Effect of medication-assisted treatment on psychosocial wellbeing among patients with opioid use disorder. A case of Mathari National Teaching and Referral hospital Nairobi City County

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Abstract

Opioid use is an epidemic globally. Although medication-assisted treatment has been effective in the treatment of opioid use disorder and the improvement of psychosocial well-being, the epidemic continues with the number of those using opioids increasing, causing a heavy burden of disease and a strain on the healthcare system in many countries. The purpose of the study was to establish the effect of medication-assisted treatment on psychosocial well-being among patients with opioid use disorder in Mathari National Teaching and Referral hospital. It was a descriptive cross-sectional study targeting a population of 1211 patients. The sample size comprised 255 patients obtained using the systematic random sampling technique. The study used Carol Riff's harm reduction models. Data collection was through questionnaires that were completed by the respondents. The interview schedule was used for the key informants (doctors, nurses, psychologists, and social workers). The instrument reliability and validity were assessed. Data was analysed using a statistical package for social science (SPSS) Version 24.0. The presentation of the results was through tables, pie charts, and graphs. The study findings revealed that most of the respondents were on medication-assisted treatment at 96.3%. There was a reduction in withdrawal symptoms, overdoses, and the number of those injecting drugs, hence a reduction in HIV, hepatitis, and T.B infections. There was resumption to school, employment, and business. However, there was a 40% relapse. The study concluded that there was a statistically significant relationship between MAT and psychosocial well-being among patients with opioid use disorder(OUD) as demonstrated by significant Pearson Correlation ($r=0.247$, $p<0.05$). Addressing the issue of relapse is important for strengthening the MAT program. Appropriate and programmatic interventions by the policymakers and stakeholders would improve the patients' psychosocial well-being. The study would be useful for future reference by other researchers. It is important to carry out related studies in other MAT clinics in Kenya for comparative purposes. A longitudinal study on the variables under investigation in this current study for five years would be interesting. It is pertinent to decentralize MAT services.

Keywords: *Psychosocial wellbeing, medication-assisted treatment, methadone maintenance treatment, mental health, opioid craving*

Introduction

Psychosocial well-being refers to inter and intra individual levels of positive functioning that include one relatedness with others and a self-referent attitude that provides one's sense of mastery and personal growth in terms of improved mental health among the patients on the medication-assisted treatment. Opioids continue to account for the largest burden of disease attributed to drug use (UNODC World drug report, 2021). An estimated 275 million people worldwide used drugs in 2020, with over 36 million people suffering from opioid use disorders. Globally, over 11 million people are estimated to inject drugs, and half of these people suffer from hepatitis C (UNODC World drug report, 2021). According to the global status of Harm Reduction (HR), a lancet global health systemic review shows that 15.6 million people who inject drugs had 17.8% HIV and 52.3% Hepatitis C causing a heavy burden of disease. (Larney, 2017).

Some of the adverse effects of Opioid use (OU) are poor health status, increased use of opioids leading to increased infections such as HIV, and hepatitis C, high mortality due to opioid overdose, and poor community reintegration. Illicit drug use is estimated to be 5.4% by the World health organization (UNODC, World drug report, 2019). If this problem is left unaddressed, the results will be a heavy burden on any country's health systems. Therefore, UN General Assembly Special Session (UNGASS) endorsed comprehensive management of health risks and consequences such as harm reduction interventions to minimize the adverse public health and social consequences of drug abuse (WHO, 2016).

The global state of harm reduction in the USA shows an increase of 21.4% between 2015 and 2016 in drug-related fatal overdoses. (UNODC, World Drug Report, 2018). The primary cause of death is Opioid Overdose (O-OD) among people who inject drugs (UNDP, 2012) The USA shows a high retention rate and improved rehabilitation (Ball & Ross, 2012). Canada reports 92% of its opioid-related deaths as accidental/unintentional (Canada, 2018). According to global status on HR, Europe, France, the United Kingdom, and China report non-adherence to the Methadone Maintenance Treatment (MMT) (Nguyen, 2017). Therefore, provisions of naloxone for the prevention of O-OD are important (UNDP, 2012).

