FACTORS INFLUENCING POLYDRUG USE AMONG METHADONE-ASSISTED THERAPY PATIENTS IN SELECTED CLINICS IN NAIROBI, KENYA

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ABSTRACT

Polydrug use is caused by multiple factors within the polydrug users' ecological system resulting in polydrug dependency, a complex behavioural disease with chronic features. This paper, guided by the social learning theory, seeks to examine some of the causal factors that lead patients undergoing therapy in Methadone assisted Therapy [MAT] clinics in Nairobi County to polydrug use. The study used a mixed methods approach utilizing both quantitative and qualitative data collection methods in a quasi-experiment. The experiment entailed pre and post-strategy for the experimental group at site A and the control group at site B, where both groups underwent baseline and end-line assessment for MAT treatment. The study population consisted of 2121 patients drawing a sample size of 120 respondents through random sampling. The end-line assessment was done using the same tools after three months during follow-up. Data analysis was done descriptively and by inferential statistics to correlate the various factors. The findings are presented in tables and indicate that biological factors, history of polydrug use within MAT patients' families, spiritual and existential factors, and MAT patients' missing Methadone dosage were statistically significant to polydrug use.

Keywords: Polydrug, Methadone dosage, MAT patients', biological factors, family history, existential factors, spiritual factors.

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I. INTRODUCTION

Polydrug use is a risk factor to substance use disorders (SUDs) (UNODC, 2018b). Generally, SUD describes a range of pathological patterns that are associated with the use of illicit drugs, psychoactive substances and misuse of prescribed drugs (UNODC, 2019b). A significant number of individuals who use psychoactive substances for non-medical use develop SUDs. As demonstrated by the APA (2013), polydrug used substances belong to ten classes of drugs namely: alcohol, caffeine, cannabis, hallucinogens, opioids, sedatives, stimulants, inhalants, tobacco and others. Encephalopathy and polydrug users show high degree of relapse in Methadone Assisted Therapy (MAT) (Kataja et al., 2019). Studies have demonstrated evidently that etiological factors influence polydrug use among patients undergoing MAT from Biopsychosocial-spiritual, social learning and self-determination factors, some of which are discussed in this paper. The logistic regression analysis determined homeless, unemployment or under benefit program, polydrug use, injecting the drug(s), hepatitis C and seropositive in MAT and without treatment for polydrug use as factors associated with harmful alcohol use in MAT (Radcliffe et al., 2019).

Some of the identified reasons for polydrug use among people in MAT are for heightened euphoria/ mood elevation, reducing Methadone dependency and some initial side effects, coping with psychological issues, sex stimulation, increased energy, ameliorating opioids withdrawal, social factors, improved quality of life, social resources and adverse experiences (Carlsen et al., 2020; Singh et al., 2019) among others. There is empirical evidence that some MAT patients' treatment takes longer than the recommended 24 months due to a lack of individual motivation and polydrug addiction (SAMHSA, 2020). Consequently, Motivation interviewing is used to reduce polydrug use craving that leads to relapse among MAT patients (Navidian et al., 2016). According to Navidian et al. (2016), Motivational Interviewing [MI] effectively lowers craving and polydrug use abstinence in treatment groups. Polydrug craving is an objective experience that denotes a desire to polydrug use and has psychological effects that generate the motivation for polydrug use. Therefore, this paper draws attention to the factors that cause while undergoing therapy.

Theoretical Underpinning

The Social learning theory (SLT), as postulated by Bandura (1977), provides an understanding of multivariate factors that underpin this study variable of key causes of Polydrug use (PDU) among patients undergoing MAT in a socio-cultural perspective (Kendra, 2019). The social learning theory observes that polydrug use is learned through observation and modelling; hence MAT patients may observe polydrug use from others and adopt similar use patterns. This theory applies the principles of reinforcement, extinction and shaping of polydrug use in MAT. The polydrug use behavior by patients undergoing MAT is learnt not only from the consequences of their behavior, but also from observing the consequences of others in polydrug use. According to Laland and Rendell (2019), this helps in cognitive understanding and coding of polydrug use that is observed, influencing present and future polydrug use among MAT patients. According to Bandura, witnessing polydrug use in MAT patients is likely to emulate polydrug use if the user goes unpunished. However, the central theme of SL theory is self-efficacy/autonomy and competence that may be achieved through motivation

interviewing (MI) which empowers and motivates MAT patients to increase intrinsic motivation for polydrug use reduction (Ackerman, 2019). This is nevertheless not our focus in this paper.

