SOCIO-DEMOGRAPHICS AND TYPES OF POLYDRUG USED BY PATIENTS UNDERGOING METHADONE-ASSISTED THERAPY

[1]Rose N. Kiiru; [2]Charity W. Waithima; [3]Peterson K. Mwangi

ABSTRACT

The *United Nations Office on Drugs and Crime* [UNODC] in 2018 reported that Polydrug are commonly used for both recreation and regular drug use with majority of users being young adults. On the other hand, Center for Disease Control and Prevention [CDC] recommends Methadone-Assisted Therapy [MAT] as a low risk and effective therapy to help persons suffering from polydrug use addiction with the intent to address withdrawal, craving, improve client, good grooming, appetite, and sleep patterns. This paper identifies some of the types of polydrug used by patients undergoing MAT with focus on the socio-demographic profiles of these patients. The study entailed employed use of quasi-experimental research design and mixed method approach that incorporated both quantitative and qualitative data in its findings. The study population consisted of 2121 MAT patients from which a sample of 120 respondents was obtained through random sampling technique. An assessment to determine the types of polydrug used and the patients' socio-demographic features was done using MAT patients' clinical records and Timeline Follow back. The findings indicate that Marijuana (90%; n=54) was the most popular used drug followed by Opioids (80%; n=48), Heroin (65%; n=39), Amphetamine- type stimulants (50%; n=30) and benzodiazepines (50%; n=30. MAT patients through a self-report indicated that the combinations of polydrug mostly used daily comprised; two or thrice or more, in both the treatment and control Benzodiazepines+ Heroin+ Cannabis /Marijuana+ Tobacco and Benzodiazepines+ Heroin+ Cannabis/ Marijuana. The mode of administration for heroin was injection, smoking and snorting; for Benzodiazepines was swallowing and smoking; while cannabis/Marijuana was smoked with tobacco through smoking, snorting, and sublingually. In conclusion, Most of the respondents 40% (n = 48) dropped out in primary, 25.83% (n = 31) dropped out in secondary. 35.29% (n=42) have never been married and 32.77% (n=39) were separated. The most used combination of polydrug was benzodiazepines, heroin, cannabis/ marijuana, tobacco and benzodiazepines, heroin and cannabis /marijuana.

Keywords: Polydrug, MAT, opioids, stimulants, depressants, tranquilizers, hallucinogens, Cannabis, socio-demographic.

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Authors
[1]R.N. Kiiru*
School of Humanities & Social Sciences,
United States International University
rosekiiru@gmail.com

[2]C. W. Waithima
School of Humanities & Social Sciences,
United States International University
rosekiiru@gmail.com

[3]P. K. Mwangi
School of Humanities & Social Sciences,
United States International University
rosekiiru@gmail.com

Corresponding Author

I. INTRODUCTION

Polydrug use is the concurrent use of more than one psychoactive substance for non-medical use (UNODC, 2018b). Young adults regularly engage in polydrug use, with heroin, cocaine, alcohol and benzodiazepines, tranquillizers as well as prescription opioids being among the top list of drug types used. Sometimes, tranquillizers and prescription opioids are used as a substitute for heroin as they repress the effects of heroin. They help manage heroin withdrawals and reduce its use and risks associated with injecting heroin (Kataja et al., 2018). Opioids are commonly the polydrug used in MAT (Tran et al., 2018). Opioids are chemicals, either natural or synthetic, that interact with specific nerve cells of the body and the brain to relieve pain. There are three different types of opioids thus; natural opioids (codeine, morphine and thebaine); semi-synthetic (hydromorphone, hydrocodone, oxycodone and heroin); and full synthetic (methadone, fentanyl, pethidine, tramadol, dextropropoxyphene and levorphanol) (National Institute on Drug Abuse [NIDA], 2019b). The abuse of these drugs leads to Opioid use disorder (OUD), a problematic pattern of non-medical opioid use leading to clinically

significant impairment and individual distress. It is characterized by tolerance and withdrawal occurring within 12 months (American Psychiatric Association [APA], 2013). According to the National Institute on Drug Abuse report, all patients testing positive for opioid use qualify to enrol in MAT clinics (NIDA, 2018b).

