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# Attitudes, beliefs, and knowledge of substance use amongst youth in the Eastern Mediterranean region: A systematic review

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ABSTRACT

*Background:* Substance use has a tremendous impact on the burden of disease. This is particularly true in the Eastern Mediterranean region (EMR), where many countries serve as suppliers of drugs. As risk perception and frequency of use are inversely correlated, targeting perception during adolescence becomes essential for prevention. In this study, we systematically reviewed the literature on attitudes, beliefs, and knowledge of substance use amongst youth in the EMR.

*Methods:* We reviewed quantitative articles addressing attitudes, beliefs, and knowledge of youth aged between 13 and 25 years towards substance use in the EMR. We searched MEDLINE, PubMed, Cochrane, PsycInfo, and PsycArticles then applied a duplicate independent method for study selection and screening. Two reviewers completed data abstraction and a narrative summary of findings.

*Results:* Our search generated 12,810 articles. Five cross-sectional studies were eligible (two analytic and three descriptive). The analytic studies described a significant correlation between intention to use and both attitudes and subjective norms. The descriptive studies portrayed a negative attitude towards use with a low threshold for considering it as serious. Beliefs pertaining to reasons for use included stress and sleeping, whereas thoughts on treatment were restricted to traditional methods based on personal resilience and religious support. Knowledge about substance use symptoms, withdrawal, and treatment was low.

*Conclusion:* Our review ascertains the role of sociocultural moral prohibition and awareness of mental health as major influencers in shaping the perception of substance use. Further research is needed to elaborate culturally-tailored survey tools.

## 1. Introduction

According to the United Nations Office on Drugs and Crime, an estimated 5.6% of the global population uses one form of illicit substance, and 0.62% suffers from a substance use disorder (UNODC, 2018a). Substance use is one of the leading causes of years of life with disability (Degenhardt et al., 2013) and is recognized as an underlying cause of death in the International Classification of Diseases cause of death guidelines (WHO, 1992). In 2015, an estimated 37 million years of healthy life were lost due to disability and premature death from substance use (UNODC, 2018a). Several Eastern Mediterranean region (EMR) countries are considered leading suppliers of drugs. For instance, in South-West Asia, Afghanistan is thought to be a main provider of opiates to neighboring countries and accounted for 86% of global opium production in 2017 with established routes to Europe, North America, and Africa (UNODC, 2018a). Morocco and Afghanistan are also two major producers of cannabis, supplying worldwide destination markets (UNODC, 2018b). Prevalence studies in the EMR countries report lower yet significant numbers relative to global prevalence rates. This is considered, by most experts, to be an underestimation of actual levels of use. The latest World Drug Report estimates the prevalence of people who inject substances in the EMR to be 0.18%, compared to 0.36% in America and 0.47% in Europe (UNODC, 2018a). On the other hand, cannabis consumption has been consistently on the rise over the period from 2010 to 2016 in countries of Asia and Africa (UNODC, 2018b).

There are noted variations between countries. A recent Iranian study reported a 2.09% prevalence rate of all illicit substance use, with a predominance of opiates (Amin-Esmaeili et al., 2016), and the lifetime prevalence of substance use disorders in Lebanon was reported to

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be 2.2% (Karam et al., 2008). An Egyptian community survey places substance use at 13% in males and 1% in females (Hamdi et al., 2013). This discrepancy between genders is common in conservative societies and has a significant impact on overall prevalence figures.

The various international frameworks used to group countries of this region together face limitations related to politics, language, and socioeconomic variability with the widespread adherence to Islam being a unifying factor (Himmich et al., 2016). Researchers have argued a specificity for research and intervention on substance use in muslim populations, which form the majority in EMR countries (Arfken and Ahmed, 2016).

Previous reviews have targeted prevalence and related behaviors in this part of the world (Salamoun et al., 2008) without addressing the triad of attitudes, beliefs, and knowledge. This is while societal perception of substances is known to influence personal decisions to use. Many cultural aspects, including family (Boyd and Holmes, 2002; Brook et al., 1990; Johnson et al., 1984), peers (Piehler et al., 2012; Scherrer et al., 2008), religion (Edlund et al., 2010; Johnson et al., 2008; Karam et al., 2010), and belonging to a community (Heath, 2001) play a critical role in both the prevalence and the regional approach to the understanding, prevention, and treatment of this disorder. In the United States and other western countries, national surveys on substance use have been carried out for decades. The latest national survey reveals perception of harm from most psychoactive substances to be at an all-time low amongst youth. This is not necessarily translated into increased prevalence of use (Schulenberg et al., 2018); the relation between attitudes and behavior is a complex one that deserves further exploration. Educational approaches that target the inaccurate perceptions of youth towards substance use have already been validated for prevention (Griffin and Botvin, 2010), as adolescence is a critical period of emotional, social, and moral development where core attitudes and behaviors towards substance use are formed (Degenhardt et al., 2014). Early intervention in this population has been shown to significantly decrease substance use (Carney and Myers, 2012; Peterson et al., 2006; Winters and Leitten, 2007).

With the growing interest in the global youth perceptions towards substance use, gaining insight into the specific situation within EMR countries that share similar sociocultural contexts has become a regional public health priority. As growing evidence points towards an evolving substance use pandemic amongst youth in the region, the World Health Organization recently drafted a strategy for mental health and substance use prevention in the EMR with an urge to promote research (World Health Organization, 2011). This systematic review investigates the available literature on the attitudes, beliefs, and knowledge of substance use amongst youth in the EMR in order to integrate the cultural background in a comprehensive understanding of the phenomenon in this region.

