

Self-medications with potential abuse in the Middle East: a systematic literature review

Malak M. Khalifeh^{1,2*}, Nicholas D. Moore¹, Pascale R. Salameh²

¹INSERM U 1219 - Pharmaco-epidemiology, University of Bordeaux, Bordeaux, France

²Department of Clinical and Epidemiological Research Laboratory, Faculty of Pharmacy, Lebanese University, Beirut, Lebanon

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***Correspondence to:**

Dr. Malak M. Khalifeh,

Email: malak.9@hotmail.com

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ABSTRACT

Self-medication (SM) is highly prevalent in the Middle East. However, regulations in the Middle East are not always enforced and therefore many prescription medicines can be purchased as SM, resulting in potential abuse of many medicines. The aim of this article, therefore, was to undertake a comprehensive review to identify the different types of self-medications involved in abuse in the Middle East and to identify harms related to SM abuse. An extensive review of the published literature pertaining to the subject (1990–2015) was conducted using PubMed, Web of Science, Cochrane and Google Scholar databases for OTC medication abuse in the Middle East. Twenty two papers were identified. Medications involved in SM abuse included: psychoactive prescription-only medicines, codeine-containing products, tramadol, anabolic steroids, sedative antihistamines, decongestants and laxatives. Moreover, studies in the region rarely reported harms related to SM abuse and strategies to limit this abuse. Potential SM abuse involving a range of medicines is a public health problem in the Middle East. Future interventions and regulations should be applied to limit the expansion of SM use and potential abuse.

Keywords: Abuse, Middle East, Over-the-counter, Self-medication

INTRODUCTION

Regulations usually distinguish between prescription only (POM) and over-the-counter (OTC) medicines. The former require medical prescription and the latter are available for self-medication (SM) without a prescription from the physician.¹ Globally, SM is reported as being on the rise due to the shift of many prescription medications to OTC.² In the Middle East, self-medication is highly prevalent since regulations are not enforced in many countries and some prescription drugs are easily available as SM. Both OTC and POM medicines may thus be available for self-medication.

Self-medication has a potential to cause undue risk, addiction and dependency. Abuse is defined as the non-medical use of medicines, e.g. to experience a 'high' or to lose weight.³ A number of specific medicines and therapeutic groups have been implicated in literature

including: cough syrups containing dextromethorphan or pseudoephedrine, opiate-based OTC analgesics, diphenhydramine and other antihistamines, sleeping aids, laxatives, anabolic steroids and other legally obtained medications⁴. Some of these may be obtained OTC, most will be POM, but may be dispensed without a prescription in some circumstances, and both may result in abuse.

This includes the non-medical use of psychoactive prescription medications, which may also be dispensed without prescription in the community pharmacy. Nonmedical use has been defined as use of these medicines without a doctor's prescription, or for longer periods than prescribed, or for reasons other than the drug's intended medical purpose (e.g., to get a "high").⁵

However, there is a lack of quantitative data on abuse of non-prescribed medications by patients in the Middle

East. There has been relatively little systematic research on this topic. It is limited to only one review article that has described the current knowledge and understanding of OTC medication abuse.⁶ Therefore, this article aims to undertake a comprehensive review to identify the different types of self-medication involved in abuse in Middle East Area. Other objectives were to identify the characteristics of those affected, harms associated with medication abuse and also interventions designed to deal with it.

METHODS

Search strategy

The initial PubMed and Web of science search was performed using the using combinations of the following terms: “over the counter”, “OTC”, “non-prescription”, “self-medication”, “prescription drugs”, “abuse”, “addiction”, “dependency” and “nonmedical use”, and a series of terms ensuring inclusion of all global and regional SM epidemiology publications. Publications from Arab and countries belonging to the WHO Eastern Mediterranean Region (EMRO) were searched (Table 1). Manuscripts in English, French, and Arabic languages were included and years were restricted to 1990 to 2007 with no age limits applied. Additional searches in the Cochrane Library and other sources from other reviews were used to identify peer-reviewed papers dealing with the review theme in WHO Eastern Mediterranean countries. Reviews were used for reference mining but they were not included.^{4,6,7}

