Changes in Substance Use Pattern in Men with Opioid Use Disorders treated with Methadone during the first year after the Earthquake in the west of Iran: A Cohort Study

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Abstract

Background

Experiencing earthquake can lead to an increase in substance use disorders (SUDs) and changes in substance use (SU) patterns in the survivors, therefore, the present study aimed to investigate changes in SU pattern in men with opioid use disorders (OUDs) treated with methadone who referred to Methadone Maintenance Treatment centers in Sarpole Zahab in the first year after the earthquake in the west of Iran in 2017–2018.

Methods

In this prospective cohort study, 180 male patients treated with methadone were enrolled in a census over three periods of four, eight, and twelve months after the earthquake.

Results

93 (51.7%) immediately and 87 people (48.3%) between 1–15 days after the earthquake had access to methadone, 18 of them (10.0%) reported the relapse in the meantime, and in all these cases, the person continued the use in the following months. An increase in the daily dose of methadone in patients was observed in the first evaluation after the earthquake compared to the time before the earthquake, the daily dose was reported in the second and third evaluations with a significant decrease. 18 people (10.0%) had a history of relapse before the earthquake, which in the first post-earthquake assessment reached 32 people (17.8%). In the second and third assessments, 26 (14.4%) and 24 people (13.3%) reported relapse of using the previous drugs without a tendency to new substances.

Conclusion

Due to the changes in the pattern of SU in men treated with methadone, preventive interventions are important for this group after the earthquake.

Background

Earthquake is an unpredictable and uncontrollable phenomenon that can cause great destruction and explosion, and thousands of people experience harmful consequences such as injuries, severe emotional distress, cognitive dysfunction, emotional distress, damage or loss of ownership, or displacement [1–6].

An earthquake measuring 7.3 on the Richter scale struck Kermanshah province in 2017 on Sunday, November 13, near Azgeleh, on the border of Iran and Iraq. The death toll was approximately 620, 9388 people were injured and about 70000 were left homeless. From November 13, 2017, when the earthquake,

measuring 7.3 on the Richter scale, hit Azgeleh, to November 13, 2018, 5511 aftershocks were recorded in Kermanshah province. Of these, 2815 registered aftershocks occurred in 2018 and 2696 in 2017. The magnitude of the earthquake was so great that it is known as the deadliest earthquake in the world in 2017 [7].

People who experience severe trauma, such as an earthquake, may use substances to relieve or adapt to negative stress and emotion [8]. People who have taken substances before an earthquake may experience more severe withdrawal symptoms (especially irritability and anger) because of stopping or reducing the dose after the earthquake, as a result, their use is likely to increase again [9]. The studies done on this issue have shown that the prevalence and severity of opioid use among the survivors of natural and unnatural disasters are increasing [10]. Most of the addicts who have been examined reported an increase in opium and heroin use after the earthquake [11].

In the post-earthquake crisis, many addicts suffer from acute stress and physical injury, and some are fully involved in helping, and from the following days, the symptoms of deprivation and the need to use substances gradually appear in them and this need are among the basic needs of these people. Some cases of substance relapse have also been reported in people who had quit before the earthquake [12].

In a qualitative study in Bam, which is one of the cities in the south of Iran, the status of addiction was examined two weeks after the earthquake, the results of this study showed that a quarter to half of the adult men in the city used opium, and a year later the prevalence of addiction in Bam was high and was estimated to be positive in more than half of the men [12–13]. Vlahov et al. [14] reported that the closer people are to the destruction center, the more their substance use (SU) will be, also the increase in drug use is one of the most important problems immediately after the disasters, whose frequency is seen in the form of comorbid post-traumatic stress disorder and depression.

Since the prevalence of substance use disorders (SUDs) in Iranian society is high, this issue is one of the most important health and social issues in mass crises and disasters, and it is necessary to be prepared when dealing with this issue. Although several studies have shown that disasters have significant psychological and psychiatric effects and cause SUDs, so far, very little research has been done on changes in drug use patterns in people treated with methadone after an earthquake, therefore, this Cohort study investigated the change in SU pattern in the people treated with methadone in Methadone Maintenance Treatment centers (MMT) clinics in Sarpole Zahab, a city in the west of Iran, during the first year after the earthquake.

