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FACTORS ASSOCIATED WITH ADHERENCE TO METHADONE AMONG HEROIN ADDICTS ATTENDING THE METHADONE ASSISTED TREATMENT CLINICS IN NAIROBI COUNTY
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FACTORS ASSOCIATED WITH ADHERENCE TO METHADONE AMONG HEROIN ADDICTS ATTENDING THE METHADONE ASSISTED TREATMENT CLINICS IN NAIROBI COUNTY

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ABSTRACT

***Objectives*: This study examined adherence levels and factors associated with adherence to methadone among heroin addicts enrolled in the methadone assisted treatment (MAT) clinics in Nairobi County.**
***Setting*: Ngara and Mathari MAT clinics, Nairobi County.**
***Design*: Descriptive cross-sectional study**
***Participants*: Heroin addicts aged above 18 years, enrolled in the MAT clinics in Nairobi and had used methadone for at least 6 months. Data was collected using semi-structured questionnaires and analysed using SPSS version 25.0, association between the variables was estimated using chi square statistics and Odds ratio. Differences between the parameter of estimate was deemed statistically significant at P<0.05.**
***Results*: Of the 225 participants, 103 (45.8%) were adherent and 122 (54.2%) were non-adherent. There was significant association between adherence to methadone with male gender (p=0.035), younger age 18 to 39 years (p= 0.014), employment (p=0.027), low level of education (p=0.022), risky behaviours (p=0.009), Living with family (p=0.007), Living Alone (p= 0.029) Living on the streets (p= 0.000), Living with friends (p= 0.021), incarcerated (p= 0.0011), lack of family and friends support (p= 0.019), being discriminated (p= 0.030), being stigmatized (p= 0.039), being isolated (p= 0.012) being abused (p= 0.028). No significant association between adherence to methadone with marital status and religion.**
***Conclusion*: The study found that 54.2% of heroin addicts attending MAT clinics in Nairobi County were non-adherent to methadone. The rate of non-adherence to methadone among heroin addicts at the MAT clinic is worrisome. Efforts are needed to improve adherence to MAT clinics by regular one on one adherence**

counselling, methadone awareness creation and decentralization of MAT clinics all over the country.

INTRODUCTION

Heroin an illegal drug, remains the most harmful drug type. It is both physically and psychologically addictive. Its addiction causes an international public health problem and is associated with the risk of fatal and non-fatal overdoses, engagement in crime to support the habit, imprisonment, risk of acquiring infectious diseases such as HIV and hepatitis C through unsafe injecting practices and the risk of psychiatric co morbidities [1]. The need to obtain heroin to starve off the withdrawal symptoms results in individuals having to prioritize their drug use over other aspects of their lifestyle leading to addiction. An estimated quarter of a billion people used drugs at least once in 2015. Even more worrisome is the fact that about 29.5 million of those drug users suffer from drug use disorders. Heroin users across the globe are estimated to be 17 million persons as of the year 2015 and the number of deaths resulting from heroin use at about 122 000 [1]. In Kenya, the prevalence of heroin use among the age group between 15 and 64 is 0.7% [2]. The United Nations Office on Drugs and Crimes (UNODC) notes that global figures of injectable drug users include 1.6 million who are HIV positive, 6.1 million living with hepatitis C and 1.3 million living with both [3]. This means that their drug use is harmful to the point that they may require treatment.

Methadone is promoted globally as the drug of choice for treating heroin addiction, reducing overdose mortality and preventing infectious disease transmission. Methadone works by altering how the brain and the nervous system functions in response to pain. As such, it serves to lessen the painful manifestations resulting from the withdrawal symptoms associated with dependency on heroin. Methadone can be administered in various forms such as a pill, liquid or wafer. Its administration is done once daily and has the implication of remaining active in the body for about eight hours. Doses of methadone can vary from one individual to another based on their state of addiction to heroin. Methadone can only be effective and sustainable if good adherence is achieved.