The theory argues that when self-efficacy/autonomy and competence are absent, it influences polydrug use and when present, it inhibits polydrug use. Therefore, polydrug use is triggered by contextual factors that arise from diverse sources of polydrug use information. These include the judgement of polydrug use, past performance, and previous responses from others (Bandura, 1977). The review of efficacy affects the outcome of polydrug use and therefore confirms or modifies the existing cognitive structures (Laland & Rendell, 2019). The theory further sheds light on understanding the learnt helplessness behavior, and locus of control effect on polydrug use or nonuse among MAT patients, which is also observed by Burger (2015). Therefore, this theory was relevant in understanding social learning factors influencing polydrug use among MAT patients**.**

II. LITERATURE REVIEW

This section presents a review of literature from past studies on the causes of polydrug use among patients undergoing methadone-assisted therapy. Some of the factors include:

Biological and Genetic factors

There appear to be several versions of genericization documented in various studies, and one of them is genetic affects patient's perceptions of addiction in essential ways (Dingel et al., 2019). The study conducted a semi-structured interview lasting 35-45 minutes with 63 participants aged 25-73 years with an average age of 47.5 years from five different programs in the United States. The study tried to understand addiction genetics through a familial tree focusing on geneticization and biological citizenship. The genetic understanding of addiction is consistent with cultural beliefs that link polydrug users-level causes of mental illness, the therapy and prevention strategies focusing on polydrug users' bodies and choice.

According to Dingel et al. (2019), different polydrug users have a background with geneticization effect of family history of opioid addiction. In this case, such patients view their addiction from a genetic lens and those without family history use this claim to reject the notion. In another study, the science behind opioid addiction cites genetic vulnerability with specific genes responsible in nucleus accumbens (NAc) regulated heroin addiction (NIDA, 2019). Therefore, the study advocates for personalized therapy among MAT polydrug users with various drug addictions.

Age of onset and polydrug use

Largely documented evidence cites the onset of substance use during adolescence and emerging adulthood (Poudel & Gautam, 2017). The early initiation is associated with polydrug use in adulthood, mortality, overdose, and polydrug use addiction. During psychosocial development those in early substance use and abuse experience multifaceted psychosocial problems ranging from social, dependency, polydrug use, educational, adverse social and health concerns; emotional; psychological and physical.

The early initiation of substance involves a complex process and ecological perspective where the gateway

hypothesis explains the use of legal to illegal; opportunistic due availability, personal centred vulnerability; genetic- personality trait, developmental, medical states, socially deviant behavior; social system- families or peers and transactional approaches- multiple risk factor. In another similar study conducted by Nkansah-Amankra (2020) on early polydrug use and polydrug progression, the results questions early drug use in adolescence as an accurate indicator of polydrug progression into adulthood. Age of onset of substance use and psychosocial problems among individuals with polydrug use disorders is associated with psychosocial issues (Kelly et al., 2018). The study had 221 participants diagnosed with SUD residing in treatment centres. A semi-structured self-administered questionnaire was used to assess the demographic characteristics and polydrug use patterns; a descriptive cross-sectional research design was used. The study used a drug use screening inventory -ra evised psychometric tool with the analysis done using descriptive and inferential statistics and multivariate linear regression for age onset. Findings indicate that age of onset was linked to social problems with17 years or lower for early onset and late onset at 18 years or higher. Early start of substance use is associated with a higher risk of psychosocial problems. This surrounds the family system, school, community; relationships, work behaviour patterns; work adjustment; late-onset (Kelly et al., 2018). Hence, advocacy as a prevention strategy would reduce initiation at this development stage.

Personality

According to Costa and McCrae (1985), there is a significant difference in personality dimensions; within each dimension of personality, there is a psychological state. Therefore, the two serve as predisposing factors to polydrug use addiction or nonuse. The five-factor model theory outlines five basic dimensions: personality traits, openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. The model supports that personality psychological states of impulsivity and sensation-seeking are risk factors for polydrug use or non-use. Personality type A reacts to daily frustration with an intense reaction than Type B. Type A possesses hostility and anger traits and is a risk factor for risk behavior and polydrug use. Psychological predisposition to the type of polydrug selected for use (Burger, 2015). Polydrug users with negative affect personality emotion traits experience psychological distress of anger and anxiety, risking polydrug use or non-use more than those with positive trait affect. Individual negative affect and negative personality emotion traits influence the selection of the psychoactive from either stimulants, opioids, depressants, or hallucinogens (Burger, 2015).

