



Comparison of Psychopathologic Characteristics between Individuals Undergoing Methadone Maintenance Treatment, Opioid Dependents, and Control Group

Hamid Jomehpour¹, Mohammad Amin Pouriran², Aazam Sadat Heydari Yazdi², Mehri Baghban Haghghi², Masume Sadat Dastgheib², Sahar Omidvar-Tehrani^{2*}, Ali Talaei^{2*}

¹Student Research Committee, School of Medicine, Shahroud University of Medical Sciences, Shahroud, Iran

²Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

Background: Methadone maintenance treatment (MMT) can theoretically reduce the psychosocial harms of opioid dependency. The increasing number of MMT clinics in Iran during the last two decades was not accompanied by a reduction in addiction rates. Therefore, this study was conducted to compare the psychopathological characteristics of individuals on MMT, opioid dependents, and a control group in the Iranian population.

Methods: This cross-sectional study was conducted in Mashhad to evaluate the psychopathological profile of 99 participants (33 opioid-dependent individuals [ODI], 33 MMT clients, and 33 controls) using the Symptom Checklist-90-Revised (SCL-90-R) questionnaire and demographic form. Parametric and non-parametric tests were used to compare the mean score of symptoms between the three groups. The Spearman correlation test was used to test the correlation of psychological features with age and dependency duration.

Findings: There was no significant difference between MMT clients and ODI regarding the Global Severity Index (GSI) and nine items of the SCL-90-R questionnaire. However, a significant difference was found between the controls and two other groups ($P < 0.001$). Paranoid ideation in the ODI was more frequent compared to MMT clients significantly ($P = 0.015$). Psychological characteristics had a direct correlation with dependency duration and an inverse correlation with age ($P < 0.05$).

Conclusion: Psychopathologic features observed in the dependent patients and MMT clients were significantly higher than in the control group. It seems that the psychopathology profile in MMT clients was not better than dependent individuals in Iran.

Keywords: Opioid dependence, Methadone, Psychopathology, SCL-90-R

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Introduction

The abuse and dependence on opioid substances are critical health problems. Substance use disorder (SUD) is a psychiatric disorder, and many factors can influence its nature, complications, severity, type of method, and success of treatment. Based on the conducted studies, there are relationships between SUD and comorbid psychiatric conditions such as depression or anxiety. These comorbidities can influence treatment acceptance or success rate.¹⁻⁴ Individuals with opioid use disorder (OUD) often suffer from psychiatric issues such as anxiety and depression or personality disorders, and they may not be able to cope with stress.⁵⁻⁷ Pharmacological agents used in maintenance treatments can reduce the risks of street drugs for addicts.¹ Currently, the best options to treat and reduce the harm of illicit use of opioids are methadone, buprenorphine, and extended-release naltrexone.⁸

Methadone maintenance treatment (MMT) is the most usual and precedent method of opioid agonist treatment, and the prevalence rate of this treatment has increased dramatically in recent years.^{2,3} According to the world drug report of the United Nations Office on Drugs and Crimes (UNODC), Iran ranks the sixth in the countries with the highest availability of methadone for medical use from 2017 to 2019.⁴ MMT is the most accepted method for the treatment of OUDs in Iran, and it is known as a cost-effective method around the world.⁹⁻¹¹ The effectiveness rate related to MMT program in different studies differs from 20% to 70%.¹²⁻¹⁵ As a part of a harm reduction program among opioid dependents, MMT is usually associated with a reduction in opioid and other illegal substances, criminality, and overdose hazards, and it promotes social function and physical and mental health.¹⁶⁻¹⁸ Multiple factors influence patient maintenance



under methadone treatment programs; including age, gender, marital status, and employment status.¹⁹ People who undergo MMT have a higher quality of life, and they experience a reduction in fear, anxiety, and fatigue four months after the beginning of MMT. In addition, men report more energy while women report less depression.²⁰ Diagnosing these comorbid psychiatric disorders in methadone-dependent patients can help identify individuals who need special attention or additional interventions.²¹

According to a prospective cohort study performed between 2011 and 2015, about 80% of opioid users had at least one another psychiatric disorder²²; also, patients receiving methadone with psychiatric comorbidity required higher doses (20% to 50% more than the usual dose) of methadone.²³ The prevalence of psychopathologies among MMT patients was 47%-76%.²⁴⁻²⁶ Also, a cross-sectional study showed more intensive psychopathologies in substance abusers with AIDS.²⁷ Therefore, the comorbidity of psychiatric disorders with methadone treatment and special needs to treat these conditions should be a concern among MMT clients because appropriate interventions can enhance the rate of maintenance and successful treatment. The present study aimed to assess the psychopathologies in MMT clients compared to opioid-dependent and non-dependent individuals.