Some common psychoactive polydrug used are divided into four categories: stimulants, opioids, depressants and hallucinogens (UNODC, 2019d; Drug policy network, 2017; Ministry of Health [MoH], 2017). The study by Radcliffe et al. (2019) reported that MAT patients had used various polydrug, namely, heroin, cocaine, Amphetamine, methamphetamines, hallucinogens, benzodiazepines, novel psychoactive drugs or NPS and cannabis in the past 30 days. The standard routes of administration included swallowing, snorting, smoking, inhaling fumes, intramuscular injection, subcutaneous injection, intravenous injection, and tropical and sublingual, among others. The effect of the route of administration influences its choice; the faster the illicit psychoactive drug hits the brain, the greater and more reinforcing its impact on the users. While the psychoactive speed of action smoking takes 7-10 seconds, intravenous takes 15-30 seconds, injecting into the muscle or under the skin takes 3-5 minutes, mucous membrane absorption, snorting and rectal 3-5 minutes, swallowing 20-30 minutes, absorbed through the skin slowly over a period of a long period (UNODC, 2019c; Drug policy network, 2017; UNODC, 2018c). Patients in MAT struggle with polydrug use by combining two or more drugs and sometimes use singly (MacNeill et al., 2019). Polydrug use is highly linked with Human Immunodeficiency Virus (HIV) risk behavior (Meacham et al., 2018). Against this backdrop, this paper evaluates the types of polydrug used by patients under MAT in relation to their socio-demographic factors. The study focused on selected hospitals in Nairobi County.

Globally, 33.12 million people are experiencing the problem of opioid use disorder (UNODC, 2019b). Methadone-assisted Therapy (MAT) patients are dependent on opioids for non-medical use and have a history of long durations of use among the population aged 15-65 (UNODC, 2019b). Patients in MAT struggle with polydrug usage combining two or more drugs. Despite the strong evidence in the application of MAT, an intervention strategy that treats OUD withdrawal (arosto) and craving, MAT patients continue to polydrug use opioids and other psychoactive drugs (Shams et al., 2019). Polydrug use interferes with MAT treatment positive outcomes (Wagner et al., 2018). A practical MAT is capable of addressing the MAT patients' withdrawal and craving and improving MAT patients grooming, appetite and sleep patterns (CDC, 2020b). While Methadone Assisted Therapy has been found to be an effective treatment for OUD. However, the best results are produced when combined with behavioural therapy focusing on MAT patients' medical, psychiatric, psychological and social needs field (NIDA, 2019b).

In Kenya, the study by Ngarachu et al. (2019) established polydrug use patterns of cannabis, 84.8% at baseline and 64.2% at follow-up, heroin and benzodiazepines among 984 MAT patients aged 28-38 years. The UNODC report established that older people portrayed higher use of polydrug such as Khat and Cannabis UNODC (2019a) than the young generation. Low economic status is associated with PDU (Center for Disease Control and Prevention, 2020b). National Authority for the Campaign Against Drug Abuse (NACADA, 2012) in Kenya also conducted a rapid assessment of drug and substance use status in Kenya. The study showed that 19.8% of the 3,362 households drawn from 8 regions in 30 counties used at least one substance, while. In Kisumu County, a study conducted among sex workers uncovered that they were on polydrug service, including heroin, to enhance their morale to engage in sex work and fight abusive clients (Syvertsen et al., 2019). Notably, MAT patients frequently use opioids (NIDA, 2018b).

II. METHODS

The study employed a quasi-experimental research design in the control and experimental groups using a mixed method approach that entailed collecting and presenting both quantitative and qualitative data (Nardi, 2018) from the MAT patient respondents. The quantitative data addressed the socio-demographic characteristics of the MAT patients at the selected clinics and the types of polydrug abused. The analysis was based on MAT patients' clinical records and self-reports from the selected MAT clinics in Nairobi County, the capital city of Kenya, and neighboring Machakos, Kajiado and Kiambu Counties.

The target population was 2121 patients, with 1207 and 914 MAT patients from Mathare MAT and Ngara MAT, respectively (Study sites clinical records, 2020). A pool of 120 study participants from a total population of 2121 MAT patients was recruited and assigned into two groups. The study sample was identified from the clinical records drawn from study sites 1 and 2, which consisted of a total population of

N = 2121. The sampling criteria is guided by Tara's (1967) formula n = N/ (1 + N (e) 2) (Louangrath, 2017; Imperial Writers, 2016).

Where:

n signifies the sample size

N signifies the population under study

e signifies the margin error of 0.05 confidence level

n=2121/ (1+2121(0.05)2

n=2121(1+5.3025) (correct formula)

n=2121/ (6.3025)

n=336

The sample size of 366 MAT patients was obtained from both study sites 1 and 2. Through systematic random sampling at an interval of eight patients, the respondents were selected from the desired sample size of 366 to attain the study sample size n = 120 at a 95% confidence interval. The quantitative data was entered into the computer and analyzed using the Statistical package for social sciences (SSPS) software version 22. The descriptive statistics presented information on the social demographic characteristic and types of polydrug used among MAT patients.

