Texila International Journal of Public Health
Volume 7, Issue 1, Mar 2019

High uptake of Medically Assisted Therapy among People Who Inject Drugs Associated with Modifiable Factors in Mathare Low Income Settlements, Nairobi, Kenya

Article by George Macharia Wambugu[1], John Gachohi[2,3], Joseph Mutai[4]
[1]*Kenya Medical Research Institute Graduate School, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.*
[2]*School of Public Health, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya*
[3]*Washington State University-Global Health Kenya, University of Nairobi Institute of Tropical and Infectious Diseases, Kenyatta National Hospital Campus, Nairobi, Kenya*
[4]*Centre for Public Health Research, Kenya Medical Research Institute, Nairobi, Kenya*
E-mail: wambugugeorge76@gmail.com[1]

Abstract

Background: The dramatic rise in intravenous drug use particularly heroin has been associated with elevated HIV transmission risk in sub-Saharan Africa. Medically assisted therapy (MAT) is crucial for HIV prevention in people who inject opioids including heroin. The objective of the present study was to determine the uptake of MAT among people who inject heroin (PWIH) and associated factors to assist in informing policy.

Methods: A cross-sectional study was conducted in Mathare low income settlement in the city of Nairobi, Kenya. Injecting heroin users were recruited in the study during the routine follow-up at a drop-in Centre. Information about factors associated with uptake of MAT among Injecting heroin users was obtained using an interviewer-administered questionnaire.

Results: Of the 110 people PWIH enrolled in study, 73 respondents had ever enrolled for MAT (uptake: 66% (95% confidence interval (CI) 57%, 75%)). Socio-demographic factors associated with uptake of MAT included age, gender, marital status, education level and employment status ($p<0.05$). Association between uptake of MAT and characteristics/practices related to the use of heroin returned four significant variables ($p<0.05$): length of time the participant had injected heroin, daily frequency of heroin injection, prior attempt to quit heroin injection and polydrug use. Key health systems factors associated with uptake of MAT included personal views about eligibility criteria for PWID and hours of operation of the MAT clinic.

Conclusion: Our study identified modifiable factors associated with MAT in low income urban settlers which if prioritized can accelerate the already high uptake found in this study.

Keywords: *Heroin, Therapy, Opioid, Human Immunodeficiency Virus, Medically Assisted Therapy, People Who inject Drugs*

Introduction

People who inject drugs (PWID) refers to people who inject psychotropic (or psychoactive) substances for non-medical purposes (WHO 2008). These drugs include opioids, amphetamine-type stimulants, cocaine, hypno-sedatives and hallucinogens WHO 2008) (NIDA 2014). Heroin is the mainstay drug for PWID (National Institute on Drug Abuse (NIDA), 2014). In Kenya, 97% of PWID are heroin users (Tun *et al.*, 2015). It is estimated 18,000 people use or inject heroin and other opiates in Kenya (CDC, 2015).

People who inject heroin and other drugs expose themselves to additional risks, including contracting human immunodeficiency virus (HIV), hepatitis B and C, and other blood-borne viruses through sharing needles (NIDA, 2017). The sharing of contaminated needles is a major route of HIV transmission in many regions (WHO, 2008). The World Health Organization (WHO) reported that up to 10% of global HIV infections are due to unsafe injecting drug use including heroin, and if Sub-Saharan Africa is excluded, up to 30% of global HIV infections are due to unsafe injecting drug use (WHO, 2008). In Kenya, it is estimated that 18-30% of PWIH are infected with HIV compared to an

DOI: 10.21522/TIJPH.2013.07.01.Art011
ISSN: 2520-3134
HIV prevalence of 5.6% in the general population (CDC, 2015). The HIV prevalence among female injecting drug users (44.5%) is particularly high compared to male injecting drug users (16.0%) with a HIV prevalence almost three times higher (United Nations Office on Drugs and Crime (UNODC) 2015). Failure to address injection drug use and HIV risk among PWID in this region will impact negatively on efforts to reduce new HIV incidence (Peterson *et al*., 2013).

WHO in collaboration with UNODC and the Joint United Nation Programs on HIV/AIDS (UNAIDS) endorsed opioid substitution therapy or medically assisted therapy (MAT) as a harm reduction intervention for PWIH and other opioids (WHO, UNODC, & UNAIDS 2009). Medically Assisted Therapy is the use of opioid agonist prescription medications for the management of persons that are dependent on opioids and have used opioids for an extended period (Ministry of Health (MOH), 2013). Medically Assisted Therapy aims to reduce the risk of contracting or transmitting HIV and viral hepatitis by substituting non-injecting drugs for the injected substance and this switches users from "black market" drugs to legal drugs dispensed under the care of a health professional, therefore minimizing the risk of overdose and other medical complications (Costigan, Crofts and Reid, 2003). Medically Assisted Therapy has been shown to be an effective way to engage people in addressing other health needs, that's assisting with adherence to treatment and facilitating access to the health system (WHO, 2009). Medically Assisted Therapy helps to reduce crime and drug users' high-risk behaviors since it reduces the urgency of acquiring the drug and also allows health professionals to keep in contact with drug users, which aids in keeping them in treatment and thereby reduces relapse (Costigan, Crofts and Reid, 2003).

