

Original Paper

# Effect of Motivational Enhancement Therapy on Patterns of Substance Abuse in Postpartum Women: A Randomized Clinical Trial



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## ABSTRACT

**Introduction:** As a biopsychosocial phenomenon, substance abuse is a major public health problem with negative economic, social, and cultural consequences.

**Objective:** This study aims to determine the effect of Motivational-Enhancement Therapy (MET) on substance abuse patterns in postpartum women with Substance Use Disorder (SUD).

**Materials and Methods:** This clinical trial was conducted on 60 eligible postpartum women with SUD (30 in the intervention group and 30 control), who were selected using a random sampling method from the postpartum unit of a hospital in Kerman, Iran in 2019. The participants in the intervention group attended four individual MET sessions and received four telephone follow-ups. All participants completed a researcher-made substance use pattern checklist before and after the intervention. Data analysis was carried out using McNemar's test, paired t-test, independent t-test, Fisher's exact test, and chi-square test. A  $P < 0.05$  was considered statistically significant.

**Results:** The mean age of women was  $29.25 \pm 5.89$  years, and most of them were housewives with elementary education. A significant reduction was observed in the number of opium ( $P = 0.008$ ) and methadone ( $P = 0.003$ ) users after the intervention. Moreover, there was a significant difference in the amount of opium and methadone use ( $P < 0.05$ ). However, no significant difference was found between the two groups in the method and frequency of substance use before and after the intervention.

**Conclusion:** MET is effective in the type and amount of opium and methadone used in postpartum women with SUD. Therefore, it can be used along with other treatments for the treatment of SUD in women after delivery.

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## Highlights

- Substance abuse is one of the potential risks for people, including women in their prepartum and postpartum periods.
- Motivational Enhancement Therapy (MET) can affect the type and amount of opium and methadone use in postpartum women with substance use disorder.
- MET has no effect on the substance use method and frequency in postpartum women with substance use disorder.

## Plain Language Summary

Substance use is a major public health problem worldwide. It has negative effects on the health of people including women with serious consequences such as rejection by the family, increased risk of addiction in children, child abuse, and increased number of street children. This study aimed to assess the effect of Motivational-Enhancement Therapy (MET) on substance use patterns among addicted postpartum women. The MET was found to have significant effects on the type and amount of opium and methadone use; it was effective in changing the type of used substance from opium to methadone and reduced the amount of opium and methadone use.

## Introduction

**S**ubstance Use Disorder (SUD) is an important social and public health concern worldwide [1]. According to the report by the United Nations Office on Drugs and Crime in 2018, 269 million people in the world use at least one type of drug or psychotropic substance per year. In Iran, more than four million people aged 15-64 years are suffering from SUD [2]. In Iranian women, it has increased in the last decade from 5% to 10% [3]. The worldwide prevalence of cannabis, amphetamine, cocaine, and opioid use has been reported 0.14%, 0.18%, 0.06%, and 0.14 in women and 0.23, 0.31, 0.14 and 0.31% in men, respectively. In the US, 12.8% of males and 7.3% of females aged 12 and older had illicit drug use in 2015. Males reported the use of marijuana (10.9% vs. 6%), cocaine (0.8% vs. 0.4%), and hallucinogens (0.6% vs. 0.3%) more than females [4].

SUD is one of the potential dangers for women during prepartum and postpartum periods [5]. Although 6-8% of Iranian women have at least one substance use disorder [6], its prevalence among pregnant women is 3-50% [7]. In pregnant mothers, it can be a risk factor for their child's health [8]. Mothers with SUD may give birth to infants with many health problems whose treatments can be costly [9]. Accidental poisoning with substances such as methadone in children is a big problem for families with addicted members [10]. In a study, it was concluded that SUD during pregnancy and lactation can reduce the duration of exclusive breastfeeding; hence, preven-

tive training programs in pregnancy should be focused on decreasing the use of such substances [11].

