Prevalence of High-Risk Behaviors among Iranian Adolescents: a Comprehensive Systematic Review and Meta-Analysis

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Authors
Bahadivand S.[1] *MSc,*
Doosti-Irani A.[2] *PhD,*
Karami M.[3] *PhD,*
Qorbani M.[4] *PhD,*
Mohammadi Y.*[5] *PhD*

[1]"Department of Epidemiology, School of Public Health" and "Students Research Committee", Hamadan University of Medical Sciences, Hamadan, Iran

[2]"Modeling of Noncommunicable Disease Research Center" and "Department of Epidemiology, School of Public Health", Hamadan University of Medical Sciences, Hamadan, Iran

[3]"Research Center for Health Sciences" and "Department of Epidemiology, School of Public Health", Hamadan University of Medical Sciences, Hamadan, Iran

[4]Non- communicable Disease Research Center, Alborz University of Medical Sciences, Karaj, Iran

[5] "Social Determinants of Health Research Center" and "Department of Epidemiology, School of Public Health", Hamadan University of Medical Sciences, Hamadan, Iran

Correspondence
Address: Department of Epidemiology, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran. Postal Code: 6517838736.
Phone: +98 (81) 38380090
Fax: +98 (81) 38380509
u.mohammadi@umsha.ac.ir

ABSTRACT

Aims Our knowledge of the prevalence of high-risk behaviors among Iranian adolescents is controversial. This paper was aimed to estimate the prevalence of drug abuse, alcohol consumption, smoking, hookah, and extramarital sex among Iranian adolescents with a systematic approach.

Information & Methods In this meta-analyses study, the databases were searched up to date of 2020/1/21 that searched major international databases including Web of Science, Medline, and Scopus, and some national databases include SID, IranDoc, Magiran, and a reference list of the selected studies to obtain the relevant studies until 2020/02/21. PRISMA checklist and the Joanna Briggs Institute critical appraisal checklist were used. Stata 11 software was used to analyze data.

Findings Out of 8047 studies identified at initial phase, 37 studies were eligible for meta-analysis. The pooled prevalence of drug abuse, alcohol consumption, smoking, hookah and extramarital sex were 4% (95% CI: 3% to 5%), 9% (95% CI: 6% to 10%), 9% (95% CI: 7% to 10%), 20% (95% CI: 14% to 25%) and 20% (95% CI: 9% to 31%), respectively.

Conclusions The prevalence of high-risk behaviors in Iranian adolescents is high. Taking primary prevention measures to reduce prevalence is recommended by legal and health measures.

Keywords Risk Behavior; Adolescents; Systematic Review; Iran

CITATION LINKS

[1] Study of risky behaviors leading ... [2] The top six risky behaviors ... [3] Determinants of smoking behavior ... [4] Hookah smoking in high school ... [5] Prevalence of water pipe ... [6] Having multiple sexual partners ... [7] Alcohol and drug use prevalence ... [8] Pattern of substance use among ... [9] Prevalence of substance ... [10] Preferred reporting items ... [11] The development of a critical ... [12] Determinants of smoking behavior ... [13] Estimation of intravenous ... [14] Investigation of substance use ... [15] Investigation of substance use prevalence ... [16] Substance abuse in Iranian high ... [17] Epidemiology of high-risk behaviors ... [18] Prevalence of cigarette smoking ... [19] Epidemiology of substance abuse ... [20] Waterpipe tobacco smoking prevalence ... [21] The prevalence of cigarette smoking ... [22] The prevalence of cigarette ... [23] Evaluation of the prevalence ... [24] Prevalence and determinants ... [25] Sexual risk-taking behaviors ... [26] Substance abuse in high school ... [27] Prevalence of health-risk behaviors ... [28] prevalence of risky behaviors and ... [29] Patterns of drug use among secondary ... [30] Naltrexone for alcohol-dependent ... [31] Prevalence of cigarette smoking ... [32] Prevalence and predictors of water ... [33] Prevalence of heroin abuse in Shiraz ... [34] Alcohol use disorders in Iran ... [35] A survey of smoking prevalence and ... [36] Prevalence of ecstasy use ... [37] Prevalence of substance use ... [38] Prevalence of cigarette and water ... [39] Prevalence of and factors associated ... [40] Prevalence of hookah smoking ... [41] Smoking habits of adolescent students ... [42] Prevalence of smoking among ... [43] Prevalence of smoking and drug ... [44] The prevalence of different kinds ... [45] Substance use disorders ... [46] Prevalence of substance use ... [47] smoking among 15-to 64-year ... [48] Predictors of transition in smoking ... [49] Drug abuse in pre ... [50] The prevalence of smoking ... [51] Meta-analysis of smoking ... [52] Prevalence and patterns ... [53] New research findings since the 2007 ... [54] Vital signs: binge drinking prevalence ... [55] Toward a global view of alcohol ... [56] Prevalence, patterns, and ... [57] Mortality attributable to excess body ... [58] The prevalence of waterpipe ... [59] Prevalence, correlates, disability ... [60] Protective correlates of stages in ...