## 2. Methods

### 2.1. Eligibility criteria

We included studies meeting the following criteria:

Population: participants between the ages of 13 and 25 years residing in the EMR.

Outcomes: for the purpose of this study, we used the following classification (Underwood, 2002): attitudes (e.g., toward the acceptability of substance use), beliefs (e.g., the perception of reasons to use substances), and knowledge (e.g., related to the side effects of substance use).

Study design: restricted to include only quantitative studies. We excluded studies of a qualitative nature (i.e., case reports, case series, and abstracts) and epidemiological manuscripts. We also excluded studies investigating the *behavior* of the youth, rather than their attitudes, in relation to substance use.

### 2.2. Search strategy

In August 2016, we electronically searched the following databases: MEDLINE (access via OVID), PubMed, Cochrane, PsycInfo, and PsycArticles (all from inception onwards). No additional sources were used. We designed a broad yet detailed search strategy to capture attitudes of youth towards all substances except alcohol and tobacco. To exclude alcohol and tobacco, we did not include them as MeSH terms or as keywords. We restricted the search to studies published in the English language. We designed the search strategy, available in Appendix A, with a medical librarian experienced in systematic review searches.

### 2.3. Selection process

We uploaded the literature search results to Endnote X7.7.1. Software. Two pairs of investigators (LT and SEH; FY and YZ) screened the articles independently. Initial screening of the title and abstract for eligibility was done using a standardized and pilot-tested screening guide. At this point, the inclusion criteria were broad and included the attitudes of youth in the world towards substance use. This initial screening was restricted to articles published after 1990 and retrieved the full text of all potentially eligible articles. Then, the same pair of reviewers independently assessed the eligibility of the resulting group of articles using another standardized and pilot-tested screening guide. This secondary full-text screening filtered articles assessing the attitudes of youth *only* in EMR countries and published from 2005 and onwards. Each pair of reviewers resolved any disagreement by discussion or by consulting a reviewer in the other pair. We documented the reasons for exclusion of full texts using standardized screening forms.

### 2.4. Data abstraction

Two reviewers (PN and SEH) extracted data from the full texts of the eligible studies. For each eligible study, we extracted the following information: participants' age, gender, and country(s), setting and sample size, substance(s) of interest, methods (study design, sampling method, sample size calculation, and response rate), instrument (administration method, validity of tool, and pilot testing), outcomes (attitude, beliefs, knowledge, and correlation between them and intention to use), results, limitations, and funding.

### 2.5. Risk of bias assessment

Two reviewers (PN and SEH) assessed the risk of bias in each eligible study and resolved any disagreement by discussion or with the help of a third reviewer. The criteria assessed were: the reporting of a sampling frame, the sampling method, the sample size calculation, the response rate, the validity of tool, and its pilot-testing.

### 2.6. Data synthesis

Although we planned to conduct a meta-analysis, we did not proceed with it given the nature of the included studies and the insufficient homogeneity in terms of the comparator. We narratively summarized the findings of the included studies.

## 3. Results

### 3.1. Search results

Our electronic search identified a total of 12,810 articles (Fig. 1). We removed 3570 duplicate articles. We screened 9240 articles and excluded 8908 records that did not fit eligibility criteria as per title and abstract screening guidelines. We assessed 332 full texts for eligibility and excluded 327 for the following reasons: missing articles (n = 28),

