Original Article

Prevalence of Substance Use During Pregnancy and the Related Factors: A Study from Southeast Iran

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Abstract
Background: Substance use during pregnancy has an increasing trend in all socio-economic classes. In addition to the fetal consequences, this problem has many other economic and social harmful effects. This study aimed to determine the prevalence of substance use and its related factors in pregnant women.
Methods: This cross-sectional study was performed using a self-administered questionnaire on 587 pregnant women in Kerman, Iran who visited public health centers and private offices to receive prenatal care. Participants were recruited from January to February 2020 using a multistage sampling method.
Results: The most prevalent substances used during pregnancy were waterpipe (8.5%), opium (2.6%), and alcohol (1.7%). Substance use in the first-degree relatives strongly correlated with substance use in pregnant women (odds ratio [OR] = 7.26). The low educational level of pregnant women's husbands was also a predictor of substance use in pregnant women (OR = 3.15).
Conclusion: Since substance use by family members was the strongest correlate of drug use during pregnancy, family-based interventions should be tailored to address early detection of such vulnerable women and to provide appropriate counseling services.
Keywords: Substance use, Pregnancy, Women

Introduction

Alcohol, tobacco, and other drugs use among pregnant women is one of the major public health concerns, worldwide. These substances have several dangerous consequences for both mothers and their fetuses (1-3). Substance use (SU) in pregnancy remains a significant public health problem, which can lead to several harmful maternal and neonatal outcomes. The side effects of SU in the pregnancy period depend on the type of substance, the amount of use, and gestational age (4,5). In addition to the direct effects of drug exposure in utero, several other variables are associated with deleterious maternal and infant consequences, including psychiatric comorbidity, polysubstance use, limited prenatal care, environmental stressors, and disrupted parental care. Furthermore, women are at the highest risk for developing SU disorder during their reproductive years (18–44) (5). It means that women who are pregnant or soon to become pregnant

are at higher risk for SU (4). SU is increasing in pregnant women as an emerging phenomenon in all socio-economic classes and races (1,4-5).

Due to the fear of legal and social punishments, guilt and shame, and to avoid exposure to SU stigma, SU data in pregnant women are substantially underreported (6,7). Estimating the actual number of pregnant women with SU is difficult and it also varies from one country to another even in different regions of a country for various reasons, including the method of collecting data, frequency, and type of substance (8). In Iran, due to the lack of a national study with high generalizability, it is difficult to estimate the prevalence of SU in this group (9).

According to the recent reports, the prevalence of SU in the world is notable (10). The global prevalence of alcohol use during pregnancy was estimated to be 9.8% (95% CI 8.9–11.1) (11). In the US, according to the CDC and based on the data of the Behavioral Risk Factor Surveillance

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System, the prevalence of alcohol use in the last 30 days has been reported to be 13.5% in pregnant women (12). Also, in another survey in the US, 17% of pregnant women were current smokers and the prevalence of using at least one drug during pregnancy was reported at 27% (13).

According to a study conducted in six provinces of Iran, 7.1% of pregnant women smoked cigarettes and 0.9% used opium during pregnancy (14). Also, the prevalence estimates of ever- and past-month use of waterpipe in southeastern Iran among pregnant women were 29.3%, and 0.1%, respectively. Moreover, the prevalence of any SU (opium, opium extract, heroin, morphine, tramadol, or tranquilizers) was reported to be 15% in lifetime and 3.3% in the past month (15).

Pregnant women who abuse drugs have various problems such as poor nutrition and poor health, social deprivation, mental health problems, and risky lifestyles (4). These mothers do not go for prenatal services and care, and as a result, they endanger their own health and their fetuses due to not receiving proper medical services (1). They also have higher rates of infectious diseases such as HIV/AIDS, hepatitis, and sexually transmitted diseases (6). These mothers and their fetuses are more prone to complications such as premature abortion, seizures, ectopic pregnancies, higher risk of congenital anomalies up to five times, mental retardation, low birth weight, respiratory diseases, and other problems such as violence, physical abuse by husbands, poverty and depression, and fetal alcohol spectrum disorders (16).

There are numerous factors contributing to women's tendency to SU, including having a partner or a close person who is abusing drugs, such as the husband, family member, or close friend (8,17). Low awareness of people about the consequences of SU, especially during pregnancy, environmental factors such as easy access to drugs, as well as having a positive attitude towards SU among the local community drives more pregnant women to use drugs (17-20).

During pregnancy, the pregnant woman's contacts with health care providers to receive prenatal care provide a good opportunity to receive the necessary information and interventions for healthier choices (8). Therefore, it is of much importance to study the status of SU during pregnancy and identify the related factors.