Methods

Design and sample

The present study is a cohort study, which was conducted prospectively, and after selecting people and starting the study, no new person entered the study. In this study, changes in the pattern of SU in men with opioid use disorders (OUDs), treated with methadone, in earthquake-stricken men were evaluated over

three periods of four, eight, and twelve months after the earthquake. The study population included all men who were treated with methadone in two private MMT centers, Shafa, Alvand, and Shohada State Center, located in Sarpole Zahab. The inclusion criteria included the individual's residence and the history of methadone use in one of the MMT centers in Sarpole Zahab and the presence of the patient in the earthquake-stricken areas at the time of the earthquake. The exclusion criteria included being reluctant to participate in the study, a lack of regular visits to MMT centers, and a lack of collaboration in the study and the use of treatments other than methadone. Sampling in this study was performed by the census method and all of the qualified people were examined at the three introduced medical centers. In Shafa Center, 150 male patients treated with methadone, in Alvand Center, 149 men treated with methadone, and in Shohada Center, 55 patients, treated with methadone, were receiving treatment. All of these individuals were evaluated according to the study inclusion and exclusion criteria, and finally, the qualified people entered the study and were tracked if they wished. Finally, by sampling, using census method, 97 patients from Shafa Center, 58 patients from Alvand Center, and 25 male patients from Shohada Center, treated with methadone, entered the research according to their desire and observance of study entry and exit criteria. Also, the patients who were reluctant to participate in the study or those who did not have regular visits to MMT centers and did not complete the follow-up process in the study were excluded from the study. The study was conducted in such a way that after approval of the project and coordination with the relevant authorities, the researchers were present in the mentioned medical centers and provided the people with the necessary explanations about the research, implementation method and its objectives, and assured them that their information would remain confidential. All patients entered the study at the same time and were tracked and re-evaluated after the earthquake by completing the relevant questionnaires during the three periods that were mentioned. The questionnaires were completed by experienced and trained psychologists through interviews with qualified patients.

First, all of these patients were initially assessed and evaluated by the demographic questionnaire and other questionnaire designed by the researcher in terms of demographic characteristics, self-report records, medical and clinical records of the person and his family, history of SUDs of the person and his family before and after the earthquake. In the implementation phase of the project, assessments were made in specific periods, and when the patients came to get their methadone.

All 180 patients treated with methadone, who were examined, were evaluated by three evaluation steps for one year and completed the study follow-up course. After completing the project, demographic information (age, place of residence, marital status, number of years living together, number of years after divorce, number of children, education, occupation, monthly income), self-report records of the patients (loss of family members in the earthquake, loss of home and car in the earthquake, amount of financial losses caused by the earthquake, current housing situation after the earthquake), medical and clinical records of the patients and their family (history and type of physical illness of the person, history and type of mental illness of the patient or his family before and after the earthquake, type of the taken substance) along with the history of SUDs of the patients and their family (age of the first SU, type of the first substance, first dose of SU, history of concomitant use of several substances and their types, history of substance withdrawal and withdrawal treatment method, history of relapse before and after the

earthquake, the number of relapse and the type of drug used in each relapse, the type of drug used before starting methadone treatment, the age of onset of methadone consumption, the average daily dose of methadone use before and after the earthquake, the interval between methadone use, history of relapse to access methadone and the type of substance consumed in the interval, history of tendency to use new substances after the earthquake and the type of the new substances which were used, history of alcohol use before and after the earthquake, history of addiction in the family) were registered in a checklist that was pre-designed by the researcher. This information was entered into the software, to be analyzed, by a statistical consultant.

Statistical analysis

First, to describe the frequency distribution of demographic characteristics, self-reporting records of the patients, medical and clinical records of the person and his family, history of drug use of the individual and his family before and after the earthquake, descriptive statistical methods were used in frequency and percentage. Then to express the average age and also to describe the average number of years of living together, the number of years after the divorce and the number of children, descriptive statistical methods as the minimum and maximum, median and mode, mean and standard deviation, were used. All analyses were performed using SPSS20 (JB39397R39KFC9) statistical software at a significance level of 0.05.