For SUD treatment, various therapeutic methods have been proposed including medication therapy, psychotherapy, counseling, cognitive therapy, family therapy, supportive groups, social skills training, and therapeutic community approaches. Motivational interviewing is a patient-centered approach for strengthening and enhancing the intrinsic motivation for change by discovering, identifying, and resolving ambivalence [12]. Of these approaches is the Motivational Enhancement Therapy (MET) [13]. There are four steps in MET including engaging, focusing, evoking, and planning. In this approach, clinicians help clients go through focusing, and encouraging them to change. Stimulating and motivating the patient to talk is an important step in this therapy [14]. By comparison of the effectiveness of MET and cognitive-behavioral therapy in reducing risky prepartum and postpartum behaviors, studies have confirmed the efficacy of both treatments in reducing the number of high-risk behaviors [15, 16]. Osterman et al. reported that MET may be effective in reducing alcohol and illicit drug use in pregnant substance users [17]. As SUD in postpartum women seriously and negatively affects couples, children, and society, health care providers should pay serious attention to its risk. Hence, given scant research on the effect of MET on patterns of SUD among postpartum women, the present study aims to determine the impact of MET on SUD in postpartum women in Kerman, Iran.

## Materials and Methods

In this clinical trial, the study population included all females with SUD admitted to the labor ward of a hospital in Kerman in 2019. Of these, 60 addicted women were selected in the study. Based on a study by Soheili et al. [18], and considering  $\alpha=0.05, P_1=0.05, P_2=0$ , the sample size was determined 30 for each group. The participants were selected by a convenience sampling method based on inclusion criteria and randomly assigned into two groups. The inclusion criteria were: being in the postpartum period, age 15-45, willingness to participate in the study and declaring consent, and having SUD according to the Diagnostic and Statistical Manual of Mental Disorders- 5th edition (DSM-5). The exclusion criteria were: absence from one session, committing a crime, and using other counseling services. During the study period, of 962 women referred for vaginal delivery, 97 had SUD. Of these, 60 women were

eligible to enter the study (Figure 1) who were selected from the postpartum unit of the hospital. The purpose of the study was explained to them, and they signed an informed consent form. Sampling was done from February to April 2019.

The instrument was a researcher-made questionnaire designed based on literature [19, 20], and experts' opinions. The first part of this tool surveys demographic information (age, number of children, couples' educational level, marital status, couples' occupation, history of criminal conviction, daily income of the head of the family, the first abused drugs, the reason for the first drug abuse, and age at onset of drug abuse). The second part was a checklist with 6 items assessing the pattern of drug abuse including type of drug (opium, poppy juice, heroin, alcohol, buprenorphine, cigarette, cocaine and methadone), method of use (injection, oral, inhaled, and smoking) (frequency of use (daily, weekly, and