Background Characteristics from MAT Patient's Clinical Records

Questionnaires were admitted to 120 MAT patients undergoing Methadone assisted Therapy respondents willing to respond. Sixty (60) MAT patients from the treatment group and 60 MAT patients from the control group participated in the study.

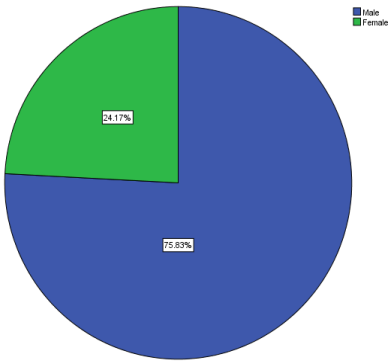
III. RESULTS

Gender of the Respondents

About the distribution of the respondents by gender, the results are presented in Figure 1. Among the 120 respondents, the analysis showed that most were male, 75.83% (n = 91) and 24.17% (n = 29) were female.

Figure 1:

Gender of the Respondents

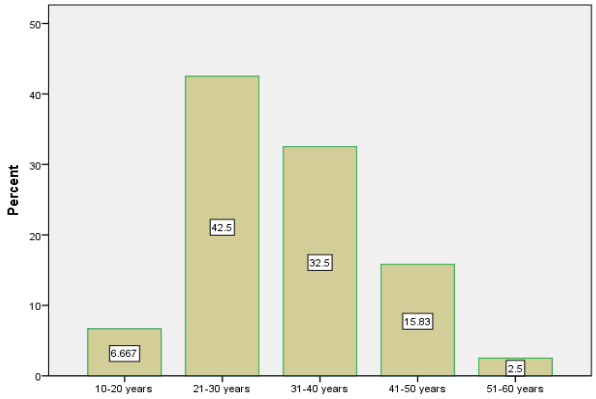


The Age Group of the Respondents

The age of the respondents was grouped into categories as presented in figure 2. Regarding the age group of the respondents, the analysis results showed that 42.5% (n = 51) were found to be of age 21 to 30 years, 32.5% (n = 39) were of age 31 to 40 years, 15.83% (n = 19) were of age 41 to 50 years, 6.667% (n = 8) were of age 10 to 20 years and 2.5% 9 (n = 3) were of age 51 to 60 years. The minimum age was 18 years old, and the mean age was 32.0 years (SD = 9.2 years).

Figure 2:

The Age Group of the Respondents

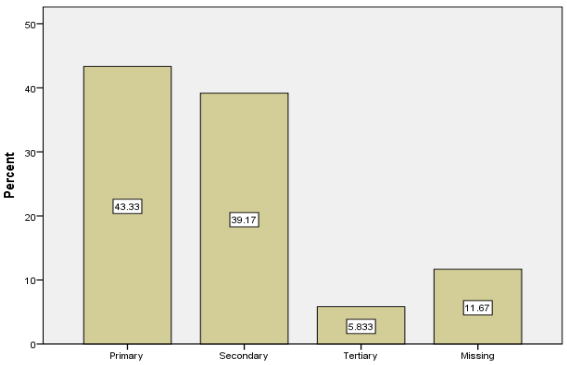


Level of Education of the Respondents

Respondents were asked to indicate their highest level of education, and the results are presented in Figure 3. Of those who attained primary education 45.33% (n = 52) of the study participants, 39.17% (n = 47) had gained secondary education, and 5.833% (n = 7) had attained tertiary education as their highest level of education. Only 14 MAT patients (11.67%) class of education was missing from the clinic records.

Figure 3:

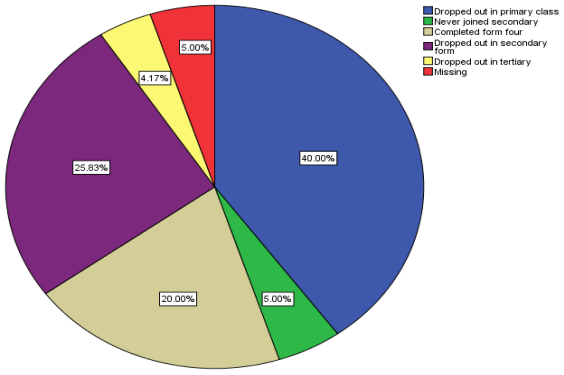
Level of Education of the Respondents



Level of Education of Respondents when Joining MAT

Respondents were asked to indicate their highest level of education when joining MAT; the results are shown in Figure 4. Most of the respondents 40% (n = 48) dropped out in primary, 25.83% (n = 31) dropped out in secondary, 20% (n = 24) completed secondary and 5% (n = 6) never joined secondary and dropped out in tertiary institution each. The findings further indicated that 5% (n = 6) and 4.17% (n = 5) dropped out in tertiary, with six MAT patients' level of education information missing from the clinic records.