From the initial list of studies produced by the electronic search, a smaller subset was included for coding if the abstract met the selection criteria cited above. The first stage of inclusion was based on screening titles and abstracts. Specifically, titles and abstracts were included if the study was related to self-medication abuse or non-medical use behavior. Articles related to alcohol or substance (other than medication) abuse or prescribed medications were excluded; although they represent an important category, they cover objectives different from those of the review theme related to SMs. Studies were also excluded via search limits if they were: review articles; carried out on animal models; hospital-based; clinical and/or randomized controlled trials; editorials, letters, opinions or comment publication type. Finally, full text articles were reviewed and assessed to determine whether inclusion criteria were met. Full-text reviews were also conducted on review articles to identify additional articles from their bibliographies.

Data extraction

The following details were extracted from each study using an extraction form that included the following: year of publication, country of origin, population sampled, recall period, and data pertaining to the study objectives.

RESULTS

Table 1: Search terminology used in literature review.

| Connector | Search Term [Text Word] |
|-----------|---------------------------------|
| | SM |
| OR | OTC |
| OR | Over the counter |
| OR | Self-prescription |
| OR | Non-prescription Drugs |
| OR | Prescription Drugs |
| AND | |
| | Misuse |
| OR | Abuse |
| OR | Dependence |
| OR | Addiction |
| OR | Inappropriate use |
| OR | Irrational Use |
| OR | Nonmedical Use |
| AND | |
| | Eastern Mediterranean Countries |
| OR | Middle East |
| OR | Arab |
| OR | GULF |
| OR | Developing Countries |
| OR | Lebanon |
| OR | Jordan |
| OR | Palestine |
| OR | Iraq |
| OR | Syria |
| OR | Iran |
| OR | Qatar |
| OR | Saudi Arabia |
| OR | Emirates |
| OR | Kuwait |
| OR | Yemen |
| OR | Oman |
| OR | Bahrain |
| OR | Egypt |
| OR | Libya |
| OR | Sudan |
| OR | Tunisia |
| OR | Pakistan |
| OR | Somalia |
| OR | Djibouti |
| OR | Afghanistan |
| OR | Morocco |

Literature search results

From the initial electronic search 696 papers were identified. After an abstract review, the most relevant abstracts were identified and full texts were reviewed. The Middle East produced 134 papers. Following secondary screening which involved reviewing the full papers to confirm that the paper strictly met the inclusion

criteria, 112 papers were eliminated, leaving 22 papers, which were included (Figure 1). These studies reported

on data collected from 1990 to 2015.

Table 2: Self-medication implicated in abuse.