Results

180 male patients treated with methadone with an average age of 36.77 and a range of changes from 20 to 61 years, to investigate the changes in the pattern of drug use in them, were evaluated during three periods after the earthquake in the west of the country. The majority of the patients, with frequencies of 75 (41.7%), 50 (27.8%), and 43 (23.9%), were in the age group of 31–40, 20–30, 41–50 years, respectively and the lowest number of the participants was 12 (6.7%), who were over the age of fifty. More than half of the patients, 99 (55.0%) of them had a high school diploma and 50 (27.8%) of them had a university degree. Those who did not have a high school diploma or had lower education than high school, 31 (17.2%) people, had the lowest number of participants. 13 (7.2%) patients reported a positive history of psychiatric illness in their family, the majority of whom, 12 (6.7%) people, had a mood disorder (depression-bipolar disorder) and 1 (0.6%) patient had an anxiety disorder. 51 (28.3%) of them reported a positive history of SUDs in their family. Among the surveyed people, 18 (10.0%) of them reported the loss of family members or relatives during the earthquake. In terms of the number of financial losses caused by the earthquake, the majority of the participants in the study, 75 (41.7%) people, reported more than 1000 million Tomans loss, and 49 (27.2%) people reported about 210–1000 million Tomans loss. Also, 56 (31.1%) people reported the maximum amount of these losses up to 200 million Tomans (Table 1).

Table 1
Frequency distribution of demographic characteristics and self-report records of men treated with methadone

Variables	Levels	Frequency (%)
age(year)	20–30	50(27.8)
	31–40	75(41.7)
	41–50	43(23.9)
	> 50	12(6.7)
education	<High school	31(17.2)
	high school	99(55.0)
	Bachelor and more	50(27.8)
history of psychiatric illness in the patient's family	Yes	13(7.2)
	No	167(92.8)
Kind of psychiatric illness in the patient's family	Mood disorder (depression-bipolar)	12(6.7)
	Anxiety disorder (Obsession-Anxiety)	1(0.6)
	No	167(92.8)
family history of addiction	Yes	51(28.3)
	No	129(71.7)
loss of family members of the patient in the earthquake	Yes	18(10.0)
	No	162(90.0)
amount of financial damage caused by the earthquake (million rials)	<= 200	56(31.1)
	210–1000	49(27.2)
	> 1000	75(41.7)
Total		180(100.0)

The results of the initial assessments showed that at the beginning of the study, the majority of the subjects, 104 (57.8%), were married, 62 (34.4%) were single and 12 (6.7%) were divorced. Also, 2 (1.1%) of them reported the death of their spouse in the years before the earthquake. The results of the second and

third evaluations of the study at the time of eight and twelve months, respectively, after the earthquake, showed that the earthquake and its aftermath did not change the marital status of the subjects who were studied. In the initial assessment, 122 (67.8%) of the people declared that they were employed and 58 (32.2%) declared that they were unemployed. In the second evaluation, one percent of the unemployed, 56 people, decreased from 32.2–31.1%, and the number of employed, 124 people, increased from 67.8–68.9%. In the initial evaluation, the majority of the people with a frequency of (47.2%), 85 people, and (41.1%), 74 people, had low (< 1.5) and average (1.5-3.0) income respectively and only 21 people (11.7%) were reported to have a good income level, (> 3.0) million Tomans. In the second evaluation, the percentage of the people with good income decreased by about one percent, and the number of the people with average and low income increased by an equal percentage and in the third evaluation, there was only a 0.6% decrease in the ratio of the people with good income levels and there was the same increase (0.6%) in the ratio of the people with low-income levels. However, in all three evaluations, the majority of the people had low, average, and good income levels, respectively. In terms of a person's history of mental illness, only 9 people (5.0%) reported a history of mood disorders as depression or bipolar disorder before the earthquake, which increased to 17 people (9.4%) in the first post-earthquake evaluation. Also, in the initial evaluation 5 patients (2.8%) reported anxiety disorders. In the second and third evaluations of the study, only mood disorders such as depression and bipolar disorder were reported whose ratio was reported (3.3%), 6 people, in the second evaluation and (5.6%), 10 people, in the third evaluation. This means that the prevalence of mood disorder during the earthquake and subsequent follow-up had increased and was higher than before the earthquake (Table 2).