Non-adherence with methadone treatment is frequently noted in global reports. In Asia, study conducted in Vietnam suggests that a total of 17.7% were non adherent to methadone treatment in the last 30 days and 8.3% reported having missed a dose in the last 7 days [4]. A survey conducted in France suggested that 55.9 % were non adherent and 9% highly non adherent to methadone [5]. Determinants of non-adherence varied across the settings. Overall, low socioeconomic status, poly substance abuse (alcohol and drug use), deficient methadone dose, long distance to MAT clinics and being dissatisfied with MAT services. The issue of adherence to MAT becomes a significant topic to consider owing to the fact that heroin addicts require a walk through their journey of detoxification from heroin and support that will ensure that they fully recover. Thus, to increase the effectiveness of MAT program, it is necessary to investigate treatment adherence as well as associated factors. A total of 271 heroin addicts attending MAT clinics in Nairobi County who were 18 years and above and had been on methadone for a period of 6 months and above were recruited in the study.

METHODS

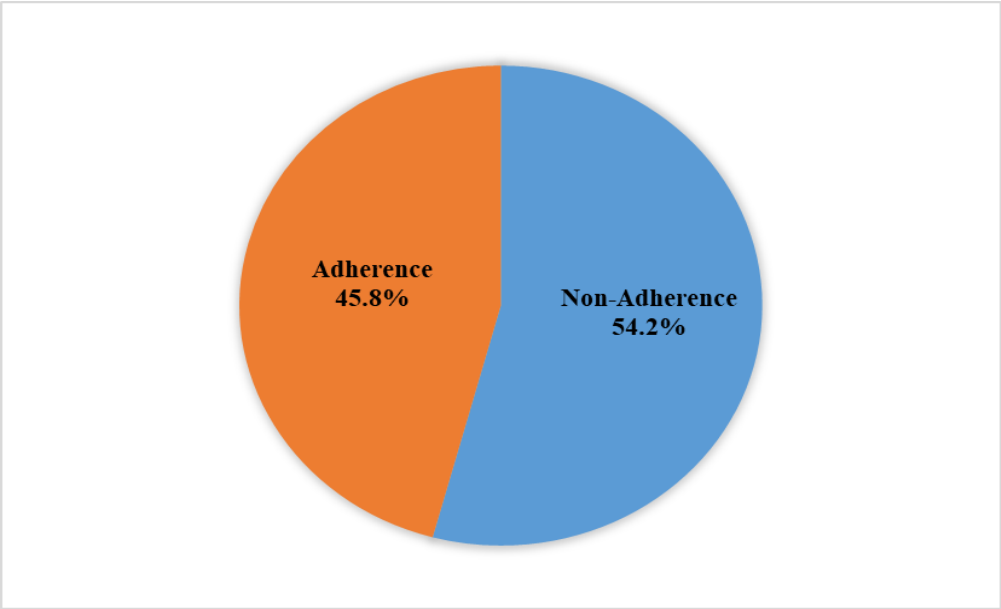
This study was conducted in Nairobi County which is the capital city of Kenya. The city has the largest slums in the world, and approximately 22% of the city's residents live in poverty [6]. The study was conducted at Mathari MAT clinic located at Mathari national teaching and referral hospital and Ngara MAT clinic. This was a descriptive cross-sectional study utilizing quantitative and qualitative method. The Cochran's sample size calculation formula was used to arrive at 271 heroin addicts. A systematic random sampling method was used to select them from the clinics. Data was collected using a structured questionnaire which was administered face to face to the heroin addicts by the principal investigator and the trained research assistant while qualitative data was collected using focused group discussion (FGD) and key information interviews guide. The questions were close-ended questions designed in respect to the objectives of the research study which were in English and Swahili and administered to the participant according to their preference.
Two FGD's were conducted for best practice so as to avoid idiosyncratic results from one FGD. It consisted of 10 participants both male and female, facilitated by the principal investigator and an external moderator. Data was recorded using a tape recorder and transcribed as soon as data was collected.
Data was analysed using SPSS version 25.0, association between the variables was estimated using chi square statistics and Odds ratio. Adherence was reported if the participant had not missed a clinic appointment and taking the daily dose of methadone in the last 5 days. Poor adherence was reported if there was a missed appointment and missed dose of methadone in the last 5 days. Differences between the parameter of estimate was deemed statistically significant at $p<0.05$. Qualitative data was analysed using thematic analysis and used to supplement, explain and interpret quantitative data. Ethical clearance was sought from JKUAT ethical review committee, institutional clearance from JKUAT board of postgraduate studies and Nairobi city council research committee. The study participants were issued with an informed consent which they were required to sign on voluntary basis so as to participate in the study. The participant would opt out of study without any negative consequences.