In spite of the evidence of effectiveness, it is estimated that only 8% of injecting drug users globally currently receive MAT (which is even less in developing countries) and there is substantial global inequity in uptake and access. For example, 90% of injecting drug users in the United Kingdom of Great Britain and Northern Ireland and 69% in Australia are receiving such therapy; compared with 3% in China and India (Mathers et al., 2010). Many of the barriers to effective uptake of MAT in the treatment of opiate dependence are system-related, patient-related, and provider-related factors which include: criminalizing laws, misperceptions and stigmas attached to opiate dependence by the people who are addicted and those who treat them and the settings in which services are provided (National Institute of Health (NIH), 2007). Higher frequency of injecting practices is associated with more severe dependence and a lower uptake of MAT (Digiusto and Treloar, 2007). The degree of exposure to the MAT intervention to PWID is the most common factor related to increased treatment uptake (Roberts, Annett, and Hickman, 2011). Treatment uptake in those attending two or more MAT health education sessions was 72% compared with 53% in those attending 0–1 session and 50% in those not attending any sessions (Goldstein *et al*., 2002). Exposure to sessions predicted treatment uptake, but also that entry was more likely if prior treatment had been undertaken and was related to desire for treatment (Booth *et al*., 1996). Influence of other drug users, stigma and satisfaction with the counselor are important barriers to treatment uptake (Coviello *et al*., 2006). Provision of free treatment increases uptake of MAT (Robles *et al*., 2004). Provision of transport has been shown to affect likelihood of treatment uptake (Strathdee *et al*., 2006).

There is little information on the uptake of MAT in Kenya and Africa among PWIH. To fill this gap, at least in partially, the present study aimed at providing information on uptake of MAT in Mathare low income urban settlements in Nairobi City, Kenya. Mathare is the second biggest low-income settlement in Nairobi (Obeng-Odoom 2013). Like many other informal settlements, it is characterized by unsafe and overcrowded housing, elevated exposure to environmental hazards, lack of access to essential services and a high prevalence of communicable diseases (Corburn 2013). Majority of drug users live in slums and other low-income communities (Deveau, Levine & Beckerleg 2006).

Materials and methods

The study was carried out in Support for Addiction Prevention Treatment (SAPTA) Drop-in Centre where needles and syringes and other harm reduction services are provided to PWID. The Centre serves PWID from Mathare low income settlements in the City of Nairobi, Kenya. The settlement is home to about 200,000 people. It is the biggest heroin drug den in the city of Nairobi (Corburn 2013).

The study design was cross-sectional. The study population comprised of PWIH who had physical evidence of injection use, reported using injectable heroin for at least 6 months and were aged 18 years and above. Those who were highly intoxicated at the time of study and were deemed unable to make a sound judgment were excluded from the study.

The study subjects were recruited during routine follow-ups at the Drop-in Centre in a consecutive manner until the desired sample size was attained. An interviewer-administered questionnaire was used to collect data on demographic and socioeconomic characteristics, attributes on drug use and utilization of harm reduction services.

Data were entered in Microsoft Excel and analyzed using Stata 13. Continuous variables were described as mean±standard deviation (sd) for data that were normally distributed. Median (interquartile range (IQR)) was used to describe variables that were not normally distributed. Bivariate analysis was conducted using chi square (($\chi 2$) test or Fisher exact test where appropriate. The threshold for statistical significance was set at $p<0.05$.

Results

Characteristics of the study participants

Socio-demographic characteristics

We enrolled a total of 110 participants, majority of whom were men (73%), un-married (72%), Christians (66%), unemployed (55%) and had attained primary school education (58%). The age of the participants ranged from 21 to 67 years with the mean ± sd age being 36.1±8.9 years.

Characterization of injectable heroin use and associated practices

The median (IQR) time of the participants was 5 (3 - 9) years with a range of 1 to 22 years. Respectively, 19%, 27%, 38% and 15% of the study participants had used heroin for periods <1 year, 2 to 4 years, 5 to 10 years and >10 years. Most (94%) of our study participants were poly-drug users. Besides injecting heroin, most of the study participants (82%) had used tobacco in the period of <30 days preceding our survey. The study participants also identified alcohol (12%), marijuana (25%) and pills (6%) as additional substances used. There was no report of cocaine use among the participants in the period under study. Concurrent use of one, two and three drugs was reported by 73%, 14% and 5% of the study participants. The participants who reported ever sharing needles were 34%. Eighty-six percent of the study participants had attempted to stop the use of injectable heroin. Figure 1 illustrates the frequency of injecting heroin on a daily basis among the study participants. The minimum and the maximum frequency of injecting heroin were one and 12 times per day respectively with a median (IQR) of 4 (3 - 6) times in a day.

