis as two separate indices.

Demographic questions included age, gender, years of education since the first year of primary school, and marital status. Questions on khat consisted of use status (daily or occasional use), age of first exposure to khat, number of hours chewing per khat session, number of days chewing per week, whether the respondent had any physical symptoms (e.g., headache, tremor, drowsiness, and fatigue) after stopping khat use, whether the respondent had thought about quitting khat use in the past, and whether the respondent had attempted to quit khat. We also asked whether the respondent currently smoked tobacco products to determine concurrent khat and tobacco users and khat-only users. Those who mentioned current tobacco use were classified as concurrent khat and tobacco users. Self-report measures of major medical and psychiatric conditions (e.g., cardiovascular diseases, liver diseases, cancer, stroke, depression, anxiety disorder, substance use disorders) were also collected.

Data analysis

Descriptive statistics were conducted to check for data adherence to assumptions of the relevant tests as well as to report sample characteristics. A series of 2 khat dependence levels (unlikely to be psychologically khat dependent [UKD: SDS-khat score 5 or lower], likely to be psychologically khat dependent [KD: SDS-khat score 6 or higher]) by 2 gender analyses of covariance (ANCOVA) controlling for tobacco use was conducted on continuous measures of khat use, sleep disturbance (PSQI total scores), and mood measures (negative affect, relaxed, and hungry). These models were tested in light of a significant gender difference and no tobacco use difference in SDS-khat found in this study (see below). If a significant khat dependence levels by gender interaction was found, a post-hoc analysis was conducted with the Bonferroni correction (*P*-value of 0.5/2 tests = 0.025 as a significant *P*-value). Chi-square tests were conducted to examine relationships between khat dependence levels and categorical measures of khat and tobacco use, as well as relationships between gender and categorical measures of khat and tobacco use. Demographic information was tested by 2 khat dependence levels by 2 gender ANOVAs (for age and length of education) and a chi-square test (for marital status). Analyses were conducted by SPSS version 22 (Chicago, IL, USA).

Results

Out of the 401 participants who were enrolled in the study, 292 (73%) identified themselves as khat chewers but 22 (5.5%) of them did not complete the SDS-khat. These individuals were excluded from the analysis, which left a final sample of 270 (67%) khat chewers (129 [47.8%] females and 141 [52.2%] males). Among the 270 participants, 110 khat users (41 females and 69 males) were included in KD group and 160 khat users (88 females and 72 males) were included in UKD group. Khat users, on average, used khat for 5.2 hours a day (SD = 2.3) for 5.7 days a week (SD = 2.0). SDS-khat scores did not differ between khat users who smoked tobacco (mean = 5.2, SD = 3.2) and khat users who didn't smoke (mean = 5.2, SD = 2.3; $F < 0.1$, n.s.).

As illustrated in Table 1, there was a significant khat dependence by gender interaction in age. A follow-up analysis with the Bonferroni correction (adjusted *P* value: 0.05/2 = 0.025) revealed that females were older than males in the KD group ($P = 0.001$); however, this gender difference was not found in the UKD group ($P = 0.56$). Men had

Table 1. Khat dependence and gender differences on demographic, khat use patterns, mood, and sleep disturbance.

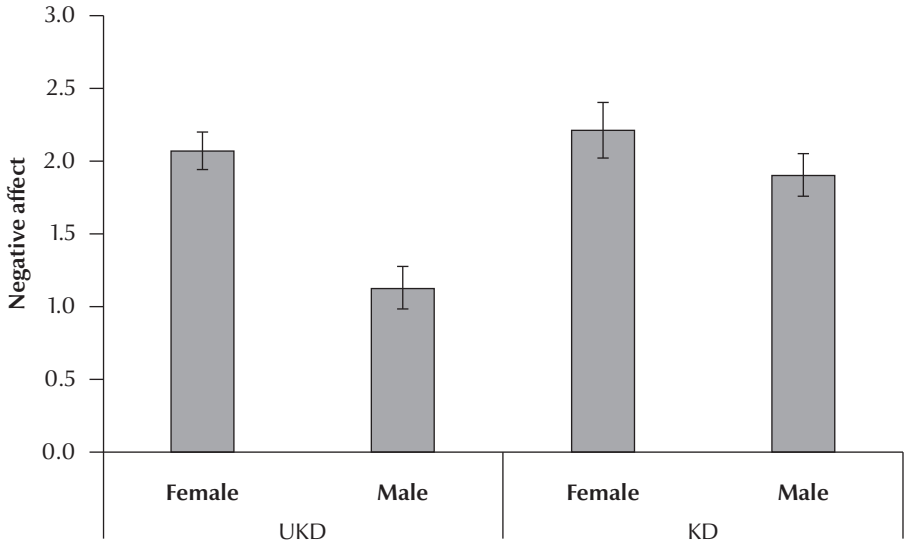
	Unlikely to be khat dependent (UKD; n = 160)		Likely to be khat dependent (KD; n = 110)		Khat dependence effect	Gender effect	Khat / gender interaction
	Female (n=88)	Male (n=72)	Female (n=41)	Male (n=69)	F or χ^2	F or χ^2	F
Age (years)	29.8 (1.0)	30.7 (1.1)	35.1 (1.5)	28.5 (1.2)	1.54	5.54*	9.31**
Married (%)	60.2	55.6	68.3	52.2	0.00	2.19	–
Education (years)	12.0 (0.5)	16.0 (0.5)	12.2 (0.8)	14.4 (0.5)	1.56	26.8***	2.17
SDS-Khat total score	2.8 (0.2)	3.6 (0.2)	7.5 (0.3)	8.4 (0.2)	408.4***	12.0**	0.02
Regular khat use (%)	46.6	68.1	73.2	87.0	19.2***	15.0***	–
Age of first exposure to khat (years)	19.5 (0.5)	14.8 (0.6)	19.1 (0.8)	13.9 (0.6)	1.13	59.2***	0.18
Hours spent per khat session	4.5 (0.2)	5.8 (0.3)	4.3 (0.3)	5.7 (0.3)	0.39	26.1***	0.04
Days of khat use (week)	4.9 (0.2)	5.6 (0.2)	6.1 (0.3)	6.5 (0.2)	20.4***	5.20*	0.39
Have physical symptoms after khat use (%)	28.4	54.2	58.5	68.1	15.7***	14.3***	–
Thought about quitting khat (%)	46.6	73.6	56.1	72.5	1.60	15.7***	–
Tried quitting khat (%)	31.8	33.3	24.4	26.1	1.55	0.01	–
Tobacco user (%)	51.1	52.8	46.3	55.1	0.000	0.50	–
Negative effect	2.1 (0.1)	1.1 (0.1)	2.2 (0.2)	1.9 (0.1)	8.80**	15.9***	4.55*
Relaxed	3.5 (0.2)	3.8 (0.2)	3.7 (0.3)	3.5 (0.2)	0.01	0.08	1.17
Hungry	1.5 (0.2)	0.9 (0.2)	1.4 (0.3)	1.5 (0.2)	1.02	0.77	2.04
PSQI total score	6.3 (0.3)	5.2 (0.4)	7.9 (0.5)	6.8 (0.4)	15.3***	8.02**	0.002

KD = likely to be khat dependent; UKD = unlikely to be khat dependent.
Continuous measures are presented in mean and standard error of the mean with brackets. Categorical measures are presented as a percentage.
** P < 0.05, ** P < 0.01, *** P < 0.001.*
F-values are shown for outcome measures that are continuous in nature. χ^2 values are shown for outcome measures that are presented in categories.

more years of education than women. Regarding influences of khat dependence, the KD group was more likely to use khat on a daily basis, hold more khat sessions during a typical week, and report having physical symptoms after stopping khat use than the UKD group. The KD group had greater levels of negative affect and poorer sleep quality relative to UKD group. With respect to gender differences, men were more likely than women to initiate khat use earlier in life, use khat longer in one session, hold more khat sessions per week, report having physical symptoms after stopping khat use, and to have thought about quitting khat use in the past. Sleep disturbance and negative mood were higher in women than in men. No other khat dependence or gender main effects were found. A significant khat dependence by gender interaction in negative affect and a post-hoc analysis revealed greater levels of negative effect in women (mean = 2.1, SEM = 0.1) than in men (mean = 1.1, SEM = 0.1) among the UKD $F(1, 157) = 22.7$, $P = 0<.001$); however, this was not the case among the KD group ($P = 0.19$; see Figure 1). No other interactions were observed.

Discussion

The observed prevalence rate for khat dependence in male subjects in this study is 48.9%, which is consistent with prevalence rates previously reported of 51% in the UK (*21*), of 52% in Saudi Arabia (*23*), and of 44% in Australia (*24*). It is a clear public health concern that roughly half of male khat users sampled in four different countries are khat dependent and likely candidates for treatment intervention. Our study is the first to report the prevalence of screening positive for khat dependence in a sample of adult women from cities in Yemen. The observed prevalence rate for khat dependence in female subjects in our sample is 31.8%. Further investigation is needed to determine whether this is representative of the true prevalence rate for women, but this raises the



UKD = unlikely to be khat dependent; KD = likely to be khat dependent.

Figure 1. Negative affect as a function of khat dependence and gender. A gender difference was found in khat users who were unlikely to be khat dependent (UKD) but not in those likely to be dependent to khat (KD).

question of a need for specific treatment services for khat dependent women.

An average khat user chewed khat at a rate of about 5 hours per day and nearly 6 days a week. Severity of khat dependence was associated with greater frequency and intensity of khat use, impaired sleep quality, and increased negative affect. Khat dependence was also higher in males than in females. Problems with sleep and negative affect were greater in individuals who are clearly more psychologically dependent upon khat, and this should be a consideration in the design and implementation of treatment strategies for patients seeking treatment for khat dependence. Our findings also highlight the importance of the assessment of physical aspects of khat dependence.

The finding of increased negative affect in khat dependent individuals is consistent with reports of enhanced distress and emotional reactivity of khat users seen in a laboratory stress environment (*34*) as well as reports of verbal aggression and disruptive behaviour in some chronic khat users (*4,17*). This is also consistent with observational reports that khat chewers experience a negative emotional state beginning 2 hours or so after the onset of a khat chewing session, a state that can last for several hours (*34*). It has been hypothesized that frequent khat chewers may experience multiple episodes of negative affect within and between khat chewing episodes, thereby increasing the likelihood of more persistent negative emotional states (*34*). Our results further suggest the role of khat dependence in the link between gender and negative affect since it was only found in non-dependent khat users. The mechanism responsible for these differences has not been defined and warrants future investigation.

The finding of an increased likelihood of impaired sleep in khat dependent individuals is consistent with clinical observations of khat users (*10,17*) as well as evidence from other investigations of habitual khat users (*19,32*). It is certainly possible that impaired sleep quality and/or sleep quantity may also increase the likelihood of negative affect in khat dependent individuals, therefore interacting in a synergistic manner.

Drug dependence produces serious mental and physical health burdens especially in low- and middle-income countries (*1*). It has been reported that khat users, typically men, get together with their peers in the afternoon and chew khat for several hours, leading to financial and familial problems (*35*). Khat use has been linked to altered neurobiological mechanisms related to stress and emotion regulation (*36*), and there is evidence to suggest that khat is associated with worsening of ongoing psychopathology (*4,5,13,37,38*). Although concurrent and khat-only users in this study showed comparable levels of khat dependence, it is possible that variants of tobacco use (duration of use, exposure, and types of tobacco products such as cigarettes and shisha) could affect khat use patterns. More research on addiction, including khat use, and related conditions is clearly warranted in a global health context.

The use of face-to-face interviews in this study may have introduced a social desirability bias and thus constitutes a study limitation. The results of this study are also limited by the use of a cross-sectional method, in that one cannot infer causality relationships. The correlational relationship between khat

dependence and observed psychosocial factors should therefore be considered bi-directional and there should be no inferences made regarding the temporal sequence between the observed psychosocial factors and khat use/khat dependence. The present results on the rate of khat dependence may not represent the entire population in Yemen due to the use of convenience sampling. Future work should validate results of SDS-khat with standardized diagnostic tools such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Statistical Classification of Diseases and Related Health Problems (ICD)

In conclusion, severity of khat dependence was associated with greater frequency and intensity of khat use, increased negative mood, and poorer subjective sleep quality. Certain patterns of khat use may therefore increase the risk of a full-blown dependence syndrome. The mediating role of khat dependence in negative health consequences and treatment outcomes should be elucidated in future research.

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References

1. Baingana F, al'Absi M, Becker AE, Pringle B. Global research challenges and opportunities for mental health and substance-use disorders. Nature. 2015;527(7578):S172–7. Epub 2015/11/19.
2. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet. 2013;382(9904):1575–86. Epub 2013/09/03.
3. Balint EE, Falkay G, Balint GA. Khat - a controversial plant. Wien Klin Wochenschr. 2009;121(19-20):604–14.
4. Odenwald M, Neuner F, Schauer M, Elbert T, Catani C, Lingenfelder B, et al. Khat use as risk factor for psychotic disorders: a cross-sectional and case-control study in Somalia. BMC Med. 2005;3:5.
5. Warfa N, Klein A, Bhui K, Leavey G, Craig T, Alfred SS. Khat use and mental illness: a critical review. Soc Sci Med. 2007;65(2):309–18.
6. Kassim S, Islam S, Croucher RE. Correlates of nicotine dependence in U.K. resident Yemeni khat chewers: a cross-sectional study. Nicotine Tob Res. 2011;13(12):1240–9.
7. Graziani M, Milella MS, Nencini P. Khat chewing from the pharmacological point of view: an update. Subst Use Misuse. 2008;43(6):762–83.
8. Toennes SW, Harder S, Schramm M, Niess C, Kauert GF. Pharmacokinetics of cathinone, cathine and norephedrine after the chewing of khat leaves. Br J Clin Pharmacol. 2003;56:125–30.
9. Centers for Disease Control and Prevention. Smoking-attributable mortality, years of potential life lost, and productivity losses–United States, 2000-2004. MMWR Morb Mortal Wkly Rep. 2008;57(45):1226–8.
10. Al-Motarreb A, Al-Habori M, Broadley KJ. Khat chewing, cardiovascular diseases and other internal medical problems: the current situation and directions for future research. J Ethnopharmacol. 2010;132(3):540–8. Epub 2010/07/14.
11. Hassan NA, Gunaid AA, El-Khally FM, Murray-Lyon IM. The effect of chewing Khat leaves on human mood. Saudi Med J. 2002;23(7):850–3.
12. Odenwald M, Hinkel H, Schauer E, Schauer M, Elbert T, Neuner F, et al. Use of khat and posttraumatic stress disorder as risk factors for psychotic symptoms: a study of Somali combatants. England: Soc Sci Med; 2009. pp. 1040–8.
13. Widmann M, Warsame AH, Mikulica J, von Beust J, Isse MM, Ndetei D, et al. Khat Use, PTSD and psychotic symptoms among Somali refugees in Nairobi - a pilot study. Front Public Health. 2014;2:71. Epub 2014/07/30.
14. al'Absi M, Grabowski J. Concurrent use of tobacco and khat: added burden on chronic disease epidemic. Addiction. 2012;107(2):451–2.
15. Hoffman R, Al'Absi M. Khat use and neurobehavioral functions: suggestions for future studies. J Ethnopharmacol. 2010;132(3):554–63.
16. Nakajima M, al'Absi M, Dokam A, Alsoofi M, Khalil NS. An examination of the Fagerström Test for Nicotine Dependence among concurrent tobacco and khat users. J Psychoactive Drugs. 2012;44(5):437–41.
17. Luqman W, Danowski TS. The use of khat (Catha edulis) in Yemen. Social and medical observations. Ann Intern Med. 1976;85(2):246–9. Epub 1976/08/01.
18. Nencini P, Ahmed AM, Amiconi G, Elmi AS. Tolerance develops to sympathetic effects of khat in humans. Pharmacology. 1984;28(3):150–4. Epub 1984/01/01.
19. Kassim S, Croucher R, al'Absi M. Khat dependence syndrome: a cross sectional preliminary evaluation amongst UK-resident Yemeni khat chewers. J Ethnopharmacol. 2013;146(3):835–41.
20. Nakajima M, Dokam A, Alsameai A, AlSoofi M, Khalil N, al'Absi M. Severity of khat dependence among adult khat chewers: the moderating influence of gender and age. J Ethnopharmacol. 2014;155(3):1467–72. Epub 2014/07/30.
21. Kassim S, Islam S, Croucher R. Validity and reliability of a Severity of Dependence Scale for khat (SDS-khat). J Ethnopharmacol. 2010;132(3):570–7. Epub 2010/09/15.
22. Kassim S, Hawash A, Johnston A, Croucher R. Validation of self-reported khat chewing amongst khat chewers: an exploratory study. J Ethnopharmacol. 2012;140(1):193–6. Epub 2012/01/17.
23. El-Setouhy M, Alsanosy RM, Alsharqi A, Ismail AA. Khat Dependency and psychophysical symptoms among chewers in Jazan Region, Kingdom of Saudi Arabia. Biomed Res Int. 2016;2016:2642506. Epub 2016/03/30.
24. Young JT, Butt J, Hersi A, Tohow A, Mohamed DH. Khat dependence, use patterns, and health consequences in Australia: an exploratory study. J Stud Alcohol Drugs. 2016;77(2):343–8. Epub 2016/03/22.
25. Lemma S, Patel SV, Tarekegn YA, Tadesse MG, Berhane Y, Gelaye B, et al. The epidemiology of sleep quality, sleep patterns,

consumption of caffeinated beverages, and khat use among Ethiopian college students. Sleep Disord. 2012;2012:583510.

26. de Wild-Hartmann JA, Wichers M, van Bemmel AL, Derom C, Thiery E, Jacobs N, et al. Day-to-day associations between subjective sleep and affect in regard to future depression in a female population-based sample. Br J Psychiatry. 2013;202:407–12. Epub 2013/05/11.
27. Ohayon MM, Roth T. Place of chronic insomnia in the course of depressive and anxiety disorders. J Psychiatr Res. 2003;37(1):9–15. Epub 2002/12/17.
28. Goldston K, Baillie AJ. Depression and coronary heart disease: a review of the epidemiological evidence, explanatory mechanisms and management approaches. Clin Psychol Rev. 2008;28(2):288–306. Epub 2007/07/03.
29. Covassin N, Singh P. Sleep duration and cardiovascular disease risk: epidemiologic and experimental evidence. Sleep Med Clin. 2016;11(1):81–9. Epub 2016/03/15.
30. Gossop M, Darke S, Griffiths P, Hando J, Powis B, Hall W, et al. The Severity of Dependence Scale (SDS): psychometric properties of the SDS in English and Australian samples of heroin, cocaine and amphetamine users. Addiction. 1995;90(5):607–14. Epub 1995/05/01.
31. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. Psychiatry Res. 1989;28(2):193–213.
32. Nakajima M, Dokam A, Kasim AN, Alsoofi M, Khalil NS, al'Absi M. Habitual khat and concurrent khat and tobacco use are associated with subjective sleep quality. Prev Chronic Dis. 2014;11:E86. Epub 2014/05/24.
33. al'Absi M, Wittmers LE, Erickson J, Hatsukami D, Crouse B. Attenuated adrenocortical and blood pressure responses to psychological stress in ad libitum and abstinent smokers. Pharmacol Biochem Behav. 2003;74(2):401–10.
34. Bongard S, al'Absi M, Khalil NS, Al Habori M. Khat use and trait anger: effects on affect regulation during an acute stressful challenge. Eur Addict Res. 2011;17(6):285–91.
35. Al-Motarreb A, Baker K, Broadley KJ. Khat: pharmacological and medical aspects and its social use in Yemen. Phytother Res. 2002;16(5):403–13.
36. al'Absi M, Khalil N, Al Habori M, Hoffman R, Fujiwara K, Wittmers L. Effects of chronic khat use on cardiovascular, adrenocortical, and psychological responses to stress in men and women. 2012.
37. Yousef G, Huq Z, Lambert T. Khat chewing as a cause of psychosis. Br J Hosp Med. 1995;54:322–6.
38. Alem A, Shibre T. Khat induced psychosis and its medico-legal implication: a case report. Ethiop Med J. 1997;35:137–9.

Pattern of addiction and its relapse among habitual drug abusers in Lahore, Pakistan

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نمط الإدمان والانتكاس بين متعاطي المخدرات المعتادين في لاهور، باكستان

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الخلاصة: تقيّم هذه الدراسة نمط تعاطي المخدرات وأسباب الانتكاس والرجوع إلى الإدمان في صفوف مدمني المخدرات من الذكور الذين يسعون للحصول على خدمات إعادة التأهيل في المراكز المختلفة في لاهور، باكستان. ولقد أُجري مسح مقطعي على مدمني المخدرات الذكور في الفترة من أبريل/ نيسان إلى ديسمبر/ كانون الأول 2016. وأجري اختيار غرضي غير عشوائي لجمع عينة من 119 مشاركاً. واستُخدم استبيان مهيكل وأُجريت مقابلات معمّقة لجمع البيانات. ومن بين المشاركين البالغ عددهم 119 مشاركاً، كان ٪71.4 في الفئة العمرية 15-35 سنة. وأُفيد بانخفاض مستويات التعليم في أغلب العينة، حيث كان ٪68.1 دون مستوى التعليم الثانوي. وشكّل غير المتزوجين (٪51.3) والعاطلون عن العمل (٪44.5) الفئتين الأكثر تعرضاً لمخاطر تعاطي المخدرات. وكان سن الإدمان في ٪45 من الحالات أقل من 18 عاماً، حيث تبين أن أغلبية الحالات كانت تتعاطى المواد المخدرة لأكثر من 5 سنوات (٪40). وتراوحت أسباب البدء في تعاطي المخدرات بين الترفيه (٪37)، والفضول (٪34.5)، والتعرض لأحداث غيرت مجرى الحياة (٪14.3). أما أسباب الانتكاس فتضمنت الارتباط بمدمنين سابقين، وردود الأفعال السلبية من جانب الأسرة، وعدم القدرة على التحكم في الرغبة في التعاطي وضغوط العمل/ الضغوط الاجتماعية.

ABSTRACT This study assessed the pattern of drug abuse and the reasons for relapse of addiction among male drug addicts seeking rehabilitative services in different centres in Lahore, Pakistan. A cross-sectional survey was conducted on male drug abusers from April to December 2016. Nonprobability purposive sampling was done to collect a sample of 119 participants. A structured questionnaire and in-depth interviews were used for data collection. Out of 119 participants, 71.4% were in the age group 15–35 years. Educational levels were low in the majority, with 68.1% below secondary education. Unmarried (51.3%) and unemployed (44.5%) participants were at the greatest risk of using drugs. The age of addiction in 45% of patients was < 18 years and 40% had been abusing substances for > 5 years. Reasons for starting drug abuse were recreation (37%), curiosity (34.5%), and life-changing events (14.3%). Reasons for relapse included association with former addicts, negative reactions from family, inability to manage the craving and work/social stress.

Schéma de dépendance et de rechute parmi les toxicomanes habituels à Lahore, Pakistan

RÉSUMÉ La présente étude avait pour objectif d'évaluer les schémas d'abus de substances psychoactives et les causes de rechute parmi les hommes toxicomanes recherchant des services de réadaptation dans différents centres de Lahore, au Pakistan. Une enquête transversale a été conduite sur les utilisateurs de substances psychoactives de sexe masculin entre avril et décembre 2016. Un échantillonnage non probabiliste par choix raisonné a été réalisé afin d'établir un échantillon de 119 participants. Un questionnaire structuré et des entretiens approfondis ont été utilisés pour la collecte de données. Sur les 119 participants, 71,4 % appartenaient au groupe d'âge des 15-35 ans. Les niveaux d'éducation étaient faibles dans la plupart des cas, 68,1 % n'ayant pas atteint l'enseignement secondaire. Les hommes célibataires (51,3 %) et chômeurs (44,5 %) étaient exposés à un risque accru de toxicomanie. L'âge de la mise en place de la dépendance était inférieur à 18 ans chez 45 % des patients, 40 % d'entre eux consommant des substances psychoactives depuis plus de 5 ans. L'aspect récréatif (37 %), la curiosité (34,5 %) et les changements de vie (14,3 %) comptaient parmi les raisons pour lesquelles les patients commençaient à utiliser des substances psychoactives. Les causes de rechute incluaient le regroupement avec d'anciens toxicomanes, les réactions négatives de la famille, l'incapacité à gérer le manque, et le stress professionnel et social.

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Introduction

Addiction is defined as a maladaptive pattern of substance use leading to clinically significant impairment or distress, occurring any time in the same 12-month period. It is manifested by tolerance, withdrawal and other symptoms (*1*).

Approximately 15.9 million people inject drugs worldwide, with the largest numbers found in China, America and Russia (*2*). Annual prevalence of all illicit drug use in Pakistan was reported as 6% in 2013 (*3*). The annual prevalence in Pakistan of cannabis use is 3.6%, opioids 2.4%, tranquilizers 1.4%, amphetamine 0.08%, solvents 0.03% and cocaine 0.01%. (*3*). The highest number of intravenous drug abusers among all provinces is in Punjab (*4*), which includes a high ratio of polydrug abuse among addicts in Lahore using heroin and opium together (*3*).

Internationally, two thirds of patients with addiction have a coexisting mental health problem (*5*). In male heroin users in Lahore, parental disharmony, paternal absence or maternal illiteracy has been shown to increase risk of addiction (*6*). Psychosocial factors like loneliness, parental coldness and peer pressure are major contributors to addiction (*7*). Curiosity to try new things is one of the most common reasons reported by drug users themselves (*8*).

Alcohol consumption accounts for loss of healthy years of life globally, and in high-income countries causes ~19% of disability-adjusted life years and ~27% of premature deaths among young people (*9*). If children initiate drug or alcohol abuse at age 10–11 years, there is a greater chance that they will be trapped in addiction at age 17–18 years (*10*). Parents who have heavy alcohol consumption are more likely to have children who abuse alcohol (*11*). Other childhood premorbid traits that determine continuation of substance abuse in adulthood are boldness and less socialization (*12*).

Family ties have an important role in the recovery process from addiction. Family support and concern for one's own health are the most important motivating factors for quitting abuse (*13*), whereas socializing with the same peer groups and easy availability of drugs are the biggest reasons for relapse (*14*).

According to the National Institute on Drug Abuse of Pakistan, only 11.2% of the addicts who need treatment actually seek it (*15*). Treatment of drug addiction and rehabilitation services are provided through a wide range of public and private institutes in Lahore. The present study targeted male addicts seeking rehabilitation services in Lahore to assess the practice of drug abuse and reasons for relapse. Few studies have been conducted in this area of research and there is a dearth of scientific evidence to target strategies to tackle this important public health issue.

Material and methods

A cross-sectional study using a mixed-methods technique was conducted among addicts currently undergoing treatment in Lahore. Total duration of the study was 6 months (March–August 2016). One hundred and nineteen addicts from different rehabilitative institutes in Lahore were selected by using a purposive sampling technique.

A structured questionnaire was developed for collection of quantitative data and personal interviews were transcribed for collection of qualitative data. Analysis was done using SPSS version 20 for the quantitative variables. Thematic analysis was carried out for qualitative questions. To explore the factors and determinants of addiction among the participants, initial codes were generated in a systematic fashion. Codes were used to create "big ideas" (or themes) from each interview and data was coded on the basis of recurrence of similar responses. Qualitative analysis, including thematic and content analysis, was carried out for qualitative data. A subset of transcripts was also double coded, that is, two members of the research group coded the same transcript to reduce personal bias. Disagreements and insights were discussed and alternative interpretations were incorporated in the analysis. Finally, interview transcripts were indexed and mapped on the basis of recurring major themes with corresponding sub-themes. To ensure reliability, 2 researchers read the interviews separately and agreed on the coding framework. A general introduction to research design, interviewing skills, gaining trust and adherence to ethical boundaries were discussed at the Institutional Review Board.

Results

Forty-two (35.3%) respondents were aged 18–24 years, 43 (36.1%) 25–34 years, 20 (16.8%) 35–44 years and 14 (11.8%) ≥ 45 years. Sixty-one (51.3%) respondents were single, 53 (44.5%) married and 5 (4.2%) divorced. Two (1.7%) respondents were illiterate, 29 (24.4%) were educated up to grade 5, 52 (43.7%) up to grade 8, 28 (23.5%) matric to grade 14 and 8 (6.7%) post-graduate, which means that 68.1% were below secondary level. Fifty-three (44.5%) respondents were unemployed and 66 (55.5%) were employed before being admitted to the facility. Only one of them was already in service and undergoing treatment after being granted medical leave from his employer. Approximately 42% had income less than Rs 30,000 (US$ 300). The majority of the respondents belong to lower socioeconomic groups. Approximately 41% of the respondents have income between US$ 100 to US$ 300..

Fifty-three (44.5%) of the respondents started using drugs when they were aged < 18 years, 43 (36.1%) at 18–25 years, 15 (12.6%) at 25–35 years and

8 (6.7%) at > 35 years, which showed that 82.8% of the respondents started abusing drugs before age 25 years. The reasons for initial drug use were recreation (n = 46, 38.6%), curiosity (n = 41, 34.5%), life-changing event (n = 17, 14.3%) and peer pressure (n = 15, 12.6%). The mode of intake was sniffing (n = 39, 32.8%), oral ingestion (n = 37, 31.1%), inhalation (n = 29, 24.3%) or intravenous injection (n = 14, 11.8%). Forty-seven (39.5%) respondents used drugs for > 5 years, 46 (38.7%) for 1–5 years, 13 (10.9%) for 6 months–1 year and 13 (10.9%) for < 6 months. Sixty-four (53.8%) respondents used a single drug and 55 (46.2%) multiple drugs. Ninety-four (79.7%) respondents reported that their drug use had been influenced by friends and 11 (9.3%) by family. Other influences included spouses, media and work colleagues. The most common drugs used were charas (n = 52, 44.4%), heroin (n = 48, 41%), hashish (n = 39, 33.3%) and alcohol (n = 33, 28.2%), followed by sedative pills, cocaine and naswar (n =14, 12%; n = 4, 3.5% and n = 3, 2.5%, respectively).

Sixty-six (55.5%) respondents were admitted to rehabilitation centres once, 23 (19.3%) were admitted twice and 30 (25.2%) ≥ 3 times. Eighty-four (70.6%) respondents reported family involvement and 35 (29.4%) no family involvement. Twenty-six (21.8%) respondents had an associated chronic disease and 93 (78.2%0 did not, and 32 (26.9%) had an associated psychiatric illness and 87 (73.1%) did not. Fifty-eight (48.7%) respondents had drugs provided by drug dealers, 29 (24.4%) by friends, 16 (13.4%) by pharmacies, 14 (11.8%) by work colleagues and 2 (1.7%) by family.

Eighty-five (72%) respondents admitted to being financially burdened because of drug abuse, and often resorted to borrowing money from friends or taking from their family, especially their parents. However, a large number (98, 83%) were now concerned for their health and were motivated to find a cure.

We conducted in-depth interviews to establish the reasons for relapse into drug abuse. Relapse was commonly reported among all 119 respondents. The following themes were identified based on the participants' responses.

Sleepy friends, sleepy places

Sixty-five (50%) participants blamed their friends or social connections for their relapse into drug abuse. Thirty-eight (32%) respondents said that friends were their source of provision of drugs, and 95 (80%) respondents reported that they obtained information about drugs from friends. Participants reported that when they returned to the same community and encountered the same people, they slowly began to indulge in the same harmful activities as before.

Family grief and sadness

Most of the participants said they experienced rude behaviour from their family and wider society, which had a negative effect. One participant relapsed solely due to taunts he faced after returning to the rehabilitation centre. They spoke about many aspects such as divorce, feeling hated by relatives, family bereavement, living in poverty, and being unemployed.

Inability to control craving

Thirty-six (30%) participants reported that they were devoid of any social support after returning to familiar locations, circumstances and people, which meant that they were not able to control their craving. Work stress and the same environment contributed negatively to relapse. Some were misusing the detoxification centres to eliminate tolerance developed by their bodies, to achieve euphoria and the same high that they felt when they used drugs for the first time. This means that they never intended to be cured but, in complete knowledge of their disease, to use the treatment centres to their own advantage.

Sick of being sick

Forty-eight (40%) participants reported that they had come willingly to the rehabilitation centre for treatment; the others stated that they were being brought forcefully by family members. One participant was sick of spending so much money on drugs. A government employee said that alcohol was readily available in their circumstances; that they normally drank to relax and smoked cigarettes with heroin and other drugs to raise their energy levels and performance. The respondent now had tremors and hallucinations and decided to seek treatment. One young participant stated that he was undergoing treatment because he did not want to die, although he also stated his belief that there was no cure for addiction. Becoming a parent was a wake-up call for one participant.

Dissatisfaction with doctors

One participant complained that he was not educated sufficiently about his disease and was not counselled properly by his doctors, which resulted in relapse into drug abuse.

Work and social stressors

The participants included healthcare professionals, for example, a dentist and a paramedic serving at the emergency department of a government hospital. Facing the same stressors that made them initiate drug use was also a cause of relapse, for example, work stress and relationship breakdown. The mass media was considered to play a negative role in their promotion of unrealistic images of relationships, which acted as a social stressor.

Discussion

In Pakistan, 4.25 million drug users required interventional treatment in 2011

(*15*). This signifies the burden of disease due to addiction. There is a strong taboo associated with addiction in Pakistan, particularly among the younger age group (< 18 years) (*16*). Women are particularly socially stigmatized if they report drug use and seek treatment (*17*), and there are no separate rehabilitation centres for female drug users. Our study targeted 3 different rehabilitation centres in Lahore. The various methods of addiction commonly practiced include sniffing, oral ingestion, inhalation and intravenous injection. Our study highlighted that ~50% of the participants were either sniffing or inhaling the drugs. On the contrary, the National Institute on Drug Abuse states that injection and smoking are the most common methods of drug administration (*18*).

We found that the majority of participants started abusing drugs before 18 or between 18 and 25 years of age. Similar findings were reported in a study in which 92.9% of the participants reported substance use before the age of 25 years (*19*). Drug abuse at an early age can have detrimental effects on the psychological, physical and social development of the individuals concerned (*20*), leading to troubled teenage years, poor academic performance and conflicts with family and friends.

Another important indicator associated with drug abuse is the duration of use. Approximately half of the participants in our study reported using drugs for > 5 years. A study conducted in Rawalpindi, Pakistan (*21,22*) had similar findings substantiating the fact that mostly chronic drug abusers seek rehabilitation services. Strategies should be devised to trace drug abusers in the early stage of their addiction to encourage them to seek help for cessation and counselling.

The main reasons for initiation of drug abuse highlighted by the participants in our study were recreation and curiosity. A study conducted in Malaysia in 2013 highlighted similar reasons, confirming the findings of our study (*23*). Lack of recreational activities can be one of the factors that trigger substance abuse. More emphasis should be placed by provincial and national government on the provision of recreational activities and places of entertainment. Such initiatives will provide alternative means to dissipate energy and become involved in healthy leisure activities. The issue of curiosity can be addressed by health education campaigns targeted at individual, group and mass levels.

The main limitation of our study was the lack of female participants. Their inclusion would have provided an opportunity to explore further the factors associated with initiation of drug abuse and associated factors of low compliance to treatment and sociocultural aspects of drug abuse. However, lack of availability of female participants and the strong social and cultural stigma and sensitivity associated with female addiction made it difficult to recruit female participants.

In conclusion, drug addiction is a problem that is escalating globally among younger age groups (< 18 years). This can have negative implications on their physical, psychological and social development. Policies and health awareness campaigns should be scaled up to address the prevalence of drug abuse among young people and highlight the factors associated with initiation of substance abuse. A multisectoral approach should be adopted and addiction cessation services should be prioritized at the primary healthcare level.

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References

1. Diagnostic and statistical manual of mental disorders. 4th edition. Washington, DC: American Psychiatric Association; 2000.
2. Mathers B, Degenhardt L, Philipps B, Weissing L, Hickman M, Strathdee SA, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. Lancet. 2008 Nov 15; 372(9651):1733–45. PMID:18817968.
3. Drug use in Pakistan 2013. Vienna: United Nations Office on Drugs and Crime; 2013 (http://www.unodc.org/documents/pakistan//Survey_Report_Final_2013.pdf, accessed 25 April 2017).
4. Narcotics and Pakistan. Consultative Sessions on the Draft Anti-Narcotics Policy 2010. Pakistan Institute of Legislative Development and Transparency; 2010 (http://www.pildat.org/publications/publication/GovernanceAssessment/NarcoticsandPakistan-ConsultativeSessionsontheDraftAnti-NarcoticsPolicy2010.pdf, accessed 25 April 2017).
5. Park S, Kim Y. Prevalence, correlates, and associated psychological problems of substance use in Korean adolescents. BMC Public Health. 2015;16:79. PMCID:PMC4728773.
6. Siddique F, Mann AA, Ali T. Influence of social factors on drug use behavior in Punjab. Pakistan. Pak J Nutr. 2012;11(11):1099–100.
7. van der Zwaluw CS1, Scholte RH, Vermulst AA, Buitelaar JK, Verkes RJ, Engels RC. Parental problem drinking, parenting, and adolescent alcohol use. J Behav Med. 2008 Jun;31(3):189–200. PMID:18189121.
8. Racz J. The role of the curiosity in interviews with drug users. Forum Qual Soc Res. 2008 May;9(2):16 (http://www.qualitative-research.net/index.php/fqs/article/view/423/917, accessed 25 April 2017).
9. Chan YF, Dennis ML, Funk RR. Prevalence and comorbidity of major internalizing and externalizing problems among adolescents and adults presenting to substance abuse treatment. J Subst Abuse Treat. 2008;34(1):14–24. PMID:17574804.
10. Hawkins JD, Graham JW, Maguin E, Abbott R, Hill KG, Catalano RF. Exploring the effects of age of alcohol use initiation and psychosocial risk factors on subsequent alcohol misuse. J Stud Alcohol. 1997 May;58(3):280–90. PMID:9130220.

11. Rossow I, Keating P, Felix L. McCambridge J. Does parental drinking influence children's drinking? A systematic review of prospective cohort studies. Addiction. 2016;111(2):204–17. PMID:26283063.

12. Hicks B, Lacono W, McGue M. Identifying childhood characteristics that underlie premorbid risk for substance use disorders: socialization and boldness. Dev Psychopathol. 2014 Feb;26(1):141–57. PMID:24280373.

13. Vignesh BT, Singh AK, Mohan SK, Murthy S, Joshi A. Association between socio-demographics and alcohol dependence. Glob J Health Sci. 2014 Jan 23;6(3):16–26. PMID:24762342.

14. Golestan S, Abdullah HB, Ahmed NB, Anjomshoa A. Environmental factors influencing relapse behavior among adolescent opiate users in Kerman (a province in Iran). Glob J Hum Soc Sci. 2010;10(4):71–6. (http://socialscienceresearch.org/index.php/GJHSS/article/view/67/46).

15. Drug facts. Treatment statistics. Revised March 2011. Bethesda, MD: National Institute on Drug Abuse (https://www.drugabuse.gov/publications/drugfacts/treatment-statistics, accessed 25 April 2017).

16. Zaman M, Razzaq S, Hassan R, Qureshi J, Ijaz H, Hanif M, et al. Drug abuse among the students. Pak J Pharm Res. 2015 Jan 1;1(1):41–7 (http://pjpr.net/index.php/pjpr/article/view/21/10, accessed 25 April 2017).

17. Shafiq M, Shah Z, Saleem A, Siddiqi MT, Shaikh KS, Salahuddin FF, et al. Perceptions of Pakistani medical students about drugs and alcohol: a questionnaire-based survey. Subst Abuse Treat Prev Policy. 2006 Oct 25;1(1):31. PMID:17064420.

18. Kuria MW. Factors associated with relapse and remission of alcohol dependent persons after community based treatment. Open J Psychiatry. 2013;3:264–72 (http://file.scirp.org/pdf/OJPsych_2013043010042069.pdf, accessed 25 April 2017).

19. Drugs, brains, and behavior: the science of addiction. Bethesda, MD: National Institute on Drug Abuse (https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drug-abuse-addiction, accessed 25 April 2017).

20. Newcomb MD, Bentler PM. Consequences of adolescent drug use: impact on the lives of young adults. Newbury Park, CA: Sage Publications; 1988.

21. Masood S, Sahar NU. An exploratory research on the role of family in youth's drug addiction, Health Psychol Behav Med. 2014 Jan 1;2(1):820–32. PMCID:PMC4346037 20:

22. Tam C, Foo YC. A qualitative study on drug abuse relapse in Malaysia: contributory factors and treatment effectiveness. Int J Collabor Res Intern Med Public Health. 2013;5(4):217–32.

23. Malik A, Nawaz S, Tahir A, Ahmed S, Ashraf S, Hanif N et al. Knowledge and awareness of harmful effect of substance abuse among usersand non-users: a cross-sectional study from Bari Imam. J Pak Med Assoc. 2012 Apr;62(4):412–5. PMID:22755297.

Drop-out from a drug treatment clinic and associated reasons

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معدلات التسرب من عيادات العلاج من الإدمان والأسباب المرتبطة بها

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الخلاصة: تمثّل الهدف من هذه الدراسة في تقييم معدلات التسّرب من العلاج والأسباب المرتبطة بها في عيادة المركز الوطني الإيراني لدراسات الإدمان. وفي فترة سنة واحدة (أبريل/ نيسان 2014 حتى مارس/ آذار 2015)، أُدرج في هذه الدراسة جميع المرضى الذين يعانون من إدمان المخدرات ممن أحيلوا للعلاج وخضعوا لتقييم أولي (حجم العينة = 242). وتمت متابعة الأشخاص الذين تلقّوا العلاج حتى مارس/ آذار 2016. وأظهر تحليل القدرة على البقاء على قيد الحياة تسرب 70.2٪ من العلاج. وأظهر اختبار رتبة اللوغريتمية أن معدلات التسرب من العلاج تختلف باختلاف الأساليب المستخدمة ($P < 0.001$)، وهو أدنى ميْل في العلاج المستمر بالإنبيوبرينورفين وأعلى ميْل في برنامج إزالة السُمِّية. وبلغت معدلات التسرب خلال الأشهر الثلاثة الأولى 62٪ (الانحراف المعياري = 0.05) و82.4٪ (الانحراف المعياري = 0.03) لإدمان الأفيونيات والمنبّهات، على التوالي. وأجريت تحليلات باستخدام برامج SPSS (الإصدار 21.0)، STATA الإحصائية (الإصدار 13.0). ومن منظور المرضى، اعتُبرت أوجه التناقض في الحوافز السبب الرئيسي لعدم البدء في العلاج أو تركه. ويمكن أن توفّر نتائج هذه الدراسة فهماً أفضل لمقدِّمي الخدمات بشأن معدلات التسرّب وما يرتبط بها من أسباب.

ABSTRACT The aim of this study was to assess drop-out rates and associated reasons among patients at the Iranian National Center for Addiction Studies (INCAS) clinic. In a one-year period (April 2014 to March 2015), all patients with drug dependence who had been referred for treatment and attended for a first assessment were included in this study (N=242). Those who received treatment were followed until March 2016. Survival analysis showed that 70.2% had dropped out from treatment. Log rank test showed that treatment drop-out rates differed between the different approaches used ($P < 0.001$), with the lowest slope inbuprenorphine maintenance treatment and the highest in the detoxification programme. Drop-out rates within the first three months was 62% (SE= 0.05) and 82.4% (SE=0.03) for opioids and stimulants dependence, respectively. Analyses were performed using SPSS (Version 21.0) and STATA software, (version 13.0). From the patients' perspective, motivational inconsistencies were considered as the main reason for not starting or leaving treatment. The findings of this study could give service providers a better grasp of drop-out rates and the associated reasons.

Taux d'abandon dans un centre de traitement de la dépendance aux drogues et raisons associées

RÉSUMÉ La présente étude avait pour objectif d'évaluer les taux d'abandon et les raisons associées parmi les patients de la clinique du Centre national iranien d'études sur les addictions (INCAS). Sur une période d'un an (avril 2014 à mars 2015), tous les patients souffrant de dépendance aux drogues ayant été transférés en vue d'un traitement et consultant pour la première fois dans cette structure ont été inclus dans l'étude (n=242). Les patients sous traitement ont été suivis jusqu'en mars 2016. L'analyse de survie a montré que 70,2 % des patients avaient abandonné le traitement. Le test du log-rank a révélé que les taux d'abandon de traitement différaient selon les approches utilisées ($p < 0,001$), la baisse la moins importante concernant le traitement d'entretien à la buprénorphine et la baisse la plus forte les programmes de désintoxication. Les taux d'abandon durant les trois premiers mois étaient de 62 % (erreur-type = 0,05) et de 82,4 % (erreur-type = 0,03) pour la dépendance aux opioïdes et aux stimulants respectivement. Les analyses ont été réalisées à l'aide des logiciels SPSS (version 21.0) et STATA (version 13.0). Selon les patients, le manque de motivation constituait l'une des raisons principales pour ne pas commencer ou abandonner un traitement. Les résultats de cette étude pourraient offrir aux prestataires de service une meilleure compréhension des taux d'abandon et des raisons associées.

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Introduction

Substance use disorder is a chronic relapsing condition which requires long-term treatment. In the Islamic Republic of Iran, it is estimated that > 1 million people are suffering from addiction to an illicit drug (*1*). During the past 2 decades, drug treatment services have expanded dramatically, both in service coverage and diversity of services. There are now > 5000 outpatient drug treatment clinics in the country. However, only 21% of people with drug use disorder have received services from these clinics in the past 12 months (*1*).

Addiction treatment is a complex process and achieving desirable outcomes relies on several factors. Retention in the treatment and completion of its course are some of the most prominent factors. Completing the course of treatment is associated with higher abstinence, lower crime rate, lower relapse and higher employment compared to those who have dropped out (*2*). At the same time, there are studies indicating that drop-out might result in wasting resources of the individual, the healthcare system and society. There have been several studies on treatment retention, drop-out and associated factors; however, due to differences in the types of treatment, treatment setting and patients' characteristics, different rates of drop-out, from 0.4% to 90%, have been reported (*3*).

Different reasons have been given for drop-out. Lack of motivation, fear of treatment failure and interpersonal conflicts have been reported as the reasons for treatment drop-out (*4–6*). Therefore, with proper detection and removal of such obstacles, one may be able better to provide the required services and fulfil treatment protocols and decrease the cost to the healthcare system.

Our knowledge regarding drop-out usually comes from the results of controlled trials in experimental settings; however, the results might not be applicable to the real world. The clinic of the Iranian National Center for Addiction Studies (INCAS) could be considered as a prototype of a specialized drug treatment clinic and observations of treatment course and outcomes from this centre can be applied to other similar facilities. The INCAS clinic, with more than a decade of experience in the field of delivering drug treatment services, is an academic centre affiliated to the Tehran University of Medical Sciences. The clinic is located at the heart of the city of Tehran and receives a variety of clients from all over Tehran.