RESULTS

Of the 271 heroin addicts on methadone in Nairobi County recruited in the study, 225 of the questionnaires were adequately filled and returned contributing to a response rate of 83%. This response rate was sufficient and representative and conforms to Mugenda and Mugenda [7] stipulation that a response rate of 50% is adequate for analysis and reporting, a rate of 60% is good while a response rate of 70% and over is excellent.
Of the, 225 103 (45.8%) were found to be adherent and 122 (54.2%) were non-adherent as seen on figure 1.

Figure 1

level of adherence among heroin addicts attending MAT clinics in Nairobi County (N= 225)



Social demographic characteristics: On social demographic characteristics, we found that, 183 (81.3%) of the participants were male and 42 (18.7%) were female. 116 (51.6%) of the were aged between 18-29 years while only 3 (1.3%) were aged 50 years and above. Regarding marital status, majority, 84 (37.3%) were single, while 58 (25.8%). were separated with regards to the level of education, majority 111 (49.3%) of the had attained secondary education while 9 (4%) had not attained any form of education. Findings on religion indicated that majority 168 (74.7%) of the participants were Christians while 46 (20.4%) were Muslims. The remaining did not subscribe to any religion. On employment status, most 153 (68.0%) of the participants were employed while 72 (32%) were unemployed as seen in table 1.

Table 1

Socio-demographic characteristics

Factors		Frequency (n)	Percentage (%)
Gender	Male	183	81.3
	Female	42	18.7
	Total	225	100.0
Age	18-29 years	116	51.6
	30-39 years	74	32.9
	40-49years and above	35	15.5
	Total	225	100.0
Marital status	Married	83	36.9
	Separated	58	25.8
	Single	84	37.3
Level of Education	Total	225	100.0
	College/university	32	14.2
	Secondary school	111	49.3
	Primary school	73	32.5
	No education	9	4.0
	Total	225	100.0

Religion	Christian	168	74.7
	Muslim	46	20.4
	No religion	11	4.9
	Total	225	100.0
Employment status	Employed*	153	68.0
	Not employed	72	32.0
	Total	225	100.0

**Employed means one who is engaged in an activity that generate money*

Factors associated with adherence to methadone: We found statistically significant association between adherence to methadone with male gender (p=0.035), younger age 18 years to 39 years (p= 0.014), employed (p=0.027), low level of education (p=0.022), risky behaviours (p=0.009), living conditions;(living with family (p=0.007), Living Alone (p= 0.029) Living on the streets (p= 0.000), Living with friends (p= 0.021), Living in a controlled environment (prison) (p= 0.0011)) and form of treatment (family and friends support (p= 0.019), being discriminated (p= 0.030), being stigmatized (p= 0.039), being isolated (p= 0.012) or deserted as well as being abused and disregarded (p= 0.028). There was no association between adherence to methadone with marital status and religion as seen in table 2.

Table 2

Factors associated with adherence to methadone among heroin addicts

Variables	Adherent (n = 103)		Non-Adherent (n= 122)		Chi-square p-value <0.05	Odds ratio value [at 95% CI]
	n	%	n	%		
Sex					p=0.035*	1.33 [0.642 - 2.768]
Male	87	84.5	96	78.7		
Female	16	15.5	26	21.3		
Age (in years)						
18 - 29	39	37.9	77	63.1	p=0.014*	4.16 [0.897 - 7.615]
30 - 39	34	33.0	40	32.8		
40-49 & above	30	29.1	5	4.1		
Marital status						
Married	53	51.5	30	24.6	p=0.349	0.62 [0.281 - 1.873]
Separated	20	19.4	38	31.1		
Single	30	29.1	54	44.3		
Employment Status						
Employed	62	60.2	91	74.6	p=0.027*	1.45 [0.693 - 2.881]
Not employed	41	39.8	31	25.4		
Religion						
Christian	73	70.9	95	77.9	p=0.476	0.57 [0.264 - 1.638]
Muslim	25	24.3	21	17.2		
No religion	5	4.9	6	4.9		
Education Level						
College/University	15	14.6	17	14.0	P=0.022*	1.74 [0.749-3.017]
Secondary	56	54.4	55	45.1		
Primary	30	29.1	43	35.2		
No Education	2	1.9	7	5.7		
Risky behaviors'						
Still injecting or smoking heroin?	Yes	16	15.5	86	70.5	p=0.009*	2.11 [0.785 - 4.142]