Studies have also shown an increase in O-OD deaths in Western Europe. An estimated 84% of overdose-related deaths, involved opioids which occurred in Turkey, Germany, and the U. K (EMCDDA, 2018).In addition, non-adherence to methadone risks relapse to OU (Hoang (Hoang, 2015). A systemic review by Dugosh found that "psychosocial treatments combined with pharmacological detoxification treatments were effective in increasing rates of levels of treatment completion, reducing OU, and facilitating longer-term abstinence (Dugosh, 2016).

An estimation of 40,800 deaths in Africa is associated with a heroin overdose. Injecting drug use remains a significant factor in the transmission of HIV, hepatitis, and other blood-borne diseases. Sixteen countries report injecting drug use in sub-Saharan Africa, including Kenya, Nigeria, Tanzania, South Africa, and Mauritius. In Sub-Saharan Africa, studies show "evidence of the effects of implementing methadone in low-income settings is accumulating" (Bruce, 2014). In the East Africa region, there is no published evidence of projected HIV prevention and the impact of MMT (Bruce et al.).

A retrospective study conducted among 629 participants at the Methadone maintenance treatment clinic at Muhumbili National Hospital in Tanzania showed a 57% retention in 12 months of study. The results were comparable to estimates from programs in the North. America, Europe, and Asia. (Lambdin, 2014). A cross-sectional study in Mwananyamala Hospital in Dar es Salaam showed that 125 out of the 126 Methadone maintenance treatment participants used opioids. In addition,50% of the participants had been on Methadone maintenance treatment within 0-12 months .23.8% of the participants were on MMT within 13-15 months at 11.11%, within 26-38 months, and 15.08% at over 39 months (Ripanda, 2019). Despite being on Methadone maintenance treatment, the patients were still using opioids.

In Kenya, the 2009/10-2013/14 Kenyan strategic plan (KNSAP111) highlighted the need to prevent new infections among injecting drug users. HR therapy that was not allowed was incorporated to reduce HIV. Kenya is the third in Sub-Saharan Africa to introduce the Methadone maintenance treatment. Studies were done to highlight the severe nature of substance abuse.

A survey was done in Kenya by NACADA on "drug and substance abuse among secondary school students" showed a prevalence rate of 0.4% for heroin ad 0.4% for cocaine, and prescription drugs at 6.8% among other substances (NACADA, 2016). Mathari National Teaching and Referral Hospital (MNTRH) was among the first public hospitals to offer Harm reduction medically assisted treatment. Enrolment of patients in the Methadone maintenance treatment. (MAT) clinic showed 44.1% in 2015, 31.7 % in 2018, and 27 % in 2019. Notably, there was no enrolment in 2020 due to covid -19. (Table 1.1). Sponsorship of the MAT Clinic is

by the United States President's Emergency Plan for AIDS Relief (PEPFAR) through the Centre for disease control (CDC) and the United States Agency for International Development (USAID), supported by the University of Maryland and UNODC. There are eight operating clinics in Kenya, two in Nairobi city county, MNTRH and Ngara health center, two in Mombasa county, Kisauni and Miritini, and one in Kisumu County(Jaramogi), one in Kilifi county, one in Kwale county and one in Kiambu county(Karuri). MNTRH, MAT clinic receives patients from various civil society organizations(CSOs) such as Support for Addictions prevention and treatment in Africa(SAPTA), Nairobi Outreach services trust(NOSET)Médecins du Monde(MdM), and Liverpool Voluntary Counselling and Testing Centres(LVCT). The purpose of the study was to establish the effect of Medication-assisted treatment on psychosocial well-being among patients with OUD at MNTRH. The objective of the study was to determine the effect of Methadone maintenance treatment (a medically assisted treatment intervention) on the improvement of OUD patients' mental health.