Uptake of medically assisted therapy

A total of 73 respondents said that they had ever enrolled for MAT thus an uptake of 66% (95% confidence interval (CI) 57% - 75%). Of those who had ever been on MAT, 61 respondents (84%) were on the therapy at the time of conducting the study.

Factors associated with uptake of medically assisted therapy

Sociodemographic factors

The findings on the evaluation of the association between sociodemographic factors and uptake of MAT are provided in Table 1. There was a significant increment in uptake of MAT with increasing age with those aged >30 years having 4-fold odds of ever having been on MAT when compared to their younger counterparts ($p<0.05$). Men had 70% lower odds of having ever enrolled for MAT (odds ratio (OR) 0.3 (95% CI 0.1, 0.8), $p=0.021$). Uptake of MAT was highest among participants who were married (83%) compared to those who were separated or divorced (71%) and those in singlehood status (70%) ($p>0.05$). An increment in uptake of MAT with increase in the education level in heroin users was observed (respectively uptake in those with tertiary, secondary, primary or no formal education was 89%, 94% and 51% respectively, $p<0.05$). Those who were on employment had approximately 3-fold odds of having ever enrolled for MAT when compared with those who were not

DOI: 10.21522/TIJPH.2013.07.01.Art011
ISSN: 2520-3134
employed (78% versus 57%, respectively, OR 2.7 (95% CI 1.1, 6.2), p=0.018). Religion was not associated with uptake of MAT (OR 2.253 (95% CI 0.986-5.146), p=0.052).

Association between uptake of MAT and characteristics/practices related to the use of heroin

Uptake of MAT progressively increased with the length time the participant had been using injectable heroin: uptake in those who had injected heroin for <5 years, 5 to 10 years and >10 years was, respectively, 53%, 74% and 88% (p<0.05). Additionally, a significant upward trend was also noted between the number of times one injected heroin daily and uptake of MAT. Uptake of MAT was 53%, 76% and 83% for those who injected heroin 1 to 3 times daily, 4 to 6 times daily and >6 times daily respectively (p<0.05). Participants who had ever attempted to quit injecting of heroin had approximately 5-fold odds of ever having been on MAT (OR 4.7 (95% CI 1.5, 14.0; p=0.003). Polydrug use was borderline predictive of uptake of MAT with those using one additional drug being about 2.5 times more likely to have ever enrolled on MAT (95% CI 0.9, 6.5; p=0.05). Sharing of needles was not associated with uptake of MAT (OR 1.3 (95% CI 0.5, 3.0; p=0.53). (Table 2).

Health systems factors

A lower uptake of MAT was observed among those who had a rated the MAT eligibility criteria for PWID unfavorably (*bad* or *very bad*) relative to those who rated it favourably (47% against 76% respectively, OR 0.2 (95% CI 0.1, 0.6; p=0.002). Favorable rating of the convenience of the hours of operation of the MAT clinic by the respondents was associated with approximately 3-fold increase in the odds of reporting having ever been on MAT (OR 2.6 (95% CI 1.1, 6.0), p=0.018). Other health systems attributes found to be significantly associated with higher uptake of MAT included; A to the clinic (OR 2.5 (95% CI 1.1, 5.6; p=0.024), acceptable waiting time for those joining MAT (OR 3.2 (95% CI 1.3, 7.4; p=0.006) and rating of the cost of transport to/from the clinic as affordable (OR 3.1 (95% CI 1.2, 8.1; p=0.014). (Table 3).

Discussion

We hereby report a high uptake of MAT with two in three PWIH in a low-income urban settlement in Kenya reporting that they had ever enrolled for the therapy. Moreover, about four in five PWIH in the same settings who had ever enrolled for MAT were on MAT at the time of the study. We related this high positive response with factors linked to the individual, characteristics/practices related to the use of heroin and health service utilization and found that gender, education levels and operating hours of the clinic were associated with uptake of MAT. To the best of our knowledge, our paper is among the pioneering ones in sub Saharan Africa (SSA) to describe PWIH and document factors associated with utilization of MAT in this group. As the available body of evidence on these factors is, thus, scarce in SSA, better understanding of patterns of injection drug use and utilization of harm reduction services in emergent markets is needed. This way, the benefits accrued from programs involved in treatment and in promoting pertinent national policies amenable to local contexts can be optimized.

