Original Research Article

Defaulting rate and associated factors among patients attending methadone maintenance clinics in Nairobi City County, Kenya

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ABSTRACT

Background: Defaulting from MMT clinics is a major public health problem affecting people globally resulting in high transmission of HIV, hepatitis B and C, increased crime rate, and reduced productivity of an individual. However, defaulting rate in the MMT clinics in Nairobi City County in Kenya remains understudied. This study was aimed at determining the defaulting rate and its associated factors from MMT clinics in Nairobi City County, Kenya.
Methods: A cross-sectional analytical study design was employed. Simple random sampling, purposive sampling and stratified sampling were utilized in this study. A sample size of 388 patients was randomly selected. A semi-structured questionnaire was used for data collection. SPSS V.24 was used for data analysis.
Results: A response rate of 95% (369) was achieved. Most were youths aged 18-35yrs (60.7%, n=224), male (76.4%, n=282), married (39%, n=144), Christians (51.8%, n=191). The defaulting rate was 53% with marital status, religion, education level, and income source being significantly associated with defaulting (p<0.05).
Conclusions: The defaulting rate from MMT was relatively high in Nairobi City County. Defaulting was linked to education, cocaine use before MMT and concurrent drug use during treatment. A number of interventional strategies were proposed by this study to improve MMT programming.

Keywords: Associated factors, Defaulting, Methadone maintenance treatment

INTRODUCTION

Methadone maintenance treatment (MMT) is regarded as an effective and frequently utilized way of managing opioid dependence in the world.[1] Opioid use disorder (OUD) is a significant public health problem that amounts to the third most predominant substance use disorder with regards to causing morbidity and premature mortality.[2] Opioid use considerably contributes to the increased prevalence of HIV and Hepatitis infections, premature mortality, increased criminal activities, overdose, and unemployment.[3] The success and effectiveness of MMT depend on the patient`s compliance with the treatment. However, worldwide MMT programmes are significantly affected by the common problem of client defaulting from treatment.[4] Defaulting from treatment in MMT clinics is associated with increased crime rates, risky behaviours such as injection of drugs, relapse risk, mortality and reduced quality of life.[5]

There is a worldwide increase in the use of opioids with the global prevalence of the preceding year being 1.2%.[6] The estimated worldwide OUD is 40.5 million.[7] There is a significant growing tendency of opioid use in Africa despite the limited research undertakings so far.[8] In Africa, opioid use has been recorded in 36 countries with the prevalence varying from an approximated 2.3% in Seychelles, 1% in Mauritius, and 0.3% in Kenya. Currently, the prevalence of opioid use in Kenya is at

0.3% in the population at large aged 15-65 years.[6] Nairobi City County has the highest number of PWIDs which is approximately between 5031 and 10937 with 18.33% of them living with HIV.[9] A recent study conducted in Nairobi City County at the Ngara MAT clinic found that the retention rate was only 54% suggesting therefore that the defaulting rate was 46%.[10]

Research on the factors associated with defaulting from MMT clinics were reported to be multifactorial. They included low doses of methadone during the first episodes of treatment, low levels of education, lack of motivation, the distance to the MAT clinic, history of opioid dependence, difference in gender roles and other interpersonal conflicts.[2]

Various studies have been carried out among methadone clients in Nairobi City County methadone treatment clinics. However, none of them has researched on the rate of defaulting treatment from the methadone clinics and its associated factors.

The aim of this study therefore was to determine the defaulting rate and its associated factors from MMT clinics in Nairobi City County, Kenya because such knowledge could inform improved programming.

METHODS

Study design and settings

The study employed a cross-sectional analytical study design with both quantitative and qualitative techniques. The study was conducted in the two available Mathari and Ngara MMT clinics in Nairobi City County. The study was carried out from December 2023 to February of 2024.

All patients currently enrolled and attending MMT clinics at the two facilities of Ngara and Mathari in the past 12 months who were aged 18 years and above were included in the study. Those who refused to participate in the study and those whose privileges had been terminated for not following the clinic operational rules and regulations were also excluded.

Sample size and sampling method

Mathari and Ngara MMT clinics were purposively sampled. Simple random sampling was used to select the patients to whom semi structured questionnaire were administered. Stratified sampling was done for FGD participants and purposive sampling for key informant interviewees. A total of 388 patients were randomly enrolled with a response rate of 95% (369) being achieved.