Since SU during pregnancy can make it a high-risk pregnancy, and the goal of optimal pregnancy care is timely diagnosis and treatment of harmful conditions, identifying such pregnancies can be useful in conducting further studies and regional and ethnic conclusions. To the best of our knowledge, no studies have investigated the prevalence of SU in pregnant women in Kerman Province. Since through knowing the extent of the problem, we can better plan for the prevention and treatment of drug use in pregnant women, the present study aimed to determine the prevalence and related factors of SU during pregnancy in Kerman, Southeast Iran.

Methods

This cross-sectional study was performed on 587 (out of 600 approached women, response rate: 97.8%) pregnant women in Kerman (a big city with a population of around 800 000) from January to February 2020. The subjects were selected through a multi-stage sampling method. The sampling framework consisted of pregnant women referring to the private offices of obstetricians and primary health care centers in Kerman to receive prenatal care. We recruited 150 participants from the four private offices of obstetricians and 450 participants from 12 primary health care centers in Kerman.

The private offices were selected from the offices that had more patients and the physicians agreed to cooperate. To select primary health care centers, first, Kerman city was divided into four regions and three primary health care centers were selected from each region. Then, the participants were selected randomly from each center.

These primary healthcare centers were selected from diverse geographical areas of the city with different socio-economic characteristics. Inclusion criteria were being pregnant and giving informed verbal consent to participate in the study.

Dependent variables: SU was categorized into lifetime and current use (during pregnancy) of opium, alcohol, waterpipe, cigarettes, and cannabis.

Independent variables: Baseline characteristics including age, level of education, gravidity, gestational age, knowledge, and attitudes toward SU, environmental factors and self-efficacy, and social factors including husband's literacy level and SU by a first-degree relative were considered as independent variables.

The research tool was a two-part structured self-administered questionnaire. The first part that measured SU had ten items with a yes/no scale. The second part measured the factors related to SU, which included four subscales of knowledge, attitude, self-efficacy, and environmental factors. Content validity was determined using an expert panel and two informal group discussions with 12 pregnant women. The Cronbach's alpha for the knowledge construct with nine items, attitude with 11 items, self-efficacy with seven items, and environmental factors with six items were 0.83, 0.75, 0.62, and 0.71, respectively. These were all scored using a 5-point (1-5) Likert scale (strongly agree to strongly disagree or very much to none) except knowledge which was scored with a yes and no scale.

The questionnaires were distributed by three trained female interviewers who were midwives or health experts. After the client received the services from the midwife or physician, she was provided with accurate and clear explanations about the purpose of the project

while assuring the confidentiality of the data and was asked to complete the questionnaire anonymously and throw it into a box (the sealed ballot box method). For the illiterate women, the questionnaire was completed through interview.

Data analysis was performed using SPSS 22 software and the significance level was considered 0.05. To describe data, frequency (percentage) and mean (SD) were used. A binary logistic regression was used to determine the relationship between variables. After bivariable analysis, independent variables with a p-value less than 0.2 were entered into a multivariable logistic regression model. The fitness of the model was also tested by the Hosmer-Lemeshow test. There was no evidence of multicollinearity regarding to the variance factor.

Results

The mean ± standard deviation (SD) age of participants was 28.9 ± 5.9 years, 44.1% of the subjects had a college/university education and 34.6% of them were in the second trimester of pregnancy (Table 1). In terms of gestational age, 46.8% of the participants were in the 28–40 weeks of pregnancy.

The highest and lowest lifetime prevalences were respectively obtained for use of waterpipe (23.9%) and chewing tobacco (0.3%). The lifetime prevalence of opium and alcohol use were 6% and 5.1%, respectively. The most commonly used drugs during pregnancy were tobacco through waterpipe (8.5%), opium (2.6%) and alcohol (1.7%), respectively. The prevalence of the use of at least one of the substances in the women`s lifetime and during pregnancy were 27.2% and 11.1%, respectively (Table 2).

The most commonly used substances in at least one

of the first-degree relatives were waterpipe (44.8%), cigarettes (31.2%), and opium (23.5%), respectively (Table 3).

Multivariable logistic regression showed that these variables increased the odds of SU: being a first-degree relative with at least one substance (OR = 7.26), lower education of husband (OR = 3.15). (Table 4).

The result of the Hosmer and Lemeshow test was in favor of goodness of fit of the model (Table 5).