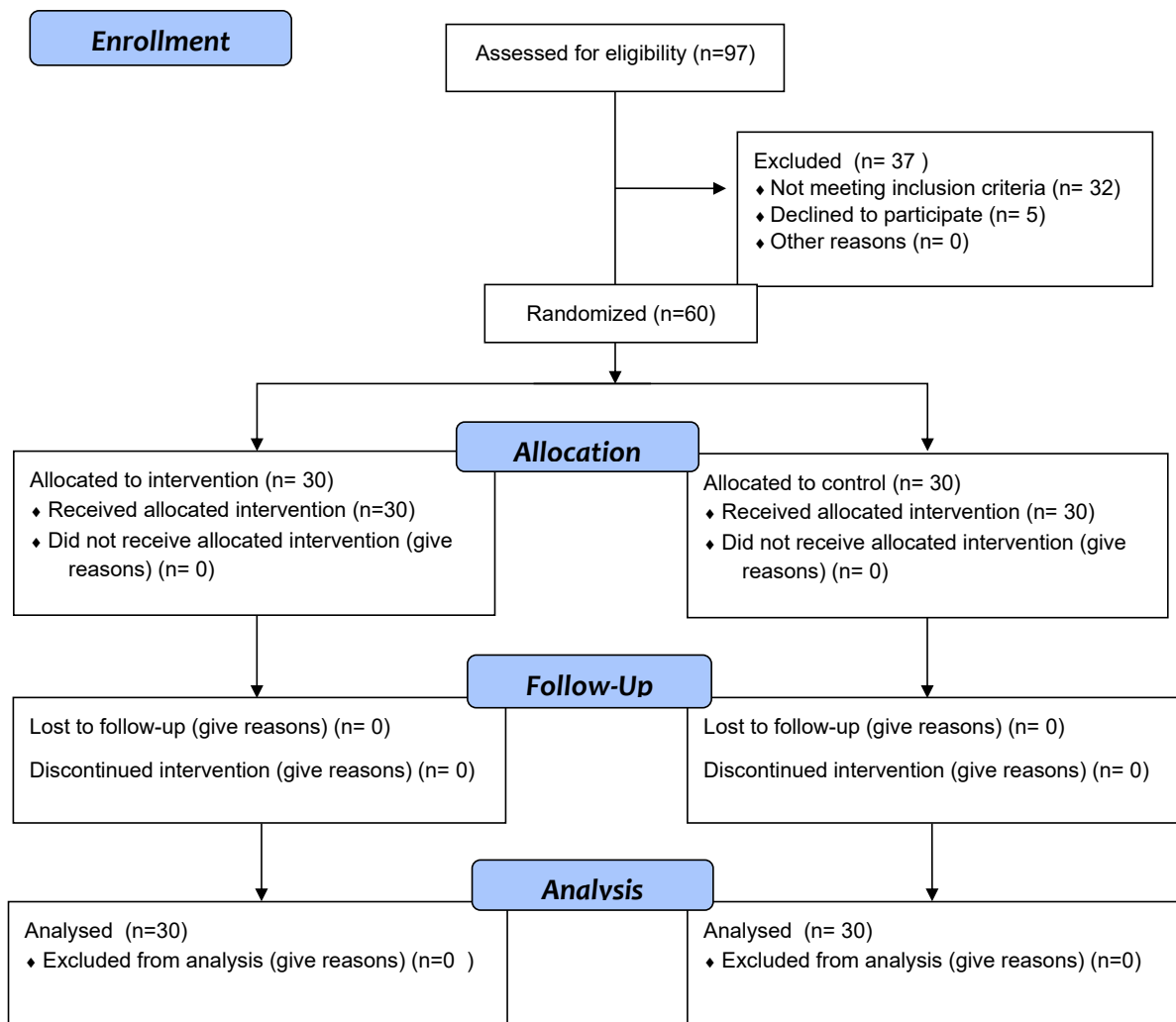


Figure 1. CONSORT flow diagram of participants

**Table 1.** Protocol of Motivational Enhancement Therapy (MET) for postpartum substance abuse

Session	Content
Motivation enhancement	Gathering information about the pattern of drug abuse, underlying factors of drug addiction, description of the side effects on the newborn, maternal and child feelings, introducing a supporting person, coping strategies
Values in conflict with addiction	Feedback on the consequences of substance abuse, activities to promote healthy life, determining their values (family, health, religion) in conflict with their addiction, decision making
Change plan	Evaluating, determining the change plan, asking to write it down
Success at maintenance phase	Reducing the likelihood of slippage, identifying the related areas of change, overcoming the problems at the maintenance phase, remedial sessions if necessary

monthly), and the amount of drug (milligram, gram, tablet, and spoon) taken in 24 hours. All items are answered by Yes or No. Ten experts including three psychologists, three psychiatrists, two midwives, and two gynecologists reviewed the content of the checklist items to determine its qualitative and quantitative content validity. Since the content validity index was equal to 0.80 and the content validity ratio was 0.80, the content validity of the checklist was confirmed. Since the checklist was developed mostly based on the robust data reported by the Iranian Welfare Organization about the frequency, amount, and pattern of substance abuse, there was no need to measure the reliability of the instrument. However, for more confidence, the inter-rater reliability of the checklist was examined. For this purpose, the checklist was completed simultaneously by two raters for ten patients and it was observed that both raters marked the checklist items similarly. It should be noted that another expert completed the checklist for both groups who was blind to the allocation of patients.

In the first intervention week, the participants who referred to the postpartum unit on Saturday, Monday, and Wednesday were included in the intervention group, and those who referred on Sunday, Tuesday, and Thursday were included in the control group. The participants were assigned to the opposite group in the second intervention week. The participants in the interventional group attended four individual counseling sessions and received four telephone follow-ups. The two first sessions were held in the hospital. The other two sessions were held on the third and tenth postpartum days in the health center (Table 1). All sessions were held in an appropriate room by a researcher expert in counseling in midwifery. The control group received routine care and usual recommendations on the adverse outcomes of SUD. The participants in both groups completed the checklist as the post-test assessment again one month after the intervention.

The collected data were analyzed in SPSS v. 22 software. A  $P < 0.05$  was considered statistically significant. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to describe the demographic characteristics. The McNemar's test, paired t-test, independent t-test, Fisher's exact test, and chi-square test were used to compare the two groups in terms of the efficacy of MET intervention.