Methodology

The study used both a descriptive survey and a cross-section study design. A descriptive survey allows the respondent's give opinions on MAT and psychosocial well-being among the patients who have OUD. Further, cross-sectional studies examine, at a specific point in time, a broad perspective of a cross-section of the population.

Cochran's formula for calculating sample size was used (Cochran, 1977). Using Cochran's formula with an estimate of variance at 0.7% to estimate the population with absolute precision=0.7% was used because the prevalence of heroin addicts is 0.7 % (NACADA, 2017).

Cochran formula: $n=\frac{z^2 \times p\,(1-p)}{d^2}$

Where: n is the estimated sample size

D is the level of precision

P is the proportion of the condition of interest

Z is the confidence level of 95%

Using the confidence interval of 95%. Expected prevalence of 0.7 % (NACADA, 2017)

And a level of significance of 5% (0.05)

$$n=\frac{1.96^2 \times 0.7(1-0.7)}{0.05^2}$$

$n=322.6944$

$n=323$

Since the sample size was less than 10,000, the sample size was adjusted using the following formula

$$nf=\frac{n}{(1+n)/N}$$

Where

nf = the desired sample size (when the proportion is less than 10,000)

n= the desired sample size when the population is more than 10,000

N= the estimate of the population size

The population size of the patients with OUD attending the medically assisted therapy is 1211

Hence

$$nf=\frac{323}{1+(323/1211)}$$

$=254.9889178$

$nf=255$

The study sample size was thus two hundred and fifty-five patients 226 males and 29 females with OUD enrolled in the medication-assisted treatment clinic, MNTRH. A systematic random sampling technique was used. Every 5th respondent was selected from the patient register until the desired sample was achieved. The study was carried out in Mathari National Teaching and Referral Hospital, located in Nairobi County, Muthaiga area along the Thika superhighway. This was purposely because it is the largest government psychiatry referral hospital,1st public hospital to pilot the medication-assisted treatment, and has highly specialized professionals in mental health. The hospital offers experiential opportunities for training and research for all disciplines in the medical field including doctors, pharmacists, nurses, psychologists, laboratory officers, and public health officers among many other disciplines.

Data collection procedure

Data collection was done by use of a researcher-developed self-administered structured questionnaire and a key informant interview guide from the health providers. It was administered to all the selected patients and key informants namely the doctors, nurses, pharmacists, psychologists, and social workers. The instrument sought to gather information on the set objectives on the effect of medication-assisted treatment on psychosocial well-being among patients with OUD. Instrument reliability was pretested to show how consistently the instrument measured the target attribute. This was done at the MNTRH general wards. The pilot study used a sample size of 10% of the projected sample as suggested by (Connelly, 2008). With a sample size of 255, the pilot sample size was 10/100x 255= 25.5, therefore the pilot sample size was 26 participants. The 26 participants were given the questionnaire for pretesting. This was done to check whether the instructions were clear and adequate and whether the participants understood what they were required to do. This included checking if the wording and the sequence were correct and if additional questions were needed, to make changes, if need be, to save time, effort, and money before the actual study is carried out.

The reliability coefficient was calculated using Cronbach's coefficient alpha of 0.7. The tool obtained a reliability coefficient of 0.8 was obtained during the pre-test and therefore was considered good. The content and internal validity were matched with the study objectives, construct validity was matched with the study objectives. Supervisors and other experts in the area of specialization ascertained the variables and the criterion validity of the instrument. An introductory letter was given from Africa Nazarene. A research permit was obtained from the National Commission of Science Technology and innovation. Mathari National Teaching and Referral Hospital, research and training committee also approved. Two research assistants were selected based on their professional qualifications, trained, and orientated; they signed a confidentiality agreement to enhance the protection of participants' identities and information. All the participants that met the inclusion criteria and were willing to participate signed an informed consent form. A list of all the patients attending the Medication assisted treatment clinic was provided from the records department, this enabled the researcher to select the participants using systemic random sampling.255 participants who met the inclusion criteria were selected.