Materials and Methods

This cross-sectional study was approved by the Ethics Committee of Mashhad University of Medical Sciences, Mashhad, Iran, and all participants signed written consent form. First, the Symptom Checklist-90-Revised (SCL-90-R) questionnaire was offered to some of the clients of the MMT clinic of Ibn-e-Sina hospital (Mashhad, Iran). Moreover, some opioid-dependent patients referred to Ibn-e-Sina hospital with similar age, duration of substance use, and gender, filled up the questionnaire. The staff of Ibn-e-Sina hospital were enrolled as the control age and sex-matched group.

The three groups of participants, including opioid-dependents, MMT patients, and non-dependent control groups were matched regarding demographic factors such as age and gender. All subjects answered questions about age, gender, marital status, educational level, occupation status, economic status satisfaction, dependency duration, type of abused substances, and the number of attempts to abstain. Some of the cases in each group were excluded from the study due to the lack of matched cases in other groups. In total, 99 cases (33 matched cases from each group) were attended, and the SCL-90-R questionnaires were filled up for them.

SCL-90-R® (*Symptom Checklist-90-Revised*)

Derogatis introduced a multidimensional test that

assesses nine psychopathology items and offers three indices of distress.²⁸ It includes 90 questions that assess the severity of psychological signs in individuals. It is beneficial to diagnose various psychological problems and assess treatment outcomes. Clinical psychologists, psychiatrists, and mental health care technicians take it for primary assessment of objective psychological signs and changes in symptoms such as depression and anxiety through clinical trials. It is offered to 13-year-old persons and older volunteers, and 12 to 15 minutes are needed to fill up. It is scored by manual method or computerized scanning. The obtained results can be compared with mean scores of non-patient adults, adult psychiatric outpatients, adult psychiatric inpatients, or non-patient adolescents.

The SCL-90-R subscales include somatization, obsessive-compulsive signs, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideations, and psychoticism. Three indices of Global Severity Index (GSI, the main global index of distress, which is the average of all responses), Positive Symptom Distress Index (PSDI), and Positive Symptom Total (PST) assess the severity of psychological signs. Those indices can detect the psychological problems to make therapeutic decisions before developing acute disorders. GSI can be used as a summary of the test results. Interpretation is reported regarding results from non-patient groups of similar age. The reports may be used to monitor changes.⁵ This test has been normalized with acceptable validity and reliability in the Iranian population.²⁹

Statistical analysis

Data were analyzed by SPSS software version 16. The frequency and prevalence of each type of psychopathology were calculated for each group. Analysis of variance (ANOVA) and Kruskal-Wallis tests were used to compare the three groups' demographic information and mean score of symptoms for normal and non-normal distribution, respectively. Spearman's correlation test was used to test the correlation of psychological features with age and dependency duration.

Results

Baseline data are summarized in [Table 1](#). Totally, 99 participants completed this study, including 33 subjects in the MMT group, 33 dependent individuals, and 33 non-dependent people. Among them, 69 were male, and 30 were female (10 in each group). The mean age of participants was 34.5, 34.7, and 34.3 years in the dependent patients, MMT cases, and controls, respectively. The mean dependency duration was 11.08 in the MMT group and 6.51 in the dependent group. The educational level of most of the participants was higher than the elementary school, and most of them were reasonably satisfied with their financial conditions. In this study, more than 66%