Data collection

Quantitative data collection was done using a researcher-administered semi-structured questionnaire with open and close-ended questions. Qualitative data were obtained from participants in FGD and KII. Data collection took place in private clinic settings with full anonymity of the patients ensured. Ethical clearance and permission to undertake this study was obtained from all relevant authorities and a written informed consent was obtained from all patients.

Socio-demographic characteristics such as (age, sex, marital status, religion, education level income source) and other risk factors were the independent variables. Defaulting from methadone treatment was the dependent variables.

Data analysis

Quantitative data was analysed using descriptive and inferential statistical methods. Chi-square test and Fishers exact test were used to assess association between defaulting and categorical variables. Logistic regression was used to determine independents predictors of MMT defaulting.

RESULTS

A total of 388 participants were enrolled into the study with a response rate of 95% (n=369 out of 388) being achieved. More than half were from Mathari 50.7% (n=187).

Table 1: Socio-demographic characteristics of the study participants.

Factors		Frequency (n=369)	Proportion %
Facility	Mathari	187	50.7
	Ngara	182	49.3
	Total	369	100.0
Age categories (WHO) (years)	18-35	224	60.7
	36-49	109	29.5
	50-64	34	9.2
	>65	2	0.5
	Total	224	60.7
Sex	Male	282	76.4
	Female	87	23.6

Continued.

Factors		Frequency (n=369)	Proportion %
	Total	369	100.0
Marital status	Married	144	39.0
	Single	121	32.8
	Separated	94	25.5
	Divorced	10	2.7
	Total	369	100.0
Religion	Christian	191	51.8
	Muslim	166	45.0
	Others	12	3.2
	Total	369	100.0
Education level	Secondary	147	39.8
	Primary	131	35.5
	Tertiary	64	17.3
	None	27	7.3
	Total	369	100.0
Income source	Not-employed	180	48.8
	Self-employed	146	39.6
	Salaried	43	11.7
	Total	369	100.0

Table 2: The relationship between socio-demographic factors and MMT defaulting rate.

Factor		Is the patient a defaulter?			Sign. at $p \leq 0.05$
		No	Yes	Total	
Facility	Mathari	80	107	187	χ =2.731, df=1, p=0.098
	Ngara	93	88	181	
Sex	Female	36	51	87	χ^2=1.451, df=1, p=0.228
	Male	137	144	281	
Age categories (WHO)	18-35	118	105	223	χ^2=8.795, df=1, p=0.003
	>36	53	90	143	
Marital status	Single	54	67	121	Likelihood ratio p<0.001
	Married	93	50	143	
	Divorced	6	4	10	
	Separated	20	74	94	
Religion	Muslim	45	120	165	χ^2=47.653, df=2, p<0.001
	Christian	122	69	191	
	Others	6	6	12	
Education level	Tertiary	55	9	64	Likelihood ratio p<0.001
	Secondary	75	71	146	
	Primary	42	89	131	
	None	1	26	27	
Income source	Salaried	37	6	43	χ^2=44.784, df=2, p<0.001
	Self-employed	78	67	145	
	Jobless	58	122	180	

Table 1 below shows the socio-demographic characteristics of the study participants. The mean age of the participants was 33.91 ranging from 18-65 years and the majority (76.4%, n=282) were male. A relatively higher proportion of the participants were married (39%, n=144), Christians (51.8%, n=191), not employed 48.8% (n=180), and had secondary level of education 39.8% (n=147).

Defaulting rate among patients attending methadone maintenance clinics

The defaulting rate among patients attending MMT clinics in Nairobi City County was slightly more than half (53% n=195) as shown in Figure 1.

**Table 3: Drug use history among patients receiving MMT.**

Drug used		Frequency (n=369)	Proportion (%)
Patterns of drug use before MAT enrolment	Single	21	5.7
	Polydrug	348	94.3
	Total	369	100.0
Drugs frequently used before MAT enrolment			
Heroin	No	6	1.6
	Yes	359	98.4
	Total	365	100.0
Alcohol	No	185	50.7
	Yes	180	49.3
	Total	365	100.0
Marijuana	No	41	11.2
	Yes	326	88.8
	Total	367	100.0
Tobacco	No	43	11.7
	Yes	324	88.3
	Total	367	100.0
Cocaine	No	156	42.5
	Yes	211	57.5
	Total	367	100.0
Others (e.g. Khat, bhang, benzhexol Sniffing glue, Morphine, diazepam, Khaini, trihexyphenidyl, antipsychotics)	No	0	0.0
	Yes	157	100.0
	Total	157	100.0
Were drugs used during MAT?	No	118	32.2
	Yes	249	67.8

A Chi square analysis was done to establish the relationship between the socio-demographic characteristics and defaulting rate from treatment as shown in Table 2. A significant relationship was found between MMT defaulting and marital status (p<0.001), age (χ^2=8.795, df=1, p=0.003) religion (χ^2=47.653, df=2, p<0.001), education level (p<0.001), and income source (χ^2=44.784, df=2, p<0.001). There was no significant relationship between treatment facility, sex and defaulting from MMT.