| Country | Reference | Evaluated drug | Study design | Participants | Results |
|-----------|-----------|---|-------------------------------------|-------------------------------|---|
| Jordan | 15 | Anabolic steroids | CS, self-administered questionnaire | 353 participants in Gym clubs | 31 (8.8%) clients admitted to using 21 products (mentioned 71 times) of anabolic steroids and other hormones (e.g., growth hormone and thyroxine) to increase muscular power at the gym or build muscle mass. |
| Jordan | 1 | Misuse and Abuse of OTC and prescription drugs | CS, self-administered questionnaire | 393 pharmacists | Most respondents (94.1%) suspected that some level of abuse/misuse occurred in their pharmacy, which was highest for decongestants, cough/cold preparations, benzodiazepines, and antibiotics. |
| Palestine | 12 | OTC | CS, self administered questionnaire | 97 pharmacists | 2/3 of respondents perceived an increase in suspected OTC misuse or abuse due to instability in region, and that majority was not regular customers. 80% of pharmacists identified antitussives as being of misuse/abuse potential, 70% identified analgesics, 41% antihistamine problems and 67% laxative misuse/abuse. Male customers were perceived more likely to abuse or misuse OTC medications in all categories except laxatives and the 20–40 age range was most commonly identified. Informing the customer's doctor, hiding products and informing customers of abuse potential were identified as strategies to reduce problem. |
| Egypt | 20 | Psychoactive medications: sédatives and tranquilliser | CS, survey | 2187 households | Of 2170 households with biological samples tested, 247 (11.4%) tested positive for any drug. Overall, opioids were the most prevalent drug in the biological samples (5.6%), although prescription drugs (prescription pain pills, sedatives, and tranquillizer) were the most commonly reported in the past 30 days in the questionnaires (7.6%). After controlling for age with direct standardization, individual prevalence of substance use (from laboratory tests) was 7.2% (95% CI 6.1-8.3) in men and 3.1% (2.5-3.7) in women-with a national prevalence of 5.1% (4.4-5.8) and a prevalence of 5.0% (4.1-5.8) in Kabul. |
| Egypt | 10 | Psychoactive medications: | Qualitative study | 40 adolescents from community | Our findings suggest that: (1) youth in Egypt had access to and were actively using substances encountered in similar research worldwide, including tobacco, alcohol, illicit drugs, glue sniffing, and pharmaceutical agents; (2) smoking cigarettes and using hashish were the most common practices, and Tramadol was the most commonly used pharmaceutical drug; (3) peer pressure from friends stood out as the most common reason to start and continue using substances, followed by adverse life events and having a parent or family member who used substances; Over the counter medications like cough syrup were mentioned occasionally and only by boys. |
| Lebanon | 17 | Psychoactive substances | CS, standardized questionnaire | 14656 secondary school pupils | Among the reported results the following are deemed of special interest: (1) Percentages of arts students who smoke tobacco, ever use prescription psychotropic substances, narcotics and alcohol consistently exceed their counterparts studying science and mathematics. (2) Ages of onset for the whole menu of substances range between 12 and 16 years. More users than non-users tend to see drug consumption as either harmless or even useful. |
| Lebanon | 18 | Psychoactive medications: | CS, self-administered questionnaire | 570 University students | Lifetime medical and nonmedical prevalence of medications were (respectively): pain (36.9%, 15.1%), anxiety (8.3%, 4.6%), sleeping (6.5%, 5/8%) and |

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| | | | | stimulants (2.6%, 3.5%). Gender differences were not observed. Lebanese were least likely to report non-medical use. Nonmedical users mostly used the drugs for their intended purpose (e.g., sleeping to help in sleep, stimulants to increase alertness). Parents and pharmacists (without a doctor's prescription) were the top two sources of all medications but stimulants whereby friends predominated. Diversion was observed in about 20% of the medical users. Lifetime marijuana users and past year alcohol abusers were three times as likely to use any prescription drug nonmedically. | |
| Lebanon | 19 | Psychoactive medications: | CS, self-administered questionnaire | 986 school students | Almost half (46%) had tried WTS compared to 25% who had ever tried cigarettes. Lifetime prevalence estimates of NMUPD were: pain relievers (8.2%), sedatives/tranquilizers (5.6%), stimulants (3.5%), antidepressants (2.5%), and sleeping pills (2.3%). WTS was associated with increased odds of sedatives/tranquilizer use (OR = 3.22, 95% CI: 1.25, 8.25), pain reliever use (OR = 4.31, 95% CI: 2.02, 9.17), and sleeping medication use (OR = 8.31, 95% CI: 2.37, 29.20), controlling for sex, age, school type, and other substance use. For cigarettes, the associations were consistently either weaker or non-existent, except with stimulant use (OR = 5.29, 95% CI: 1.55, 18.05). |
| Pakistan | 23 | Self-medication | CS, self-administered questionnaire | 268 university students | Out of 268 respondents (male = 61.6%, female = 38.6%), 138 were non-health professional students whereas 130 were health professional students. The prevalence of SM was 95.5%. Most common factor (45.7%) responsible for SM was "low severity of disease". Most common symptom (50.8%) that caused SM and stocking of medications was "storage of medications for multi purposes". Some respondents (22.7%) got addicted due to SM. Most of the students trust in allopathic medications system. |
| Pakistan | 24 | Benzodiazepine | CS, pretested questionnaire | 749 participants from households | The overall percentage of benzodiazepine consumption was estimated to be 14%. There were significantly more benzodiazepine users in the peri-urban Sultanabad community to the urban community of Garden (p-value = 0.001). The mean age (\pm SD) for users was 51.3 (\pm 15.6) years compared to 37.1 (\pm 14.4) years among non-users. Bromazepam was the most widely used benzodiazepine (29%); followed by diazepam, with a median duration on primary use being 144 weeks. The adjusted logistic regression model revealed that increasing age, location, female sex, unemployment and psychiatric consultation were associated with increased likelihood of benzodiazepine use. |
| Pakistan | 27 | Psychoactive drugs: Benzodiazepine | Case series | 118 adults at clinics | Over 40% of the study subjects were taking psychoactive drugs without an advice from their doctor. In all, 78% were taking psychoactive drugs for >6 months and 67% were using these drugs on a regular basis. Over 85% were using these for induction of sleep and 59% for relaxation. Seventy-five percent of study participants reported that they can afford these pills and over 46% were able to get these drugs easily; significantly more men compared to women (58% vs. 39%; difference of proportion = -19.7; 95% CI = -37, -1.5). All other studied characteristics were equally distributed among men and women. |
| Pakistan | 26 | Benzodiazepine | CS, structured questionnaire | 475 patients visiting Aga Khan hospital | The results showed that majority of population was aware of one or more Benzodiazepines (80.4%) and 30.4% had used them at some point in life. 42.4% of the users had been using it for more than a year. Commonest reason for use was sleep disturbance. Frequency of usage was higher for females, married individuals, educated (Grade1, 2), high socioeconomic status and housewives. |