Figure 4:
Level of Education of the Respondents when Joining MAT

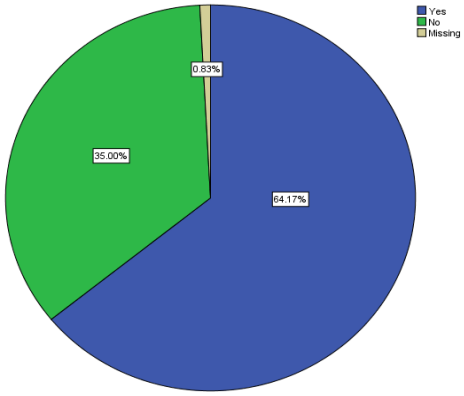


The Employment History of the Respondents

The respondents were asked whether or not they are working; the results are shown in Figure 5. More than half of the respondents, 64.71% (n = 77) were working while 35.29% (n = 42) were not working. Only one respondent's information on employment was missing from the clinic records. The clinic records also revealed that out of the 77% of the respondents working (60.8%; n = 73) had casual jobs, and 1.7% (n = 2) had permanent and pensionable jobs. The study participants included house helpers, touts, hairdressers, drivers, bartenders, nurses, dog breeders, hawkers, garbage collectors, housewives and artists as some of their work. One respondent was a medical doctor.

Figure 5:

The Employment History of the Respondents

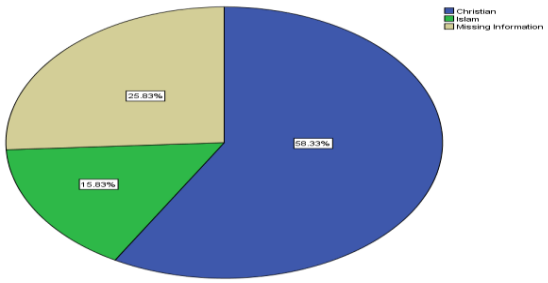


The Religion of the Respondents

The study sought to find out the religion of the respondents, and the results are shown in Figure 6. The analysis results in Figure 6 showed that most of the respondents (58.33%; n = 70) were Christians, 15.83% (n = 19) were Muslims, and 25.83% (n = 31) did not have their information on religion available in the records. MAT clinic records also revealed that most respondents (27.5%; n = 33) reported not being religiously active, while 4.2% (n = 5) were active.

Figure 6:

The Religion of the Respondents

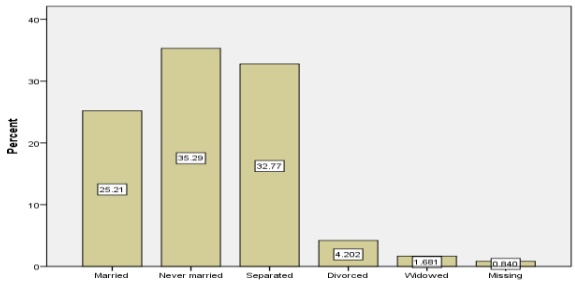


Marital Status of the Respondents

The study sought to determine the marital status of the respondents, as presented in Figure 7. The results showed that majority of the respondents 35.29% (n = 42) never married, 32.77% (n = 39) are separated, 25.21% (n = 30) are married, 4.2% (n = 5) are divorced and 1.68% (n = 2) are widowed. Only two MAT patients' marital status information was missing from the clinical records. This is an indication that the majority of MAT patients are single.