The two in three PWIH found to have ever been on MAT in this study was lower than similar reports in Britain and Northern Ireland where the uptake was >90% and in Australia (69%) (Mathers *et al.*, 2010). These differences could in part be explained by the fact that the harm reduction interventions were introduced earlier in the developed countries. The nascent status of the MAT programs in SSA countries, including Kenya, implies that they are still on the learning phase implementing the best approaches in recruiting and retaining drug users in their settings. Clearly, the Kenya settings are very different from the developed world in context of economic, social and environmental factors. However, Kenya's momentum looks encouraging relative to the global average of the proportion of PWIH on MAT in the developing countries which is estimated to be 3% (Petersen *et al.*, 2013). This disparity could perhaps be due to the averages being derived from figures from different settings such as rural and urban, high and low-income settings and the delivery channels of the MAT providers (public versus private) among others. For instance, a study conducted in Malaysia reported that 18.7% of study participants had previous experience with MAT (Vijay *et al.*, 2015). Similarly, research on access to MAT in low- and middle-income countries reported lower

proportions of previous enrollment for MAT with the average enrollment being 37% (Lawrinson *et al.*, 2008). The incentivization of services associated with private enterprises, both for profit and not-for-profit, may be the primary reason for the observed high uptake of MAT in our study population. For the same reason advanced above about different settings based on local economic, social and environmental factors, we are limited in generalizing our findings to the entire Kenyan context.

Lower uptake levels of MAT in men found in this study is consistent with findings in Nairobi that found that, proportionately, more women compared to men had ever received drug treatment to address heroin addiction (Oguya 2014). Women are generally more receptive to new health interventions relative to men with reports positive health seeking behavior than men (Oguya 2014) (Pinkham, Stoicescu and Myers 2012). In addition, we found that female PWID were more motivated to enroll for MAT especially if their partner was already enrolled for MAT or if they were pregnant. Indeed, the two factors have been documented as the central reason for MAT uptake in women. Conversely, punitive policies that separate women who use drugs from their children can deter pregnant women and mothers from accepting treatment (Pinkham, Stoicescu & Myers 2012). In this study, we posit that favourable guidelines in Kenya, for instance, all women using heroin are eligible to enroll for MAT regardless of their mode of using heroin, duration of using heroin, health status and support structure may explain the higher proportion of women under MAT (MOH 2013). These findings perhaps point out the need to have the harm reduction services' provision models that are responsive to the well-documented diversity of uptake of healthcare interventions among the different gender. For instance, the eligibility criteria should be reviewed to enable quicker enrollment of men for MAT. Also, community-based outreach programs and peer-based approaches could be useful approaches for reaching men, particularly if they are tailored to their needs, and are socially, rather than just bio-medically oriented.

We found lower uptake of MAT in PWIHs with low literacy levels (primary school and no formal education). This agrees with a Kenyan study that found that educated heroin users are more likely to have good health seeking behavior and engaged in less risky behaviours (Sylvia *et al.*, 2017). It is expected that people with higher educational attainment are more likely to have positive health seeking behavior and are more likely to make informed decisions on matters concerning their health than their less educated counterparts. Low income settlements are normally characterized by socioeconomic inequalities and a young, mobile population. Besides, given the early starting age of substance use and the youthfulness of PWIH, it might be argued that injectable heroin use may cause untimely exit from the educational system. Subsequently, in a reinforcing positive feedback loop, lack of education becomes a constraint to the acquisition of requisite skills for getting stable income that then may be associated with heroin use (Sylvia *et al.*, 2017) (MOH 2013).

Marital status was a significant predictor of uptake of MAT with the uptake being lowest among people in marital singlehood and highest among married people. This is in concordance with a Kenyan Coast study which found that marital status had a significant influence on heroin users' predisposition to seek professional help to address heroin addiction (Sylvia *et al.*, 2017). It is possible that the social support emanating from being married may provide the impetus for enrolling for MAT in this group. The poor social support structure (being unmarried) and the high rates of unemployment need to be considered when implementing harm reduction programs since they have been documented as risk factors for relapse (Deveau, Barry and Beckerleg 2009). Generally, this corroborates findings from studies on harm reduction interventions which show that uptake is enhanced by having a supportive social structure. For instance, an Australian study found that uptake of HCV treatment, which is also a harm reduction intervention, was associated with living with the support of family (Alavi 2013)

Injecting heroin for a longer duration was associated with higher uptake of MAT. This could be explained by the intense experiences of the adverse effects of injecting heroin including, but not limited to, those that are socioeconomic and physiological in nature. The Kenyan MAT eligibility criteria favoured PWID who had injected heroin for more than 1 year before it was reviewed in 2017 and this may explain this significance. In Georgia, MAT patients need to have been drug users for more than three years and be injecting for at least one year before enrollment to MAT (Todadze and Lezhava 2008). In our study, increment in uptake of MAT was observed with increased daily frequencies of injecting heroin, quite in contrast with Digiusto and Treloar (2007) who found that

DOI: 10.21522/TIJPH.2013.07.01.Art011
ISSN: 2520-3134
higher frequency of injecting practices is associated with more severe dependence and a lower uptake of MAT. Probably the explanation behind this observation is that increasing daily dosage/frequency resulted in an elevation of negative experiences from health, social or financial dimensions either singly or as combinations. We further argue that just like in the frequency of injectable heroin use, the significant association between recent poly-drug use and uptake of MAT could be due to the resultant upsurge in undesired effects (health, social , legal, financial) and hence the desire to change for the better. These hypotheses, however, need to be authenticated in longitudinal studies.