	No	87	84.5	36	29.5		
Living conditions							
	Frequency						
Living with family	138	91	65.9	47	34.1	p=0.007*	1.63[0.627 - 2.633]
Living Alone	51	9	17.6	42	82.4	p=0.029*	1.31 [0.219 - 2.401]
Living on the streets	8	0	0.0	8	100.0	p=0.000*	4.08 [2.618 - 5.542]
Living with friends	24	3	12.5	21	87.5	p=0.021*	2.14 [0.731 - 3.550]
Living in a controlled environment (prison)	4	0	0	4	100.0	p=0.011*	2.75 [0.822 - 4.678]
Form of Treatments							
Family and friends support	yes	94	65.3	50	34.7	p=0.019*	1.21 [0.509 - 1.911]
	No	9	11.1	72	88.9		
Being discriminated	Yes	5	13.2	33	86.8	p=0.030*	1.56 [0.329 - 2.791]
	No	98	52.4	89	47.6		
Being stigmatized	Yes	16	34.0	31	66.0	p=0.039*	1.07 [0.215 - 1.927]
	No	87	48.9	91	51.1		
Being isolated or deserted	Yes	21	29.6	50	70.4	p=0.012*	1.85 [0.640 - 3.021]
	No	82	53.2	72	46.8		
Being abused and disregarded	Yes	13	43.3	17	56.7	p=0.028*	1.39 [0.428 - 2.352]
	No	90	46.2	105	53.8		
Note: *Significant p<0.005							

The study further explored personal reasons that led to missing the methadone dose. The most common personal reasons for missing the methadone treatment were being busy 50 (41%); being out of town 19 (16%) and lacking fare to get to the clinic 14 (11.8%) as seen in table 3.

Table 3

Personal reasons for missing the methadone dose

	Frequency (n)	Percent (%)
Busy	50	41.0
Bad side effects	6	4.9
Little methadone dosage	13	10.4
Was out of town	19	16.0
Incarcerated	10	8.3
Lack of transport	14	11.8
Lateness	6	4.9
Sick	3	2.8
Total	122	100.0

Participants from qualitative interviews further illustrated that they were not able to come for their daily dose of methadone because of their busy schedule, lack of transport to the clinic and being incarcerated. One sexual worker reported that she could not come for her methadone dose because of her busy schedule during the day. Further a nurse from one of the facilities reported that heroin addicted incarcerated are unable to access methadone.

> *'I work as female sex worker and my work demands me to work at night. MAT clinic does not operate on a 24hour basis so sometimes I don't come for my dose because I am tired and sleeping during the day'* **Female heroin addict**

> *'Been incarcerated is a major reason for non-adherence to methadone treatment because once incarcerated, heroin addicts are not able to access methadone at the prison'* **Nurse**

DISCUSSION

To our knowledge, this is the first study exploring the levels of adherence to methadone among heroin addicts attending MAT clinics in Nairobi County. This study indicates most of the heroin addicts were non- adherent (54.2%) to methadone. The findings found adherence levels to be lower compared to other studies done in different countries where they found adherence to methadone treatment to be much higher. Hoang, Nguyen, Nguyen, Tran, & Latkin [8] in a study in Vietinum reported adherence to methadone treatment to be at 65.6% . the difference to the results could be beccause of the set up, methadone clinics in Nairobi County are flooded by clients from the slum area and the study in vietinum was from the mountainside. According to the findings, the major reasons for non-adherence to the methadone treatment included being busy (41.0%), lack of transport (11.8%), incarceration (8.3%) and being out of town (16.0%). The respondents reported busy schedule which was mostly due to the operating hours of the clinics which operated from 7 am to 12 pm. Financial constrains caused lack of transport because by the time of the study methadone clinics in Nairobi County also carted for the clients seeking services from the neighboring County Kiambu. The study findings agreed with those of Emmanuel, Akhtar and Rahbar [9],