Introduction

Risk behaviors are one of the serious health threats that have been paid attention to in recent years due to rapid social changes [1, 2]. Many studies showed that there is an increasing trend in the prevalence of these behaviors. The global statistics show that 1.1 billion people over 15 years of age are smokers [3], and 24% use hookahs [4, 5]. Sexual behavior, as one of the major risk behaviors with a prevalence of over 10%, increases the risk of communicable diseases such as AIDS [6]. Furthermore, alcohol consumption may endanger human life by increasing the risk of developing chronic diseases and traffic accidents. Global prevalence rates of alcohol use disorders among adults were estimated to range from 0% to 16%. On average, every person aged 15 years and older in the world drinks 6.2 liters of alcohol per year [7]. Substance use is rising in the world and Iran. The estimated prevalence among the adult population is about 5% globally and 5.3% in Iran. Drug abuse is associated with AIDS and hepatitis B and C [8, 9].

According to the importance and growing trend of high-risk behaviors, and due to conflicting findings on the prevalence of high-risk behaviors in Iranian adolescents, this study aimed to provide reliable and valid statistics on the prevalence of top risky behaviors among Iranian adolescents.

Information and Methods

In this meta-analyses study, the databases were searched up to date of 2020/1/21. Alarms inform of the database was activated for newly published studies. The studies were selected which reported the prevalence of cigarette and drug consumption, alcohol consumption, sexual behavior, and pipe smoking among 10–19-year-old Iranians. In terms of study type, exclusively included cross-sectional studies, and therefore, other studies such as interventional studies were excluded. No time limitations were imposed, and the languages of the included studies were English and Persian.

PRISMA checklist (preferred reporting items for systematic reviews and meta-analyses) was used to conduct and write this study [10]. Relevant articles were identified through searching the electronic databases, including PubMed, Scopus, Web of Science, search engine Google Scholar, and Iranian databases include SID, Iran Medex. Furthermore, a reference list of selected studies was investigated to find neglected studies. The keywords used for searching PubMed were as follows: (adolescent [Mesh Terms] OR teen [Text Word] AND (smoking [Mesh Terms] OR "alcohol consumption" [Mesh Terms] OR "waterpipe smoking" [Mesh Terms] OR "drug abuse" [Mesh Terms] OR "sexual behavior" [Mesh Terms] OR "high-risk behavior") [Title-Abstract] AND (prevalence [Mesh Terms]). In Web of Science and Scopus, we searched the mentioned keywords as the topic (TS) and TITLE-ABS-KEY, respectively. The Joanna Briggs Institute critical appraisal checklist [11] was used for evaluating the quality of the studies that reported prevalence rates. The checklist consists of 7 items that evaluate different parts of an article. Based on the checklist, if the article in question had that item, we marked it with a + sign, and if it did not have the item, we marked it with a - sign. Thus, the highest score that each article received seven, and the lowest score was zero.