Drug use history among patients receiving MMT

Table 3 illustrates patterns of drug use among patients receiving MMT. Before enrollment into MMT, polydrug use was prevalent (94.3%, n=348) among the patients. Almost all participants used heroin with only 4 participants reporting prescription opioids (morphine). The frequency of use of the different drugs before MMT enrolment is as follows: heroin (98.4%, n=359), alcohol (49.3%, n=180), marijuana (88.8%, n=326), tobacco (88.3%, n=324), and cocaine (57.5%, n=211). Most patients (67.8%, n=249) on MMT therapy reported using other drugs concurrently.
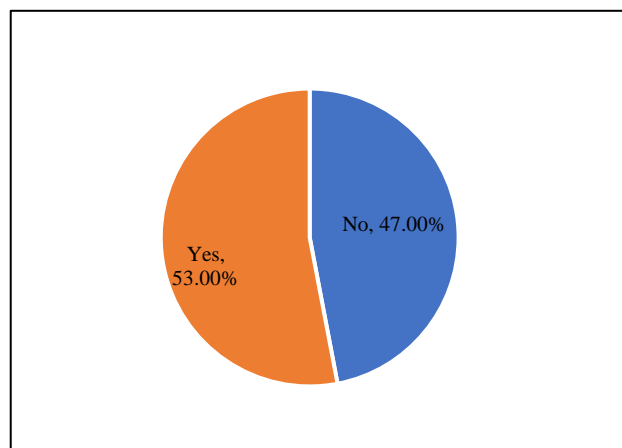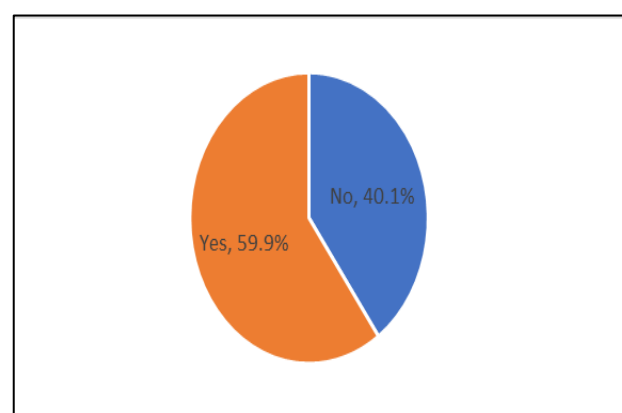

Figure 1: Defaulting rate.

The relationship between patients' drug use history and MMT defaulting rate

Table 4 evaluates the association between MMT defaulting and drug use behaviors. A significant association between patterns of drug use and MMT defaulting was seen (χ^2=5.333, df=1, p=0.021). A significant association was also found between MMT defaulting and a history of pre-MMT cocaine use (χ^2=35.476, df=1, p=0.000). Similarly, concurrent use of other drugs during MMT treatment was also significantly associated with defaulting (χ^2=58.772, df=1, p=0.000).

Social networks

After joining MMT, the majority, 59.9% (n=220), reported having support from friends and family on the recovery journey, while 40.1% (n=147) indicated no support as shown in Figure 2.

Figure 2: Support from friends and family in MMT recovery journey.

**Table 4: The relationship between patients' drug use history and MMT defaulting rate.**

		Is the patient a defaulter?		Significant at p≤0.05
		No	**Yes**	
Patterns of drug use	Single	15	6	
	Polydrug	158	189	χ^2=5.333, df=1, p=0.021
	Total	173	195	
Heroin	No	2	4	
	Yes	167	191	Fisher's Exact p=0.412
	Total	169	195	
Alcohol	No	94	90	
	Yes	75	105	χ^2=3.246, df=1, p=0.072
	Total	169	195	
Marijuana	No	23	18	
	Yes	148	177	χ^2=1.631, df=1, p=0.202
	Total	171	195	
Tobacco	No	24	18	
	Yes	147	177	χ^2=2.070, df=1, p=0.150
	Total	171	195	
Cocaine	No	101	55	
	Yes	70	140	χ^2=35.476, df=1 ,p=0.000
	Total	171	195	
Were other drugs used during MMT?	No	90	28	
	Yes	83	165	χ^2=58.772, df=1, p=0.000
	Total	173	193	

Table 5: Relationship between social support and MAT defaulting rate.