Table 1. Demographic factors among MMT, ODI, and non-dependent groups

Characteristics	MMT	ODI	Non-dependent
Age (y), Mean±SD	34.36±7.40	34.75±6.95	34.45±8.08
Duration of dependency (y), Mean±SD	11.08±6.30	6.51±5.07	0
Education level, No. (%)			
Uneducated	0 (0)	2 (6.1)	0 (0)
Elementary school	7 (21.2)	9 (27.3)	4 (12.1)
More than elementary school	26 (78.8)	22 (66.7)	29 (87.9)
Economic satisfaction, No. (%)			
Unsatisfied	12 (36.4)	14 (42.4)	8 (24.2)
Fairly satisfied	19 (57.6)	14 (42.4)	22 (66.7)
Completely satisfied	2 (6.1)	2 (6.1)	3 (9.1)
Not answered	0 (0)	3 (9.1)	3 (9.1)
Marital status, No. (%)			
Single	6 (18.2)	6 (18.2)	9 (27.3)
Married	24 (72.7)	22 (66.7)	23 (69.7)
Divorced	3 (9.1)	5 (15.2)	1 (3.0)
Abused substance, No. (%)			
Opium	17 (51.5)	11 (33.3)	0
Heroin	5 (15.1)	1 (3.0)	0
Crystal	25 (75.7)	26 (78.7)	0
Cannabis	2 (6.1)	2 (6.1)	0
Hookah	3 (9.1)	4 (12.1)	0
Alcohol	1 (3.0)	0 (0)	0
Cigarette	20 (60.6)	17 (51.1)	0
Narcotic drug	4 (12.1)	11 (33.3)	0
Frequency of abstinence No. (%)			
Never	3 (9.1)	5 (15.2)	0
Once	3 (9.1)	7 (21.2)	0
More than one time	26 (78.8)	19 (57.6)	0
Not answered	1 (3.0)	2 (6.1)	0

Abbreviations: MMT, Methadone maintenance treatment; ODI, opioid dependent individuals.

of individuals were married. Most divorced individuals (15.2%) were seen in the dependent population. The most frequently abused substance was crystal (51.5%) and opium (29.2%). In total, 37.4% were dependent on cigarette smoking. Most of them had tried to abstain more than once, and the number of attempts was higher in the MMT group. As shown in Table 2, the mean overall GSI was 0.58, 1.46, and 1.21 in the MMT, non-dependent, and dependent subjects, respectively. The highest mean score of symptoms in the opioid-dependent and MMT subjects was related to depression (1.86 and 1.45, respectively). There was no significant difference in GSI and nine items of SCL-90-R between the dependent and MMT groups. However, there were significant differences in the GSI score between non-dependent and dependent individuals ($P<0.001$) and between non-dependent individuals and

the MMT group ($P<0.001$). There was a significant difference in nine test items between the dependent and non-dependent groups; however, there was no difference between the MMT and non-dependent groups regarding hostility and paranoid ideations. The dependent group had higher mean scores in all of the symptoms. The results are shown in Table 2.

As reported in Table 3, there was a significant correlation between somatization, obsession, compulsion, interpersonal sensitivity, depression, anxiety, phobic anxiety, paranoid ideation, psychoticism, and GSI. Moreover, somatization, obsession and compulsion, interpersonal sensitivity, depression, anxiety, phobic anxiety, hostility, psychoticism, and GSI were correlated with dependency duration.

The results of the ANOVA test indicated that overall there were no significant differences, except for paranoid ideations, which was higher in the dependent men compared to MMT men ($P=0.015$), and somatization in the dependent persons with 12 to 20 years of dependency was higher in comparison with the MMT group with less than 10 years of dependency ($P=0.049$).

Discussion

The present study showed that dependent participants compared to MMT individuals had poorer individual and psychopathology situations, higher rates of divorce, and lower educational levels. Moreover, MMT patients had more problems than non-dependent participants. Anxiety and depression were higher in the dependent and MMT individuals than in the controls. Paranoid ideation was significantly higher in the dependent population than in the MMT group.

Dependent individuals had the highest rate of divorce and the lowest marriage rate. This finding is consistent with the results, indicating that being married predicts more decrease in cocaine and heroin use over time. However, this result has been confirmed only for married couples who have a close and personal relationship with each other.³⁰ The lowest level of education related to the dependent group emphasizes the influential role of education in preventing dependency; otherwise, higher levels of education in the MMT group than in the dependent group seem to be effective for patients to seek treatment. Heydari Fard et al found that individuals with lower levels of education were more vulnerable to addiction.² Other studies also showed that educational level was a good predictor of better clinical and health outcomes.^{31,32} Considering drug abusers with depression have more psychopathologies and risky behaviors and less cooperation to treatment, focused attention to earlier diagnosis and treatment is essential for these disorders. Demographic differences did not influence the GSI of psychiatric symptoms differences between the dependent and MMT groups. There were no differences

Table 2. Mean GSI and nine items of psychopathology in MMT, ODI and non-dependent groups