Questions of the checklist as follow:
(A) Was the sample frame appropriate to address the target population?
(B) Were study participants sampled appropriately?
(C) Was the sample size adequate?
(D) Were the study subjects and the setting described in detail?
(E) Were valid methods used for the identification of the condition?
(F) Was there appropriate statistical analysis?
(G) Was the response rate adequate, and if not, was the low response rate managed appropriately?

Two authors independently reviewed the articles according to the criteria. In addition, the articles were reviewed regarding the title, abstract, and full text. To extract the required information for meta-analysis, an excel form was designed. This form included the name of the first author, year of publication, age, sex, province of study, sample size, prevalence, and type of high-risk behavior that were favorable.

At initial search, 7998 studies were retrieved from the databases. Additionally, 29 records were identified through other sources (Figure 1). In the next step, 883 duplicate studies were removed. During the review of the full text of the articles, 157 articles were entered into the data extraction process. Afterward, the required data were extracted from 37 papers and were analyzed; studies with a sample size of 515361 individuals were eligible to be included in the meta-analysis [4, 5, 7, 12-45]. Results for assessing the quality of the studies included in the final phase are shown in Table 1. The majority of the studies possessed the appropriate quality according to the checklist. Out of 37 articles reviewed, 6 articles received 6 points [14, 18, 22, 23, 27, 28, 45] and the remaining (31 articles) received 7 points [4, 5, 7, 12, 15-17, 19, 21, 24-26, 29, 31, 32, 34-44, 46, 47]. The heterogeneity calculated in the studies was 95%.

The summary measure was included the prevalence of high-risk behavior were extracted from the included studies. The random-effects model was used to obtain one single estimate of the prevalence. The pooled prevalence with a 95% confidence interval (95% CI) was reported. Stata 11 software was used (StataCorp., College Station, TX, USA).
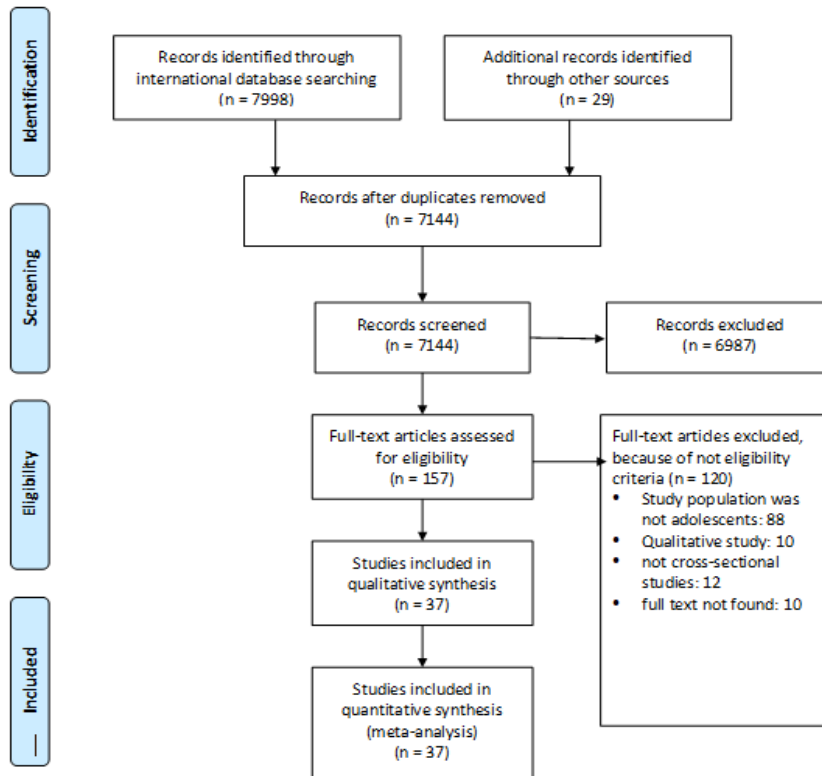
Figure 1) A flow chart depicting the stages of retrieving articles and checking eligibility criteria for meta-analysis