For opioid dependence, the INCAS clinic offers an assortment of services including methadone and buprenorphine maintenance treatment, short-term detox programmes with counselling, and other psychosocial rehabilitation approaches. The provided treatment modality for each patient is based on patient characteristics, severity of dependence, previous treatment attempts and patient preference. Maintenance treatments could continue for several years but usually buprenorphine maintenance treatment (BMT) is provided for 1 year and detox programmes are followed by 6-months relapse-prevention counselling. For amphetamine-type stimulants dependence, the centre offers a treatment package, called the Matrix model, which is a structured 24-session individual psychotherapy with a cognitive–behavioural approach along with family education. The therapy sessions are provided 2 or 3 times a week. These sessions cover areas such as: trigger and craving management techniques; basic required skills for remission (e.g., managing boredom and other negative emotions, building trust, stress and anger management); and relapse-prevention counselling. For cannabis dependence, similar core cognitive–behavioural techniques, as in the Matrix model, are provided for the patients. Group family education sessions are also provided. Patients are encouraged to attend group therapy, focusing on relapse prevention, after the completion of the structured therapy sessions. After 1 session of initial assessment and development of a treatment plan, the second appointment for all modalities is made within the next 7 days.

This study was carried out in a group of treatment-seeking clients of the INCAS clinic. The aims of this study were: (1) to assess the rates of drop-out in the total sample and in different treatment categories; and (2) to assess the reasons for drop-out in those who had left the treatment and provide pragmatic recommendations in order to achieve higher treatment retention rates.

Methods

We included 242 clients from April 2014 to end of March 2015 who had been referred to the INCAS clinic for treatment of opioids, amphetamine-type stimulants, prescription drugs and cannabis dependence. The INCAS clinic benefits from an electronic registry system, called Addiction Treatment Centers Automation Software (ATCAS). ATCAS was used to obtain the clients' sociodemographics, contact information, and data regarding the pattern of substance abuse and the treatment approach at each entry point. The study was conducted in 2 phases. First, drop-out was assessed using the ATCAS registry up to the end of March 2016 and survival analysis was carried out. Second, the reasons for drop-out were gathered via telephone interviews using a questionnaire.

Drop-out was defined either as not attending at all after the first assessment or otherwise according to the specific treatment modality started. For opioid substitution treatment, a ≥ 7-day leave of treatment, and for psychotherapy and detox and relapse-prevention programmes, failure to show up for the next therapy session, even after setting

another appointment were considered as drop-out.

The interviewer contacted all individuals who dropped out (either those who did not start treatment or those who had left after treatment initiation) from April to September 2015. The interviewer was a trained nurse making telephone calls with the use of ATCAS registry. For ethical and professional considerations, interviews were conducted after confirmation of the identity of the respondent. This was achieved by asking for national identity and birth certificate numbers and other identifying data. After confirming the identity of the client, the interviewers introduced themselves and gave the reasons for calling. After obtaining oral consent and stating the participant's right of refusal, the interview began. First, an open-ended question regarding the client's overall opinion toward treatment obstacles was asked. Then the interview continued by using a structured questionnaire.

Instruments

A modified version of Reason for Leaving Treatment Questionnaire (RLTQ) was implemented (*6*). RLTQ consists of 28 true/false questions and covers 7 domains: motivational inconsistencies (4 questions), staff conflicts (3 questions), boundary concerns (5 questions), outside influences (4 questions), programme expectations (4 questions), problem severity (4 questions) and logistic problems (4 questions). Respondents were asked to determine if the statement related to their decision not to start or to leave the treatment. A domain was considered positive if one of its related questions was true. In order to implement RLTQ, the questionnaire was translated and modified according to the cultural context of the addiction treatment services in the country. Two other questions for boundary concerns and 2 questions to assess pharmacological adverse effects for those receiving maintenance treatments were added to the questionnaire. Therefore, the total number of questions for those on maintenance programmes and nonpharmacological approaches were 32 and 30, respectively. Content validity of the questionnaire was assessed by an expert panel of drug treatment specialists.

Ethical considerations

The research protocol was approved by the Ethics Committee of Tehran University of Medical Sciences in Iran (No. IR.TUMS.REC.1394.2136). Participation in the study was on a voluntary basis, and oral consent was obtained before all interviews. All questionnaires and the database of the study were kept confidential by the research team.

Data analysis

SPSS Statistics for Windows version 21.0 (IBM Corp., Armonk, NY, USA) and Stata Statistical Software version 13 (Stata Corp., College Station, TX, USA) were used for data analysis. For quantitative variables (such as age), *t* test and analysis of variance were used. For qualitative variables (such as gender, marital status, type of treatment and substance of abuse) χ^2 test was applied. Survival analysis (Kaplan–Meier: log rank test and Cox regression) was used to assess days staying in treatment. For those who started treatment, the period of survival of each case was calculated between the date of admission to the clinic and the date of leaving treatment or completion of treatment. For the case of methadone maintenance treatment (MMT), survival was calculated until the end of the study period in March 2016. The survival data were considered to be subject to right censoring. *P* values < 0.05 were considered statistically significant in all tests.

Results

Between April 1, 2014 and March 31, 2015, 242 individuals with substance use disorders (226 men and 16 women) were referred to the INCAS clinic for treatment and attended for initial assessment. A total 16 689 person–days of services were delivered. Following the initial assessment, treatment need was identified as solely for stimulants (56.2%), solely for opioids (32.6%), both for stimulants and opioids (7.4%) or solely for cannabis or prescription drugs (3.8%). Among the clients, 61 (25.2%) visited only once and did not return again, although the initial assessment was done and the treatment approach was determined and recommended. Treatment initiation failure was 26.4%, 26.9%, 21.0% and 8.3% for psychotherapy, MMT, BMT and detox programme, respectively. Moreover, treatment initiation failure was 28.7%, 25.3% and 11.1% for stimulant, opioid and combination of opioid and stimulant dependence, respectively and zero for cannabis and prescription drugs.

In addition to the 61 clients who, following the first assessment, did not take up further treatment offered at the centre, from the remaining 181 clients who did engage further, 127 (70.2%) subsequently dropped out. Drop-out rate after treatment initiation was 74.3% for psychotherapy and 63.0–66.7% for the other 3 medically assisted treatment modalities. The overall incidence rate of drop-out from the treatment was 7.6 per 1000 person–days of service [95% confidence interval (CI): 6.4–9.1]. Twenty-five percent had left the treatment in the first 12 days and 50% in the first 42 days. Drop-out during the first 3 months was seen in 62.0% [standard error (SE) 0.05] of opioid-dependents and 82.4% (0.03) of stimulant-dependents ($P < 0.001$).

Comparison of those who had dropped out with those remaining on treatment revealed that age, gender, marital status, employment, substance of abuse and treatment modality were not significantly correlated with drop-out (Table 1).

Rates of drop-out from different treatment approaches (detox programmes, psychotherapy, BMT and

Table 1 Characteristics of participants who either remained in treatment or left/not started treatment

Patient characteristics	All patients (*n* = 242)	Patients who stayed in treatment (*n* = 54)	Patients who did not start or left treatment (*n* = 188)	*P*
Age, yr, mean (SD)	36.1 (9.4)	36.9 (10.6)	35.9 (9.1)	0.49
Min–Max	15–74	18–63	15–74	
Sex, male (%)	226 (93.4)	49 (90.7)	177 (94.2)	0.37
Marital status (%)				0.86
Married	137 (57.3)	29 (54.7)	108 (58.1)	
Never married	79 (33.1)	18 (34.0)	61 (32.8)	
Previously married	23 (9.6)	6 (11.3)	17 (9.1)	
Educational status (%)				0.02*
Illiterate or elementary school	21 (9.2)	6 (11.3)	15 (8.6)	
Middle school	47 (20.6)	6 (11.3)	41 (23.4)	
High school	104 (45.6)	33 (62.3)	71 (40.6)	
Higher education	56 (24.6)	8 (15.1)	48 (27.4)	
Occupation (%)				0.65
Employed	147 (61.5)	34 (64.2)	113 (60.8)	
Unemployed or not in labour force	92 (38.5)	19 (35.8)	73 (39.2)	
Reason for referral (%)				0.39
Stimulants	136 (56.2)	24 (44.4)	112 (59.6)	
Opioids	79 (32.6)	23 (42.6)	56 (29.8)	
Opioids+ stimulants	18 (7.4)	5 (9.2)	13 (6.9)	
Prescription drugs	5 (2.1)	1 (1.9)	4 (2.1)	
Cannabis	4 (1.7)	1 (1.9)	3 (1.6)	
Treatment (%)				0.43
Methadone maintenance treatment	63 (26.0)	17 (31.5)	46 (24.5)	
Buprenorphine maintenance treatment	19 (7.8)	5 (9.3)	14 (7.4)	
Detoxification + relapse prevention program	12 (5.1)	4 (7.4)	8 (4.3)	
Psychotherapy	148 (61.2)	28 (51.8)	120 (63.8)	

**Level of significance < 0.05.*

MMT) are demonstrated in a Kaplan–Meier curve (Figure 1). Log rank test showed that treatment drop-out differed significantly for different approaches ($P < 0.001$), with the lowest slope for BMT and highest for detox. Cox regression analysis showed that detoxification resulted in a significant decrease (hazard ratio: 3.27, 95% CI: 1.10–9.78) in remaining on treatment, after adjustment for education and type of substance.

To assess the reasons for not starting or leaving treatment, a minimum of 3 and a maximum of 7 telephone calls were made to the 188 individuals who either did not start treatment or had dropped out after initiation. Seventy people (37.2%) could not be reached due to several possible reasons: wrong number in the registry, change of phone number, disconnected line or non-response to the call. Contact was made with 118 individuals, from which 40 (33.9%) refused to participate in the study. In addition, 2 were incarcerated and 2 were in a residential drug treatment facility. Another 2 had passed away, both opioid dependent, 1 due to accidental electrocution and 1 had committed suicide. The questionnaire was filled out for 76 individuals (Figure 2). Those who could not be reached or refused to participate did not significantly differ in age ($P = 0.66$), gender ($P = 0.29$), type of substance ($P = 0.29$) and treatment modality ($P = 0.42$) from those who completed the telephone interview.

While answering the initial open-ended question regarding the reason of not stating or leaving treatment, the following answers were found to be

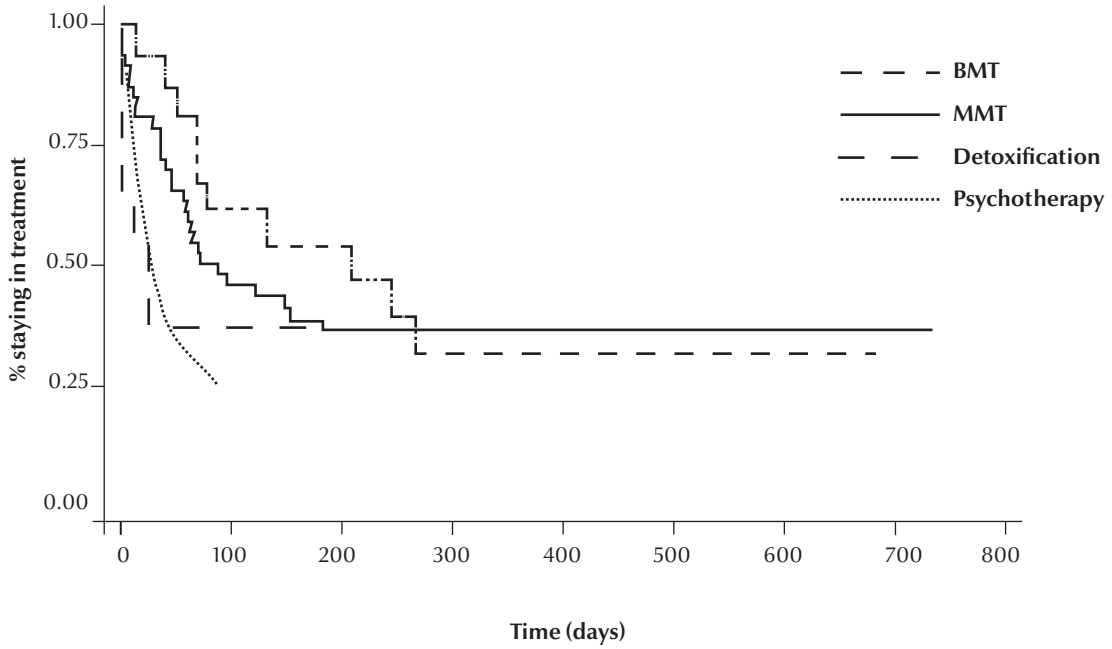

Figure 1 Rates of drop-out demonstrated in a Kaplan–Meier curve for staying in treatment (n = 181). BMT = buprenorphine maintenance treatment; MMT = methadone maintenance treatment

more common: commuting difficulties, dissatisfaction with the services, cost of treatment and finally lack of motivation. Some indicated adverse effects of methadone; another group had difficulties matching themselves with the working hours of the centre, had conflicts in the family or were concerned about treatment failure. Few indicated medical conditions or stigma regarding attending a drug clinic.

Results of the interview with RLTQ (Table 2) showed that outside influences (86.3%) followed by motivational inconsistencies (65.8%) were the most common reasons for not starting or leaving treatment. Staff conflicts were reported by 27.6% of respondents. In the outside influences domain, 61.6% believed that they could get better on their own or through self-help groups. In the motivational inconsistencies domain, 50.0% mentioned that they had changed their minds about being in treatment at that moment.

Apart from the outside influences domain (P = 0.01), others were not significantly correlated with treatment modality. Three clients from detox programmes, 43 from psychotherapy services, 13 in MMT and 4 in BMT indicated outside influences for not starting or leaving treatment. Motivational inconsistency did not have a significant association with gender (P

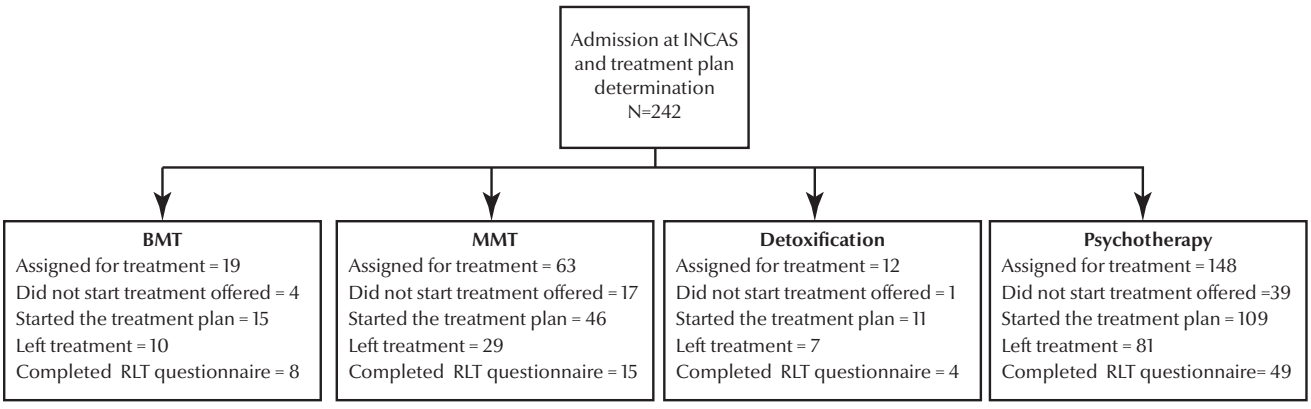

Figure 2 Flow diagram indicating participants' responses.

Table 2 Participants' reasons for not starting or leaving treatment

Item	*n*	%
Motivational inconsistencies (*n* = 76)	50*	65.8*
I changed my mind about being in the treatment at this point	38	50.0
I had no good reason to stop using drugs	21	27.6
I did not feel motivated enough to keep coming	25	32.9
I lost hope in my ability to change right now	27	35.5
Staff conflicts (*n* = 76)	21*	27.6*
I had a negative interaction with another staff member	11	14.5
I did not like or trust some of the staff	15	19.7
I felt that staff did not like, respect or want to help me	15	20.0
Boundary concerns (*n* = 75)	34*	45.3*
I had a personality conflict with people at the programme	19	25.3
I was worried that the therapist would talk about my situation to my family	11	14.7
I was worried that the therapist would give my personal information to the police	6	8.0
I felt my privacy or confidentiality might not be respected	12	16.0
Somebody I know is a client or staff member in the programme	7	9.3
I said or did some things that would make it hard for me to go back	9	12.0
I was worried I would get involved in the wrong things like drugs, sex or crime because of people around the programme	8	10.7
Outside influences (*n* = 73)	63*	86.3*
Problems with family or acquaintances kept me from coming in	16	21.9
I felt that I could get better on my own or with self-help meetings	45	61.6
I did not have enough support from people in my life to stay in the programme	21	28.8
I decided to go to another programme for help	32	43.8
Program expectations (*n* = 73)	42*	57.5*
I did not like the rules the programme had	24	32.9
I was confused about what the programme wanted me to do	13	17.8
I did not like the kind of services offered at the programme	20	27.4
The wait to start the programme was too long	25	34.3
Problem severity (*n* = 73)	34*	46.6*
My medical problems kept me from coming	7	9.6
My drug use was so heavy I could not come in	17	23.3
My alcohol use was so heavy I could not come in	2	2.7
My mental health or psychological problems kept me from coming	27	37.0
Logistical problems (*n* = 73)	42*	57.5*
I had transportation problems that kept me from coming	26	35.6
I had childcare problems that kept me from coming in	1	1.4
The hours of the programme were not good for me	24	32.9
I did not have money or insurance to pay for the programme	22	30.1
Drug treatment problem (*n* = 12)	7*	58.3*
I thought that I would become dependent to methadone or buprenorphine	6	50.0
I thought that I would experience side effects of methadone or buprenorphine	3	25.0

**Any item endorsed.*

= 0.20), marital status (P = 0.29), level of education (P = 0.56), employment (P = 0.83) and the type of substance (P = 0.28). Clients aged ≤ 30 years mentioned motivational inconsistencies significantly more that those aged > 30 years (P = 0.03). Among those who completed the questionnaire, 3 were women. All 3 mentioned motivational inconsistency as the main reason and none reported conflicts with staff or severity of the problem.

Service-related factors constituted a lower, but still considerable proportion of the reasons given for not starting

or leaving treatment. Long waiting list before the initiation of the treatment package (34.3%), service delivery hours (32.9%), having difficulties with following the regulations of the centre (32.9%), cost of services and lack of insurance coverage (30.1%), disinterest in the proposed treatment modality (27.4%) and ambiguities regarding expectations from treatment outcomes (17.8%) were the mentioned reasons in this regard.

A higher number of those who had not started treatment following their initial assessment reported motivational factors, staff conflicts and logistic problems as their main reasons for drop-out. A significant number of these clients mentioned that they decided to go to another programme after their first visit to this centre.

Discussion

This study showed that more than two thirds of the clients had dropped out of treatment, even after excluding those for whom the treatment had not been initiated. Other studies have also indicated high drop-out rates. In a systematic review, Brorson et al. indicated that in more than one-third of the 122 included studies, attrition rates of 50–90% were reported (*3*). Drop-out differed according to the definition and the treatment setting and the time span of evaluation. A systematic review of randomized clinical trials showed that 47.9% on BMT and 37.7% on MMT had dropped out within 2–52 weeks (*7*). The studies included in the mentioned systematic review benefitted from a structured and highly supervised treatment plan. However, the effectiveness is not usually the same in the real world. For instance, a study reported 67.6% drop-out within 18 months in MMT clinics (*8*). In another study half of the patients dropped out within 12 months (*9*). Another study showed that the rate of 12-week opioid abstinence was 16% in BMT and 8% in those on oral naltrexone (*10*). The result of a national household study in the Islamic Republic of Iran indicated that nearly 40% of those receiving an outpatient health service for addiction have dropped out of treatment (*1*).

Several factors influence treatment retention. Treatment modality has been proposed as one of the most important factors. In the current study, treatment drop-out happened earlier in the detox programme and later in BMT. Opioid substitution treatment programmes are associated with lower mortality, crime, injecting drug use, HIV acquisition, and also benefit from higher retention rates (*11*). Although, maintenance treatments are associated with more desirable outcomes, the cost of the treatment and the associated financial burden could influence the individual's choice (*12,13*). When comparing MMT with BMT, MMT was associated with lower cost and higher effectiveness and higher retention rates in randomized trials (*7,14*). Better retention rates of BMT in our study might have been due to the selection of patients. Those with less severe opioid dependence are preferably offered BMT. Although all 3 approaches of detox, MMT and BMT are provided in this centre and most of the clients were married, literate and employed, MMT was preferred. Client preference has an important role in treatment choice and could be the reason for higher rates of methadone implementation at the centre.

The type of substance can also influence treatment retention. In the current study, drop-out in the first 3 months was significantly higher in those with stimulant compared to opioid dependence. The review by Brorson et al. indicated that in most of the studies, type of substance was not correlated with treatment retention (*3*). There have been a few studies on retention rates for stimulant dependence (*15–17*). A study on the trend of drop-out in this group indicated 53–64% rates of drop-out (*15*). Another study indicated that treatment attrition was not significantly different in heroin versus amphetamine users. For decades, opium has been the main substance of abuse in the Islamic Republic of Iran, while methamphetamine is a new phenomenon. The results from 3 repeated national studies on drug use show that methamphetamine appeared in the mid-2000s (*18–20*). Since amphetamine-type stimulant treatment has just recently started in the country, it is necessary to enhance staff training and supervision to improve the quality of such services and to try to optimize retention rates.

In the current study, 25.2% of the clients attended only a single visit at the clinic, and although a thorough assessment was done and the treatment plan was agreed, the client did not return for initiation of the programme. Other studies have also reported significant attrition after the first visit. For example, drop-out rates of 15% (*21*), 27% (*22*) and 25.9–41% (*23*) have also been reported after the initial assessment. Therefore, the first contact is crucial. Building a proper rapport, providing useful information and raising awareness regarding treatment outcomes could help in retaining the individual in the treatment process. It is necessary to assess the motivational aspects of the client and utilize proper techniques to enhance them during the first contact.

Regarding the reasons for drop-out, factors associated with service delivery although reported by a minority of respondents, are also of importance. Other studies have indicated that these factors constitute a minority of the reasons for leaving treatment (*6,24,25*). However, adding reasons related to boundary concerns, programme expectations and logistical problems results in a significant contribution of clinic-related factors. Removing such obstacles could promote the quality of the provided services. The clinics should closely monitor organizational factors that might negatively affect patient adherence. Developing quality assurance

and improvement measures, providing social support packages, flexible timing, insurance and commuting facilitation could have desirable effects on the treatment process and thus lower drop-out.

Another finding of this study was that motivational inconsistencies were one of the main reasons for not starting or leaving treatment. Most of the respondents stated that they had changed their mind about being on treatment and some felt they were not ready for a change at the moment. Lack of motivation has been reported as a reason for drop-out in several different studies (*3,4,6,25,26*). Addiction treatment is a long-lasting process and requires several changes in the individual's lifestyle and abstaining from pleasure-seeking behaviour. It is obvious that the individual's motivation will change during this process. Therefore, regular monitoring and use of motivational enhancement techniques and teaching adaptive coping skills could increase treatment retention.

Outside influences were also frequently mentioned as reasons for not starting or leaving treatment. Most of the respondents believed that they could use other methods for recovery, either on their own or through self-help groups. It is possible that particularly for some of those initially engaging with and requiring psychotherapy, alternative available supports may be associated with a capacity for self-recovery outside of treatment and so a person may reasonably feel that he or she does not need to attend specific treatment services. This points to a potential positive reflection on the possible value of practitioners and services providing good information and visibility of the additional or alternative external supports available, including from the initial assessment onwards.

Another group mentioned conflicts with the family members as an obstacle for treatment. External factors are a part of the patient's real world, but could serve for denial or as an excuse to procrastinate the treatment process. Assessing the clients' beliefs in this regard and their support from significant others could be used to tackle this obstacle.

Demographics did not correlate with drop-out in our study. The only exception was that younger individuals had lower levels of motivation than older ones. In other studies, low motivation has been found to be more prevalent in clients who are single than those who are married (*6*). Considering the findings of the current study, it seems that use of motivational techniques and obtaining the support of the family, especially for those who are younger, could help in achieving better results.

The study had some limitations. The sample size was small in some subgroups: detoxification as a treatment modality, young age group and female gender. Moreover, building the trust of the interviewees through telephone calls was challenging. Although several measures were adopted to facilitate engagement in the process and to obtain consent, a significant number did not either answer or refused to participate in the study. Recall bias was another limitation of the study, and in some cases it had been a while since the patients had dropped out of treatment and had difficulty to recall the reason why they left.

Conclusions

The results of the current study indicated that the motivational inconsistencies had the highest impact on not starting or leaving treatment, while several other influential, and potentially remediable, service-related factors were also identified. The findings of this study could be of use for service providers and policymakers to adopt proper measures to increase treatment retention. It is also recommended that for enhancing the motivation of the clients, novel and more client-centred approaches with proper involvement of family members be adopted.

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Competing interests: None declared

References

1. Amin-Esmaeili M, Rahimi-Movaghar A, Sharifi V, Hajebi A, Radgoodarzi R, Mojtabai R, et al. Epidemiology of illicit drug use disorders in Iran: prevalence, correlates, comorbidity and service utilization results from the Iranian Mental Health Survey. Addiction. 2016 Oct;111(10):1836–47. PMID:27177849
2. Kleber HD, Weiss RD, Anton RF Jr, George TP, Greenfield SF, Kosten TR, et al. Treatment of patients with substance use disorders, second edition. American Psychiatric Association. Am J Psychiatry, 2007 Apr;164(4 Suppl):5–123. PMID:17569411
3. Brorson HH, Ajo Arnevik E, Rand-Hendriksen K, Duckert F. Drop-out from addiction treatment: a systematic review of risk factors. Clin Psychol Rev. 2013 Dec;33(8):1010–24. PMID:24029221
4. Palmer RS, Murphy MK, Piselli A, Ball SA. Substance user treatment dropout from client and clinician perspectives: a pilot study. Subst Use Misuse. 2009;44(7):1021–38. PMID:19938942
5. Stark MJ. Dropping out of substance abuse treatment: a clinically oriented review. Clin Psychol Rev. 1992;12(1):93–116.

6. Ball SA, Carroll KM, Canning-Ball M, Rounsaville BJ. Reasons for dropout from drug abuse treatment: Symptoms, personality, and motivation. Addict Behav. 2006 Feb;31(2):320–30. PMID:15964152
7. Mattick RP, Breen C, Kimber J, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. Cochrane Database Syst Rev. 2004;(3):CD002207. PMID:15266465
8. Lin HC, Chen KY, Wang PW, Yen CF, Wu HC, Yen CN, et al. Predictors for dropping-out from methadone maintenance therapy programs among heroin users in southern Taiwan. Subst Use Misuse. 2013 Jan;48(1–2):181–91. PMID:23368704
9. Smyth BP, Fagan J, Kernan K. Outcome of heroin-dependent adolescents presenting for opiate substitution treatment. J Subst Abuse Treat. 2012 Jan;42(1):35–44. PMID:21940134
10. Mokri A, Chawarski MC, Taherinakhost H, Schottenfeld RS. Medical treatments for opioid use disorder in Iran: a randomized, double-blind placebo-controlled comparison of buprenorphine/naloxone and naltrexone maintenance treatment. Addiction. 2016 May;111(5):874–82. PMID:26639678
11. Connock M, Juarez-Garcia A, Jowett S, Frew E, Liu Z, Taylor RJ, et al. Methadone and buprenorphine for the management of opioid dependence: a systematic review and economic evaluation. Health Technol Assess. 2007 Mar;11(9):1–171. PMID:17313907
12. Stotts AL, Dodrill CL, Kosten TR. Opioid dependence treatment: options in pharmacotherapy. Expert Opin Pharmacother. 2009 Aug;10(11):1727–40. PMID:19538000
13. Kleber HD. Pharmacologic treatments for opioid dependence: detoxification and maintenance options. Dialogues Clin Neurosci. 2007;9(4):455–70. PMID:18286804
14. King JB, Sainski-Nguyen AM, Bellows BK. Office-based buprenorphine versus clinic-based methadone: a cost-effectiveness analysis. J Pain Palliat Care Pharmacother. 2016;30(1):55–65. PMID:27007583
15. Brecht ML, Greenwell L, Anglin MD. Methamphetamine treatment: trends and predictors of retention and completion in a large state treatment system (1992–2002). J Subst Abuse Treat. 2005;29(4):295–306. PMID:16311182
16. Gonzales R, Ang A, McCann MJ, Rawson RA. An emerging problem: methamphetamine abuse among treatment seeking youth. Subst Abus. 2008;29(2):71–80. PMID:19042326
17. Maglione M, Chao B, Anglin MD. Correlates of outpatient drug treatment drop-out among methamphetamine users. J Psychoactive Drugs. 2000 Apr–Jun;32(2):221–8.
18. Razaghi EM, Rahimi A, Hosseini M, Madani S, Chatterjee A. Rapid situation assessment of drug abuse in Iran (http://www.unodc.org/pdf/iran/publications/RSA2000SUMMARY.pdf, accessed 14 March 2017).
19. Narenjiha H, Rafiei H, Baghestani AR, Nouri R, Shirinbayan P, Farhadi MH, et al. Rapid situation assessment of drug abuse in Iran (year 2004): research report. Tehran: Dariush Institute; 2005 (in Persian).
20. Narenjiha H, Rafiei H, Baghestani AR, Nouri R, Ghafouri B, Soleimaninia L, et al., editors. Rapid situation assessment of drug abuse in Iran (year 2007) Tehran: Dariush Institute; 2009 (in Persian).
21. Claus RE, Kindleberger LR. Engaging substance abusers after centralized assessment: predictors of treatment entry and dropout. J Psychoactive Drugs. 2002 Jan-Mar;34(1):25–31. PMID:12003110
22. Rohrer JE, Vaughan MS, Cadoret RJ, Carswell C, Patterson A, Zwick J. Effect of centralized intake on outcomes of substance abuse treatment. Psychiatr Serv. 1996 Nov;47(11):1233–8. PMID:8916242
23. Li X, Sun H, Marsh DC, Anis AH. Factors associated with pretreatment and treatment dropouts: comparisons between Aboriginal and non-Aboriginal clients admitted to medical withdrawal management. Harm Reduct J. 2013 Dec;10:38. PMID:24325629
24. Laudet AB, Stanick V, Sands B. What could the program have done differently? A qualitative examination of reasons for leaving outpatient treatment. J Subst Abuse Treat. 2009 Sep;37(2):182–90. PMID:19339133
25. Evans E, Li L, Hser Y-I. Client and program factors associated with dropout from court mandated drug treatment. Eval Program Plann. 2009 Aug;32(3):204–12. PMID:19150133
26. Longshore D, Teruya C. Treatment motivation in drug users: a theory-based analysis. Drug Alcohol Depend. 2006 Feb;81(2):179–88. PMID:16051447

National Rehabilitation Center programme performance measures in the United Arab Emirates, 2013

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مقاييس أداء البرامج بالمركز الوطني لإعادة التأهيل بالإمارات العربية المتحدة، 2013

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الخلاصة: تهدف هذه الدراسة إلى قياس أداء البرامج بالمركز الوطني لإعادة التأهيل والخدمات التي يقدمها المركز. وأُعِدت أداة مكونة من ست نقاط استناداً إلى المعايير الدولية وتم توفير مقاييس الأداء المناسبة لها. وطُبِّقت عناصر الأداة على ملفات البيانات الإلكترونية لعام 2013. وأشارت النتائج إلى وجود بعض القضايا التشغيلية والقضايا التي تتعلق بالجودة ونظام البيانات. وبينما تيسَّر الوصول إلى المعلومات الخاصة بالطاقة الاستيعابية ووقت الانتظار ومشاركة الأسر، كان من الصعب تصنيف معلومات أخرى والوصول إليها، في حين لم تتوفر بعض المعلومات الأخرى في النظام الإلكتروني وتعيَّن استرجاعها من مصادر أخرى، مثل المعلومات حول فعالية البرامج. وارتفع معدل عدم الحضور في المواعيد المحددة (46٪)، ومعدل الدخول إلى المركز مرة ثانية (52٪) ولم تحضر معظم الأسر الجلسات الأسرية (72٪) وكانت الدراسة مفيدة للغاية إذ حددت الثغرات في العمليات والسجلات. ووزِّعت النتائج على الفِرق المختلفة للاستفادة منها في تحسين جودة البيانات والخدمات، وسوف تُستَخدم الأداة في عمليات التقييم السنوي.

ABSTRACT The aim of this study was to measure the performance of the National Rehabilitation Center (NRC) programme and the services it provides. A 6-point tool was developed based on international standards with appropriate performance measures. The elements of the tool were applied to the electronic data files for 2013. The results showed that there were some operational, quality and data system issues. Some items were easily accessible, e.g. capacity, waiting time, family involvement. Others were difficult to sort and find and some were not available in the electronic system and had to be retrieved from other sources, e.g. programme effectiveness. There was a high no-show rate for appointments (46%) and readmission rate (52%) and most families did not attend family sessions (72%). This was a valuable exercise which identified gaps in operations and records. The findings were shared with the different teams to help improve the quality of data and services and the tool will be used for annual performance evaluations.

Mesure de la performance du programme du Centre national de réadaptation aux Émirats arabes unis, 2013

RÉSUMÉ : La présente étude avait pour objectif de mesurer la performance du programme du Centre national de réadaptation et les services qu'il fournit. Un outil en six points comportant des mesures de la performance a été élaboré sur la base des normes internationales. Les éléments de l'outil ont été appliqués aux fichiers de données électroniques pour l'année 2013. Les résultats ont montré certains problèmes aux niveaux des opérations, de la qualité et du système de données. Certaines informations étaient facilement accessibles (capacité, temps d'attente, implication familiale), contrairement à d'autres informations difficiles à obtenir (efficacité du programme) ou qui n'étaient pas disponibles dans le système de données électroniques et devaient être obtenues via d'autres sources. Il y avait un taux élevé de non-présentation aux rendez-vous (46 %) et de réadmission (52 %) ; la plupart des familles n'assistaient pas aux séances qui leur étaient dédiées (72 %). L'exercice s'est révélé très instructif et a permis d'identifier des lacunes dans les opérations et les dossiers. Les conclusions ont été portées à la connaissance des différentes équipes de façon à améliorer la qualité des données et des services et l'outil sera utilisé pour les évaluations annuelles de la performance.

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Introduction

The National Rehabilitation Center (NRC) is the main addiction treatment facility in the United Arab Emirates. It provides data on the programme performance on an annual basis to its monitoring board. In order to reach consensus on what tools to use for the evaluation of our programme, we reviewed the available data from the Guiding Principles and Elements of Recovery-oriented Systems of Care (*1*), the Treatment Outcomes Profile data of the National Drug Treatment Monitoring System in the United Kingdom (*2*), and the Drug Evaluation Network System (DENS) (*3*). As highlighted by Garnik and colleagues, much research is still needed to develop new performance measures that are "important, scientific and feasible" (*4*). Our paper focuses on the development of 3 types of measures—structural, process and outcome measures—as well as composite measures that include multiple domains.

Methods

Several meetings were held with the research team, the clinical team and the data group at the NRC to discuss and review the available data and to come to consensus on items for programme performance measures that are meaningful, clearly defined and readily accessible in the electronic data system. We developed a 6-point tool—the NRC Program Performance Scale—which incorporated some of the items and guidelines from the reviewed data in order to evaluate the treatment services and to monitor progress and treatment effectiveness. The tool includes both structural and process measures, which are outlined below.

1. *Access to treatment*: This is a measure of the capacity and overload of the treatment facility, assessed by:
   - Number of contacts made by patients requesting treatment per year
   - Number of no-shows (patients who booked an appointment but did not show up for it)
   - Average waiting time for admitting patients to treatment.
2. *Use of evidence-based practices*: This measures the different types of treatment programme delivered and attempts to compare their effectiveness with a focus on:
   - Number of patients referred to each programme and the number who completed each programme
   - Use of addiction medications when indicated.
3. *Family engagement*: A very important component of a successful outcome is engaging families in the patient treatment. Family therapy has been shown to increase retention in treatment, reduce drug use (*5*), improve relationships and reduce domestic violence (*6*). Family therapy among patients released from prison was also found to reduce parole violations and relapse (*7*). This measure includes:
   - Number of family sessions recommended by the treatment team and the number of sessions attended
   - Relation between the number of family sessions attended and retention in treatment.
4. *Treatment completion*: This measure includes:
   - Number of patients completing the different phases of treatment
   - Number of patients transferred between different phases of treatment
   - Drop-out rates in each phase of treatment and reasons for drop-out
   - Number of readmissions.
5. *Participation in continuing care*: This measures the connectivity of different organizations that provide services to patients for their long-term treatment, e.g. vocational programmes, social welfare, housing, education and health. In essence, this a measure of how the different organizations operate as a recovery-oriented system of care. The NRC is primarily a treatment organization, so we tried to determine 2 measures:
   - Number of patients referred by the NRC to different organizations based on their long-term treatment needs
   - Number of patients receiving long-term treatment at the NRC, e.g. attending self-help groups and patients who come for their follow-up medication appointments at the outpatient clinic.
6. *Satisfaction with treatment*: This measure is derived from a survey that was answered by the patients at the end of treatment asking for their feedback on different components of the services provided, starting from initiating the call to discharge from treatment.

Data were collected from the electronic medical records of all NRC patients for the year 2013 using a data collection template created in Excel. Following the completion of data collection, the data were revised, cleaned and edited as necessary for statistical analysis. Descriptive statistics were used as appropriate.

Results

Patient number and characteristics

A total of 632 new patients were admitted for treatment at the NRC between January 2013 and December 2013. Of these, 460 (73%) were admitted voluntarily and 172 (27%) through the legal system. The age of the patients ranged from 14 to 67 years, with a mean age of 29 (SD 9.3) years. The majority of the patients (98%) were males, 56% resided in Abu Dhabi, 61% were single, 70% had middle or secondary school education

and 68% used more than one substance.

Programme outcomes

Access to treatment

A total of 850 people requested voluntary appointments in 2013 for either new assessment [559 (66%)] or re-assessment if they had been admitted before to the NRC, 291 (34%). All 850 subjects were booked for appointments, however only 460 showed up.

The average waiting time from contacting the centre for an appointment and having the appointment was 6.9 days: 493 (58%) patients waited between 1 and 10 days, 173 (20%) had appointments scheduled on the same day and 184 (22%) waited 10 days or more for an appointment.

Use of evidence-based practices

Some programmes were listed as such in the electronic system, e.g. matrix programme (a group therapy programme based on cognitive behavioural therapy and relapse prevention), while others were not, e.g. contingency management. The data listed in the system and the number of sessions attended by patients are presented in Figure 1. Meditation, reflection, 12-step group, interpersonal therapy and matrix were the top 5 programmes/activities attended by the patients. Data on patient enrolment, completion and drop-out from each programme were not available in the system so we could not compare the effectiveness of each as planned.

Data on medications prescribed per patient were not available in the system; however the number of prescriptions for each medication for 2013 was

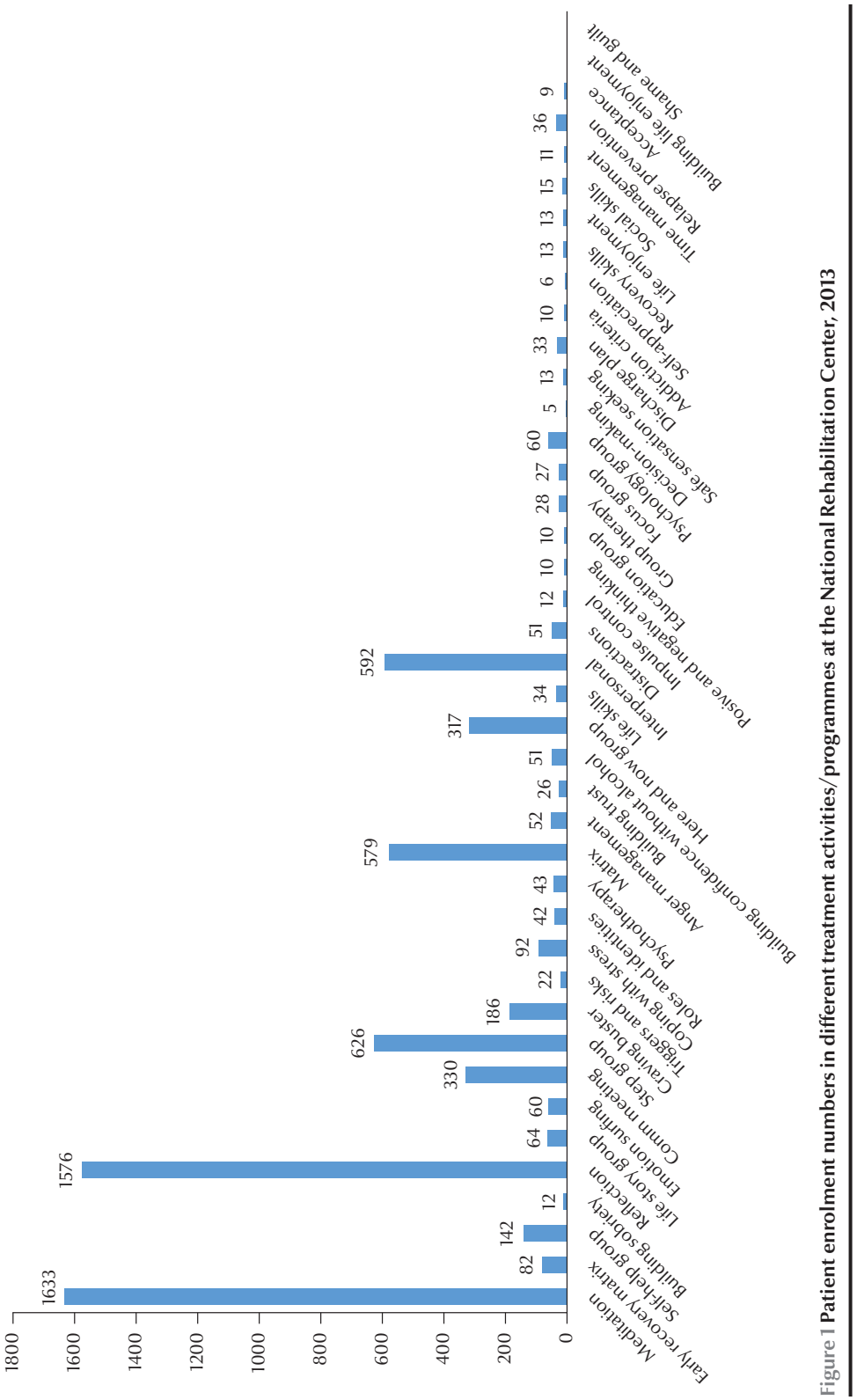

Figure 1 Patient enrolment numbers in different treatment activities/programmes at the National Rehabilitation Center, 2013

obtained from the pharmacy (Figure 2). Lofexidine (0.2 mg tablets) was the most prescribed medication in 2013, mainly for opiate withdrawal, followed by bupronorphine (8 mg SL film).

Family involvement

Most of the families of the 632 patients admitted, 456 (72%), did not attend any family sessions, 125 (20%) attended 1-3 sessions and 51 families (8%) attended more than 3 sessions. Family attendance varied somewhat by the patient's age. We expected to see more family sessions among younger patients, however more families attended 1-3 sessions in the older patient age group > 50 years (35%) compared with 16% in the younger age group < 20 years.

Treatment completion

Most patients were admitted initially to either the detox unit (30%) or outpatient services (49%) as shown in Figure 3.

Detox programme: In 2013, 436 patients received detox treatment. Of these, 58 (13%) completed detox and were discharged home on their request, 169 (39%) completed detox and were transferred to inpatient services and 61 (14%) completed detox and were transferred to the outpatient services. About a third, 148 (34%), dropped out, left against medical advice or were discharged for disruptive behaviour.

Outpatient programme: A total of 552 patients received treatment from the outpatient programme in 2013. Of these, 194 (35%) dropped out, left against medical advice or had a disciplinary discharge, 162 (30%) transferred to inpatient services, 13 (2%) completed treatment and were discharged and 183 (33%) were still continuing in the programme by the end of the year.

To study the possible reasons for dropping out of these programmes, we examined the family visits among those who dropped out. We also looked at place of residence as a possible contributing factor because almost half of the NRC patients lived in other Emirates, not Abu Dhabi, which required long travelling times. For the detox programme, families did not attend any family sessions in 133 (90%) of the 148 patients who dropped out. For the outpatient programme, families did not attend any sessions in 177 (91%) of the 194 patients who dropped out and for 11 (6%) patients, their families attended 1 session. There was no association between living outside of Abu Dhabi city and drop-out for either programme: 104 (54%) patients who dropped out of the outpatient programme and 74 (50%) who dropped out of the detox programme lived in Abu Dhabi.