Symptom	Group	Mean	SD	P value (two groups)		P value (three groups)
Somatization	MMT	1.29	0.78	Dependent	0.937	0.001
	Dependent	1.35	0.79	Non-dependent	0.002	
	Non-dependent	0.73	0.54	MMT	0.005	
Obsession and compulsion	MMT	1.29	0.77	Dependent	0.378	<0.001
	Dependent	1.51	0.73	Non-dependent	<0.001	
	Non-dependent	0.66	0.42	MMT	0.001	
Interpersonal sensitivity	MMT	1.26	0.84	Dependent	0.146	<0.001
	Dependent	1.61	0.84	Non-dependent	<0.001	
	Non-dependent	0.65	0.53	MMT	0.005	
Depression	MMT	1.45	0.98	Dependent	0.091	<0.001
	Dependent	1.86	0.86	Non-dependent	<0.001	
	Non-dependent	0.58	0.38	MMT	<0.001	
Anxiety	MMT	1.24	0.76	Dependent	0.370	<0.001
	Dependent	1.48	0.88	Non-dependent	<0.001	
	Non-dependent	0.48	0.43	MMT	<0.001	
Hostility	MMT	1.00	0.79	Dependent	0.230	0.001
	Dependent	1.30	0.84	Non-dependent	<0.001	
	Non-dependent	0.57	0.57	MMT	0.058	
Phobic anxiety	MMT	0.86	0.67	Dependent	0.998	<0.001
	Dependent	0.85	0.73	Non-dependent	<0.001	
	Non-dependent	0.22	0.31	MMT	<0.001	
Paranoid ideation	MMT	1.26	0.78	Dependent	0.040	0.002
	Dependent	1.72	0.87	Non-dependent	0.002	
	Non-dependent	1.07	0.56	MMT	0.534	
Psychoticism	MMT	0.90	0.71	Dependent	0.607	<0.001
	Dependent	1.05	0.70	Non-dependent	<0.001	
	Non-dependent	0.37	0.37	MMT	0.002	
GSI	MMT	1.21	0.70	Dependent	0.230	<0.001
	Dependent	1.46	0.63	Non-dependent	<0.001	
	Non-dependent	0.58	0.30	MMT	<0.001	

Abbreviations: MMT, Methadone maintenance treatment; ODI, opioid dependent individuals; GSI, Global Severity Index. Significant *P* values have been shown in bold.

between women and men in the dependent or MMT groups in the recent studies. Although earlier studies showed a relationship between education level and drug abuse continuing, it did not affect psychopathology.³³⁻³⁵ Also, marriage, which has been reported as a preventive factor for drug abuse in previous studies, did not affect psychopathology in this study.^{30,36}

Most of the MMT group people abused heroin and opium. However, cigarette smoking and alcohol drinking were seen more often in the MMT group, which is inconsistent with the results from earlier studies.³⁷ Sedative drug abuse was also more common in the MMT group. It suggests that sedative drug abuse in the dependent individuals is due to previous psychopathological diseases, such as anxiety and dysthymia.³⁸ Mean dependency duration and the number of attempts to abstain were higher in the MMT group, suggesting that failing to abstain can

lead to a chronic problem. The dependent group was less satisfied with their economic status. Financial satisfaction is a subjective factor; therefore, it does not seem that poor economic status would be an independent risk factor for falling into addiction. Inversely, psychosocial problems related to addiction and worse economic levels are the most important causes of their dissatisfaction. The MMT group individuals were more satisfied because they received help to improve their quality of life.

The present study showed that GSI, as a profile of psychological status, had a direct linear correlation with dependency duration and an inverse correlation with age. It seems that long-term dependency leads to regression of psychosocial conditions while the increase in age can reduce their psychopathological issues. The high mean of anxiety in the dependent group not only may point to their thoughts about the loss of their job and social

Table 3. Results of the Spearman's correlation test between age and addiction duration with psychopathologies

Symptom	Correlation	Age	Addiction duration
Somatization	correlation coefficient	-0.226	0.393
	significance	0.012	<0.001
Obsession and compulsion	correlation coefficient	-0.184	0.502
	significance	0.034	<0.001
Interpersonal sensitivity	correlation coefficient	-0.232	0.390
	significance	0.010	<0.001
Depression	correlation coefficient	-0.250	0.470
	significance	0.006	<0.001
Anxiety	correlation coefficient	-0.230	0.537
	significance	0.011	<0.001
Hostility	correlation coefficient	-0.150	0.281
	significance	0.069	0.003
Phobic anxiety	correlation coefficient	-0.192	0.476
	significance	0.029	<0.001
Paranoid ideation	correlation coefficient	-0.188	0.167
	significance	0.031	0.054
Psychoticism	correlation coefficient	-0.199	0.376
	significance	0.024	<0.001
Global Severity Index (GSI)	correlation coefficient	-0.279	0.501
	significance	0.0030	<0.001