		Is the patient a defaulter?		Significant at p≤0.05
		No	**Yes**	
Support from family and friends during recovery (at entry to MAT clinic)	No	42	105	
	Yes	131	88	χ^2=34.453, df=1, p<0.001
	Total	173	193	

Social support from friends and family members was significantly associated with MMT defaulting status (Table 5). However, 45.6% of the patients who defaulted faced stigma and misinformation. And this was significant at (p<0.001).
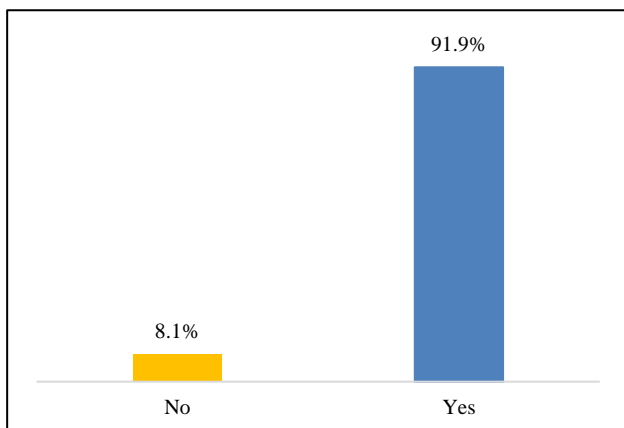
Figure 3: Awareness of MMT.

The study participant's awareness and perceptions of MMT

There was unanimity on the importance of MMT therapy among respondents, with 100% (n=367) believing MMT is important. Further, as shown in Figure 3, the responses regarding awareness of the benefits of MMT indicated that 91.9% (n=339) acknowledged the benefits of MMT, while 8.1% (n=39) did not. However, awareness was not significantly linked with MMT defaulting status (χ^2=0.524, df=1, p=0.469).

Institutional factors

The institutional factors of MMT clinics are shown in Table 6. A majority of the patients reported residing far from the facility. More than two-thirds of respondents (71.3%, n=263) stated the cost of transport to the clinics was affordable, with an average spending on transport of Kshs 113.98 (SD=98.87). Most patients rated the Healthcare workers' (HCWs) compassion and attentiveness as good 55.0% (n=203). The above findings

are consistent with the open-ended follow-up questions. When asked to describe (HCWs), patients' opinions were divided, with some providing a positive review. For instance, some mentioned that HCWs are empathetic, caring, and understanding while others said they were inconsiderate and lethargic. Clinic hours were found convenient by majority of respondents 64.3% (n=236). Moreover, 72.1% (n=263) stated that wait time did not affect their attendance, whereas 27.9% (n=102) reported that it did. About a third (32%) of the patients expressed frustration with long waiting times, often leading them to leave without receiving necessary treatment.

Table 6: Institutional factors.

Factor		Frequency (n=369)	Proportion (%)
Distance to nearest MMT clinic?	Very far	144	39.0
	Far	127	34.4
	Near	98	26.6
	Total	369	100.0
Transportation cost.	Not afford	106	28.7
	Affordable	263	71.3
	Total	369	100.0
Level of compassion/Attentiveness of HCWs at MMT clinics	Good	203	55.0
	Average	102	27.6
	Poor	64	17.3
	Total	369	100.0
Are clinic hours convenient?	No	131	35.7
	Yes	236	64.3
	Total	367	100.0
Wait time at clinic?	Appropriate	237	64.6
	Long	130	35.4
	Total	367	100.0
Has wait time affected attendance?	No	263	72.1
	Yes	102	27.9
	Total	365	100.0

Table 7: Relationship between institutional factors and MMT defaulting rate.

		Is the patient defaulter?		Significant at p≤0.05
		No	**Yes**	
Distance to MMT clinic	Near	53	45	
	Far	120	150	χ^2=2.681, df=1, p=0.102
	Total	173	195	
Transportation cost	Not afford	69	37	
	Affordable	104	158	χ^2=19.545, df=1, p<0.001
	Total	173	195	
Level of friendliness of HCWs at MMT clinics	Good	122	80	
	Average	42	60	χ^2=43.813, df=2, p<0.001
	Poor	9	55	
	Total	173	195	
Are clinic hours convenient?	No	41	90	
	Yes	132	103	χ^2=20.876, df=1, p<0.001
	Total	173	193	
Has wait time affected attendance?	No	141	121	
	Yes	28	74	χ^2=20.519, df=1, p<0.001
	Total	169	195	

The analysis in Table 7 shows the associations between institutional factors and MMT defaulting. It reveals significant associations between defaulting and the perceived affordability of transport costs (χ^2=19.545, p<0.001), as well as the level of friendliness of healthcare workers at MMT clinics (χ^2=43.813, p<0.001). Additionally, convenience of clinic hours (χ^2=20.876, p<0.001) and the impact of wait time on attendance

(χ^2=20.519, p<0.001) were also significantly associated with MMT defaulting.