Figure 7:

Marital Status of the Respondents

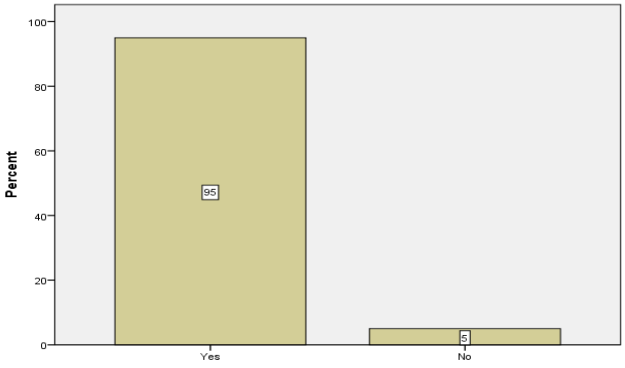


Types of polydrug used by patients undergoing MAT

On identifying the types of polydrug used by patients undergoing Methadone assisted Therapy, clinical records during baseline assessment showed 95% of the 120 MAT patients (n = 114) had tested positive for the use of illicit opioids for non-medical reasons during MAT entry. In comparison, the rest of the respondents 5% (n = 6) the medical history was not available. The results are shown in Figure 8.

Figure 8:

Tested Positive for Illicit Opioids



The results from the secondary clinical MAT patients' clinical records and self-reports showed that the most used combination of polydrug was:

- Alcohol + Marijuana + Heroin
- Alcohol + Khat
- Alcohol + Marijuana + Tobacco
- Benzodiazepines + marijuana
- Alcohol + tobacco + Marijuana
- Heroin + Marijuana + Tobacco
- Benzodiazepines + Heroin + Marijuana
- Benzodiazepines + Heroin+ Marijuana + Tobacco

The study participants mentioned other drugs they use, which include: Tobacco (cigarette, Kuber (*Ndovu/Skari)*, electronic cigarettes, Chavis), tobacco laced with cocaine, jet fuel, khat, hashish, shisha and Rohypnol locally known as (*bugizi*). Methadone-assisted Therapy patient self-report revealed the most used combinations of polydrug used daily once, two or thrice or more, in both the treatment and control Benzodiazepines + Heroin + Cannabis /Marijuana + Tobacco and Benzodiazepines + Heroin + Cannabis/ Marijuana. Mode of administration for heroin (injection, smoking, snorting), Benzodiazepines (swallowing, smoking), cannabis/Marijuana (smoking), tobacco (smoking, snorting, sublingually).

Frequency, quantity, and patterns of the different types of polydrug used by the respondents from both the treatment and the control group before MI was administered.

Table 1 presents the frequency and percentages of the commonly used drugs by MAT patients during baseline assessment. More than half the MAT patients in the control group reported to using Marijuana (90%; n = 54), Opioids (80%; n = 48) Amphetamine- type stimulants (50%; n = 30) and benzodiazepines (50%; n = 30. Marijuana (78%; n = 47) and Heroin (65%; n = 39) were the most used drugs among MAT patients from the treatment Group. The results are shown in Table 1.

Table:

Timeline Follow-Back Method Assessment During Baseline Assessment

Polydrug used	Treatment Group		Control Group	
	Frequency (n)	Percentages (p)	Frequency (n)	Percentages (p)
Alcohol	19	33.30%	26	43.30%
Cannabinoids/ Marijuana	47	78.30%	54	90.00%
Cocaine	7	11.90%	7	11.70%
Crack	3	5.10%	3	5.00%
Amphetamine-type stimulants	16	27.60%	30	50.00%
Opioid analgesics, including methadone	9	29.00%	48	80.00%
Heroin	39	65.00%	21	35.00%
Hallucinogens, including MDMA/ecstasy	1	1.70%	18	30.00%
Sedatives and hypnotics	23	39.00%	13	21.70%
Benzodiazepines	16	28.60%	30	50.00%
Inhalants	3	5.10%	11	18.30%

Frequency, quantity, and patterns of the different types of polydrug used by the respondents from both the treatment and the control group after MI was administered.

After the MI was administered to the treatment group, during online assessment the same TFLB psychometric tool used in the baseline was administered to both the treatment and the control group in the endline among MAT Patients at 90.83% (n=109). The treatment group were 93.33% (n-56) and the control group 83.33% (n=53). The results in Table 2 reveal that despite the reduction in polydrug use, the frequency of marijuana and opioids were still the most commonly abused substances**.**

Table 2:

Timeline Follow-Back Method Assessment During Endline Assessment

Polydrug used	Treatment Group		Control Group	
	Frequency (n)	Percentages (p)	Frequency (n)	Percentages (p)
Alcohol	8	15.10%	19	35.80%
Cannabinoids/ Marijuana	36	66.70%	45	84.90%
Cocaine	3	5.60%	5	9.40%
Crack	2	3.70%	3	5.70%
Amphetamine-type stimulants	11	21.60%	16	30.20%
Opioid analgesics, including methadone	20	57.10%	31	59.60%
Heroin	19	35.20%	19	35.80%
Hallucinogens, including MDMA/ecstasy	2	3.80%	15	28.30%
Sedatives and hypnotics	10	18.90%	19	35.80%
Benzodiazepines	9	17.60%	30	56.60%
Inhalants	1	1.90%	8	15.10%

Comparison of Tables 1 (baseline assessment) and 2 (end-line assessment) for the treatment group reveals a significant reduction in the frequency of polydrug use of the MAT patients, as shown in Table 3.