Primary and secondary data were collected by the use of questionnaires that were pretested with a pilot group of patients with OUD in the general wards of Mathari National Teaching and Referral Hospital This pretesting was done to provide a check on the feasibility of the data collection tool for coding and also for any flaws and ambiguity that contained written down items on the social demographic of the participants, They contained closed (structured), open-ended (unstructured) and scaled questions. The study used a questionnaire since it was descriptive.The researcher also prepared a structured interview schedule based on the research objectives for the key informants. These were doctors, nurses, psychologists, social workers, and record officers who signed informed consent. This waswas a face-to-face interview that lasted 20-30 minutes. This technique was used because of its adaptability, and flexibility. The researcher to ensure completeness, consistency,

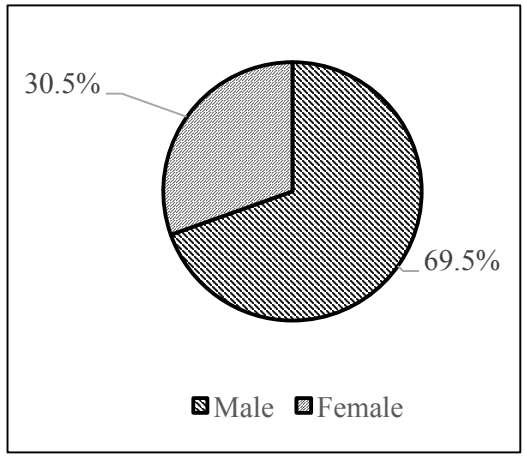
uniformity, and accuracy of information checked all the questionnaires filled out during the study.

Data Processing and Analysis

The data was first cleaned to identify and correct inaccurate, incomplete, and inconsistent information from the questionnaires. The data was coded before capturing it into the computerized software. The data was analysed using the statistical package for social science (SPSS) version 24.0. The descriptive data was presented using percentages, figures, pie charts, and tables. Inferential statistics were presented through the Pearson correlation.

Results

The response rate for the questionnaire was 95.3%, and the interview response rate was 100 percent. The overall response rate was 95.5% .This percentage was considered sufficient for analysis. The findings show that more than two-thirds were males (69.5%) while females were (30.5%). This is indicative of the fact that most of the patients undergoing treatment for OUD were males. These findings are shown in Figure 4.1.



n=243

Figure 4. 1: Gender of Respondents

Source: Field Data, 2021.

The findings showed that most of the respondents (59.7%) were aged between 36 and 45 years. These were followed by less than a third (30%) who were aged between 46 and 55 years. The least, about a fifth, were aged between 26 and 35 years at 10.3%. This shows that most of those suffering from OUD were more than 35 years old; an indication that opioids use was more prevalent among older generations. These findings are presented in Figure 4.2