Higher uptake of MAT was observed among PWIH who rated the operational hours of the clinic offering MAT as convenient. Similarly, a research on access to HIV treatment and care for PWID in Kenya reported time as a structural barrier to access of healthcare services (Guise *et al.,* 2016). The inconveniences associated with the hours of operation could perhaps be linked to the opportunity costs involved, such as having to choose between going to the clinic and using that time for gainful labour. Also the inconvenience of hours of operations may be reflection of the direct and indirect costs involved in accessing the health facility, for example, the timing of heavy traffic in the city, and the associated cost in terms of money and time spent. It could also be associated with the fears and experiences of stigma from the community, heath care providers or even other clients seeking services in the same facility. There is a need to explore the issue further and, more importantly, put in place mitigation measures. For instance, adjustments of clinic routines and extending hours of operation including giving priority for PWID within queues when accompanied by an outreach worker and assistance with transport by outreach projects to the clinic. In line with this, adaptations of MAT clinics, even those serving the general population care, in a manner that could further support access of services for PWID has been recommended (Beyrer *et al.,* 2011) This could entail extending hours of operation, shortening the waiting time *et cetera*. Similar observations were also made in a case study conducted in Kenya that noted that MAT services were limited due to the low number of delivery sites and also staff shortages meaning that there was always a long waiting list (Hyde 2016). Moreover, some potential clients are unable to travel the long distance every day for their dose.

Access to the MAT Clinic was associated with MAT uptake. Ayon *et al* (2018) also reported accessibility as a barrier in accessing conventional health services. To mitigate this effect, having outreach programs may be initiated to supplement the health facility-based programs and improve access to MAT. Provision of transport or transport refunds may also be a means to circumvent this barrier to utilization of MAT. Other health systems barriers included inappropriateness of the waiting time to join MAT, unfavourable MAT eligibility criteria and cost of transport to/from the clinic being unaffordable. These latter findings are not necessarily surprising, and they build on existing literature regarding barriers of access to health services among drug users in general (Ayon *et al* 2017, Guise *et al* 2016; Mlunde *et al*., 2016; Nambiar, Stoove, & Dietze, 2014).

The findings from the present survey have potentially substantial implications on policy and practice with regard to PWIH. First, the sociodemographic characteristics of the PWIH must be borne in mind when designing and implementing interventions targeting this key population. For instance, it has been shown that drug users with low literacy, often find it difficult to understand concepts such as the disease concept of addiction, craving and denial (Deveau *et al* (2006). Thus, given the low literacy levels of PWIH, programs aimed at creating awareness and promoting uptake of interventions must be tailored to match the level of education of the targeted population. Moreover, innovative approaches that ensure convenient operating hours to PWID while offering harm reduction services need to be explored to optimize the uptake and benefits of these important interventions. This may include, among others, offering some or all the services through outreach programs, community-based approaches and integrating the services in the conventional/routine services offered in health facilities.

Generalizability of the findings from our survey could be limited by the non-random sampling method utilized in the enrolling the participants. The study also relied on self-reported data which could be a source of bias in our results. Despite these constraints, this study sheds light on the barriers and possible facilitators of MAT uptake in the city of Nairobi which can inform and/or enrich the implementation of the recently unveiled harm reduction programs in Kenya. This research also suggests a shift in paradigms of injectable heroin use with poly-drug use being a common habit.

Conclusions

The study identified modifiable factors associated with MAT uptake in low income urban settlers which if prioritized can accelerate the already high uptake found in this survey.

Our findings have implications on the MAT program in Kenya and other growing drug markets in SSA that may be experiencing outbreaks of injection drug use and the attendant upsurge of incidences of HIV infections.

Acknowledgements

We greatly appreciate the management and staff of SAPTA Drop in Center. We also thank the study participants.