Table 2

Frequency distribution of demographic characteristics and medical records of the studied men treated with methadone before the earthquake and three stages of post-earthquake evaluation

Variables	Levels	Before the earthquake	4 months after the earthquake	8 months after the earthquake	12 months after the earthquake
occupation	Employed	—	122(67.8)	124(68.9)	124(68.9)
	unemployed	—	58(32.2)	56(31.1)	56(31.1)
income	Low	—	85(47.2)	86(47.8)	85(47.2)
	Middle	—	74(41.1)	75(41.7)	75(41.7)
	High	—	21(11.7)	19(10.6)	20(11.1)
history of mental illness	Mood disorder (depression-bipolar)	9(5.0)	17(9.4)	6(3.3)	10(5.6)
	Anxiety disorder (Obsession-Anxiety)	0(0.0)	5(2.8)	—	—
	No	171(95.0)	158(87.8)	174(96.7)	170(94.4)
Total		180(100.0)			

The first age of SU for 111 (61.7%) of the patients participating in the study was 21–30 and 48 (26.7%) of them were ≤ 20 . Also, 21 (11.7%) of the patients reported the age of over 40 as the first age for SU, of whom 120 (66.7%) patients reported 1–2 g and 37 (20.6%) reported > 2 g as their first dose that they took. Also, the type of substance that was first used by the majority of the patients was reported, for 162 (90.0%) of them, to be in the category of opium and for 12 (6.7%) in the category of stimulants. 5 (2.8%) of the patients also expressed that their first drug use was as a combination of opium, stimulant, and hallucinogenic drugs. Among the patients about (63.9%), 115 patients, had no history of simultaneous use of several substances and the rest of the patients, (28.4%) 51 of them, had a history of simultaneous use of several substances and, 50 patients (27.8%) reported a history of simultaneous use of different substances derived from opium and 1 (0.6%) reported a history of simultaneous use of different substances from the stimulants. 85 (47.2%) had a history of drug withdrawal, the majority of whom, 45 (25.0%), had been hospitalized and 17 (9.4%) had tried to go through withdrawal using possible methods at home. In terms of the type of substances that were used before methadone treatment, the majority of the people, 162 (90%), reported opium, and 11 of them (6.1%) stimulants as the substance they used earlier. Also, 6 people (3.3%) reported several kinds of substances they used before starting methadone treatment. Among them, only 1 person (0.6%), in terms of the type of drug used before, used a substance in the category of hallucinogenic drugs. The first age of methadone consumption, as the first age of SU for the majority of the patients participating in the study, 95 patients (52.8%), was in the age group of 21–

30 years. For 72 people (40.0%) age > 30 and for 13 people (7.2%) < = 20 were reported as the first ages of methadone consumption. More than half of the patients, 93 people (51.7%), had access to methadone shortly after the earthquake and the rest of the patients, (48.3%) 87 people, had access to methadone between 1–15 days after the earthquake and among them, 18 people (10.0%) reported relapse of SU until they had access to methadone. 16 (9.0%) of them reported the use of opium and 2 of them (1.1%) reported the use of stimulants before having access to methadone and almost in all cases of relapse, the person continued to use it in the months that followed. It should be noted that in terms of the type of the substance that was used, except methadone after the earthquake, 5 patients mentioned the use of other drugs including 3 patients (1.7%) who reported drug abuse and 2 patients (1.1%) who reported neurological drug use and one patient, who had drug abuse experience, reported relapse of SU by using opium until he had access to methadone (Table 3).

Table 3

Frequency distribution of drug use records in the studied men treated with methadone before the earthquake and three evaluation stages after the earthquake

Variables	Levels	Frequency (%)	Variables	Levels	Frequency (%)
the first age of SU	<=20	48(26.7)	Kind of SU before starting methadone treatment	opium	162(90.0)
	21–30	111(61.7)		stimulants	11(6.1)
	> 30	21(11.7)		hallucinogenic	1(0.6)
kind of SU	opium	162(90.0)	first age of methadone use	alcohol	—
	stimulants	12(6.7)		multi substance	6(3.3)
	hallucinogenic	—		<=20	13(7.2)
	alcohol	—		21–30	95(52.8)
	multi substance	5(2.8)		> 30	72(40.0)
the average dose of the substance	< 1 gr	3(1.7)	Time to access methadone after an earthquake(day)	0	93(51.7)
	1–2 gr	120(66.7)		1	8(4.4)
	> 2 gr	37(20.6)		2	12(6.7)
	N/A	20(11.1)		3	27(15)
history of multi SU	opium	50(27.8)		4	22(12.2)
	stimulants	1(0.6)		5	10(5.6)
	hallucinogenic	—		7	4(2.2)
	alcohol	—		9	1(0.6)
	multi substance	14(7.8)		10	2(1.1)
	No	115(63.9)		15	1(0.6)
history of quit substance	Yes	85(47.2)	SU before accessing methadone after an earthquake	Yes	18(10.0)
	No	95(52.8)		No	162(90.0)
Therapeutic methods in quitting SU	N/A	5(2.6)	kind of substance before access to methadone	opium	16(9.0)
	hospitalization in the ward	4(2.2)		stimulants	2(1.1)
	hospitalization in the camp	45(25.0)		hallucinogenic	—