## Results

The mean age of participants were  $29.25 \pm 5.89$  years. The majority of them were housewives (93.3% in intervention group and 90% in the control group) with elementary education (60% in the intervention group and 80% in the control group) living with their husbands (83.3% in the intervention group and 83.3% in the control group). Their husbands had mostly elementary education and temporary jobs. Opium was the first drug used by the majority of women (80% in the intervention group and 73.3% in the control group). Home was the first place for drug abuse in most cases (86.6% in the intervention group and 80% in the control group). The majority of women in both groups had no history of criminal conviction (20% in the intervention group and 23.3% in the control group). No statistically significant difference was found between the two groups in terms of demographic variables (Table 2).

All substances were consumed by inhalation or orally. After the intervention, the most common method of use for opium in the intervention ( $n=60$ , 25%) and control ( $n=18$ , 75%) groups and for poppy juice in the intervention and control groups ( $n=5$ , 50% in both) was inhalation. However, the most common method for methadone use in the intervention ( $n=12$ , 70.6%) and control ( $n=5$ , 29.4%) groups was oral method. Inhalation was also the most common method for cocaine use in both groups percentage and frequency of other cases have not been reported due to lack of aggregated and

**Table 2.** Demographic and obstetric characteristics in two study groups

Variables	No. (%)		P
	Intervention	Control	
Age(y)	≤31	16(53.3)	0.79**
	>31	14(46.7)	
Occupation	Housewife	28(93.3)	0.99*
	Employed	2(6.7)	
Educational level	Illiterate	3 (10)	0.27*
	Elementary or middle school	18(60)	
	High School and higher	9 (30)	
Number of children	1-2	15(50)	0.99**
	>2	15(50)	
Husband' seducation	Illiterate	4(13.3)	0.19*
	Elementary or middle school	20 (66.7)	
	High school and higher	6 (20)	
Living with husband	Yes	24(80)	0.99*
	No	6(20)	
Husband's occupation	Employed	20 (66.7)	0.053**
	Unemployed	10(33.3)	
Husband's income	No income	10 (33.3)	0.06**
	<5 \$ per day	20 (66.7)	
First absued drug	Opium	24(80)	0.33*
	Heroin	2(6.7)	
	Other	4(13.3)	
The place for druge abuse	Home	26(86.6)	0.99**
	Sociality	4(13.4)	
The reason for drug abuse	Pain relief	4(13.3)	0.4**
	Spouse consumption	8(26.7)	
	Others	18(60)	
History of criminal conviction	Yes	6(20)	0.75**
	No	24(80)	

\*Fisher test\*\* Chi-Square test

**Table 3.** Comparing the number of opium and methadone users before and after the intervention

Variables	Group	No. (%)				P*
		Before intervention		After intervention		
		Yes	No	Yes	No	
Opium use	Intervention	15(50)	15(50)	7(23.3)	23(76.7)	0.008
	Control	18(60)	12(40)	18(60)	12(40)	
	P**	0.43		0.004		
Methadone use	Intervention	9(30)	21(70)	15(50)	15(50)	0.03
	Control	5(16.7)	25(83.3)	7(23.3)	23(76.7)	
	P**	0.22		0.03		

\*McNemar test, \*\*Chi-Square test

**Table 4.** Comparing the amount of opium and methadone use per day before and after the intervention

Time	Mean±SD		P*	Mean±SD		P*
	Control	Intervention		Control	Intervention	
	Methadone use (mg)			Opium use (g)		
Before	20.80±5.63	28.66±16.5	0.7	3.87±2.73	2.88±1.02	0.16
After	22.80±2.51	20.66±5.5	0.02	3.98±2.71	1.72±1.22	0.04
P**	0.06	0.13	—	0.04	0.01	—

\*Independent t-test, \*\*Paired t-test

individual. The results of Fisher test showed no statistically significant difference between the two groups in terms of the method of drug use after MET. The majority of mothers in both groups were using drugs daily; a small number of them had weekly or monthly use. Poppy juice was mostly used daily in the intervention (n=4, 44%) and control (n=5, 55.6%) groups similar to opium (n=7, 29.2% in the intervention group; n=17, 70.8% in the control group), and cocaine (n=2, 66.7% in the intervention; n=1, 33.3% in the control group). The results of Fisher test showed no statistically significant difference between the two groups after MET regarding how often women used drugs.