Discussion

The prevalence of SU among pregnant women has shown an increasing pattern in the recent years and pregnant women with SU disorders are at higher risk of adverse health and social outcomes (9,21). Therefore, early detection of this problem is very important in order to perform the necessary preventive interventions and treatments by health care providers (22). A comparison of lifetime prevalence and current use during pregnancy showed that during pregnancy, the consumption rate was significantly decreased (up to 60%) compared to that before the pregnancy period. This finding can be discussed from two perspectives. Firstly, during pregnancy, SU might be underreported (23), so it is necessary to use other strategies in accordance with ethical principles for early detection of mothers at risk and preventing maternal and fetal consequences. Secondly, it has been shown that pregnant women, due to their care for child's health, avoid SU during this period, and this view seems more reasonable. In a similar study in Iceland, the prevalence of cigarette smoking in studied women was 12.6% before pregnancy, which decreased to 5.3% during pregnancy

Table 1. Demographic characteristics of the studied women

Variable	Pregnant women	Pregnant women's husbands
	No. (%)	No. (%)
Educational level		
Illiterate	10 (1.7)	11 (1.9)
Elementary and secondary	91 (15.5)	139 (23.7)
High school	227 (38.7)	197 (33.6)
College	259 (44.1)	240 (40.9)
Gravidity		
1	211 (35.9)	
2	222 (37.8)	
3	114 (19.4)	
4 and more	40 (6.9)	
Gestational period		
1st trimester	109 (18.6)	
2nd trimester	203 (34.6)	
3rd trimester	275 (46.8)	

Table 2. Prevalence of substance use during lifetime and pregnancy in the studied women

Substance use type	Life time use	During pregnancy
	No. (%) (95% CI)	No. (%) (95% CI)
Smoking	43 (7.3) (5.2-9.4)	14 (2.4) (1.2-3.6)
Using Waterpipe	140 (23.9) (21.1-26.7)	50 (8.5) (6.2-10.8)
Drinking Alcohol	30 (5.1) (3.3-6.9)	10 (1.7) (0.6-2.7)
Chewing tobacco	2 (0.3) (0.06-0. 5)	2 (0.3) (0.06-0. 5)
Using Opium	35 (6.0) (4.1-7.9)	15 (2.6) (1.3-3.9)
Using at least one of the substances	164 (27.2) (23.6-30.8)	65 (11.1) (8.6-13.6)

Table 3. The prevalence of substance use in the first-degree relatives of the studied women

Substance use type	No. (%)
Waterpipe	263 (44.8)
Smoking	183 (31.2)
Drinking alcohol	97 (16.5)
Chewing tobacco	54 (9.2)
Using Opium	138 (23.5)
Using at least one of the substances	321 (53.3)

Table 4. Correlates of substance use by pregnant women in the Southeastern of Iran (abuse of at least one of the studied substances)

Variables	Substance use Mean±SD/No. (%)		Univariate logistic regression			Multiple logistic regression		
	Yes	No	OR	95% CI for OR	P value	OR	95% CI for OR	P value
Knowledge	3.21±1.19	3.59±1.24	0.78	(0.68-0.91)	0.001			
Attitude	3.51±0.39	3.53±0.43	0.91	(0.60-1.40)	0.70			
Self-efficacy	4.19±0.64	4.31±0.55	0.72	(0.53-0.97)	0.03			
Environmental factors	3.72±0.70	3.70±0.80	1.02	(0.87-1.29)	0.87			
Age	28.17±5.60	29.02±6.03	0.98	(0.95-1.01)	0.12			
Gravidity								
<3	11 (6.7)	29 (6.9)	1					
3	34 (20.7)	80 (18.9)	1.12	(0.50-2.50)	0.78			
2	60 (36.6)	162 (38.3)	0.98	(0.46-2.08)	0.95			
1	59 (36)	152 (35.9)	1.02	(0.48-2.18)	0.95			
Gestation period								
3rd trimester	82 (50)	193 (45.6)	1					
2nd trimester	46 (28)	157 (37.1)	0.45	(0.45-1.05)	0.08			
1st trimester	36 (22)	73 (17.3)	1.16	(0.72-1.87)	0.54			
Using by first-degree relative								
No	23 (14)	243 (57.4)	1			1		
Yes	141 (86)	180 (42.6)	8.28	(5.12-13.39)	<0.001	7.26	(4.45-11.83)	<0.001
Educational level of the pregnant women								
College	51 (31.1)	208 (49.2)	1					
High school	75 (45.7)	152 (35.9)	2.01	(1.33-3.04)	0.001			
Elementary and secondary	34 (20.7)	57 (13.5)	2.43	(1.44-4.11)	0.001			
Illiterate	4 (2.4)	6 (1.4)	2.72	(0.74-9.99)	0.13			
Educational level of pregnant women's husbands								
College	38 (23.2)	202 (47.8)	1			1		
High school	63 (38.4)	134 (31.7)	2.50	(1.58-3.95)	<0.001	1.94	(1.19-3.16)	0.008
Elementary and secondary	61 (37.2)	78 (18.4)	4.16	(2.57-6.73)	<0.001	3.15	(1.88-5.29)	<0.001
Illiterate	2 (1.2)	9 (2.1)	1.81	(0.25-5.68)	0.83	1.37	(0.25-7.41)	0.71

Table 5. Hosmer-Lemeshow test for goodness of fit with multiple logistic model

	Chi-Square	df	P value
Multiple logistic regression (Final step in backward elimination)	1.42	5	0.92

(24). Therefore, it is possible to use this opportunity for early treatment of drug users and provide them with early interventions and support.