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| | | | | | More (59%) were prescribed than not and of them most by GP (58.5%). Only 36.5% of them were particularly told about the long-term addiction potential by the use of these drugs. |
| Pakistan | 25 | Benzodiazepine | Retrospective case report analysis | 447 patients admitted to Aga Khan hospital between Jan1989 and Dec 1994 | Of the 329 medication self-poisoning cases, 84% were benzodiazepine overdoses. Diazepam was the preferred drug in 69% of these cases, with majority ingesting between 20-30 tablets of 5 mg each, 44% bought the benzodiazepine over the counter (OTC) for the purpose of overdose. The preference for benzodiazepines over analgesics (as freely available) may be related to the motives underlying parasuicide acts and their popularity as 'sleeping pills' in Pakistan. |
| Pakistan | 8 | Benzodiazepine | Retrospective case report analysis | 314 cases over period 3.5 years Jan 1989-Jun 1992 | Most of the subjects were young adults, with married women representing the single largest group. Self-poisoning with medication was the most common method, and benzodiazepines the most frequently used drug accounting for 74% of cases. Interpersonal conflict with the opposite sex was the most common precipitating cause. In Pakistani culture, marriage appears to be a significant source of stress for women. |
| Iran | 14 | Anabolic steroids | CS, self-administered questionnaire | 202 body builders in clubs | The frequency of anabolic steroid abuse was 18.8%. The mean period of bodybuilding activity was significantly higher in those used the anabolic drugs (38.8 months), comparing to those did not use any drugs (14.3 months). Oxymetholone was the most common drug used by athletes (42% merely used Oxymetholone). The frequency of anabolic steroids abuse was not related to education and age of the bodybuilder athletes. |
| Iran | 11 | Anabolic steroids | Case-control study | 50 athletic drug users with reported use as a case group and 50 athletic nonusers and 50 nonathletic nonusers | Our findings showed that athletic drug users had a lower self-efficacy, more dysfunctional attitudes, and exhibited external locus of control rather than control groups. They were also more sensitive to psychological morbidity. Most of relations were statistically significant. |
| Iran | 28 | Tramadol and Codeine | CS, self-administered questionnaire | 537 school students (selected by cluster sampling in 2008–2009 scholar year | Sixty cases (11.2%) of students had at least one-time substance abuse (including alcohol, cannabis, opium, heroin, ecstasy). General prevalence of substance use was shisha (qalian) smoking (43%), cigarette (21.8%), codeine or tramadol tablet (13.2%), alcohol (9.9%). Frequency of substance abuse in males (18.9%) was significantly more than in females (7.7%; p0.05). |
| Iran | 32 | Psychoactive medications: | CS | High school students | Rates of lifetime and daily use of prescription sedatives (mostly benzodiazepines) were 2.7% and 3.8%, respectively, in high school boys and 4.4% and 0.44%, respectively, in girls in the Kerman study |
| Iran | 22 | Tramadol | CS, questionnaire filled by interviewer | 162 patients who had sought tramadol from a pharmacy | Of 162 patients, 92 (56%) patients did not have a prescription. At least 103 (64%) patients reported criteria for addiction (i.e., for feeling of psychological wellbeing, unable to cease taking the drug, more than two weeks of tramadol use). In total, 145 (89%) patients were aged younger than 30 years, and 90 (55%) patients were aged younger than 18 years. More than 63% of patients reported a history of addiction or drug abuse. Most of the patients with no prescription (88%) had abuse/addiction criteria |
| Iran | 29 | Tramadol | CS | 36 patients referred to the addiction unit in Ibn-Rushed | 78% were males and 22% were females. Their age was 16-57y (mean27y). 90% of the sample was on Tramadol alone and 10% on polydrugs. About 92% of them were iatrogenic abusers. Most of the patients were without previous history of drug abuse. More than one fifth of |