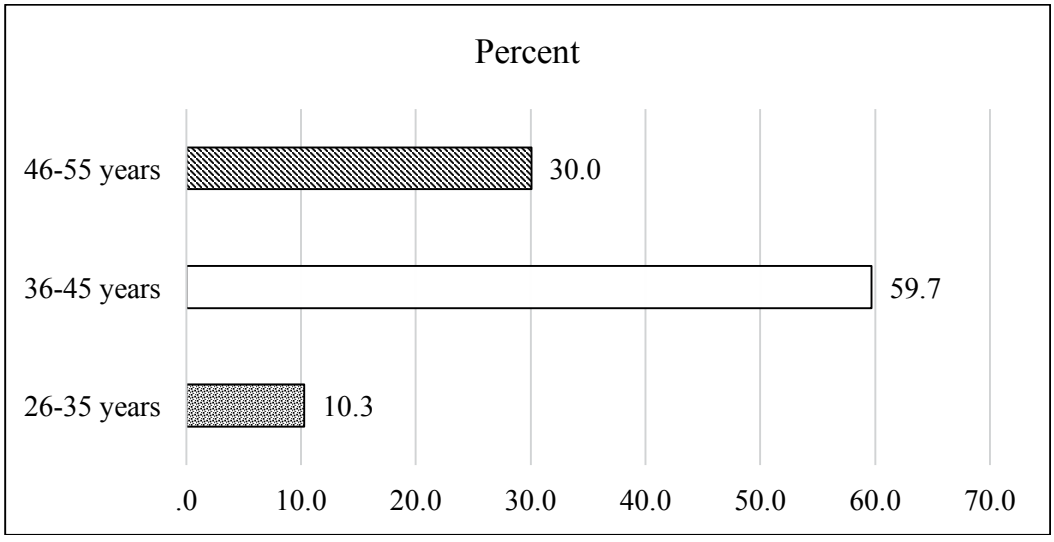


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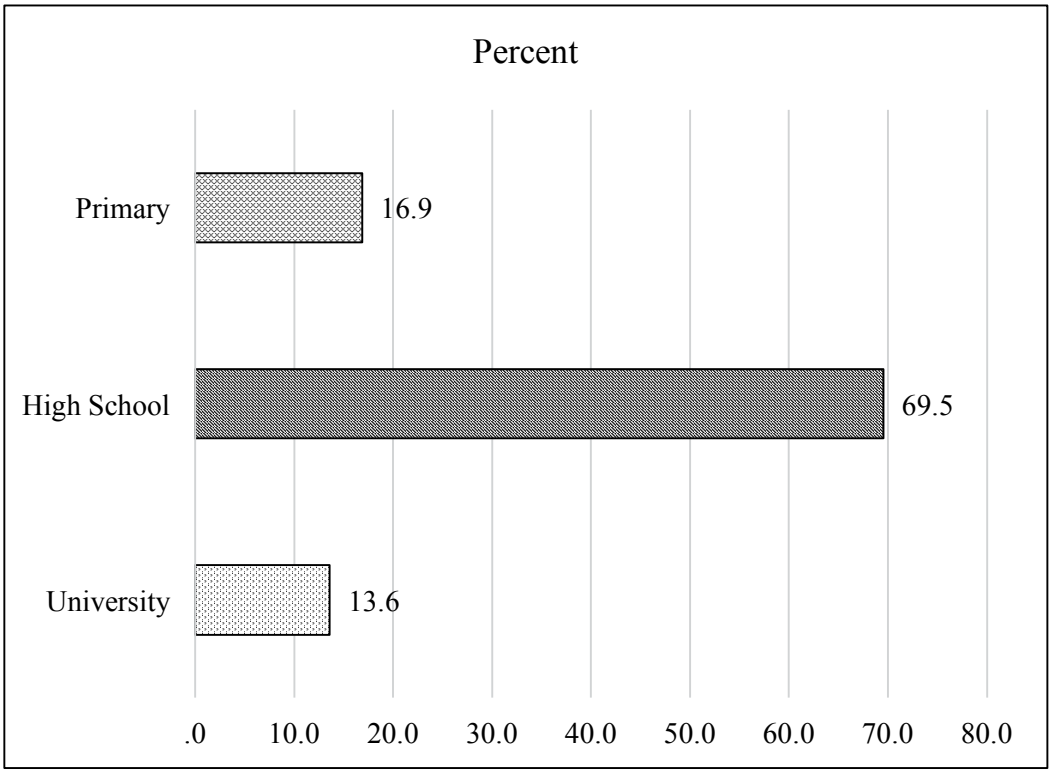
Figure 4. 2: Age of Respondents
Source: Field Data, 2021.