Readmission rates for 2013: The total number of admissions for 2013 was 1324. Of these admissions, 692 (52%) were readmitted one or more times to different programmes: 247 (36%) were readmitted to detox and 244 (35%)

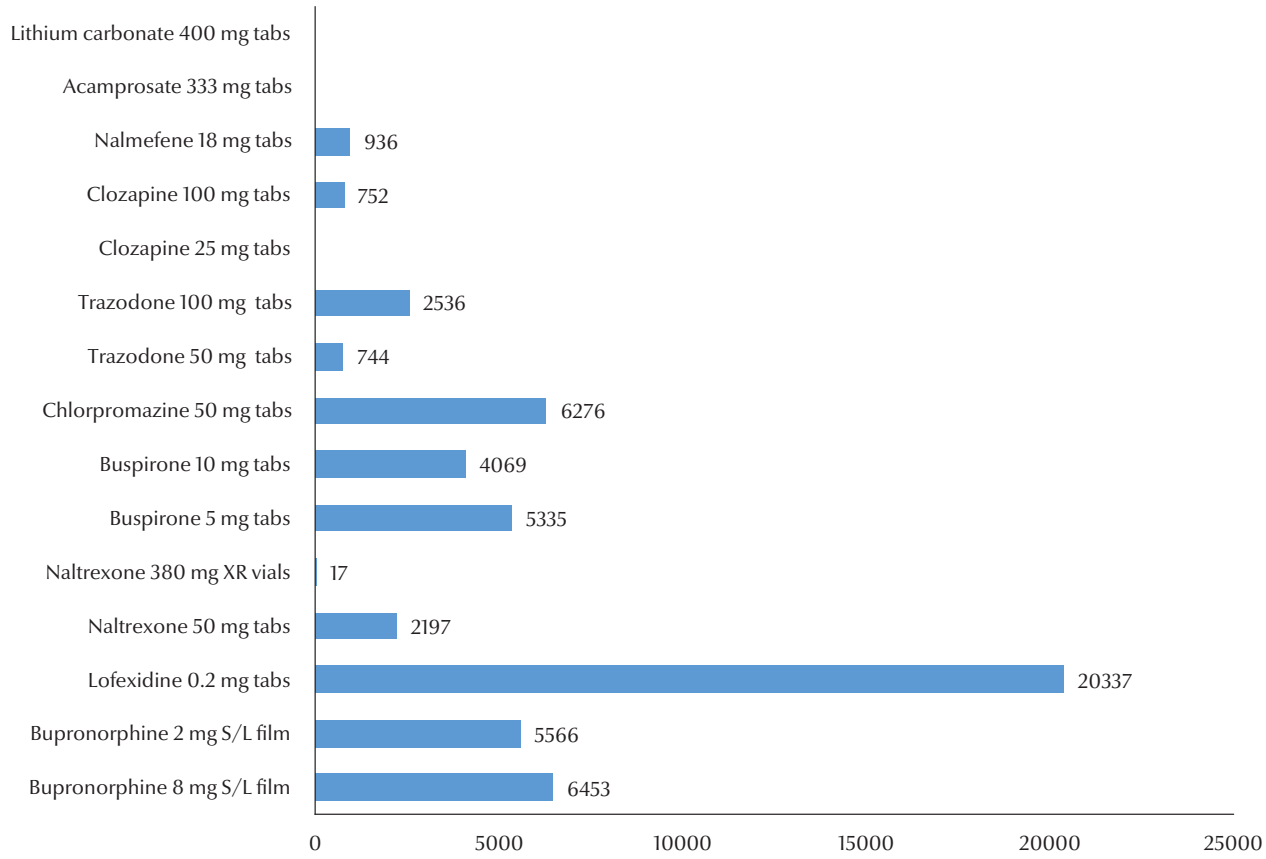

Figure 2 Numbers of medications used by the patients at the National Rehabilitation Center, 2013

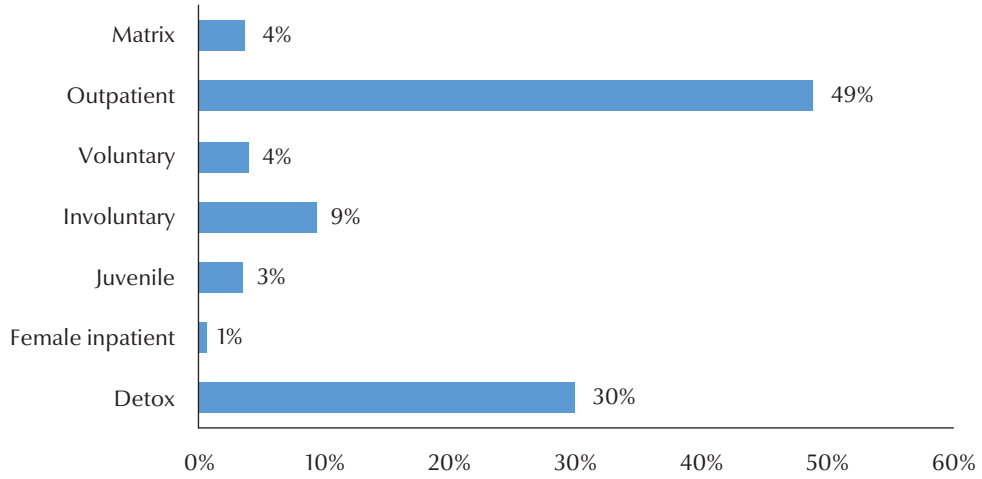

Figure 3 Admissions to different treatment programmes at the National Rehabilitation Center, 2013

to outpatients, and 39 (6%) were re-admitted involuntarily and 136 (20%) voluntarily.

Participation in continuing care

Data on the number of patients attending the continuing care groups or the medication appointments were not available in the electronic data system in 2013. Data obtained from the counsellor who runs the groups showed that 4–7 patients on average attended the evening groups on a weekly basis. Data from the outpatient clinic showed that 24 patients on average attended their long-term medication appointments. At the end of 2013, the NRC signed a memorandum of understanding with the department of labour and 3 patients were referred for employment after they had completed their treatment. There were also 66 patients who received financial assistance to pay loans and other bills while in treatment in 2013.

Patient satisfaction

At the end of treatment and prior to discharge, patients were asked to answer a survey regarding their experience at the NRC (Figure 4). The survey covered satisfaction with the many service components, including accessibility, admission process, facilities, treatment team. They were asked to rate each item on a scale of 0–100%. The results were very favourable and averaged over 75% satisfaction.

Discussion

This exercise was valuable as the first step to establishing clear criteria to measure the NRC programme performance. The findings were useful for programme performance and also served to highlight gaps for the organization. The team has come up with specific recommendations that can be grouped in three areas: operational issues, quality issues and electronic data system issues.

Operational issues

1. The number of no-shows was high. If all patients showed up for their scheduled appointments, it is not clear if the staff would be able to handle the work load. A clear policy on how to deal with no-shows is advised, e.g. overbooking, or not offering new appointments for repeated no-shows > 3 times.
2. A large number of families did not attend the recommended family visits. A clear directive is needed for the treatment team to invest in motivating families to attend these sessions. Offering family groups and home visits by the social workers for special cases may help.
3. The reasons why patients drop out need to be examined. For example, patients who travel long distances and others who have to return to their work sooner could benefit from a shorter course of intensive treatment or from linking them with a primary care doctor near their place of residence with consultation from an NRC professional. New and practical treatment interventions that take advantage of technology are highly recommended for the NRC to start as pilot programmes, such as tele-psychiatry (*8*), Internet-based therapy (*9,10*) and e-health.

Quality issues

1. Treatments programmes need to be documented as such with enrolment, retention and drop-out data recorded for each.
2. Medications need to be listed per patient.
3. The readmission rate in 2013 was 52%. Readmission rates to the detox and outpatient programmes were almost identical to the drop-out rates. The programme needs to invest in these areas to remedy the underlying reasons for drop-out and readmission.

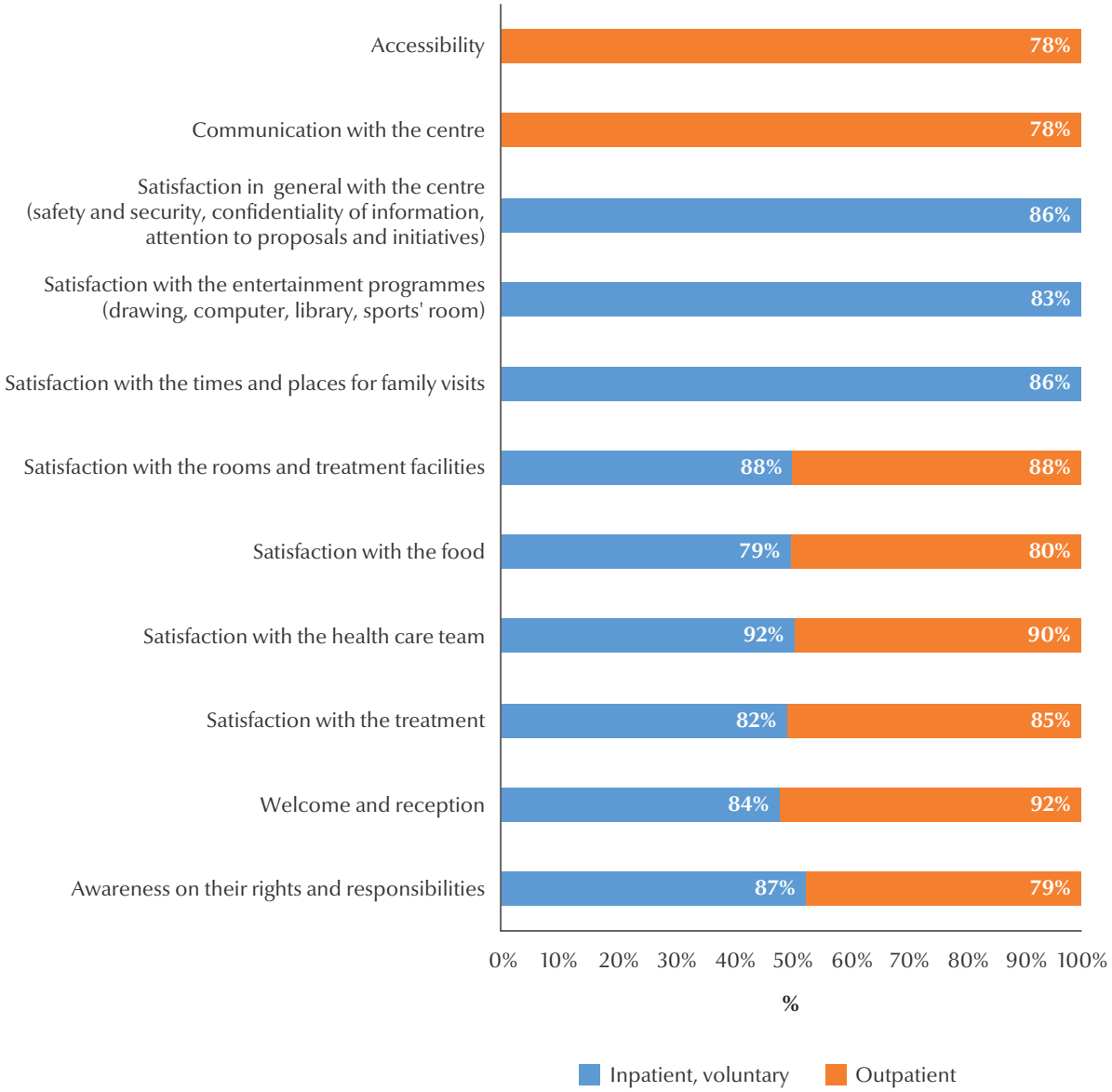

Figure 4 **Patient (voluntary inpatient and outpatient) satisfaction with the services at the National Rehabilitation Center, 2013**

4. More coordination is needed between services within the NRC as well as between other organizations for patient referral.

Electronic data system issues

1. Data categorization: multiple subcategories that overlap and not clearly defined, should be streamlined and better defined.
2. Data entry: grouping and better clarification of the different behavioural programmes is needed (e.g. contingency management, motivational interviewing, cognitive behavioural therapy), and the medications prescribed for treatment per patient need to be better recorded.
3. Operational issues: standard operating procedures are needed for data extraction where staff roles and responsibilities are well defined.

Our objectives and the amount and type of data we wanted to capture may have been too ambitious for the newly operational electronic data system. There were more missing data than we anticipated. Further programme evaluations are expected to be smoother and shorter.

Conclusions

Evaluating the performance of addiction treatment programmes is crucial in this age of performance-based budget allocation and competing service organizations. We believe this exercise will improve the quality of services in our facility for the coming years. We hope that by sharing our experience other countries in the Middle East and North Africa region can benefit from it. As far as we know, there are no published data from any country in the Middle East and North Africa using similar programme

performance methods. This will make it hard to compare our scale with others in the region. However, the items examined are straightforward and in line with international standards, and other countries in the region should find them easy to adopt, e.g. capacity and waiting time, drop-out rates and relapse. Furthermore, identifying the reasons for relapse and finding solutions for them will help improve treatment outcomes. Dealing with the stigma attached to drug addiction and mental illness and getting families involved (*11,12*) are common problems in the region. Almost three-quarters of the families of patients at our centre did not attend any family sessions. Family education and public awareness are crucial areas to focus on in order to improve addiction services in the Middle East and North Africa region.

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References

1. Sheedy CK, Whitter M. Guiding principles and elements of recovery-oriented systems of care: what do we know from the research? Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration; 2009.
2. The treatment outcomes profile (TOP). Guidance notes for the reporting of TOP to NDTMS. National Treatment Agency for Substance Abuse; 2007 (http://www.nta.nhs.uk/uploads/top_ndtms_guidance_notes_190607.pdf, accessed 15 March 2017).
3. Carise D, McLellan AT, Gifford LS. Development of a "Treatment Program" descriptor: The Addiction Treatment Inventory. Subst Use Misuse. 2000;35(12-14):1797–818.
4. Garnik DW, Horgan CM, Acevedo A, McCorry F, Weisner C. Performance measures for substance abuse disorders-what research is needed? Addict Sci Clin Pract. 2012;7:18.
5. Liddle HA, Dakof GA. Efficacy of family therapy for drug abuse: Promising but not definitive. J Marital Fam Ther. 1995;21(4):511–43.
6. O'Farrell TJ, Fals-Stewart W. Behavioral couples therapy for alcoholism and drug abuse. J Subst Abuse Treat. 2000;18(1):51–4.
7. Shapiro C. Integrating family-focused interventions into the criminal justice system. New York: The Vera Institute of Justice; 1999 (http://archive.vera.org/sites/default/files/resources/downloads/bodega_family.pdfaccessed 15 March 2017).
8. Hilty DM, Ferrer DC, Parish MB, Johnston B, Callahan EJ, Yellowlees PM. The effectiveness of telemental health: A 2013 review. Telemed J E Health. 2013;19(6):444-54.
9. Barak A, Hen L, Boniel-Nissim M, Na'ama S. A comprehensive review and a meta-analysis of the effectiveness of Internet-based psychotherapeutic interventions. J Technol Hum Serv. 2008;26(2/4) doi.org/10.1080/15228830802094429.
10. Gustafson DH, Boyle MG, Shaw BR, Isham A, McTavish F, Richards S, et al. An ehealth solution for people with alcohol problems. Alcohol Res Health. 2011;33(4):327-37
11. Buchman DZ, Reiner P. Stigma and addiction: being and becoming. Am J Bioeth. 2009;9(9):18-9.
12. Livingston JD, Milne T, Fang ML, Amari E. The effectiveness of interventions for reducing stigma related to substance use disorders: a systematic review. Addiction. 2012;107(1):39-50.

Prevalence, determinants and impacts of khat chewing among professional drivers in Southwestern Saudi Arabia

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انتشار مضغ القات بين السائقين المحترفين في جنوب غرب المملكة العربية السعودية ومحدّداته والآثار المترتبة عليه

نبيل جوزيف عوض الله، حسن علي سويدي

الخلاصة: كان الهدف من هذه الدراسة تقييم معدّل انتشار مضغ القات ومحدّداته، واستكشاف آثاره الاجتماعية والاقتصادية وعلى العمل، ودراسة علاقته بحوادث المرور على الطرق بين السائقين المحترفين في منطقة جازان، المملكة العربية السعودية. وقد أجريَت دراسة مقطعية شملت 215 سائقاً جاؤوا من محطات النقل في منطقة جازان من خلال أخذ عينة عنقودية عشوائية. وقد تم استخدام أسلوب المقابلات مع استبيانات لجمع البيانات، وكان 47.4٪ من السائقين حالياً يمضغون القات. وباستخدام الانحدار اللوجستي، اتضح أن لمضغ القات عوامل مُنْبِئة مستقلة هي أن يكون من مواطني المملكة العربية السعودية، أو مطلقاً أو أرملاً، والعمل لمدة تقل عن 4 ساعات/ يوم، ولا يستخدم حزام الأمان. وارتبط مضغ القات بشكل نوعي مع ساعات عمل أقل، ومتوسط مرتفع من حوادث المرور على الطرقات، وتكرار أعلى للمخالفات المرورية. وكشفت الدراسة عن نقص في معرفة السائقين حول مخاطر القات. والنتيجة أن عادة مضغ القات تؤثر على ما يقرب من نصف السائقين المحترفين في منطقة جازان. وعلاوة على ذلك، فإن مضغ القات ارتبط بضعف القدرة على العمل والإنتاج، وبالنزاعات العائلية، وبانتهاك قواعد المرور.

ABSTRACT The objective of this study was to assess the prevalence and determinants of khat chewing, and explore its social, economic and work impacts and examine its relation with road traffic accidents (RTA) among professional drivers in Jazan region, Saudi Arabia. A cross-sectional study was conducted on 215 drivers recruited from transport stations in Jazan region by random cluster sampling. An interview questionnaire was utilized for data collection, and 47.4% of drivers were currently khat chewers. Using a logistic regression, the independent predictors of khat chewing were being a citizen of Saudi Arabia, divorced or widowed, working for less than 4 hours/day, and a non-seatbelt user. Khat chewing was significantly associated with shorter working hours; higher average number of significant RTA, and higher frequency of traffic violation. In conclusion, khat chewing habit affected almost half of the professional drivers in Jazan area. Moreover, khat chewing was associated with impaired working ability and productivity, family conflicts, and violation of traffic rules.

Prévalence, déterminants et conséquences de la consommation de khat chez les chauffeurs professionnels dans le sud-ouest de l'Arabie saoudite

RÉSUMÉ La présente étude avait pour objectif d'évaluer la prévalence et les déterminants de la consommation de khat, d'étudier ses conséquences sociales, économiques et dans le milieu du travail, et d'examiner sa relation avec les accidents de la circulation parmi les chauffeurs professionnels de la région de Jazan, en Arabie saoudite. Une étude transversale a été réalisée auprès de 215 chauffeurs sélectionnés dans des terminaux de transport de la région de Jazan sur la base d'un sondage aléatoire en grappe. Un questionnaire d'entrevue a été utilisé pour la collecte des données, et 47,4 % des chauffeurs ont déclaré consommer du khat au moment de leur participation à l'enquête. La régression logistique a révélé que les variables indépendantes étaient le fait d'être citoyen saoudien, divorcé ou veuf, de travailler moins de 4 heures par jour, et de ne pas porter sa ceinture de sécurité. La consommation de khat était fortement associée à un faible nombre d'heures travaillées, à un nombre moyen plus élevé d'accidents de la circulation graves, et à une fréquence plus importante des enfreintes du code de la route. En conclusion, l'habitude de consommation de khat affectait près de la moitié des chauffeurs professionnels de la région de Jazan. En outre, la consommation de khat a été associée à une détérioration de l'aptitude au travail et de la productivité, à des conflits familiaux, et à des infractions du code de la route.

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Introduction

Historically, khat grew wild in countries bordering the Red Sea and along the east coast of Africa (*1*). In Saudi Arabia khat cultivation and consumption are forbidden and the ban is strictly enforced (*2*), and this has been generally accepted by the population, with the exception of people in the southwestern region of Jazan. In this area, which shares a border with Yemen, khat has been cultivated for centuries and its use is still widespread in the city of Jazan and the surrounding rural areas (*3*).

The prevalence of khat chewing varies depending on sociocultural habits, availability of khat and law enforcement. An estimated 10 million people worldwide chew khat leaf daily (*4*). In Jazan Region, the current prevalence of khat chewing among the general population is reported to be 48.7% (*5*). There is growing evidence that the new generation of students favours the ban on khat, even though they continue to chew the leaves before examinations (*6*). The overall prevalence among students is 21.4% (*7*). In contrast, there are no available data on its prevalence among professional drivers.

The most important reported motivating factors for khat chewing are the sense of stimulation and social recreation. Khat chewers claim that it heightens the sense of increased energy levels, alertness, ability to concentrate, improved self-esteem and increased libido (*8*). Also, it maintains social contact as a socializing herb (*9*).

Several studies have indicated the adverse effects of habitual khat chewing on mental, physical and social wellbeing (*10–18*). Socially, family life is harmed because of neglect, dissipation of family income and inappropriate behaviour such as drug use, smoking, alcohol and risky sexual behaviour (*2*).

Khat chewing has been found to decrease the work capability and increase the rate of accidents (*19*). The problem of road traffic accidents is becoming an internationally recognized concern and is a major cause of morbidity and mortality in Saudi Arabia. Most of the road traffic accidents are related to driver error and ~50% are associated with excessive speed and violation of safety rules (*20*). Khat chewing may be associated with a misplaced sense of alertness and may cause hallucinations (*21*).

The objectives of this study were to assess the prevalence of khat chewing among professional drivers in Jazan Region, evaluate the determinants of khat chewing among them, and explore the impact of khat chewing on work ability, road traffic accidents and violations, and socioeconomic aspects.

Methods

Study sample and design

A cross-sectional study was carried out on a randomly selected, representative sample of professional drivers from Jazan Region. Jazan is one of the smallest provinces of Saudi Arabia and is located just north of Yemen. It is subdivided into 14 governorates and the capital is the city of Jazan. The professional drivers were identified as people who were paid to drive a vehicle, including taxis, buses and heavy good vehicles.

The minimum sample size of 196 drivers was calculated according to the formula of Swanson and Cohen (*22*), with an anticipated 48% of the population chewing khat (*5*), and absolute precision of 7% at 95% confidence. To account for possible nonresponse, a total of 215 drivers were initially planned for the study.

Proportional allocation, random cluster sampling was used to select the study population. The proportional factor adopted was calculated by dividing the total population in each governorate by the total populations in the selected governorates. Besides Jazan Governorate (255 340 individuals), 5 of the remaining 13 governorates of Jazan Region were randomly selected by simple random technique. These included Sabya (198 086 individuals), Abu Arish (128 447), Samtah (123 943), Ahad Almasarihah (70 038) and Al-ddarb (52 062). The required number of drivers from each governorate was calculated by multiplying the proportional factor by the planned sample size. The required drivers from each governorate were collected from bus and taxi stations and companies with heavy goods vehicles through cluster sampling on first available basis till completion of the sample for each particular governorate.

Study tools and data collection

All the participants were interviewed personally in their working places and were asked to complete an anonymous questionnaire composed of the following sections:

- sociodemographic questions such as age, area of residence, nationality, marital status and educational level;
- questions about occupation such as type of vehicle, duration of work, average working hours, use of seatbelt and impact of khat chewing on work ability;
- questions to assess khat chewing habits, including onset, frequency, place of session, cost per month in Saudi riyal and US dollars, quantity of khat used, duration of session, other associated habits or addictions, attempted cessation, and times of trouble with family;
- questions about motivating factors for khat chewing, including increased alertness and concentration, taste, increased energy, feeling refreshed, increased self-esteem and sexual desire, fear of withdrawal symptoms, and promotion of social discussion;
- questions to assess the history of road traffic accidents and traffic violations in the previous month; significant accidents were considered to be those that required hospital admission for

>24 hours or were associated with fracture, disability or loss of an organ.

Data entry and analysis

We used SPSS version 18.0 for data entry and analysis. Descriptive statistics were presented as number and percentage for categorical data and mean and standard deviation (SD) for continuous data. χ^2 tests were used for the association between categorical variables. Significant factors predicting khat chewing on univariate analysis were entered into multiple logistic regression analysis to establish the independent predictors of khat chewing. Odds ratios (ORs) and 95% confidence intervals were calculated. $P < 0.05$ was considered statistically significant.

Ethics

The study was approved by the Ethics Committee of King Khalid University. Oral informed consent was obtained from the respondents after explaining the importance of the study. Confidentiality and privacy were guaranteed for all participants.

Results

The study included 215 drivers whose sociodemographic characteristics are summarized in Table 1. Their age ranged between 22 and 89 years with an average of 47.8 (11.9) years. They were recruited according to the proportion of the population of the 6 governorates. Most participants were Saudi (82.8%) and married (88.2%). Most of them (76.3%) had an educational level that ranged between primary and secondary schooling. The age and area of residence of the drivers were not significantly associated with khat chewing. Saudi drivers reported a significantly higher rate of khat chewing compared to non-Saudi drivers (55.6% vs 8.1%, $P < 0.001$). Also, divorced/widowed drivers reported a significantly higher rate of khat chewing compared to single or married drivers (100% vs 47.4% and 45.8%, respectively, $P = 0.032$).

Almost two-thirds of the drivers (65.6%) had chewed khat, while 47.4% were currently khat chewers (Table 2). The average age at onset of chewing khat was at 23.1 (7.1) years with a median of 20.0 years; 48% started after the age of 20 years and 17.6% started at ≤15 years. The most frequent reasons expressed for continuing chewing khat were promoting dialogue and social discussion (79.4%), making them feel refreshed (54.9%) and increased energy (47.1%). More than a third of the participants (38.2%) reported khat chewing 1 day per week, whereas 11.8% of them reported its daily use. The median cost of khat chewing was 600 Saudi riyal (US$160) per month and 47.1% of

Table 1 Sociodemographic criteria of professional drivers in Saudi Arabia (*n* = 215)

Characteristics	Total (*n*=215)	Current khat chewer (*n*=102)	*P*-value
	n (%)	*n* (%)	
Age (yr)			
Mean (SD)	47.8 (11.9)	46.32 (12.1)	0.09
≤45	79 (36.8)	39 (49.4)	
46–59	102 (47.4)	48 (47.1)	0.872
≥ 60	34 (15.8)	15 (44.1)	
Area of residence			
Jazan	63 (29.3)	30 (47.6)	
Sabya	51 (23.7)	27 (52.9)	
Abu Arish	32 (14.9)	12 (37.5)	0.196
Samtah	28 (13.0)	18 (64.3)	
Ahad Almasarihah	27 (12.6)	9 (33.3)	
Al-ddarb	14 (6.5)	6 (42.9)	
Nationality			
Saudi	178 (82.8)	99 (55.6)	<0.001
Non-Saudi	37 (17.2)	3 (8.1)	
Marital status			
Single	19 (8.8)	9 (47.4)	
Married	190 (88.4)	87 (45.8)	0.032
Divorced/widowed	6 (2.8)	6 (100)	
Educational level			
Illiterate	34 (15.8)	13 (38.23)	
Primary	58 (27.0)	27 (46.6)	0.12
Intermediate	49 (22.8)	30 (61.2)	
Secondary	57 (26.5)	27 (47.4)	
More than secondary	17 (7.9)	5 (29.41)	

SD = standard deviation.

Table 2 Prevalence and pattern of Khat chewing among professional drivers in Saudi Arabia

Prevalence (*n*=215)	*n* (%)
Experienced khat chewers	141 (65.6)
Current khat chewers	102 (47.4)
Pattern of khat chewing (n=102)	
Age at starting khat chewing (yr)	
Mean (SD)	23.1 (7.1)
Median	20.0
≤15	18 (17.6)
16–20	35 (34.4)
>20	49 (48.0)
Reason/s for continuing khat chewing	
Increase alertness and concentration	37 (36.3)
Taste	12 (11.8)
Increase energy	48 (47.1)
Makes me feel refreshed	56 (54.9)
Increase self esteem and sexual desire	9 (8.8)
I am addictive and use it to prevent withdrawal symptoms of khat	9 (8.8)
Promote dialogue and social discussion	81 (79.4)
Others	9 (8.8)
Frequency of chewing khat	
1–2 d/mo	21 (20.6)
1 d/wk	39 (38.2)
2–4 d/wk	30 (29.4)
Daily	12 (11.8)
Cost of khat chewing /month	
Median (range) (SR)	600 (60–5000)
Median (range) (USD)	160 (16–1334)
≤500 (SR)	29 (28.4)
501–1000 (SR)	48 (47.1)
>1000 (SR)	25 (24.5)
Quantity in g/session	
<300 (<bundle)	87 (85.3)
300–500 (bundle)	9 (8.8)
>500 (>bundle)	6 (5.9)
Duration in h/session	
<3	25 (24.5)
3–5	65 (63.7)
>5	12 (11.8)
Other materials taken during chewing khat[a]	
Shisha	31 (30.4)
Cigarette smoking	42 (41.2)
Energy drinks	43 (42.2)
Sweet drinks	35 (33.3)
Others (cola, black tea, ice water)	26 (25.5)
Family member share khat chewing	54 (52.9)
Frequency of family conflicts due to khat chewing	
Nothing	72 (70.6)
1 or 2 times	17 (16.7)
3–9 times	3 (2.9)
≥10 times	10 (9.8)
History of trial to quit chewing khat	47 (46.1)
Obstacles to quitting chewing khat[a]	
Social commitment	76 (74.5)
Peer pressure	60 (59.6)
Unwillingness (no motivation)	28 (28.3)
Need to kill time	11 (10.6)

[a]*Not mutually exclusive.*
SD = standard deviation; SR = Saudi Riyal, USD = US dollar.

drivers spent from 501 to 1000 Saudi riyal per month on khat chewing. The majority (85.3%) chewed <300 g/session (<1 bundle) of khat. Almost two-thirds of them (63.7%) spent 3–5 hours per session khat chewing. Among the participants, 42.2%, 41.2% and 33.3% reported taking energy drinks, smoking cigarettes and consuming sweet drinks, respectively, during khat chewing. Other family members shared khat chewing with 52.9% of them and 29.4% reported family troubles due to khat chewing. Less than half of drivers who were chewing khat (46.1%) reported attempting to quit, and the most frequent obstacles to quitting were social commitment (74.5%) and peer pressure (59.6%).

Taxi drivers reported a significantly higher rate of khat chewing compared to bus and heavy goods vehicle drivers (58.6% vs 39.8%) (Table 3). The average working time for drivers chewing khat were significantly lower compared to nonchewers [7.11 (2.67) vs 8.13 (3.72) hours; $P < 0.05$]. Furthermore, their average daily working hours [4.53 (1.88)] were significantly lower compared to those of nonchewing drivers [5.46 (2.63); $P < 0.05$]. Meanwhile, the average night-time driving was not significantly associated with khat chewing. All the drivers who reported never using a seatbelt were khat chewers compared with only 34.3% of those who reported always using a seatbelt. The difference was highly significant ($P < 0.001$). History of having road traffic accidents was not significantly associated with khat chewing ($P = 0.675$). However, the average number of serious crashes was significantly higher among khat chewers compared to nonchewers [2.65 (1.45) vs 1.97 (0.87); $P = 0.01$]. Traffic violations in the previous month were significantly more frequently reported among khat chewers than nonchewers (72.7% vs 27.3%; $P = 0.012$). Moreover, 47.7% of the khat chewers with a history of road traffic accidents admitted that khat chewing may have been a contributory factor. About 47.1% of the drivers admitted that khat chewing impaired their working ability on the day after a khat chewing session, to different extents (always, usually or sometimes).

Table 4 summarizes the results of multiple logistic regression analysis for predictors of khat chewing among drivers in Jazan Region. Being Saudi drivers was the highest predictor for khat chewing (OR = 7.53). Divorced or widowed drivers had almost double the risk for chat chewing compared to single drivers (OR = 2.03). Drivers who worked >12 hours/day were less likely to chew khat compared to those who worked for ≤4 hours (OR = 0.23). Drivers who never used a seatbelt while driving had a 4-fold higher likelihood of chewing khat compared to those who always used a seatbelt (OR = 4.04).

Discussion

The present study showed that about half of the drivers (47.4%) in Jazan Region were current khat chewers. This was in conformity with the previously reported prevalence of khat use among the general population in Jazan Region (48.7%) (*5*). It was surprising to find in the present study that khat chewing was not significantly affected by the level of education. This indicates that the availability of adequate income to purchase khat and motivating factors for khat use are more important than the level of awareness of its effects.

In the present study, the most frequent reasons for continuing chewing khat were promoting dialogue and social discussion, making the chewer feel refreshed, more energetic, alert and attentive. Similar claims of positive physiological aspects to khat chewing and strong energizing effect of workers have been reported elsewhere (*3*). For Yemenis, khat may be less of a drug than a medium for socialization (*23*).

The significantly higher prevalence of khat chewing among divorced or widowed drivers in the current study is explained by the ability of the psychoactive leaves to give temporary relieve from fatigue, loss of excitation, and sleep (*24*). Also, in the light of the current study, khat chewing has been reported to increase family conflicts and consequently may be implicated in divorces.

In the present study, drivers who worked for longer hours were less likely to chew khat compared to other drivers even after control of other confounders. Moreover, about half of them reported that khat chewing impair their working ability on the day after khat chewing. The drivers' claims that khat chewing increases alertness and concentration in the present study is contrary to previous findings (*11*) that some khat chewers experience anxiety, tension, restlessness, hypnologic hallucinations, hypomania and aggressive behaviour or psychosis, and consequently they are unable to work for long duration.

In the present study, the median age for starting khat chewing was 20 years and only 17.6% of the respondents initiated khat chewing at age ≤15 years. However, in a study conducted in Ethiopia, 36.4% of people reported that the age of onset of khat chewing was 10–15 years (*25*) and the median age of onset reported from Agaro and Gondar was 14.6 and 16.4 years, respectively (*25, 26*). Many factors increase the risk of khat chewing during adolescence, including socioeconomic status, neighbourhood, cultural context, peer influence, teachers' influence and perhaps most importantly, family influences (*27*). It is reported that social acceptability of khat chewing and socialization of this habit increase the likelihood of adolescents adopting the behaviour in Jazan Region (*28*). This fall in the age of initiation of khat chewing indicates the failure of prevention strategies (*29*).

More than 40% of the respondents in the present study reported cigarette smoking and having energy drinks with khat chewing. This finding is in line with other studies in Ethiopia and Somalia (*2,4*). A study in Gondar, Ethiopia has

Table 3 Work determinants and impacts of khat chewing among professional drivers in Saudi Arabia (*n*=215)

Work impacts	Total (*n*=215)	Nonchewer (*n*=113) *n* (%)	Current chewers (*n*=102) *n* (%)	*P*-value
Type of vehicle				
Taxi	87	36 (41.4)	51 (58.6)	0.023
Bus/heavy goods vehicle	128	77 (60.2)	51 (39.8)	
Work duration (yr)	91	46 (50.5)	45 (49.5)	0.203
≤5	68	32 (47.1)	36 (52.9)	
6–10	56	35 (62.5)	21 (37.5)	
>10				
Average working time (h/d) mean (SD)				
≤4	39	8.13 (3.72)	7.11 (2.67)	0.024
5–8	107	23 (59.0)	16 (41.0)	
9–12	55	45 (42.1)	62 (57.9)	<0.001
>12	14	31 (56.4)	24 (43.6)	
		14 (100)	0 (0.0)	
Average daytime driving time (h) (n=198) mean (SD)				
≤4		5.46 (2.63)	4.53 (1.88)	0.006
5–8	82	42 (51.2)	40 (48.8)	
>8	108	58 (53.7)	50 (46.3)	0.029
	8	8 (100)	0 (0.0)	
Average night time driving (h) (n=183) mean (SD)		4.39 ± 2.26	3.53 ± 2.56	0.39
≤4	133	69 (51.9)	64 (48.1)	
5-8	44	21 (47.7)	23 (52.3)	0.891
>8	6	3 (50.0)	3 (50.0)	
Use of seat belt				
Always	70	46 (65.7)	24 (34.3)	–
Usually	52	34 (65.4)	18 (34.6)	–
Sometimes	53	17 (32.1)	36 (67.9)	–
Rarely	31	16 (51.6)	15 (48.4)	<0.001
Never	9	0 (0.0)	9 (100)	
RTA[a]	77	39 (50.6)	38(49.9)	0.675
Average major RTA[b]		1.97 (0.87)	2.65 (1.45)	0.01
Traffic violations[c]	22	6 (27.3)	16 (72.7)	0.012
Reduced ability to work on the day after khat chewing [d]	–	–	–	–
	–	–	–	–
Always	–	–	6 (5.9)	–
Usually	102	–	9 (8.8)	–
Sometimes	–	–	33 (32.4)	–
Rarely	–	–	20 (19.6)	–
Never	–	–	34 (33.3)	–
Khat chewing cause of RTA (yes/possible) [d]	38	–	18 (47.4)	–
Khat chewing cause of violations (yes/possible) [d]	16	–	1 (6.3)	–

[a]Working history of RTA. [b]Reportable, causing fractures, disability or loss of life. [c]History of traffic violation in the previous month. [d]Among khat chewers only. RTA = road traffic accident; SD = standard deviation.

also shown that smoking is common and accompanies khat chewing (*30*). Traditionally, cigarette smoking and energy drinks accompany khat chewing in order to achieve maximum excitement (*4*).

In the current study, khat chewing was significantly associated with road traffic accidents, and nearly half of the drivers involved stated that chewing khat may have been a possible cause of these crashes. Khat chewing was also significantly associated with a higher rate of traffic violations and significantly poorer compliance with wearing seat belts. All these factors may act together to make road traffic accidents more severe among khat chewers. Research

Table 4 Multivariate analysis for predictors of khat chewing among professional drivers in Jazan Region

	Adjusted OR	(95% CI)	*P* value
Nationality			
Saudi (*n*=178)	7.53	4.21–47.96	0.00
Non-Saudi (*n*=37)	Ref	–	
Marital status			
Single (*n*=19)	Ref	–	
Married (*n*=190)	0.96	0.32–6.25	0.359
Divorced/widowed (*n*=6)	2.03	1.08–21.02	0.013
Average working time (h/d)			
≤4 (*n*=39)	Ref	–	
5–8 (*n*=107)	1.42	0.62–4.29	0.459
9–12 (*n*=55)	1.09	0.33–6.02	0.525
>12 (*n*=14)	0.23	0.09–0.56	0.022
Use of seat belt			
Always (*n*=70)	Ref	–	
Usually (*n*=52)	1.02	0.12–3.29	0.458
Sometimes (*n*=53)	2.66	0.73–4.02	0.152
Rarely (*n*=31)	1.86	0.42–6.22	0.336
Never (*n*=9)	4.04	1.02–12.02	0.002

Terms of type of vehicle, religion and average daytime driving time were removed from the final logistic regression model (not significant).
CI = confidence interval; OR = odds ratio; Ref = reference group.

on African/Middle Eastern drivers stopped by German police on suspicion of driving under the influence of drugs has found that driving ability is severely impaired by khat consumption (*31*). Also, qualitative research from Ethiopia has found that chewing khat is a major contributor to road traffic accidents, and hence potential fatalities, and are related to the fact that khat increases driver confidence and vehicle speed, thus making drivers irritable, with impaired concentration and misplaced sense of alertness (*21*). The impaired working ability on the day after a khat chewing session reported by most of the drivers in the current study may play a role in increasing the risk and severity of road traffic accidents (*21*).

In the current study, the median monthly cost of khat chewing was 600 Saudi riyal (US$160). This represent money that could have been spent on other beneficial purposes. The average working hours for khat-chewing drivers were significantly lower than for nonchewers. Additionally, khat chewing was associated with loss of working hours and most of the chewers spent a long time (3–5 hours) chewing khat on >1 day/week. A considerable percentage of them reported work impairment on the next day after a chewing session. These results are in conformity with other studies that have indicated that khat chewing is associated with significant economic loss due to the cost of khat chewing, impaired working ability in a highly productive age group, and suppressed occupational motivation (*3, 12,32,33*).

In the social domain, the current study revealed that almost a third of khat chewing drivers reported family conflicts, and on more than half of these occasions, other family members were also involved in khat chewing. Previous studies have indicated that family disruption is a prominent problem associated with khat chewing, which includes frequent quarrels, breach of family ties, neglect of the education and care of children, waste of family resources, encouragement of prostitution and encouragement of family members to become involved in khat chewing (*2*).

About half of the khat-chewing drivers reported failed attempts to quit, with the most frequent obstacles being social commitment and peer pressure. Peer pressure always plays a major role in drug abuse and smoking initiation (*34–35*). One study showed that negative peer pressure was a factor in the initiation of khat use and hindered quitting (*29*). Also, the presence of social dependence and community acceptance and absence of khat chewing stigmatization may make quitting difficult.

The strengths of the current study include that it is believed to be the first study among professional drivers to identify the magnitude and predictors of khat chewing, its relation to traffic accidents and violations, and its socioeconomic impacts. However, this study had a few limitations that should be mentioned. First, we relied on past history data to address the problem, which could have biased the results of the impact of khat chewing. Second, data collection depended mainly on self-reporting, although every effort was made to minimize any possible over- or

under-reporting by the participants. Third, because this was a cross-sectional study, the temporality of the associations between khat chewing and the related problems cannot be certain and it is difficult to confirm a causal relationship. Also, being a cross-sectional design gives only a current snapshot of the problem that may be different if the time-frame were changed.

Conclusion

According to the present study, khat chewing habit affects almost half of the professional drivers in Jazan Region. There were some associations between khat chewing and work impairment, driving-related problems, as well as some behavioural and social impacts. Longitudinal and experimental studies are necessary to investigate the mechanisms that might cause these associations. There should be coordination between different community partners in Jazan Region including health practitioners, religious leaders, educationalists and social leaders to establish programmes to combat khat chewing to tackle and stigmatize this deeply rooted social problem.

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References

1. Luqman W, Danowski TS. The use of khat (Catha edulis) in Yemen: social and medical observations. Ann Intern Med. 1976 Aug;85(2):246–9. PMID:942147
2. Elmi AS. The chewing of khat in Somalia. J Ethnopharmacol. 1983 Aug;8(2):163–76. PMID:6139513
3. Ageely HM. Health and socioeconomic hazards associated with khat consumption. J Family Community Med. 2008 Jan;15(1):1–9. PMID:23012161
4. National Drug Intelligence Center. Intelligence bulletin: khat (Catha edulis). Johnstown, PA: NDIC; 2003 (http://www.justice.gov/ndic/pubs3/3920/index.htm, accessed 14 February 2017).
5. Milaat AA, Bani IA, Ageely HM, El-Naggar MM. Assessment of Health risk factors and social problems associated with Khat use in Jazan region. Project research report, King Abdulaziz University, Jazan, Saudi Arabia; 2006.
6. Varisco DM. On the meaning of chewing: the significance of Khat (Catha edulis) in the Yemen Arab Republic. Int J Middle East Stud. 1986 Feb;18(1):1–13.
7. Ageely HM. Prevalence of Khat chewing in college and secondary (high) school students of Jazan region, Saudi Arabia. Harm Reduct J. 2009 Jun 20;6:11. PMID:19545389
8. Numan N. Exploration of adverse psychological symptoms in Yemeni khat users by the Symptoms Checklist-90 (SCL-90). Addiction. 2004 Jan;99(1):61–5. PMID:14678063
9. Kalix P. The pharmacology of khat. Gen Pharmacol. 1984;15(3):179–87. PMID:6376274
10. Hassan NA, Gunaid AA, Abdo-Rabbo AA, Abdel-Kader ZY, al-Mansoob MA, Awad AY et al. The effect of khat chewing on blood pressure and heart rate in healthy volunteers. Trop Doct. 2000 Apr;30(2):107–8. PMID:10842563
11. Yousef G, Huq Z, Lambert T. Khat chewing as a cause of psychosis. Br J Hosp Med. 1995 Oct 4-7;54(7):322–6. PMID:8556211
12. Dhadphale M, Omolo OE. Psychiatric morbidity among khat chewers. East Afr Med J. 1988 Jun;65(6):355–9. PMID:3181055
13. Al-Motarreb AL, Broadley KJ. Coronary and aortic vasoconstriction by cathinone, the active constituent of khat. Auton Autacoid Pharmacol. 2003 Oct-Dec;23(5-6):319–26. PMID:15255816
14. Al-Motarreb S, Briancon N, Al-Jaber B, Al-Adhi F, Al-Jailani MS, Salek KJ. Khat chewing is a risk factor for acute myocardial infarction: a case-control study. Br J Clin Pharmacol. 2005 May;59(5):574–81. PMID:15842556
15. Al-Hadrani AM. Khat induced Haemorrhoidal disease in Yemen. Saudi Med J. 2000 May;21(5):475–7. PMID:11500685
16. Abdul-Ghani NA, Eriksson M, Kristiansson B, Qirbi AA. The influence of Khat chewing on birth weight in full term infants. Soc Sci Med. 1987;24(7):625–7. PMID:3589757
17. Eriksson M, Abdul-Ghani NA, Eriksson M, Kristiansson B. Khat chewing during pregnancy and some characteristics of the chewers. East Afr Med J. 1991 Feb;68(2):106–11. PMID:2040229
18. Al-Hebshi NN, Skaug N. Effect of Khat chewing on 14 selected periodontal bacteria in sub- and supragingival plaque of a young male population. Oral Microbiol Immunol. 2005 Jun;20(3):141–6. PMID:15836514
19. Corkery JM, Schifano F, Oyefeso A, Ghodse AH, Tonia T, et al. Bundle of fun' or 'bunch of problems'? Case series of khat-related deaths in the UK. Drugs Educ Prev Policy. 2011;18(6):408–25.
20. Ansari S, Akhdar F, Mandoorah M, Moutaery K. Causes and effects of road traffic accidents in Saudi Arabia. Public Health. 2000 Jan;114(1):37–9. PMID:10787024
21. Eckersley W, Salmonb R, Gebru M. Khat, driver impairment and road traffic injuries: a view from Ethiopia. Bull World Health Organ. 2010 Mar;88(3):235–6. PMID:20428394
22. Swanson WH, Cohen JM. Color vision. Ophthalmol Clin North Am. 2003 Jun;16(2):179–203. PMID:12809157
23. Lqman W, Donaldson T. The use of Khat (Catha edulis) in Yemen. Social and medical observations. Ann Intern Med. 1976 Aug;85(2):246–9. PMID:942147
24. Megerssa B, Esayas A, Mohamed A. Socio-economic impact of khat in Mana District, Jimma Zone, South Western Ethiopia. Agricultural Science. Engineering and Technology Research. 2013;1(4):44–59.
25. Kebede Y. Cigarette smoking and khat chewing among college students in Northwest Ethiopia. Ethiop J Health Dev. 2002;16(1):9–17 (http://www.ajol.info/index.php/ejhd/article/view/9818/31243).
26. Fekade A, Challi J, Tadesse M. Khat chewing among Agaro secondary school students. Ethiop Med J. 1994 Jul;32(3):161–6. PMID:7957128
27. Johnson V, Pandina RJ. Effects of the family environment on adolescent substance use, delinquency, and coping styles. Am J Drug Alcohol Abuse. 1991;17(1):71–88. PMID:2038985
28. Mahfouz MS, Alsanosy RM, Gaffar AM. The role of family background on adolescent khat chewing behavior in Jazan Region. Ann Gen Psychiatry. 2013 May;12(1):16. PMID:23688046

29. Alsanusy R, El-Setouhy M. Why would khat chewers quit? An in-depth, qualitative study on Saudi khat quitters. Subst Abus. 2013;34(4):389–95. PMID:24159910

30. Zein A. Polydrug abuse among Ethiopian university students with particular reference to khat. In: Dagne E, editor. International Symposium on Khat (Catha edulis), Addis Ababa, Ethiopia, December 15, 1984. Natural Products Research Network for Eastern and Central Africa; 1984:85–9.

31. Toennes SW, Kauert GF. Driving under the influence of khat-alkaloid concentrations and observations in forensic cases. Forensic Sci Int. 2004 Feb;140(1):85–90. PMID:15013169

32. Gelaw Y, Haile-Amlak A. Khat chewing and its socio-demographic correlates among the staff of Jimma University. Ethiop J Health Dev. 2004;18(3):179–84 (http://www.ajol.info/index.php/ejhd/article/view/9957/31320).

