Prevalence and patterns of tobacco, alcohol, and drug use among Iranian adolescents: A meta-analysis of 58 studies

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ABSTRACT

Adolescence is the critical age when adopting high-risk and health-threatening behaviors including smoking, drug and alcohol use is at its peak. Accordingly, this meta-analysis aimed to provide comprehensive nationwide estimates of tobacco, alcohol, and drug use among Iranian adolescents; and to compare their habits with other societies.

Electronic databases, including PubMed, Medline, Embase, Google scholar and National Persian databases of SID, Magiran, and IranMedex were utilized in identifying relevant articles. The included studies were those having publications of quantitative estimates and standard errors of the prevalence of cigarette and drug use among 14–19-year-old high school students in Iran from 2000 to 2014. Random-effects meta-analyses were done including a total of 80,588 high school students.

The most common drugs among adolescents in Iran were hallucinogens [25.3% (95% CI: 23.9–26.8)], sleeping pills and tranquilizers [25% (95% CI: 24–26.1)], hookah [23.1% (95% CI: 22.2–23.9)], opiates [22% (95% CI: 21.3–22.7)] and central nervous system (CNS) stimulants [20.1% (95% CI: 19.1–21.1)]. Furthermore, overall estimates for cigarette smoking, alcohol and chewing tobacco/Pan/Nas in the participants were 16.8% (95% CI: 16.4–17.2), 14.7% (95% CI: 14.2–15.3) and 10.0% (95% CI: 8.7–11.4), respectively. However, there was some heterogeneity in the pattern of drug use across the country (P < 0.01). Additionally, the risk of smoking, drinking and drug use by boys was considerably greater than girls. Moreover, data showed a varying trend of drug use over three studied periods of time.

In conclusion, a diverse pattern and trend of tobacco smoking, alcohol drinking and drug use among adolescents in Iran was verified. Therefore, preventive and control measures (i.e. education) provided in schools should be compatible with age groups, with emphasis being laid on pattern of use in different parts of the country.

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1. Introduction

The abusive use of drugs, tobacco, cigarette, alcohol and other traditional and newly emerging addictive products has become a major public health concern around the world(Aarons et al., 1999; Bauman & Phongsavan, 1999; Cuijpers, 2002; Faggiano et al., 2010; Hong, Lee, Grogan-Kaylor, & Huang, 2011). Currently, about one billion people (about one-seventh of the world's population) smoke cigarettes, and this number is anticipated to rise to 1.5–1.9 billion by 2025 (Guindon & Boisclair, 2003). Furthermore, a recent report by the United Nations Office of Drugs and Crime (UNODC) showed that 5% of the world's population used illicit drugs in 2010. This office also estimated global

cost of drug abuse at 0.3%–0.4% of the worlds' gross domestic product (GDP) (Chakravarthy, Shah, & Lotfipour, 2013).

Cigarettes, tobacco and alcohol are among the most common drugs used across the word, and their usage varies across different regions of the world. Interestingly, although drug abuse and smoking show a fairly stable or reducing trend in many developed countries, they are rapidly increasing in developing countries. Thus, in the next few years, the major burden of drug abuse and smoking will be imposed on these countries, which are less equipped to cope with these challenges (Hickman et al., 2014; Melotti et al., 2011; Mesic et al., 2013; Moeini, Poorolajal, & Gharghani, 2012; Rajabizadeh et al., 2011).

On the contrary, studies suggest that the habits and eventually the addiction to smoking by many adults begin in adolescence. Consequently, the age range of 10–20 years is very crucial and plays a determinant role in adopting high-risk and health-threatening behaviors. Generally, the first adolescence years is characterized with biological, cognitive, social and emotional changes which affect the choice of behavior. During this stage, more time is spent outside academic setting and home with

peers. Therefore, they are at an increased risk of indulging in cigarettes, tobacco and alcohol, as well as partaking in drug usage (Bauman & Phongsavan, 1999; Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Brown et al., 2008; Hale & Viner, 2013; Rhee, Yun, & Khang, 2007; Skara & Sussman, 2003).

Importantly, the pattern of drug use among adolescents in developed countries is different from that of developing countries. For example, several studies on high-school students showed that daily smoking is most common in Bulgaria and Croatia (Kokkevi, Richardson, Florescu, Kuzman, & Stergar, 2007). The prevalence rate of cigarette smoking has also been reported variously from 7% in Nigeria to 30% in Hong Kong; while approximately 19% of Iranian adolescents have demonstrated to smoke cigarette. (Degenhardt et al., 2008; Mohammadpoorasl, Nedjat, Fakhari, Yazdani, & Fotiou, 2014). In comparison with other countries, 99% of students in Zimbabwe and 32% in Wales indulge in alcohol consumption(Smart & Ogborne, 2000). Similarly, in Iran, alcohol consumption among juveniles varied from 4.3% in Shiraz, 2003 to 37.7% in Kerman, 2010 (Ahmadi & Hasani, 2003; Ziaaddini, Sharifi, Nakhaee, & Ziaaddini, 2010).