Variables	Levels	Frequency (%)	Variables	Levels	Frequency (%)
	Home remedies and self-medication	17(9.4)		alcohol	—
	Camp and self-medication	7(3.9)		No	162(90.0)
	Methadone treatment	3(1.7)	drugs use other than methadone after an earthquake	drug abuse	3(1.7)
	herbal therapy	2(1.1)		using psychiatric drugs	2(1.1)
	N/A	2(1.1)		No	175(97.2)
total		180(100.0)	total		180(100.0)

Before the earthquake, in terms of the average daily dose of methadone used by the patients, the majority of them were reported with the frequency of 127 (70.6%), 33 (18.3%), 17 (9.4), respectively, to use 11–20 and < 10 and 21–30 cc methadone per day, and only (1.7%) 3 people used methadone over 30 cc per day. However, there were significant changes in these results in the first evaluation after the earthquake. So that in this evaluation, the majority of the patients with frequencies of 117 (65.0%), 22 (12.2%), and 18 people (10.0%) were reported to be in the consumption categories of 11–20 and 21–30 and less than 10 cc of methadone per day, respectively, and about (12.8%) 23 people were in the methadone category consumption over 30 cc per day. The results showed an increase in the daily dose of methadone used by the patients in the first evaluation after the earthquake, compared to the previous time. However, the amount of methadone used by the patients in the second evaluation after the earthquake decreased significantly and in the third evaluation after the earthquake, a significant decrease was also observed. In these two evaluations, over time, the number of people who used methadone with daily doses above 30 cc per day decreased, and the number of the people who used it with daily doses below 30 cc per day increased. This means that in the second evaluation after the earthquake, only 6 people (3.4%) and in the third evaluation after the earthquake, only 3 people (1.7%) with daily used doses of methadone above 30 cc per day were reported. In terms of the history of relapse before the earthquake, 18 people (10.0%) reported a positive history of relapse, among whom 8 people (4.5%) reported relapse once and 10 (5.5%) reported 1–3 times. In the first post-earthquake evaluation, the number of patients with a positive history of relapse increased and reached 32 people (17.8%). Of the 18 people (10.0%) who had a history of relapse before the earthquake, 16 (8.9%) had a relapse of using opium, 1 (0.6%) had a relapse of using stimulants, and 1 (0.6%) also reported relapse of simultaneous use of several drugs, and none reported relapse of using new substances. The relapse of use for all of them was reported as a return to their previous drug consumption. In the first evaluation after the earthquake, 32 people (17.8%) reported relapse of drug use, among whom, only 4 (2.2%) reported relapse with a tendency to new drug 2 (1.1%), opium and 2 (1.1%) reported stimulant. In the second and third evaluations after the earthquake, 26

(14.4%) and 24 (13.3%) reported relapse, respectively that none of these people reported a relapse with a tendency to a new substance and in fact, all of them expressed the relapse of their SU by using the previous substance they had used. Before the earthquake, 37 people (20.6%) reported a positive alcohol history, which in the first post-earthquake evaluation decreased to 5.0%, 9 people. In the second and third evaluations after the earthquake, the alcohol use ratio, which was the same in both evaluations, reached 8 people (4.4%). In terms of housing conditions, in the first post-earthquake evaluation, 129 people (71.7%) reported that they were living in Conex boxes and only 3 (1.7%) were living in tents. The rest of them, 48 people (26.7%) reported that they were living in either their own or rented homes. In the second post-earthquake evaluation, 133 people (73.9%) reported living in Conex boxes, and only 1 person (0.6%) lived intent. In the third post-earthquake evaluation, 121 people (67.2%) lived in Conex boxes and 2 (1.1%) lived in tents, and the rest lived in their own or rented homes (Table 4).

