

# Lapse and Relapse Rates in Narcotics Anonymous versus Methadone Maintenance Treatment: A 12-Month Prospective Study

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## Abstract

**Objective:** The present study aimed to compare lapse and relapse-free survival between patients treated in Narcotics Anonymous (NA) groups and Methadone Maintenance Treatment (MMT) centers and to determine the relationship between social support scale and treatment outcome.

**Method:** This study was a prospective, 12-month cohort study using the random sampling method to select 100 newcomer patients treated by the NA Association as well as 100 patients in MMT centers. The data were collected using a demographic questionnaire and Social Support Appraisals (SSA) scale at the onset of the study along with follow-up phone calls every other week.

**Results:** All participants were male, aged between 18 and 65 with a mean (SD) age of 38.98 ( $\pm$  10.85) years. Prevalence of relapse in 12 months was 60.5%. The lapses in the MMT group and relapses in the NA group were significantly higher ( $P < 0.001$ ). The younger patients with lower levels of education are at greater risk of lapse/relapse. The mean score of SSA was significantly higher in the MMT group than the NA group in all subscales, including friends, family, and the others' support ( $P < 0.001$ ). The mean scores of SSA subscales for the participants without relapse in the NA group was significantly higher in comparison to the MMT group.

**Conclusion:** Detection of factors related to drug abuse relapse/lapse may help addiction therapists to identify drug abuse patients with lapse/relapse and to develop treatment and policy guidelines to prevent relapse in addiction recovery.

**Key words:** *Addiction; Cohort; Methadone; Narcotics; Recurrence; Survival Analysis*

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## Article Information:

Received Date: 2020/06/04, Revised Date: 2020/12/07, Accepted Date: 2021/04/17



One of the growing global health problems is opiate addiction. According to the report of United Nations' Office on Drugs and Crime (UNODC) in 2019, the global statistics show that approximately 53.4 million individuals have a current or past use of opiates (heroin and opium) in 2017, accounting for 1.1 percent of the 15–64-year-old world population. The subregions with the highest prevalence of opiate use include near and Middle East and South-West Asia (1.6%), South Asia (1.3%) and Central Asia and Transcaucasia (0.9%) (1). There are about 1.2 to 3.7 million drug users in Iran, among whom opium addiction is more prevalent than other drug addictions (2). In 2017, Iranian officials claimed that the number of drug addicts across the country had doubled in the past six years alone (3). Many efforts have been made by Iran's health system for treatment of addicts; however, the greatest problem during recovery is relapse (4, 5).

With regard to opioid addiction, two types of treatment modalities are frequently used in Iran. Methadone maintenance treatment (MMT) programs and self-help groups (Twelve-Step-oriented treatments), and mainly Narcotics Anonymous (NA) are the most common approaches for treatment of opioid dependence in Iran (6, 7). In spite of different treatment programs, majority of addicts do not achieve stable abstinence and have a life-long habit of using opium (8). Pashaei *et al.* (2014) studied predictors of retention in MMT programs in Iran and reported that relapse rates are 25%, 50%, and 75% after four months, ten months and twenty-six months, respectively (9). Another study by Zare *et al.* (2012) showed duration of abstinence for NA participants is 8.5 months (10). Few studies have been carried out to compare the lapse- and relapse-free survival between patients treated in NA groups and MMT centers.

Returning to drug use occurs in two forms; (a) complete return or relapse, and (b) partial return or lapse (slip). In several studies, the word lapse (or slip) has been used interchangeably with relapse. It might be advantageous to adopt an approved definition of relapse, which would precisely differ from a lapse/slip in terms of clinical significance and severity (11). Based on a medical model in regards to addiction as a disease, the definition of drug relapse is as follows: a patient comes back to the disease following a phase of partial recovery (12). Different operational definitions of relapse have been proposed in studies. For example, it refers to one day of heavy use (13), or a mixture of substance use and its negative effects (e.g. job loss, detention, interpersonal relationship problems and etc.). Some other studies defined relapse as drug abuse after a period of abstinence. Literature on substance abuse treatment distinguishes lapse and relapse. Lapse is defined as a temporally restricted and isolated pattern of drug use, whereas relapse is defined as a more severe and prolonged pattern of drug use. Lapse is differentiated from full-blown relapse; however, it is merely the first

step of the trajectory toward relapse (14). Various methods such as self-reporting and/or urinalysis, structured interviews, self-administered surveys and follow-up phone calls have been proposed for measuring incidence of relapse/lapse as a measure of returning to drugs (15). Some studies have shown that relapse cannot be avoided in the course of substance dependency treatment (16).

Previous studies indicate that various factors such as age, gender, unemployment, marital status, peer group relationships, history of drug abuse in the family, and inadequate social support are correlated with relapse (17). Social workers believe that relapse prevention is possible through supportive social relationships. The social-emotional condition of the patient's first-degree relatives is of great importance to prevent drug relapse (18). Several studies have shown that mere participation in peer support groups can lead to positive outcomes. Social support decreases addictive behavior by improving the patients' self-efficacy, managing stress, affecting willingness to begin or preserve performance adjustment, and changing availability of drug cues in the environment and reductions in habitual craving (19).