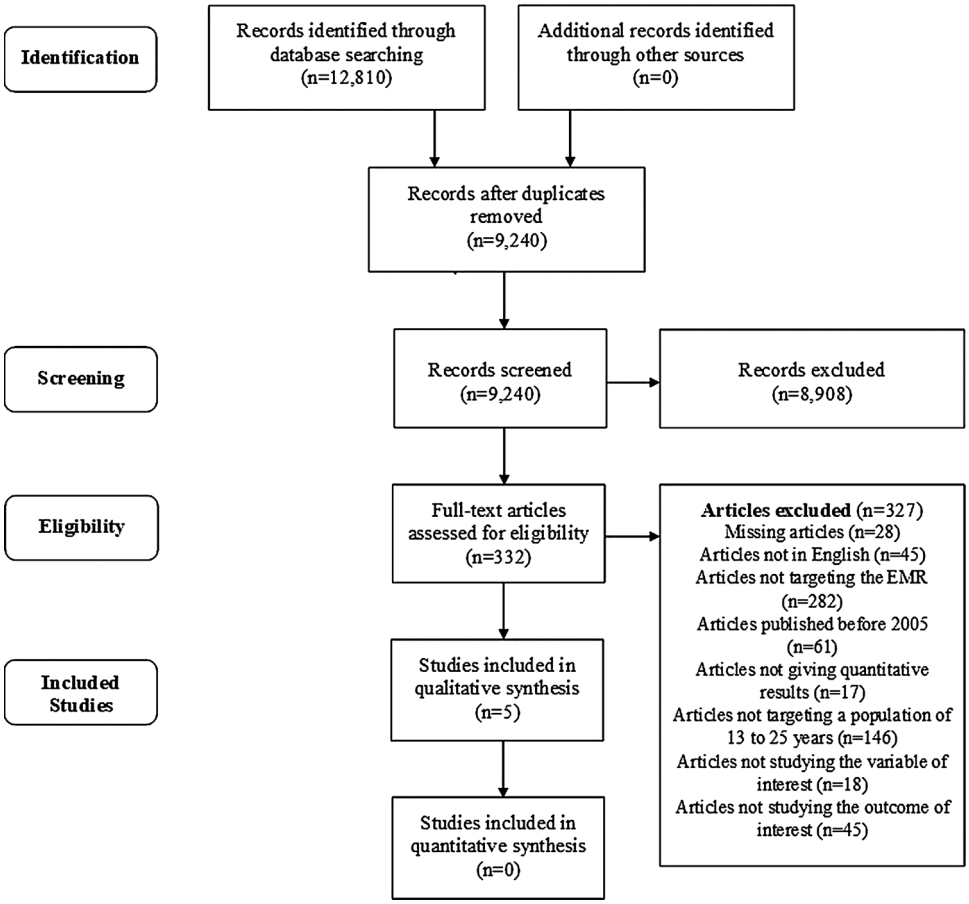


**Fig. 1.** Systematic review flowchart. Five studies were included in the qualitative analysis.

articles not written in the English language (n = 45), articles not targeting the EMR (n = 282), articles published before 2005 (n = 61), articles not giving quantitative results (n = 17), articles not targeting a population of 13–25 years (n = 146), articles not studying the variable of interest (n = 18), and articles not studying the outcome of interest (n = 45). We included 5 studies in the qualitative synthesis (Bashirian et al., 2012; Haddad et al., 2010; Jalilian et al., 2015; Khalid et al., 2014; Shafiq et al., 2006).

### 3.2. Characteristics of included studies

Five studies examined the attitudes, beliefs, and knowledge of young people in the EMR towards substance use. The characteristics of each included study are described in Table 1. Countries in which the studies were conducted were: Pakistan (n = 2) (Khalid et al., 2014; Shafiq et al., 2006), Iran (n = 2) (Bashirian et al., 2012; Jalilian et al., 2015), and Jordan (n = 1) (Haddad et al., 2010). All studies were cross-sectional with a population age ranging from 13 to 25 years. Two studies recruited their populations from schools (Bashirian et al., 2012; Haddad et al., 2010), while the three others recruited them from universities (two from medical universities only (Jalilian et al., 2015; Shafiq et al., 2006) and one from medical, business, and law schools (Khalid et al., 2014)). Only one study focused on the use of cannabis specifically (Khalid et al., 2014).

### 3.3. Methodological features

The methodological features of the included studies are described in Table 2. All five studies described their sampling frame and reported pilot-testing their tools. However, fewer fulfilled the following factors related to the risk of bias: using random approach to sampling (n = 2) (Bashirian et al., 2012; Haddad et al., 2010), reporting sample size calculation (n = 2) (Jalilian et al., 2015; Khalid et al., 2014), and using validated tools (n = 0). The response rate was not stated for one study (Haddad et al., 2010) and varied across the remaining from 60% to 100%. Only one study reported on the handling of missing data (Bashirian et al., 2012). None of the included studies specified whether the survey questions were open-ended or prompted. All these methodological shortcomings limit the depth of direct comparative analysis between studies.

### 3.4. Comparison of results

The results in this section are grouped by common themes of interest, recurrent in most studies. An exhaustive description of individual studies is presented in Tables 1 and 3.

#### 3.4.1. Attitudes, beliefs, and knowledge of substance use by population groups

*3.4.1.1. High schoolers.* In the study by Haddad et al. (2010), a comparison was made between grade 10 and 11 high school students. More than half of adolescents (65%) considered substance use a problem, and older students reported more awareness ($X^2$ = 46.54, p = 0.000). A total of 33% rated their knowledge of substance use as "very good". Most of these were students in the higher grade ($X^2$ = 57.220, p = 0.000). Similarly, in the study by Shafiq et al. (2006), seniors (4th and 5th years) significantly reported fewer benefits of substance use compared to juniors (1st, 2nd, and 3rd years) ($X^2$ = 10.2–12.3, p = 0.01).

*3.4.1.2. Medical students.* Three studies included medical students in their sample. In Shafiq et al. (2006), a predominant anti-drug opinion

**Table 1**
Characteristics of studies about attitudes, beliefs, and knowledge of substance use amongst youth in the Eastern Mediterranean region countries.

| Study ID | Study Design | Participants | Country | Setting and Sample Size | Drug(s) of Interest | Funding |
|---|---|---|---|---|---|---|
| **Shafiq et al.** (2006) | Cross-sectional | **Age:** 18 to 25<br>**Gender:** 52% males 48% females | Pakistan | Private medical university in Karachi<br>Time of recruitment not reported<br>N = 174 | Benzodiazepines<br>Charas<br>Heroin | Reported as not funded |
| **Haddad et al.** (2010) | Cross-sectional | **Age:** 15 to 18<br>**Gender:** almost equally distributed | Jordan | Schools from the educational directorate in a large urban area in Northern Jordan<br>Time of recruitment not reported<br>N = 400 | Not reported | Reported as not funded |
| **Bashirian et al.** (2012) | Cross-sectional | **Age:** 14 to 17<br>**Gender:** males only | Iran | Four high schools in different regions in the city of Hamadan<br>Time of recruitment not reported<br>N = 700 | Not reported | Funded by grants from the Tarbiat Modares University, Department of Health Education |
| **Khalid et al.** (2014) | Cross-sectional | **Age:** 22 ± 2<br>**Gender:** 60.7% males 39.3% females | Pakistan | Medical, business, and law schools from both private and public sectors in Karachi<br>Time of recruitment from June 2010 to November 2010<br>N = 150 | Cannabis | Not reported |
| **Jalilian et al.** (2015) | Cross-sectional | **Age:** 18 to 22<br>**Gender:** males only | Iran | Two medical universities<br>Time of recruitment in the year 2014<br>N = 355 | Not reported | Funded by the depute of research of Isfahan University of Medical Sciences |