Table 4

The pattern of change in drug use and related records in the studied men treated with methadone before the earthquake and three stages of post-earthquake evaluation

variables	Levels	before the earthquake	4months after the earthquake	8 months after the earthquake	12 months after the earthquake
average daily dose of methadone(CC)	<= 10	33(18.3)	18(10.0)	20(11.1)	29(16.1)
	11–20	127(70.6)	117(65.0)	133(73.9)	139(77.2)
	21–30	17(9.4)	22(12.2)	21(11.7)	9(5.0)
	31–40	1(0.6)	18(10.0)	5(2.8)	2(1.1)
	41–50	—	2(1.1)	—	—
	51–60	2(1.1)	3(1.7)	1(0.6)	1(0.6)
history of relapse	Yes	18(10.0)	32(17.8)	26(14.4)	24(13.3)
	No	162(90.0)	148(82.2)	154(85.6)	156(86.7)
Kind of substance used in relapse	opium	16(8.9)	29(16.1)	25(13.9)	24(13.3)
	stimulants	1(0.6)	3(1.7)	1(0.6)	—
	multi substance	1(0.6)	—	—	—
	No	162(90.0)	148(82.2)	154(85.6)	156(86.7)
history of alcohol use	Yes	37(20.6)	9(5.0)	8(4.4)	8(4.4)
	No	143(79.4)	171(95.0)	172(95.6)	172(95.6)
Current residence status	tent	—	3(1.7)	1(0.6)	2(1.1)
	Conex	—	129(71.7)	133(73.9)	121(67.2)
	personal home	—	46(25.6)	40(22.2)	51(28.3)
	rental house	—	2(1.1)	6(3.3)	6(3.3)
total				180(100.0)	

Discussion

This cohort study was performed to investigate changes in SU patterns in the men treated with methadone during the first year after the earthquake of November 13, 2017. The result of the study showed that of those people who were investigated, 93 immediately and 87 between 1 and 5 days after the earthquake had access to methadone. Among them, 18 people reported relapse until they had access

to methadone (16 opium, 2 stimulants) and in almost all cases of relapse, the person had continued to use substances in the following months. It should be noted that in terms of the type of the substance that was used, except methadone after the earthquake, five people mentioned the use of other drugs (3 medications and 2 neurological drugs). This finding is aligned with the results of the research done by Pollice, Bianchini, Roncone & Casacchia [15], showing that the rate of SU among young people increased after the L'Aquila earthquake in Italy, according to the results among the people with psychiatric disorders (314 people) the use of alcohol, tobacco, and cannabis in the post-earthquake period were reported to be 179, 128 and 69 people, respectively. In another study, Rahimi-Movaghar et al. [16] showed that 27.4% of men and 4.5% of women had a history of opium use after experiencing an earthquake. On the other hand, daily opium use was reported to be 16.9% in men and 2.7% in women, eight months after the earthquake. Among men, opium, alcohol, and then cannabis were the most commonly used substances. Overall, 20.5 percent of men and 2.3 percent of women reported an increase in the use of one of the illegal substances, which were studied, in comparison with the time before the earthquake, although some reported a decrease in SU. In explaining this finding, it can be said that usually after an event such as an earthquake a person suffers from many daily problems that may reduce his ability to adapt. In such cases, the person is unable to change the living conditions and may consider SU as the only way to change the situation [17]. Research has shown that the prevalence and severity of opioid use among the survivors of natural and unnatural disasters increases [10]. In fact, the increase of drug use is one of the most important and fundamental problems that, immediately after disasters, is mostly caused in the form of comorbid post-traumatic stress disorder (PTSD) [9].

Another finding of the study showed that before the earthquake, in terms of the average daily dose of methadone, the majority of the patients (177 people) had consumed less than 21–30 cc of methadone in one day, but these results in the first evaluation after the earthquake were observed with significant changes. In this evaluation, the majority of the patients (157 people), (117 people) were in the consumption categories of 20–21 and 21–30 cc of methadone. These results indicated an increase in the daily dose of methadone used by the patients in the first evaluation after the earthquake compared to the previous time. However, the amount of methadone used by the patients in the second and the third evaluations decreased significantly. In these two evaluations, the number of people with a daily dose of methadone more than 30 cc per day decreased over time and the number of people with a daily dose of methadone less than 30 cc per day increased. This means that in the second evaluation after the earthquake, 6 people and in the third evaluation after the earthquake, 3 people with daily doses of methadone above 30 cc per day were reported. Also, in terms of the history of recurrence before the earthquake, 18 people reported a positive history of relapse, and none of them reported relapse with new substances, which was true for the second and third assessments as well. In fact, the relapse for all of them was reported as a return to the previous drug that they had used. 18 of them reported the number of relapse between 1–3 times. On the other hand, in the first post-earthquake evaluation, the number of people with a positive history of relapse increased to 32 people. Also, in the second and third evaluations after the earthquake, 26 people and 24 people reported relapse, respectively. 37 people reported a positive history of alcohol consumption before the earthquake as well, which in the first evaluation after the