There was no significant difference in the number of drug users between the two groups after the intervention except for opium (P=0.04) and methadone (P=0.03). The number of women who used opium decreased after MET, but there was an increase in the number of methadone users after MET. This indicates that women in the intervention group changed their substance to a safer one (from opium to methadone) (Table 3). Amount of drug usage before and after the intervention was not statistically different except for opium (P=0.04) and methadone (P=0.02) according to the results of t-test; opium and methadone usage decreased significantly in the intervention group (Table 4).

## Discussion

The present study revealed that MET could not affect the patterns of substance abuse in postpartum women, except in the number of opium and methadone users and the amount of opium and methadone use. The most common substances used by women were opium, poppy juice, methadone, methamphetamine, heroin, alcohol, and cigarettes. Abasi and Mohammadkhani reported similar results. The most commonly used substances in their study were opium, heroin, cannabis, and poppy juice. According to them,

the use of new drugs such as methamphetamine, marijuana, and cocaine has significantly increased in the world, but opium and its derivatives remain the most commonly used drugs in Iran [6]. Perhaps the reason for the desire to use opium and its derivatives in Iran, is their availability, reasonable price, and quality. Researchers believe that physical pain, pleasure, curiosity, lack of emotional relationships, marital and psychological problems, family tensions, substance availability, and peer pressure are the reasons for drug abuse among women in Iran [19, 20, 21]. However, in the present study, husbands' addiction was the first reason for drug abuse among the women, which indicates the impact of spouses on each other.

The results of one study showed that MET combined with pharmacotherapy was effective in changing alcohol use [22]. MET was also reported to be effective in preventing relapse to substance use after treatment [23]. Intervention with MET in a clinical trial on 200 pregnant women reduced alcohol and drug use [17]. The results of the present study are consistent with these findings. Another clinical trial showed that MET could improve the readiness to change the pattern of methamphetamine use in adolescents [24]. Although this study was performed on adolescents, it supports the results of the present study. Osterman et al. showed a significant reduction in alcohol use after MET among pregnant women [17]. The results of Windsor et al. showed the effectiveness of cognitive-behavioral therapy in reducing substance use [25]. However, in our study MET could only change the type of used substance from opium to methadone and decreased the amount of methadone use in postpartum women. Postpartum conditions, lactation, the hospital environment, and a short interval between sessions could be the reasons for not achieving all the study goals. People struggling with SUD often have doubts about their addiction which can make them decide whether to seek treatment or ignore it. Those who decide to receive treatment may

still be reluctant and change their mind. Although they seriously tend to change themselves, after a while they may relapse to substance use [26]. Change in pattern of substance use is not a one-dimensional phenomenon, but a multifaceted phenomenon, consisting of social, cultural, family, and economic dimensions. The counseling method used in this study has been specifically developed as one of the three interventions tested in the 1993 Multilevel Approach toward Community Health plan and includes a comprehensive clinical study of drug abuse and alcohol dependence [27, 28].

One of the limitations of the study was that only women with vaginal birth participated in the study and women with cesarean section refused to cooperate. One of the strengths of the study was that women easily confessed their addiction and asked for help for their newborns. Based on the results of this study, it can be concluded that MET is effective in changing the type of used substance from opium to methadone and can reduce the amount of methadone use in postpartum women with SUD. Therefore, motivational interviews can be used along with other methods for the treatment of SUD in women after delivery. It is recommended to study stopping substance abuse during pregnancy and to assess its effect on the growth and development of newborns.

## Ethical Considerations

### Compliance with ethical guidelines

This study has an ethical approval obtained from [Kerman University of Medical Sciences](#) (code: IR.KMU.REC.1397.213) and registered by Iranian Registry of Clinical Trials (ID: IRCT20151103024866N13). All participants signed the informed consent form.

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### Authors' contributions

Fatemeh Esmaeilnejad Hasaroeih and Katayoun Ali-dousti designed the study and drafted the manuscript; Atefeh Ahmadi prepared the counselling package; Nasim Shahrahmani collected data; Moghaddameh Mirzaee conducted data analysis; Morteza Hashemian was responsible to manage the probable side effects of

change in substance type/amount. All authors read and approved the final manuscript.

### Conflict of interest

The authors declare that there is no conflict of interest in this study.

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