For the control group, there was a significant reduction in opioids use (48 vs 31). Although marijuana intake was still more frequent (54 vs 45) for MAT patients in the control group the heavy users of this drug reported a significant reduction in the quantity intake of the drug to a few rolls a day. During endline assessment, three MAT patients who were on cessation of MAT after MI indicated to have stopped entirely heroin use. Only one of the patients noted to have completely stopped alcohol use, while another indicated to have stopped entirely sedatives and hypnotics. The primarily used combination of drugs, Heroin + benzodiazepines + marijuana + tobacco, was no longer reported among these patients. One of the patients said to have been gradually reducing marijuana from 30 rolls a day to seven rolls a day with the help TLFB plan. Cannabis or marijuana was the most reduced polydrug in this group in quantity taken in a day.

Table 3:

Reduced Polydrug use in the Treatment Group

Polydrug Used	Before MI		After MI	
	Frequency (n)	Percentages (p)	Frequency (n)	Percentages (p)
Alcohol	19	33.30%	8	15.10%
Cannabinoids/ Marijuana	47	78.30%	36	66.70%
Heroin	39	65.00%	19	35.20%
Benzodiazepines	16	28.60%	9	17.60%

IV. DISCUSSION

The findings from the baseline and end line assessment found that the common types of polydrug used by patients undergoing MAT are tobacco, non-prescribed opioids, heroin, benzodiazepines and cannabis/marijuana. The study reviewed patterns of heavy and daily polydrug use being once, twice, three or more times and low consumption with skipped patterns. Further, it was established that the polydrug used fall under four categories of psychoactive drugs: stimulants (Tobacco), opioids (non-prescribed opioids and heroin), depressants (benzodiazepines) and hallucinogen classification (UNODC, 2019d; Drug policy network, 2017; Ministry of Health (MoH), 2017).

The study also established that the most used polydrug from the baseline and end line assessment are cannabis/ marijuana and heroin for the treatment group and cannabis/marijuana, opioids and benzodiazepines for the control group. Study findings from MAT patient self-report revealed that the most used combinations of polydrug on a daily basis by both the treatment group and the control group is Benzodiazepines + Heroin + Cannabis/Marijuana + Tobacco and Benzodiazepines + Heroin + Cannabis/ Marijuana. More so, MAT patient's patterns of polydrug use are consistent with UNODC (2018b) findings on the concurrent use of more than one psychoactive substances for non-medical use.

After three months follow up, endline assessment on types of polydrug use by MAT patients in both treatment and control groups reviewed high frequency use of marijuana and opioids and were the most commonly polydrug used. However, the findings from the treatment group reveal a significant reduction in the frequency of cannabis/marijuana, heroin, benzodiazepines, and cannabis/marijuana polydrug while there was a reduction in use among the control group there.

Furthermore, out of the seven MAT patients who were on cessation after MI, three indicated to have stopped entirely heroin use, one alcohol use, and one had stopped using sedatives and hypnotics. The primarily used combination of drugs, heroin + benzodiazepines + marijuana + tobacco, was no longer used. One MAT patient in the treatment group reduced marijuana polydrug use from 30 rolls a day to seven rolls a day with the help of the TLFB plan.

Other studies support this study's findings on the most common types of polydrug used by patients undergoing MAT in both the treatment group and the control group, among them the Ministry of health report, whose findings established cannabis/marijuana as the most commonly polydrug used by MAT patients despite its use prohibition in Kenya (MoH, 2017). Results from self-report revealed that cannabis/

marijuana polydrug use are associated with MAT patients need to experience "relaxation, stimulation and numb the feelings." The study findings agree with UNODC (2019c) on cannabis as the most used psychoactive drug by MAT patients and which is noted to contain mind-altering chemical tetrahydrocannabinol (THC). Cannabis/marijuana is not categorized in the four classes of psychoactive substances due to its different effects on MAT patients. The findings agree with studies that support that the influence of cannabis has individual differences in the MAT patients' central nervous system. At the same time, in some, it acts as a stimulant, depressant, and in others, it acts as a hallucinogen (Burgess, 2019). From MAT patient's self-reports, the study found MAT patients used cannabis/ marijuana commonly for stimulation, sedation, relaxation and mind-altering. Therefore, MAT patients' frequency, quantity and patterns of cannabis/ marijuana use are based on the expected outcome of either acting as a depressant, stimulant and hallucinogen, as echoed by McBrien et al. (2019) findings. Self-reports from MAT patients support the argument that cannabis /marijuana is used as a depressant; when asked the same question, one MAT patients stated, "After MAT, there is always a gap that has to be filled marijuana/cannabis."