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| | | | | Mental Teaching Hospital | the patients had at least one seizure. |
| Iran | 9 | Tramadol | Phase 1 Prospective study | 1894 school students | Prevalence of lifetime tramadol misuse was 4.8%. Adjusted OR of tramadol misusers with substance abuse was: 2.2 with alcohol, 5 for cannabis, 8.9 for ecstasy and 2.3 for opium, 0.5 for methamphetamines. Tramadol could be related factor or cofactor for alcohol, cannabis and ecstasy use. |
| Iran | 21 | Tramadol | CS, interview using questionnaire | 480 consecutive patients presenting with pain visiting 10 clinics in Zahedan. | Prevalence of opioid use was 28.5% in patients presenting with pain. No significant relationship between opioid use and chronic pain (> 6 months). Significant relationship with opioid use with 5 factors: previous opioid use by friends (72.9% vs 20.4% without friends), Occupation (58.5% private sector/self-employed vs 17.4% housewives), cigarette smoking (60.8% vs 21.8% not smoking), consultation for a psychological problem (38.3% vs 23.3% without), and death of a spouse (60% vs 26.1% without). |



Figure 1: Selection of articles.

Study characteristics

The studies in the 22 publications differed substantially in sample size, recall period, and location. These studies reviewing overall prevalence, frequencies and pattern of SM misuse originated from different countries: Iran (n=6), Pakistan (n=6), Jordan (n=2), Lebanon (n=3), Egypt (n=2), Iraq (n=2), and Palestine (n=1). Most studies were cross-sectional (CS) in nature except for 1 case series, 2 retrospective case report analyses, 1 prospective study, 1 qualitative study, and 1 case control

study.^{8-11,25,27} Most of the studies used self-administered questionnaires or face to face interviews for data collection or mixed data collection techniques.

Definitions of SM abuse

Some articles did not distinguish between misuse and abuse as separate problems, although some attempts to do this were identified in the literature. Two studies referred to terms of OTC medication abuse and/or misuse and they used these terms uniquely.^{1,12} The term abuse was also described as frequent use of OTC medications. It also referred to nonmedical use of prescription medication.^{11,13-21}

Moreover, the terminology of abuse was not also distinguished from the terms addiction or dependence. For example, tramadol addiction symptoms were deemed to be increased tramadol dosage or continuing its use without a physician’s permission, inability to stop using the drug or to decrease the dose, or feeling “incomplete” upon its withdrawal.²²

Scale of SM abuse

Methods used to describe the extent of SM abuse varied. This variety is due to the use of different methods and data sources. Several studies relied on the perception of pharmacists (in Jordan and Palestine studies), whilst others relied on sampling the public, pharmacy customers or among university or school students. Others were from hospitals (e.g. in Pakistan), and self-reported abuse from specific groups such as gym club users (in Jordan and Iran).