Tables

Table 1. Relationship between sociodemographic factors and uptake of MAT

Characteristic	Ever enrolled		OR* (95% CI†)	χ2, df§, P-value
	Yes (n, (%))	No (n, (%))		
Age (years)				
> 35	40(74.1)	14(25.9)	4.0(1.5 - 11.0)	7.583,1,0.006
30 – 35	23(71.9)	9(28.1)	3.6(1.2 - 11.0)	5.171,1,0.023
< 30	10(41.7)	14(58.3)	REF	
Sex				
Male	48(60.0)	32(40.0)	0.3(0.1 - 0.9)	5.321,1,0.021
Female	25(83.3)	5(16.7)	REF	
Marital status				
Separated/divorced	32(71.1)	13(28.9)	2.9(1.2 -7.4)	5.291,1,0.021
Married	25(83.3)	5(16.7)	5.9(1.8 - 19.1)	9.816,1,0.002
Single	16(45.7)	19(54.3)	REF	
Religion				
Christian	53(72.6)	20(27.4)	2.3(0.99 - 5.14)	3.785,1,0.052
Muslim	20(54.1)	17(45.9)	REF	
Highest level of education				
Tertiary	8(88.9)	1(11.1)	7.6(0.9 - 63.6)	4.535,1,0.039
Secondary	29(93.5)	2(6.5)	13.7 (3.0 - 61.8)	16.616,1,<0.001
Primary/No formal education	36(51.4)	34(48.6)	REF	
Employment status				
Employed	39(78.0)	11(22.0)	2.7(1.2 - 6.3)	5.560,1,0.018
Unemployed	34(56.7)	26(43.3)	REF	

*Odds ratio †Confidence interval §Degrees of freedom

Table 2. Uptake of MAT and characteristics/practices related to the use of heroin

Characteristic	Ever enrolled		OR* (95% CI†)	χ2, df, P-value
	Yes (n, (%))	No (n, (%))		
Duration on heroin use (years)				
> 10	15(88.2)	2(11.8)	6.7(1.4 -32.2)	6.725,1,0.010
5 - 10.	31(73.8)	11(26.2)	2.5(1.0 - 6.0)	4.273,1,0.039

DOI: 10.21522/TIJPH.2013.07.01.Art011
ISSN: 2520-3134

< 5	27(52.9)	24(47.1)	REF	
Frequency of injecting heroin (daily)				
> 6	15(83.3)	3(16.7)	4.4(1.1-17.2)	5.159,1,0.027
4 to 6	31(75.6)	10(24.4)	2.8 (1.1 - 6.8)	5.013,1,0.025
1 to 3	27(52.9)	24(47.1)	REF	
Ever shared needles				
Yes	26(70.3)	11(29.7)	1.3(0.6 - 3.1)	0.381,1,0.537
No	47(64.4)	26(35.6)	REF	
Being on other drugs in the last 30 days				
No	7(100.0)	0(0.0)	1.6(1.4 - 1.8)	3.789,1,0.052
Yes	66(64.1)	37(35.9)	REF	
Polydrug use in the last 30 days				
Yes	56(70.0)	24(30.0)	2.5 (0.98-6.56)	3.863,1,0.049
No	11(47.8)	12(52.2)	REF	
Ever tried quitting using heroin				
Yes	67(72.0)	26(28.0)	4.7 (1.6 - 14.1)	8.695,1,0.003
No	6(35.3)	11(64.7)	REF	

*Odds ratio †Confidence interval §Degrees of freedom

Table 3. Association between uptake of MAT and selected health systems attributes

Health system attribute	**Ever enrolled**		**OR (95% CI)**	**χ2, df, P-value**
	Yes (n, (%))	**No (n, (%))**		
Transport costs to/from clinic (US $)				
≤ 1	31(57.4)	23(42.6)	0.4(0.1-1.1)	3.250,1,0.071
1 – 2	21(72.4)	8(27.6)	0.8(0.2-2.5)	0.215,1,0.643
> 2	21(77.8)	6(22.2)	REF	
MAT Clinic is:				
(Very-) Far	48(75.0)	16(25.0)	2.5(1.1-5.7)	5.114,1,0.024
Near	25(54.3)	21(45.7)	REF	
Rating of HCWs (in terms of being caring, friendly and listening)				
Good	50(66.7)	25(33.3)	1.0(0.4-2.4)	0.010,1,0.922
Average/Poor	23(65.7)	12(34.3)	REF	
Convenient clinic operational hours				
Yes	43(76.8)	13(23.2)	2.6(1.2-6.0)	5.551,1,0.018
No	30(55.6)	24(44.4)	REF	
Rating of waiting time to join MAT				
Appropriate	42(79.2)	11(20.8)	3.2(1.4-7.4)	7.603,1,0.006
Long	31(54.4)	26(45.6)	REF	
Rating of MAT eligibility criteria for PWID				
Bad/Very bad	18(47.4)	20(52.6)	0.3(0.1-0.6)	9.384,1,0.002

Good	55(76.4)	17(23.6)	REF	
Rating of cost of transport to/from the clinic				
Affordable	31(81.6)	7(18.4)	3.2(1.2-8.1)	6.021,1,0.014
Very-/expensive/unaffordable	42(58.3)	30(41.7)	REF	