Each of the two common treatments for the opioid dependency (MMT and NA) has a different effect on abusers. Research has thoroughly examined the effectiveness of these treatment options on keeping opioid mis-users drug free. More detailed analysis and comparison of these two therapeutic approaches in the future may help to improve treatment, develop an even more effective treatment, and reduce relapse in patients. This study was carried out to follow a cohort of patients with substance abuse at the beginning of their treatment over one year for lapse and relapse. We aimed to measure the lapse and relapse rates in NA and MMT groups and to assess the relationship between social support scale and patient's lapse- and relapse-free survival.

## Materials and Methods

### *Study design and participants*

The study used a prospective cohort design. There was a 12-month follow-up for each patient, estimated based on the date of entry into the treatment program. According to previous studies, about 50% of patients treated with MMT and 35% of patients participating in NA develop relapse during the first year. Taking into account this relapse rate, and according to  $\alpha = 0.05$  and Power of 80%, the sample size was calculated at 167 patients, which in the present study is considered to be 200 patients. Therefore, 100 patients in the NA Association as well as 100 patients in the MMT group were enrolled. The first patient was referred to one of the MMT clinics of Shahroud in May 2017, and the last patient had a follow-up in January 2019. There are 46 MMT clinics in Shahroud, and about 7,400 patients are treated through MMT programs.

New participants (male, 18–65 years) were selected to enroll in the study using a random sampling method. In the MMT group, the new patients with one month of experience in an MMT program, who were in the maintenance phase, had follow-ups. There are 32 NA centers in Shahroud and about 900 patients take part in these regularly open meetings. The participants in the NA group had recently quit drugs and already completed outpatient treatment and the detoxification period. They were the newcomers, drug-free patients who recently joined the NA group in order to prevent addiction relapse. Exclusion criteria included patients transferred from a group to another group.

The participants were invited, and the researchers, after describing the research process, conducted a face-to-face interview with each of the patients. When they agreed to take part in the study, the written consent forms were signed by all the participants in the groups. They then completed the questionnaires containing questions on their demographic information, history of drug abuse, and social support scale.

Each patient was followed up and monitored 12 months for addiction recurrence (lapse/relapse) in two treatment groups. The participants were the only source of information about addiction; hence, lapses and relapses were recorded based on self-reports in telephone calls every other week. Only patients who had no relapse and did not leave treatment were followed up for 12 months. The date of return to drug abuse and quitting treatment in the patients with relapses was recorded, and these patients were excluded from the study. For the patients whose lapse did not lead to a relapse, the dates of their lapses were recorded, and they did not leave the study. In this study, the lapse was defined as the first use of drugs after baseline assessment. If the lapse/slip continued until the next follow-up week, it was considered as a relapse. Therefore, drug abuse for one week or less was defined as a lapse, and drug abuse for at least two consecutive weeks was defined as a relapse.

### **Instruments**

Data were collected by two questionnaires and interviews. A demographic questionnaire was developed by researchers in a way to collect data including general and baseline information (gender, age, marital status, occupation status, and level of education), family history (number of sisters, brothers and children, family history of addiction), pre-treatment status (type of drug used, duration of use, drug return frequency), and treatment start date. Questionnaires were filled out at the beginning of the study by patients under treatment in MMT and NA programs, and the obtained data were recorded in files.

The second questionnaire was the Social Support Appraisals (SSA) scale, whose validity and reliability were confirmed in Iran. SSA was first developed by Vaux *et al.* (1986). This scale contains 23 items addressing friend's support (7 items), family support (8 items), and support from others (8 items). The items of

this questionnaire could have responses as "Correct" or "Incorrect" being counted as one and two points, respectively. The minimum and maximum scores of the scale were 0 and 23, respectively. The higher scores of SSA were defined as greater social support, while lower scores were described as inadequate social support (20). The Iranian version of SS-A was translated and tested psychometrically by Asgari *et al.* Cronbach's alpha for this questionnaire was reported to be 0.75 (21). Zarghami *et al.* examined its internal consistency using Cronbach's alpha and reported values as follows: family support (0.76), friend's support (0.75), support from others (0.75), and total social support (0.82) (22).

### **Statistical analyses**

In order to run the statistical analysis, SPSS 20 and STATA 14 software were used. Descriptive statistics (e.g. mean, percentage, standard deviation, and frequency) were assessed. Furthermore, the relationship between qualitative variables was examined using the Chi-square test. ANOVA and t-tests were used to compare the means. Survival analysis was performed using log-rank test to compare survival rates and significant variables entered into semi-parametric Cox model with  $P < 0.3$ .

### **Ethical Statements**

The present study was completed in accordance with the Declaration of Helsinki and the Ethical Guidelines for Medical and Health research established by Ministry of Health and Medical Education and Ministry of Science, Research and Technology, Iran. This paper was not extracted from a thesis. The local Ethics Committee affiliated with Shahroud University of Medical Sciences approved this study (Registration code: IR.SHMU.REC.1396.9). All participants provided their informed written consent for participation in the present study.

### **Results**

The participants' socio-demographic and drug abuse information is presented in Table 1. The most commonly consumed drugs before treatment entry were opium sap (81%), opium (79.5%), crystal (33%) and hashish (25%). The results showed that age and previous unsuccessful treatments were significantly higher in the MMT group ( $P < 0.05$ ). There was no statistically significant difference between MMT and NA groups with regard to other demographic variables. Table 1 also shows the comparison of lapse and relapse between MMT and NA groups. As it can be observed, most patients with lapse did not experience any relapse ( $P < 0.001$ ).