Marijuana usage (Delva et al., 2005; Ferigolo et al., 2004; Stronski, Ireland, Michaud, Narring, & Resnick, 2000) also ranged from 2% in Greece to 69.2% in Southern Brazil across the world. Similarly, its usage ranged from 0.8% in the city of Shiraz in 2003 to 3.3% in Sarakhs in 2014 among Iranian students (Ahmadi & Hasani, 2003; Khajehdaluee, Zavar, Alidoust, & Pourandi, 2014). Throughout the world, the lowest to highest consumption rates of central nervous system stimulants by the youth (hashish, marijuana, grass, and cannabis) (Degenhardt et al., 2008; Swadi, 1999) ranged from 1.6% in the US to 27% in New Zealand. Similar records have shown a 0.3% usage of Hashish among Iranian adolescents. Furthermore, according to the available data, a portion of about 0.6% to 22% of the world students reported stimulants use (amphetamine, methamphetamine, ecstasy, and Ritalin) compared to a small fraction (1.1%) of students in Iran, who reported ecstasy consumption (Botvin, 2000; Mohammadkhani, 2012; Smart & Ogborne, 2000).

Additionally, 4% to 28.3% of the world adolescents reported usage of tranquilizers/sedatives drugs (T/S) (Kokkevi, Fotiou, Arapaki, & Richardson, 2008), of whom about 0.1% to 21% are addicted to cocaine and psychotropic drugs (Ferigolo et al., 2004; Minozzi, Amato, Bellisario, & Davoli, 2014). There has been some evidence showing that about 0.1% to 5.4%, of the students have stated LSD consumption globally (Minozzi et al., 2014). In comparison, addiction to tramadol was reported among 4.7% to 36% of students in Iran (Nazarzadeh et al., 2013; Nazarzadeh, Bidel, & Carson, 2014). Importantly, over the past decade, there has been a dramatic increase in consumption of opioids and other addictive drugs. Significantly, most opium and its derivatives users are reported from Asia, including Iran which serves as a transit route of the drugs from the producing country of Afghanistan to other parts of the world (Ansari-Moghaddam et al., 2012; Minozzi et al., 2014).

Another important point to note is the indulgence of the adolescents in several high-risk behaviors simultaneously. It has been reported that alcohol consumption or drug abuse by adolescents does not occur alone; alcohol consumption may be accompanied by other high-risk behaviors like smoking or drug use. Consequently, some adolescents below 18 years of age have experienced two or more high-risk behaviors, simultaneously. Evidence suggests that in some cases, people have turned to other substances to quit the one they already used, which predisposed them to multiple high-risk behaviors. For example, smokers are more likely to use alcohol, and vice versa. It is also believed that cannabis users are more likely to use other drugs and vice versa (Aarons et al., 1999; Bojorquez, Fernandez-Varela, Gorab, & Solis, 2010; Brener & Collins, 1998; Brown et al., 2008; Hale & Viner, 2013; Melotti et al., 2011).

The data indicate that prevalence of simultaneous tobacco and alcohol usage among adolescents varies from 4% to 17% in different places.

For instance, in the Democratic Republic of Congo, 15% of 14–19-year-old boys simultaneously used cigarettes and alcohol. Health reports in the United States of America demonstrated multiple drug usage among 17% of young people (Hickman et al., 2014).

Accordingly, monitoring pattern of drug and tobacco usage by adolescents in different parts of the world is proposed to be a major health concern. Therefore, several studies have been conducted in various parts of Iran, showing a significant frequency distribution of tobacco, alcohol and drug usage among the youth. However, there has been no comprehensive study to summarize the results from previous studies conducted so far. More importantly, Iran serves as a transit route for drug trafficking from the main drug producing country (Afghanistan) to Europe. These geographical and social locations make Iran suitable and convenient for the consumption and tendency toward addictive substances among teenagers.

Thus, the primary purpose of the current review was to provide comprehensive nationwide estimates of the overall prevalence rate of tobacco, alcohol, and drug use among Iranian adolescents. A secondary objective was to further estimate the prevalence of tobacco, alcohol, and drug use in Iran by region, gender, and across three time periods. Additionally, the study compared these estimates with other societies descriptively.

2. Material and methods

2.1. Data sources and search strategy

Relevant articles were identified through searches of the electronic databases including PubMed, Medline, Embase, Google Scholar and National Persian Databases of SID, Magiran, Iran Medex and also from citations in the selected papers. The search was conducted using the following medical subject heading terms and/or text words: "cigarette", "medication abuse", "drug abuse", "adolescent", "high school", and "Iran". Furthermore, exploration of related studies continued using the name of every single substance under study, including "cigarette", "alcohol", "opium", "tobacco", etc. Other relevant studies were identified by scanning through reference lists of selected articles and reviews.

2.2. Inclusion and exclusion criteria

The studies containing already published quantitative estimates and standard errors of the prevalence of cigarettes and drugs consumption among 14–19-year-old high school students in Iran, in Persian or English language from 2000 to 2014 were included in the study. Also, the studies which reported prevalence of smoking and drug use in the last 30 days or 12 months, or in the lifetime as current, regular, permanent, often, daily, every day, continually, or regularly were examined. However, the studies that provided only frequency of smoking or drug use, with no means to calculate the standard error and consequently confidence interval were excluded. Some authors have multiple identical publications on one subject. For example, they first published the findings of their research project partially and then completely in Persian or in English. Consequently, information from the most recent publications or manuscript with full details was used for the present review to avoid duplication.

2.3. Data extraction

The following data were extracted for each eligible study independently by two authors (F.S.S. & A.A.M.): Family name of the first author, year of publication, region, study design, sample size, study setting, data collection setting, age, sex and reported prevalence, and their confidence intervals regarding use of smoking as well as different drugs. The confidence intervals, however, were not available in some reports. Therefore, the following equation was used to