*Odds ratio †Confidence interval §Degrees of freedom

Figures

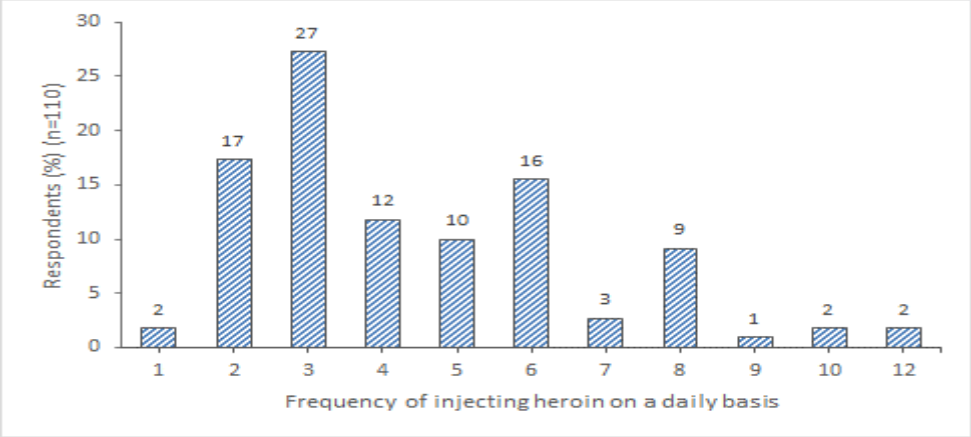

Figure 1. Daily frequency of injecting heroin among the respondents

References

[1].Alavi, M., Grebely, J., Micallef, M., Dunlop, A. J., Balcomb, A. C., Day, C. A., ... & Enhancing Treatment for Hepatitis C in Opioid Substitution Settings (ETHOS) Study Group. (2013). Assessment and treatment of hepatitis C virus infection among people who inject drugs in the opioid substitution setting: ETHOS study. *Clinical Infectious Diseases*, *57*(suppl_2), S62-S69.

[2].Ayon, S., Ndimbii, J., Jeneby, F., Abdulrahman, T., Mlewa, O., Wang, B., ... & Mburu, G. (2018). Barriers and facilitators of access to HIV, harm reduction and sexual and reproductive health services by women who inject drugs: role of community-based outreach and drop-in centers. *AIDS care*, *30*(4), 480-487.

[3].Beckerleg, S., Telfer, M., & Sadiq, A. (2006). A rapid assessment of heroin use in Mombasa, Kenya. Substance use & misuse, 41(6-7), 1029-1044.

[4].Beyrer, C., Baral, S., Kerrigan, D., El-Bassel, N., Bekker, L. G., & Celentano, D. D. (2011). Expanding the space: inclusion of most-at-risk populations in HIV prevention, treatment, and care services. *Journal of acquired immune deficiency syndromes (1999)*, *57*(Suppl 2), S96.

[5].Booth, R. E., Crowley, T. J., & Zhang, Y. (1996). Substance abuse treatment entry, retention and effectiveness: out-of-treatment opiate injection drug users. *Drug and alcohol dependence*, *42*(1), 11-20.

[6].Centers for disease control and prevention (CDC Kenya). Kenya Annual Report. Nairobi. CDC. 2015.

[7].Costigan, G., N. Crofts, and G. Reid. "Manual for reducing drug related harm in Asia. Revised and updated." (2003).

[8].Corburn, J. (2013). *Healthy city planning: from neighbourhood to national health equity*. Routledge.

[9].Coviello, D. M., Zanis, D. A., Wesnoski, S. A., & Alterman, A. I. (2006). The effectiveness of outreach case management in re-enrolling discharged methadone patients. *Drug and alcohol dependence*, *85*(1), 56-65.

[10]. Deveau, C., Levine, B., & Beckerleg, S. (2006). Heroin use in Kenya and findings from a community based outreach programme to reduce the spread of HIV/AIDS. *African Journal of Drug & Alcohol Studies*, *5*(2), 95-107.

[11]. Digiusto, E., & Treloar, C. (2007). Equity of access to treatment, and barriers to treatment for illicit drug use in Australia. *Addiction*, *102*(6), 958-969.

[12]. Gelmon, L. (2009). *Kenya HIV prevention response and modes of transmission analysis.* National AIDS Control Council.

[13]. Goldstein, R. Z., & Volkow, N. D. (2002). Drug addiction and its underlying neurobiological basis: neuroimaging evidence for the involvement of the frontal cortex. *American Journal of Psychiatry*, *159*(10), 1642-1652.