Table 1) Result of risk of bias of the eligible studies using the Joanna Briggs Institute critical appraisal checklist (The letters represent the checklist questions)

Reference	A	B	C	D	E	F	G	Quality
[4]	+	+	+	+	+	+	+	7
[5]	+	+	+	+	+	+	+	7
[7]	+	+	+	+	+	+	+	7
[12]	+	+	+	+	+	+	+	7
[14]	+	+	+	+	+	+	-	6
[15]	+	+	+	+	+	+	+	7
[16]	+	+	+	+	+	+	+	7
[17]	+	+	+	+	+	+	+	7
[18]	+	+	+	+	+	+	-	6
[19]	+	+	+	+	+	+	+	7
[20]	+	+	+	+	+	+	+	7
[21]	+	+	+	+	+	+	+	7
[22]	+	+	+	+	+	+	-	6
[23]	+	+	+	+	+	+	-	6
[24]	+	+	+	+	+	+	+	7
[25]	+	+	+	+	+	+	+	7
[26]	+	+	+	+	+	+	+	7
[27]	+	+	+	+	+	+	-	6
[28]	+	+	+	+	+	+	-	6
[31]	+	+	+	+	+	+	+	7
[32]	+	+	+	+	+	+	+	7
[33]	+	+	+	+	+	+	+	7
[34]	+	+	+	+	+	+	+	7
[35]	+	+	+	+	+	+	+	7
[36]	+	+	+	+	+	+	+	7
[37]	+	+	+	+	+	+	+	7
[38]	+	+	+	+	+	+	+	7
[39]	+	+	+	+	+	+	+	7
[41]	+	+	+	+	+	+	+	7
[42]	+	+	+	+	+	+	+	7
[43]	+	+	+	+	+	+	+	7
[44]	+	+	+	+	+	+	+	7
[45]	+	+	+	+	+	+	-	6
[47]	+	+	+	+	+	+	+	7
[48]	+	+	+	+	+	+	+	7
[49]	+	+	+	+	+	+	+	7

Findings

The pooled prevalence of drug abuse, alcohol consumption, extramarital sex, smoking, and hookah by sex with a 95% confidence interval (CI) showed in Table 2.

Thirty-six articles reported the prevalence of smoking in both genders, 12 articles in women and 18 articles in men. The pooled prevalence of smoking was 9% (95% CI: 7% to 10%), moreover, prevalence in girls and boys were 5% (95% CI: 3% to 7%) and 10% (95% CI: 8% to 11%) respectively (Table 3).

Fifteen articles reported the prevalence of alcohol consumption in both genders. On the other hand, six articles reported prevalence in girls and eight articles in boys. The pooled prevalence of alcohol in both genders, girls and boys were 9% (95% CI: 6% to 10%), 6% (95% CI: 3% to 9%) 11% (95% CI: 8% to 15%) respectively (Table 4).

Sixteen out of 37 articles reported the prevalence of hookah. The prevalence of hookah for genders, girls and boys were 20% (95% CI: 14% to 25%), 13% (95% CI: 8% to 18%), 24% (95% CI 12% to 38%) respectively (Table 5).

Information on the prevalence of drug abuse was presented by 24 studies. The overall prevalence of drug abuse in both genders was 4% (95% CI: 3% to 5%), in women was 2% (95% CI: 1% to 3%) and in men was 5% (95% CI: 4% to 7%). Descriptive characteristics of Studies reporting the prevalence of drug abuse were presented in Table 6.

Seven articles reported the prevalence of extramarital sex in Iranian adolescents. The pooled prevalence of extramarital sex in both genders, in women and in men was 20% (95% CI: 9% to 31%), 13% (95% CI 4% to 31%) and 24% (95% CI: 15% to 33%) respectively (Table 7).