**Table 2**
Methodological characteristics of studies about attitudes, beliefs, and knowledge of substance use amongst youth in the Eastern Mediterranean region countries.

| Study ID | Sampling Method | Sample Size Calculation | Response Rate | Administration Method | Validity of Tool and Pilot Testing | Limitations |
|---|---|---|---|---|---|---|
| **Shafiq** et al. (2006) | Convenient sampling | Not reported | 87% | In person, self-administered | **Validity:** Self-developed tool, no validation reported<br>**Pilot testing:** pretested on 25 students | **Selection bias:** Students from a single and private medical college |
| **Haddad** et al. (2010) | Multistage random sampling | Not reported | Not reported | In person, self-administered | **Validity:** Self-developed tool, no validation reported<br>**Pilot testing:** pretested on 40 individuals | **Selection bias;** Students from a single geographic region |
| **Bashirian et al.** (2012) | Random cluster sampling | Not reported | 100% | Not reported | **Validity:** Self-developed tool, no validation reported<br>**Pilot testing:** pretested on 30 students like the participants | Not reported |
| **Khalid** et al. (2014) | Convenient sampling | Based on a prevalence of 7% of illicit drug use in Pakistan | 60% | In person, self-administered | **Validity:** Self-developed tool, no validation reported<br>**Pilot testing:** pretested on 10 students of Ziauddin University, Karachi | **Cross-sectional study:** cause and effect relationship not assessed<br>**Nonresponse bias** |
| **Jalilian** et al. (2015) | Not reported | At 95% significant level according to the results of the study by Moghadam et al. (2013) | 84% | Not reported | **Validity:** Self-developed tool, no validation reported<br>**Pilot testing:** pretested on 18 male medical college students like the participants | Not reported |

**Table 3**
Summary of results of studies about attitudes, beliefs, and knowledge of substance use amongst youth in the Eastern Mediterranean region countries.