33. Aden A, Dimba EA, Ndolo UM, Chindia ML. Socio-economic effects of khat chewing in north eastern Kenya. East Afr Med J. 2006 Mar;83(3):69. PMID:16771102

34. Reda AA, Moges A, Biadgilign S, Wondmagegn BY. Prevalence and determinants of khat (Catha edulis) chewing among high school students in eastern Ethiopia: a cross-sectional study. PLoS One. 2012;7(3):e33946. PMID:22479484

35. Feigin A, Higgs P, Hellard M, Dietze P. The impact of khat use on East African communities in Melbourne: a preliminary Investigation. Drug Alcohol Rev. 2012 May;31(3):288–93. PMID:21463373

Review

Substance use prevention: evidence-based intervention

Maria Renstrom [1], Marica Ferri [2] and Ahmed Mandil [3]

الوقاية من تعاطي مواد الإدمان: التدخل المستند إلى الأدلة

ماريا رينستروم، ماريكا فيري، أحمد منديل

الخلاصة: تمثّل المشكلة العالمية لتعاطي المخدرات شاغلاً خطيراً للصحة العامة لا يقتصر أثرها على الصحة والسلامة ورفاهية المجتمعات فقط، بل يمتد ليشمل التنمية الاجتماعية والاقتصادية كذلك. وتؤثر هذه المشكلة على الأطفال والشباب وأسرهم على وجه الخصوص. فينبغي لجميع الدول الأعضاء وضع تدابير وبرامج للوقاية من تعاطي مواد الإدمان على سبيل الأولوية بغية تعزيز الصحة والحد من المخاطر الاجتماعية. وخلال العقود القليلة الماضية، تحقق تقدّم كبير في علوم الوقاية أدى إلى وضع معايير دولية للوقاية وتصميم تدخلات مستندة إلى النتائج تحظى بالقبول على المستوى العالمي. ويتضمّن هذا العرض المتطلبات والمكونات والتدخلات الاستراتيجية الرئيسية اللازمة لاعتماد نهج للصحة العامة إزاء الوقاية من تعاطي المخدرات واضطراباتها وتبعاتها الصحية والاجتماعية. ويهدف إلى توفير الدعم للدول الأعضاء والمجتمع المدني لتحديد العناصر الرئيسية التي تساعد البلدان والمجتمعات المحلية على زيادة عناصر الحماية من تعاطي المخدرات فيما يتعلق بعوامل الخطر في جميع المجالات ذات الصلة.

ABSTRACT The global substance use problem is a serious public health concern that affects not only health, safety and well-being of communities, but also social and economic development. It particularly affects children, young people and their families. All Member States should set substance use prevention measures and programmes as a priority in order to promote health and reduce social harm. During the past few decades there has been a significant advance in prevention science that has led to the development of international prevention standards and globally accepted evidence-based interventions. This review looks into the key requirements, components and strategic interventions needed for a public health approach to prevention of substance use and disorders, and its health and social consequences. It aims at supporting Member States and civil society to identify the key elements that support countries and local communities to increase the number of substance use protective approaches in relation to risk factors across all relevant domains.

Prévention de l'utilisation de substances psychoactives : interventions reposant sur des bases factuelles

RÉSUMÉ Le problème mondial posé par l'usage de la drogue constitue une préoccupation de santé publique sérieuse qui a non seulement des répercussions sur la santé, la sécurité et le bien-être des communautés, mais aussi sur le développement économique et social. Il affecte particulièrement les enfants, les jeunes et leurs familles. Tous les États Membres devraient accorder la priorité aux mesures et programmes de prévention de l'usage des substances psychoactives afin de promouvoir la santé et de diminuer l'impact social. Au cours des dernières décennies, on a observé une avancée notable dans le domaine des sciences de la prévention, qui a conduit à l'élaboration de normes de prévention internationales et à la mise en place d'interventions reposant sur des bases factuelles reconnues à l'échelle mondiale. La présente analyse a passé en revue les exigences, composantes et interventions stratégiques principales requises dans le cadre une approche de santé publique de prévention de l'utilisation des substances psychoactives et des troubles associés, ainsi que ses conséquences sanitaires et sociales. Elle vise à soutenir les États Membres et la société civile dans l'identification des éléments clés permettant d'aider les pays et les communautés locales à augmenter le nombre d'approches de protection contre l'utilisation de substances psychoactives en rapport avec les facteurs de risque dans tous les domaines pertinents.

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Introduction

The issue of drug policy has been high on the political agenda lately. Mostly due to the special session of the United Nations (UN) General Assembly on the world drug problem (UNGASS 2016) which was convened in New York from 19 to 21 April 2016. Its purpose was to review the progress made in implementation of the Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem. At the UNGASS, the UN member states adopted a joint commitment to effectively address and counter the world drug problem. In the commitment, the governments declare that they will take effective and practical measures that protect people and prevent progression to drug use disorders. The governments also promise increasing the availability, coverage and quality of scientific evidence-based prevention measures and tools that target relevant age and risk groups in multiple settings (*1*).

Prevalence and health burden

The majority of those who develop frequent and long-term substance use and substance use disorders (SUDs) later in life begin in adolescence. There are clear associations between early onset and frequent use of drugs and concurrent and subsequent poor health, violence, injuries, psychosocial, and educational outcomes (*2*). Substance use has a significant contribution to the global burden of disease. According to the Global Burden of Disease Study 2010, mental and substance use disorders accounted for 7.4% (6.2–8.6) of all disability-adjusted life years (DALYs) worldwide. Among DALYs caused by mental health and substance use disorders, Illicit drug use disorders accounts for 10·9% (8.9–13·2) and alcohol use disorders for 9.6% (7.7–11.8)(3). Recent figures from the World Health Organization (WHO) reveal that drug use disorders accounted for 0.55% of the total global burden of disease (GBD) (0.70% for men and 0.37% for women) (*4*).

In 2012, approximately 3.3 million net deaths (5.9% of all global deaths) were attributable to alcohol consumption, while 5.1% of the global burden of disease and injury were attributable to alcohol consumption (*5*). Worldwide, approximately 34% of 15 to 19-year-old adolescents are estimated to be current drinkers (*5*), while cannabis is, by far, the most frequently used illicit drug by adolescents and young adults (*6*). However, tobacco is the only legal drug that kills many of its users when used exactly as intended by manufacturers (*7*). WHO has estimated that tobacco use, whether smoking or smokeless, is currently responsible for the annual global death of 6 million people, many of whom die prematurely. This includes approximately 600 000 people estimated to die from the effects of second-hand smoke (sometimes referred to as environmental tobacco smoke). Although often associated with ill-health, disability and death from chronic non-communicable diseases, tobacco use is also associated with increased risk of death from communicable diseases (*7*).

Data on substance use among young people is often limited. School-based surveys can provide useful comparisons within and across countries, but do not include young people who are not attending schools. Most of the public access data comes from high-income countries in Europe and North America, as well as Australia and New Zealand.

Substance use prevention

Substance use and substance use disorders are largely preventable. In fact, evidence-based substance use prevention can save both lives and money, since frequent substance use is not only associated with numerous social and health consequences for the individual drug users but also for their families, friends, work colleagues, health and social sector and economic development.

To generate the evidence to respond to the substance use problem, much of the research over the past decades on substance use prevention has been trying to determine which factors increases the risk of initiation of substance use/SUDs; how this behaviour develops; and how substance use and its health and social harms can be prevented or minimized. As a result, evidence-informed prevention programmes and interventions are currently able to address the identified risk factors for substance use, and to promote protective factors found to be the most relevant to reduce substance use/SUDs. Research shows that crucial periods of risk for substance use occur during key life transitions. An important community level risk factor is access to and availability of substances and normative beliefs that substance use is "tolerated and accepted" (*8*).

The Sustainable Development Goals (SDGs) adopted by the UN General Assembly in September 2015 acknowledges the right of all girls and boys to have access to quality early childhood development, care and pre-primary education. Additionally in SDG 3.5 it asks for strengthening the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol (9).

Development and implementation of effective substance use prevention framework: key issues

Substance use prevention is one of the key components of a public health approach. Evidence-based substance use

Box 1. Risk and protective factors (*8,10*)

Risk factors

- High availability of substances in the environment
- Substance use/dependence among patients
- Substance use by older siblings
- Lack of parental supervision
- Low quality of family relations
- Family disruption and problematic economic conditions
- Low perception of harm in society, especially among your people
- Individual risk factors: mental disorders, conduct disorder, aggressive behaviour, academic failure

Protective factors

- Reduced availability and high prices
- Parental monitoring
- Academic competence
- Effective policies
- Strong neighbourhood attachment
- Strong positive attachment or bond between children and parents
- Positive external support system
- Individual attributes such as positive temperament and disposition, self-control

prevention has a potential for preventing, delaying or reducing substance use, and/or its negative health and social consequences, both for individuals and society. Substance use prevention activities are commonly thought of as being most relevant to young people; however, prevention is equally relevant to all age groups. Prevention strategies and programmes that are based on scientific evidence, working with whole populations, families, schools, and communities as comprehensive multisector approaches to prevention, has gained traction in recent years. The risk and protective factors are summarized in Box 1 (*10*).

The process and framework to develop an effective national substance use prevention programme or strategy is crucial. Firstly, a supportive policy and legal framework is a prerequisite. Secondly, to be able to make a difference, strong leadership and a solid base of awareness and political commitment are needed. Substance use prevention and health promotion should never be stand-alone interventions, but should be integrated parts of national public health and/or substance use policies, especially in low- and middle-income countries. If possible, the interventions should undergo cost-effective analysis in order to select the policy/intervention that would yield the best outcome/result (i.e. best-buys; cost-effective interventions). Furthermore, they should be developed in coordination with multiple sectors at all levels. If developed and adopted at the national level, the prevention programme can also pave the way for designing strategies and programmes at local levels that are cost-effective, evidence informed, and that address actual needs of the community, specifically the more vulnerable groups (e.g. young people and subgroups).

When resources are limited, the most cost-effective interventions that address the needs of the community should be prioritized, followed by training of required staff and allocation of adequate resources to sustain the long-term viability of programmes. In general, an effective prevention framework of action requires the following characteristics and should:

- have clear public health objectives, cover the whole prevention chain, leading from universal and selective to indicated prevention,
- address each community's specific problems – retaining the core elements of the general framework,
- be developed to meet the main targeted area/group, namely;
  - the age of the target group,
  - the level of risk of the target group and,

  - the setting in which the intervention/strategy is planned to be delivered.
- be based on scientific evidence with involvement of relevant stakeholders in the whole process of development and implementation,
- include screening, brief intervention, and referral to treatment to identify, reduce, and prevent substance use disorders,
- target the most important risk and protective factors at individual, environmental and societal levels,
- be implemented in multiple settings (e.g. educational settings, workplace, media) for longer periods of time with subsequent follow-up sessions,
- aim at working with schools, families, and communities to ensure that children and youth – especially the most marginalized and poor – grow and stay healthy and safe into adulthood.

Depending on these factors interventions can be, a) environmental, addressing societies or social environments and targets social norms including market regulations; b) universal, targeting whole populations; c) selective, targeting subsets of population; and d) indicated, targeting individuals with identified risk. Indicated prevention addresses intrapersonal factors, while selective prevention addresses social vulnerability (*10*). The most challenging part for all policies and interventions is to successfully implement them and manage to engage the community and the stakeholders in the process. There are some steps to be taken, namely:

- starting with assessing the prevention needs based on, for example, epidemiological data, focus groups or mapping (needs assessment),
- building prevention capacity and identifying if and how the aims of the intervention can be achieved with available resources (resource assessment),
- developing a strategic plan,
- selecting effective and science-based family, school and community-based prevention programmes, policies and practices,
- starting the process and outcome evaluation at the beginning of the intervention to enable the evaluation of both outcomes, the process of delivering the intervention and the implementation of the programme and,
- feedback to the actors/policy makers to retain their commitment and safeguard a long-term engagement.

In summary, the focus of substance prevention should be on a comprehensive and coherent package of interventions based on the evolving evidence for prevention, which can decrease health problems and health-compromising behaviours, improved educational and work outcomes, and contribute to positive health. The package should include age and culturally relevant interventions targeting individuals, families and vulnerable youth and incorporate screening and brief interventions, motivational interviewing, family management programmes, interactive social/life skills programmes and monitoring etc. The interventions should target different life stages, different settings such as health services, school settings and recreation etc., and involving all relevant stakeholders for its implementation, observing the full range of human rights.

Substance Use Prevention in primary health care settings:

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was developed under WHO's auspices in response to the overwhelming global public health burden associated with psychoactive substance. The ASSIST was designed to be used in primary health care (PHC) settings, where hazardous and harmful substance use among visitors may go undetected, or even become worse. The package includes an 8-item questionnaire designed to be administered by a PHC worker to a visitor, which takes 5–10 minutes to administer. It was designed to be used for screening for the following substances, tobacco products; alcohol; cannabis; cocaine; amphetamine-type stimulants (ATS); sedatives and sleeping pills (benzodiazepines); hallucinogens; inhalants; opioids, as well as other drugs. The ASSIST determines a risk score for each substance, which is used to start a discussion with PHC visitors about their substance use. Such score falls into a 'lower', 'moderate' or 'high' risk category which determines the most appropriate intervention for that level of use (i.e. 'no treatment', 'brief intervention' or 'referral to specialist assessment and treatment' respectively). Scores in the midrange on the ASSIST are likely to indicate hazardous or harmful substance use ('moderate risk'), while higher scores are likely to indicate substance dependence ('high risk'). The ASSIST obtains information from PHC visitors about lifetime use of substances and use of substances and associated problems over the last 3 months. Taken together, these questions provide an indication of the level of risk associated with the PHC visitor's substance use, and whether use is hazardous and likely to be causing harm (now or in the future) if use continues (*11*).

Prevention interventions during life course – what works?

Prenatal & Infancy

Universal: Screening and brief Intervention targeting all pregnant women could be introduced as a preventive intervention in maternity care as a part of ordinary care (*12*). Screening and brief interventions, which can be delivered by nurses or midwives who work

in PHC, hospital settings or antenatal care, are among the most effective and cost-effective prevention services (*13*).

Selective: Targeting women at high risk and conducted by trained nurses or social workers. Pregnancy and motherhood are periods when women are receptive to address their use of substances that would harm the fetus. It is also the period when pregnant women would address their own dependence. Evidence-based Referral to Treatment (SBIRT) is an evidence-based practice used to identify, reduce and prevent high-risk use and dependence on alcohol and illicit drugs (*14*). There are some positive outcomes from prenatal and infancy visits for low-income unmarried women with substance use disorders, with a focus on improving the health of both the mother and her baby. The available evidence indicates that this intervention should be delivered by trained health workers through regular visits over two years of the baby's life. The health worker should provide basic parental training and support the mothers to address both health and socio-economic needs (*15*).

Indicated: Targeting women with substance use disorders, offering treatment that follows rigorous clinical guidelines based on scientific evidence (*12*).

Children and adolescents

Parenting skills programmes: Prevention programmes and interventions are most effective during key transition periods, for example the period of transition from middle to high school. Even if the target group of the intervention is children in early or middle childhood the most cost-effective intervention is universal in addition to selective parenting skills programmes (*16,17*). In well-resourced countries, universal programmes can be offered to all parents, but in low- and middle-income countries these interventions could be *selective* or *indicated* to be more cost-effective alternatives.

Universal: In middle childhood, the role of schools and peer groups grow in importance and there are several good reviews that have found certain interactive school-based programmes that can prevent substance use. (*17,18,19*). Universal programmes targeting and implemented during early adolescence have more positive results in preventing substance use than programmes targeting younger or older children. To be effective, the interventions/programmes should use interactive methods delivered through a series of structured sessions once a week and over several years by trained facilitators. This can be a costly intervention if implemented correctly with several booster sessions and education of educators.

Selective: Evidence exists that early education in support of social and cognitive development of pre-school children (2–5 years old) from deprived communities can reduce cannabis use as well as other illicit drugs and tobacco smoking. The intervention should be delivered by trained teachers and the sessions should be daily (*20*). Most importantly, it has now been shown that disseminating information alone, using ex-drug users and focusing only on the building of self-esteem and emotional unstructured sessions, have no observed prevention outcomes (*8*).

Targeting families

There is a dearth of methodologically sound research in this area, but the research that has been conducted does suggest strongly that the family can have a central role in preventing substance use and later misuse among young people. Universal and selective prevention interventions delivered to families are shown to be able to deter, or at least delay, the onset of substance use by children and adolescents. To be effective, the intervention should involve the whole family in the prevention activities. It should include parental functioning and/or parent–children relationships, and provide family members with the information and skills indicated to be necessary to prevent substance use. Universal prevention programmes to families can be delivered to family-as-a-system without any prior screening for vulnerability.

Selective: In prevention, a prior family screening would improve effectiveness when targeting families at risk of substance-related problems. Families at risk are those where one or more family members have substance use problems/SUDs, and/or families with high levels of parental conflict and violence, poor quality of relations, family disruption and/or serious economic problems. Indicated prevention to high-risk families requires close collaboration between parents, teachers, health and/or social services and home visits for disadvantage families (*16*).

Prevention interventions targeting different settings (education sector/ communities/ general population)

Education sector response

The education sector can play a key role in preventing and reducing substance use among children and young people not only because this will be effective in improving health outcomes, but it would also improve learning and school performance. A summary of evidence-based preventive approaches is presented in Box 2. Ensuring that schools deliver effective programmes to reduce substance use requires action at different levels including:

- National and school level policy framework to prevent and address substance use among children and young people;
- National curricula (contents and methods for the delivery of these con-

tents) including skills-based prevention education;

- Evidence-based interventions related to curricula implemented in educational institutions;
- Evidence-based interventions related to the school environment implemented in educational institutions;
- School health services, providing both prevention and care and support for young people who use substances;
- Training and support for teachers, school health practitioners and other school staff to plan, develop and implement a comprehensive school-based intervention strategy;
- Management, coordination, and evaluation of response in the education sector including monitoring of prevalence of substance use among children and young people.

Schools: A systematic examination of reviews of school-based substance use prevention was conducted as a part of the preparations for the UNESCO, UNODC and WHO international expert meeting held in Istanbul, Turkey, from 29 September to 2 October, 2015. The text below is just a short summary of the review and more information can be found in the UNESCO booklet, Education Sector Responses to Substance Use among Children and Young People (*21*).

Since adolescence often is per se a risk factor, and the majority of substance users start to use at this age, school is an efficient setting for universal prevention. Schools can offer a systematic and efficient way of reaching large numbers of young people by providing all individuals with the information and skills necessary to help them prevent problems and prepare them for the adult life. The school itself can become an important protective factor. Evidence suggests that school-based programmes to prevent substance use can have positive impacts on improving school attainment and engagement as well as health and well-being in general. In addition, policies aimed at keeping children in school can play an important role. Nevertheless, since school-based programmes on substance use often only reach a low percentage of all school children, they should be scaled up and form part of more comprehensive strategies for drug use prevention in order to achieve a wider population-level impact. Furthermore, education-sector responses to substance use depend on providing sufficient training for teachers, school health practitioners and other school staff to effectively deliver interventions. Thus, training is recognized as a critical component of prevention implementation.

The different types of school-based preventive interventions that are shown to impact on different types of substance use or harm include the following:

Universal: Multicomponent interventions delivered at school and based on social influence and/or learning social skills are helpful for reducing substance use, especially cannabis.

Selective: Interactive interventions targeted at problem students are proven to help reduce substance use and 'drink-driving' behaviour. Peer-led interventions are shown to reduce substance use and tobacco use.

Indicated: School settings working together with the school health systems can also be an efficient setting for indicated prevention when organised in a non-stigmatising way.

Programmes based on a combination of social competence and social influence approaches seemed to have better results than programmes only based on social competence or social influence approaches alone, with positive results in preventing marijuana use at longer follow-up, and in preventing any substance use.

EU–DAP (Unplugged) Experience:

The effect of a school-based substance abuse prevention program, called Unplugged, was evaluated within the "European Drug Addiction Prevention (EU-DAP) Trial" in several European countries, concentrating on frequency of alcohol consumption and alcohol-related problem behaviours, in addition to tobacco and cannabis use among

Box 2. Evidence-based prevention approaches relevant to school settings (*8*).

Evidence-based prevention approaches relevant to school settings as defined in UNODC international standards, including the following:

- Policies to keep children in school
- Classroom environment improvement programmes
- Personal and social skills education
- Prevention education based on personal and social skills and social influence
- School policies and culture
- Addressing individual psychological vulnerabilities
- Brief intervention (mentoring, parenting skills programmes, and other community based prevention interventions)

European students, more than 10 years ago. Thus, during 2004–2005, a total of 7079 students aged 12–14 years from 143 schools in 7 European countries participated in this cluster randomized controlled trial. Schools were randomly assigned to either control (65 schools, 3532 students) or to a 12-session standardized programme based on the comprehensive social influence model (78 schools, 3547 students). Alcohol use and frequency of alcohol-related problem behaviours were investigated through a self-completed anonymous questionnaire at baseline and 18 months thereafter. The association between intervention and changes in alcohol-related outcomes was expressed as odds ratio (OR), estimated by multilevel regression model. This intervention prevention programme was found to be associated with a decreased risk of reporting alcohol-related problems (OR = 0.78, 95% confidence intervals [CI] = 0.63–0.98). The risk for alcohol consumption was not modified by exposure to the program (OR = 0.93, 95% CI = 0.79–1.09). In the intervention group, non-drinkers and occasional drinkers at baseline were found to progress towards frequent drinking less often than in the control group. Thus, school curricula based on the comprehensive social-influence model can delay progression to frequent drinking and reduce occurrence of alcohol-related behavioural problems, as demonstrated among European students (*22*).

Such EU-DAP methodology and applications were extended to several Eastern Mediterranean Region (EMR) member states / institutions, including: Egypt (General Secretariat of Mental Health; Cairo University); Jordan (Anti-narcotic Directorate and National AIDS Program, Ministry of Health); Kuwait (Ministry of Education); Lebanon (NGOs as: Mentor Arabia, SKOUN, OUM El-Nour); Morocco (NASSIM NGO); and United Arab Emirates (National Rehabilitation Center). Results of implementation are under evaluation (*19*).

Communities

Community interventions can address the whole community; however they do not necessarily need to address all members of the community. The community-wide approach focuses on engaging an entire community, rather than focusing on implementing only one particular programme. It allows a community to lead, plan, implement and evaluate its efforts across community sectors in relevant settings for individuals, families, schools, workplaces and the community at large. This approach is shown to work both in low, middle and high-income countries.

Universal: Engaging community support groups and involving family members, are shown to help young people living in problem families.

Selective: Multicomponent and interactive interventions delivered in the community are shown to reduce drug, tobacco and alcohol use in high-risk youths. Multicomponent interventions involving the community have also been shown to reduce car accidents, public nuisance and crime related to alcohol consumption

Selective: Mentoring programmes are shown to reduce alcohol use in young people.

Selective: Targeting clubs and party settings can address potential harmful use of alcohol and drug use in recreational settings, both at national and international level. Using several tools such as brochures, and community mobilisation supported by media campaigns.

Selective: Engaging police supervision in venues and their immediate surroundings is shown to reduce public disorder while training staff on preventing / reducing clients' alcohol consumption and intoxication levels (*16*).

The general population/ universal

One of the most effective policies to prevent substance use/SUDs is restrictions on the availability of substances by adopting and implementing an effective and balanced substance control policy including both supply and demand reduction. Interventions targeting the general population could be through taxation, enforced age limits, restrictions on advertising (legal substances), or reducing illicit production, trafficking and sales of illicit drugs. Mass-media campaigns associated with other interventions, both school-based and/or community-based, can help reduce car accidents and drug-driving behaviours. Drink and drug driving policies and countermeasures have been shown to be effective both in reducing the number of road crashes, mortality and morbidity but also to reduce substance use.

Monitoring and evaluation

Fewer than half of all countries monitor child and adolescent alcohol use, with even fewer monitoring drug use. A lack of national monitoring reduces the possibility of making informed prioritization and measuring the outcomes/impacts of different policies, programmes and interventions.

Conclusion

Substance use prevention is one of the key components of a public health approach. Evidence-based substance use prevention has a potential for preventing, delaying or reducing substance use, and/or its negative health and social consequences, both for individuals and societies.

As several of the behavioural risk and protective factors – especially during childhood and early school years – are found to be relevant to both substance use, mental health and violence prevention, a comprehensive approach to the above mentioned risk behaviours

when targeting children and families could be cost-effective, likewise for monitoring these outcomes in a more coherent way in the future. In addition, a particular focus is needed on the role of the health sector. Health systems need to scale up their contributions to prevent substance use/SUDs. The health sector, especially primary health care and the school health services, has a pivotal potential for early identification and counselling and enhanced an contribution to counter the world drug problem.

WHO policy briefs, WHO mhGap, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) Best Practice Portal and the United Nations Office on Drugs and Crime (UNODC) International Standards on Drug Use Prevention can be used, among others, as planning tools to facilitate the development and coordination of preventive work and engage national and local actors and sectors in the global drug policy dialogue.

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References

1. Transnational Institute (TNI). The UNGASS outcome document: diplomacy or denialism? Amsterdam: TNI; 14 March 2016 (https://www.tni.org/en/article/the-ungass-outcome-document-diplomacy-or- denialism, accessed 12 April 2017).
2. Burkhart G, Simon R. Prevention strategies and basics. In: el-Guebaly N, Carrà G, Galanter M, editors. Textbook of addiction treatment: international perspectives, Milan: Springer; 2015:115-142.
3. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet 2013; 9:382 (9904):1575-86.
4. World Health Organization. Health statistics and information systems. Estimates for 2000-2015. Geneva: World Health Organization; 2016 (http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html, accessed 12 April 2017).
5. World Health Organization. Global status report on alcohol and health. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf, accessed 12 April 2017).
6. United Nations Office on Drugs and Crime (UNODC). World drug report. Vienna: UNODC; 2015 (https://www.unodc.org/documents/wdr2015/World_Drug_Report_2015.pdf, accessed 12 April 2017).
7. World Health Organization. Global report on trends in prevalence of tobacco smoking. Geneva: World Health Organization; 2015 (http://apps.who.int/iris/bitstream/10665/156262/1/9789241564922_eng.pdf, accessed 12 April 2017).
8. United Nations Office on Drugs and Crime (UNODC). International standards on drug use prevention. Vienna: UNODC; 2013 (https://www.unodc.org/documents/prevention/UNODC_2013_2015_international_standards_on_drug_use_prevention_E.pdf, accessed 12 April 2017).
9. Open Working Group proposal for Sustainable Development Goals. http://undocs.org/A/68/970
10. European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Best Practice Portal. Lisbon: EMCDDA; 2016 (http://www.emcdda.europa.eu/best-practice, accessed 12 April 2017).
11. Humeniuk R, Henry-Edwards S, Ali R, Poznyak V, Monteiro M. The alcohol, smoking and substance involvement screening test (ASSIST): manual for use in primary care. Geneva: World Health Organization; 2010 (http://apps.who.int/iris/bitstream/10665/44320/1/9789241599382_eng.pdf, accessed 12 April 2017).
12. World Health Organization. Guidelines for the identification and management of substance use and substance use disorders in pregnancy. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/107130/1/9789241548731_eng.pdf, accessed 12 April 2017).
13. Solberg LI, Maciosek MV, Edwards NM. Primary care intervention to reduce alcohol misuse. Ranking its health impact and cost effectiveness. Am J Prev Med. 2008;34(2):143-152.
14. Bernstein E, Bernstein J, Feldman J, Fernandez W, Hagan M, Mitchell P, et al. An evidence based alcohol screening, brief intervention and referral to treatment (SBIRT) curriculum for emergency department (ED) providers improves skills and utilization. Subst Abus. 2007;28(4):79-92
15. Toumbourou JW, Stockwell T, Neighbors C, Marlatt GA, Sturge J, Rehm J. Interventions to reduce harm associated with adolescent substance use. Lancet. 2007;369(9570):1391-401.
16. United Nations Office on Drugs and Crime (UNODC). Compilation of evidence-based family skills training programmes. Vienna: UNODC; 2012 (http://www.unodc.org/docs/youthnet/Compilation/10-50018_Ebook.pdf, accessed 12 April 2017).
17. Bühler A and Thrul J. Prevention of addictive behaviours. Luxembourg: EMCDDA; 2015 (http://www.emcdda.europa.eu/attachements.cfm/att_242416_EN_TDXD15018ENN.pdf, accessed 12 April 2017).
18. World Health Organization. European framework for quality standards in school health services and competences for school health professionals. Copenhagen: WHO Regional Office for Europe; 2014 (http://www.euro.who.int/__data/assets/pdf_file/0003/246981/European-framework-for-quality-standards-in-school-health-services-and-competences-for-school-health-professionals.pdf?ua=1, accessed 12 April 2017).
19. European Drug Addiction Prevention Trial (EU-DAP) (http://www.eudap.net/Contacts.aspx, accessed 12 April, 2017)
20. Substance Abuse and Mental Health Services Administration (SAMHSA). Prevention programs that address youth marijuana use. Using prevention research to guide prevention practice. Washington, DC: SAMHSA; 2014 (https://www.samhsa.gov/capt/sites/default/files/resources/prevention-youth-marijuana-use.pdf accessed on 12 April, 2017).
21. United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Office on Drugs and Crime (UNODC), World Health Organization (WHO). Education sector responses to the use of alcohol, tobacco and drugs. Paris: UNESCO; 2017 (http://unesdoc.unesco.org/images/0024/002475/247509e.pdf, accessed 12 April 2017).
22. Caria MP, Faggiano F, Bellocco R, Galanti MR; EU-Dap Study Group Collaborators. Effects of a school based prevention program on European adolescents' patterns of alcohol use. J Adolesc Health. 2011;48(2):182–188.

Review

Development of services for substance use problems: need for a system-based approach

Thomas F. Babor [1]

تصميم خدمات للتصدِّي لمشكلات تعاطي مواد الإدمان: الحاجة إلى اعتماد نهج قائم على النظم

توماس بابور

الخلاصة: يصف هذا الاستعراض الابتكارات القائمة على مستوى النظم التي يمكن أن تحسِّن من إمكانية الوصول وتوفير النفقات وتكامل الخدمات العلاجية للاضطرابات المتعلقة بتعاطي مواد الإدمان. وبعد استحداث نموذج مفاهيمي لوصف موارد خدمات العلاج من إدمان المخدرات وسماتها وفعاليتها، يُجرى استعراض الأدلة في ثلاثة مجالات (الرعاية الصحية الأولية، والعدالة الجنائية، والصحة النفسية) بما يوضح كيف يمكن استخدام المفاهيم على مستوى النظم في تنظيم الخدمات لتعظيم أثرها على السكان. كما يُولى اهتمام خاص لقضايا النظم فيما يتصل بتصميم الخدمات في بلدان إقليم شرق المتوسط.

ABSTRACT This review describes systems-level innovations that may enhance accessibility, economy and integration of treatment services for substance-related disorders. After introducing a conceptual model to describe the resources, qualities and effectiveness of drug treatment services, evidence is reviewed in three areas (primary care, criminal justice, and mental health) that illustrate how systems-level concepts can be used to organize services to maximize their population impact. Special attention is given to systems issues in relation to the development of services in countries of the Eastern Mediterranean Region.

Développement des services de prise en charge des problèmes liés à l'utilisation de substances : nécessité d'une approche systémique

RÉSUMÉ La présente étude décrit les innovations systémiques qui pourraient améliorer l'accessibilité, l'économie et l'intégration de services de traitement des troubles liés à la consommation de substances. Après l'introduction d'un modèle conceptuel visant à décrire les ressources, les qualités et l'efficacité des services de traitement de la toxicomanie, les données factuelles sont examinées dans trois domaines (soins primaires, droit pénal, et santé mentale) qui illustrent la façon dont les concepts systémiques peuvent être utilisés pour organiser des services de façon à maximiser l'impact sur la population. Une attention particulière est accordée aux questions systémiques liées au développement de services dans les pays dela Région de la Méditerranée orientale.

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Introduction

Countries of the Eastern Mediterranean region have both a religious prohibition on alcohol consumption and social discouragement of drinking (*1*). Nevertheless, there are historical, cultural and religious differences among countries that may affect the meaning of addiction and the societal response to it in terms of treatment interventions. In Saudi Arabia and Kuwait, the possession, sale or consumption of alcohol (regardless of the person's faith) is strictly forbidden. In the United Arab Emirates, the possession, sale or consumption of alcohol by Muslims is illegal but alcohol consumption is officially permissible for non-Muslims. The use of opioids is strictly prohibited in all countries of the region and penalties for possession and use are severe. To avert a prison sentence, dependent individuals in many countries of the region can present themselves for treatment.

Not only are alcohol and other substances forbidden in Islam, addictive behaviour is socially stigmatized. This may affect the accuracy of epidemiological surveys as well as screening and diagnostic procedures. Nevertheless, there is evidence suggesting that Arab/Muslim communities in many countries have experienced both endemic and epidemic drug problems (*1,2*). The condemnation of alcohol and drug use by Islam, the law and the culture within these societies provides an important contextual feature within which treatment programmes must operate; particularly in terms of the effects of stigma and stigmatizing attitudes and the role of the family in prevention and recovery.

The evaluation of treatment effectiveness for patients with substance use disorders is typically based on studies that compare outcomes associated with a particular therapeutic intervention, such as opioid substitution treatment, drug counselling or psychosocial therapy, with an untreated control group or a group exposed to a standard intervention. This is an important way to evaluate treatment, but programme administrators and policy-makers must also consider the cumulative and additive impact of an entire range of treatment services; sometimes referred to as the treatment network or system of services (*3*). The system approach addresses the question: to what extent does a network of services as a whole affect the incidence and prevalence of substance use disorders at the level of the community or nation? Ideally, a treatment system should be designed to operate as a coordinated and integrated set of services in order to meet the needs of populations as well as individuals.

Research and theory in the area of drug treatment systems is derived mainly from high-income countries, but recently, attention has been devoted to system issues as they affect low- and middle-income countries (where system issues are relevant to the planning and expansion of services; particularly in response to epidemics of substance use (*3*). After introducing a conceptual model to describe the resources, qualities and effectiveness of drug treatment services, evidence is reviewed in three areas (primary care, criminal justice and mental health) that illustrate how systems-level concepts can be used to organize services to maximize their population impact. In this article, special attention is given to systems issues in relation to the development of services in countries of the Eastern Mediterranean Region, which has unique features that support the need for treatment systems that are tailored to the needs of different populations.

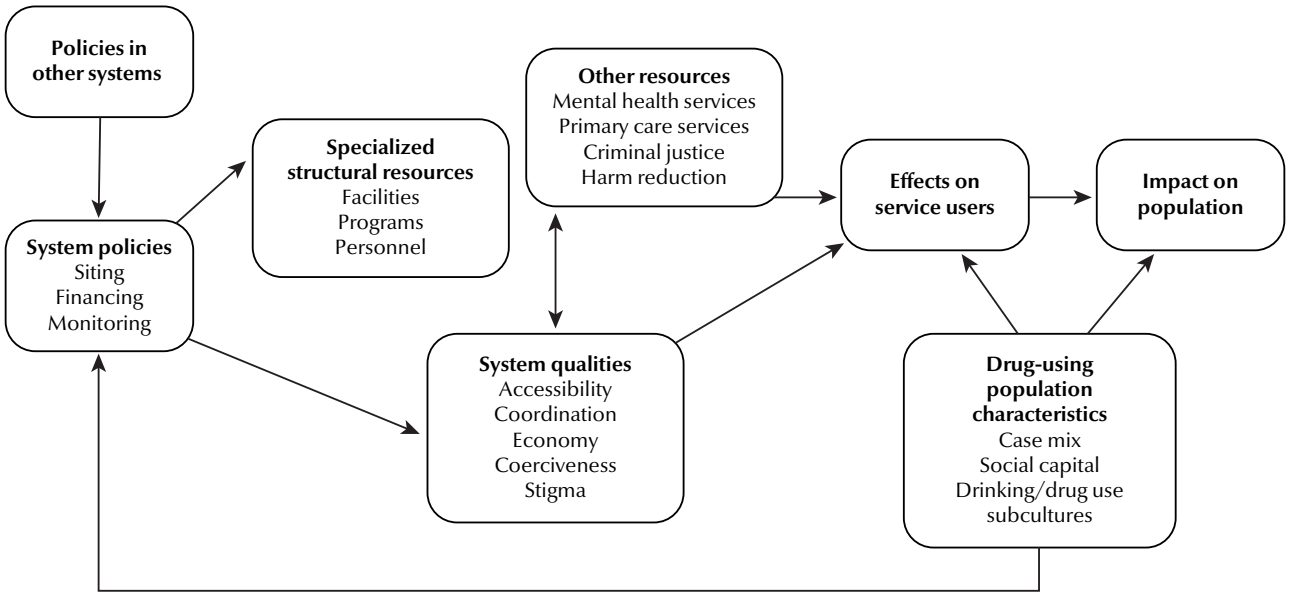
A Treatment Systems Conceptual Model

The term system refers to coherence, integration and organization. In most countries, services vary in the extent to which their components are integrated, mutually supportive and meet the needs of their target populations. Services for substance use disorders are often fragmented and unevenly distributed; in part because they tend to be financed and managed by multiple agencies. This situation is complicated by the fact that services tend to be distributed across different geographic areas and branches of government (*3,4*).

Conceptualizing treatment services for drug users as a system raises a set of questions that are not generally considered when specific types of services are evaluated merely in terms of their effectiveness with individual drug users. For example, given the limited amount of financial resources devoted to drug treatment, are there ways of designing service systems to minimize cost while maximizing the public health impact? How should a system balance the need to provide high-intensity services for the most severely impaired drug users with the desire to make effective, but less-intensive services (e.g., outpatient treatment) accessible to those whose drug problems are less serious? In addition to the appropriate mix of services, how can services be made more accessible, efficient, economical and effective by applying systems concepts?

Figure 1 presents a conceptual model for describing a service system and its impact. According to this model (*3*), the policies of a service system affect its structural resources and system qualities, which in turn determine the effectiveness of a collection of services and their impact on population rates of substance-related problems, including drug overdoses, substance-related disease (e.g., hepatitis and HIV infection), criminal activities and psychiatric disorders.

System policies are regulations, laws and financing mechanisms that affect the type, amount and organization of services. According to a survey conducted by the World Health Organization (WHO) (*2*), two thirds of the United Nations (UN) member states report having a government unit responsible



Adapted from Babor et al., 2010

Figure 1. Conceptual model of population impact of service systems

for alcohol and drug treatment services. Nevertheless, only 45.8% of these countries have an annual budget appropriation for treatment programmes. In many countries, support for drug treatment is combined with funding allocations for mental health services (2). In the Eastern Mediterranean Region, less than half of the countries (42.8%) have a budget allocation for drug services, and most of these services are provided through mental health budgets. Most countries use tax revenues, user fees and private insurance to pay for alcohol and drug services. Tax funding is more important in high-income countries, whereas out of pocket financing is more common in the poorer countries (2). Out-of-pocket payments seem to play a major role in funding services in the Eastern Mediterranean, with one third of the treatment financed in this way through private clinics and practitioners.

As suggested in the figure, financing and other government policies have a direct effect on the structural resources in the system. These resources include the types of facilities (e.g., hospitals, clinics and hotlines), the programmes delivered in those facilities (e.g., detoxification, rehabilitation, vocational training and psychotherapy), and the personnel in those programmes (e.g., certified counsellors, social workers, psychiatrists and recovering persons). Mental health services, primary care networks, and harm reduction programmes may also constitute resources for the treatment system, to the extent that there are formal or informal linkages with specialized substance abuse services.

In contrast to the structural resources, system qualities are less-tangible parts of the system that are nevertheless important to the overall functioning of a service network. The key qualities of a treatment system are accessibility, coordination, economy, coerciveness and stigma (3). Accessibility refers to how easy or difficult it is to enter a particular service. Coordination refers to whether services are provided in a concerted rather than haphazard fashion, and whether different programmes in the system work synergistically rather than independently or even competitively. The term economy refers to whether the services make efficient use of resources and are cost-effective. Coercion refers to the pressure placed on drug users to seek treatment services. It is most prevalent in the criminal justice system but is often present in more subtle ways (e.g., family pressure) in other types of service. Coerciveness can increase demand for services, but it can also stigmatize the people who use them.

The conceptual model posits that structural resources and system qualities, along with the characteristics of drug using population, are responsible for two important outcomes. The first is the effectiveness of the system in terms of reduced substance use and improved health and social outcomes for clients who use the system. The second is the impact on population health, including overdose deaths, incidence of bloodborne infectious disease, public safety (e.g., amount of property crime), and social welfare (e.g., child abuse rates).

Despite a pervasive assumption that treatment services reduce the burden of disease attributable to drug abuse, there has been virtually no research on this question. Several case studies have suggested that the impact can be significant

when a new component is added to an existing system. For example, the introduction of large-scale opioid substitution treatment (OST) services in France in the 1990s was associated with a decrease in heroin arrests (*5*) and drug-related mortality and AIDS cases. Similar reductions in crime occurred in Switzerland following the expansion of opioid substitution treatment. In both countries the heroin market may have been significantly disrupted because a large number of heavy users, many of whom were also heroin sellers, were removed from the drug market (*6*).

The population impact of alcohol services, particularly Alcoholics Anonymous groups and professionally provided treatment, has been studied in several countries. Smart and Mann (*7*) found that: 1) increases in Alcoholics Anonymous membership and amount of professionally provided services in the United States of America (USA) and Canada were associated with decreased rates of alcohol problems; and 2) such changes may be large enough to have a considerable impact on hospital admissions and death from liver cirrhosis. Although drug and alcohol treatment and social services can reduce drug-related crime, infectious disease, overdoses, the quantity of drugs consumed and alcohol-related disease, they are unlikely to eliminate a nation's drug or alcohol problems.

Systems-level innovations that may enhance accessibility, economy and integration

According to the conceptual model, the functioning of the system can be improved by the delivery of substance-specific services as well as the coordination of specialized services with primary health care, criminal justice and mental health services. These kinds of systems-level innovations have been shown to enhance the accessibility, economy and integration of drug treatment services (*8*), and they are described here in terms of new care models, early identification programmes, and drug treatment in criminal justice and psychiatric settings.

Care models

As treatment services became more specialized, new models have been developed to describe how they relate to the different types of population needs. These concepts include the continuum-of-care model and the chronic-care model.

The continuum-of-care model refers to the way service users pass through the mix of treatment options available to them (*9*). In an ideal system, the services are accessed sequentially, beginning with diagnostic assessment, which is then used to assign patients to particular settings according to the acuity, severity and complexity of the diagnosed disorder and the availability of appropriate services. One example of the continuum-of-care model is the stepped-care approach in which patients are assigned initially to the least-intensive level of care. If they do not respond at this level, they are stepped up to a more intensive level.

The chronic-care model addresses the most persistent and serious cases of substance dependence; especially those characterized by co-occurring medical and psychiatric disorders. The model works by coordinating specialized services over time, under the assumption that once substance dependence has developed, there is a need for continuing care and management, as is done with chronic conditions like diabetes and hypertension. Rush (*9*) has defined a series of tiers that constitute the most important elements of a continuum of services for chronic substance users. They include health promotion, early intervention, crisis management, as well as residential programmes, outpatient counselling, and pharmacotherapy. The highest tier includes specialized care functions for individuals with complex problems, such as inpatient withdrawal management, forensic services and long-term psychiatric care.

Early identification in primary health care

A public health approach that has attracted the interest of policy-makers and health authorities in many parts of the world is systematic screening for substance use in healthcare and social service settings, followed by brief intervention (for at risk substance users) or referral to treatment (for those who are likely to be drug dependent). This form of early identification is accomplished through the use of self-report questionnaires such as the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), developed by WHO to improve early detection in primary healthcare settings, as well as schools and emergency departments (*10*).

Screening is typically followed by a brief intervention, which refers to any time-limited effort (e.g., 1 or 2 conversations or meetings) to provide information or advice, increase motivation to avoid substance use, or to teach behaviour change skills that will reduce substance use as well as the risk of negative consequences. The largest brief intervention study of drug users (*11*) was conducted by WHO in primary healthcare settings in Australia, Brazil, India and the USA. Drug users scoring within the moderate-risk range on the ASSIST screening test for cannabis, cocaine, amphetamine-type stimulants, or opioids were assigned to either a wait-list control group or an intervention condition where they received brief motivational counselling for the drug receiving the highest risk score. Compared with control participants, those receiving the brief intervention reported significantly reduced drug involvement 3 months later.

In a meta-analytical review of 21 studies of motivational interviewing interventions for adolescent substance

use behaviour change, Jensen et al. (*12*) found small but statistically significant effect sizes at follow-up, suggesting that motivational interviewing interventions for adolescent substance use retain their effect over time. Motivational interviewing interventions were effective across a variety of substance use behaviours, session lengths, clinician education levels and setting.

In addition to early identification of at-risk substance users, screening programmes typically identify a smaller proportion of persons with substance dependence. Rapp et al. (*13*) compared the linkage effect of 2 interventions – 5 sessions of strengths-based case management or 1 session of motivational interviewing – with the referral standard of care at a centralized intake unit in the USA. Strengths-based case management was better than 1 session of motivational interviewing, although both improved linkage with treatment compared to standard care. This research suggests that the routine or opportunistic use of drug screening in primary care and other healthcare settings may improve not only the early identification of substance use disorders, but also the referral of more serious cases to appropriate treatment interventions.

Drug treatment in association with the criminal justice system

Drug treatment is increasingly being provided as an adjunct to the criminal justice system. It is also used in some countries as an alternative to incarceration. Research suggests that immediate but modest sanctions for positive drug tests produce substantial reductions in drug use and offending among individuals who are under criminal justice supervision. This kind of coerced or mandated abstinence is typically required of offenders on community release, who are drug-tested at least weekly with immediate re-incarceration for a missed or drug-positive test. Mandated abstinence programmes for drug and drink-driving offenders on community release (*14*) and programmes for addicted physicians (*15*) have been found to be effective.

Another system innovation is the drug treatment court, which combines drug testing and criminal sanctions with mandatory treatment. Drug courts now operate in all 50 states in the USA and other countries have adopted these programmes as well (*16*). Drug courts can reduce crime and promote treatment participation (*17*,*18*). Evaluations of adult drug treatment courts (*19*) have found an average drop in recidivism from 50% to 38%. Rossman et al. (*20*) found that the drug court programme practices in the USA, such as judicial status hearings, judicial praise, case management, substance abuse treatment and discretionary use of the extent of punishment (in case of noncompliance) were all related to reductions in crime and substance use.

Another area in which criminal justice and drug treatment collaborate in the interests of public health is prison treatment programmes. Research suggests that drug treatment in prisons and after release helps prisoners remain abstinent, prevents recidivism, and facilitates continued employment, especially if a therapeutic community treatment model is used (*21*,*22*). Opioid substitution therapy in particular is an effective approach in the prison setting (*23*).

Nevertheless, there are ethical concerns in some countries about the extent to which legal coercion is being exercised appropriately. Even modest levels of coercion raise ethical questions (*24*). Some ethicists (*25*) argue that treatment for drug dependence cannot be administered to an unwilling patient. Others (*26*) suggest that persons with drug dependence cannot provide informed consent to treatment because they are not autonomous agents. Given the human rights and ethical issues raised by compulsory treatment centres, 12 UN entities including WHO issued a public request for Member States to close compulsory drug detention and rehabilitation centres and implement voluntary health and social services in the community (*27*,*28*).

Treatment in psychiatric settings

The co-occurrence of substance use disorders and other psychiatric disorders, especially affective and personality disorders, is common among both adults and adolescents. Untreated or poorly treated co-occurring disorders may result in poorer physical health, decreased social functioning and increased risk of being homeless or incarcerated (*29*,*30*).