Also, the lifetime prevalence of at least one of the substances (besides tobacco) was 27.9%, and the highest prevalence was related to hookah (23.9%). The prevalence of SU in our study was higher than that in other studies conducted in Iran (14, 25, 26). In this study, the most frequent drug after tobacco was opium. In a similar study in the neighboring provinces, opium and its derivatives were the most prevalent drugs used which is in line with our results (15). In the present study, the prevalence of alcohol consumption during pregnancy was slightly higher than that in similar studies in Iran, but compared

to other countries with a smaller Muslim population, it was far lower (16,25-27).

Despite high rate of opium use by first-degree relatives of our subjects, the prevalence of opioid use in pregnancy in this population compared to similar studies in Iran and other parts of the world (15,23) was not higher. This is a good opportunity for health providers to identify this small number of drug users and provide them with the necessary support and interventions to prevent fetal and maternal consequences.

In the present study, the level of education of spouses had a significant reverse relationship with the prevalence of SU in pregnant women. Also, SU among the family members (first-degree relatives) was the strongest risk factor for predicting SU in pregnant women, which is consistent with the results of previous studies (14,28). Therefore, it can be concluded that social and family factors play a decisive role in the use of drugs by pregnant mothers, and it is necessary to direct interventions

toward the families and spouses of these women. For this, at the first referring of the pregnant women to healthcare centers for maternity care, a special intervention program should be designed and implemented for identifying them and their families as vulnerable groups.

This study showed that higher levels of knowledge and self-efficacy of pregnant women are associated with lower prevalence of SU. In line with the present study, the results of Nakaseko et al indicated that people who were aware of the health risks of SU and had higher self-efficacy had lower alcohol and tobacco consumption (29). Also, the results of Hamadneh et al showed that pregnant women with a higher level of knowledge about the risks of smoking on perinatal outcomes (such as abortion, placental abruption, and fetal death) had a lower smoking rate (30). Therefore, it seems that educating pregnant women regarding the dangers of SU and increasing their self-efficacy may have a positive effect on reducing SU during pregnancy. Because high self-efficacy strengthens the skill of negative response among pregnant women. This capability could help them to avoid drug use under the influence of their close relatives (31-33).

A positive attitude toward SU could increase the tendency of SU. In fact, they are directly and significantly related to each other. People who are more permissive about SU are more likely to become drug users. According to the studies conducted in Iran and other countries, there is a traditional belief and a positive attitude towards SU, especially opium use for various reasons, including its reducing effects on stress, blood pressure, problems and complications during pregnancy, blood lipids and sugar levels, as well as its beneficial effects on cardiovascular diseases and also as an analgesic; therefore, this false belief has made people more inclined to use these substances (20). In this study, there was no significant relationship between environmental factors and SU in the studied population, which may be related to easy and ubiquitous access of all residents to the substances, especially tobacco due to the geographical status of this province.

In Iran, as a part of maternity care in health centers, referred pregnant women are asked about their history of consumption, which provides a good opportunity for early diagnosis and correction of this high-risk behavior in the early stages of pregnancy. Similar studies have proven the effectiveness of these screening programs (33), but due to the shortcomings of the self-report, it is better to identify SU in accordance with the principles of ethics through urine tests.

This study was conducted for the first time to estimate the prevalence of SU and its associated factors among pregnant women in southeast Iran. We tried to measure the outcome and predictor variables using a standard tool to reduce information bias. Moreover, we included participants from different parts of the city to have a representative sample.

Conclusion
Since substance use by family members was the strongest correlate of drug use during pregnancy, family-based interventions should be tailored to address early detection of such vulnerable women and to provide appropriate counseling services.

Limitations
One of the important limitations of this study regarding the generalizability is that this study was performed on those who sought to receive pregnancy care and since addicted people with high risk behaviors rarely refer for health care, they might be missed from the study. Moreover, owing to the self-reporting nature of the survey, underreporting might have occurred.

Authors' Contribution
Conceptualization: Abedin Iranpour, Mohammad Mahdi Fadakar Davarani.
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Visualization: Abedin Iranpour.
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Writing–review & editing: Abedin Iranpour, Ali Karamoozian, Hamid Sharifi.

Competing Interests
None.

Ethical Approval
The study received ethics approval (IR.KMU.REC.1398.333) from Kerman University of Medical Sciences Ethics Committee. In addition to obtaining informed verbal consent, the questionnaires were anonymous and the items were designed and selected as insensitive as possible, and in order to maintain confidentiality and achieve more accurate answers, asking questions was conducted in a private area of the clinic.

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