| Study ID | Outcomes | Results |
|---|---|---|
| **Shafiq et al.** (2006) | **Attitudes** | • **Intention for use:** none 10%, did not know 9%<br>• **Discouragement of colleagues from use:** females (89%) > males (71%) ($X^2 = 42.3$, $p = 0.01$), day scholars > hostellers ($X^2 = 24.8$, $p = 0.01$) |
| | **Beliefs** | • **Use perceived as serious:**<br>*Benzodiazepines:* 26% considered daily use serious, 20% considered once-per-week use serious<br>*Charas:* 47% considered once-in-a-lifetime use serious, 14% considered use at social gatherings serious<br>*Heroin:* 58% considered once-in-a-lifetime use serious, 11% considered use at social gatherings serious<br>• **Factors predisposing for use:** consumption by friends 90%, consumption by family members 74%, tobacco smoking 76%<br>• **Reasons identified for use:** peer pressure 96%, academic stress 90%, curiosity/experimentation 88%, to get high 88%<br>• **Reasons deemed justifiable for use:** sleeping 34%, academic stress 20%, curiosity/experimentation 20%<br>• **Reasons not to use:** moral unacceptability 78%, religion 76%, fear of adverse effects 57%, fear of being caught 38%<br>• **Perceived benefits of use:** improvement of academic performance 10%, alleviation of stress 54% - seniors ($4^{th}$ and $5^{th}$ years) reporting fewer benefits as compared to juniors ($1^{st}$, $2^{nd}$, and $3^{rd}$ years) ($X^2 = 10.2$-$12.3$, $p = 0.01$) |
| | **Knowledge** | • **Knowledge of adverse outcomes:** addiction 92%, threat to own or others' lives 80%, socially inappropriate behavior 72%, diminished academic performance 67% |
| **Haddad et al.** (2010) | **Attitudes** | • **Attitudes towards substances:** problem among adolescents 65% - grade 11 reporting more awareness of substance use as a problem compared to grade 10 ($X^2 = 46.54$, $p = 0.000$) |
| | **Beliefs** | • **Use perceived as serious:** 87% considered occasional use extremely harmful, 93.3% considered frequent use extremely harmful<br>• **Factors helpful for abstinence**[*]: resisting peer pressure 30%, thinking of drugs as a killer 17%, staying away from places that sell drugs 11%, practicing sports 8.3%, getting involved in social work 4.3%<br>• **Beliefs about treatment:** support recommended to resist temptation for use 77.3%, institutions can be accessed 50.3%[**], institutions can be helpful for adolescents 56.3%[**], drug users can abstain 36.5%, mosques can assist for substance use 11.8%[**] - methods for treatment: just quit and forget 30%, prayers 22.8%, medical treatment 17.5%, counseling 4.3%<br>• **Beliefs about sources of information about substances:** parents and relatives 48.5%, friends/classmates/teachers 25%<br>• **Beliefs about withdrawal symptoms:** aggression 33%, bouts of fits 23.8%, fainting 11.5%, nausea and vomiting 9.5%, no withdrawal 3.8% |
| | **Knowledge** | • **Knowledge of substance use:** heard of substance use 70.5%, knew about various forms of substance use 49.5%, rated their knowledge of substance use as "very good" 33% - grade 11 reporting more knowledge than grade 10 ($X^2 = 57.220$, $p = 0.000$)<br>• **Knowledge of complications:** unsatisfactory health 81%, respiratory problems 87%, heart diseases 86%, psychiatric disorders 27.8%, social ostracism 26.8%, legal imprisonment 33.8%, dropping out of school 85%, loss of employment 87%, social unacceptability 89%, untrustworthiness 83%, social ostracism for users 83% and their families 82%, burden to society 82%, spending money for nothing 87%, running short of money 86%, experiencing poverty 55% - grade 11 reporting more consequences than grade 10 ($p = 0.000$)<br>• **Knowledge of treatment options:** individuals or institutions assisting people with substance use 28%, treatment centers for substance use 17.8%, local youth centers 15.8%, voluntary organizations 13.5% |
| **Khalid et al.** (2014) | **Attitudes** | • **Intention for use:** 17.3%<br>• **Justification of use:** justified occasional use 17.3% (law students 24.1%), did not justify use under any circumstances 82.7% (medical students 88.2%) |
| | **Beliefs** | • **Use perceived as serious:** 62% - of which 38% believed society to be concerned about the use<br>• **Reasons identified for use:** addiction 40.7%, depression 36%, stress 32%, peer pressure 26%, exams 26%, recreation 20.7%, curiosity 16.7%<br>• **Factors helpful for abstinence:** awareness programs 81.3%, religion 44.7%, health risks 44.7%, supportive families 37.3%, fear of repercussions 27.3%<br>• **Beliefs about users:** more likely to try other illicit substances 59.3%, more likely to smoke cigarettes 71.3%, antisocial 26%, abuses prescription medications 32.7%, drinks alcohol 56.7%, has criminal history 20.7%, very aggressive 28%, drives recklessly under influence 29.3%, often disrupts class 20% |
| | **Knowledge** | • **Knowledge of symptoms:** weight loss and memory problems 48.7%, dizziness 44%, violent behaviors 44.7%, confusion 42.7%, insomnia 38%, increased libido 29.3%, distorted perception 28%, blurred vision 24%, feeling of elation 23.3%, numbness 20.7%, excessive energy 17.3%, creative thinking 15.3%, increased suspiciousness 12.7%<br>• **Knowledge of complications:** psychiatric disorders 60.7%, social problems 58%, cancer 36.7%, death 32%, bronchitis 25.3%, impaired learning 24%, infertility 22%<br>• **Knowledge of addictive potential:** lack of physiological addictive potential, lack of withdrawal symptoms, and presence of psychological habituation 66% |
| **Bashirian** et al. (2012) | **Correlation between attitudes/beliefs and intention to use** | • **Bivariate analysis:** intention to use significantly correlated with attitude towards drug use ($r = 0.383$) and subjective norms ($r = 0.427$) ($0.01 < p < 0.05$ for all)<br>• **Logistic regression analysis:** attitude (OR = 1.062 [1.015-1.112], $p = 0.01$) and subjective norms (OR = 1.087 [1.026-1.152], $p = 0.005$) predictors of intention to use |
| **Jalilian** et al. (2015) | **Correlation between attitudes/beliefs and intention to use** | • **Bivariate analysis:** intention to use significantly correlated with attitude towards drug use ($r = 0.535$), outcome expectation ($r = 0.464$), outcome expectancies($r = 0.404$), subjective norms ($r = 0.623$), and self-control ($r = -0.0394$) ($p < 0.01$ for all)<br>• **Multiple regression analysis:** attitude, outcome expectation, outcome expectancies, subjective norms, and self-control accounting for 49% of the variation in intention to use (adjusted R squared = 0.49, $p < 0.001$) |

(*continued on next page*)

**Table 3** (*continued*)

| Study ID | Outcomes | Results |
|---|---|---|
| | | • **Logistic regression analysis:** attitude (OR = 1.062 [1.006-1.121], p = 0.029), outcome expectancies (OR = 1.115 [0.999-1.245], p = 0.053), and subjective norms (OR = 1.269 [1.090-1.476], p = 0.002) predictors of intention to use |

* labeled as an attitude in the study.
** labeled as knowledge in the study.

was noted, and 78% had no intention of ever using a drug. Khalid et al. (2014) reported an even higher number of students (88.2%) finding no justification for the use of cannabis regardless of circumstances. Khalid et al. (2014) included medical students as part of a wider university sample but did not conduct a subgroup analysis.

*3.4.2. Cultural factors as modulators of attitudes and behavior*

*3.4.2.1. Religion.* Religion was a common theme in many of the included studies. In the study by Khalid et al. (2014), just under 50% of the sample mentioned religion as a coping strategy for abstinence from substance use. In the study by Haddad et al. (2010), a smaller percentage (11.8%) mentioned mosques as a treatment option for substance use. The use of prayers was also stated by 22.8% as an effective approach to maintaining abstinence. Amongst the reasons for avoiding substance use, the majority of the sample in the study by Shafiq et al. (2006) mentioned moral unacceptability (78%) and religion (76%).