The heterogeneous nature of these data sources makes assessing the international scale of SM abuse and between countries comparisons difficult. For example, studies based on pharmacists’ perceptions appeared to generate varied descriptions of medicines that may be

abused. The situation in Jordan was studied by Absoul-Younes et al., who found that 94.1% of pharmacists suspected some abuse or misuse of OTC medications, and a mean estimate of “abusers” visiting each pharmacy in the last 3 months was 18.6 for regular customers, and 15.4 for new customers.¹ Another similar study was conducted in Palestine by Swaileh et al based on perception of community pharmacists. Swaileh et al reported that 66% of community pharmacists believe that there is an increase in misuse/abuse of OTC products.^{12,13} Ullah showed that some students (22.7%) in Pakistan became addicted because of SM.²³

Absoul-Younes et al. reported that Jordanian pharmacists perceived the majority of abusers to be 26-50-year-old males.¹ Similarly, Sweileh et al. reported pharmacists as perceiving males to be more likely abusers than females in all categories except laxatives, in the 20-40-year-old age range.¹⁵

Self-medications implicated in abuse

OTC medications implicated in misuse and abuse belong to different groups: Psychoactive medications including: tramadol²⁰⁻²², Benzodiazepines^{1,8,24-26}, Tramadol^{9,10} and Psychoactive medications.^{17-19,27} Codeine based products²⁸, Anabolic steroids^{11,14,15}, and cough medications^{1,12,28} or laxatives.¹

These OTC medications were identified in different Eastern Mediterranean countries related to different pharmacologic groups in different settings (Table 2).

Psychoactive medicines

Abuse or nonmedical use of psychoactive medicines is highly prevalent in the Eastern Mediterranean area. The Psychotropic medicines frequently self-medicated include narcotic pain killers, tranquilizers, stimulants, and sedatives.^{17,18} Psychotropic medicines have been reported to be abused for pain, anxiety, insomnia, obesity, and enhancing academic performance or for getting high.^{17-19,27} Nonmedical users mostly used these drugs for sleeping disturbance to help in sleep or relax, and stimulants to increase alertness.^{18,27}

Benzodiazepines were commonly cited by pharmacists in Jordan as being abused, as regulations restricting their supply were not always enforced.¹ Zabihi reported that 44% of people bought benzodiazepine for the purpose of overdose.²² Others may use diazepam as a preferred drug due to their motives underlying parasuicide as reported in Pakistan. In 42% of cases, the drugs were available in the subject's home.⁸ Self-poisoning cases were in 84% due to benzodiazepine overdoses.^{8,25} In Pakistan, the life time prevalence of benzodiazepine use was reported to be 30.4%; 42.4% of the users had been using it for more than a year.²⁶ Bromazepam was the most widely used benzodiazepine (29%). Rates of lifetime and daily use of prescription sedatives (mostly benzodiazepines) were

2.7% and 3.8%, respectively, in high school boys and 4.4% and 0.44%, respectively, in girls in the Kerman study.²² Lifetime medical and nonmedical prevalence of medications were (respectively): pain (36.9%, 15.1%), anxiety (8.3%, 4.6%), sleeping (6.5%, 5/8%) and stimulants (2.6%, 3.5%)¹⁹.

Codeine and Tramadol can be easily obtained without prescription from community pharmacies in some countries even though they should only be dispensed as prescription medicines. The prevalence of Tramadol misuse among Iranian students was 4.7%.⁹ In the Zanjan study lifetime use rates for narcotic drugs, including codeine and tramadol, were 9.5% among high school boys and 16.8% among girls.²⁸ Momtazi reported that the general prevalence of codeine or tramadol tablet possession among school students was 13.2%.²⁸ Tramadol was the most commonly used pharmaceutical drug among youths in Egypt.¹⁰ Ghandour showed that psychoactive pain relievers ranked the highest, and stimulants the lowest, both medically and non-medically among university students.¹⁸ Long-term misuse of opioids was associated with increased risk for substance abuse. Tramadol could be a related factor or cofactor for alcohol, cannabis and Ecstasy use.⁹ Most patients reported a history of addiction or drug abuse.²² Prevalence of opioid use was 28.5% in patients presenting with pain, with no significant relationship between opioid use and chronic pain (>6 months).²¹

Anabolic steroids

In Amman, 31 (8.8%) gym club clients admitted to using 21 anabolic steroids and other hormones (e.g., growth hormone and thyroxine) to increase muscular power or build muscle mass.¹⁵ The majority of participants were males (75.6%) and between 19 and 32 years of age.