The patients were also asked to point out their highest levels of education. The responses show that most of them had a high school education at 69.5%. The least had primary and university level education at 16.9% and 13.6% respectively. These findings show that high school graduates without further higher education were more likely to have OUDs.The results are presented in figure 4.3

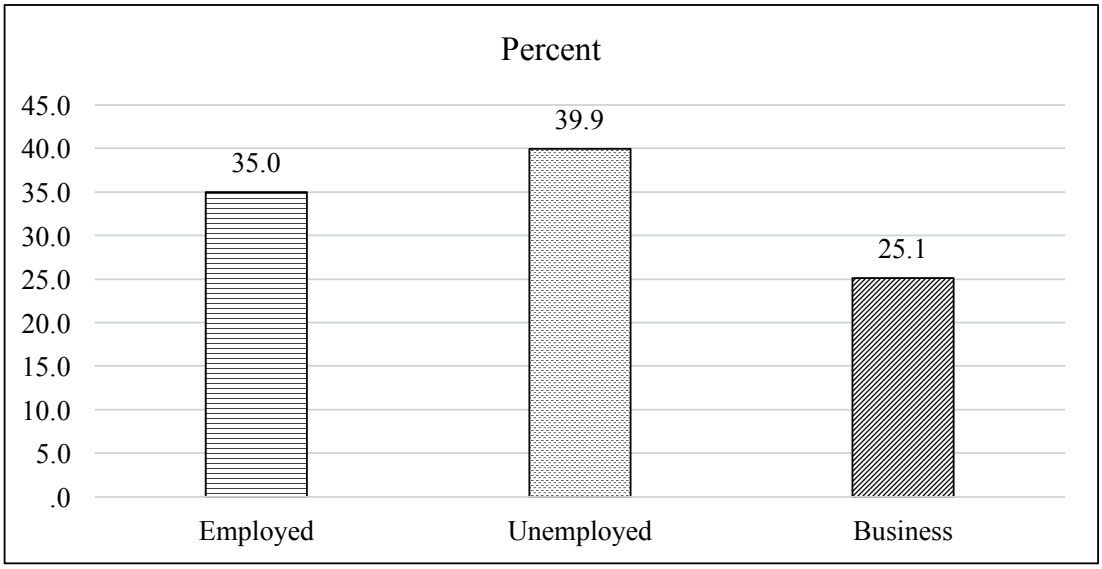


n=243

Figure 4. 3: Highest Level of Education

Source: Field Data, 2021.

When asked to indicate their employment statuses, most of the respondents (39.9%) stated that they were unemployed. While those employed accounted for another 35%, the rest, slightly more than a quarter (25.1%) were in business. This shows that opioid use was more common among unemployed persons. The findings are presented in Figure 4.4

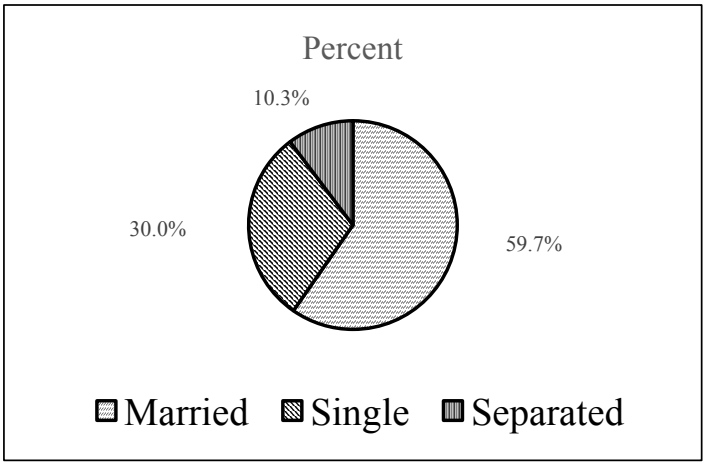


n=243

Figure 4. 4: Employment Status

Source: Field Data, 2021.

The respondents were asked to indicate their marital status. The findings show that the majority were married (59.7%). These were followed by those who were single at 30.3%. The least were those who were separated at 10.3%. This shows that the married were the most affected by OUD. The findings are presented in figure 4.5



n=243

Figure 4. 5: Marital Status

Source: Field Data, 2021.