Table 2) Pooled prevalence of drug abuse, alcohol consumption, extramarital sex, smoking, and hookah by sex with 95% confidence interval (CI)

Type of behavior	Number of articles	Male (%)	Female (%)	Both gender (%)
Smoking	36	10 (95% CI:8 to 13)	5 (95% CI:3 to 7)	9 (95% CI:7 to 10)
Alcohol consumption	15	11 (95% CI:8 to 15)	6 (95% CI:3 to 9)	9 (95% CI:6 to 11)
Water pipes smoking	16	24 (95% CI:12 to 38)	13 (95% CI:8 to 18)	20 (95% CI:14 to 25)
Drug abuse	24	5 (95% CI:4 to 7)	2 (95% CI:1 to 3)	4 (95% CI:3 to 5)
Extra marriage sex	7	24 (95% CI:15 to 33)	13 (95% CI:4 to 31)	20 (95% CI:9 to 31)

Table 3) Descriptive characteristics of Studies reporting prevalence of smoking in adolescents

First Author	Year	City	Sex	Sample Size	Prevalence (%95 CI)
Fotouhi A.	2009	Tehran	M	389	6.1 (3.72 to 8.48)
Fotouhi A.	2009	Tehran	F	654	.9 (0.18 to 1.62)
Ghaderi N.	2016	Marivan	M	470	4.7 (2.79 to 6.61)
Karimy M.	2013	Zarand	Both	365	15.1 (11.43 to 18.77)
Mohamad K.	2007	Tehran	M	1385	12.8 (11.04 to 14.56)
Mohammadpoorasl A.	2012	Tabriz	Both	4801	1.4 (1.07 to 1.73)
Pirdehgan A.	2017	Yazd	M	448	10.7 (7.84 to 13.56)
Pirdehgan A.	2017	Yazd	F	256	3.5 (1.25 to 5.75)
Shahraki-Sanavi F.	2018	Zahedan	F	457	.22 (0.21 to 0.65)
Ahmadi J.	2004	Shiraz	M	470	6.2 (4.02 to 8.38)
Poorolajal J.	2012	Hamedan	F	573	6.8 (4.74 to 8.86)
Poorolajal J.	2012	Hamedan	M	588	13.4 (10.65 to 16.15)
Ahmadi J.	2003	Shiraz	F	200	1.5 (0.18 to 3.18)
Ahmadi J.	2003	Shiraz	M	197	15.2 (10.19 to 20.21)
Shamshiri-Milani H.	2011	Tehran	F	2313	12.7 (11.34 to 14.06)
Porasal A.	2007	Tabriz	Both	4081	8.7 (7.84 to 9.56)
Nazarzadeh M.	2012	Zanjan	M	1100	10.8 (8.97 to 12.63)
Najafi K.	2009	Guilan	M	1041	25.9 (23.24 to 28.56)
Najafi K.	2009	Guilan	F	886	13 (10.79 to 15.21)
Mohammad-Alizadeh-Charandabi M.	2015	Sanandaj	M	760	13.1 (10.70 to 15.50)
Mohammad-Alizadeh-Charandabi M.	2015	Sanandaj	F	764	6.4 (4.66 to 8.14)
Mohammad-Poorasl A.	2007	Tabriz	M	1785	4.4 (3.45 to 5.35)
Mohammadi F.	2014	Babolsar	M	450	17.2 (13.71 to 20.69)
Nakhaee N.	2011	Kerman	M	755	28 (24.80 to 31.20)
Nakhaee N.	2011	Kerman	F	922	9.5 (7.61 to 11.39)
Nakhaee N.	2011	Kerman	Both	1750	18.7 (16.87 to 20.53)
Heydari G.	2007	Tehran	M	712	6 (4.26 to 7.74)
Heydari G.	2007	Tehran	F	381	2 (0.59 to 3.41)
Ramezankhani A.	2010	Tehran	M	2272	6.8 (5.76 to 7.84)
Ramezankhani A.	2010	Tehran	F	2251	6.1 (5.11 to 7.09)
Ghavidel N.	2012	Nazarabad	Both	400	7.8 (5.17 to 10.43)
Mohammadpourasl A.	2006	Tabriz	M	1785	4.4 (3.45 to 5.35)
Namakin K.	2008	Birjand	M	1233	3.9 (2.82 to 4.98)
Mojahed A.	2004	Zahedan	F	259	.4 (0.37 to 1.17)
Mojahed A.	2004	Zahedan	M	216	2.3 (0.30 to 4.30)
Moradi Gh.	2004	Kordestan	Both	2468	6.9 (5.90 to 7.90)