Comparison of SSA subscales between MMT and NA groups is shown in Table 2. The mean score of SSA was significantly higher in the MMT group than the NA group through all subscales including friends, family, and the others' support ( $P < 0.001$ ). The mean scores of SSA subscales in MMT and NA group members with no

relapse were compared, and the result indicated that the mean scores of the three subscales were significantly higher in the NA group ( $P < 0.001$ ).

Table 3 compares the SSA scores between MMT and NA groups based on their relapses. In the MMT group, those who had no relapse received significantly greater support from friends and others; however, no significant family support was observed. In the NA group, the mean scores of SSA subscales were significantly higher for participants who experienced no relapse.

The Log-rank test was used to compare lapse and relapse rates in MMT and NA groups (Figure 1); it was shown that lapses in the MMT group and relapses in the NA group were significantly higher in comparison ( $P < 0.001$ ) (Figure 1. A, B). The probability of a one-month, three-month, six-month, and one-year survival of the patients without lapse was estimated by the Kaplan-Meier method to be 91.5%, 68%, 55.5%, and 49.9%, respectively (Figure 1. C, D). The mean duration of lapses in patients was 230.71 days (about 7.5 months) with a confidence interval of 210.25-251.18.

Kaplan-Meier survival curves were significantly different for effective factors such as groups ( $P = 0.01$ ), age of first drug use ( $P < 0.001$ ), number of children ( $P = 0.001$ ) and three subscales of SSA ( $P = 0.02$ ). The factors and variables with  $P < 0.3$  were imported to the cox regression model. The final model backward elimination method is presented in Table 4. The risk of lapses was approximately 3.1 times higher in the MMT group compared to the NA group. The proportional hazards assumption should be evaluated for all the predictors tested in the Cox model. One technique to evaluate the proportional hazards for a continuous predictor is to plot the Schoenfeld residuals versus time. Under proportional hazards, the curves should be almost parallel and should not intersect after time apart.

The probability of a one-month, three-month, six-month, and one-year survival of patients without relapse was estimated by the Kaplan-Meier method to be 94.5%, 79%, 70.5%, and 53%, respectively (Figure 1. E, F). The mean duration of relapse among patients was 266.83 days (approximately 8.7 months) with a confidence interval of 249.06-284.6.

Factors affecting number of relapses were detected using the log-rank test. These factors included group ( $P < 0.001$ ), age of first drug use ( $P = 0.04$ ), level of education ( $P = 0.01$ ), opium ( $P = 0.03$ ), sap ( $P = 0.006$ ), heroin ( $P < 0.001$ ), crystal ( $P = 0.004$ ), crack ( $P = 0.02$ ), other substances ( $P < 0.001$ ), addicted first-degree relatives ( $P = 0.006$ ), addicted father ( $P = 0.007$ ), addicted brother ( $P = 0.03$ ), addicted friends ( $P < 0.001$ ), number of relapses ( $P = 0.02$ ), and all three subscales of SSA ( $P < 0.001$ ). These factors and variables with  $P < 0.3$  were imported to the cox regression model. The final model retrospective elimination method is presented in Table 4.

According to Table 4, risk of relapse is approximately 4.82 times higher in the NA group than the MMT group. Risk of relapse in patients who were addicted to heroin and had an addicted friend were 2.14 and 2.28 times higher in comparison to the other patients, respectively. Risk of relapse in patients with more than eight previous unsuccessful treatments was about twice as high as others. Friends' support and family support also had significant impact on relapse times.

Tables 5 and 6 show the relationship between the participants' socio-demographic and drug abuse information and the nature of relapses (just lapse, just relapse, both lapse and relapse, neither lapse nor relapse) in the MMT and NA group members.

**Table 1. Socio-Demographic Drug Abuse Characteristics and the Comparison of Lapse and Relapse between Participants (N=200) in Methadone Maintenance Treatment and Narcotic Anonymous Groups**

Variable, N (%)	Total (N = 200)	MMT <sup>†</sup> group (n = 100)	NA <sup>‡</sup> group (n = 100)	Statistical test	P-Value
Age (yrs) §	38.98 ± 10.85	40.72 ± 11.33	37.25 ± 10.11	T = 2.28	0.02 <sup>*</sup>
<b>Marital Status</b>					
Married	163(100)	83(50.9)	80(49.1)	$\chi^2 = 2.09$	0.55
Single	27(100)	11(40.7)	16(59.3)		
Divorced	9(100)	5(55.6)	4(44.4)		
<b>Employment Status</b>					
Unemployed	22(100)	6(27.3)	16(72.7)	$\chi^2 = 10.54$	0.01 <sup>*</sup>
Government employee	16(100)	12(75)	4(25)		
Self employed	160(100)	80(50)	80(50)		
Others	2(100)	2(100)	0		
<b>Family Status §</b>					