The findings showed that most of the respondents were under Methadone Maintenance Treatment (MMT) (96.3%) as shown in table 4.1

Table 4. 1: Enrolment and Methadone enrolment and retention among the Patients with OUD from December 2014 to March 2021 at MNTRH

	Enrolment			Methadone retention	
Year	Number of patients	Male	Female	Male	Female
2014	22	18	4	18	24
2015	554	466	88	388	69
2016	597	500	97	382	52
2017	597	500	97	362	52
2018	930	809	121	543	77
2019	1064	142	126	623	74
2020	1211	1061	150	595	76
2021	1224	1063	161	597	68

Source: Field Data, 2021.

These findings from MNTRH show that most of the patients under methadone enrolment and retention were males since 2015. The number had been on the increase since 2014 with a significant drop for males in 2020 which could be explained by challenges related to COVID-19 pandemic. The respondents were asked to point out what they would say about medication-assisted treatment on psychosocial well-being.

One of the respondents said: "We have greatly improved. There have been a few withdrawals and a reduction in overdoses. Those who were injecting heroin had reduced, injection scars had reduced, and some of us have gone back to school, employment, and business" [Respondent A5, April 23, 2021, MNTRH]. In the same accord, another respondent said: "There had been remarkable improvement, female fertility had improved as shown by improvement in their menses also evidenced by the number of new pregnancies. I am a proud father of a baby boy courtesy of MAT. HIV and TB among us have reduced". [Respondent A1, April 21, 2021, MNTRH].

There had been reductions in new HIV and other blood-borne infections transmission through sharing needles. This corroborates with secondary data from MNTRH that show low levels of infection for patients on methadone as shown below:

Table 4. 3: Infection Transmission Prevention and Treatment among the Patients on Methadone

Infection transmission prevention				
Year	Number of patients	HIV	HEPATITIS C	TB
2014	22	7	9	0
2015	554	90	72	1
2016	597	9	9	0
2017	597	0	0	0
2018	930	20	8	0
2019	1064	9	3	0
2020	1211	1	0	0
2021	1224	0	0	0

Source: Field Data, 2021

Furthermore, the respondents were asked if they thought that the mental health among patients with opioid use disorder had improved since they started the treatment. The responses show that there had been major changes with some being able to go on with their lives without the challenges associated with OUD.

In this regard, one of the respondents said:"*Yes, there is observable behavior change. Most can go with their life and some of them have gone back to school, employment and businesses*". [Respondent A7, April 22, 2021, MNTRH].

Some of the respondents also affirmed the improvement in the mental health of the study respondents. Some of them had gone back to normal life and fertility, as already pointed out, had gone back to normal. To this end, one of the respondents said:"*Fertility among some of them is well evidenced by Medication-Assisted Treatment (MAT), many babies have been born among those on methadone maintenance treatment*". [Respondent A8, April 22, 2021, MNTRH].

Interpersonal relationships among the study respondents had also improved. In this regard, one of the respondents pointed out that: their mental health had improved compared to when they began, their behaviour was now good, cognitive functioning greatly had improved, concentration was good, and generally, patients had developed good coping skills. The respondents were asked if there had been a reduction in opioid use among the patients with opioid use disorder receiving the methadone maintenance treatment. Although a small number of the health care providers said that there had been changes, most of them were of contrary opinion. They posted that most of them were still using opioids. This was aggravated by the fact that there were high levels of use of other substances. Furthermore, one of the respondents said that 40% of the patients had relapsed. In this regard, respondent A3 said:

"No. Most of them are using other substances; they were poly-substance users. Indeed, 40% of the patients have relapsed". [Respondent A3, April 21, 2021, MNTRH].

Improvement of mental health at (r=0.247, $p<0.05$ is indicative of the fact that MAT has a significant relationship with psychosocial well-being. Therefore, they strengthened the methadone maintenance treatment that could affect the Psychosocial Well-being of patients undergoing treatment for OUD at MNTRH.

Table 4. 7: Pearson Correlation

Correlations		
		Improvement of mental health
MAT	Pearson Correlation	.247**
	Sig. (2-tailed)	.000
	N	243

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Field Data, 2021.