*3.4.2.2. Societal influence.* Familial and sociocultural influences for and against substance use were highlighted in all studies. Peer pressure was inconsistently reported across studies. 96% in Shafiq et al. (2006) identified it as a reason for substance use, while only 26% in Khalid et al. (2014) agreed. Along the same lines, 30% in Haddad et al. (2010) mentioned resisting peer pressure as a method to maintain abstinence.

A predominantly negative social perception of substance use was common to all surveys. In the mind of responders, substance use was associated with social problems (58%) (Khalid et al., 2014), social ostracism for users (83%) and their families (82%), legal imprisonment (33.8%), dropping out of school (85%), loss of employment (87%), social unacceptability (89%), and burden to society (82%) (Haddad et al., 2010).

*3.4.3. The perception of cannabis*

One of the studies (Khalid et al., 2014) specifically focused on cannabis. 'Charas' (a local street name for cannabis) was also particularly stated as one of the substances of interest by Shafiq et al. (2006). A majority of respondents (62%) in the study by Khalid et al. (2014) perceived the use of cannabis as a serious risk. Nonetheless, 17.3% of participants reported an intention to use cannabis. Relatively fewer (47%) had concerns about cannabis in the study by Shafiq et al. (2006), but this was still higher than for other substances of dependence such as benzodiazepines (26%).

*3.4.4. Correlation between attitudes/beliefs and intention to use*

The two Iranian studies by Bashirian et al. (2012) and Jalilian et al. (2015) attempted to explore the correlation between the Theory of Planned Behavior variables and the Social Cognitive Theory variables and the intention to use substances. Applying a logistic regression analysis, Bashirian et al. (2012) showed that attitude (OR = 1.062 [1.015–1.112], p = 0.01) and subjective norms (OR = 1.087 [1.026–1.152], p = 0.005) were predictors of intention to use. Similar results were obtained by Jalilian et al. (2015) who reported that attitude (OR = 1.062 [1.006–1.121], p = 0.029), outcome expectancies (OR = 1.115 [0.999–1.245], p = 0.053), and subjective norms (OR = 1.269 [1.090–1.476], p = 0.002) were all predictors of intention to use.

## 4. Discussion

The Eastern Mediterranean region is an arbitrary construct that includes a variety of cultural and religious groups living within geographical continuity. Global policymakers agree that these countries share enough to justify approaching them as an entity. Compared to western societies where most research on substance use is based, family and religion play a more prominent role in shaping individual attitudes and beliefs towards various societal phenomena in this part of the world. This includes sexual behavior, personal autonomy, and human rights, all of which have implications for substance use.

The five studies identified through our systematic review emanate from three countries out of twenty-two: Iran, Pakistan, and Jordan. They all target youth aged between 13 and 25 years old. Although these countries may differ in the form of government, language, and levels of education, they are all majority Muslim nations that share conservative official ideological dogmas and common values on major social issues. Iran is ruled by a clerical regime drawing its ideology from the Shia sect of Islam. Pakistan is a republic where tensions between modernity and Sunni conservatism have dominated the political and social debate for decades. Jordan is a parliamentary monarchy with a strong Arabic and Islamic heritage (Al-Hassan and Takash, 2011). As such, they are broadly representative of the EMR, taking into consideration the dearth of regional research on the topic. Indeed, a cross-sectional study conducted amongst medical students in Saudi Arabia, that did not meet our inclusion criteria, assessing perception towards both alcohol and substances revealed concordant attitudes with our results (Al-Haqwi, 2010).

As substance use is a major public health problem in the EMR, establishing an understanding of its associated attitudes, beliefs, and knowledge in the specific sociocultural context of these countries would help elaborate appropriate preventive measures. The science of behavioral prevention and modification relies heavily on such insight that has so far been understudied in the EMR despite consistent reporting of widespread substance use.

In our systematic review, the results of the two analytic studies support the hypothesis that attitudes and subjective norms are major influencers of intention to use in this part of the world (Bashirian et al., 2012; Jalilian et al., 2015). An interesting finding across the board was a predominantly negative attitude towards substance use that fails to account for previously reported prevalence rates (Amin-Esmaeili et al., 2016; Karam et al., 2008). This discrepancy could stem from misreporting of true attitudes towards substances, which is possibly a reflection of the conservative social context or for fear of personal repercussions. This was a concern explicitly reported by many participants in the descriptive studies (Haddad et al., 2010; Khalid et al., 2014; Shafiq et al., 2006). Stigma, but also religious and legal prohibition, commonly lead to underreporting. Alcohol consumption is particularly understudied and is often studied separately from other substances (Sweileh et al., 2014). In a recently published study at the American University of Beirut in Lebanon, medical students displayed a significantly higher tolerance towards substance use (Talih et al., 2018) than their Iranian and Pakistani counterparts. This difference could reflect a more liberal tendency in the wider Lebanese population which tends to be more religiously diverse and more exposed to western lifestyles than other EMR countries. A separate recently published

Lebanese study also showed that knowledge about substances increased with seniority through medical school and that religion constituted a significant predictor for abstinence (Assaf et al., 2018). These findings further corroborate the tight relationship between our studied outcomes and local cultural factors.

In terms of treatment options, there was a widespread belief in the power of "quitting and forgetting" to achieve abstinence. For others, Islamic centers and mosques were favored as treatment centers, further emphasizing the expected role of religious authorities in addressing social issues in these countries. The trust placed in them could be positively exploited by combining social and medical approaches.