Table 4) Descriptive characteristics of Studies reporting the prevalence of alcohol consumption in adolescents

First author	Year	City	Sex	Sample Size	Prevalence (%95 CI)
Baheiraei A.	2013	Tehran	F	1201	8.4 (6.83 to 9.97)
Baheiraei A.	2013	Tehran	M	1201	15.1 (13.08 to 17.12)
Mohamad K.	2007	Tehran	M	1385	16.8 (14.83 to 18.77)
Pirdehgan A.	2017	Yazd	M	448	2.3 (0.91 to 3.69)
Pirdehgan A.	2017	Yazd	F	256	10.5 (6.74 to 14.26)
Shahraki-Sanavi F.	2018	Zahedan	F	457	0 (0.00 to 0.00)
Ahmadi J.	2004	Shiraz	M	470	2.8 (1.31 to 4.29)
Ahmadi J.	2003	Shiraz	F	200	1 (0.38 to 2.38)
Ahmadi J.	2003	Shiraz	M	197	7.6 (3.90 to 11.30)
Amin-Esmaeili M.	2017	Iran	Both	997	5 (3.65 to 6.35)
Shamshiri-Milani H.	2011	Tehran	F	2313	8.2 (7.08 to 9.320
Najafi K.	2009	Guilan	M	1041	16.6 (14.34 to 18.86)
Najafi K.	2009	Guilan	F	886	3.4 (2.21 to 4.59)
Mohammad-Poorasl A.	2007	Tabriz	M	1785	12.7 (11.16 to 14.24)

Table 5) Descriptive characteristics of Studies reporting the prevalence of waterpipe smoking in adolescents

Author	Year	City	Sex	Sample size	Prevalence (%95 CI)
Baheiraei A.	2012	Tehran	F	350	13.8 (10.19 to 17.41)
Danaei M.	2017	Kerman	Both	1090	14.9 (12.78 to 17.01)
Hessami Z.	2017	Tehran	Both	1830	13.6 (12.03 to 15.17)
Pirdehghan A.	2017	Yazd	M	448	31.1 (33.70 to 42.70)
Pirdehgan A.	2017	Yazd	F	256	18.8 (14.01 to 23.59)
Shahraki-Sanavi F.	2018	Zahedan	F	457	10.13 (7.36 to 12.90)
Mohamadi M.	2017	Kurdistan	M	932	43.1 (39.92 to 46.28)
Mohamadi M.	2017	Kurdistan	F	905	29.2 (26.24 to 32.16)
Baheiraei A.	2013	Tehran	F	609	21.4 (18.14 to 24.66)
Baheiraei A.	2013	Tehran	M	592	34.8 (30.96 to 38.64)
Fakhari A.	2015	Azarbaijan Gharbi	M	2240	5.1 (4.19 to 6.01)
Fakhari A.	2015	Azarbaijan Gharbi	F	2952	0.9 (0.56 to 1.24)
Mohammad-Alizadeh-Charandabi M.	2015	Sanandaj	M	760	13.8 (11.35 to 16.25)
Mohammad-Alizadeh-Charandabi M.	2015	Sanandaj	F	764	7.1 (5.28 to 8.92)
Mohammadpoorasal A.	2014	Tabriz	M	739	9.3 (7.21 to 11.39)

Table 6) Descriptive characteristics of Studies reporting prevalence of Drug abuse in adolescents