Minkoff (*31*) has developed a set of principles for the treatment of co-occurring disorders that focus on treatment engagement and case management. This model recommends matching services to the severity of each co-occurring disorder, taking into account diagnosis, treatment phase, and levels of motivation and disability. Within psychiatric settings, Miller and Carroll (*32*) recommend universal screening for the full range of substance-related problems, followed by brief motivational counselling as a first-line intervention. The general orientation of these models is to reduce the separation between mental health and addiction services by means of programme-level modifications, alterations in clinical practice guidelines, the use of integrated screening tools, and clinician training initiatives (*33*).

To the extent that the existing literature suggests that continuity of care, a period of abstinence from substance use, and coordination of mental health services are beneficial to persons with co-occurring disorders, the application of systems concepts should result in better outcomes for this population (*8*). In addition, it is likely that coordinating and matching services to client needs could be improved by better diagnostic evaluation, taking into account the major differences of substance use disorders combined with internalizing,

externalizing or psychotic disorders. The evidence suggests that among patients being treated for co-occurring mental and substance-use-related disorders, outcomes are improved when otherwise separate drug and psychiatric treatments are offered in combination within an integrated treatment plan that addresses both substance abuse and other psychiatric problems simultaneously.

Other systems innovations

Countries vary in the nature and extent of existing services. In order to build an optimal system of services, planning and quality improvement need to occur on a periodic basis. Three ways to do this are service mapping, needs assessment and needs-based planning.

Service mapping involves the description of system structures and qualities. WHO has designed a procedure for assessing, monitoring and evaluating treatment systems for substance use disorders in relation to population needs (*4*). The WHO-Substance Abuse Instrument for Mapping Services (SAIMS) identifies gaps in service delivery and specifies areas for system improvement.

In order to identify unmet treatment needs, some methods involve primary data collection and others rely on secondary analysis of existing data sources. Although there are no international standards for assessing unmet need, the SAIMS permits incremental planning that directs resources at the most important and manageable treatment needs in a population. The simplest procedure is to use population surveys to estimate the number of people in need of treatment. For example, the rates of dependence and harmful use can translate into the potential demand for specialized services (residential and outpatient) as well as early intervention services in other health care settings. The need for substance abuse services in the general population can also be estimated through the use of both health statistics and social indicators, such as substance-related mortality and morbidity, social problem statistics, and expert opinion on treatment needs.

For service systems that are already well resourced, it may be more fruitful to conduct needs-based planning. This approach (*33*) requires the development of a model of the service system and uses population prevalence data to estimate the types of treatment services to be received by subgroups in the population; potentially including persons with various combinations of co-occurring disorders.

Another system innovation is workforce development to increase the number of trained professionals who can provide high-quality services. Although primary healthcare professionals can provide some types of care, substance abuse and mental health professionals, particularly psychiatrists, nurses, social workers and trained counsellors, are needed to manage those patients who are referred for specialized care and to deliver training, support and supervision to nonspecialists. Effective treatment policy requires planning for the preparation of this workforce, which should be integrated into their primary training rather than left to continuing education efforts afterwards.

In addition to the recruitment of trained professionals to manage the treatment of persons with severe dependence and its medical and psychiatric complications, there is a major role for nongovernmental organizations (NGOs) and self-help groups (*34*), particularly in relation to rehabilitation. Civil society can play a key role in the self-help movement, especially Narcotics Anonymous and Cocaine Anonymous. In many low- and middle-income countries, traditional healers are involved in treating substance use disorders (*2*). In the Eastern Mediterranean Region, The Turkish Green Crescent Society has an extensive network of programmes in Turkey, Palestine and Lebanon. In addition to treatment, it focuses on the protection of young people from tobacco, alcohol, drugs, gambling and technology addictions.

Conclusions

A high-level review by the Commission on Narcotic Drugs (*35*) reaffirmed that drug dependence is a health problem that requires further strengthening of public health system responses to drug-related problems. Consideration of system issues begins with the need to organize services to fit the needs of countries and communities. Prevalence of drug use in some Eastern Mediterranean Region countries is higher than the global average. High prevalence rates of drug use and its health and social consequences, particularly in countries like Afghanistan, Islamic Republic of Iran, and Pakistan, are also determined by the unique position of the region having countries with the largest production of opium in the world and straddling the major opioid trafficking routes. Other problems come with the high rates of alcohol and other substance abuse in guest worker communities in the Gulf States.

A model framework to guide the formulation of national drug treatment policy includes a series of logical steps designed to identify the basic needs of a country, bring the right stakeholders to the policy-making table, evaluate the evidence supporting effective strategies, and implement performance measurements to evaluate progress and provide feedback. Implementation of changes at the systems level will likely come in different forms depending on the existing services in a particular country as well as current trends in substance abuse within the general population. There are now a large number of evidence-informed treatment interventions that are ready for implementation in systems of care in both low- and high-income countries. These interventions, along with innovations in the organization of

services, can directly address the system quality issues discussed above, such as access, equity and coordination. Nevertheless, there are many obstacles to implementing changes across current treatment systems at the local, regional and national levels. While identification of evidence-based practices is a first step, attempts to implement major changes with therapist manuals and one-time workshops is unlikely to result in major changes. Rather, participatory planning, individual performance feedback, and specific incentives for implementation (e.g., money for training, pay raises and promotions) are needed to encourage systems to adopt new approaches (*8*).

Beyond the implementation of evidence-based practices at the level of service providers and treatment programmes, changes in treatment policies that operate at the level of treatment systems are the most effective way to create an optimal configuration of treatment services. Coordination between the criminal justice system, mental health services, primary health care and the treatment system can reduce drug use, improve health, prevent crime and decrease recidivism. To the extent that treatment services organized within a system of early intervention, formal treatment and mutual-help organizations are based on effective strategies, they have the potential to have an impact at the population level in a variety of areas targeted by drug policy.

Given the diversity of system models and system development levels, each country needs to develop services that meet its own particular needs and resources. There is not a single system model that applies to all countries and development levels. Information from high-resourced countries may not easily transfer to low-resourced countries. Greater cooperation and networking among service system planners at similar development levels should be encouraged, in order to share information about system elements that may have higher priority (e.g., mutual help, primary care and professional training), especially in low- and middle-income countries.

Planned innovation should be a high priority in the improvement of service systems. Systems concepts and data should be used to introduce innovations into the service systems to improve accessibility, equity, efficiency, effectiveness and quality. The sociocultural context of disadvantaged communities, guest workers, and indigenous populations should be a major priority in the planning and development of service systems.

Activities to strengthen treatment service systems should include the following elements:

- regional collaboration to oversee treatment mapping exercises and service planning activities;
- provision of feedback to national health authorities regarding the current status of national treatment systems based on the results of population needs assessment and treatment mapping exercises to improve the availability and effectiveness of services;
- networking among treatment programme administrators, public health authorities, academics and other stakeholders to share information, experience and best practices;
- workforce development activities – training and continuing education;
- quality assessment and quality improvement activities; and
- applied research that informs the further development of service systems.

No matter how efficacious a treatment may be, it will produce little benefit to individuals and society if it is not available, accessible and provided in a way that encourages help-seeking and retention in care. This presents opportunities for improving the population impact of treatment and prevention by means of better coordination with mental health, primary care and criminal justice interventions.

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References

1. Al Marri TS, Oei TP. Alcohol and substance use in the Arabian Gulf region: a review. Int J Psychol. 2009 Jun;44(3):222–33. PMID:22029498
2. ATLAS on Substance Use: resources for the prevention and treatment of substance use disorders. Geneva: World Health Organization; 2010 (http://www.who.int/substance_abuse/activities/atlas/en/, accessed 14 March 2017).
3. Babor T, Caulkins J, Edwards G, Fischer B, Foxcroft D, Humphreys K, et al. Drug policy and the public good. Oxford: Oxford University Press; 2010.
4. Babor TF, Poznyak V. The World Health Organization substance abuse instrument for mapping services: rationale, structure and functions. Nord Stud Alcohol Drugs. 2010;27(6):703–11 (http://www.nordicwelfare.org/PageFiles/4930/15_Babor.pdf).
5. Emmanuelli J, Desenclos J-C. Harm reduction interventions, behaviors and associated health outcomes in France, 1996–2003. Addiction. 2005 Nov;100:1690–700. PMID:16277629
6. Killias M, Aebi MF. The impact of heroin prescription on heroin markets in Switzerland. Crime Prev Stud. 2000;11:83–99 (http://www.popcenter.org/library/crimeprevention/volume_11/04-Killias.pdf).
7. Smart RG, Mann RE. The impact of programs for high-risk drinkers on population levels of alcohol problems. Addiction. 2000 Jan;95(1):37–51. PMID:10723824

8. Morisano D, Babor TF, Robaina KA. Co-occurrence of substance use disorders with other psychiatric disorders: implications for treatment services. Nord Stud Alcohol Drugs. 2014 Feb;31(1):5–25 (https://www.degruyter.com/view/j/nsad.2014.31.issue-1/nsad-2014-0002/nsad-2014-0002.xml).
9. Rush B. Tiered frameworks for planning substance use service delivery systems: origins and key principles. Nord Stud Alcohol Drugs. 2010;27(6):617–36 (http://www.nordicwelfare.org/PageFiles/4930/08_Rush.pdf).
10. Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, Brief Intervention, and Referral to Treatment (SBIRT): toward a public health approach to the management of substance abuse. Subst Abus. 2007;28(3):7–30. PMID:18077300
11. Humeniuk RE, Ali RL, Babor T, Souza-Formigoni MLO, de Lacerda RB, Ling W, et al. A randomized controlled trial of a brief intervention for illicit drugs linked to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in clients recruited from primary health-care settings in four countries. Addiction. 2012 May;107(5):957–66. PMID:22126102
12. Jensen CD, Cushing CC, Aylward BS, Craig JT, Sorell DM, Steele RG. Effectiveness of motivational interviewing interventions for adolescent substance use behavior change: a meta-analytic review. J Consult Clin Psychol. 2011 Aug;79(4):433–40. PMID:21728400
13. Rapp RC, Otto AL, Lane DT, Redko C, McGatha S, Carlson RG. Improving linkage with substance abuse treatment using brief case management and motivational interviewing. Drug Alcohol Depend. 2008 Apr 1;94(1–3):172–82. PMID:18242883
14. Kleiman M. Controlling drug use and crime among drug-involved offenders: Testing, sanctions, and treatment. In: Heymann PH, Brownsberger WN, editors. Drug Addiction and Drug Policy. The struggle to control dependence. Cambridge, MA: Harvard University Press; 2001.
15. DuPont RL, McLellan AT, Carr G, Gendel M, Skipper GE. How are addicted physicians treated? A national survey of physician health programs. J Subst Abuse Treat. 2009 Jul;37(1):1–7. PMID:19482236
16. Drug Treatment Court Program for the Americas. Volume 1. Inter-American Drug Abuse Control Commission/Organization of American States; 2013 (http://www.cicad.oas.org/fortalecimiento_institucional/dtca/Resources/Newsletters/Newsletter%202013%20Vol%201.pdf, accessed 14 March 2017).
17. Gottfredson DC, Najaka SS, Kearly B. Effectiveness of drug treatment courts: evidence from a randomized trial. Criminol Public Policy. 2003;2(2):171–96 (https://ccjs.umd.edu/sites/ccjs.umd.edu/files/pubs/gottfredson2003.pdf).
18. Wilson DB, Mitchell O, MacKenzie DL. A systematic review of drug court effects on recidivism. J Exp Criminol. 2006;2(4):459–87.
19. Mitchell O, Wilson DB, Eggers A, MacKenzie DL. Assessing the effectiveness of drug courts on recidivism: a meta-analytic review of traditional and non-traditional drug courts. J Crim Justice. 2012 Jan–Feb;40(1):60–71.
20. Rossman S, Rempel M, Roman JK, Zweig JM, Lindquist CH, Green M et al. The Multi-site adult drug court evaluation: the impact of drug courts. Volume 4. Washington: Urban Institute Justice Policy Center; 2011 (https://www.ncjrs.gov/pdffiles1/nij/grants/237112.pdf, accessed 14 March 2017).
21. Pearson FS, Lipton DS. A meta-analytic review of the effectiveness of corrections-based treatments for drug abuse. Prison J. 1999;79:384–410.
22. Mitchell O, Wilson DB, MacKenzie DL. Does incarceration-based drug treatment reduce recidivism? A meta-analytic synthesis of the research. J Exp Criminol. 2007 Dec;3(4):353–75.
23. Hedrich D, Alves P, Farrell M, Stover H, Moller L, Mayet S. The effectiveness of opioid maintenance treatment in prison settings: a systematic review. Addiction. 2012 Mar;107:501–17. PMID:21955033
24. Seddon T. Coerced drug treatment in the criminal justice system: conceptual, ethical and criminological issues. Criminol Crim Justice. 2007;7(3):269–86.
25. Stevens A. The ethics and effectiveness of coerced treatment of people who use drugs. Hum Rights Drugs. 2012;2(1):7–15.
26. Caplan AL. Ethical issues surrounding forced, mandated or coerced treatment. J Subst Abuse Treat. 2006 Sep;31(2):117–20. PMID:16919736
27. UNAIDS. Joint statement. Compulsory drug detention and rehabilitation centres; 2012 (http://www.unaids.org/sites/default/files/sub_landing/files/JC2310_Joint%20Statement-6March12FINAL_en.pdf, accessed 14 March 2017).
28. United Nations Office on Drugs and Crime, World Health Organization. Principles of drug dependence treatment; 2008 (http://www.unodc.org/documents/drug-treatment/UNODC-WHO-Principles-of-Drug-Dependence-Treatment-March08.pdf, accessed 14 March 2017).
29. Buckley PF. Prevalence and consequences of the dual diagnosis of substance abuse and severe mental illness. J Clin Psychiatry. 2006;67 Suppl 7:5–9. PMID:16961418
30. Cleary M, Hunt G, Matheson S, Siegfried N, Walter G. Psychosocial interventions for people with both severe mental illness and substance misuse. Cochrane Database Syst Rev. 2008;1.
31. Minkoff K. An integrated model for the management of co-occurring psychiatric and substance disorders in managed-care systems. Dis Manag Health Outcomes. 2000 Nov;8(5):251–7.
32. Miller WR, Carroll K. Rethinking substance abuse: what the science shows, and what we should do about it. New York: Guilford Press; 2006.
33. Rush B. (2014). Evaluating the complex: alternative models and measures for evaluating collaboration among substance use services with mental health, primary care and other services and sectors. Center for Addiction and Mental Health. Unpublished report.
34. Medina-Mora ME. Can science help close the treatment gap? Addiction. 2010 Jan;105(1):15–6. PMID:20078455
35. Political declaration and plan of action on international cooperation towards an integrated and balanced strategy to counter the world drug problem. Vienna: United Nations Office on Drugs and Crime; 2009 (https://www.unodc.org/documents/ungass2016/V0984963-English.pdf, accessed 14 March 2017).

Interventions for the management of substance use disorders: an overview

Richard A. Rawson [1] and Nicolas Clark [2]

التدخلات المتعلقة بإدارة الاضطرابات الناجمة عن تعاطي مواد الإدمان: استعراض وتوصيات

ريتشارد راوسن، نيكولاس كلارك

الخلاصة: خلال السنوات الخمسين الماضية، بُذلت جهودٌ منهجية لزيادة الخدمات العلاجية وتحسينها لصالح الأفراد الذين يعانون من اضطرابات ناجمة عن تعاطي مواد الإدمان عن طريق تصميم قاعدة أدلة لتوجيه الممارسات استرشاداً بالأدلة البحثية. ويستعرض موجز السياسات هذا أساساً جزئياً لاختيار بعض الممارسات المحددة باعتبارها مستندة إلى الأدلة ثم يعرض مجموعة من السياسات التي حددتها منظمة الصحة العالمية ضمن أدلتها الإرشادية الخاصة ببرنامج عمل بشأن سد الثغرات في مجال الصحة النفسية، حسبما أُوصي بتنفيذه لعلاج الأفراد الذين يعانون من اضطرابات ناجمة عن تعاطي مواد الإدمان. وعند إعداد موجز السياسات هذا، استعرضت مجموعة متنوعة من الوثائق والمراجعات والأدلة الإرشادية. وتتمثل النتيجة التي خلصنا إليها في أن برنامج عمل منظمة الصحة العالمية المعني بسد الثغرات في مجال الصحة النفسية يمثل أكبر ملخص تجميعي للتدخلات التي تنطوي على أدلة على الدعم والتقبل السريري والتنفيذ على نطاق واسع والتوافق بين الخبراء. وستعمل التوصيات الواردة في موجز السياسات هذا على إدماج التوصيات الرئيسية المتعلقة بعناصر الاضطرابات الناجمة عن تعاطي مواد الإدمان الواردة في خطة عمل سد الثغرات في مجال الصحة النفسية.

ABSTRACT For the past 50 years, there has been a systematic effort to expand and improve treatment services for individuals with substance use disorders by developing an evidence base to guide practice. This policy brief aims to review the available interventions for the management of substance use disorders, examine the evidence base for these interventions, including the WHO Mental Health Gap Action Programme intervention guide, and make recommendations related to the treatment of substance use disorders. In the development of this policy brief, numerous documents were reviewed. The WHO Mental Health Gap Action Programme intervention guide offers the most well synthesized summary of interventions that have evidence of support, clinical acceptance, extensive implementation and expert consensus. The recommendations within this policy brief incorporate the core recommendations on substance use disorder elements included in the mhGAP intervention guide.

Interventions pour la prise en charge des troubles liés à la consommation de substances psychoactives : examen et recommandations

RÉSUMÉ Au cours des 50 dernières années, des efforts systématiques ont été déployés pour étendre et améliorer les services de traitement des individus souffrant de troubles liés à la consommation de substances psychoactives, par le biais de l'élaboration d'une base de données factuelles visant à orienter les pratiques. La présente note d'orientation a pour objectif de passer en revue les interventions disponibles pour la prise en charge des troubles liés à la consommation de substances psychoactives, d'examiner les bases factuelles pour ces interventions dont le guide d'intervention du Programme d'action de l'OMS : Combler les lacunes en santé mentale (mhGAP), et d'effectuer des recommandations concernant le traitement de ces troubles. Au cours de l'élaboration de cette note d'orientation, divers documents ont été examinés. Le guide d'intervention du Programme mhGAP de l'OMS offre la meilleure synthèse d'interventions fournissant des informations sur le soutien dont elles bénéficient, l'acceptation clinique, une mise en œuvre étendue, et les consensus d'experts. Les recommandations de la note d'orientation intègrent les recommandations principales portant sur les éléments relatifs aux troubles liés à la consommation de substances psychoactives compris dans le guide d'intervention du Programme mhGAP.

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Introduction

This policy brief aims to review the available interventions for the management of substance use disorders, examine the evidence for these interventions including the WHO Mental Health Gap Action Programme (mhGAP) intervention guide, and make recommendations related to the treatment of substance use disorders.

Evidence-based practices

While there has been a large amount of research on the treatment of substance use disorders, there has been considerable controversy about what constitutes an "evidence-based practice" and which of these practices should be applied in "real world" treatment settings. The importance of translating scientific advances in disease-specific interventions into clinical practice has been emphasized throughout the health care system, largely stemming from the consistent observation of a wide gap between research and practice (*1*). As a move toward "evidence-based practice" has permeated health care systems and policy, several working groups in the field of addiction treatment have considered ways to align with this initiative. In the field of addiction, however, consensus regarding the optimal procedures for identifying practices with sufficient empirical foundation to be considered "evidence-based" has not yet been reached.

What is evidence-based practice?

Adapting Sackett et al.'s definition (*2*), evidence-based practice is characterized as "the integration of best research evidence with clinical expertise and patient values". The most debated components of this definition are the concepts of i) best research evidence and ii) clinical expertise.

Best research evidence

Although it has been appropriately noted that the definition of "best research evidence" depends upon the nature of the clinical question (e.g. etiological questions versus identification of the most efficacious treatment for a particular disease) (*3*), descriptions of this concept, to date, uniformly acknowledge a variety of sources from which data can be brought to bear on clinical decision-making. These sources include randomized clinical trials, quasi-experimental investigations, correlational studies, field studies, case reports and clinical guidelines based upon professional consensus (*4*).

As an alternative to weighting individual studies, clinicians may draw upon published syntheses of study findings, typically in the form of systematic reviews and meta-analyses. Hierarchical models of research evidence place both of these methods in the highest tier alongside randomized clinical trials. Systematic reviews evaluate research evidence based upon pre-defined objective criteria. Over the past 10 years, the Cochrane Collaboration and the Agency for Healthcare Research and Quality have accelerated the dissemination of synthesized information related to health care practices through systematic reviews (*5,6*).

In meta-analyses, the standard methodology for evaluating the strength of evidence involves the calculation of an effect size, or summary statistic showing the magnitude of the treatment effect, averaged across studies. While meta-analyses are a useful metric method for measuring the usefulness of a treatment approach, there are some disadvantages to this technique. Specifically, the use of aggregate estimates of effect size may hide qualitative differences between the individual studies. Additionally, meta-analyses are subject to publication bias (also known as the "file drawer problem"), that is the tendency of publishing studies showing an effect of a treatment rather than those showing no effect, thereby biasing the pool of clinical data from which meta-analyses are conducted.

Nevertheless, synthesized reports on treatment effectiveness, whether in the form of meta-analyses or systematic reviews, remain a valuable resource to inform clinical decision-making.

Clinical expertise

Two other broad categories of documents that summarize recommendations for translating research evidence into clinical practice are practice guidelines and best practices.

Practice guidelines are "systematically developed statements to assist practitioners and patient decisions about appropriate health care for specific clinical circumstances" (*7*). These statements are developed through a consensus process that includes clinical and research experts in the appropriate field, and their developers may also elicit input from health care provider organizations, consumer groups and government agencies, depending upon the scope and purpose of the guidelines. In terms of content, practice guidelines may include approaches to the prevention, diagnosis or treatment of an illness (*8*). Content might be drawn from various theoretical frameworks and flexibility is allowed in the actual implementation of the practice.

Best practices documents aim to guide treatment programme planning and to outline processes that help dissemination of research-based intervention strategies to clinical settings (*8*). These documents often include guidelines for service delivery, such as recommended scope of services, assessment and intervention techniques, considerations when treating special populations and processes for coordinating treatment with other types of services. In terms of substance use disorders, best practices documents often inform both policy, by describing optimum standards of treatment service delivery for addicted populations, and also the

advancement of standards for training clinicians in the field of addiction.

WHO Mental Health Gap Action Programme intervention guide

The WHO Mental Health Gap Action Programme (mhGAP) intervention guide is an important example of the development of a guide based on the best available evidence and through a systematic approach (*9*). It includes guidance on evidence-based interventions designed to identify and manage a number of priority conditions for low- and middle-income countries, with the objective of scaling up care for mental, neurological and substance use disorders. The mhGAP intervention guide was developed through an intensive process of evidence review. Systematic reviews were conducted to develop evidence-based recommendations. The process involved a WHO Guideline Development Group of international experts who collaborated closely with the WHO Secretariat. The recommendations were then converted into clear stepwise interventions for management of alcohol and substance use disorders, again with the collaboration of an international group of experts.

The mhGAP intervention guide was developed to facilitate mhGAP-related delivery of evidence-based interventions in non-specialized health care settings. However, the recommended interventions included in the sections below also represent the core set of interventions that are needed within a specialized system of care for substance use disorders.

Substance use disorders

The differences in the neurobiological, physiological, psychological and behavioural effects of the different categories of drugs are substantial. The public health concerns about the effects and consequences of these different substance use disorders and the impact of how the drugs are taken are also substantial. It should be noted that in most parts of the world a single substance use disorder is rare (*10*). Many individuals who require treatment for substance use are using more than one drug and, in some parts of the world, they are combining their substance use with alcohol. Therefore, when selecting treatment approaches, one should consider poly-substance use/dependence.

Brief interventions

Brief interventions can be useful with individuals who use small and moderate amounts of drugs and for some specific substance use disorders, such as cannabis use disorders (*11*). Although brief interventions can also be useful in initially communicating with individuals with serious substance dependence disorders, they are generally not sufficient to help dependent individuals significantly reduce or stop dependent use. However, brief interventions may be a good first step in engaging patients in more intensive treatment.

Harm-reduction strategies

An overarching harm reduction philosophy should be an essential component to all treatment activities for individuals with substance use disorders. Harm or risk reduction strategies are intended to help patients moderate but not necessarily eliminate harmful behaviours, thereby limiting the physical, psychological and interpersonal harm caused by their drug use. These strategies may constitute the entirety of the interventions used or they may be combined with other treatment strategies.

Regardless, in considering treatments for individuals with substance use disorders, reducing the harms created by drug use should be a main priority. Prevention of drug injection and its harmful consequences, specifically bloodborne diseases, by providing needle and syringe programmes and opioid substitution treatments, facilitating/providing testing and treatment, when possible, for bloodborne viral illnesses and promoting safe sexual practices are among the main harm reduction approaches. Over time, when a relationship has been established, intensified efforts should be made to encourage people who inject drugs to get more involved in the comprehensive treatment package for their substance use disorders.

Opioid use disorders

Opioid use disorders are a substantial public health problem. These disorders primarily occur with injection heroin use and use of prescription opiate pain killers (mainly oral use), including oxycodone, hydrocodone, tramadol (increasingly) and buprenorphine (in a few areas). In many parts of the world, injection of heroin is the major contributor to the spread of HIV, hepatitis C and other infectious diseases (*12,13*). Overdose deaths associated with both injecting heroin and taking prescribed opiates are a significant concern (*14*).

The main objectives of treating and rehabilitating people with opioid dependence are to: reduce dependency on illegal drugs and the morbidity and mortality associated with their use; improve physical and psychological health; reduce criminal behaviour; and help social reintegration and functioning. As no single treatment is effective for all individuals with opioid dependence, various psychosocial and pharmacological treatment options are needed. Relapse following detoxification alone is extremely common and therefore detoxification is rarely an adequate treatment on its own.

Managing opioid overdose and overdose prevention

Opioid overdose is a potentially fatal event and rapid emergency measures are needed. Naloxone is a short-acting opioid antagonist that can quickly reverse an opioid overdose (*15*). Naloxone is effective when delivered by intravenous, intramuscular, subcutaneous and intranasal routes (*16*). Guidelines recommend delivery of naloxone until clinical reversal is apparent.

Naloxone can also be provided to opiate users and family members of individuals who use opioids for use outside of medical settings (e.g. at home) in the event of an opiate overdose. The distribution of naloxone to individuals at risk of overdose (e.g. those being discharged from residential care or those who undergo detoxification) is being increasingly used to prevent fatal overdoses.

Managing opioid withdrawal

Extensive research on withdrawal from opioids suggests that unless post-withdrawal treatment is effectively implemented, relapse (and potential overdose) is almost inevitable very soon after withdrawal. Where available, opioid agonist maintenance treatment should be considered, with either methadone or buprenorphine as an alternative to withdrawal, and patient education should be conducted about the risks/benefits of withdrawal versus maintenance treatment. If a decision is made about the management of withdrawal symptoms, buprenorphine or methadone should be prescribed for a limited time (e.g. 3 to 21 days) in a low dose with a tapering approach. Care should be taken particularly if the person has been prescribed other sedative drugs. Clonidine or lofexidine can also be given along with other symptomatic treatments (e.g. anti-emetics to treat nausea, simple analgesics to treat pain and light sedatives to treat insomnia).

Opioid relapse prevention pharmacotherapy

For individuals who have been successfully withdrawn from opioids, naltrexone hydrochloride can be used as part of relapse prevention management. As an opioid antagonist, naltrexone prevents opioid receptors from being activated by agonist compounds, such as heroin or prescribed opioids, and is reported to reduce opioid cravings and prevent relapse. Naltrexone requires that patients be abstinent from opioids for 5–10 days after discontinuation of opioids. Premature use of naltrexone can cause a very uncomfortable immediate withdrawal reaction. Naltrexone is generally taken daily, although a monthly injection of extended release naltrexone may improve patients' adherence to their medication regimens.

Opioid agonist maintenance treatment

Opioid agonist maintenance treatment (also known as opioid substitution treatment) is defined as the administration under medical supervision of a prescribed long-acting opioid agonist (or partial agonist) medication that has the capacity to prevent the emergence of withdrawal symptoms and reduce craving. These medicines are usually administered orally in the form of a tablet, a film strip or a solution, thereby reducing the risk of infections associated with injections. Medicines used in substitution therapy are prescribed in relatively stable doses over a long period (usually more than 6 months), which allows stabilization of brain functions and prevention of craving and withdrawal. Agonist maintenance therapy has extensive scientific support and is the most effective pharmacological therapy for opioid dependence.

Methadone

Methadone is a synthetic opioid most commonly used for substitution therapy and is typically administered orally as a liquid. There is a large amount of research that provides very strong support for the safety and efficacy of methadone (*16–18*). Methadone is included on the WHO Model List of Essential Medicines (*19*). The initial methadone dose should be based on the level of opioid tolerance, allowing a high margin of safety to reduce inadvertent overdose. The dosage should then be quickly adjusted upwards if there are ongoing opioid withdrawal symptoms and downwards if there is any sedation. From there, the dose should be gradually increased to the point where illicit opioid use stops. Patients should be monitored with clinical assessment and drug testing. Psychosocial assistance should be offered to all patients.

Buprenorphine

Buprenorphine has a weaker opioid agonist activity than methadone and is not well absorbed if taken orally; therefore, the usual route of administration is sublingual. Because the effect of buprenorphine plateaus with increasing doses, buprenorphine is therefore less likely than either methadone or heroin to cause an opioid overdose, even when taken simultaneously with other opioids. Buprenorphine maintenance treatment should start with a dose that is suited to the pattern of opioid use, including the level of tolerance, the duration of action of opioids used and the timing of the most recent opioid use. From there, the dose should be rapidly increased (i.e. over days) to one that produces stable effects for 24 hours.

Methadone versus buprenorphine for opioid agonist maintenance treatment

Evidence on the effectiveness of methadone and buprenorphine for opioid agonist maintenance treatment shows that both medications provide good outcomes in most cases (*20*). In general, methadone is frequently recommended over buprenorphine because methadone has been shown to be more cost-effective. However, making both medications available may attract

greater numbers of people to treatment and improve treatment matching.

Psychosocial treatment

Psychosocial interventions—including cognitive and behavioural approaches and contingency management techniques—can add to the effectiveness of treatment, if combined with agonist maintenance treatment and medications for assisting opioid management. However, there is little evidence that psychosocial services, in the absence of medications, produce significant benefits for the management of opioid use disorders. Psychosocial services should be made available to all patients, although those who do not take up the offer should not be denied pharmacological treatment.

Psychostimulant use disorders

Psychostimulant drugs include cocaine and amphetamine-type stimulants (ATS) (known under the names methamphetamine, crystal meth, captagon and yaba). Although there are significant differences in the neurobiological and pharmacokinetic effects between cocaine and ATS (e.g. the half-life of cocaine is 1–2 hours and the half-life of ATS is 10–12 hours), treatment considerations are similar. At the present time, there are no effective medications for maintenance treatment of psychostimulant dependence (*21*). While medications may be useful in management of the psychosis associated with their acute and chronic use, as well as for the alleviation of symptoms in early abstinence, psychosocial treatments have the best evidence of effectiveness for the treatment of psychostimulant dependence.

Treatment for intoxication/ psychosis and "withdrawal"

In addition to exhibiting anxiety, depression and psychosis, individuals presenting with acute psychostimulant intoxication may be violent or suicidal (*21*). Conservative care consists of placing non-threatening individuals in a quiet and calm environment, while more agitated patients may require benzodiazepines or neuroleptics, and possibly gastric lavage and/or activated charcoal to promote clearance of the drug. While traditional antipsychotic medications (e.g. haloperidol) and benzodiazepines are effective in reducing symptoms of psychosis and agitation, olanzapine and other medications appear to be better tolerated.

Harm reduction approaches

Compared with opioid use disorders, the development of harm reduction strategies for psychostimulant users is much less advanced. In situations where psychostimulants are injected, providing clean injection equipment, education and encouragement to switch to non-injection routes of administration may be useful. In many parts of the world, men who have sex with men use psychostimulants at higher rates than in the general population. The high risk sexual behaviour associated with psychostimulant use is a major contributor to the transmission of HIV. Therefore, easy access to condoms and education about safer sexual practices may be useful harm reduction approaches in this group.

Cannabis use disorders

Cannabis is the most commonly used illicit drug across the world (*22*), with an estimated prevalence of 3.9% (among those aged 15–64) or 180.6 million users. It is estimated that around 1 in 11 recreational cannabis users (*23,24*) and 25–50% of daily cannabis users develop cannabis dependency (*25,26*). Cardiovascular and respiratory function problems have been found to be greater among daily cannabis smokers, and the risk of road traffic incidents while driving under the influence of cannabis is 2–3 times higher (*27,28*). Cannabis users are twice as likely to develop a mental disorder as non-users, especially if cannabis use started during adolescence and/or there is a predisposition to mental illness. There are no effective medications for cannabis dependence. Psychosocial support is the main treatment option for the management of cannabis dependence, including brief interventions.

Psychosocial treatments for substance use disorders

The essential factors for the successful use of all psychosocial interventions are empathy, respect for the patient and the use of positive reinforcement methods to encourage and reinforce positive changes in the lives of patients. Praise and support for patient progress (even small increments of change) and consistent support for patients are also critical. There are specific psychosocial counselling approaches that improve treatment success including:

Cognitive behavioural therapy (CBT). This is a form of "talk therapy" based on the principles of conditioning and learning that is used to teach, encourage and support individuals about how to reduce/stop their drug use. CBT encompasses a range of interventions that may be quite different in application and focus and may incorporate relapse prevention and coping skills therapy. CBT provides skills that are valuable in assisting people to reduce drug use and/or start abstaining from drug use, and provides skills to help people sustain their reduced use and/or abstinence.

Motivational interviewing/motivational enhancement therapy (MI/MET): Many, if not most, problem drug users are unsure about stopping their drug use. MI/MET is a set of techniques that allow professionals treating substance

use disorders to address the uncertainty common among many drug users and promote changes in their lives (*29,30*). MI/MET helps individuals recognize the problems in their lives created by drug use and create a pathway to make positive changes. When using MI/MET, health workers respond to patients in a consistent, non-judgmental, supportive and most constructive way by 1) expressing empathy; 2) developing the difference between the patient's goals and aspirations and his/her current self-destructive behaviour; 3) avoiding argument; 4) accommodating the patient's resistance to behaviour change; and 5) supporting the patient's self-efficacy to bring about constructive behaviour changes. MI/MET has broad application in many situations to address the challenges of working with individuals with substance use disorders.

Contingency management/motivational incentives: Contingency management applies the principles of positive reinforcement for performance of desired behaviours consistent with a reduction or cessation of drug use. Typically, contingency management involves the conditional delivery of a voucher (which can be traded for desired items or privileges) or other incentives for behaviours such as attendance at the treatment sessions or production of a negative urine test. Contingency management has been widely applied to many drug dependence disorders, and a meta-analysis of research findings has documented strong evidence of its efficacy in many studies, types of disorders and populations (*31*).

Family therapy and couples therapy: Family and couples therapy comes from learning-based behavioural models of etiology and uses cognitive-behavioural techniques to bring about change in both maladaptive interpersonal behaviour and problem drug and alcohol use. These techniques use a combination of psychoeducation and CBT to assist the patient and his/her family or spouse in developing more positive coping skills for addressing problem situations that may be associated with drug use. Communication skills are also part of many of these approaches to provide patients and their family/spouse with skills that reduce the maladaptive communication patterns that can lead to relapse to drug use. To effectively deliver family and couples therapy, significant specialized training is needed.

Self-help groups: People with drug dependence can benefit from participating in a self-help group, e.g. Narcotics Anonymous. Involvement in these groups can be very useful in assisting patients to achieve and maintain abstinence from drugs and alcohol. These groups generally recommend a total abstinence from all drugs and alcohol, although in some parts of the world, moderation groups are available.

Implementing treatment approaches

When decisions are made about which management approaches for substance use disorders should be implemented within a country or region, decision-makers should consider the priorities of the country and the approaches that would be a good fit for the country. Two of the most important considerations are the use of opioid agonist medicines and the workforce needed for psychosocial treatment.

Opioid agonist medication

The evidence on the efficacy and effectiveness of methadone and buprenorphine is overwhelming (*20,32*). Opioid agonist treatment reduces or eliminates illegal opioid use, reduces injection behaviour, reduces relapse and improves health. The training required to prepare doctors to deliver these medicines is relatively simple and the per-patient cost for these pharmacotherapies is less than many other interventions, particularly those involving residential care. However, one concern about the use of these medicines is their potential diversion to illicit markets. In some areas of the world where these medicines have been introduced with poor controls over prescribing practices and/or lax pharmacy practices, they have been diverted to the illicit market. When the decision is made to consider these medicine, an effective control mechanism is essential.

Psychosocial treatment workforce

The development of effective treatment systems that can deliver psychosocial treatment is dependent upon the availability of well-trained professionals. In many parts of the world, there are limited opportunities for professionals to receive useful training for effective use of these treatment approaches. Even mental health professionals, including psychiatrists, need some specific training to use psychological interventions for substance use disorders. In addition, there is a shortage of mental health professionals dealing with substance use disorders, particularly in low- and middle-income countries. Therefore, the absence of a qualified, trained workforce is a serious limitation to the delivery of effective psychosocial treatment services.

Workforce training efforts should focus on the substance use disorders of greatest public health concern and build the workforce capacity needed for management of these disorders. One strategy that has been used with success is the use of a pyramid training model, in which highly skilled local experts are trained to provide the foundation for an in-country training capacity. Training physicians and psychiatrists is an essential step to create in-country expert training capacity. In national plans for service implementation, targets for workforce capacity development should be identified to make clear the knowledge and skills needed for training as well as the

number and type of professionals that will be needed.

Conclusion

A major challenge to improving the effectiveness of services for substance use disorders is the implementation of evidence-based practices. Efforts have been made, including the WHO mh-GAP intervention guide, to provide reviews and summaries of the existing evidence on the efficacy of a wide range of practices to treat substance use disorders. The treatment of opioid use disorders has received the most empirical attention, and there are numerous medicines and behavioural and harm reduction practices that are established as providing benefits to patients and society. For other substance use disorders, medicines and specific harm reduction strategies have not been as well developed or researched. However, there are a set of psychosocial and behavioural strategies that have evidence to support their usefulness. The summary provided in this article provides a snapshot of the evidence-based practices for substance use disorders as of 2016. As new evidence arises, this document and others like it will need to be updated to maintain an accurate picture of the knowledge available to guide the development of services for substance use disorders.

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References

1. Lamb S, Greenlick MR, McCarty D, editors. Bridging the gap between research and practice: Forging partnerships with community-based drug and alcohol treatment. Washington (DC): National Academy Press; 1998.
2. Sackett DL, Straus SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: How to practice and teach EBM. London: Churchill Livingstone; 2000.
3. Sackett DL, Wennberg JE. Choosing the best research design for each question. BMJ. 1997;315:1636.
4. Miller WR, Zweben J, Johnson WR. Evidence-based treatment: Why, what, where, when, and how? J Subst Abuse Treat. 2005;29:267–76.
5. Clarke M. The Cochrane collaboration and systematic reviews. Br J Surg. 2007;94:391–2.
6. Walshe K, Rundall TG. Evidence-based management: From theory to practice in health care. Milbank Q. 2001;79:429–57.
7. Field MJ, Lohr KN, editors. Clinical practice guidelines: Directions for a new program. Institute of Medicine Committee to Advise the Public Health Service on Clinical Practice Guidelines. Washington (DC): National Academy Press; 1990.
8. Lacroix SI. Evidence-based and best practice addiction treatment resources: A primer for librarians. Behav Soc Sci Librar. 2002;21:59–72.
9. World Health Organization. WHO Mental Health Gap Action Programme (mhGAP). 2015 (http://www.who.int/mental_health/mhgap/en/, accessed 10 April 2017).
10. World drug report – 2014. New York: United Nations Office on Drugs and Crime (UNODC); 2014 (http://www.unodc.org/documents/wdr2014/World_Drug_Report_2014_web.pdf, accessed 10 April 2017).
11. Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, brief intervention, and referral to treatment (SBIRT): Toward a public health approach to the management of substance abuse. Subst Abus. 2007;28(3):7–30.
12. Bao YP, Liu ZM. Systematic review of HIV and HCV infection among drug users in China. Int J STD AIDS. 2009;20(6):399–405. 10.1258/ijsa.2008.008362.
13. Wang X, Zhang T,, Ho WZ. Opioids and HIV/HCV infection. J Neuroimmune Pharmacol. 2011;6(4):477–89. 10.1007/s11481-011-9296-1.
14. Hser Y-I, Evans E, Grella C, Ling W, Anglin D. Long-term course of opioid addiction. Harv Rev Psychiatry. 2015;23(2):76–89. 10.1097/HRP.0000000000000052.
15. Boyer E. Management of opioid analgesic overdose. N Engl J Med. 2012;367:146–55.
16. SAMHSA opioid overdose prevention toolkit. HHS Publication No. (SMA) 13-4742. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2013 (https://store.samhsa.gov/shin/content/SMA13-4742/Overdose_Toolkit_2014_Jan.pdf, accessed 10 April 2017).
17. Amato L, Davoli M, Perucci CA, Ferri M, Faggiano F, Mattick RP. An overview of systematic reviews of effectiveness of opiate maintenance therapies: Available evidence to information clinical practice and research. J Subst Abuse Treat. 2005;28:321–9.
18. Mattick RP, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. Cochrane Database Syst Rev. 2009 Jul 8;(3):CD002209. 10.1002/14651858.CD002209.pub2.
19. WHO model list of essential medications. Geneva: World Health Organization; 2013. (http://www.who.int/medicines/publications/essentialmedicines/18th_EML_Final_web_8Jul13.pdf, accessed 10 April 2017).
20. Connock M, Juarez-Garcia A, Jowett S, Frew E, Liu Z, Taylor RJ, et al. Methadone and buprenorphine for the management of opioid dependence: A systematic review and economic evaluation. Health Technol Assess. 2007;11(9):1–171.
21. Ling W, Mooney L, Haglund M. Treating methamphetamine abuse disorder. Curr Psychiatr. 2014;13(9):37–44.
22. World drug report – 2013. New York: United Nations Office on Drugs and Crime (UNODC); 2013 (http://www.unodc.org/unodc/secured/wdr/wdr2013/World_Drug_Report_2013.pdf, accessed 10 April 2017).
23. Anthony J, Warner LA, Kessler RC. Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: Basic findings from the National Comorbidity Survey. Exp Clin Psychopharmacol. 1994;2:244–68.
24. Lopez-Quintero C, Pérez de los Cobos J, Hasin DS, Okuda M, Wang S, Grant BF, et al. Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: Results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Drug Alcohol Depend. 2011;115(1-2):120–30.

25. Hall W. The adverse health effects of cannabis use: What are they, and what are their implications for policy? Int J Drug Policy. 2009;20:458–66.

26. Hall W, Degenhardt L. Adverse health effects of non-medical cannabis use. Lancet. 2009;374:1383–91.

27. Hall W. What has research over the past two decades revealed about the adverse health effects of recreational cannabis use? Addiction. 2015;110(1):19–35. 10.1111/add.12703

28. Ramaekers JG, Berghaus G, van Laar M, Drummer OH. Dose related risk of motor vehicle crashes after cannabis use. Drug Alcohol Depend. 2004;73(2):109–19.

29. Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. J Consult Clin Psychol. 2003;71:843–61.

30. Hettema J, Steele J, Miller WR. Motivational interviewing. Annu Rev Clin Psychol. 2005;1:91–111.

31. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: A meta-analysis. Addiction. 2006;101(11):1546–60.

32. National Institute of Health and Clinical Excellence. 2011. Drug misuse: psychosocial interventions: NICE guideline 51 [webpage] (http://guidance.nice.org.uk/CG51, accessed 10 April 2017).

Review

Public health alternatives to incarceration for drug offenders

Nicholas Clark [1], Kate Dolan [2] and David Farabee [3]

بدائل الصحة العامة لعقوبة السجن بالنسبة إلى مرتكبي جرائم المخدرات

نيكولاس كلارك، وكيت دولان، وديفيد فارابي

الخلاصة: يشكّل متعاطو المخدرات نسبة كبيرة من تعداد نزلاء السجون. وبمجرد دخولهم السجن، تتزايد مخاطر انتقال الأمراض المُعدية إليهم مثل فيروس نقص المناعة المكتسب (الإيدز) والتهاب الكبد والسل، وعند إطلاق سراحهم يواجهون مخاطر مرتفعة من تعاطي جرعة قاتلة. فيمثل الانتكاس والنكوص القاعدة بعد إطلاق سراحهم من السجن. ونادراً ما يجرى تنفيذ برامج العلاج من المخدرات المستند إلى الأدلة داخل السجون، وإن كان العلاج من المخدرات داخل السجون يحدّ من انتقال الأمراض المعدية والنكوص وتعاطي جرعات قاتلة بعد إطلاق سراح السجين. ومع إقرار العديد من السلطات القضائية بالمردودات السلبية المرتبطة بعقوبة السجن، فقد بدأت في النظر في بدائل مثل عدم إنزال العقوبة في حالة استخدام المخدرات غير المشروعة للأغراض الشخصية؛ وتوفير العلاج وإعادة إدماج مرتكبي جرائم المخدرات في المجتمع؛ ونقل التركيز من خفض العرض إلى تدابير الحد من الطلب والضرر في المجتمع وداخل السجون. وتتضاعف الاحتمالات بأن النساء اللاتي يعانين من مشكلات مرتبطة بالمخدرات واجهن عقوبة السجن مقارنة باحتمالات تعرض الرجال للسجن. وبالمثل، تزداد معدلات انتشار فيروس نقص المناعة المكتسب (الإيدز) في صفوف النزيلات. وينبغي إيلاء اهتمام قوي لتنفيذ العقوبات غير السالبة للحرية المفروضة على النساء، لا سيما خلال فترات الحمل وبالنسبة للنساء اللائي ترعين أطفالاً صغاراً.

ABSTRACT Drug users are vastly overrepresented in prison populations. Once inside they face increased risks of acquiring infections such as HIV, hepatitis and TB, and on release they face an elevated risk of fatal overdose. Relapse and recidivism are the norm following release from prison. The implementation of evidence-based drug treatment programmes in prison is rare, yet drug treatment in prison reduces the transmission of infections, recidivism and fatal overdose on release. Recognising the negative returns associated with incarceration, many jurisdictions have begun to consider alternatives such as depenalisation of the personal use of illicit drugs, provision of treatment and social reintegration of drug offenders, and a shift in focus from supply reduction to demand and harm reduction measures in the community and in prison. Women with drug problems are twice as likely to have been imprisoned for a drug offence as incarcerated men. Similarly, HIV prevalence is higher among female inmates. Serious attention should be paid to implementation of non-custodial sentences for women, particularly during pregnancy and those with young children.