In Iran, lifetime anabolic use was 11.0% among male students and 1.8% among girls. Shakeri et al have shown that 11 to 20-year-old athletes who use anabolic steroids had a lower sense of self-efficacy and a more dysfunctional attitude than nonusers.¹¹ Sepehri et al. showed that 23.7% of bodybuilding athletes under the age of 20 had used anabolic steroids, mostly oxymetholone.¹⁴ Oxymetholone was the most common drug used by athletes (42%).¹⁴

Cough/cold products and laxatives

Over the counter medicines like cough syrup were mentioned occasionally and only by boys as abused medications.¹⁰ 94.1% of pharmacists suspected that some level of abuse/misuse occurred in their pharmacy, which was highest for decongestants, cough/cold preparations.¹ Swaileh et al reported that antitussives, analgesics, antihistamines, and laxatives were identified by pharmacists as misused and abused medications.¹²

Sources and reasons for SM abuse

Medication abuse is due to easy accessibility from pharmacies without prescription.¹ Over 46% of study participants in Pakistan reported that they were able to get these drugs easily.²⁷ Moreover, 56% of patients requesting tramadol did not have a prescription.²³ In 42% of cases the drugs were available in the subject's home.⁸

Zabihi reported that 88% of the patients requesting tramadol in community pharmacies without prescription had abuse/addiction criteria.²² Poor knowledge is found to be an important factor for SM abuse. Most common symptom (50.8%) that caused SM and stocking of medicines was storage of medicines for multiple purposes (50.8%).²³ More tramadol users than non-users tended to see tramadol consumption as either harmless or even useful.¹⁷ Only 36.5% of patients in Pakistan were told about the long-term addiction potential of these drugs.²⁶ Friends are an important source for such misuse, where peer pressure from friends, or having a family member who used them, stood out as the most common reason to start and continue using substances.^{10,17,18}

Gender differences were observed in abuse of psychotropic medications. Female sex was associated with increased likelihood of benzodiazepine use.^{24,26} However, the percentage of tramadol consumption was higher in males (78%) than in females (22%) in the Iraqi community.²⁹ Abuse of analgesics is considered as risky behaviour and is initiated during early adolescence, particularly between 12 and 16 years.¹⁷ The mean age was 16.3 years among Iranian students and was 27 years among Iraqi community.^{9,29} In the Babol study 89% patients were aged younger than 30 years, and 55% patients were aged younger than 18 years.²² However, Iqbal found that benzodiazepine users were older compared to the non-users.²⁴

The frequency of psychotropic medications abuse was mostly related to low educational level and socioeconomic status.^{17,26} Cigarette or water pipe smoking was associated with increased odds ratio of sedatives/tranquilizer use and sleeping medication use.^{19,21} Abuse is also related to occupation, where housewives have more risk for abuse than employed individuals.^{21,26}

Effects related to SM abuse

A range of problems and harms associated with OTC medication abuse have been identified, related to pharmacological or psychological effects of the drug that is abused. Both lead to concerns about overdoses of medication, reported as poisoning behavior.

Wazaify reported that 9.6% participants experienced adverse effects with anabolic steroids, the majority of which were: tachycardia, palpitations, hypertension, priapism, testicular atrophy, renal, and psychological

problems.¹⁵ Moreover, Shakeri et al showed that athletic drug users had a lower self-efficacy, more dysfunctional attitudes, and exhibited external locus of control.¹¹ In addition, they were also more sensitive to psychological morbidity.