A number of limitations can be reported in our systematic review. In their efforts to identify attitudes, beliefs, and knowledge of substances, the authors of the five studies used a range of non-validated scales and surveyed different populations. Due to this measurement bias along with the lack of a random approach to sampling in three of the studies (Jalilian et al., 2015; Khalid et al., 2014; Shafiq et al., 2006), external validity is limited. It is difficult to draw direct comparisons between age groups or between countries. In the two studies by Bashirian et al. (2012) and Jalilian et al. (2015), only males were surveyed, whereas in the study by Haddad et al. (2010) only one directorate in the north of the country was included. The samples in the young adult age group are even less representative, as they are drawn from institutions of higher learning and, in two studies (Jalilian et al., 2015; Shafiq et al., 2006), are exclusively comprised of medical students. This population tends to be better informed about substance use through exposure to scientific literature and international perspectives. While school children could be perceived as representing their age group, children attending a particular school are more likely to share specific socio-economic characteristics. In addition, the response rate was not reported in one study (Haddad et al., 2010) and was low in another (Khalid et al., 2014). Participation bias is a concern in these two studies, as students with stronger affinity for the topic would be more likely to share their views.

## 5. Conclusions

Despite the limitations inherent to the reviewed studies, they still provide insight into attitudes, beliefs, and knowledge towards substance use in the EMR. They highlight the role of religious moral prohibition and poor mental health awareness as primary modulators of youth perception. The review emphasizes the need for population-wide validated and culturally sensitive surveys. It also promotes the development and implementation of tailored mental health awareness programs in this region.

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## Contributors

Dr. Joseph El-Khoury designed the study, wrote its protocol, assisted in the writing of the discussion, and finalized the manuscript. Dr. Paul Noufi participated in the screening process, assisted in the writing of the methods and results, and finalized the manuscript. Dr. Amanda Ahmad participated in the screening process and assisted in the writing of the introduction. Dr. Elie Akl helped in the design of the study, the screening process, the writing of the manuscript, and the proofreading process. Dr. Samer El Hayek participated in the screening process, assisted in the writing of the methods and results, and finalized the manuscript. All authors contributed to and approved of the final version of the manuscript.

## Conflict of interest

None declared.

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## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.drugalcdep.2018.12.019.

## References

Al-Haqwi, A.I., 2010. Perception among medical students in Riyadh, Saudi Arabia, regarding alcohol and substance abuse in the community: a cross-sectional survey. Subst. Abuse Treat. Prev. Policy 5, 2.
Al-Hassan, S., Takash, H., 2011. Attributions and attitudes of mothers and fathers in Jordan. Parent. Sci. Pract. 11, 142–151.
Amin-Esmaeili, M., Rahimi-Movaghar, A., Sharifi, V., Hajebi, A., Radgoodarzi, R., Mojtabai, R., Hefazi, M., Motevalian, A., 2016. Epidemiology of illicit drug use disorders in Iran: prevalence, correlates, comorbidity and service utilization results from the Iranian Mental Health Survey. Addiction 111, 1836–1847.
Arfken, C., Ahmed, S., 2016. Ten years of substance use research in Muslim populations: where do we go from here? J. Muslim Ment. Health 4908, 13–24.
Assaf, G., Noureddine, S., P Kouyoumdjian, S., El Khoury, J., 2018. Medical students' knowledge, attitudes and behaviours related to substance use in Lebanon: A cross-sectional survey. East. Mediterr. Heath J. 23, 734–743.
Bashirian, S., Hidarnia, A., Allahverdipour, H., Hajizadeh, E., 2012. Application of the theory of planned behavior to predict drug abuse related behaviors among adolescents. J. Res. Health Sci. 12, 54–60.
Boyd, C.J., Holmes, C., 2002. Women who smoke crack and their family substance abuse problems. Health Care Women Int. 23, 576–586.
Brook, J.S., Brook, D.W., Gordon, A.S., Whiteman, M., Cohen, P., 1990. The psychosocial etiology of adolescent drug use: a family interactional approach. Genet. Soc. Gen. Psychol. Monogr. 116, 111–267.
Carney, T., Myers, B., 2012. Effectiveness of early interventions for substance-using adolescents: findings from a systematic review and meta-analysis. Subst. Abuse Treat. Prev. Policy 7, 25.
Degenhardt, L., Whiteford, H.A., Ferrari, A.J., Baxter, A.J., Charlson, F.J., Hall, W.D., Freedman, G., Burstein, R., Johns, N., Engell, R.E., Flaxman, A., Murray, C.J., Vos, T., 2013. Global burden of disease attributable to illicit drug use and dependence: findings from the Global Burden of Disease Study 2010. Lancet 382, 1564–1574.
Degenhardt, L., Whiteford, H., Hall, W.D., 2014. The Global Burden of Disease projects: What have we learned about illicit drug use and dependence and their contribution to the global burden of disease? Drug Alcohol Rev. 33, 4–12.
Edlund, M.J., Harris, K.M., Koenig, H.G., Han, X., Sullivan, G., Mattox, R., Tang, L., 2010. Religiosity and decreased risk of substance use disorders: is the effect mediated by social support or mental health status? Soc. Psychiatry Psychiatr. Epidemiol. 45, 827–836.
Griffin, K.W., Botvin, G.J., 2010. Evidence-based interventions for preventing substance use disorders in adolescents. Child Adolesc. Psychiatr. Clin. N. Am. 19, 505–526.
Haddad, L., Shotar, A., Umlauf, M., Al-Zyoud, S., 2010. Knowledge of substance abuse among high school students in Jordan. J. Transcult. Nurs. 21, 143–150.
Hamdi, E., Gawad, T., Khoweiled, A., Sidrak, A.E., Amer, D., Mamdouh, R., Fathi, H., Loza, N., 2013. Lifetime prevalence of alcohol and substance use in Egypt: A community survey. Subst. Abuse 34, 97–104.
Heath, I., 2001. 'A fragment of the explanation': the use and abuse of words. Med. Humanit. 27, 64–69.
Himmich, H., Kazatchkine, M.D., Stimson, G.V., 2016. Drug policy and human rights in the Middle East and North Africa: harm reduction, legal environment and public health. Int. J. Drug Policy 31, 4–5.
Jalilian, F., Ataee, M., Matin, B.K., Ahmadpanah, M., Jouybari, T.A., Eslami, A.A., Mahboubi, M., Alavijeh, M.M., 2015. Cognitive factors related to drug abuse among a sample of Iranian male medical college students. Glob. J. Health Sci. 7, 143–151.
Johnson, G.M., Shontz, F.C., Locke, T.P., 1984. Relationships between adolescent drug use and parental drug behaviors. Adolescence 19, 295–299.
Johnson, T.J., Sheets, V.L., Kristeller, J.L., 2008. Identifying mediators of the relationship between religiousness/spirituality and alcohol use. J. Stud. Alcohol Drugs 69, 160–170.
Karam, E.G., Mneimneh, Z.N., Dimassi, H., Fayyad, J.A., Karam, A.N., Nasser, S.C., Chatterji, S., Kessler, R.C., 2008. Lifetime prevalence of mental disorders in Lebanon: first onset, treatment, and exposure to war. PLoS Med. 5, e61.
Karam, E.G., Ghandour, L.A., Maalouf, W.E., Yamout, K., Salamoun, M.M., 2010. A rapid situation assessment (RSA) study of alcohol and drug use in Lebanon. J. Med. Liban.