Alternatives de santé publique à l'incarcération pour les auteurs d'infractions liées à la drogue

RÉSUMÉ Les toxicomanes sont largement surreprésentés parmi les détenus des prisons. Une fois incarcérés, ils sont d'autant plus exposés au risque de contracter des infections telles que le VIH, l'hépatite et la tuberculose, et à leur libération, ils font face à un risque élevé d'overdose fatale. Les rechutes et la récidive sont la norme après une remise en liberté. La mise en œuvre de programmes de traitement de la toxicomanie reposant sur des données factuelles est rare en milieu carcéral, alors que traiter la toxicomanie en prison permet de réduire la transmission d'infections, la récidive et l'overdose fatale à la sortie. Prenant note des conséquences négatives associées à l'incarcération, de nombreuses juridictions ont commencé à envisager des alternatives telles que la dépénalisation de l'usage personnel de substances illicites, la fourniture d'un traitement et la réinsertion sociale des auteurs d'infractions liées à la drogue, ainsi qu'un changement de priorité, passant de mesures de réduction de l'offre à des mesures de réduction de la demande et d'atténuation des effets nocifs dans la communauté et en prison. Les femmes toxicomanes sont deux fois plus susceptibles d'être emprisonnées pour des infractions liées aux drogues que les hommes. De même, la prévalence du VIH est plus élevée chez les femmes détenues. Une sérieuse attention doit être portée à l'application de peines non privatives de liberté pour les femmes, notamment lorsqu'elles sont enceintes ou en charge de jeunes enfants.

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Introduction

Globally, at any given time, there are over 10 million people held in prisons and between 2.5 and 3 million of these are held in pre-trial detention. However, turnover in the prison populations is thought to be at least 3 times that with some 30 million individuals being detained and released into the community each year. The vast majority of prisoners are male, with females accounting for less than 10% of this population (*1*). Drug offenders account for 3–29% of prison inmates in the European Union (EU), 4–29% of inmates in non-EU European countries, 5–53% of inmates in the Americas and 10–58% of inmates in Asia/Oceana (*2*). In the United States of America (USA), between 24% and 36% of all heroin addicts pass through the corrections system each year, representing more than 200 000 individuals (*3*).

Incarceration has traditionally been justified on the basis of its assumed effect on deterrence, crime reduction, rehabilitation and retribution. However, there is now a considerable body of evidence indicating that punishment (including imprisonment) provides neither deterrence (*4*) nor rehabilitation (*5*), and that the effects on crime reduction are minimal, even in countries with high rates of incarceration (*6*).

Relapse and re-offence are usual after release from prison. In the USA, for example, drug-use relapse rates (even among those who participate in prison-based programmes) are more than 80%, and 3-year re-arrest rates are consistently around 70%. From 1996 to 2006, the population of the USA increased by 13% and the imprisoned population increased by 33%, yet the proportion of prisoners with a drug problem increased by 43% (*7*). Drug-dependent offenders are more likely to return to prison than other offenders. In the USA, over 50% of drug-dependent inmates have a previous imprisonment compared with 31% of other inmates. In New South Wales, 84% of heroin-dependent inmates were re-imprisoned within 2 years of release, compared to 44% of all prisoners (*8*). Australian drug injectors reported an average of 5 imprisonments (*9*). These high rates confirm that most drug offenders do not receive treatment while in prison nor are they being referred to treatment on release.

Although drug use tends to occur at a lower level in prison than in the community, the infectious disease risks are often ***higher***, as inmates share syringes when they cannot access sterile ones (nor can they access products to sterilize them). As a result, having one or more prior incarceration is a major risk factor for having HIV and hepatitis C. In fact, among injection drug users in Tehran, Islamic Republic of Iran, a history of shared needles in prison was found to be the strongest predictor of being HIV-positive (*10*). In two Scottish prisons, 6% and 25% of injection drug users reported that they started injecting while in prison (*11*). The risk of death among people on parole during the first 2 weeks after release from prison is nearly 13 times greater than among individuals of similar demographic background, with drug overdose being the leading cause of death (*12*).

Recognizing the high cost and negative returns associated with imprisonment, many authorities have begun to consider alternatives. From a public health perspective, such alternatives include:

- Decriminalize personal use of illicit drugs,
- Provide treatment and social reintegration of people with drug use disorders who come into contact with the criminal justice system,
- Move the focus of funding away from supply-reduction measures towards demand- and harm-reduction measures.

Rationale for alternatives to incarceration for drug offenders

Alternative approaches to imprisonment are consistent with the obligations UN Member States have under the international drug control conventions, as the following details:

- ***Alternatives to conviction and punishment are permitted in the international drug control conventions and treatment is encouraged.*** The 3 international drug control conventions each contain a clause that allows for treatment and social reintegration as an alternative to conviction and punishment. The conventions also explicitly mention the need to make treatment available.
- ***Conviction of minor drug offences does not prevent drug use.*** Conviction and punishment of minor drug offences does not deter drug use and does not lead to rehabilitation.
- ***Conviction and punishment of minor drug offences is often disproportionate.*** The International Narcotics Control Board (INCB) has also reminded Member States of this principle of proportionality in criminal justice and to take the Tokyo rules into consideration (*13*).
- ***Conviction and punishment is expensive and causes harm.*** Imprisonment is more expensive than treatment and uses valuable resources that could be used more effectively for the prevention and treatment of drug use disorders. Increased spending on prisons in the USA, for example, has been shown to correlate with a reduction in spending on education, education being one of the most effective investments a country can make in preventing drug use (*14*).
- ***Treatment and social reintegration reduce both drug use and drug-related crime.*** Treatment of substance use disorders has been consistently

shown to reduce drug-related crime. The extent of the reduction varies depending on the type of substance use disorder and the type of treatment. In the treatment of opioid dependence, drug use and drug-related crime can be reduced by more than 50% with the use of opioid maintenance treatment such as methadone (*15*). Non-dependent drug use can be reduced by brief interventions, while dependent use of cannabis and stimulants can be reduced by more structured psychosocial interventions (*16*). Overall, most experts agree that treatment of substance use disorders leads to a significant reduction in offending (*17,18*).

- ***Treatment for drug use disorders is a cost-effective way to reduce drug use and crime in addition to other benefits.*** In addition to reducing drug use, treatment of substance use disorders reduces health care problems such as HIV and facilitates employment. Cost-benefit analyses of drug treatment, looking at the effect on health care costs, employment, and government expenditure on social services and crime, have estimated the returns on investment range from 7:1 to 18:1, meaning that for every dollar spent on drug treatment, savings of between 7 and 18 dollars are returned (*18,19*).

Public health alternatives

Decriminalization

Countries can decriminalize the personal use of illicit drugs. The international drug control conventions distinguish between "minor" and "serious" drug offences. The accepted interpretation of this phrasing is that minor crimes may be managed entirely by referral to treatment, by education or even simply by admonishment as an alternative to conviction or punishment, whereas serious crimes should result in conviction and punishment, in proportion to other offences in the country.

Thirty countries have reformed their drug policies to permit some form of decriminalization (*20*). Decriminalizing drug possession and investing in demand and harm reduction services can provide major benefits for public safety and health, including:

- reducing the number of people in prison,
- reducing criminal justice costs and redirecting resources from criminal justice to health systems,
- redirecting law enforcement resources to prevent serious and violent crime,
- reducing unjust racial disparities in drug law enforcement and sentencing, imprisonment and related health characteristics and outcomes,
- minimizing the social exclusion of people who use drugs, and creating a climate in which they are less fearful of seeking and accessing treatment, using harm reduction services and receiving HIV/AIDS services.

Other benefits are: increasing uptake into drug treatment, improving relations between law enforcement and the community, and protecting people from the wide-ranging and debilitating consequences of a criminal conviction and period of imprisonment.

Although countries are free to enforce higher penalties, a public health

Box 1. Effects of reduced sentencing for drug use offences in Portugal

Drug use has been decriminalized in Portugal since 2001. Possession and sale of proscribed drugs remain illegal in the country but people in possession of drugs for "personal use" (up to a 10-day supply of any drug) are not prosecuted criminally but redirected to a Commission for Dissuasion of Drug Addiction. These committees are composed of a social worker, a doctor and a legal adviser, who assess the level of substance abuse or dependence of the drug user and direct them to appropriate treatment. This measure was accompanied by a greater allocation of resources to treatment (e.g. methadone substitution), harm reduction (e.g. needle and syringe programmes) and prevention interventions.

During the first 6 years of the programme, the committees dealt with approximately 500 cases a month. The number of people undergoing substitution treatment increased from 6040 in 1999 to 14 877 in 2003. Lifetime prevalence of substance use increased from 8% to 12% between 2001 and 2007. However, there was a reduction in recent or current use, particularly in the age group 15–24, consistent with a pattern of experimentation and with data showing higher rates of discontinuation. In terms of public health effects, there was a sharp decline in the number of new HIV-positive cases among people who inject drugs (from 1400 in 2000 to 400 in 2006) and a reduction in the number of drug-induced deaths (from around 80 in 2001 to 20 in 2008). In terms of effects on crime, the number of convictions for drug trafficking remained stable in the period of 2001-2005 (around 5000 per year); at the same time, there was a significantly reduced burden on the courts (in 2000 there had been 7592 drug use charges) and on the prison system (prison overcrowding decreased from 119 prisoners per available place down to 101.5 in 2005).

approach that is consistent with the drug control conventions is to use the flexibility within the conventions to avoid conviction and punishment of people who commit drug offences related to the personal use of illicit drugs. Also, consistent with this approach is the encouragement of all people with substance use disorders who come into contact with the criminal justice system to receive the treatment they need, regardless of the severity of the crime.

Encouraging treatment

Opportunities for treatment as an alternative to conviction and punishment can occur at many stages in the criminal justice process, starting from initial police contact through to community reintegration after prison. In the same way that treatment and care provided to people with drug use disorders outside the criminal justice sector, treatment is usually as an outpatient, but may include residential therapeutic care for those in need of such services.

Schemes within the criminal justice system that facilitate treatment and care as an alternative to conviction or punishment fall into 4 broad areas depending on their location in the criminal justice process: 1) police diversion schemes, cannabis caution schemes; 2) regular court and probation service based schemes; 3) specialist problem-solving courts, including drug courts; and 4) early release/aftercare of sentenced prisoners.

In combination with these schemes, interaction with the health care system and diversion away from the criminal justice system can occur at numerous points: 1) pre-arrest (i.e. as an alternative to arrest); 2) police arrest; 3) in police custody and police custody on suspicion of a criminal offence; 4) in the pre-trial process; 5) during the trial process; 6) on sentencing; 7) on entry to prison; 8) in prison; 9) on preparation for release from prison; 10) on release into the community, including while on parole; and 11) on leaving the criminal justice system (either on release from prison, or when the parole period ends).

Drug courts

A systematic review of the effectiveness of drug courts found that participants have lower re-offence than non-participants; on average re-offence decreased from 50% to 38%, and can last for up to 3 years. Larger reductions in re-offence were found in adult drug courts that had high graduation rates and those that accepted only non-violent offenders. Juvenile drug courts have substantially smaller effects on re-offence (*21*).

There are currently more than 2 000 drug courts operating in the USA. Programmes also operate in Australia, Canada, United Kingdom and New Zealand. Drug courts vary in how they manage their caseloads, in the ancillary services they offer and in the testing and sanction schedules they apply. What they all have in common is the provision of ongoing supervision from a judge, with offenders appearing before the judge for regularly scheduled updates. The drug court movement has been very successful. Many evaluations suggest that this is an effective approach to managing offenders in the community (*22*), although most of the support comes from non-randomized evaluations. The most rigorous evaluation, using a randomized, intent-to-treat design was conducted on the Baltimore City Drug Court in Maryland, USA. A 1-year follow-up showed significantly lower levels of drug use and fewer arrests among those assigned to the drug court versus those in the control situation. By the time of the 3-year follow-up, these differences were no longer significant, although trends still favoured the drug court participants (*23,24*).

Box 2. Drug treatment courts in Australia

The Australian state of New South Wales first created drug courts in 1999. Offenders may be directed to drug courts if they meet the eligibility criteria regarding the kind of offence committed (drug supply and sexual assault prevent inclusion) and proven dependence on drugs. The drug court offers a treatment programme as an alternative to imprisonment on condition that the offender pleads guilty. Compliance with treatment is strictly regulated through urine testing and regular reports to the court. The 1-year programme includes a stabilization phase (3 months), including access to opioid substitution therapy if needed; a consolidation phase (3 months) to develop life and job skills; and a reintegration phase (6 months) where the offender should reintegrate into the community and secure employment.

An evaluation has shown that people who entered the programme were less likely to have further convictions, especially if they successfully completed it (the likelihood of a subsequent conviction for crimes against a person was 23% for the control group and 9% for those who completed treatment; for crimes against property, the likelihoods were 44% and 39% respectively). Cost-benefit analyses also showed that drug courts were as cost-effective as conventional sanctions in delaying time to the first offence and more cost-effective in reducing the frequency of subsequent offending.

Community supervision and treatment

Awareness of the high prevalence of drug use among criminal offenders prompted a number of large-scale efforts in the USA to use the power of legal pressure to encourage substance-abusing offenders to enter treatment. The most common form was "diversion," in which adults convicted of nonviolent drug possession offences have the option of participating in drug treatment in the community instead of imprisonment or probation without treatment. Unfortunately, evaluations of these efforts showed that these diverted offenders were more likely to be rearrested for a drug crime than other participants referred to treatment by the criminal justice system (*25*) or similar offenders charged prior to this initiative (*26*). One of the most important findings to emerge from these evaluations was that requiring the existing treatment system to provide services for drug users of all severity levels resulted in a misallocation of resources. Most importantly, attempting to treat everyone with a drug use history meant many offenders with serious drug use disorders received inadequate care. Moreover, lax and inconsistent enforcement of these referrals allowed offenders to ignore treatment referrals—and even scheduled probation appointments and drug testing—with no penalties. These experiences made it clear that effective management of drug offenders requires close monitoring and consequences for non-compliance. It also became clear that targeting treatment resources on those with the highest need is more effective than offering low levels of treatment for everyone. This can be construed as a continuum of services ranging from random drug testing coupled with gradually increasing sanctions to residential care with the full complement of ancillary medical and social services.

Drug treatment for prisoners

Given the large number of injection drug users and the fact many inmates start injecting in prison and are at risk of injecting-related harm, the prison setting would seem the logical place to provide drug treatment. With heroin often the main drug injected in prison, it follows that medication assisted treatment of opioid dependence (MATOD) would be the ideal treatment. MATOD uses medicines such as methadone or buprenorphine and psychosocial support. MATOD has been shown to reduce injecting and syringe sharing (*27*) and hepatitis C transmission (***28,29***) in prison and mortality after release from prison (*29*). MATOD reduced post-release criminal activity (*30*) and re-imprisonment by up to 20% among a group with a high rate of re-imprisonment (*31*).

Cognitive behavioural therapy (CBT) has been shown to reduce re-arrest (*32,33*) and re-imprisonment (*34*). It has also been identified as an effective treatment for criminal behaviour and alcohol and drug use problems in offenders (*35,36*). Prison-based cognitive behavioural therapy

Box 3. Effect of expanding treatment as a means of reducing drug related crime in the United Kingdom

In 2001 the United Kingdom government created the National Treatment Agency for Substance Misuse (NTA) to "improve the availability, capacity and effectiveness of drug treatment in England"; one of the key objectives was to reduce drug-related crime. The agency oversaw the implementation of a new drug treatment system based on the best available evidence according to experts in the field of substance abuse.

The introduction of treatment programmes overseen by the NTA has led to a large increase in the number of drug users in treatment, from around 100 000 in 2001 to 210 815 in 2008/09. The new system was also more efficient, with shorter waiting times for treatment: in 2001 the average waiting time for an appointment was 9 weeks while in 2008/09 it was 5 days. A study on the effect of treatment on outcomes (Drug Treatment Outcomes Research Study, 2009) showed that the greatest reductions in drug use were found in problem drug users: 12 months after the baseline interviews, 49% of heroin users and 61% of crack users were no longer using drugs. Treatment also affected risk behaviours such as sharing injecting equipment; of the people who inject drugs who reported sharing at baseline, 77% had stopped sharing 1 year later. Treatment also had a positive effect on crime: around 40% of users at the start of the study had committed offences in the previous 4 weeks; this fell to 16% after 1 year. Interestingly, the study also showed that users referred to treatment by the criminal justice system were as likely to complete treatment successfully as users referred by other sources. The net benefit to society per person undergoing treatment, considering their improved outcomes in terms of health and crime, was £6527. In addition, for every £1 invested in drug treatments, £2.50 are returned to society. A more recent study by the NTA (Estimating the crime reduction benefits of drug treatment and recovery, 2012) estimated that drug treatment prevented approximately 4.9 million crimes in 2010/2011, corresponding to £960 million in savings to society (including the public, businesses and the justice and health systems).

(interventions were cost-effective in terms of re-offence (*37*).

Women in prison

The number of imprisoned women is increasing in all 5 continents; it increasing by an average of 16% in the past 6 years (*1*). In 2012, more than 600 000 women and girls were held in prisons worldwide (*38*). Imprisoned women are twice as likely to have a drug problem as male prisoners and are more likely to have been imprisoned for a drug offence than imprisoned men (*39*). A global review found HIV prevalence was higher in female than in male inmates in 15 countries, including Afghanistan (4% versus 1%) and was lower than male inmates in only 7 countries (*40*).

Women who are poor and uneducated are more likely to be arrested and less likely to afford legal counsel than men. Alternatives to incarceration for drug-involved women are needed, especially for those in prison for non-violent offences who pose no risk to public safety. Serious attention should be paid to the development and implementation of non-custodial sentences for women, particularly during pregnancy and when they have young children. A study of women seeking treatment in the Islamic Republic of Iran found that they were more likely to have been in prison (48%) than in drug treatment (20%) (*41*).

Treatment coverage for prisoners

Although a country may provide drug treatment for inmates, the coverage is often very poor. In 1996, 5 countries provided methadone for prisoners; this increased to 29 countries in 2009 (*42*), to 41 countries in 2012 (*43*) and to 43 countries in 2013 (*44*). Even when a country provides MATOD to inmates, few receive it. A review of 20 countries with prison-based MATOD found less than 10% of inmates in 17 countries were in treatment (*42*). An assessment revealed that injecting drug use is known to occur in 148 countries (*45*).

Of the 2.3 million prison inmates in the USA, 65% meet the DSM-IV medical criteria for alcohol or other drug abuse and addiction, but only 11% received treatment for their addictions with less than 1% of prison budgets spent on treatment (*7*).

Demand and harm reduction measures

There needs to be a shift in the focus of funding from supply reduction measures to demand and harm reduction measures. In addition to reducing drug use, treatment of drug use disorders reduces health care problems such as HIV and assists with a return to work. Even within many prison systems, there is a focus on supply-reduction measures at the expense of demand- and harm-reduction measures. An Australian study found that despite an extensive use of drug searches and urinalysis, the detection of drugs was modest for both strategies. The most commonly used drug was cannabis with the detection of drugs such as amphetamines and heroin being very low. Several millions of dollars are spent on these supply-reduction measures, while many inmates go untreated for drug dependency (*46*).

Conclusion

An imprisonment-based response to drug use in society is costly, is associated with significant public health risks, particularly for women who use drugs, and is of questionable benefit to public safety. Opportunities for alternatives to imprisonment exist at every step in the criminal justice process, and examples can be found from different authorities around the world for each of these. Such examples demonstrate the feasibility of such approaches, but also the challenges in setting up effective programmes. Further work is needed to clearly evaluate the relative effect on public health and public safety of the different approaches.

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Box 4. Aftercare in Canada

In response to the high levels of drug abuse among women offenders in Canadian correctional services, the Women Offenders Substance Abuse Program was established in 2003 to provide treatment and support during and after imprisonment. The treatment programme consists of 4 modules: education and engagement; intensive therapeutic treatment; relapse prevention and maintenance; and community relapse prevention and maintenance (CRPM). The first 3 models are offered to women during imprisonment while CRPM is offered after release, while under supervision in the community.

Women who participated in the CRPM module had significantly better outcomes than those who only participated in the modules in prison. Only 5% of women who had participated in CRPM had returned to prison 1 year later, compared to 38% of those who had no exposure to CRPM. The reasoning for this approach is that offenders in prison are sheltered from many of the environmental factors that trigger offending and drug abuse and continuing therapy after release can be particularly helpful in preventing relapses.

Table 1 Summary of treatment alternatives to conviction or punishment, including their advantages and disadvantages

	Police referral	Regular court or probation-based services	Drug courts	Aftercare
Point of intervention	Pre-arrest, pre-booking, or pre-court appearance	Pre-plea/pre-trial, post-plea/post-trial, or post-sentence	Pre-plea/pre-trial, post-plea/post-trial, or post-sentence	Post imprisonment/ early release
Key features: who initiates the process?	– Police refer participant to education, assessment or treatment. It can either be based on police discretion or be a standard procedure that first arrest gets plan A, second arrest gets plan B, third arrest gets plan C.	– Participant is referred to treatment by court or probation service. The process is initiated by key criminal justice persons (magistrate, judge, court worker, prosecution, defence lawyer) – Court oversight is generally limited to reports from the treatment sector, although the participant is required to appear in court for specific events such as treatment non-compliance or sentencing – Health and justice have clearly defined and separate roles – Communication between teams may be provided by a coordinator – Court may pay for treatment, if necessary	– Judge/magistrate with specialist knowledge is the leader of a multidisciplinary drug treatment service – Participants are required to appear in court regularly – Standardized regimens of treatment are commonly used and frequent urine testing may be required – Rewards for compliance with programme conditions & sanctions for non-compliance to effect behavioural change	– Services assess individual needs of participants prior to release from prison and provide access to a variety of medical and psychosocial services within the community, including ongoing drug treatment
Advantages	– Time and cost savings on criminal justice processing – Police in a good position to coordinate referral to appropriate services – The offender presents at a time of crisis when motivated to enter treatment	– Time and cost savings on criminal justice processing – Large volume of participants processed – Regular courts can process individuals – Participants chose their own treatment	– Judge-led multidisciplinary decision-making – Authority figure of judge instrumental in therapeutic change – Close supervision of participants – Swift application of sanctions for non-compliance	– Facilitates reintegration into the community
Disadvantages	– Police discretion may be open to misuse	– Objectives of justice and treatment services may diverge – Judicial oversight may be limited – Communication between justice and health services may be limited – Rewards for compliance or sanctions for non-compliance may be delayed or inadequate – Judicial discretion may be open to misuse	– Judges may lack specialist expertise in clinical decision-making – There may be blurring of distinctions between criminal justice and treatment – Resource intensive and potentially costly to establish – Relatively few offenders processed – Participants have less choice in the treatment method	– Coordination is required to ensure individualized treatment and rehabilitation needs are met and maintained over time – Not a complete alternative to conviction or punishment

References

1. Walmsley R. World Female Imprisonment List (second edition) Women and girls in penal institutions, including pre-trial detainees/remand prisoners: London: International Centre for Prison Studies; 2012.
2. Bewley-Taylor D, Hallam C, Allen R. The incarceration of drug offenders: an overview. London: King's College; 2009.
3. Boutwell AE, Nijhawan A, Zaller N, Rich JD. Arrested on heroin: a national opportunity. J Opioid Manag. 2007;3:328–32.
4. Torny M. The future of imprisonment. Oxford: Oxford University Press; 2004.
5. Gendreau P, Cullen FT, Goggin C. The effects of prison sentences on recidivism. Ottawa: Solicitor General Canada; 1999.

6. Kuziemko I, Levitt SD. An empirical analysis of imprisoning drug offenders. J Public Econ. 2004;88(9):2043–66.
7. CASA. The National Center on Addiction and Substance Abuse at Columbia University. Behind bars II: substance abuse and America's prison population. New York: CASA; 2010.
8. Steering Committee for the Review of Government Service Provision. Report on government services. Canberra: Productivity Commission; 2010.
9. Dolan K, Wodak A, Hall W. HIV risk behaviour and prevention in prison: a bleach programme for inmates in NSW. Drug Alcohol Rev. 1999;18(2):139–43.
10. Zamani S, Kihara M, Gouya MM, Vazirian M, Nassirimanesh B, Ono-Kihara M, et al. High prevalence of HIV infection associated with incarceration among community-based injecting drug users in Tehran, Iran. J Acquir Immune Defic Syndr. 2006;42(3):342–6.
11. Gore SM, Bird AG, Ross AJ. Prison rites: starting to inject inside. BMJ. 1995;311:1135.
12. Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, et al. Release from prison: a high risk of death for former inmates. N Engl J Med. 2007;356(2):157–65.
13. United Nations Office on Drugs and Crime (UNODC). INCB Annual report. New York: UNODC; 2007 (http://www.incb.org/incb/en/publications/annual-reports/annual-report-2007.html).
14. United Nations Office on Drugs and Crime UNODC). Why promote prison reform? New York: UNODC; 2016 (https://www.unodc.org/unodc/en/justice-and-prison-reform/prison-reform-and-alternatives-to-imprisonment.html).
15. World Health Organization. Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence. Geneva: World Health Organization; 2009 (http://www.who.int/substance_abuse/publications/Opioid_dependence_guidelines.pdf?ua=).
16. World Health Organization. mhGAP, Intervention guide for mental, neurological and substance use disorders in non-specialized health settings. Geneva: World Health Organization; 2010 (http://www.who.int/mental_health/publications/mhGAP_intervention_guide/en/).
17. Prendergast ML, Podus D, Chang E, Urada D. The effectiveness of drug abuse treatment: a meta-analysis of comparison group studies. Drug Alcohol Depend. 2002;67(1):53–72.
18. Godfrey C, Stewart D, Gossop M. Economic analysis of costs and consequences of the treatment of drug misuse: 2-year outcome data from the National Treatment Outcome Research Study (NTORS). Addiction. 2004;99(6):697–707.
19. Rydell, CP, Everingham SS. Controlling cocaine: supply versus demand programs (Vol. 331). Santa Monica: Rand Corporation; 1994.
20. Strathdee SA, Beletsky L, Kerr T. HIV, drugs and the legal environment. Int J Drug Policy. 2015 Feb;26 Suppl 1:S27-32.
21. Mitchell O, Wilson DB, Eggers A, MacKenzie DL. Assessing the effectiveness of drug courts on recidivism: a meta-analytic review of traditional and non-traditional drug courts. J Crim Justice. 2012;40(1):60–71.
22. Belenko S. Research on drug courts: a critical review. Natl Drug Court Inst Rev. 1998;1(1):1–42.
23. Gottfredson D, Exum L. The Baltimore City Drug Court: one-year results from a randomized study. J Res Crime Delinq. 2002;39:337–56.
24. Gottfredson DC, Kearley B, Najaka SS, Rocha C. The Baltimore City Drug Treatment Court: three-year self-report outcome study. Eval Rev. 2005;29(1):42–64.
25. Farabee D, Hser YH, Anglin MD, Huang D. Recidivism among an early cohort of California's Proposition 36 offenders. Criminol Public Policy. 2004;3(4):501–22.
26. Urada D, Longshore D. SACPA Offenders. Evaluation of the substance abuse and crime prevention act: final report. Sacramento: California Department of Alcohol and Drug Programs; 2007.
27. Larney S. Does opioid substitution treatment in prisons reduce injecting-related HIV risk behaviours? A systematic review. Addiction. 2010;105(2):216–23.
28. Marco A, Gallego C, Caylà JA. Incidence of Hepatitis C Infection among Prisoners by Routine Laboratory Values during a 20-Year Period. PLoS One. 2014;9(2):e90560. 10.1371/journal.pone.0090560
29. Dolan KA, Shearer J, White B, Zhou J, Wodak A. Four-year follow-up of imprisoned male heroin users and methadone treatment: mortality, re-incarceration and hepatitis C infection. Addiction. 2005;100(6):820–8.
30. Kinlock TW, Gordon MS, Schwartz RP, Fitzgerald TT, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: Results at 12 months post release. J Subst Abuse Treat. 2009;37(3):277–85.
31. Larney S, Toson B, Burns L, Dolan K. Effect of prison-based opioid substitution treatment and post-release retention in treatment on risk of re-incarceration. Addiction. 2012;107(2):372–80.
32. Burnette KD, Prachniak K, Leonard A, Robinson KD, Swan ES, Little GL. Effects of moral reconation therapy on female offenders in a prison-based therapeutic communitiy. Cog Behav Treat Review. 2005;14(3):1–4.
33. Golden L. Evaluation of the efficacy of a cognitive behavioral program for offenders on probation: thinking for a change. Doctoral dissertation, University of Texas Southwestern Medical Center at Dallas; 2002.
34. Little GL, Robinson KD, Burnette KD. Cognitive-behavioral treatment of felony drug offenders: a five-year recidivism report. Psychol Rep. 1993;73(3 Pt 2):1089–90.
35. Harada T. The randomized controlled trial of the prison-based Japanese Matrix program (J-MAT) for methamphetamine abusers. Nihon Arukoru Yakubutsu Igakkai Zasshi. 2012;47(6):298–307.
36. Blacker J, Watson A, Beech AR. A combined drama-based and CBT approach to working with self-reported anger aggression. Crim Behav Ment Health. 2008;18(2):129–37.
37. Aos S, Lee S, Drake E, Pennucci A, Klima T, Miller M, et al. Return on investment: Evidence-based options to improve statewide outcomes (Document 11-07-1201). Olympia (WA): Washington State Institute for Public Policy; 2011.
38. Walmsley R. World prison briefs. International Centre for Prison Studies; 2011 (http://www.prisonstudies.org/info/worldbrief/wpb_stats.php, accessed 22 February 2012).
39. Lakobishvili E. Cause for alarm: the incarceration of women for drug offences in Europe and Central Asia, and the need for legislative and sentencing reform: London: Harm Reduction International; 2012.
40. Dolan K. HIV prevalence in prison: a global overview. A Global overview. The 20th International AIDS Conference, 19-25 July 2014, Melbourne, Australia.
41. Dolan K, Salimi S, Nassirimanesh B, Mohsenifar S, Mokri A. The establishment of a methadone treatment clinic for women in Tehran, Iran. J Public Health Policy. 2011;32:219–30.
42. Larney S, Dolan K. A literature review of international implementation of opioid substitution treatment in prisons: Equivalence of care? Eur Addict Res. 2009b;15:107–12.

43. Harm Reduction International. The Global State of Harm Reduction. Towards an integrated response. London: Harm Reduction International; 2012.

44. Dolan K. HIV services in prison: A Global overview. The 20th International AIDS Conference, 19-25 July 2014, Melbourne, Australia.

45. Mathers et al. (2008). Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. 372 (9651) 1733–1745.

46. Dolan K, Rodas A. Detection of drugs in Australian prisons: supply reduction strategies. Int J Prison Health. 2014;10(2):111–7.

Review

Alcohol and substance use in humanitarian and post-conflict situations

Fahmy B. Hanna [1]

تعاطي الكحول ومواد الإدمان في الأوضاع الإنسانية وفي أعقاب الصراعات

فهمي بهجت حنا

الخلاصة: هناك طائفة واسعة من مشاكل تعاطي مواد الإدمان منتشرة في مجموعة متنوعة من الأوضاع الإنسانية. وتبرز الدلائل الإرشادية للجنة الدائمة المشتركة بين الوكالات بشأن دعم الصحة العقلية والنفسية والاجتماعية في حالات الطوارئ أن تعاطي المخدرات في الأوضاع الإنسانية وفي أعقاب الصراعات، يقترن بمشاكل تتضمن العنف القائم على نوع الجنس، والجريمة المنظمة، والإهمال الجسيم للأطفال. وبرغم أن تعاطي المخدرات يُعَدُّ مشكلةً صحية عامة في الأوضاع الإنسانية إلا أن هذا المجال كان مهملاً على الدوام في الصحة العامة ولا توجد سوى معلومات محدودة للغاية في هذا الصدد سواء في الكتابات المنشورة أو الكتابات غير الرسمية. وتعرض هذه المقالة نظرة عامة حول المشكلة وأدوات التقييم والتدخلات القائمة للتصدي لتعاطي مواد الإدمان أثناء الصراعات وفي أعقابها.

ABSTRACT A wide range of substance use problems are prevalent in a variety of humanitarian settings. The Inter Agency Standing Committee (IASC) guidelines on mental health and psychosocial support during emergencies highlights that during humanitarian and post conflict situations, substance use is associated with problems including gender-based violence, organized crime and the serious neglect of children. Although substance use is a public health issue in humanitarian settings it has always been a neglected area of public health with very limited information available in both published and grey literature on this matter. This review presents an overview of the problem and existing assessment and interventions tools to address substance use in conflict and post-conflict situations.

Consommation d'alcool et de substances psychoactives dans les situations de crise humanitaire et après un conflit

RÉSUMÉ Un grand nombre de problèmes liés à la consommation de substances psychoactives sont prévalents dans différentes situations de crise humanitaire. Les directives du Comité permanent interorganisations (CPI) en matière de santé mentale et de soutien psychosocial en situations d'urgence mettent en évidence l'association de la consommation de substances psychoactives en situation de crise humanitaire et après un conflit avec des problèmes incluant la violence à l'encontre des femmes, le crime organisé et des actes de négligence grave envers les enfants. Si la consommation de substances psychoactives constitue un problème de santé publique dans les situations de crise humanitaire, elle a toujours été un domaine négligé de la santé publique, avec des données très limitées sur la question, que ce soit dans la documentation publiée ou dans la littérature grise. La présente étude offre un aperçu du problème et des outils d'évaluation et d'intervention existants pour s'attaquer à l'utilisation de substances psychoactives dans les situations de conflit et d'après-conflit.

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Introduction

The Eastern Mediterranean and North African Region has several countries facing conflict or post-conflict situations, which has caused areas of instability and unrest, and forced huge internal and external displacements. Conflict situations are affecting countries such as the Syrian Arab Republic, Yemen, Somalia, Iraq and Libya and post-conflict situations can be seen in Sudan (specifically Darfur) and Afghanistan. Huge numbers of migrants in countries like Lebanon and Jordan are another consequence of these instabilities in the region. To add to the list, natural disasters are a serious threat to the Region, happening almost every year in the form of earthquakes and floods (e.g., earthquake in Afghanistan in 2014 and floods in Pakistan in 2010). Substance use is already identified as a significant health problem in countries such as the Islamic Republic of Iran, Pakistan, Afghanistan and Libya and there are reports of rising problems in some other countries (*1*). The goal of this article is to present an overview of the problem and existing assessment and intervention tools to address substance use in conflict and post-conflict situations and to provide a set of recommendations to address this important public health matter.

Links between humanitarian situations and substance use

The evidence on correlation between substance use and conflict situation is not fully developed. Although increasing use of substances is reported among combatants and ex-combatants, probably as a means of coping with stress, changes in the pattern of use could also be of concern; similar to what has happened in Afghanistan and Libya (*2*). In Afghanistan, conflict and drug policy have been linked to a shift from traditional opiate use to the new pattern of opioid injection. In post-conflict Libya, a rapid increase in opioid injection with a subsequent HIV epidemic among drug users has struck the health system (*3*).

Specific patterns of drug use in conflict areas in the Region can be observed, such as using khat in Somalia. Khat is a traditional substance of use in Somalia, although a study in Northwest Somalia has shown a different pattern of traditional use, with 60% of recent khat use among ex-combatants compared to 28% of recent use among civilian war survivors and 18% in civilians with no war experience (*4*).

Increasing trends of substance use in areas of conflict and post-conflict and among displaced people can be attributed to several reasons. First, a situation of instability and inadequate rule of law leads to lack of proper border control and consequently new routes of trafficking and increased access to drugs. Additionally, when people who have already been under extreme stressful conditions gain access to drugs, they may use them to relieve stress or mental conditions such as depression and anxiety. According to Ezard et al. (*5*), several reasons are given for using substances, including self-medication for pain and mental health problems, the stress of adapting to life in a new environment, and exposure to unfamiliar patterns of alcohol and other substance use.

Among all the mental conditions associated with substance use in humanitarian situations, post-traumatic stress disorder (PTSD) has been studied more extensively. PTSD is a risk factor for substance abuse and addiction. Clinical observations suggest that PTSD patients may use psychoactive substances without a physician's directions to relieve traumatic memories and other symptoms associated with PTSD (*6*). According to the National Institute on Drug Abuse, among individuals with substance use disorders, 30–60% meet the criteria for comorbid PTSD. Patients with substance use disorders tend to suffer from more severe PTSD symptoms than do PTSD patients without substance use disorders (*7*).

Another area of concern is disruption of the supply chain for opioid substitution treatment in conflict areas. A recent example of this condition occurred in the Ukraine conflict in 2014, which led to abrupt discontinuation of opioid substitution therapy in Crimea and lack of medical supply of methadone and buprenorphine in Eastern Ukraine (*8*). During or following emergencies, supply of substances and medications for treatment of substance use disorders can be disrupted, causing sudden withdrawal among people dependent on substances. Additionally, social sciences highlight that alcohol and substance use among war-uprooted populations increases and causes further problems, such as domestic violence. For example, a study among 296 school children in the north-eastern provinces of Sri Lanka showed that fathers' alcohol intake and previous exposure to war were significantly linked to the amount of maltreatment reported by their children (*9*). Finally, from a political sciences point of view, use of alcohol and drugs can be linked to violence during conflicts. Some studies have shown that after controlling for armed-group- and individual-level variables, drug intake and alcohol consumption boosts the number of violent actions perpetrated during conflicts (*10*).

Substance use and veterans

Substance use is a major health problem among soldiers and combatants in conflict and war zones. Drugs can be used as stimulants for fighters, quell for traumatic situations, and even as an alignment with prevailing cultural practices in the serving area. Although drug use among soldiers is not a new

phenomenon, the most prominent example in the modern world can be found among the American veterans during the Vietnam War (*11*). A national study in the United States of America found that 75% of Vietnam combat veterans with PTSD met criteria for substance abuse or dependence, mostly to heroin. In particular, Vietnam veterans with combat-associated PTSD face a heightened risk of dying from a fatal drug overdose (*12*).

The American veterans of the wars in Iraq and Afghanistan drew new attention to the problem of drug use among this population. Vietnam veterans famously struggled with heroin dependency, whereas more recent veterans are at increased risk of becoming dependent on opioid painkillers. One study of veteran affairs healthcare users reported that > 11% of veterans from operations in Afghanistan and Iraq have been diagnosed with a substance use disorder: an alcohol use disorder, a drug use disorder, or both. Additionally, veteran affairs data show that ~22% of those veterans with PTSD also have a substance use disorder (*13*). The existing literature mostly comprises studies on American veterans, although research on the situation of drug use in other conflict/war zones would enrich the existing knowledge, specifically on contextual factors that may affect emerging substance use disorders among veterans.

Substance use and displaced population groups

Substance use in conflict-displaced populations can be a continuation or exaggeration of predisplacement patterns, or similar to the host population, or a mixed picture. In a review of 10 studies on substance abuse, Ezard has suggested that substance use (e.g., alcohol, opiates or minor tranquilizers) is common in some displaced settings (*14*).

<body>Refugees can be at greater risk of substance use because of facing higher levels of stress, unemployment and problems in coping with a new culture. Substance use problems can develop in the country of origin, in transit, in temporary refuge or in resettlement. Two theories have tried to explain drug use pattern among refugees; one of which is the Assimilation/Acculturation Model, which adopts the social norms of the new community with regards to drug use; and the other is the Acculturative Stress Model, which focuses on difficulties of coping with new social and cultural norms that could result in drug use as a coping mechanism. A variety of risk factors for developing problem substance use in these settings has been reported, including male gender, exposure to war trauma, displacement, and coexisting mental health problems. Limited studies exist with regard to drug use pattern among children/adolescents and female refugees. Adolescents and young adults could be specifically vulnerable, considering that these age groups are more vulnerable to drug use, and disruption of social norms and family structure can add to their vulnerability. Women can be exposed to severe traumatic situations due to violence and sexual exploitation specifically in camps, which together with other stressful factors of refugees' lives can lead to substance use, although this phenomenon has not been studied fully (*15*).

Availability and access to treatment services for displaced populations is another challenging issue. Refugees may not be allowed to utilize local treatment services, services can be expensive, or refugees may not have access to services out of the camps. Cultural and language differences would add more complexity to this situation.

Available assessment tools for alcohol and substance use in humanitarian and post-conflict situations

The Economic and Social Council of the United Nations in its 2004 resolution on "Drug control and related crime prevention assistance for countries emerging from conflict" (*16*) has specifically tackled the increasing problem of drug use in conflict and post-conflict zones among the general population and soldiers, especially child soldiers, and the need for Member States to address this issue by adopting comprehensive measures. The resolution calls for action to enhance drug control measures from a supply and demand reduction perspective. It also draws the Member States' attention to the full spectrum of the problem, ranging from the general population to more vulnerable groups, mainly women, children, combatants and ex-combatants. Today, there are limited tools available to assess the extent and nature of problems among different population groups. There are also a few intervention measures, although the existing literature suggests they are underutilized. An overview of existing assessment and intervention tools is presented here.

Rapid assessment of alcohol and other substance use in conflict-affected and displaced populations: a field guide

This is the main instrument available for rapid assessment of substance abuse in emergency settings that focus only on substance abuse, and was developed by the Office of the United Nations High Commissioner for Refugees (UNHCR) and the World Health Organization (WHO). The tool has been used in several settings in 6 different countries: Kenya, Liberia, Northern Uganda, Islamic Republic of Iran, Pakistan and Thailand (*17*).

Assessing mental health and psychosocial needs and resources toolkit for humanitarian settings

This toolkit developed by WHO and UNHCR integrated items for assessment of alcohol and other substance use (AOSU) needs, resources and capacities as part of several instruments rather than as a discrete instrument.

Among the 12 instruments for assessment included in this toolkit, the following 3 have included substance abuse as part of the assessment (*18*). Tool number 1: who is where, when, doing what (4ws) in mental health and psychosocial support: summary of manual with activity codes. The 4Ws is nowadays a commonly used mapping tool in humanitarian and post-conflict settings (HPS), and alcohol and substance use disorders are included as 1 subcategory under section 8, namely 8.7 Interventions for alcohol/substance use problems. The 4ws were implemented following the Haiti earthquake in 2010 by the UN Children's Fund to map the Mental Health and Psycho-Social Support response. One of the key findings was limited services for alcohol/substance use despite the high needs identified in the community at that time. Tool number 5: checklist for integrating mental health in primary health care in humanitarian settings: alcohol/substance use is mentioned in section 2 on worker capacity indicators at primary healthcare level. Tool number 6: neuropsychiatric component of the health information system: alcohol/substance use is a component of this system, and is one of 7 neuropsychiatric categories identified.

Available interventions

Inter Agency Standing Committee guidelines

The Inter Agency Standing Committee Guidelines on Mental Health and Psychosocial Support in Emergency Settings can help to plan, establish and coordinate a set of minimum multisector responses to protect, support and improve people's mental health and psychosocial wellbeing in the midst of an emergency. These offer essential advice on how to facilitate an integrated approach to address the most urgent mental health and psychosocial issues in emergency situations, having a specified action sheet 6.5 for guidance on minimizing harm related to alcohol and other substance use. The guidelines also include recommendations to integrate substance and alcohol abuse in interventions of emergency preparedness, minimum response to emergencies, as well as comprehensive responses to emergencies (*19*).

Mental Health Gap Action Programme Humanitarian Intervention Guide (mhGAP-HIG)

The WHO mhGAP-HIG includes specific modules on alcohol and substance use disorder, designed mainly for training nonspecialized healthcare professionals. It was recently used to build the capacity of healthcare professionals to manage alcohol and substance use disorder in Iraq, while the main mhGAP-IG has been used in several countries affected by emergencies, including Syrian Arab Republic, Libya and Somalia (*20*).

It is important to mention that, in addition to the above tools that can be used at community/population level, there are some research, diagnostic and assessment tools with relevance to substance use in humanitarian settings. For example, the WHO Composite International Diagnostic Interview tool, which includes a component for assessment of substance use at individual case level (*21*). Additionally, the WHO Alcohol, Smoking and Substance Involvement Screening (ASSIST) Package and WHO Alcohol Use Disorders Identification Test (AUDIT) are simple methods for screening individual cases in primary healthcare settings and have been used in several humanitarian settings, including in low-income countries (*22*, *23*).

Conclusion and recommendations

In humanitarian settings little attention is paid to substance use when other health, social and even other mental health problems are seen as more pressing; however, in some conditions emergencies can bring new opportunities for partnerships with the international community that strengthen national substance abuse management services.

There is evidence that substance use is a problem among affected populations and increases the burden on already overstretched mental health systems in post-conflict states. International organizations can take proactive measures for advocacy and awareness-raising, especially at the level of policy-makers, including donors, for humanitarian agencies to enhance their involvement in the area of substance use in humanitarian and post-conflict situations. At the national level, Member States should prioritize development of services for substance use in humanitarian and post-conflict situations, adapt the available tools for these contexts, and promote research and evidence on the subject of substance use in humanitarian and post-conflict situations.

In summary, addressing substance use requires a concerted effort involving multiple sectors and several levels of engagement. It is recommended that humanitarian efforts should include advocacy for policy and decision makers to include substance use in responses. More experience is required collectively on how best to respond to substance use among populations affected by humanitarian and post-conflict situations.

Interventions need to be conducted and results disseminated. International donors should dedicate funds for research on substance use and its treatment in post-conflict and humanitarian settings, and a global forum for exchange of experience, ideas, information and evidence is required.