Author	Year	City	Sex	Sample Size	Prevalence (%95 CI)
Pirdehgan A.	2017	Yazd	M	448	0.4 (0.18 to 0.98)
Baheiraei A.	2013	Tehran	F	1201	2.1 (1.29 to 2.91)
Baheiraei A.	2013	Tehran	M	1201	3.1 (2.12 to 4.08)
Mohamad K.	2007	Tehran	M	1385	2.1 (1.34 to 2.86)
Mohammadpoorasl A.	2012	Tabriz	M	2760	2.4 (1.83 to 2.97)
Mohammadpoorasl A.	2012	Tabriz	F	2041	0.6 (0.26 to 0.94)
Pirdehgan A.	2017	Yazd	F	256	0
Shahraki-Sanavi F.	2018	Zahedan	F	457	0
Sohrabivafa M.	2017	Dezful	M	150	30.5 (23.13 to 37.87)
Sohrabivafa M.	2017	Dezful	F	150	25.7 (18.71 to 32.69)
Agahi C.	1982	Esfahan	both	712	11 (8.70 to 13.30)
Ahmadi J.	2004	Shiraz	M	470	8.3 (5.81 to 10.79)
Ahmadi J.	2003	Shiraz	F	200	0
Ahmadi J.	2003	Shiraz	M	197	1.5 (0.20 to 3.20)
Shamshiri-Milani H.	2011	Tehran	F	2313	2.3 (1.69 to 2.91)
Porasal A.	2007	Tabriz	M	2041	2.4 (1.74 to 3.06)
Porasal A.	2007	Tabriz	F	2760	0.6 (0.31 to 0.89)
Najafi K.	2009	Guilan	M	1041	3.3 (2.21 to 4.39)
Najafi K.	2009	Guilan	F	886	1.5 (0.70 to 2.30)
Mohammad-Poorasl A.	2007	Tabriz	M	1785	2 (1.35 to 2.65)
Ghavidel N.	2012	Nazarabad	both	400	1.3 (0.19 to 2.41)
Mohammadpoorasl A.	2007	Tabriz	M	1785	16.7 (14.97 to 18.43)
Mojahed A.	2004	Zahedan	F	259	1.6 (0.07 to 3.13)

Table 7) Descriptive characteristics of Studies reporting the prevalence of extra marriage sex in adolescents

First Author	Year	City	Sex	Sample Size	Prevalence (%95 CI)
Mohamad K.	2007	Tehran	M	1385	28 (25.64 to 30.36)
Shahraki-Sanavi F.	2018	Zahedan	F	457	1.32 (0.27 to 2.37)
Sohrabivafa M.	2017	Dezful	M	150	20 (13.60 to 26.40)
Sohrabivafa M.	2017	Dezful	F	150	12.2 (6.96 to 17.44)
Mikaeili N.	2015	Iran	M	893	14.85 (12.52 to 17.18)
Rashid Kh.	2015	Tehran	M	511	33.9 (29.80 to 38.00)

Discussion

We aimed to estimate the prevalence of high-risk behaviors among Iranian adolescents using meta-analysis. The findings showed that the prevalence of behavioral risk factors among Iranian adolescents is relatively high. In this study, we found that the highest prevalence of high-risk behavior belongs to hookah smoking, followed by alcohol consumption and drug abuse. In all behaviors, the prevalence in boys was higher than in girls. Our study showed that the highest prevalence was related to hookah use and extramarital sex.

Rahim Meagher & Izadian's review study shows that alcohol, opium, and hashish were the most commonly used drugs. The prevalence of tobacco smoking (cigarettes, hookah, and pipe) among high school students was reported by 21% in their lifetime [50]. The difference between our results with Rahim Movaghar's results comes from the type of prevalence. We used point prevalence, while Rahim Movaghar used lifetime prevalence, and therefore, lifetime prevalence is higher than point prevalence. Moreover, findings of a systematic review study by Haghdoost showed that the lowest and highest prevalence of smoking among male students was 13.4 and 39.9, respectively, while it was 0.7 and 25.5%, respectively, among female students [51]. Meta-analysis Moosazadeh in men and women indicated the prevalence of 22.9 (20.6-25.2) and 0.6 (0.3-0.9) respectively [51].