Study findings established polydrug depressant use of benzodiazepines for non-medical reasons. The findings result agree with Ngarachu et al. (2019) on benzodiazepine polydrug use by patients undergoing MAT aged 28-38 years, though the current study used MAT patients aged 18-57 of 32 years. The findings on polydrug of benzodiazepines and cannabis /marijuana and heroin among MAT patients agree with (Radcliffe et al.; Ngarachu et al., 2019). Self-reports from MAT patients in this study revealed that benzodiazepine polydrug use induces "relaxation, calmness and sleep." This finding is consistent with NIDA (2020e), which supports that Benzodiazepine as a psychoactive depressant drug depresses the central nervous system. Results from (NIDA, 2018; Winstanley et al., 2020) confirm these study findings that benzodiazepine polydrug use calm and sedates MAT patients. In addition, the study established alcohol, sedatives and hypnotics (Rohypnol) and inhalants in low quantity and frequency. However, despite its harmful effect, Radcliffe et al. (2019) revealed a high amount of alcohol polydrug use by MAT patients from England. Rohypnol depresses central never system NIDA (2020e); these study findings through MAT patient self-report cited Rohypnol polydrug use under sedative and hypnotics in pursuit for its "sedating effect."

The study found polydrug stimulant use of tobacco among MAT patients; Lee echoes the findings. (2019) that tobacco is commonly polydrug used by patients undergoing MAT combined with alcohol. The study found polydrug use of cocaine and amphetamine-type stimulants but in low quantity and frequency; however, Singh et al. (2019) found high use of amphetamine-type stimulants in Malaysia.

Current study findings revealed MAT patients' polydrug use of non-prescribed opioids and heroin. Tran et al. (2018) and Wang et al. (2018) support the study findings and NIDA (2020e) that non-prescribed opioid drugs are the most commonly polydrug used among patients with opioid dependency. The study finding concurs with Tran et al. (2018) on opioid polydrug use in MAT settings and Makarenko et al. (2018), whose studies found MAT patients had used opioids once in 12 months while in MAT treatment. The current study found that MAT patients polydrug use non-prescribed opioids daily. Ripanda et al. (2019) findings are consistent with the present study that MAT patients use opioids after enrolling in MAT in Tanzania. This study's findings concur with Kataja et al. (2018), that supports polydrug use of non-prescribed opioids daily to repress the effects of heroin and help manage heroin withdrawals, reduce its use and risks associated with injecting heroin. The study findings through MAT self-report revealed opioid analgesics use, including non-prescribed Methadone and tramadol polydrug use in low quantity and frequency. However, Richert's et al. findings established opioid treatment drugs as the most commonly used polydrug in Sweden among MAT patients who buy from dealers. In the current study, results from MAT patient's self-report found that MAT patients buy methadone from other MAT patients who do not swallow it upon being given their daily MAT dosage. Current study findings on tramadol use by MAT patients are consistent with NODC (2019a) findings on tramadol use as one of the most misused opioid prescriptions for non-medical use.

Through the MAT clinical records, enrolment criteria in MAT were opioid dependency, [SAMHSA], (2018). Despite this, the study found that MAT patients continue to use non-medical prescribed opioids in the treatment and control groups.

The study through self-assessment report finds that heroin polydrug use was low in dosage for various reasons. Wambugu's (2019) study found on heroin use

out of 110 enrolled in the study, 73 continued with heroin usage despite being enrolled in MAT. This supports the study findings that MAT patients continue to use heroin despite being in MAT. Results from the self-report found the mode of heroin administration was through intramuscular injection and smocking. This was associated with the risk of HIV among 17 MAT patients in the current study who were found with evidence of HIV chronic illness from MAT clinical records. The study findings agree with Wambugu's (2019) findings that patients used heroin through injection, which is highly considered to increase HIV transmission. Other studies support the association of injecting heroin with increased HIV Rhodes and Rhodes, (2018) and increased criminal activity and illicit sex (CDC, 2020b). The findings are consistent with this study's findings on evidence of forensic history among MAT patients.