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References

1. Atlas: substance use in the Eastern Mediterranean Region 2015. Cairo: World Health Organization. Regional Office for the Eastern Mediterranean; 2017 (EMRO Technical Publications Series, 45; http://apps.who.int/iris/bitstream/10665/254675/1/emropub_2017_19560.pdf, accessed 16 March 2017).
2. Hanna FB. Literature review and scoping to explore substance abuse management services in humanitarian and post conflict settings [thesis]. Aarhus University and Novara University; 2014.
3. Devakumar D, Birch M, Osrin D, Sondorp E, Wells JCK. The intergenerational effects of war on the health of children. BMC Med. 2014;12:57.
4. Odenwald M, Frank Neuner F, Schauer M, Elbert T, Catani C, Lingenfelder B, et al. Khat use as risk factor for psychotic disorders: a cross-sectional and case–control study in Somalia. BMC Med. 2005;3:5.
5. Ezard N. Rapid assessments of substance use in populations displaced by conflict: a case study of alcohol use in Mae La refugee camp, Thailand [thesis] London School of Hygiene and Tropical Medicine; 2011.
6. North CS, Smith EM, Spitznagel EL. Posttraumatic stress disorder in survivors of a mass shooting. Am J Psychiatry. 1994 Jan;151(1):82–8. PMID:8267140
7. National Institute on Drug Abuse. Updated 2006. NIDA community drug alert bulletin – stress & substance abuse (http://archives.drugabuse.gov/StressAlert/stressalert.html, accessed 30 August 2014).
8. Ritter C. Substitution maintenance treatment in Ukraine: humanitarian and medical mission 16–21 May 2014. Cooperation Group to Combat Drug Abuse and illicit trafficking in Drugs , Pompidou Group, Council of Europe (https://www.coe.int/T/DG3/Pompidou/Source/focus/P-PG(2014)%20Misc%201rev%20Report%20medical%20expert%20mission%20to%20Ukraine0406.pdf, accessed 16 March 2017).
9. Catania C, Jacob N, Schauer E, Kohilia M, Neuner F. Family violence, war, and natural disasters: A study of the effect of extreme stress on children's mental health in Sri Lanka. BMC Psychiatry. 2008 May 2;8:33. PMID:18454851
10. Hecker T, Haer R. Drugs boosting conflict? A micro-level test of the linkage between substance use and violence. Terrorism Political Violence 2015;27(2):205–24.
11. Stanton MD. Drugs, Vietnam, and the Vietnam veteran: an overview. Am J Drug Alcohol Abuse. 1976;3(4):557–70. PMID:1032764
12. Healing a broken system: veterans and the war on drugs. New York: Drug Policy Alliance; 2012 (http://www.drugpolicy.org/sites/default/files/DPA_Healing%20a%20Broken%20System_Veterans%20and%20the%20War%20on%20Drugs_November%202012_Final_0.pdf, accessed 16 March 2017).
13. Substance Abuse and Mental Health Services Administration. Behavioral health issues among Afghanistan and Iraq U.S. War Veterans. In Brief 2012 Summer;7(1) (http://store.samhsa.gov/shin/content/SMA12-4670/SMA12-4670.pdf, accessed 16 March 2017).
14. Ezard N, Oppenheimer E, Burton A, Schilperoord M, Macdonald D, Adelekan M, et al. Six rapid assessments of alcohol and other substance use in populations displaced by conflict. Confl Health. 2011 Feb 11;5(1):1. PMID:21310092
15. Sowey H. Are refugees at increased risk of substance misuse? Drug and Alcohol multicultural Education Centre; 2005 (http://web.archive.org/web/20070809152830/http://www.damec.org.au/downloads/Refugee_Drug_Alcohol_Vulnerability.pdf, accessed 16 March 2017).
16. ECOSOC Resolution 2004/39. Drug control and related crime prevention assistance for countries emerging from conflict (http://www.un.org/en/ecosoc/docs/2004/resolution%202004-39.pdf, accessed 16 March 2017).
17. Rapid assessment of alcohol and other substance use in conflict-affected and displaced populations: a field guide. Geneva: Word Health Organization, United Nations High Commission for Refugees; 2008 (http://www.who.int/mental_health/emergencies/unhcr_alc_rapid_assessment.pdf, accessed 16 March 2017).
18. Assessing mental health and psychosocial needs and resources toolkit for humanitarian setting. Geneva: Word Health Organization, United Nations High Commission for Refugees; 2011 (http://www.who.int/mental_health/resources/toolkit_mh_emergencies/en/, accessed 16 March 2017).
19. IASC guidelines on mental health and psychosocial support in emergency settings. Geneva: Inter-Agency Standing Committee; 2007 (http://www.who.int/mental_health/emergencies/guidelines_iasc_mental_health_psychosocial_june_2007.pdf, accessed 16 March 2017).
20. mhGAP Humanitarian Intervention Guide. Geneva: Word Health Organization, United Nations High Commission for Refugees; 2015 (http://www.who.int/mental_health/publications/mhgap_hig/en/, accessed 16 March 2017).
21. Wangary MK. Cost effectiveness of community based and institution based detoxification and rehabilitation of alcohol dependent persons in Kenya [thesis]. University of Nairobi; 2010.
22. 22. Salamé J, Barbour B, Salameh P. Do personal beliefs and peers affect the practice of alcohol consumption in university students in Lebanon? East Mediterr Health J. 2013 Apr;19(4):340–7. PMID:23882959
23. 23. Widmann M, Apondi B, Abednego M, Warsame AH, Isse M, Mutisu V, et al. The modified ASSIST-linked Brief Intervention for khat users: a randomized controlled intervention study. 34. Symposium der Fachgruppe Klinische Psychologie und Psychotherapie der DGPs, 4–7. May 2016, Bielefeld.

Review

Khat use and related addiction, mental health and physical disorders: the need to address a growing risk

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تعاطي القات وما يتصل به من اضطرابات إدمانية ونفسية وبدنية: ضرورة التصدِّي للمخاطر المتنامية

مايكل أودنفالد، مصطفى العبسي

الخلاصة: يمثّل تعاطي القات مشكلة إدمان تميز إقليم شرق المتوسط، بل إنه يعد ممارسة تحظَى بقبول ثقافي واسع النطاق في بعض البلدان ويتزايد انتشارها في أخرى. ولئن كان تعاطي القات بقدر ضئيل قد لا يسبب آثاراً خطيرة، فإن التعرض له لفترة طويلة يمكن أن يؤدِّي إلى الإدمان وبعض الاضطرابات النفسية والأمراض البدنية مثل ارتفاع ضغط الدم، والمضاعفات القلبية الوعائية، واختلال الأداء الجنسي، وتسمُّم الكبد، وانخفاض وزن المواليد لأمهات تتعاطين القات. ولقد أدَّى انتشار التعاطي والعبء الواقع على الصحة والاقتصاد إلى زيادة المخاطر في الإقليم، وإن كان مدى المشكلة لم يخضع لتقييم ملائم بعد. وعلاوةً على ذلك، لا تطبق معظم البلدان المعنية سياسة وخطة واضحتين بشأن تعاطي القات، وبالتالي تكاد لا توجد أي خطة منظّمة للوقاية والعلاج من أجل مواجهة هذه المشكلة. ويقدّم هذا الاستعراض صورة لمدى انتشار المشكلة، ويتناول بالتفصيل المبادرات البحثية والمعاهدات الدولية والسياسات والخدمات الصحية القائمة ذات الصلة، ويعرض أفضل التدخلات على مستوى السياسات والبرامج في البلدان التي ينتشر بها تعاطي القات.

ABSTRACT Khat use is a drug problem characteristic of the Eastern Mediterranean Region, which is a widespread culturally accepted practice in some countries and is becoming more prevalent in others. Although limited use may not be accompanied by serious consequences, prolonged exposure could lead to dependence, psychosis and other psychiatric disorders and physical conditions such as hypertension, cardiovascular complications, sexual dysfunction, hepatoxicity and reduced birth weight of infants born to khat-chewing mothers. The widespread use and its burden on health and economy has raised concerns in the Region, although the extent of the problem is not well assessed. Additionally, most countries do not have a clear policy and plan with regard to khat use, and therefore there is hardly any structured prevention and treatment plan in place to respond to the problem. This review presents a picture of the extent of the problem, elaborates on related existing research initiatives and international treaties, policies and health service provisions, and outlines best policy and programme interventions in khat-use countries.

Consommation de khat, dépendance, affections de santé mentale et troubles physiques associés : nécessité de s'attaquer à un risque croissant

RÉSUMÉ La consommation de khat est un problème de toxicomanie caractéristique de la Région de la Méditerranée orientale. Elle constitue une pratique largement acceptée au plan culturel dans certains pays et devient de plus en plus prévalente dans d'autres. Bien qu'une consommation limitée ne s'accompagne pas de conséquences graves, une exposition prolongée peut conduire à la dépendance, à la psychose et à d'autres troubles psychiatriques, ainsi qu'à des états pathologiques physiques telles que l'hypertension, des complications cardio-vasculaires, un dysfonctionnement sexuel, une hépatotoxicité et une réduction du poids à la naissance pour les enfants nés de mères consommatrices de khat. L'utilisation répandue du khat et la charge qu'elle exerce sur la santé et l'économie suscitent des inquiétudes dans la Région, bien que l'étendue du problème ne soit pas parfaitement estimée. En outre, la plupart des pays ne disposent pas de politiques et de plans clairs concernant la consommation de khat. Il n'y a donc pour ainsi dire quasiment aucun plan de prévention et de traitement structuré en place pour répondre à ce problème. La présente analyse donne un aperçu de l'étendue du problème, détaille les initiatives de recherche et les traités internationaux existants sur la question, les politiques et les prestations de services, et définit les meilleurs politiques et programmes d'intervention dans les pays où la consommation de khat existe.

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Background

A unique characteristic of drug use in the Eastern Mediterranean and North African region is the culturally sanctioned use of khat. Khat use is widely prevalent in countries like Yemen, Kenya, Somalia, Ethiopia and Djibouti and an increasing pattern is reported from some other countries such as Oman and Saudi Arabia (*1,2*). There are also studies showing a growing problem of khat use in the United Kingdom (UK) and European countries, specifically among the migrant communities (*3*). The exact number of khat users is unclear but it is estimated that more than 10 million people use khat on any day (*1*), predominantly in the mentioned countries, with a male predominant pattern. Yemen, where khat use is culturally accepted, has the largest population of khat users. It had been reported that 15 to 20% of children under 12 years of age use khat (lifetime) in Yemen (*4*). Today, the domestic khat market greatly contributes to Yemen's national economy and Ethiopia and Kenya earn a significant proportion of their foreign currencies by khat exportation (*5*).

Khat comes from the young and tender leaves and shoots of the khat tree (*Catha edulis)*. Khat leaves have been consumed for centuries for their mildly stimulating properties caused by several alkaloids. Cathinone [S-(-)-alpha-aminopropiophenone] is considered to be the main psychoactive compound, but it is unstable and swiftly decomposes after harvesting; cathinone resembles amphetamine in chemical structure and affects the central and peripheral nervous system and behaviour similarly (*6*).

While chewing the fresh leaves has always been preferred, in the past it was often only available in dried form, powder or paste, e.g. to brew as "Abyssinian tea" or "Bushman's tea" (*7*). Today, soon after harvesting, the twigs and shoots are rolled into bundles and wrapped in banana leaves in order to retain moisture (*8*). In most instances, bundles are the traded units, but lower qualities might also be marketed in standard plastic bags (*9*). The leaves and tender stems are usually chewed and kept in a tight wad in the cheek. Within about 30- 60 minutes the user experiences excitability, euphoria, talkativeness and flow of ideas, known among khat users in a number of countries as *mirquaan* (*10*). This is followed by a quieter, more introvert phase, giving way to a gradual comedown, and often restlessness, irritability and a depressive reaction (*11*). These unpleasant aftereffects motivate khat chewers to carry on chewing without stopping (*5*). Users often experience sleep problems during the night and a hangover the next morning (*1*). Usually, regular khat users experience psychological withdrawal symptoms at the time of the day of their usual khat intake (in Somali known as *haddar*) which involves restlessness, concentration difficulties, irritability and impaired impulse control (*1*).

Since the mid-20th century, khat use patterns have profoundly changed and become more excessive and informal – i.e. not restricted to traditional and formal use occasions and by the traditional use norms (*2,12*). This is related to the increased availability and spread of the habit to groups that have traditionally not had contact with the substance (*1*). While khat users traditionally were mono-substance users, more recently concomitant use is increasingly reported, indicating that khat users functionally modulate their physiological and psychological state with a set of other substances (*13,14*). Most obvious is tobacco use which is strongly associated with khat use (*15*). Research efforts in Yemen have documented that the vast majority of khat users also smoke tobacco but the casual direction or origin of this khat- tobacco use association is unknown (*15,16*). Data from Yemeni khat users with and without nicotine use in the UK have led researchers to hypothesize on an enhancement effect (*17*).

Khat use has been associated with numerous health problems. Basic research studies have found evidence of altered stress response (*18*), cognitive deficits (*19,20*) and insomnia (*21*) in habitual khat users. Research has shown that prolonged exposure to khat may lead to a long-lasting sensitization to the effects of other drugs (*22*). In addition to physical and mental harm, much time and household income is spent in obtaining and chewing khat (*23*), which severely affects the users' social life and family (*24*).

Adverse effects of khat use

Dependence

Excessive and prolonged khat use could have the potential to induce psychological dependence with a dominant feature similar to dependence on amphetamine-type stimulants, although more empirical studies are needed in this regard (*1*). The potential to induce psychological dependence is confirmed by a number of recent studies, using a version of the Severity of Dependence Scale (SDS) that has been adapted and validated for the study of khat dependence (*25, 26*). It has been shown that khat chewers scoring high on this instrument show more khat-related behaviours and have higher khat alkaloid levels in their saliva (*27*). About 39% of a sample of Yemeni khat users living in the UK scored at a level comparable with a clinical population with severe heroin dependence in need of treatment (*28*).

Little information is available on the prevalence of khat dependence as defined by the International Classification of Diseases (ICD) or Diagnostic and Statistical Manual of Mental Disorders (DSM). Recently, a study showed the applicability of the dependence syndrome as defined by DSM-IV (*29*): 31% of a group of 204 khat users of Yemeni origin living in the UK fulfilled the

DSM-IV criteria for dependence (*29*) while 84% of 25 chronic psychotic patients in Somalia (*30*) and 100% among 33 khat-using male Somali refugees in Nairobi (*9*) fulfilled the DSM-IV criteria for dependence. An early Ethiopian study, using the WHO's Composite International Diagnostic Interview, found a lifetime prevalence of khat dependence according to the ICD-10 criteria of 5% among males (1.3% among females) in a representative sample from a traditional khat-producing area (*31*). More recent population-based studies on khat dependence are missing in any of the khat-using countries.

Psychosis and other psychiatric disorders

Khat use is higher among individuals suffering from traumatic and stressful events (*9,32*), those with pre-existing mental disorders (*33*) in an attempt to "self-medicate" pre-existing symptoms such as depression, anxiety and trauma (*34,35*), and those experiencing medication side-effects (*36*). Khat helps individuals with mental disorders to feel better but increases the risk of additional psychotic symptoms (*34*). More than 20 case reports describe khat-induced psychotic disorders (*1,37*). Systematic information on family vulnerability to psychosis is not reported, although in one case with a family history, a small amount seemed to be sufficient for the psychotic reaction. Some other clear features emerged: most cases had used khat excessively before the onset of psychotic symptoms and showed violent behaviour in the course of the disorder. Most cases completely remitted upon abstinence within 2–4 weeks even without medication. But most cases had repeated such episodes. Some recent studies confirmed the effects of khat use on pre-existing psychotic disorders (*30,36,38,39*). However, the effects of khat use on psychotic exacerbation depend on the specific khat-chewing patterns (noxious patterns are: high quantity use, daily use, nighttime use, very long use sessions), the amount used and whether a patient discontinues the antipsychotic medication or not (*30,36*).

A few studies have started to address the question of whether khat use might be a risk factor for the development of chronic psychotic disorders (*14,39,40*). Early onset of use and excessive consumption were suggested as potential risk factors, but the evidence is preliminary.

Taken together, the recent findings partly support earlier reports on the harm of khat use to mental health, specifically with excessive use and among vulnerable individuals (e.g. those with pre-existing mental disorders and a high trauma and stress load as well as adolescent users). Moderate khat use does not appear to cause mental disorders *per se* (*41*).

Physical disorders

Besides psychiatric sequelae, numerous physical health problems have been associated with khat use (*42,43*). A comprehensive review of the physical effects of khat use is beyond the scope of this paper as we focus here on mental health consequences. As with mental health, adverse effects are commonly linked with prolonged or excessive use. However, the major shortcoming of this literature is that other explanations for the physical disorders have not been systematically ruled out, for example tobacco smoking which is frequently combined with khat use (*15,21*) and the agrochemical content in the leaves (*44,45*). The negative physical consequences associated with khat use include mucosal problems (*46*), oral lesions (*47*), gastric cancers and duodenal ulcers (*42*), hypertension (*48*), cardiovascular complications (*49*), stroke (*50*), sexual dysfunction (*51*), hepatoxicity (*52*) and reduced birth weight of infants born to khat-chewing mothers (*53*), to mention just a few.

Additional recent findings in the literature relevant to the effect of chronic khat use are indicated in Box 1.

Current international research initiatives

Several international initiatives currently exist in the field of khat research.

1. The NIH-funded international Khat Research Program is the largest current research initiative with a high scientific output. The programme was initially launched as part of a Fogarty International Research Collaboration Award (FIRCA) from the NIH in 2005.

Ongoing research coordinated by the Khat Research Program seeks to develop a knowledge base to guide the development of effective harm reduction, prevention and treatment strategies for concurrent tobacco-khat use. The Program to date has particularly focused on mapping the effects of khat use and identifying potential targets that may be addressed in future prevention and intervention efforts. There is virtually no empirical information to inform effective intervention techniques to reduce or discontinue khat use in either khat-only users or concurrent khat and tobacco users, but the Program's collective knowledge output could provide a solid basis for development of evidence-based interventions that are feasible, cost-effective and scalable in low-resource settings. This would fill a clear gap in efforts to reduce any harm to public health that may be caused by khat use. Additionally, the increased use among women and children, the concurrent use of tobacco and the potential increase in abuse of other drugs (e.g., abuse of sedatives) adds urgency to this effort (*62*).

2. In Saudi Arabia, the Substance Abuse Research Center (SARC, http://sarc.sa/portal/home.html) was established in 2011 by the University of Jazan with a focus on the substance

Box 1. Recent findings on the effects of chewing khat

Animal research verifies:

- Dose-dependent effect of cathinone on aggression, anxiety, withdrawal and appetite using vervet monkeys (*54*)
- Dose- and time-dependent effect of cathinone on stress and sex hormone production (*55*)

Chronic khat use leads to:

- Impaired attention and working memory (*19,56–58*)
- Higher experience of anger and more pronounced negative reactions during stress (*59*)
- Abnormal diurnal stress hormone profile: enhanced evening and attenuated morning cortisol levels (*18*)

Concurrent tobacco use among khat chewers is:

- Greater in males (*16*)
- Culturally proscribed: males use cigarettes, while females use shisha (*16,60*)
- Harmful to short-term memory, learning and delayed recall (*20,58*)
- Linked to abnormal (blunted) cardiovascular response to stress (*61*)

use patterns in Jazan province where khat use has been a traditional practice and current use patterns are becoming more excessive. Its aim is carry out research and support educational campaigns and provision of treatment in the community. SARC has conducted a series of epidemiological studies to shed light on the current khat use and its associated problems in Jazan province (e.g. school performance and quality of life) (*63–66*). It has also conducted studies to gain insight into motives for using khat and to explore reasons for and subjective consequences of quitting among a group of volunteers who had stopped khat use (*67,68*). The study provides insight into how khat chewers can be supported to stop using it. The centre is currently planning a longitudinal study to compare the benefits of bupropion versus placebo administration on discontinuation of khat use and abstinence.

3. An initiative funded by the German government, which currently involves the University of Konstanz (Germany), the University of Nairobi (Kenya), the University of Munich (LMU, Germany), the University of Jimma (Ethiopia) and several NGOs, aims i) to develop and evaluate sustainable interventions for community-based mental health care that include khat (*30,69,70*), ii) to develop and evaluate currently not available research and clinical methods (*30,71*) and iii) to study the effects of khat use on psychotic developments in cross-sectional and longitudinal studies in order to identify noxious khat use patterns and mediating and moderating variables (*9*).

International drug control treaties: key provisions for khat and its metabolites

The following khat alkaloids are internationally controlled: cathinone is listed in Schedule I and cathine in Schedule III of the International Convention on Psychotropic Substances of 1971 and norephedrine is controlled under the 1988 Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (*72*).

In contrast to that, khat leaves are currently not scheduled or controlled under international conventions. The WHO Expert Committee on Drug Dependence critically reviewed khat in its 34th session in 2006 (*72*). They concluded that evidence was not enough to warrant international control of khat leaves and did not recommend scheduling them. However, in view of the potential adverse health consequences of excessive khat use patterns, they recommended that member countries should adopt educational campaigns in order to inform the public about the potential negative consequences and discourage its use. This is supported by scientific reviews, i.e. compared to other substances of abuse, khat leaves have a low potential for dependence, and physical and social harm (*73,74*).

In the WHO Eastern Mediterranean Region, most khat countries currently have a laissez-faire attitude concerning khat (Yemen, Somalia, Djibouti) while Saudi Arabia has banned it. In its 6th meeting in 2007, the Regional Advisory Panel on Impacts of Drug Abuse (RAPID) of the WHO Regional Office for the Eastern Mediterranean

conducted an intercountry consultation on khat (75). The panel discussion highlighted that khat is a sensitive issue in the Region, that a balanced approach is required and that in-depth studies on the scope of the problem are currently missing to guide politics. The panel developed 7 recommendations for the Member States that especially addressed the potentially harmful non-traditional excessive use patterns: 1) Contain the use of khat though market-interventions similar to tobacco, 2) Conduct awareness-raising activities on the health and social consequences, 3) Protect vulnerable groups such as children, women and people with pre-existing mental disorders, 4) Make international research literature available, 5) Establish and maintain appropriate surveillance systems, 6) Generate evidence through research to guide informed policies and interventions, and 7) Undertake a coordinated interagency, inter- and intragovernmental and nongovernmental organization effort to address the multisectoral and interdisciplinary activities related to khat.

In the European Union, where millions of immigrants from khat countries reside, the khat trade has been growing for more than a decade and legitimate and illegal transportation networks have emerged. Among the European Community countries, 15 members and Norway have imposed a ban on khat leaves so far (most recently The Netherlands in 2013 and Great Britain in 2014); in the rest, the status of khat leaves is not specifically controlled under drug laws (3). In 2011, the European Monitoring Centre for Drugs and Drug Addiction published a policy briefing on khat (76). In the briefing, the weak data sources are pointed out and a balanced and multisectoral approach is recommended focusing on the potential harms.

In the United States of America, the import and trafficking of khat leaves are controlled by the Drug Enforcement Agency because khat alkaloids are scheduled substances under the Controlled Substance Act (cathinone Schedule I, cathine Schedule IV).

Review of interventions

In general, there is a scarcity of research on psychological and pharmacological interventions that address khat-related health problems. The developments, mainly related to khat dependence and mental health problems among khat chewers, are reviewed briefly:

Webpages, non-scientific reports and observations reported in scientific papers, as reviewed by Odenwald and colleagues (77), reveal that several forms of khat counselling and dependence treatment currently exist, offered by different service providers. In several European countries, public treatment services for individuals with khat dependence are offered by integrating them into the existing services for illegal substances. Several projects have been implemented to assist dependent khat users to access and utilize such services. Although no scientific evaluation has been conducted, at least there are descriptions of methods used and experiences in single publications and reports. For example, several reports describe an outreach project in Aarhus, Denmark for khat-addicted individuals among the Somali immigrant community (*78,79*). Somali community workers identify khat addicts, assist them with their every-day problems and accompany them on their way through out- and inpatient substance use treatment and psychiatric services. Of about 100 clients in the project period, 27 were brought in for substance use treatment and 19 suffered from additional mental disorders. Similar projects have been implemented in the UK, e.g. by the nongovernmental charity organization MIND.

Very few substance use treatment services offer specialized khat treatment. In Sweden, the Stockholm County Council substance treatment services opened a specialized outpatient clinic for khat use disorders in 2012, especially targeting the migrant population from countries with a high prevalence of khat use (*80*). In 2013, a year after opening, about 10 people had approached the clinic, most of them with external motivation (sent by the social services department) (Abdi YA, personal communication, 2013).

Very few psychotherapeutic treatment studies have addressed the topic of treatment of khat use disorders, all of whom used CBT techniques. A study in the north-west of Somalia (Somaliland) involving 35 patients compared a comprehensive treatment package for severe mental disorders with and without a psychoeducation component (psychoeducation included information on the negative effects of khat and on induced deterioration of psychotic symptoms, as well as advice and assistance to reduce use and it was addressed to patients and families). Both groups had reduced khat use in the early phase; however during the follow up most patients relapsed but those in the psychoeducation component group had a significantly lower frequency of use (*30*).

Concerning pharmacological treatment studies, nothing has ever been published except for some early case reports with bromocriptine (*81*), a substance that is not used any more for the treatment of addiction. Further research on pharmacological treatment is currently planned by the SARC initiative in Saudi Arabia.

Rationale and evidence for prevention

At present there is relatively little scientific knowledge on best practices, key concepts and evidence-based approaches available on khat-related preventive measures. Analysis of the

current situation related to preventive measures demonstrates that national khat policies on prevention have rarely been implemented in khat-producing countries. The analysis of these national health-related strategies on khat is difficult because they have often not been sustained due to a lack of political will and because some of the countries are in transition and governance is constrained. Having analysed these attempts and reviewed previous writings by experts (*2,5,76*), we propose the following five elements are needed in order to implement successful preventive measures.

1. Future measures should be strictly based on empirical evidence. Empirical research suggests that khat is a heterogeneous commodity and different use patterns exist.
2. The measures should be designed to be implemented in a sustained manner involving all stakeholders.
3. The target groups need to perceive preventive measures as neutral and health-related (e.g. reduce overuse and excesses, reduce agrochemical and toxin contamination or preserve traditional moderate khat use).
4. Future khat policies should use interstages between the extreme levels of the currently prevailing dichotomous approach (i.e. laissez-faire vs. legal ban, representing the extreme poles of the repertoire of possible actions) on khat and should include harm reduction and public health interventions. Measures should be multifaceted, adapted, differential and non-uniform.
5. Khat-related policies need to be coordinated and harmonized on a regional and international level.

We note that future research must test these guiding recommendations and improve on them to advance preventive interventions and achieve the desired outcomes.

Conclusion and recommendations for national policies

Given the complexity of the problem of khat use and its correlation with the cultural and societal structures of the consumers, WHO Member States have not yet adopted a systematic approach to address this growing problem. In order to gain a clear picture of the extent of the problem, a khat-related data collection system needs to be integrated into the standard governmental statistical monitoring and reporting systems, e.g. in agriculture, trade, tax and health.

Data collection should be complemented by research on priority areas with the aim to better inform policy-makers and to empirically evaluate measures that have already been taken. Priority areas are:

- Develop and evaluate adequate research methods and resources for khat research (e.g. quick tests for khat alkaloids in body fluids).
- Determine the impact of khat use or overuse on the development of physical and mental health problems, e.g. schizophrenia, oral and gastric cancers or cerebral haemorrhage.
- Develop and evaluate effective interventions and methods of care for khat-related health problems.
- Develop and evaluate effective preventive measures.

In order to achieve these aims, research capacities need to be developed and research resources need to be made available in khat-use countries.

By including khat in consumer protection laws and related laws, minimum standards can be set to monitor and control khat production, distribution and consumption (e.g. define maximum permissible limits of relevant chemical compounds). At the same time, special prevention measures need to be taken to address vulnerable groups, including children and adolescents, people with pre-existing mental and physical disorders on whom khat has a proven negative effect, and women during pregnancy and breastfeeding and their children. General prevention measures need to be developed to inform the public about noxious khat use patterns (not of khat use *per se*), such as prolonged chewing or concomitant nicotine use, in order to clearly distinguish "traditional" khat use that probably causes little or no harm for healthy individuals from excessive use of khat.

For those who are affected by any kind of disorder related to khat use and comorbid conditions, treatment services should be provided. The focus is on primary health care where all patients should be routinely screened for substance use. At-risk substance users and concurrent users of khat and other substances, most notably nicotine, should be motivated to stop this practice, e.g. by applying the ASSIST-linked Brief Intervention for moderate khat users (*82*). The development of information material and manualized treatment tools for various severe user groups as well as the training of different specialists in the health care sector in order to detect and manage khat-related health problems are among the other basic measures that health systems can adopt. Appropriate specialized services are needed for treatment of khat dependency and also the comorbidity of khat use with mental disorders.

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References

1. Odenwald M, Klein A, Warfa N. Khat addiction. In: El-Guebaly N, Galanter M, Carrá G, editors. Textbook of addiction treatment: international perspective. New York: Springer; 2015.
2. Gatter P. Politics of Qat: the role of a drug in ruling Yemen. Wiesbaden: Ludwig Reichert Verlag; 2012:836p.
3. Griffiths P, Lopez D, Sedefov R, Gallegos A, Hughes B, Noor A, et al. Khat use and monitoring drug use in Europe: the current situation and issues for the future. J Ethnopharmacol. 2010;132(3):578–83.
4. Al-Mugahed L. Khat chewing in Yemen: turning over a new leaf. Bull World Health Organ. 2008;86(10):741–2.
5. Odenwald M, Warfa N, Bhui K, Elbert T, et al. The stimulant khat–another door in the wall? A call for overcoming the barriers. J Ethnopharmacol. 2010;132(3):615–9.
6. Kalix P. Pharmacological properties of the stimulant khat. Pharmacol Ther. 1990;48(3):397–416.
7. Krikorian AD. Khat and its use: an historical perspective. In: Shahandeh B, Geadah R, Tongue A, Tongue E, Rolli J, editors. The Health and Socio-Economic Aspects of Khat Use. International Conference on Khat, Antananarivo, Madagascar, January 17-21, 1983. Proceedings. Lausanne: International Council Against Alcohol and Addictions; 1983.
8. Carrier N, editor. Kenyan khat: the social life of a stimulant. Boston: Brill; 2007 [African Social Studies Series].
9. Widmann M, Warsame AH, Mikulica J, von Beust J, Isse MM, Ndetei D, et al. Khat use, PTSD and psychotic symptoms among Somali refugees in Nairobi -a pilot study. Front Public Health. 2014;2:71.
10. Al-Motarreb A, Baker K, Broadley KJ. Khat: pharmacological and medical aspects and its social use in Yemen. Phytother Res. 2002;16(5):403–13.
11. Hassan NA, Gunaid AA, El-Khally FM, Murray-Lyon IM. The effect of chewing Khat leaves on human mood. Saudi Med J. 2002;23(7):850–3.
12. Gebissa E. Keeping tradition and killing time: the use and misuse of khat in Ethiopia. In: Gebissa E, editor. Taking the place of food: khat in Ethiopia. Trenton (NJ): The Red Sea Press; 2010:57–88.
13. Negussie B. Substance use among high school students in Dire Dawa, Ethiopia. Harar Bulletin of Health Sciences. 2012;4(1):38–52.
14. Tulloch AD, Frayn E, Craig TK, Nicholson TR. Khat use among Somali mental health service users in South London. Soc Psychiatry Psychiatr Epidemiol. 2012;47(10):1649–56.
15. al'Absi M, Grabowski J. Concurrent use of tobacco and khat: added burden on chronic disease epidemic. Addiction. 2012;107(2):451–2.
16. Nakajima M, al'Absi M, Dokam A, Alsoofi M, Khalil NS, Al Habori M. Gender differences in patterns and correlates of khat and tobacco use. Nicotine Tob Res. 2013;15(6):1130–5.
17. Kassim S, Islam S, Croucher RE. Correlates of nicotine dependence in UK resident Yemeni khat chewers: a cross-sectional study. Nicotine Tob Res. 2011;13(12):1240–9.
18. al'Absi M, Khalil NS, Al Habori M, Hoffman R, Fujiwara K, Wittmers L. Effects of chronic khat use on cardiovascular, adrenocortical, and psychological responses to stress in men and women. Am J Addict. 2013;22(2):99–107.
19. Hoffman R, al'Absi M. Working memory and speed of information processing in chronic khat users: preliminary findings. Eur Addict Res. 2013;19(1):1–6.
20. Nakajima M, Hoffman R, al'absi M. Poor working memory and reduced blood pressure levels in concurrent users of khat and tobacco. Nicotine Tob Res. 2013;16(3):279–87.
21. Nakajima M, Dokam A, Kasim AN, Alsoofi M, Khalil NS, al'Absi M. Habitual khat and concurrent khat and tobacco use are associated with subjective sleep quality. Prev Chronic Dis. 2014;11:E86.
22. Banjaw MY, Schmidt WJ. Behavioural sensitisation following repeated intermittent oral administration of Catha edulis in rats. Behav Brain Res. 2005;156:181–9.
23. Milanovic B. Qat expenditures in Yemen and Djibouti: An empirical analysis. J Afr Econ. 2008;17(5):661–87.
24. Aden A, Dimba EA, Ndolo UM, Chindia ML. Socio-economic effects of khat chewing in north eastern Kenya. East Afr Med J. 2006;83(3):69–73.
25. Kassim S, Islam S, Croucher R. Validity and reliability of a severity of dependence scale for khat (SDS-khat). J Ethnopharmacol. 2010;132(3):570–7.
26. Nakajima M, Dokam A, Alsameai A, AlSoofi M, Khalil N, al'Absi M. Severity of khat dependence among adult khat chewers: the moderating influence of gender and age. J Ethnopharmacol. 2014;155(3):1467–72.
27. Kassim S, Hawash A, Johnston A, Croucher R. Validation of self-reported khat chewing amongst khat chewers: an exploratory study. J Ethnopharmacol. 2012;140(1):193–6.
28. Kassim S, Croucher R. Khat chewing amongst UK resident male Yemeni adults: an explanatory study. Int Dent J. 2006;56:97–101.
29. Kassim S, Croucher R, Al'absi M. Khat dependence syndrome: a cross-sectional preliminary evaluation amongst UK-resident Yemeni khat chewers. J Ethnopharmacol. 2013;146(3):835–41.
30. Odenwald M, Lingenfelder B, Peschel W, Haibe FA, Warsame AM, Omer A, et al. A pilot study on community-based outpatient treatment for patients with chronic psychotic disorders in Somalia: Change in symptoms, functioning and co-morbid khat use. Int J Ment Health Syst. 2012;6(1):8.
31. Awas M, Kebede D, Alem A. Major mental disorders in Butajira, southern Ethiopia. Acta Psychiatr Scand Suppl. 1999;397:56–64.
32. Bongard S, Nakajima M, al'Absi M. Khat chewing and acculturation in East-African migrants living in Frankfurt am Main/Germany. J Ethnopharmacol. 2015;164:223–8.
33. Bhui K, Craig T, Mohamud S, Warfa N, Stansfeld SA, Thornicroft G, et al. Mental disorders among Somali refugees. Developing culturally appropriate measures and assessing socio-cultural risk factors. Soc Psychiatry Psychiatr Epidemiol. 2006;41:400–8.
34. Odenwald M, Hinkel H, Schauer E, Schauer M, Elbert T, Neuner F, et al. Use of khat and posttraumatic stress disorder as risk factors for psychotic symptoms: a study of Somali combatants. Soc Sci Med. 2009;69(7):1040–8.
35. Odenwald M, Lingenfelder B, Schauer M, Neuner F, Rockstroh B, Hinkel H. Screening for posttraumatic stress disorder among Somali ex-combatants: a validation study. Confl Health. 2007;1:10.
36. Teferra S, Hanlon C, Alem A, Jacobsson L, Shibre T. Khat chewing in persons with severe mental illness in Ethiopia: a qualitative study exploring perspectives of patients and caregivers. Transcult Psychiatry. 2011;48(4):455–72.
37. Odenwald M. Chronic khat use and psychotic disorders: a review of the literature and future prospects. Sucht. 2007;53(1):9–22.

38. Bimerew MS, Sonn FCT, Korlenbout WP. Substance abuse and the risk of readmission of people with schizophrenia at Ammanual Psychiatric Hospital, Ethiopia. Curationis. 2007;30(2):74–81.

39. Odenwald M, Neuner F, Schauer M, Elbert T, Catani C, Lingenfelder B. Khat use as risk factor for psychotic disorders: A cross-sectional and case-control study in Somalia. BMC Med. 2005;3(1):5.

40. Kroll J, Yusuf AI, Fujiwara K. Psychoses, PTSD, and depression in Somali refugees in Minnesota. Soc Psychiatry Psychiatr Epidemiol. 2010;46:481–93.

41. Bhui K, Warfa N. Trauma, khat and common psychotic symptoms among Somali immigrants: A quantitative study. J Ethnopharmacol. 2010;132(3):549–53.

42. Al-Motarreb A, Al-Habori M, Broadley KJ. Khat chewing, cardiovascular diseases and other internal medical problems: The current situation and directions for future research. J Ethnopharmacol. 2010;132(3):540–8.

43. Al-Habori M. The potential adverse effects of habitual use of Catha edulis (khat). Expert Opin Drug Saf. 2005;4(6):1145–54.

44. Date J, Tanida N, Hobara T. Qat chewing and pesticides: a study of adverse health effects in people of the mountainous areas of Yemen. Int J Environ Health Res. 2004;14(6):405–14.

45. Daba D, Hymete A, Bekhit AA, Mohamed AM, Bekhit Ael-D. Multi residue analysis of pesticides in wheat and khat collected from different regions of Ethiopia. Bull Environ Contam Toxicol. 2011;86(3):336–41.

46. Halboub E, Dhaifullah E, Abdulhuq M. Khat chewing and smoking effect on oral mucosa: a clinical study. Acta Med (Hradec Kralove). 2009;52(4):155–8.

47. Lukandu OM, Koech LS, Kiarie PN. Oral lesions induced by chronic khat use consist essentially of thickened hyperkeratinized epithelium. Int J Dent. 2015;2015:104812.

48. Getahun W, Gedif T, Tesfaye F. Regular khat (Catha edulis) chewing is associated with elevated diastolic blood pressure among adults in Butajira, Ethiopia: a comparative study. BMC Public Health. 2010;10:390.

49. Al Suwaidi J, Ali WM, Aleryani SL. Cardiovascular complications of Khat. Clin Chim Acta. 2013;419:11–4.

50. Vanwalleghem IE, Vanwalleghem PW, De Bleecker JL. Khat chewing can cause stroke. Cerebrovasc Dis. 2006;22(2-3):198–200.

51. Mohammed A, Engidawork E. Reproductive parameters are differentially altered following subchronic administration of Catha edulis Forsk (Khat, Celastraceae) extract and cathinone in male rats. J Ethnopharmacol. 2011;134(3):977–83

52. Chapman MH, Kajihara M, Borges G, O'Beirne J, Patch D, Dhillon AP, et al. Severe, acute liver injury and khat leaves. N Engl J Med. 2010;362(17):1642–4.

53. Mwenda JM, Arimi MM, Kyama MC, Langat DK. Effects of khat (Catha edulis) consumption on reproductive functions: a review. East Afr Med J. 2003;80(6):318–23.

54. Nyongesa AW, Oduma JA, Nakajima M, Odongo HO, Adoyo PA, al'Absi M. Acute and sub-chronic effects of purified cathinone from khat (Catha edulis) on behavioural profiles in vervet monkeys (Chlorocebus aethiops). Metab Brain Dis. 2013;29(2):441-9.

55. Nyongesa AW, Oduma JA, Nakajima M, Odongo HO, Adoyo PA, al'Absi M. Dose-response inhibitory effects of purified cathinone from khat (Catha edulis) on cortisol and prolactin release in vervet monkeys (Chlorocebus aethiops). Metab Brain Dis. 2013;29(2):451-8.

56. Colzato LS, Ruiz MJ, van den Wildenberg WP, Hommel B. Khat use is associated with impaired working memory and cognitive flexibility. PLoS One. 2011;6(6):e20602.

57. Hoffman R, Al'Absi M. Khat use and neurobehavioral functions: suggestions for future studies. J Ethnopharmacol. 2010; 132(3):554–63.

58. Hoffman R, Al'absi M. Concurrent use of khat and tobacco is associated with verbal learning and delayed recall deficits. Addiction. 2013;108(10):1855–62.

59. Bongard S, al'Absi M, Khalil NS, Al Habori M. Khat use and trait anger: effects on affect regulation during an acute stressful challenge. Eur Addict Res. 2011;17(6):285–91.

60. Nakajima M, al'Absi M. Psychosocial deterrents of tobacco and khat use among men and women. Public Health. 2013;127(7):684–6.

61. al'Absi M, Nakajima M, Dokam A, Sameai A, Alsoofi M, Saem Khalil N. Concurrent tobacco and khat use is associated with blunted cardiovascular stress response and enhanced negative mood: a cross-sectional investigation. Hum Psychopharmacol. 2014;29(4):307–15.

62. Global Health Risks: Mortality and burden of disease attributable to selected major risks. Geneva: World Health Organization; 2009.

63. Al-Sanosy RM, Mahfouz MS, Gaffar AM. Khat chewing habit among school students of Jazan region, Saudi Arabia. PLoS One. 2013;8(6):e65504.

64. Al-Sanosy RM. Pattern of khat abuse and academic performance among secondary school and college students in Jazan region, Kingdom of Saudi Arabia (KSA). J Family Community Med. 2009;16(3):89–95.

65. Sheikh KA, El-Setouhy M, Yagoub U, Alsanosy R, Ahmed Z. Khat chewing and health related quality of life: cross-sectional study in Jazan region, Kingdom of Saudi Arabia. Health Qual Life Outcomes. 2014;12:44.

66. Alsanosy RM, Mahfouz MS, Gaffar AM. Khat chewing among students of higher education in Jazan region, Saudi Arabia: prevalence, pattern, and related factors. BioMed Res Int. 2013;2013:487232.

67. Mahfouz MS, Alsanosy RM, Gaffar AM. The role of family background on adolescent khat chewing behavior in Jazan Region. Ann Gen Psychiatry. 2013;12(1):16.

68. Alsanusy R, El-Setouhy M. Why would khat chewers quit? An in-depth, qualitative study on Saudi Khat quitters. Subst Abus. 2013;34(4):389–95.

69. Abednego M, Veltrup C, Warsame AH, Isse MM, Widmann M, Ndetei D, et al. Developing an integrated treatment for PTSD and khat dependence: results from a case series among Somali refugees. Paper presented at the XIV Conference of European Society for Traumatic Stress Studies, 10-13 June 2015, Vilnius, Lithuania.

70. Widmann M, Veltrup C, Apondi B, Warsame AH, Abednego M, Ndetei D, et al. Brief intervention to reduce khat consumption: Do clients with PTSD show smaller effects? Paper presented at the XIV Conference of European Society for Traumatic Stress Studies, 10-13 June 2015, Vilnius, Lithuania.

71. Odenwald M, Hinkel H, Schauer E, Neuner F, Schauer M, Rockstroh B, et al. The effect of khat on psychotic disorders: the validation of a measurement method for clinical practice in Somalia. Poster presented at the CPDD 70th Annual Scientific Meeting, San Juan, Puerto Rico, 14-19 June, 2008.

72. WHO Expert Committee on Drug Dependence. Thirty-fourth report. Geneva: World Health Organization; 2006:36 (Technical Report Series No. 942).

73. van Amsterdam J, Opperhuizen A, Koeter M, van den Brink W. Ranking the harm of alcohol, tobacco and illicit drugs for the individual and the population. Eur Addict Res. 2010;16(4):202–7.

74. Nutt DJ, King LA, Phillips LD; Independent Scientific Committee on Drugs. Drug harms in the UK: a multicriteria decision analysis. Lancet. 2010;376(9752):1558–65.

75. Report of the Sixth Meeting of the Regional Advisory Panel on Impact of Drug Abuse (RAPID 6), Cairo, Egypt, 16-19 October 2007. Cairo: World Health Organization Regional Office for the Eastern Mediterranean; 2008:16 (Key messages on khat) (http://apps.who.int/iris/bitstream/10665/115923/1/who_em_mnh_181_e_en.pdf, accessed 13 December 2016).

76. EMCDDA. Khat use in Europe: implications for European policies. Drugs in Focus - Briefing of the European Monitoring Centre for Drugs and Drugs Addiction. Lisbon: European Monitoring Centre for Drugs and Drugs Addiction; 2011.

77. Odenwald M, Hinkel H, Schauer E, Neuner F, Schauer M, Elbert TR, et al. The consumption of khat and other drugs in Somali combatants: a cross-sectional study. PLoS Med. 2007;4(12):e341.

78. Kraagegaard I. Linking social work and treatment efforts in connection with khat addiction in diaspora. Paper presented at the ESF-LiU conference "The changing use and misuse of Catha edulis (khat) in a changing world: tradition, trade and tragedy". Linköping, Sweden, 5-9 October 2009.

79. Al-Khalil IB. Aarhus reaches out to khat addicts. Aarhus, Denmark: Aarhus Municipality; 2010:12.

80. Abdi YA. Khat -en tuggande bomb [Khat – a chewing bomb]. Stockholm: Vardguiden; 2012:10–1.

81. Giannini AJ, Miller NS, Turner CE. Treatment of khat addiction. J Subst Abuse Treat. 1992;9(4):379–82.

82. Humeniuk R, Henry-Edwards S, Ali R, Poznyak V, Monteiro M. The ASSIST-linked brief intervention for hazardous and harmful substance use: manual for use in primary care. Geneva: World Health Organization; 2010.

Review

Use of amphetamine-type stimulants in the Islamic Republic of Iran, 2004–2015: a review

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تعاطي المنبهات من نمط الأمفيتامينات في جمهورية إيران الإسلامية: استعراض

بيرنج شادلو، معصومة أمين-إسماعيلي، مينو هفت-بارادران، علي رضا نوروزي، رضا غوربان-جهرومي، أفرين رحيمي-موفاغار

الخلاصة: المنبهات من نمط الأمفيتامينات هي ثاني أكثر المخدرات غير المشروعة شيوعاً حول العالم، بعد القنب. وقد زاد إنتاج هذا النوع من المنبهات في شتَّى أرجاء العالم، ومن بينها الشرق الأوسط، والغرض من هذا الاستعراض هو تقييم الوضع الراهن لتعاطي المنبهات من نمط الأمفيتامينات في جمهورية إيران الإسلامية. ويَرِد في ثنايا هذا التقييم دراسة وطنية حول عموم السكان، ودراسة لتقدير حجم المشكلة على الصعيد الوطني بطرق غير مباشرة، و16 دراسة لطلاب الجامعات، و5 دراسات لطلاب المدارس، ودراستين عن فئات سكانية أخرى محددة، والعديد من الدراسات التي أجريت على فئات سكانية مختلفة ممن يتعاطون المخدرات. وتشير النتائج إلى أن الإبلاغ الذاتي عن تعاطي الأمفيتامينات وحبوب النشوة (إكستاسي) في عام 2016 يقل عن 1٪ بين عموم السكان وطلاب الجامعات والمدارس الثانوية، إلا أن معدل انتشار الأمفيتامينات مرتفع في فئات بعينها، وكانت هناك زيادة في نسبة من يتعاطون المنبهات من نمط الأمفيتامينات في صفوف المترددين على مراكز العلاج من الإدمان. وتنذر نتائج هذا الاستعراض بالحاجة إلى إجراء دراسات وبائية أعلى من حيث الجودة، فضلاً عن رصد أدق لتعاطي المنبهات في الفئات السكانية المختلفة.

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 < 1% in the general population and university and high-school students, but the prevalence was higher in certain groups. There has also been an increase in the proportion of ATS users among clients of drug treatment centres. The findings highlight the need for high quality epidemiological studies and closer monitoring of stimulant use in different populations.

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.