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Sister	2.28 ± 1.4	2.28 ± 1.5	2.29 ± 1.3	T = -0.05	0.96
Brother	1.43 ± 1.08	1.37 ± 1.1	1.5 ± 1.05	T = -0.85	0.39
Child	1.85 ± 1.65	2.06 ± 1.7	1.65 ± 1.48	T = 1.75	0.08
Education (yr) §	9.25 ± 3.94	9.3 ± 3.99	9.1 ± 3.9	T = 0.5	0.62
<b>Drug Abuse</b>					
Age of onset	18.43 ± 3.6	18.76 ± 4.05	18.1 ± 3.11	T = 1.29	0.19
Opioids (yes)	162(81)	80(49.4)	82(50.6)	$\chi^2 = 0.13$	0.72
Cannabis (yes)	88(44)	40(48)	48(52)	$\chi^2 = 1.8$	0.18
Crystal (yes)	67(33.5)	33(49.3)	34(50.7)	$\chi^2 = 0.02$	0.88
Crack (yes)	62(31)	28(45.1)	34(54.9)	$\chi^2 = 0.14$	0.71
Other drugs (yes)	14(7)	8(57.1)	6(42.9)	$\chi^2 = 0.31$	0.57
<b>Family Members Abusing</b>					
A Family Member (yes)	122(61)	56(45.9)	66(54.1)	$\chi^2 = 2.1$	0.15
Parent (yes)	91 (45.5)	44 (48.3)	45 (51.7)	$\chi^2 = 0.18$	0.67
Sibling (yes)	45(22.5)	22(47.7)	23(52.3)	$\chi^2 = 0.12$	0.73
Spouse (yes)	3(1.5)	2(66.7)	1(33.3)	$\chi^2 = 0.34$	0.56
Friends (yes)	71(35.5)	35(49.3)	36(50.7)	$\chi^2 = 0.02$	0.88
Other relatives (yes)	17(8.5)	6(35.3)	11(64.7)	$\chi^2 = 1.6$	0.2
Pervious Relapse (yes)	181(94.5)	93(51.4)	88(48.6)	$\chi^2 = 1.45$	0.23
Previous unsuccessful treatments (number)	4.47 ± 3.58	5.01 ± 3.88	3.93 ± 3.17	T = 2.15	0.03*
<b>Lapse and Relapse (yes)</b>					
Just relapse	61(33.5)	25(26.6)	69(73.4)	$\chi^2 = 38.86$	< 0.001*
Just lapse	67(33.5)	79(79)	21(21)	$\chi^2 = 67.28$	< 0.001*
Both lapse and relapse	33(16.5)	22(66.7)	11(33.3)	$\chi^2 = 4.39$	0.04*
Neither lapse nor relapse	39(19.5)	18(46.2)	21(53.8)	$\chi^2 = 0.29$	0.59

†Methadone Maintenance Treatment, ‡Narcotic Anonymous, §Mean ± SD, \*Significant.

**Table 2. Comparison of Social Support Subscales in Methadone Maintenance Treatment and Narcotic Anonymous Groups and Members without Relapse**

Subscales of social support§	Total (N=200)	MMT† group (n=100)	NA‡ group (n=100)	Statistical test	P-Value
<b>All members</b>					
Friends Support	19.81 ± 5.69	21.18 ± 4.87	18.44 ± 6.13	T = 3.49	0.001*
Family Support	22.88 ± 6.5	24.98 ± 4.99	20.79 ± 7.17	T = 4.79	< 0.001*
Others Support	22.84 ± 5.85	24.68 ± 4.21	21 ± 6.65	T = 4.67	< 0.001*
<b>Members without relapse</b>					
Friends Support	23.17 ± 4.93	22.03 ± 4.51	25.97 ± 4.86	T = -4	< 0.001*
Family Support	26.66 ± 5.53	25.29 ± 5.04	29.97 ± 5.32	T = -4.26	< 0.001*
Others Support	26.32 ± 4.76	25.23 ± 4.08	28.87 ± 5.35	T = -3.76	< 0.001*

†Methadone Maintenance Treatment, ‡Narcotic Anonymous, §Mean ± SD, \*Significant.

**Table 3. The Score of Subscales of Social Support in Methadone Maintenance Treatment and Narcotic Anonymous Group Members**

Subscales of Social Support <sup>§</sup>	MMT <sup>†</sup> group (n = 100)		NA <sup>‡</sup> group (n = 100)	
	Relapse		Relapse	
	Yes	No	Yes	No
Friends Support	18.64 ± 5.12	22.06 ± 4.51	15.05 ± 2.62	25.96 ± 4.86
P-Value	0.002 <sup>*</sup>		< 0.001 <sup>*</sup>	
Family Support	24.04 ± 4.8	25.29 ± 5.04	16.67 ± 2.6	29.96 ± 5.3
P-Value	0.28		< 0.001 <sup>*</sup>	
Others Support	22.92 ± 4.18	25.26 ± 4.08	17.46 ± 3.3	28.87 ± 5.35
P-Value	0.01 <sup>*</sup>		< 0.001 <sup>*</sup>	

<sup>†</sup>Methadone Maintenance Treatment, <sup>‡</sup>Narcotic Anonymous, <sup>§</sup>Mean ± SD, <sup>\*</sup>Significant.

**Table 4. Result of Semi-Parametric Cox Regression Model for Effective Factors Related to Lapse and Relapse**

Variable		HR	SE	z	P-value	95% CI for HR	
Factors related to lapse							
Group	MMT						
	NA	0.32	0.09	-4.02	< 0.001	0.18	0.55
Factors related to relapse							
Group	MMT						
	NA	4.82	1.33	5.67	< 0.001	2.84	8.48
Heroin	NO						
	Yes	2.14	0.53	3.06	0.002	1.36	3.48
Addicted Friend	NO						
	Yes	1.99	0.43	3.15	< 0.001	1.29	3.07
Previous unsuccessful treatments	< 8						
	> 8	1.96	0.5	2.61	0.008	1.19	3.25
Friend Support		0.88	0.03	-3.81	< 0.001	0.83	0.94
Family Support		0.89	0.02	-3.85	< 0.001	0.84	0.94

HR, hazard ratio; SE, standard error; CI, confidence interval.