Abbreviation: GSI, Global Severity Index.
Significant *P* values are shown in bold.

relationships, but also, it may be due to direct side effects of drugs. The high mean of depression in the MMT group may reflect underlying problems which push a person toward dependency, but negative results such as social unacceptance may also intensify. The high depression and anxiety in dependent and under methadone treatment individuals have been reported in several types of earlier research.³⁹⁻⁴¹

Although confirming previous research, both groups of dependent and methadone patients had worse psychological status than non-dependent individuals,^{21,42} the better psychological status of the MMT group than the dependent group was not significant, except for a few symptoms, because conventional consults did not have considerable benefits. Callaly and colleagues' study showed that the prevalence of the psychiatric disorder in MMT patients is 7 to 10 times higher than that found in the adult population and 2 to 3 times higher than that in the population with SUD.²⁵ Previous studies have found that opioid-dependents without treatment have lower rates of depressive disorder, more social support, fewer legal problems, and less severe heroin use than those who seek treatment.⁴³ It may point to imperfect treatment strategies of MMT that cannot result in a complete drug abstinence and do not improve psychosocial status, as in a recent study, psychopathology prevalence in MMT group has been reported higher than that reported in previous studies conducted using SCL-90-R.⁶

However, somatization among chronic dependent individuals was higher compared to those who selected methadone treatment after a short duration of dependency; it pointed to physical and psychosomatic regression of dependent individuals after the duration of dependency.

Limitations

The present study has some limitations. One of the limitations is that all of the respondents were male individuals and were recruited from one center, which may limit generalizability. Another limitation is that the sample size was relatively small; therefore, a longitudinal study with a larger sample size and female individuals is recommended. The other limitation is that it was not possible to distinguish the current versus lifetime prevalence of psychiatric comorbidity in this study.

Conclusion

As a result of more psychopathologies and less cooperation in the treatment of substance dependents with psychiatric disorders, paying attention to their early diagnosis and treatment is very important. In this study, the psychological status in the MMT group was not better than that in addicts. This finding can demonstrate that imperfect strategies of MMT, and the inability to sustain abstinence, cannot improve psychosocial status as they ought to. Therefore, new measures should be taken to enhance patient skills in addition to more persuasion of addicts, failing to abstain several times, toward the MMT method. New programs are needed to improve patients' skills and provide outpatient services and treatment communities and persuasion of dependent persons failing to abstain frequently to receive methadone treatment. Giving more attention to early diagnosis of psychiatric disorders coexisting in these patients and using rapid screening tools such as the SCL-90-R questionnaire is an appropriate approach to making decisions for each patient.

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Author Contributions

Conceptualization: Ali Talaei.

Data curation: Sahar Omidvar Tehrani, Hamid Jomehpour, Mohammad Amin Pouriran.

Formal Analysis: Sahar Omidvar Tehrani, Mohammad Amin Pouriran.

Funding acquisition: Masume Sadat Dastgheib.

Investigation: Sahar Omidvar Tehrani, Hamid Jomehpour.

Methodology: Ali Talaei.

Project administration: Ali Talaei, Sahar Omidvar Tehrani.

Resources: Sahar Omidvar Tehrani, Hamid Jomehpour, Mohammad Amin Pouriran, Azam Sadat Heydari Yazdi.

Software: Mohammad Amin Pouriran, Mehri Baghban Haghighi.

Supervision: Ali Talaei, Sahar Omidvar Tehrani.

Validation: Hamid Jomehpour, Masume Sadat Dastgheib

Visualization: Ali Talaei, Sahar Omidvar Tehrani, Hamid Jomehpour, Mohammad Amin Pouriran.

Writing – original draft: Sahar Omidvar Tehrani, Hamid Jomehpour, Mohammad Amin Pouriran.

Writing – review & editing: All Authors.

Conflict of Interests

The authors declare that they have no competing interests.

Ethics Approval

The study was approved by the Ethics Committee of Mashhad University of Medical Sciences, Mashhad, Iran (Ethical code: IR.MUMS.REC.1391.44).

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