Discussion

The study sought to determine the effect of MAT on the psychosocial well-being of the patients with OUD attending the MAT clinic, MNTRH. The study findings indicated that most of the respondents (96.3%) were under Medication-assisted treatment as well as HIV, Hepatitis C, and Tuberculosis treatment as shown in Table 4.3. This is a good indication that patients with opioid use disorder have embraced the medication-assisted treatment program. Demographic data showed that most of the patients enrolled in MAT were males at 69.5% and females at 30.5% as shown in figure 4.1. However, there was a significant drop in male patients in 2019 and 2022, which could be explained by the challenges related to Covid -19 pandemic. These findings are supported by secondary data on the enrolment and methadone retention among the patients with OUD at the Mathari National Teaching and Referral Hospital (MNTRH) Nairobi City County as shown in Table 4.1. The stakeholders, therefore, need to come up with mitigation measures in case of such a pandemic as the Covid -19 to ensure the patients do not miss their daily dosage

Adherence to the methadone is key to the effectiveness of the MAT program. The high retention of patients to the MMT could reduce the use of opioids and improve the quality of life (Jiang, 2014). There were high levels of methadone retention as in a similar study in the USA that showed an increasing negative opioids test in urine conducted at different times during the treatment (Protocal, 2016). In another similar study, the MMT clinic at Muhumbili National Hospital in Tanzania showed a 57% retention in 12 months of study. This was comparable to estimates from programs in the North. America, Europe, and Asia. (Lambdin, 2014) . Another study found that there were significant reductions in opioid use, improved mental health, and retention rates were high. (Scheibe, 2020). A study in South Africa on the outcome of high retention in opioid substitution treatment concluded that high retention is a result of the harm reduction principles and restorative justice and attraction (Marks M. S., 2020). However, in contrast, a study by Jiang, showed there were high dropout levels from MMT in China (Jiang, 2014).

The findings from the health workers' response on methadone maintenance treatment in the improvement of the mental health of the patients with opioid use disorder, showed that it had helped stop the craving for heroin (Jiang, 2014). Improvement of mental health had also been evidenced by a few withdrawals. Some of those treated had gone back to school, employment, and business return; indicating significant levels of rehabilitation (Ball & Ross, 2012). Physical examination showed that injection scars had reduced. There had also been reductions in new HIV and other infections. This corroborates secondary data from MNTRH that showed low levels of infection for patients on methadone.

The respondents were asked if there had been a reduction in opioid use among the patients with opioid use disorder receiving the methadone maintenance treatment. Although a small number of the health care providers said that there had been changes, most of them were of contrary opinion. They posted that most of them were still using opioids. This was aggravated by the fact that there were high levels of use of other substances this was in agreement with a study done in Tehran, Iran that found the patients to be using multiple substances (Shekarchizadeh, 2012). Furthermore, one of the respondents said that 40% of the patients had relapsed. This corroborates the study Hoang that shows that poor adherence to methadone risks relapse to opioid use (Hoang, 2015).

Conclusion

The results show that the medication-assisted treatment influenced the psychosocial well-being among patients with OUD at MNTRH Nairobi County. The study findings show that the mental health among patients with OUD at MNTRH (dependent variable) was influenced by Medication-assisted treatment as demonstrated by significant Pearson Correlation ($r=0.247$, $p<0.05$). Based on the findings, the patient reported improvement. There was a reduction in withdrawal symptoms, overdoses, and the number of those injecting drugs, hence a reduction in HIV, hepatitis, and T.B infections. Fertility had improved. There was notable behavior change, cognitive functioning greatly had improved, concentration was good, and generally, patients had developed good coping skills. There was resumption to school, employment, and business. However, there was a 40% relapse. Addressing the issue of relapse is important for strengthening the MAT program. Appropriate and programmatic interventions by the policymakers and stakeholders would improve the patients' psychosocial well-being. The study would be useful for future reference by other researchers.

Recommendations

It is important to carry out related studies in other MAT clinics in Kenya for comparative purposes.

A longitudinal study on the variables under investigation in this current study for five years would be interesting.

It is pertinent to decentralize MAT (Rhodes T. , 2018)services.

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