**Table 5. The Relationship between Sociodemographic and Drug Abuse Characteristics of Participants (N = 200) and Their Laps and Relapse**

Variable, N (%)	Just lapse	Just relapse	Both lapse and relapse	Neither lapse nor relapse	p-value
Age (yrs) <sup>†</sup>	40.43 ± 11.5	39.2 ± 10.74	39.63 ± 11.26	36.02 ± 9.5	0.24
Education (yrs) <sup>†</sup>	9.46 ± 3.62	8.5 ± 4.15	9.3 ± 4.52	10.64 ± 3.6	0.01 <sup>*</sup>
<b>Marital Status</b>					
Married	53(79.1)	77(81.9)	25(75.8)	33(84.6)	
Single	10(14.9)	12(12.8)	5(15.2)	5(12.8)	0.85

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Divorced	3(4.5)	5(5.3)	3(9.1)	1(2.6)	
Widowed	1(1.5)	0	0	0	
<b>Employment Status</b>					
Unemployed	3(4.5)	15(16)	4(12.1)	4(10.3)	
Government employee	7(10.4)	5(5.3)	1(3)	4(10.3)	0.34
Self employed	56(83.6)	73(77.7)	27(81.8)	31(79.5)	
others	1(1.5)	1(1.1)	1(3)	0	
<b>Family Status<sup>†</sup></b>					
Sister	2.11 ± 1.45	2.32 ± 1.34	2.06 ± 1.29	2.46 ± 1.5	0.32
Brother	1.43 ± 0.83	1.47 ± 1.22	1.63 ± 1.43	1.33 ± 1.1	0.66
Child	1.98 ± 1.7	1.83 ± 1.68	1.72 ± 1.82	1.69 ± 1.52	0.8
<b>Drug Abuse</b>					
Age of onset	18.78 ± 4.18	17.59 ± 3.14	17.03 ± 3.07	19.87 ± 3.13	0.004*
Opium (yes)	50(74.6)	82(87.2)	27(81.8)	30(76.9)	0.13
opium sap (yes)	52(77.6)	81(86.2)	28(84.8)	26(66.7)	0.08
Opium & Opium sap (yes)	35(52.2)	69(73.4)	22(66.7)	17(43.6)	0.003*
Drug except opium & Opium sap (yes)	30(44.8)	72(76.6)	30(90.9)	24(61.5)	< 0.001*
Heroin (yes)	2(3)	23(21.5)	10(31.3)	3(7.7)	< 0.001*
Hashish (yes)	13(19.4)	27(28.7)	11(33.3)	10(25.6)	0.4
Grass (yes)	9(13.4)	21(22.3)	11(33.3)	8(20.5)	0.11
Crystal (yes)	14(20.9)	45(47.9)	22(66.7)	8(20.5)	< 0.001*
Crack (yes)	8(11.9)	23(24.5)	11(36.4)	3(7.7)	0.006*
Other drugs (yes)	4(6)	4(4.3)	2(6.1)	6(15.4)	0.12
<b>Family Members Abusing</b>					
Father (yes)	23(34.3)	52(55.3)	22(66.7)	10(25.6)	0.002*
Mother (yes)	3(4.5)	2(2.1)	0	1(2.6)	0.66
Brother (yes)	13(4.5)	27(28.7)	13(39.4)	4(10.3)	0.02*
Sister (yes)	0	1(1.1)	1(3)	0	0.16
Spouse (yes)	1(1.5)	2(2.1)	1(3)	0	0.77
Friends (yes)	14(20.9)	48(51.1)	23(69.7)	9(23.1)	< 0.001*
Other relatives (yes)	5(7.5)	68(72.3)	26(78.8)	18(46.2)	0.01*
<b>Relapse</b>					
Previous unsuccessful treatments>8	7(10.4)	22(23.4)	10(30.3)	3(7.7)	0.003*
Relapse (yes)	63(94)	88(93.6)	31(93.9)	30(76.9)	0.01*
Number of Relapse	4.03 ± 3.25	5.29 ± 3.7	6.48 ± 3.84	3.23 ± 3.31	0.03*

<sup>†</sup>Mean ± SD, \*Significant.

**Table 6. The Relationship between Sociodemographic and Drug Abuse Characteristics of MMT<sup>†</sup> (N = 100), NA<sup>‡</sup> Group Members (N = 100) and Lapse/Relapse**