Meta-analyzing by Ansari Moghadam among students reported a prevalence of smoking by 16.8% [52]. Smoking among Hong Kong youth ranged from 2 to 64 .The percentage of adolescent smokers also varies in Iran's neighboring countries, 13.7% in Pakistan to 18% in Lebanon [48]

In our study, the prevalence of cigarettes was lower than that of Meta-analysis studies, and this may make the different definitions from predictors and population.

Another emerging concern is alcohol consumption among adolescents. A study conducted by the World Health Organization in 2012, in 15-year-olds, in 36 European countries and Canada showed that the pattern of alcohol consumption among adolescents in It was similar to the United State [53]

In the United States, The prevalence of alcohol in 2016 reported that 19% of youth aged 12 to 20 years drink alcohol [54]. However, consumption was much higher than in Africa and the Middle East [55]. A study conducted in 35 European countries showed that alcohol consumption in adolescents is 44%, ranging from 19% in Greece and 17% in the UK [56]. In Iran, the prevalence of alcohol consumption was lower compared to other countries. The rate obtained in our study was lower than in other studies .Both the sale and consumption of alcohol by the Iranian government are strictly prohibited. For religious beliefs, alcohol consumption in Iran is forbidden, and therefore, both the sale and consumption of alcohol

by the Iranian government are strictly prohibited. To reduce alcohol consumption, families should be educated because families are considered as teenage models. In families where liquor is used, the tendency to use high is easily accessible to teenagers. Therefore, parental supervision of adolescents, friends, and personal expenses is a protective factor against high-risk use by adolescents. Compared with global prevalence, Iran has an equal prevalence of waterpipe smoking. The prevalence of hookah globally is estimated to be 24% approximately [54, 57]. The prevalence of waterpipe smoking from 38 studies showed that the current rate of waterpipe smoking among university students in EMR countries is 15-28%, in South Asia 33%, in the United States 10%, and Europe 8% [58]. The rate obtained in our study was as high as in other studies. Adolescents find hookah smoking soothing, energizing, and part of their culture. However, they are not aware of the dangers of hookah smoking; they mistakenly believe that hookah smoking is the healthiest choice among tobacco products.

In this study, we found that the prevalence of drug abuse in Iran is higher than in global statistics. Prevalence of drug abuse in Europe, the United States, and higher percentages were 1.4%, 1%, and 1.6%, respectively [59]. In 36 European countries, CNS stimulants (cannabis) were the most popular drug prevalence rates ranging from 2% in Greece to 53% in Scotland. Based on Europe School Survey, marijuana usage was 19% in Italy, 15% in Spain, 8% in Poland, 6% in Norway and Sweden, 4% in Hungary, 2% in Greece, 41% in England, and 37% in Ireland [60].

Iran has a long border with Afghanistan, as one of the largest drug producers globally, and therefore, transportation, sell and access to the drug in Iran is easy. Therefore, to reduce drug abuse among adolescents, besides the educational programs for students, enforcement of the border with Afghanistan to prevent Smuggling drugs into Iran is recommended.

Extramarital sex was common among Iranian adolescents. In Iran, due to religious and cultural beliefs, having extramarital sex is undesirable. Therefore, discussion on this issue, including research on it, is very difficult, and therefore its control is very difficult. In this study, some limitations were present. We did not access the full text of several studies; therefore, we exclude them from the final analysis. The exclusion of these studies may affect our results, although we hope their effects are negligible.

Conclusion

The prevalence of cigarettes, hookahs, drugs, alcohol consumption and extra marriage sex relations among Iranian adolescents is high; therefore, policymakers need to plan to reduce these behaviors.

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