who in a similar study in Pakistan found that although a majority of the heroin addicts who had been enrolled in the methadone assisted treatment were adherent, a significant number of them were non-adherent. cited reasons included low economic status and work-related commitments. Similarly, Hoang et al.[10] observed that lack of transport costs and being overly held up at work as some of the reasons behind non-adherence to the methadone maintenance therapy. Findings also concurred with Jiang, Lee, Lee and Pickard [11] who cited being incarcerated, being ill, being busy in one's daily activities, being unable to afford bus fares and lack of support from family as some of the reasons that occasioned poor adherence to methadone treatment.

On factors associated with adherence to methadone, the sociodemographic factors reported being male and below 40 years of age influenced non- adherence. Men were likely to forget to come to the clinic because of busy schedule at work and the feeling that the methadone dose administered is little. Those above 40 years of age adhered more to methadone treatment because of the possibility of feeling that they should focus more on important things in life as they had wasted most of their youth been drug addicts. These findings were in agreement with those of Opala [12] who while reviewing the war on drugs in Kenya observed that that heroin use was rampant among youth especially in slum dwellings. Findings were in line with those of Lin, Lan, Li and Rou [13] in which majority of heroin addicts with poor adherence to methadone treatment were found to be male, aged below 40 years. Similarly, in a study in Vietnam, Nguyen, Thi, Latkin and Carl [14] reported that the odds of being non-adherent to methadone treatment were significantly higher in male compared to female heroin addicts, in younger heroin addicts compared to the older ones. Socio economic factors reported low education status having primary and no education as a factor to non adherence also, employment status; being employed influced busy schedule and umemployment contributed to lack of transport money to visit the methadone clinic. Findings were in agreement with Jiang, Lee, Lee and Pickard [11] who noted that socio-economic factors, including employment status and income level were significantly associated with poor adherence to methadone treatment. Similarly, low economic status characterized by lack of jobs and hence lack of income was established as one of the social-economic barriers to better adherence [15]. Nguyen, Thi, Latkin and Carl [14] in Vietnam, reported that less educated heroin addicts compared to the more educated heroin addicts were more likely to not adhere to treatment. It also agreed with Sylvestre and Clements [16] who stated that having primary to secondary rather than tertiary level of education was all associated with poor adherence to medication assisted treatment. Socio cultural factors found that continuous injection or smoking of heroin, living with an alcoholic or illegal drugs user, and lack of family and friends support were significant risk factors to methadone treatment adherence. Continuous use of drugs like heroin, marijuana and alcohol while still on methadone treatment was likely due to little dose the client received after been enrolled in the methadone treatment. Findings were in agreement with Ramli, Zafri, Junid and Hatta [17] who in a study did establish that having friends or residing with persons that abused alcohol or that abused illegal drugs were risk factors that significantly correlated with non-compliance to methadone treatment. A similar observation was made by Parpouchi, Moniruzzaman, Rezansoff, Russolillo and Somers [18] who noted that majority of drug addicts face negative and harsh treatment from their immediate family and friends including being discriminated against, being abused, being stigmatized, being disregarded and being isolated. On their part,

Bond and Witton [19] in a review of the perspectives on the pharmacological treatment of heroin addiction pointed out that cultural aspects including one's faith, living together with alcoholics or persons that use illegal drugs and entertaining relationships with persons that still inject/smoke heroin act as enablers of non-adherence.

CONCLUSION

The study found that 54.2% of heroin addicts attending MAT clinics in Nairobi County were non-adherent to methadone. The rate of non-adherence to methadone among heroin addicts at the MAT clinic is worrisome. Efforts are needed to improve adherence to MAT clinics by regular one on one adherence counselling, methadone awareness creation and decentralization of MAT clinics all over the country.

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