Variables, N (%)	Just lapse		Just relapse		Both Lapse and relapse		Neither lapse nor relapse	
	MMT	NA	MMT	NA	MMT	NA	MMT	NA
<b>Age (yrs) §</b>	41.28 ± 11.72	35.4 ± 9.29	43.28 ± 11.09	37.72 ± 10.3	42.5 ± 11.62	33.72 ± 8.02	35.38 ± 8.95	36.57 ± 0.14
P value	0.13		0.02*		0.03*		0.7	
<b>Education(yrs)</b>	9.4 ± 3.64	9.8 ± 3.67	8.6 ± 4.8	8.47 ± 3.9	8.68 ± 4.64	10.54 ± 4.2	10.3 ± 3.83	10.85 ± 3.49
P value	0.75		0.86		0.27		0.69	
<b>Marital Status</b>								
Married	47(88.7)	6(11.3)	20(26)	57(74)	17(68)	8(32)	16(48.5)	17(51.5)
Single	7(70)	3(30)	3(25)	9(75)	3(60)	2(40)	1(20)	4(80)
Divorced	2(66.7)	1(33.3)	2(40)	3(60)	2(66.7)	1(33.3)	1(100)	0
Widowed	1(100)	0	0	0	0	0	0	0
P value	0.34		0.77		0.94		0.27	
<b>Employment Status</b>								
Unemployed	2(66.7)	1(33.3)	3(20)	12(80)	3(75)	1(25)	1(25)	3(75)
Government employee	7(100)	0	2(40)	3(60)	1(100)	0	3(75)	1(25)
Self-employed	47(83.9)	9(16.1)	19(26)	54(74)	17(63)	10(37)	14(45.2)	17(54.8)
others	1(100)	0	1(100)	0	1(100)	0	0	0
P value	0.52		0.31		0.73		0.35	
<b>Family Status</b>								
Sister §	2.21 ± 1.47	1.6 ± 1.26	2.5 ± 1.47	2.26 ± 1.3	2.18 ± 1.18	1.81 ± 1.53	2.16 ± 1.65	2.71 ± 1.34
P value	0.22		0.41		0.45		0.26	
Brother §	1.4 ± 0.79	1.6 ± 0.79	1.6 ± 1.52	1.43 ± 1.1	1.63 ± 1.61	1.6 ± 1.02	0.94 ± 1.2	1.67 ± 0.91
P value	0.49		0.56		0.99		0.04*	
Child §	2.12 ± 1.7	1.2 ± 1.31	2.28 ± 2.05	1.67 ± 1.52	2.09 ± 1.97	1 ± 1.26	1.55 ± 1.6	1.8 ± 1.47
P value	0.11		0.11		0.1		0.1	
<b>Drug Abuse</b>								
Age of onset	18.89 ± 4.4	18.1 ± 2.73	17.44 ± 3.47	17.64 ± 3.03	17.32 ± 3.4	16.45 ± 2.06	20.17 ± 3.3	19.62 ± 3.18
P value	0.58		0.71		0.27		0.69	
Opium (yes)	44(88)	6(12)	20(24.4)	62(75.6)	18(66.7)	9(33.3)	16(53.3)	14(46.7)
P value	0.58		0.2		0.99		0.1	
opium sap (yes)	44(84.6)	8(15.4)	20(24.7)	61(75.3)	18(64.3)	10(35.7)	12(46.2)	14(53.8)
P value	0.84		0.29		0.49		0.99	

Heroin (yes)	2(100)	0	8(34.8)	15(65.2)	8(80)	2(20)	2(66.7)	1(33.3)
P value	0.55		0.31		0.28		0.45	
Hashish (yes)	10(76.9)	3(23.1)	9(33.3)	18(66.7)	8(82.7)	3(27.3)	5(50)	5(50)
P value	0.36		0.35		0.6		0.77	
Grass (yes)	6(66.7)	3(33.3)	8(38.1)	13(16.9)	7(36.6)	4(36.4)	2(25)	6(75)
P value	0.9		0.17		0.79		0.18	
Crystal (yes)	12(85.7)	2(14.3)	16(35.6)	29(64.4)	15(68.2)	7(31.8)	5(62.5)	3(37.5)
P value	0.94		0.06		0.79		0.29	
Crack (yes)	7(87.5)	1(12.5)	9(39.1)	14(60.9)	9(75)	3(25)	0	3(100)
P value	0.84		0.11		0.44		0.09	
Other drugs (yes)	4(100)	0	1(25)	3(75)	1(50)	1(50)	3(50)	3(50)
P value	0.39		0.9		0.6		0.83	
<b>Family Members Abusing</b>								
Father (yes)	19(82.6)	4(17.4)	17(32.7)	35(67.3)	16(72.7)	6(27.3)	4(40)	6(60)
P value	0.68		0.13		0.8		0.65	
Mother (yes)	3(100)	0	0	2(100)	0	0	1(100)	0
P value	0.45		0.39				0.27	
Brother (yes)	9(69.2)	4(30.8)	10(37)	17(63)	9(69.2)	4(30.8)	2(50)	2(50)
P value	0.09		0.14		0.8		0.87	
Sister (yes)	0	0	1(100)	0	1(100)	0	0	0
P value			0.009*		0.47			
Spouse (yes)	1(100)	0	1(50)	1(50)	1(100)	0	0	0
P value	0.67		0.44		0.47			
Friends (yes)	11(78.6)	3(21.4)	19(39.6)	29(60.4)	18(87.3)	5(21.7)	5(55.6)	4(44.4)
P value	0.44		0.004*		0.03*		0.52	
Other relatives (yes)	2(40)	3(60)	20(29.4)	48(76.6)	19(73.1)	7(26.9)	9(50)	9(50)
P value	0.003*		0.32		0.13		0.65	
<b>Relapse</b>								
Previous unsuccessful treatments>8	6(85.7)	1(14.3)	12(54.5)	10(45.5)	10(100)	0	2(66.7)	1(33.3)
P value	0.96		0.001*		< 0.001*		0.45	
Relapse (yes)	55(87.3)	8(12.7)	24(27.3)	64(72.7)	22(71)	9(29)	14(46.7)	16(53.3)
P value	0.04*		< 0.001*		0.04*		0.91	
No. of Relapse	4.14 ± 3.23	3.4 ± 3.47	7.96 ± 3.8	4.33 ± 3.2	8.04 ± 3.5	3.36 ± 2.15	3.66 ± 3.9	2.85 ± 2.7
P value	0.51		< 0.001*		< 0.001*		0.45	

\*Methadone Maintenance Treatment, †Narcotics Anonymous, § Mean ± SD, \*Significant.