Despite the risk of HIV through injection, some studies report that despite MAT patients receiving the same MAT treatment, MAT patients show differences in treatment outcomes for a mode of intake for opioids users such as those who inject drugs and those who smoke (Morgan et al., 2019) as well as on gender variations.

This study did not look at the types, quantity and frequency of polydrug use against gender, level of education, employment, duration in MAT, or patterns of use among MAT partners, which may have given polydrug use patterns among MAT patients. Furthermore, the study did not assess the MAT patients' differences and how personality trait is associated with the preferred types of polydrug used.

Despite MAT, patients receive MAT treatment at no cost to manage withdrawal and craving effects, reduce opioid use and criminal activities, increase ability to gain and maintain employability, increase birth outcomes and improve wellbeing (SAMHSA, 2020b). The study findings reveal that MAT patients polydrug use different types of psychoactive drugs for various reasons based on MAT patients' expected outcome of the kind of polydrug chosen. Though MAT is effective in managing withdrawal and craving for Opioids, it does not reduce polydrug use among MAT patients (Carlsen et al., 2020). This explains the polydrug use patterns found in the current study findings among MAT patients despite the substantial economic investment in the two MAT clinics in Kenya.

V. CONCLUSION

Baseline results showed common types of polydrug used by patients undergoing MAT under four categories of psychoactive drugs: Stimulants, Opioids, Depressants and Hallucinogens. Individual differences in polydrug use inform the choice of polydrug that cut across the four categories with daily and heavy use or low use with skipped days. The frequency of polydrug use is once, twice, thrice, or more daily. The polydrug types include alcohol, marijuana, cocaine, crack, amphetamine-type stimulants, opioids, heroin, hallucinogens, MDMA/ecstasy, sedatives and hypnotics, benzodiazepines, and inhalants. The other polydrug used are tobacco/cigarette, Kuber (*Ndovu/Skari*) electronic cigarettes, Chavez, tobacco laced with cocaine, jet fuel, khat and shisha.

The common polydrug used by patients undergoing MAT are Tobacco, Non-prescribed opioids, heroin, benzodiazepines and cannabis/ marijuana. In contrast, the majorly polydrug combination is Benzodiazepines + Heroin + Marijuana and Heroin + benzodiazepines + marijuana + tobacco. Polydrug use standard modes of administration is as injection, snorting, swallowing, smoking and sublingually. The source some of the polydrug used is obtained from MAT patients who peddle drug. Some peers, MAT educators, polydrug use.

At endline follow-up, marijuana and opioid were the most commonly polydrug used by the treatment and control groups. In the treatment after MI, there was a significant reduction in cannabis/marijuana, heroin, benzodiazepines, Cannabis/marijuana polydrug and in the control group, opioid use. The treatment group had seven MAT patients on cessation, of which five stopped heroin, alcohol, sedatives, and hypnotics. Use interesting results, they stopped the commonly used polydrug combination Heroin + benzodiazepines + marijuana + tobacco. In the control group, no stoppage of polydrug use was established except for a reduction. Based on the results from the treatment group and the control at baseline and end line, Timeline follow back (TLFB) is a valid psychometric tool for testing polydrug prevalence and has test-retest reliability. Their reduction and stoppage of polydrug use in the treatment group are associated with MI, while the decrease in the control group is associated with MAT. Therefore, MI reduces and stops polydrug use, and MAT is effective in managing withdrawal from and craving for opioids, but it does not reduce polydrug use. Hence, combining MI and MAT reduces and stops polydrug use among MAT patients.

VI. RECOMMENDATIONS

- To develop a program on cannabis/marijuana interaction with Methadone assisted Therapy that will help reduce Cannabis/marijuana and polydrug use by donor organizations in partnership with the Ministry of Health.
- Empowering and enabling Methadone assisted Therapy patients in gaining control to monitor and evaluate their Methadone assisted Therapy and polydrug use, support of the program and impromptu screening and encourage feedback to the MAT clinicians on the types of polydrug used that inform the treatment plan to reduce polydrug use and duration of stay in MAT by the Ministry of Health in partnership with donor organization.
- Advocacy on the effect of polydrug use on methadone-assisted therapy, duration in MAT, MAT dosage and overdose by the MAT clinicians to help them build a rational understanding of the polydrug use reduction, and implementation of Motivation interviewing to reduce types of polydrug used and its related impacts of craving and withdrawal through MAT patients taking own responsibility and support from MAT clinician as a trusted partner in their polydrug use reduction

VII. CONFLICT OF INTEREST

Authors declare no conflict of interests.

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