More than one fifth of the tramadol abusers had had at least one seizure.²⁹ In Pakistan, data from hospital records show that of 329 medications self-poisoning cases, 84% were benzodiazepine overdoses. Diazepam was the preferred drug in 69% of these cases, with a majority ingesting between 20-30 5 mg tablets. 44% had bought the benzodiazepine for the purpose of overdose.²⁵

Strategies to limit misuse and abuse

Studies that include strategies to limit misuse and abuse are scarce in the Middle East. Only two studies have reported strategies to limit such practice. The studies that surveyed pharmacists sought practical strategies and a number of common approaches to limit misuse and abuse. These included advising customers to the abuse potential of products, refusing sales, requesting for prescriptions, hiding products from regular shelf, claiming products were not in stock, calling their doctor to verify, and supplying only limited amounts.^{1,30}

DISCUSSION

Abuse behavior is widely present in the Middle East. This review summarizes different drugs involved in SM abuse and their prevalence in different study settings. These findings are consistent with other studies performed in developed countries, which have highlighted a high prevalence of OTC abuse. For example, Cooper R suggested medications such as stimulants, tramadol, sedatives, cough products and codeine based analgesics as being liable to abuse.⁶ Another study of Tulare County, California, Drug Court clients found that 16.2% admitted to abusing OTC medications, mostly ephedrine and other stimulants.⁴

Abuse behavior could be widely present due to easy availability of such medicines without prescription in community pharmacies. Throughout the world, problematic use of drugs containing substances with psychoactive properties used for SM has been recognized as an important issue in community pharmacies, particularly for opioids, antihistamines with sedative properties, and sympathomimetics.³¹ This is applicable also for psychoactive medicines, benzodiazepines and anabolic steroids. Abuse is found to be a common behavior among adults and adolescents. Apparently, the uncontrolled consumption and lack of monitoring of consumption of medications is an important reason for abuse of SM. Friends or peer pressure were also important sources of self-medication abuse. The absence of medical supervision coupled with motivations such as "to get high" renders this issue a high priority for national

awareness. We found no evidence-based interventions to limit misuse.

There is a clear problem of medication abuse in the Middle East. There is a tension between giving easy access to OTC medicines for self-medication where it is easy and desirable, and the risk of such products being abused. Quick interventions for controlling the use of SM and restricting the sales of other medicines as opioids, anabolic steroids, psychoactive medications and codeine containing products should be promising in this field. There is often a lack of awareness and educational programs concerning SM abuse. Education of health providers and consumers is also important to emphasize the correct use of OTC medicines.

Our results are limited by the heterogeneity of the data. Studies used different methods for data collection, which limits comparability between studies. Data based on qualitative methods are scarce; with only one identified study.¹⁰ The absence of qualitative data suggests these studies were structured survey designs. The use of retrospective case report analysis, such as those obtained from hospital centers in various reports as those conducted in Pakistan, and using details of patients attending these centers offers potentially more statistically robust cases.^{8,25} However, such data did not distinguish between prescription and OTC obtained medicines. Studies done based on pharmacists' perceptions provide more subjective data although they have high response rate.^{1,30}

No clear patterns relating to those affected or their experiences were identified. However, several study designs have involved sampling those suspected of abusing medicines at targeted settings as gym clubs and body building clubs.^{11,14,15} These studies represent less subjective accounts of the problem but are specific to certain groups.

In addition, such research may not be easily accessible: some databases were not accessible, nor was unpublished data. The lack of standardization of term, especially the distinction between abuse, misuse, dependence and addiction contributed to the confusion.

CONCLUSION

This review shows that SM abuse involving a range of medicines constitutes a public health problem in the Middle East. It also shed lights on the importance of controlling the use of medicines in the Middle East and the availability of restricted drugs. However, much research remain to be done on SM abuse in Eastern Mediterranean countries, to quantify the prevalence of abuse, report harms and evaluate interventions. These findings also signal the immediate need to raise awareness and education among adolescents, parents and health professionals, and to reinforce relevant policies. In addition, quick interventions are also needed to limit the

expansion of SM behaviour in this area. There is clearly a need for a coordinated effort to train researchers in the field, and conduct standardized studies to measure the extent and the effects of self-medication abuse in the Middle East. From these, the obviously necessary evidence-based efforts to limit and control such abuse can be derived.

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