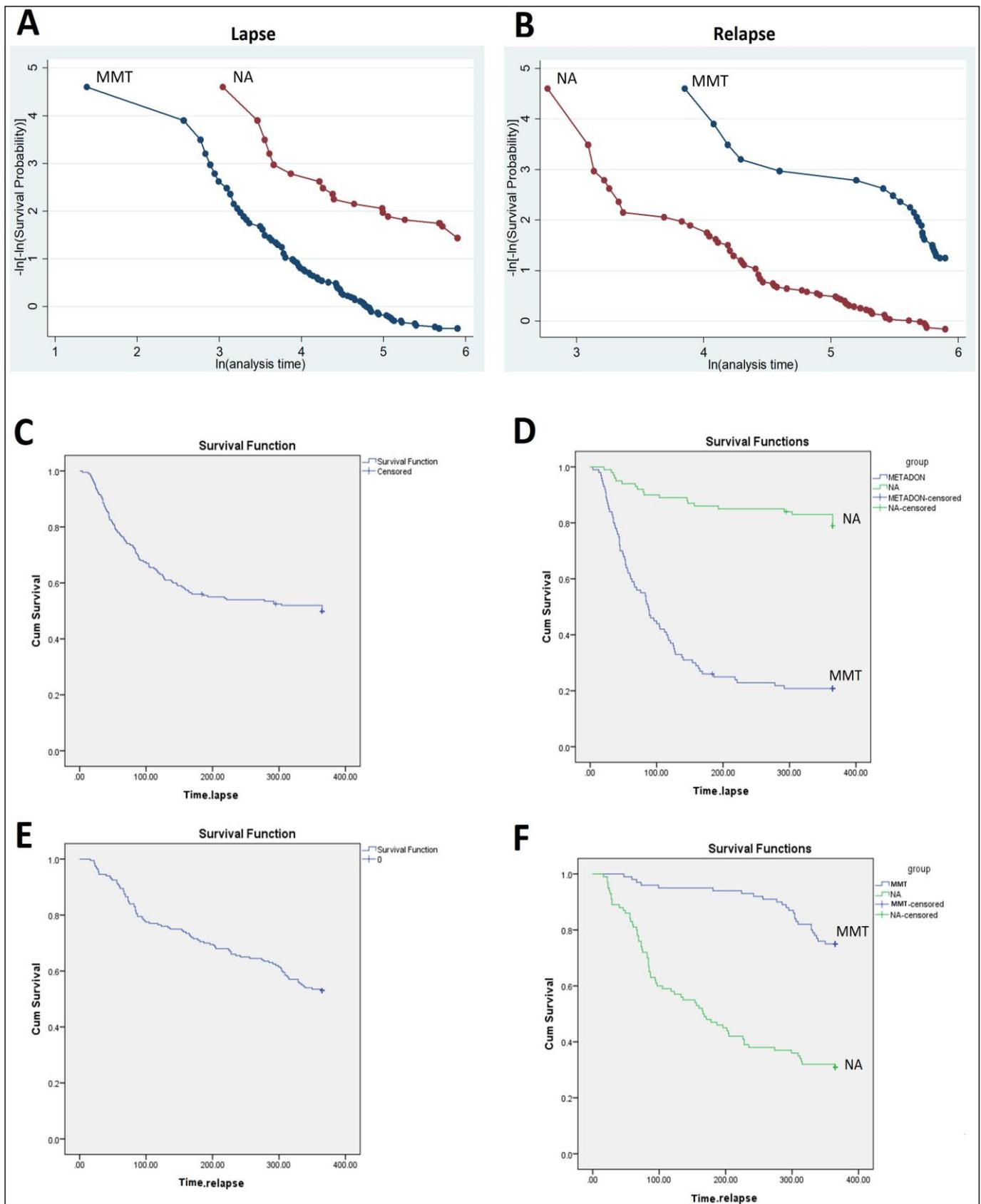


Figure 1. (A) Kaplan–Meier Survival Estimate of Laps by Groups (B) Kaplan–Meier Survival Estimate of Relapse by Groups. (C) Kaplan–Meier Survival Curve by Time for Lapse. (D) Kaplan–Meier Survival Estimate of Lapse by Groups. (E) Kaplan–Meier Survival Curve by Time for Relapse. (F) Kaplan–Meier Survival Estimate of Relapse by Groups.

### Discussion

The present study aimed to compare recurrence of addiction in NA groups and MMT centers and to assess effect of social support on addiction relapses. In this study, prevalence of relapses during 12 months was 60.5%. Several studies have been conducted to examine drug abuse relapse ratio and reported values ranging from 30% to more than 90% (23-27). In general, there was no statistically significant relationship between lapses and relapses in patients because most patients with lapses had no relapse. In contrast, Smyth *et al.* (2010) reported that lapses instantly resulted in a relapse in most treated patients (28). In line with our finding, Gossop *et al.* showed that one lapse does not necessarily lead to a full relapse (29). Termorshuizen's study revealed that daily use of sufficient doses of methadone reduced the risk of relapse (30).