DOI: 10.21522/TIJPH.2013.07.01.Art011
ISSN: 2520-3134
[14]. Guise, A., Rhodes, T., Ndimbii, J., Ayon, S., & Nnaji, O. (2016). Access to HIV treatment and care for people who inject drugs in Kenya: a short report. *AIDS care*, *28*(12), 1595-1599.
[15]. Hyde Lily (2016). State of harm reduction in Kenya, key information about drug use -community action against harm reduction CAHR http://www.cahrproject.org/wp-content/uploads/2016/04/kenya-report
[16]. Lawrinson, P., Ali, R., Buavirat, A., Chiamwongpaet, S., Dvoryak, S., Habrat, B., ... & Newcombe, D. (2008). Key findings from the WHO collaborative study on substitution therapy for opioid dependence and HIV/AIDS. *Addiction*, *103*(9), 1484-1492.
[17]. Mathers, B. M., Degenhardt, L., Ali, H., Wiessing, L., Hickman, M., Mattick, R. P., ... & Strathdee, S. A. (2010). HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage. *The Lancet*, *375*(9719), 1014-1028.
[18]. Ministry of Health (2013). Kenya National Guidelines for: Standard Operating Procedures for Medically Assisted Therapy for People Who Use Drugs. Nairobi.
[19]. Ministry of Health. Kenya National Guidelines for: Standard Operating Procedures for Medically Assisted Therapy for People Who Use Drugs. Nairobi. 2013.
[20]. Mlunde, L. B., Sunguya, B. F., Mbwambo, J. K. K., Ubuguyu, O. S., Shibanuma, A., Yasuoka, J., & Jimba, M. (2016). Correlates of health care seeking behaviour among people who inject drugs in Dar es Salaam, Tanzania. *International Journal of Drug Policy*, *30*, 66-73.
[21]. Nambiar, D., Stoové, M., & Dietze, P. (2014). A cross-sectional study describing factors associated with utilisation of GP services by a cohort of people who inject drugs. *BMC health services research*, *14*(1), 308.
[22]. National Institute on Drug Abuse (NIDA). Heroin. NIDA. 2014.
[23]. National Institute on Drug Abuse (2017). Heroin
[24]. National Institutes of Health. (2007). NIH Consensus Statement: Effective Medical Treatment of Opiate Addiction.
[25]. Obeng-Odoom, F. (2013). The State of African Cities 2010: Governance, inequality and urban land markets. *Cities*, *31*, 425-429.
[26]. Oguya, F. O. (2014). *Assessment of Risk Behaviour and HIV Prevalence among People Who Inject Drugs in Nairobi County, Kenya* (Doctoral dissertation, Kenyatta University).
[27]. Pinkham, S., Stoicescu, C., & Myers, B. (2012). Developing effective health interventions for women who inject drugs: key areas and recommendations for program development and policy. *Advances in Preventive Medicine*, *2012*.
[28]. Petersen, Z., Myers, B., Van Hout, M. C., Plüddemann, A., & Parry, C. (2013). Availability of HIV prevention and treatment services for people who inject drugs: findings from 21 countries. *Harm reduction journal*, *10*(1), 13.
[29]. Roberts, J., Annett, H., & Hickman, M. (2010). A systematic review of interventions to increase the uptake of opiate substitution therapy in injecting drug users. *Journal of Public Health*, *33*(3), 378-384.
[30]. Robles, R. R., Reyes, J. C., Colón, H. M., Sahai, H., Marrero, C. A., Matos, T. D., ... & Shepard, E. W. (2004). Effects of combined counseling and case management to reduce HIV risk behaviors among Hispanic drug injectors in Puerto Rico: a randomized controlled study. *Journal of Substance Abuse Treatment*, *27*(2), 145-152.
[31]. Strathdee, S. A., Ricketts, E. P., Huettner, S., Cornelius, L., Bishai, D., Havens, J. R., ... & Latkin, C. A. (2006). Facilitating entry into drug treatment among injection drug users referred from a needle exchange program: Results from a community-based behavioral intervention trial. *Drug and alcohol dependence*, *83(*3), 225-232.
[32]. Todadze, K., & Lezhava, G. (2008). Implementation of drug substitution therapy in Georgia. *Central European journal of public health*, *16*(3).
[33]. Tun, W., Sheehy, M., Broz, D., Okal, J., Muraguri, N., Raymond, H. F., ... & Geibel, S. (2015). HIV and STI prevalence and injection behaviors among people who inject drugs in Nairobi: results from a 2011 bio-behavioral study using respondent-driven sampling. *AIDS and Behavior*, *19*(1), 24-35.
[34]. United Nations Office on Drugs, & Crime. (2010). *World drug report 2010*. United Nations Publications.
[35]. Vijay, A., Bazazi, A. R., Yee, I., Kamarulzaman, A., & Altice, F. L. (2015). Treatment readiness, attitudes toward, and experiences with methadone maintenance therapy among people who inject drugs in Malaysia. *Journal of substance abuse treatment*, *54*, 29-36.
[36]. WHO, U. (2008). Principles of Drug Dependence Treatment: Discussion Paper. *United Nations publication.*

[37]. WHO, U. (2009). UNAIDS. WHO, UNODC, UNAIDS technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users. *World Health Organisation*.