DISCUSSION

This study investigated the defaulting rate among study participants on MMT and its associated factors. Among the study participants, the majority were male (76.4%, n=282) similar to a study that shows that substance use is higher among men as compared to females.[10] This study established a defaulting rate of 53% among patients attending MMT clinics in Nairobi City County. This defaulting rate was relatively higher than for a study conducted in Nepal that had a defaulting rate of 25% however, that was the defaulting rate within 6 months compared to this study which was within a year.[11]

This study found that socio-demographic factors such as marital status, religion, education level, and income source were significantly associated with the defaulting rate. This was consistent with a study in Tanzania that found that income source impacted defaulting from MMT.[12] This study established no significant association between the gender roles and defaulting rate further supporting the previous study.[2] In this study there was no significant relationship between age and the defaulting rate which was in contrast with the study in Nepal that indicated age as an associated factor to MMT defaulting rate.[11]

Polydrug use before enrolment in MMT was significantly associated with defaulting treatment. A similar study also found that polydrug use before and during treatment resulted in patients defaulting from MMT clinics.[13] This can be attributed to the severity of psychological issues and intense substance use disorder that interferes with the patient's ability to comply with treatment guidelines and increases the probability of relapse. At the time of enrolment, a majority were using heroin (98.4% n=359) with only 1.6% using prescription opioids (morphine). This is attributed to the nature of MMT clinics which deals with injection drug users.[14] The use of cocaine prior to treatment was significantly associated to defaulting rate. This is consistent with other studies that suggest development of concurrent psychiatric issues including depression and ADHD leading to treatment complication. Similarly, patients who were on cocaine before enrolling in MMT tended to perceive methadone dose as insufficient resulting in persistent drug use therefore increasing the chances of defaulting.[15]

Concurrent use of other drugs while on methadone treatment was also significantly associated with defaulting. This illustrates the challenge posed on the effectiveness of MMT by continued substance use. Studies show that use of benzodiazepines or cocaine impeded methadone's effectiveness.[16]

This study also established a significant association between the institutional factors such as transport availability, level of friendliness of HCWs, convenience of clinic hours and the impact of waiting time on attendance to the defaulting rate. This was consistent with a study in Tanzania which showed that clinic policies and transportation cost contributed to defaulting.[17] In this study, support from friends and family during MMT was significantly associated with defaulting rate. Another study also established that factors such as peer influence, family conflicts and inconvenient clinic hours were among the factors contributing to defaulting from MMT treatment.[18]

Limitation of this study includes the reliance of social networks data on self-reporting therefore may have had a potential for social desirability bias. There was a variation in literacy level of the patients attending methadone maintenance clinic and therefore some had a difficult time comprehending and responding to questions.

CONCLUSION

In conclusion, the defaulting rate among study participants attending MMT clinics in Nairobi City County was relatively higher than the WHO average of 30-50%. The study showed that there were several factors associated with defaulting from MMT clinics. Those who had higher levels of education, were married, and had a source of income and of the Christian faith were less likely to default treatment. In addition, inconvenient clinic hours, lack of transport to far distance clinic, friendliness of the HCW, and cost were also factors associated with defaulting. Peer influence and family conflicts also contributed to defaulting. This study found a strong relationship between polydrug use before enrolment into MMT, cocaine use, and concurrent drug use during MMT and defaulting. These findings were significant because it illustrated how the history of drug use interferes with methadone effectiveness by increasing the defaulting rates. Therefore, developing targeted interventions that could be used to address these factors could improve treatment retention in other MMT programmes in the Kenya.

This study recommends that MMT clinics should address holistic patient needs through comprehensive care provision. It also advocates for improved funding by National Ministry of health and other stakeholders to support integrated mental health and substance use services within MMT programmes. Further research is recommended to explore in greater details the significance of numerous substances use on methadone effectiveness in MMT clinic settings.

ACKNOWLEDGEMENTS

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