58, 76–85.
Khalid, S., Zaidi, W., Ahmad, F., 2014. Evaluation of the awareness and perception of professional students in medicine, business and law schools of Karachi, regarding the use of (recreational) cannabis. J. Pak. Med. Assoc. 64, 1025–1030.
Peterson, P.L., Baer, J.S., Wells, E.A., Ginzler, J.A., Garrett, S.B., 2006. Short-term effects of a brief motivational intervention to reduce alcohol and drug risk among homeless adolescents. Psychol. Addict. Behav. 20, 254–264.
Piehler, T.F., Veronneau, M.H., Dishion, T.J., 2012. Substance use progression from adolescence to early adulthood: effortful control in the context of friendship influence and early-onset use. J. Abnorm. Child Psychol. 40, 1045–1058.
Salamoun, M., Karam, A., Okasha, T., Atassi, L., Mneimneh, Z., Karam, E., 2008. Epidemiologic assessment of substance use in the Arab world. Arab J. Psychiatry 19, 100–125.
Scherrer, J.F., Grant, J.D., Duncan, A.E., Pan, H., Waterman, B., Jacob, T., Haber, J.R., True, W.R., Heath, A.C., Bucholz, K.K., 2008. Measured environmental contributions to cannabis abuse/dependence in an offspring of twins design. Addict. Behav. 33, 1255–1266.
Schulenberg, J., Johnston, L., O'malley, P., Bachman, J., Miech, R., Patrick, M., 2018. Monitoring the Future National Survey Results on Drug Use, 1975–2017. University of Michigan, Ann Arbor.
Shafiq, M., Shah, Z., Saleem, A., Siddiqi, M.T., Shaikh, K.S., Salahuddin, F.F., Siwani, R., Naqvi, H., 2006. Perceptions of Pakistani medical students about drugs and alcohol: a questionnaire-based survey. Subst. Abus. Treat. Prev. Policy 1, 31.
Sweileh, W.M., Zyoud, S.H., Al-Jabi, S.W., Sawalha, A.F., 2014. Substance use disorders in Arab countries: research activity and bibliometric analysis. Subst. Abus. Treat. Prev. Policy 9, 33.
Talih, F., Daher, M., Daou, D., Ajaltouni, J., 2018. Examining burnout, depression, and attitudes regarding drug use among Lebanese medical students during the 4 years of medical school. Acad. Psychiatry 42, 288–296.
Underwood, C., 2002. Belief and attitude change in the context of human development. In: UNESCO (Ed.), Sustainable Human Development in the Twenty-First Century. Encyclopedia of life support systems, Oxford, UK.
United Nations Office on Drugs and Crime (UNODC), 2018a. World Drug Report 2018: Global Overview of Drug Demand and Supply. United Nations Office on Drugs and Crime, Vienna.
United Nations Office on Drugs and Crime (UNODC), 2018b. World Drug Report 2018: Analysis of Drug Markets. United Nations Office on Drugs and Crime, Vienna.
Winters, K.C., Leitten, W., 2007. Brief intervention for drug-abusing adolescents in a school setting. Psychol. Addict. Behav. 21, 249–254.
World Health Organization, 2011. Regional office for the Eastern Mediterranean. Report of the Regional Committee for the Eastern Mediterranean Fifty-Eighth Session.
World Health Organization (WHO), 1992. The ICD-10 classifications of mental and behavioural disorders. Clinical Descriptions and Diagnostic Guidelines. World Health Organization, Geneva.