Significantly, most patients with relapses were in the NA group, and majority of patients with lapses were in the MMT group. Tolerance to methadone (31), inadequate dosage (32), and sexual dysfunction as the side-effects of methadone (33) may cause slipping in this group. However, MMT patients after lapses had less desire for opioid as a result of the agonist replacement therapy (34), and slipping result was less during relapses in some cases. On the other hand, the number of patients with both lapses and relapses was larger in the MMT group. This might be due to the use of synthetic opiates as the patient does not fully feel drug free, and the lapses result in relapses in some of the MMT patients.

In this study, MMT and NA groups were homogenous in terms of all demographic characteristics but age, as the NA members were younger. The present findings also showed the significant relationship between age at first drug use and education with lapse/relapse rates. Younger patients with lower levels of education were at greater risk of lapse/relapse. Similarly, numerous studies have indicated that age at first drug use, younger age, and level of education play a key role in relapse (23, 35, 36). In our study, the mean age was higher in the MMT group than in the NA group. One explanation is that the inclusion criteria for MMT in Iran are as follows: 10 years of addiction, at least three earlier attempts of drug free treatment and injection drug abuse, and at least 20 years of age. Accordingly, the older patients with longer duration of addiction and many previous unsuccessful treatments are included in MMT programs.

Our findings demonstrated that the type of drug affects rate of relapse significantly. There was a higher risk of relapse for the participants who consumed opium, opium sap, heroin and crystal in comparison to the patients who abused other drugs. In line with our findings, Kassiani *et al.* (2015) reported opium (23) and Brecht *et al.* (2014) found methamphetamine (37) to be more significantly associated with relapse in comparison to other drugs.

In agreement with previous studies concerning social support and addiction relapse (38), the present study indicated that the mean scores of SSA subscales for the

participants without relapse in the NA group was significantly higher in comparison to the MMT group. Furthermore, the relapsed NA members had significantly more addicted friends, addicted family members and relatives than MMT group members. The results of a study by Atadokht *et al.* (2015) revealed the perceived social support of the addicts in decreasing frequency of drug abuse relapse (18). Lack of social support from family, friends, and community reduces patient resistance against environmental stress, resulting in relapse of disease and drug abuse. Since drug abusers often feel lonely, development of a support network for such individuals would prevent addiction relapse. Lack of social support from family, friends, and society reduces stability in patients facing environmental stress, leading to drug abuse relapse (39). Conversely, MacDonald *et al.* (2017) showed that social support was not always an effective predictor for addiction recovery, and other conditions may contribute to effectiveness of social support (40). Similarly, despite higher social support scores for the NA group in the present study, the younger patients in the NA group significantly had more lapse/relapse than MMT group members. Young age-related cognitive declines may be associated with irrational decisions and dominate other factors affecting relapse.

According to various studies, many addicts were treated in peer support groups (19), and the positive effect of NA membership reduced lapse/relapse rates. In line with the present study, a strong and positive relationship between social support of NA members and effective improvement with willingness to continue membership in this group has been documented. Humans are social creatures who need to be respected by others and need to be attached to a system of relationships. Accordingly, the support obtained from similar members in a group such as NA induces a sense of respect to patients, and this is of paramount importance for a treatment to be successful. NA members define their identity with a sense of belonging. Drug abusers gain social identity by attending addiction groups; and this new identity helps them participate in NA meetings regularly, leading to successful treatment. Treatment of drug abuse in a group is therefore the most successful method for treatment retention (41) because of social supports and identity participants receive in a group (42). Previous studies showed that membership in groups enhance self-confidence and improve social status of patients under treatment. These are important factors in treatment and relapse reduction (19).

### Limitation

The present study had some limitations. Addicted women were not included in the present research as the NA group had no female members in Shahroud. Women treated with methadone were significantly fewer than men in MMT centers (only five women agreed to participate in this study). Regarding the small number of

women, we did not include them in this study. We applied the participants' self-reported relapse to drug use because of time, cost, and resource considerations. In the NA group, anonymity is a crucial value, and participants believe research may violate their anonymity. We assured the participants that we would preserve their anonymity and patients who trusted us entered the study. Moreover, a member of the NA group helped us collect data. A few studies have specifically examined drug abuse relapse/lapse using survival analysis, and this can be regarded as one of the strengths of the present research. Future research is suggested to replicate the present study on addicted women because women's roles in social relationships differ from men's. It is also recommended that research be conducted on a group named Methadone Anonymous (MA), who benefit from concurrent agonist therapy and supportive peer group membership. Results can be compared to patients adopting only one therapeutic method.

### Conclusion

Detection of factors related to drug abuse relapse/lapse may help addiction therapists identify drug abuse patients with lapse/relapse and develop treatment and policy guidelines to prevent relapse in addiction recovery. Methods can be performed more effectively by participation of the addicts' families.

### Acknowledgment

The authors wish to thank all the participants in this project. Moreover, they thank Dr. M.H. Emamian, deputy of research and technology at Shahroud University of Medical Sciences, for his guidance and cooperation.

This research was funded by a specific project grant from Shahroud University of Medical Sciences (Grant No: 950248).

### Conflict of Interest

None.

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