earthquake, this number decreased to 9 people. In the second and third evaluations after the earthquake, the alcohol consumption ratio reached 8 people in the same proportion. This finding of the study is aligned with the results of a study by Rahimi-Movaghar et al., [17] in which he showed that 56 opioid addicts declared that more than half of them consider the SU the cause of the reduction of psychological damage and injuries caused by earthquakes or counteracting them. In this regard, Farhodian et al., [18] examined the changes in the number of consumers, consumption patterns and the status of medical services for addicts during one year after the earthquake in Bam and one of the surrounding villages, the results showed an increase in the prevalence of SU, especially in men. In their research, opium was the most common substance that was used. Most of the interviewees believed that opium and heroin use had increased in Bam after the earthquake. SU increase in teenagers and women has also been reported, which is consistent with the first evaluation. Explaining this finding, it can be said that temporary peace because of SU, severe problems, or hopelessness, and decreased motivation to quit are among the causes of relapse of consumption after an earthquake. On the other hand, given that many of these people experience injuries, health problems, loss of family members, loss of property, or job, that all of these factors can lead to the relapse of drug use [12].

- It is recommended that mental health care providers provide services to the addicts who have suffered severe psychological stress during the earthquake by going to addiction rehab clinics and MMT clinics at the time of the earthquake, and take appropriate measures to calm them down. Also, by going to their homes and establishing effective interaction, provide more emotional support, and try to form new and alternative social networks. Furthermore, by involving the patients in reconstruction programs and daily affairs, they should act effectively to reduce the psychological and economic pressures of the survivors. It is also recommended that when there is an earthquake or other natural disasters, along with the necessary food and medicine items, substances such as methadone, should be provided free of charge to eligible people undergoing treatment in MMT centers with this treatment until stability is achieved in the area. The present study faced limitations, including that the present sample included only men treated with methadone in the clinics of Sarpole Zahab in the first year after the Kermanshah earthquake, therefore caution should be exercised in generalizing to people in other geographical areas. Also, in this study, the samples were not randomly selected. It is suggested that in future research, both sexes be randomly entered into the study. This study was conducted by face-to-face interview and this method may have led to a reduction in the amount of reporting. On the other hand, after such events, there is a tendency among the people to show the problems that they have after the event greater and the problems before it smaller, which may be the cause of the overestimation of SU increase after the earthquake.

Conclusion

Overall, the study concluded that after an earthquake, there is a possibility of an increase in the prevalence of SUDs and the severity of SU. In such cases, continuous monitoring of drug use is essential and due to the prevalence of SUDs and methadone use in Iranian men, this issue needs to be given serious attention by health policymakers and the Crisis Management Organizations.

Abbreviations

MMT: Methadone Maintenance Treatment centers; SUDs: Substance Use Disorders; SU: Substance Use; OUDs: Opioid Use Disorders

Declarations

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Availability of data and materials

All relevant raw data will be freely available to any scientist wishing to use them for non-commercial purposes, without breaching participant confidentiality.

Authors' contributions

SMM, VF, JS and MA conceived, designed, evaluated and drafted the manuscript, SMM and FR participated in designing the evaluation, collected the data, and helped to draft the manuscript, SH and SS re-evaluated the data, performed the statistical analysis, interpreted findings and revised the manuscript, OD, MA, VF, JS and SMM interpreted the findings and revised the manuscript, All authors read and approved the final manuscript.

Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

Ethics approval and consent to participate

The medical research and ethical committee of Kermanshah University of medical sciences, Kermanshah, Iran; approved the study (registration No.IR.KUMS.REC.1397.181 at the date of June 12, 2018; grant number 97168), which was performed by the ethical principles laid down in the seventh and current

edition (2013) of the Declaration of Helsinki. All participants were volunteers who signed written informed consent.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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