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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

Table 1 Characteristics of the studies on stimulant use among high-school students, university students and other young populations

Author (Date)	Language of report	Year of study	City/ province	Sample size	Response rate (%)	Settings/participants	Mean age (range) (years)	Sampling	Self-report/ Anonymous
University students									
Moasheri et al. (2007) (*20*)	Farsi	2004	Birjand	536	NS	Azad University medical sciences, other sciences/ undergraduate students	20.6 (NS)	Multistage random	NS
Amiri et al. (2009) (*21*)	English	2005	Astara	1380	88.8	Azad University/ undergraduate students	24.2 (18–46)	Stratified random	Yes/Yes
Zarrabi et al. (2009) (*24*)	English	2005–2006	Rasht	827	NS (2.2% incomplete questionnaires)	Medical sciences university/ undergraduate students	22.1 (14–40)	Simple Sampling	Yes/Yes
Taremian et al. (2008) (*45*)	Farsi	2005–2006	Tehran	2997	NS	6 universities of other sciences/undergraduate students	NS	Probability sampling	Yes/Yes
Mansourian et al. (2009) (*46*)	Farsi	2006	Gorgan	300	NS	Medical and other sciences university/under and postgraduate students	20.95 (18–29)	Simple random	NS
Amin-Esmaeili et al. (2016) (*25*)	English	2006	Tehran	1761	96.8	Medical sciences university/ undergraduate students	20.4 (15–43)	Census	Yes/Yes
Shams Alizadeh et al. (2008) (*22*)	Farsi	2006–2007	Kurdistan	1186	89.2	Medical sciences university/ under and postgraduate	NS	Census	Yes/Yes
Amin-Esmaeili et al. (2016) (*25*)	English	2007	Tehran	1741	96.1	Medical sciences university/ undergraduate students	20.2 (16–41)	Census	Yes/Yes
Sajjadi et al. (2009) (*47*)	Farsi	2008	Gonabad	350	100	Medical sciences, Payam-Noor and Azad University/ undergraduate students	21.9 (NS)	Multistage random	NS
Amin-Esmaeili et al. (2016) (*25*)	English	2008	Tehran	1755	90.7	Medical sciences university/ undergraduate students	20.2 (17–42)	Census	Yes/Yes
Amin-Esmaeili et al. (2016) (*25*)	English	2009	Tehran	1568	90.6	Medical sciences university/ undergraduate students	20.1 (15–40)	Census	Yes/Yes
Taremian et al. (2014) (*45*)	English	2009–2010	Tehran	4000	NS (418 incomplete questionnaires)	Medical sciences university/ under and post-graduate	NS	Stratified random	Yes/Yes
Barati et al. (2012) (*15*)	Farsi	2011	Hamadan	500	80	Medical sciences, other sciences and Azad University/ under and postgraduate students	NS (21–45)	Probability sampling	Yes/Yes
Pirzadeh et al. (2012) (*23*)	English	2011	Isfahan	267	100	Medical sciences university/ undergraduate students	20.95 (NS)	Stratified random	No/No

Table 1 Characteristics of the studies on stimulant use among high-school students, university students and other young populations (*concluded*)

Author (Date)	Language of report	Year of study	City/ province	Sample size	Response rate (%)	Settings/participants	Mean age (range) (years)	Sampling	Self-report/ Anonymous
Abbasi Ghahremanloo (2014) (*48*) and Abbasi-Ghahramanloo et al. (2015) (*18*)	English	2012–2013	Tehran	2212	90.5	Medical sciences university/ undergraduate	21.16 (16–44)	Stratified random	Yes/Yes
Safiri et al. (2016) (*19*)	English	2015	Tabriz	1777	93.7	Medical sciences university/ under and post-graduate students	NS	Multistage random	Yes/NS
Roshandel et al. (2010) (*17*)	English	NS	Guilan	254	NS	Medical sciences university	NS	Stratified random	Yes/NS
High-school students									
Najafi et al. (2005) (*49*)	Farsi	2003–2004	Rasht	1500	NS (26 incomplete questionnaires)	High school/1st–3rd grade and pre-university students	NS	Multistage random	Yes/Yes
Mohammadkhani (2012) (*26*)	Farsi	2005–2006	10 provinces	2680	NS (150 incomplete questionnaires)	Middle & high School/ 2nd and 3rd middle School and 1st grade of high school students	(13–18)	Multistage random	Yes/NS
Naderifar et al. (2011) (*50*)	Farsi	2008	Zahedan	837	NS	High school/pre-university students	18	Multistage random	Yes/NS
Alaee et al. (2011) (*27*)	Farsi	2010	Karaj	447	NS	High school/1st–3rd grade students	16.5 (NS)	Multistage random	Yes/Yes
Bidel et al. (2014) (*28*)	Farsi	2011–2012	Ilam	1000	93.7	High school/2nd grade students	16.2 (12–22)	Stratified random	Yes/Yes
Other young populations									
Barooni et al. (2008) (*29*)	Farsi	2004	Tehran	2000	95.2	Coffee shops/youth 15–25 years	21.03 (15–25)	Non-probability	Yes/NS
Angoorani et al. (2012) (*30*)	English	2007–2008	Tehran	930	90.6	Gym clubs/male body-builders	25.2 (16–40)	Multistage random	No/No

Table 2 Prevalence of stimulant use among university students, 2004–2015

Author (Date)	Study year	Number of respondents	Timeframe	Prevalence (%)		
				Males	Females	Total
Methamphetamine						
Taremian et al. (2014) (*16*)	2009–2010	3582 (NS)	Lifetime	1.6	0.6	1
Barati et al. (2012) (*15*)	2011	400 (240 males, 160 females)	Lifetime	NS	NS	18
			Past year			10.5
			Past month			5.5
Safiri et al. (2016) (*19*)	2015	1730 (705 males, 1025 females)	Past year	2.3	0.3	1.1
Roshandel et al. (2010) (*17*)	NS	254 (167 males, 87 females)	NS* (probably lifetime)	NS	NS	0.4
Amphetamine						
Roshandel et al. (2010) (*17*)	NS	254 (167 males, 87 females)	NS (probably lifetime)	NS	NS	0.8
Amphetamine/ methamphetamine						
Abbasi-Ghahramanloo et al. (2015) (*18*)	2012–2013	1992 (613 males, 1379 females)	Lifetime	0.8	0.1	0.3
			Past year	0.3	0.1	0.2
			Past month	0.0	0.1	0.1
Ecstasy						
Moasheri et al. (2007) (*20*)	2004	536 (386 males,, 150 females)	Lifetime	11.7	1.6	4.3
Amiri et al. (2009) (*21*)	2005	1226 (657 males, 569 females)	Lifetime	7.4	3.6	5.6
Zarrabi et al. (2009) (*24*)	2005–2006	827 (532 males, 295 females)	Lifetime	NS	NS	2.05
			Past month			0.72
Mansourian et al. (2009) (*46*)	2006	300 (NS)	Lifetime	NS	NS	3.0
Shams Alizadeh et al. (2008) (*22*)	2006–2007	1056 (614 males, 427 females)	Lifetime	4.4	1.1	2.7
			Past year	NS	NS	1.4
			Past month	NS	NS	0.3
			Continuous	NS	NS	0.1
Sajjadi et al. (2009) (*47*)	2008	350 (192 males, 158 females)	Lifetime	NS	NS	6.0
Taremian et al. (2014) (*16*)	2009–2010	3582 (NS)	Lifetime	2.3	0.6	1.2
Pirzadeh et al. (2012) (*23*)	2011	267 (105 males, 162 females)	Lifetime	3.8	1.2	2.2
Barati et al. (2012) (*15*)	2011	400 (240 males, 160 females)	Lifetime	NS	NS	8.5
			Past year			6.5
			Past month			4.5
Abbasi-Ghahramanloo et al. (2015) (*18*)	2012–2013	1992 (613 males, 1379 females)	Lifetime	0.8	0.1	0.3
			Past year	0.5	0.1	0.2
			Past month	0.2	0.1	0.2
Ritalin						
Taremian et al. (2014) (*16*)	2009–2010	3582 (NS)	Lifetime	7.9	3.4	5.0
Abbasi-Ghahramanloo et al. (2015) (*18*)	2012–2013	1992 (613 males, 1379 females)	Lifetime	7.5	2.0	3.7
			Past year	5.1	1.7	2.7
			Past month	1.0	0.7	1.0
Safiri et al. (2016) (*19*)	2015	1730 (705 males, 1025 females)	Past year	4.1	1.4	2.5
Roshandel et al. (2010) (*17*)	NS	254 (167 males, 87 females)	NS (probably lifetime)	NS	NS	2.0

Table 2 Prevalence of stimulant use among university students, 2004–2015 (*concluded*)

Author (Date)	Study year	Number of respondents	Timeframe	Prevalence (%)		
				Males	Females	Total
ATS (ecstasy or methamphetamine)						
Taremian et al. (2008) (*45*)	2005–2006	2989 (1133 males, 1856 females)	Lifetime	NS	NS	0.7
ATS (ecstasy, Ritalin, methamphetamine)						
Amin-Esmaeili et al. (2016) (*25*)	2006	1700 (577 males, 1123 females)	Lifetime	2.3	1.1	1.5
			Past year	1.6	0.7	1.0
			Past month	0.5	0.1	0.2
			Daily	0.2	0.0	0.06
Amin-Esmaeili et al. (2016) (*25*)	2007	1602 (571 males, 1031 females)	Lifetime	4.2	1.7	2.6
			Past year	2.3	1.4	1.7
			Past month	0.4	0.8	0.6
			Daily	0.0	0.3	0.2
Amin-Esmaeili et al. (2016) (*25*)	2008	1644 (555 males, 1089 females)	Lifetime	3.2	1.3	1.9
			Past year	2.2	0.6	1.2
			Past month	0.5	0.2	0.3
			Almost daily	0.4	0.0	0.1
Amin-Esmaeili et al. (2016) (*25*)	2009	1528 (501 males, 1027 females)	Lifetime	2.2	0.9	1.3
			Past year	0.6	0.4	0.5
			Past month	0.2	0.0	0.06
			Daily	0	0	0
Stimulants or hallucinogens						
Barati et al. (2012) (*15*)	2011	400 (240 males, 160 females)	Lifetime	24	21	22.8

ATS = amphetamine-type stimulants; NS = not specified.

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

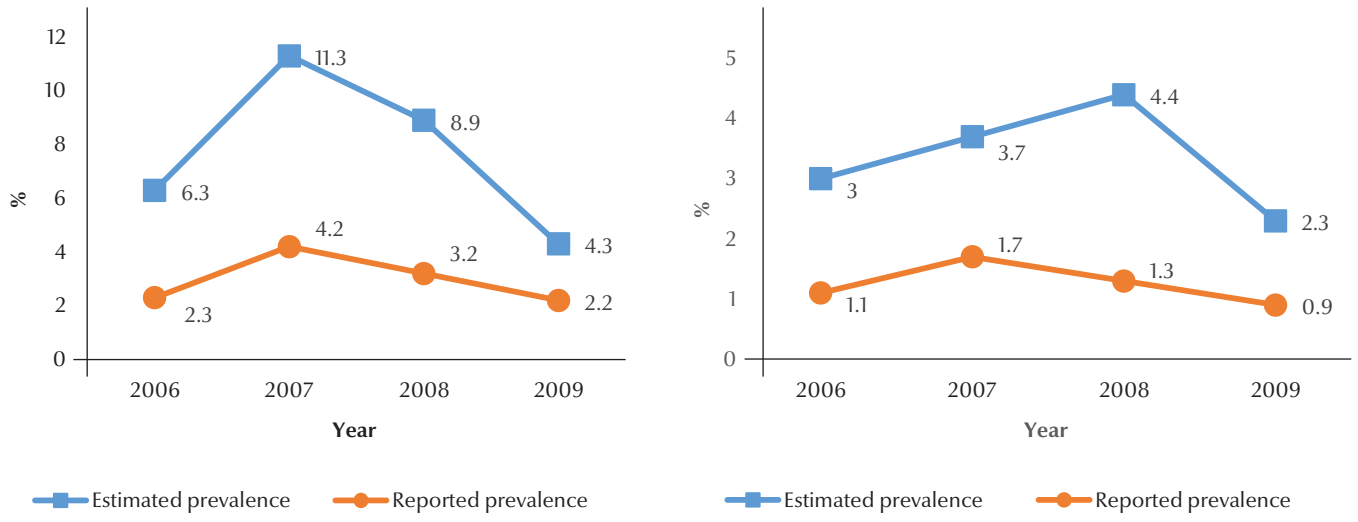

Figure 1 Prevalence of lifetime stimulant use according to self-report and indirect estimates among male and female students at Tehran University of Medical Sciences, 2006/09 (*14*)

Table 3 Prevalence of stimulant use in high-school students, 2004-

Author (Date)	Study year	Number of respondents	Timeframe	Prevalence (%)		
				Males	Females	Total
Methamphetamine						
Mohammadkhani (2012) (*26*)	2005/06	2538 (1283 males, 1255 females)	Lifetime	0.4	0.2	0.3
			Past year	0.3	0.1	0.2
Alaee et al. (2011) (*27*)	2010	447 (208 males, 239 females)	Lifetime	1.1	0.0	0.4
Bidel et al. (2014) (*28*)	2011/12	Male: 937	Lifetime	2.1	–	–
Ecstasy						
Najafi et al. (2005) (*49*)	2003/04	1474 (751 males, 723 females)	Lifetime	0.7	0.6	0.7
Mohammadkhani (2012) (*26*)	2005/06	2538 (1283 males, 1255 females)	Lifetime	1.5	0.2	0.8
			Past year	1.0	0.2	0.6
Naderifar et al. (2011) (*50*)	2008	837 (539 males, 298 females)	Lifetime	0	0	0
Alaee et al. (2011) (*27*)	2010	447 (208 males, 239 females)	Lifetime	3.9	0.4	2.0
Bidel et al. (2014) (*28*)	2011/12	937 (males)	Lifetime	2.7	–	–

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.

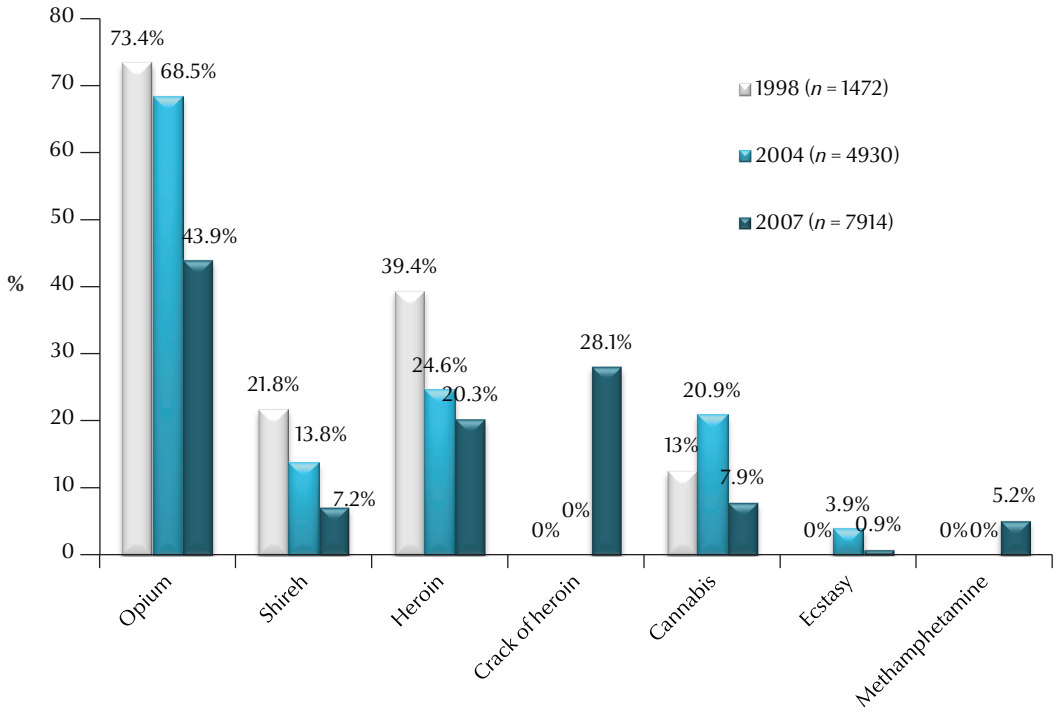

Figure 2 **Prevalence of drug use reported in 3 national surveys among people with drug dependence according to type of drug used (*31–33*). Shireh is the condensed extract of remnants of smoked opium.**

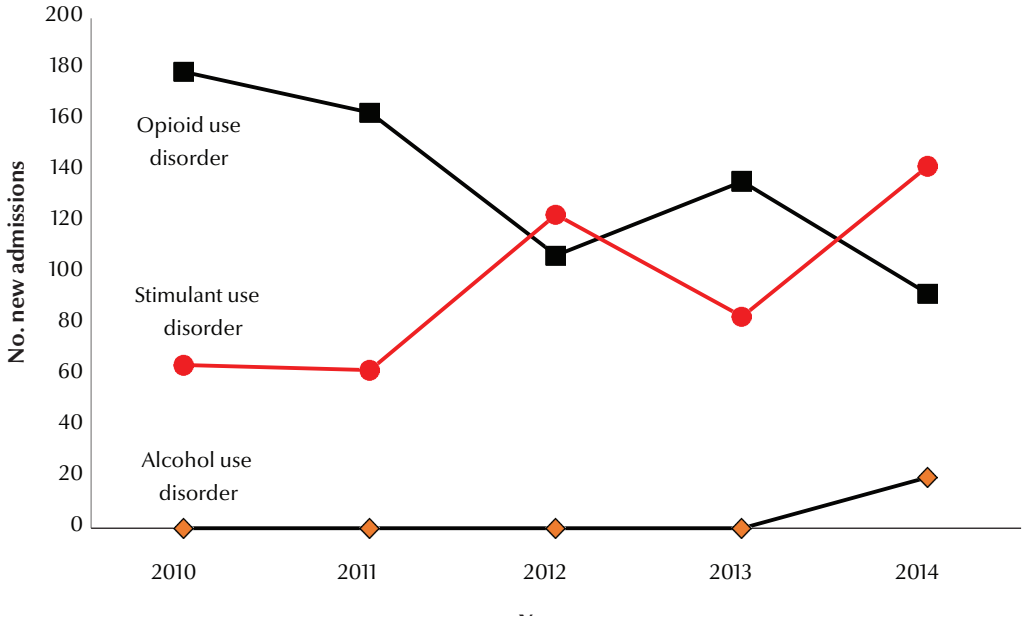

Figure 3 **Number of new admissions to the treatment clinic of the Iranian National Center for Addiction Studies clinic according to drug use disorder, 2010/14**

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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References

1. World Drug Report. Vienna: United Nations Office on Drugs and Crime; 2016.
2. World Drug Report. Vienna: United Nations Office on Drugs and Crime; 2014.
3. Global synthetic drugs assessment. New York: United Nations; 2014.
4. Drug Report 2015. Tehran: Iran Drug Control Headquarters (DCHQ); 2015.
5. Yasami MT, Shahmohammadi D, Naghavi M, Bagheri-Yazdi A, Zojaji A, Rahimi-Movaghar A, et al. Epidemiology of drug abuse in I.R. Iran. Tehran: Ministry of Health and Drug Control Headquarters; 2002.
6. Rahimi-Movaghar A, Amin-Esmaeili M, Sharifi V, Hajebi A, Hefazi M, Rad Goodarzi R, et al. The Iranian Mental Health Survey: design and field procedures. Iran J Psychiatry. 2014;9(2):96–109.
7. Sharifi V, Amin-Esmaeili M, Hajebi A, Motevalian A, Radgoodarzi R, Hefazi M, et al. Twelve-month prevalence and correlates of psychiatric disorders in Iran: the Iranian Mental Health Survey, 2011. Arch Iran Med. 2015;18(2):76–84.
8. Diagnostic and Statistical Manual of Mental Disorders (DSM-5®). Arlington (VA): American Psychiatric Association; 2013.
9. Amin-Esmaeili M, Rahimi-Movaghar A, Sharifi V, A. Hajebi, R. Radgoodarzi, R. Mojtabai, et al. Epidemiology of illicit drug use disorders in Iran: prevalence, correlates, comorbidity and service utilization results from the Iranian Mental Health Survey. Addiction. 2016;111(10):1836–47.
10. Rahimi-Movaghar A, Sharifi V, Motevalian A, Amin-Esmaeili M, Hadjebi A, Rad Goodarzi R, et al. Iranian National Mental Health Survey: prevalence, severity and costs of mental disorders and service utilization (IranMHS). Tehran: Mehrsa; 2014.
11. Nikfarjam A, Shokoohi M, Shahesmaeili A, Haghdoost AA, Baneshi MR, Haji-Maghsoudi S, et al. National population size estimation of illicit drug users through the network scale-up method in 2013 in Iran. Int J Drug Policy. 2016;31: 147–52.
12. Ziaaddini, H., T. Ziaaddini, and N. Nakhaee, Pattern and trend of substance abuse in eastern rural Iran: A household survey in a rural community. J Addic. 2013: 297378-297378.
13. Rahimi-Movaghar, A., E. Sahimi Izadian, and M. Younesian, The drug use situation in university students in Iran: A literature review. Payesh, J Iranian Institute Health Sciences Research. 2006; 2(5): 83-104.
14. Rahimi-Movaghar A, Khastoo G, Moinolghorabaei M, Yunesian M, Sadeghi AR. Use of stimulant substances among university students in Tehran: a qualitative study. Iran J Psychiatry Behav Sci. 2011;5(2):32–42.
15. Barati M, Allahverdipour H, Jalilian F. Prevalence and predictive factors of psychoactive and hallucinogenic substance abuse among college students. J Fundamentals Mental Health. 2012;13(4):374–83.
16. Taremian F, Bolhari J, Peyravi H, Asgari A. Drug use prevalence among students of universities of medical sciences in Tehran. Research on Addiction. 2014;7(28):9–21.
17. Roshandel A, Safavi M, Rafienejad-Zahra Kheiri A, Mohamadi A. Prevalence of substance use and depression among the university students in Iran. Eur Psychiatry. 2010; 25(Suppl.):1262.
18. Abbasi-Ghahramanloo A, Fotouhi A, Zeraati H, Rahimi-Movaghar A. Prescription drugs, alcohol, and illicit substance use and their correlations among medical sciences students in Iran. Int J High Risk Behav Addict. 2015;4(1):e21945.
19. Safiri S, Rahimi-Movaghar A, Yunesian M, Sadeghi-Bazargani H, Shamsipour M, Mansournia MA, et al. Subgrouping of risky behaviors among Iranian college students: a latent class analysis. Neuropsychiatr Dis Treat. 2016;12:1809–16.
20. Moasheri, N, Miri M, Mashreghi Moghadam H, Eslami M. A study of Birjand University students' knowledge and attitude towards taking Ecstasy pills. J Birjand Univ Med Sci. 2007;13(4):9–15.
21. Amiri ZM, Shakib AJ, Moosavi AK. Prevalence and risk factors of ecstasy use among college students in Astara, Islamic Republic of Iran. East Mediterr Health J. 2009;15(5):1192–200.
22. Shams Alizadeh N, Moghadam M, Mohsenpour B, Rostami Gooran N. Prevalence of substance abuse in medical students of Kurdistan University. Scientific J Kurdistan Univ Med Sci. 2008;13(2):18–26.
23. Pirzadeh A, Mirkarimi K, Kamran A, Fathian Z. Exploring practice of Isfahan University of Medical Science students regarding using ecstasy based on health belief model in 2011. J Educ Health Promot. 2012;1:32.
24. Zarrabi H, Najafi K, Kafi M, Shirazi M. Substance use among students of Guilan University of Medical Sciences in Iran in 2005-2006. Acta Medica Iranica, 2009. 47(6):473–8.
25. Amin-Esmaeili M, Yunesian M, Sahimi-Izadian E, Moinolghorabaei M, Rahimi-Movaghar A. The Prevalence of illicit substance use among students of medical sciences in Tehran: results from four repeated surveys from 2006 to 2009. J Child Adolesc Subst Abuse. 2016;26(2):1–10.
26. Mohammadkhani S. Prevalence of cigarette smoking, alcohol drinking and illegal drugs use among Iranian adolescents. J Kerman Univ Med Sci. 2012;19(1):32–48.
27. Alaee R, Kadivar P, Mohammadkhani S, Sarami G, Alaee S., The prevalence of tobacco, hubble-bubble, alcoholic drinks, drugs, and stimulants among high-school students. Research on Addiction. 2011;5(18):99–114.
28. Bidel Z, Nazarzadeh M, SaburMohamadi M, Zareimanesh E, Tazval J, Mohamadi E, et al. Smoking stages, prevalence of drug abuse and role of associated psychological and social factors: a study on male high school students in Ilam city, Iran. J Kerman Univ Med Sci. 2014; 21(1): 81–93.
29. Barooni S. Mehrdad R, Akbari E. A survey of ecstasy use among 15–25 year-olds in five areas of Tehran. Tehran Univ Med Sci J. 2008;65(11):49–54.
30. Angoorani, H, Narenjiha H, Tayyebi B, Ghassabian A, Ahmadi G, Assari S. Amphetamine use and its associated factors in body builders: a study from Tehran, Iran. Arch Med Sci. 2012;8(2):362–7.
31. Razaghi EM, Rahimi-Movaghar A, Hosseini M, Madani S, Chatterjee A. Rapid situation assessment of drug abuse in Iran 1999. Tehran: Iranian Welfare Organization and UNDCP; 1999.
32. Narenjiha H, Rafiei H, Baghestani AR, Nouri R, Shirinbayan P, Farhadi MH, et al. [Rapid situation assessment of drug abuse in Iran (year 2004): research]. Tehran: Dariush Institute; 2005 [In Farsi].
33. Narenjiha H, Rafiei H, Baghestani AR, Nouri R, Ghafouri B, Soleimaninia L, et al., editors. [Rapid situation assessment of drug abuse in Iran (year 2007)]. Tehran: Danjeh Publications; 2009 [In Farsi].
34. Malekinejad M, Rahimi-Movaghar A, Noroozi A, Page K, Mohraz M, McFarland W, et al. Exploring factors influencing crucial drug transitions among young drug users, in Tehran, Iran (Final report). San Francisco: University of California, San Francisco (UCSF) and Tehran: Iranian Research Center for HIV/AIDS (IRCHA) 2013.
35. Sara GE, Burgess PM, Harris MG, Malhi GS, Whiteford HA. Stimulant use and stimulant use disorders in Australia: findings from the National Survey of Mental Health and Wellbeing. Med J Aust. 2011;195(10): 607–9.

36. Sara G, Burgess P, Harris M, Malhi GS, Whiteford H, Hall W. Stimulant use disorders: characteristics and comorbidity in an Australian population sample. Aust N Z J Psychiatry. 2012;46(12):1173–81.
37. Substance Abuse and Mental Health Services Administration. Results from the 2013 national survey on drug use and health: summary of national findings. Rockville: Substance Abuse and Mental Health Services Administration; 2014.
38. EMCDDA (European Monitoring Centre for Drugs and Drug Addiction). European drug report, trends and developments. Luxembourg: EMCDDA; 2015.
39. Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE, Miech RA. Monitoring the Future national survey results on drug use, 1975–2013: Volume II, college students and adults ages 19–55. Ann Arbor: Institute for Social Research, The University of Michigan; 2014:424.
40. Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE, Miech RA. Monitoring the Future national survey results on drug use, 1975–2013. Volume I, Secondary school students. Ann Arbor: Institute for Social Research, The University of Michigan; 2014:630.
41. Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, et al. The 2011 ESPAD report: substance use among students in 36 European countries. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs (CAN); 2012.
42. Omidvar T, Sharifi V. Amphetamine psychosis and eye autoenucleation. Aust N Z J Psychiatry. 2012;46(1):71.
43. Barr AM, Noroozi A. Methamphetamine-associated psychosis: a new health challenge in Iran. DARU J Pharmaceut Sci. 2013;21(1):1–3.
44. Rahimi-Movaghar A, Amin-Esmaeili M, Safarcherati A, Sarami H, Rafiey H. A scientometric study of Iranian scientific productions in the field of substance use and addiction research in the years 2008 to 2012. Addict Health. 2015;7(3–4):99–108.
45. Taremian F, Bolhari J, Pairavi H, Ghazi Tabatabaeii M. the prevalence of drug abuse among university students in Tehran. Iran J Psychiatry Clin Psychology. 2008;13(4):335–42.
46. Mansourian M, Kargar M, Behnampoor N, Rahimzade H, Ghorbani M. Knowledge and attitude of university students about ecstasy in Gorgan – Iran. J Gorgan Uni Med Sci. 2009;10(4):60–3.
47. Sajjadi M, Shariatifar N, Matlabi M, Abbasnezhad A, Basiri K, Nazemi H. The rate of knowledge and attitude toward psychoactive drugs and its abuse prevalence in Gonabad University students. Quarterly Horizon Med Sci. 2009;15(2):58–64.
48. Abbasi Ghahremanloo A. Assessment of prevalence of using psychoactive drugs and addictive substances in students of Tehran University of Medical Sciences and calcification of students with Latent Class Analysis [Thesis]. Tehran: Tehran University of Medical Sciences; 2014.
49. Najafi K, Avakh F, Khalkhali S, Nazifi F, Farahi H, Faghirpour M. The prevalence of substance use among high-school students in Rasht City (Iran). Iran J Psychiatry Clin Psychology. 2005;11(2):233–6.
50. Naderifar M, Ghaljaei F, Akbarizadeh M, Ebrahimi Tabas E. An investigation in knowledge, attitude and performance of high school students regarding ecstasy abuse, Zahedan, 2008. J Fundamentals of Mental Health. 2011;12(48):710–9.

Short communication

Developing an interministerial substance use response strategy for Lebanon: process, content and lessons learned

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تطوير استراتيجية مشتركة بين الوزارات لمكافحة المخدرات والإدمان في لبنان: العملية والمحتوى والدروس المستفادة

ساندرا حجل، نور كيك، ربيع الشماعي، وليد عمار

الخلاصة: تُظهر الأدلة المتعلقة باستخدام المواد المسببة للإدمان في لبنان زيادةً في معدلات الاستخدام، وقلة توفُّر الخدمات المستندة إلى الأدلة العلمية وسهولة محدودة للوصول إليها، ومستوى عال من الوصمة والتمييز تجاه مستخدمي المواد. وتماشياً مع "استراتيجية الصحة النفسية واستخدام المواد المسببة للادمان في لبنان 2015–2020"، استهلّت وزارة الصحة العامة عملية تطوير استراتيجية تركّز على الاستجابة لاستخدام المواد المسببة للادمان للتصدي لهذه التحديات بالتعاون مع وزارة التعليم العالي، ووزارة الداخلية والبلديات، ووزارة العدل ووزارة الشؤون الإجتماعية. نتج عن هذا التعاون إطلاق استراتيجية مشتركة بين الوزارات تشمل ستة مجالات عمل تغطي الطيف الكامل للاستجابة للمواد المسببة للادمان وتتضمن أهدافاً استراتيجية تتصدَّى للتحديات التي تم تحديدها خلال الاجتماعات التشاورية مع الجهات الفاعلة. وأسهمت المبادئ الرئيسية التالية التي اعتُمدت طوال العملية في النجاح في تطوير هذه الاستراتيجية، وهي: الارتكاز على الأدلة والأطر الدولية، وتعظيم مشاركة كافة الجهات الفاعلة، ومنح الأولوية للتوافق الوطني، والحفاظ على المرونة، وتعظيم الشفافية.

ABSTRACT Evidence on substance use in Lebanon shows an increase in usage, limited availability and accessibility to evidence-based services, and high level of stigma and discrimination. In line with the "Mental Health and Substance Use Strategy for Lebanon 2015–2020", the Ministry of Public Health initiated the process of developing a strategy focused on substance use response to address these challenges in collaboration with the Ministries of Education and Higher Education, Interior and Municipalities, Justice and Social Affairs. The result of this process was a strategy launched jointly by the ministries including six domains of action covering the whole spectrum of substance use response with strategic objectives addressing the challenges identified through stakeholders' consultations. The following key principles adopted throughout the process contributed to the successful development of the strategy: building on evidence and international frameworks, maximizing the participation of all stakeholders, prioritising national consensus, maintaining flexibility and maximizing transparency.

Élaboration d'une stratégie interministérielle de réponse à la consommation de substances psychoactives au Liban : processus, contenu et leçons apprises

RÉSUMÉ Les données sur l'utilisation de substances psychoactives au Liban font état d'une augmentation de la consommation, d'une disponibilité et d'une accessibilité limitées de services reposant sur des données scientifiques, ainsi que d'un degré élevé de stigmatisation et de discrimination. Conformément à la « Stratégie sur la santé mentale et l'utilisation de substances psychoactives au Liban 2015-2020 », le ministère de la Santé publique a initié un processus visant à élaborer une stratégie de lutte contre la consommation de substances psychoactives, en collaboration avec les ministères de l'Éducation et de l'Enseignement supérieur, de l'Intérieur et des Municipalités, de la Justice, et des Affaires sociales. Ce processus s'est conclu par le lancement conjoint d'une stratégie par les ministères. Celle-ci inclut six domaines d'action couvrant le spectre complet de la lutte contre les substances psychoactives avec des objectifs stratégiques traitant des problèmes identifiés lors de consultations avec les parties prenantes. Les principes clés suivants, adoptés au cours de ce processus, ont contribué à l'élaboration réussie de la stratégie : exploitation des données et des cadres internationaux existants, maximisation de la participation de

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Introduction

Evidence on substance use in Lebanon shows a high prevalence, early age of initiation, high treatment gap, and increased burden (*1–4*). Affordable and accessible specialized evidence-based quality services remain limited within the health and social welfare sectors, and are mainly delivered in the private sector and centralized, without quality monitoring (*5,6*). Stigma and discrimination, in addition to a low level of public awareness regarding laws and available services, further limit accessibility to services.

Despite the magnitude of the substance use burden, the public health response has been limited. Moreover, the increase of the population residing in Lebanon due to the Syrian crisis has overstretched the health system (*7*). Nevertheless, the crisis has generated an opportunity to synergize efforts between humanitarian organizations and the government to strengthen the existing health system. With this aim, in 2014, the Ministry of Public Health, supported by the World Health Organization (WHO), United Nations Children's Fund (UNICEF) and International Medical Corps (IMC), launched the National Mental Health Programme (NMHP) to reform the mental health system in Lebanon and scale up services. In May 2015, the NMHP launched the first "Mental Health and Substance Use Strategy for Lebanon 2015–2020" (*5*). One key objective in this strategy is the development of a national strategy focused on substance use response (*5*).

Methods

The development process of the Substance Use Response Strategy (Figure 1) was designed and modified throughout to maximize the participation of all relevant stakeholders and ensure universal approval of a common vision for substance use response, along with objectives and actions that are approved by all the main participants.

Stakeholder consultations

The process began with bilateral meetings between the NMHP and stakeholders in the response to substance use to identify opportunities and challenges in the Lebanese context. The identification of challenges and priorities to be addressed continued with a National Consultation during which key persons from relevant ministries, international and local nongovernmental organizations (NGOs), professional associations, healthcare organizations and universities participated. The information gathered from these consultation meetings and from the literature review fed into a situation analysis including assessment of Strengths Weaknesses, Opportunities and Threats.

Drafting

The first draft of the Strategy was developed based on the situation analysis and in line with the WHO Regional Framework for Strengthening Public Health Response to Substance Use. Six domains of action were set with goals for each domain that address the identified critical issues to the strengthening of the substance use response in Lebanon. Strategic objectives were defined under every domain as key measures for the successful achievement of the set goals. An implementation plan was developed in which, for each objective, defined actions were identified with specification of the main actors to be involved in their implementation and the time frame for their achievement. Once the first draft was finalized, it was sent for revision to all involved ministries: Ministries of Social Affairs, Education, Interior

Figure 1. Development process of the Inter-ministerial Substance Use Response Strategy for Lebanon 2016–2021

and Municipalities, and Justice. Bilateral meetings took place between the NMHP and the respective ministries to discuss further the draft and edit it accordingly.

Expert review

The draft was subsequently sent for review to local and international experts. More than 30 experts from a variety of stakeholder groups (UN agencies, local and international organizations, and health professionals) shared their feedback through completing a form designed to prompt feedback on the clarity, relevance, feasibility, content of the strategy and additional suggestions. The draft was revised based on all the feedback received.

Consensus building

A ministerial consensus meeting with the general directors of all ministries involved was held to agree on the latest draft and on the steps forward. Following the latter meeting, a national consensus meeting was organized during which the draft was presented to participants that included representatives and key persons from all stakeholder groups. A compilation of the feedback received from the expert review was presented, in addition to the responses to it, and additional feedback on the draft was gathered from participants.

Public posting

The revised draft was then posted online for review and feedback by the public through an online anonymous feedback form. Once public feedback was addressed, the strategy document was finalized for launching.

Results

The aforementioned multi-step process has led to the launching of the Inter-Ministerial Substance Use Response Strategy for Lebanon 2016–2021, setting tailored domains of actions and goals in line with a core set of values and principles (Table 1). The latter constitute a framework that will guide national efforts for the prevention of substance use disorders; the treatment, rehabilitation and social re-integration of persons with substance use disorders; and harm reduction and supply reduction. Achievement of the goals in every domain of action will assist in reaching the outcomes and in the long-term contribute to the impacts highlighted in Figure 2.

Discussion

Certain key principles were followed throughout the strategy development process and contributed to an output that is tailored as much as possible to the Lebanese context and that addresses the challenges and priorities identified by all stakeholders through evidence-based strategic objectives.

Building on evidence and international guidelines and frameworks

A key principle followed during the strategy formulation was its alignment with international evidence. As such, the strategy was framed in line with the WHO Regional Framework for Strengthening Public Health Response to Substance Use. The strategic objectives under each domain aim at scaling up evidence-based interventions or

Table 1. List of domains of action and their respective goals

	Domain	Goal
Domain 1	Leadership and governance	Strengthen effective leadership and governance for substance use response
Domain 2	Health and social welfare sectors response	Increase the availability and accessibility to high-quality, evidence-based, gender- and age-sensitive prevention, harm reduction, treatment, rehabilitation and social re-integration services while ensuring continuum of care through appropriate case management and interagency coordination.
Domain 3	Supply reduction	Reduce availability of illicit substances through strengthening capacities of relevant governmental bodies
Domain 4	Monitoring and surveillance	Gather evidence-based knowledge systematically to inform substance-use planning and service development
Domain 5	International cooperation	Increase the engagement of all relevant sectors in the international substance use policy discourse
Domain 6	Vulnerable groups	Improve access to equitable evidence-based services for substance-use response for vulnerable groups living in Lebanon

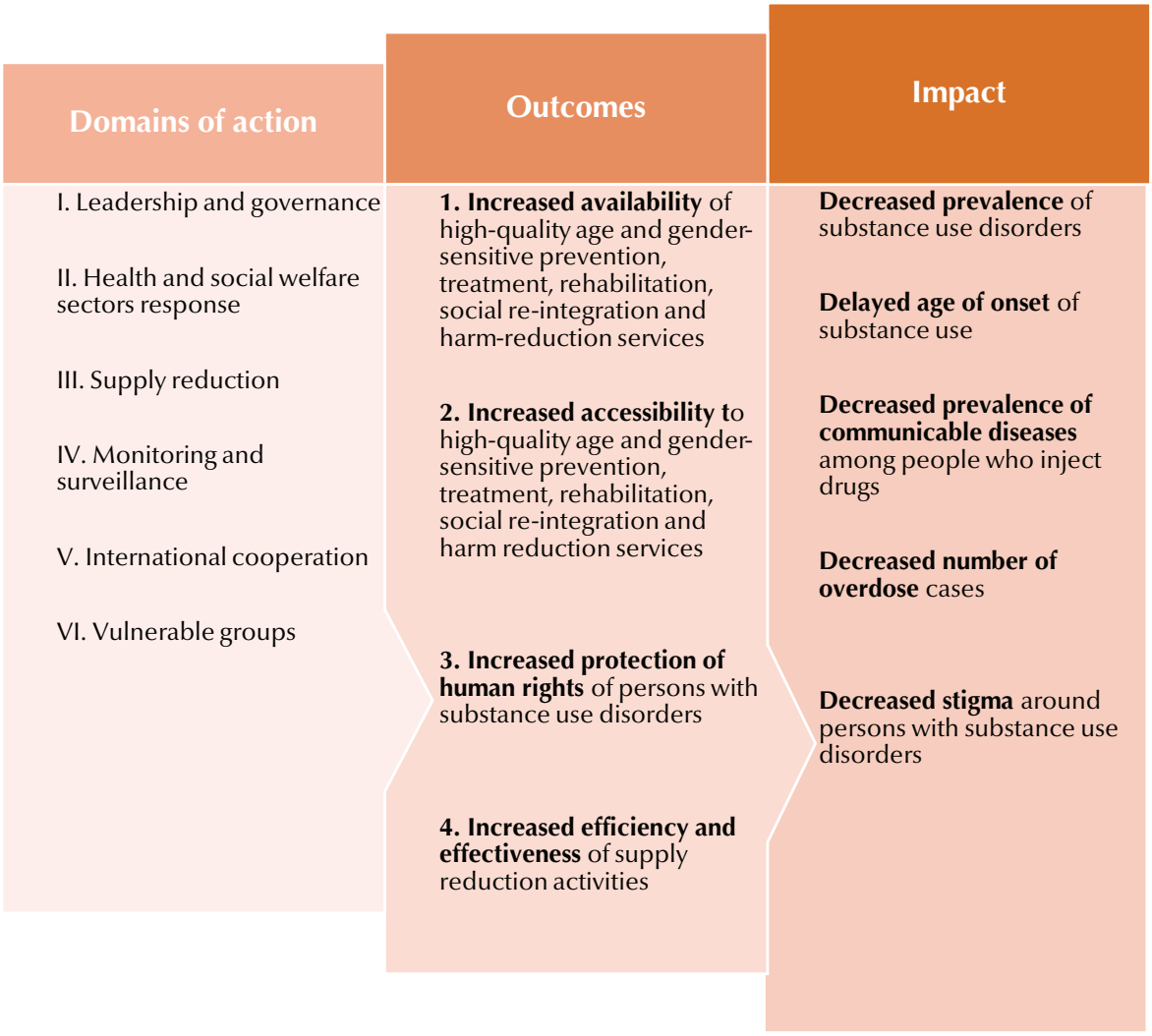

Figure 2. Outcomes and impacts of the Inter-Ministerial Substance Use Response Strategy for Lebanon 2016–2021

building local evidence for effectiveness, feasibility and adaptability of interventions in Lebanon. Furthermore, the feedback received from reviewers was addressed based on its agreement with international evidence, cost-effectiveness, best practices, adaptability to the local context and respect of human rights principles.

Maximizing the participation of all stakeholders in the development process

The involvement of all stakeholders at different stages throughout the process was essential to guarantee consensus over a unified roadmap to guide action towards strengthening the response. The interministerial collaboration was an essential milestone for the strategy development. All involved ministries in the substance use response needed to be involved in the process to ensure common ownership of a comprehensive strategy designed to cover all domains of action in the response with a clear definition of roles and responsibilities. Furthermore, the involvement of local NGOs and experts, current users and the general public provided a grounded perspective on the issues and challenges faced and the potential opportunities and means to address them. The public posting of the strategy draft was a key step to ensure the opportunity for public review. The consequent national consensus reached about the Strategy will contribute to ensure effective coordination and collaboration for its implementation.

Maintaining flexibility in the process and prioritizing national consensus

Many *ad hoc* factors affected the process and the preset timeline for developing this strategy. In particular, the engagement of multiple stakeholders with varying agendas and different operational modes affected the duration of every step of the process. Since the

involvement of all stakeholders is key to the development of a strong policy document, setting realistic timelines and maintaining a margin of flexibility are necessary. Furthermore, while alignment with international frameworks of action is essential, adopting them with flexibility is crucial to ensure that the strategy is responsive to the needs of the country. For instance, two domains of action (supply reduction and vulnerable groups) – additional to those in the WHO Regional Framework – were added to the strategy in response to the needs highlighted through stakeholder consultations. Moreover, health and social sectors responses were grouped under one domain as they are the two major sectors in Lebanon that provide and cover services for persons with substance use disorders. Prevention was set as a subdomain under this latter domain because it was considered to be a key component of the public health and social welfare response and could not be set separately from them. All the above, along with the flexibility in incorporating suggestions of partners, contributed to the successful building of a national consensus around the strategy, which is vital for a more coordinated and unified action.

Maximizing transparency throughout the process

Transparency in strategy development processes is key to ensuring accountability towards all stakeholders. Transparency was maintained throughout the process through multiple actions: dissemination of the recommendations from the consultation and consensus meetings to participants and stakeholders; presentation of the process, presentation during the national consensus meeting of all feedback received from reviewers, in addition to the responses to this feedback and the edits made accordingly to the strategy; and online posting of the draft strategy for public review.

Conclusion

The involvement of key stakeholders and consensus building throughout the strategy development was critical to pave the way for the creation of synergy between different stakeholders and agendas and thus for the alignment of efforts towards a unified vision. This alignment could contribute to the maximization of resources for the achievement of common goals and the implementation of an evidence-based roadmap that is nationally traced and agreed upon. Indeed, the jointly launched strategy by multiple ministries will hopefully allow for a more effective response with greater resource mobilization and stronger implementation in collaboration with all relevant actors from all stakeholder groups.

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References

1. Karam EG, Mneimneh ZN, Dimassi H, Fayyad JA, Karam AN, Nasser SC, et al. Lifetime prevalence of mental disorders in Lebanon: first onset, treatment, and exposure to war. PLoS Med. 2008 Apr 1;5(4):e61. PMID:18384228
2. Ministry of Public Health, Republic of Lebanon. WHO-AIMS Report on Mental Health System in Lebanon. Beirut; 2015 (http://www.moph.gov.lb/en/Pages/0/9109/who-aims-report-on-mental-health-system-in-lebanon-, accessed 24 May 2016).
3. Substance use and misuse in Lebanon: The Lebanon rapid situation assessment and responses study. United Nations Office on Drugs and Crime. Cairo; 2003. (http://www.unodc.org/pdf/egypt/rsa_report_lebanon_2003.pdf, accessed 10 May 2016).
4. Karam EG, Ghandour LA, Maalouf WE, Yamout K, Salamoun MM. A rapid situation assessment (RSA) study of alcohol and drug use in Lebanon. J Med Liban. 2010 Apr-Jun;58(2):76–85. PMID:20549893
5. Ministry of Public Health, Republic of Lebanon. Mental health and substance use. prevention, promotion, and treatment. Situation analysis and strategy for Lebanon 2015 - 2020. Beirut; 2015 (https://data.unhcr.org/syrianrefugees/download.php?id=11485, accessed 13 March 2017).
6. Ministry of Public Health, Ministry of Education and Higher Education, Ministry of Interior and Municipalities, Ministry of Justice, and Ministry of Social Affairs. Inter-Ministerial Substance Use Response Strategy for Lebanon; 2016. (www.moph.gov.lb/DynamicPages/download_file/1545, accessed 13 March 2017).
7. World Health Organization. Country Cooperation Strategy at a glance.Lebanon. 2014. (http:// http://apps.who.int/iris/bitstream/10665/136909/1/ccsbrief_lbn_en.pdf, Accessed 14 March 2017).

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