Specific personality state is associated with polydrug use. The study on specificity of personality relationships to particular forms of concurrent polydrug users among MAT patients supports its risk factor (Mahu et al., 2019), Canada. The study utilised 138 MAT patients; 65.9% were a male, mean age of 40.18 years. The Bayesian confirmatory factor analysis was used to ascertain the structural validity of the four-factor personality model of polydrug use risk factors and substance use risk profile scales personality scale linked to polydrug use within 30 days—latent hierarchal model analysis linked polydrug use to personality states. The tranquillizer is polydrug used by MAT patients with anxiety sensitivity personality states. Alcohol, cannabis and stimulants are polydrug used by MAT patients with sensation-seeking personality states. The MAT patients' psychological hopelessness is associated with current opioid use.

Results provide insight into the role of the individual differences in personality state patterns and the polydrug use (Mahu et al., 2019).

Individual differences in polydrug use relapse

Chen et al. (2019) conducted a study on polydrug use patterns and their impact on relapse among heroin-dependent patients in Shanghai, China, to understand the effects of polydrug use patterns on deterioration. The study was conducted among 564 heroin-dependent patients with five years of follow-up after completing the treatment data from the electronic medical record in the compulsory rehabilitation centres. A follow-up was made on 503 patients guided by their medical history. Baseline assessment involved addiction severity index, temperament, character inventory, medical outcome, and study social support scale upon discharge from rehabilitation. The secondary data of relapse results were retrieved from the medical electronic record system, and polydrug use patterns were analysed through latent classes. Cox regression model examined the association of latent classes in cohorts of alcohol polydrug13.7%, low poly-drug users 76.5%, amphetamine-type stimulants polydrug users 9.7% and heroin relapse. Therefore, the study identified individual differences in polydrug use patterns and a history of low heroin polydrug 76.5% among MAT patients predict heroin relapse risk (Chen et al., 2019).

Tolerance and polydrug use

Polydrug use of opioids while under MAT leads to overdose-induced respiratory depression due to tolerance (Bristol, 2019). According to the study, over time the pleasurable effect of polydrugs diminishes due to tolerance leading to increased dosage to achieve the pleasing effect and avoid withdrawals. The first dose of polydrug has a physiological effect. It takes a couple of weeks to become physically dependent on a polydrug, though there are individual differences. The polydrug used show individual differences and assessing personal reasons for enhanced co-morbidity and effects can inform MAT treatment. When polydrugs are taken on a regular basis by MAT patients, individuals risk becoming physically dependent and influence continued use and physiological adaptation (NIDA, 2019). The study provides an understanding of polydrug use and the mechanism of tolerance promoted informed case management of patients undergoing MAT.

The pleasurable effect

Opioid addiction is people's use of opioids psychoactive for non-medical use (UNODC, 2020b). The physiologic drives and the problem of opioid addiction have been known since science discovered their medical potential in the pain, cough, and diarrhoea management (NIDA, 2019). Heiskanen et al. (2019), while studying people on polydrug use, particularly opioids agonist remifentanil for non-medical in Finland, showed that they do so to experience an increased personal pleasure. The study examined the effects of remifentanil and naloxone on subjective emotional responses evoked by pleasant and unpleasant film clips. The study had 31 male volunteers aged 20-35years who completed a set of subjective emotional rating questionnaires. After this infusion of remifentanil, placebo and naloxone, ten films clip were seen in random order as they rated their experience of emotional and arousal. The study findings show that acute opioid administration change the range of emotions from responses to increasing the positive for remifentanil and decreasing the negative feelings toward Naloxone. These findings concur with NIDA (2019) that people suffering from opioid addiction use opioids to experience

pleasurable effects, reinforcing and encouraging repeat to achieve the same experience (NIDA, 2019). The study result implies that the opioids system mediates emotional responses to external stimuli.

Dependency

According to NIDA (2019), when patients undergoing MAT polydrug use heroin, it enters the brain and converts to morphine. It binds to and activates opioid receptors in the brain called Mu-opioids receptors (MORs). The human body has endorphins that bind the MORs receptors in the brain and the body to regulate pain, hormone release and feeling of well-being. Activated MORs in the brain's reward centre stimulate the release of neurotransmitter dopamine, influencing a reinforcement of heroin-taking behavior. The use of heroin inhibits the function of the endorphin in the brain and body. When the intake of opioids is reduced, patient experience withdrawal such flulike symptoms, restlessness, leg movements, headache, diarrhoea, muscle and bone pain, insomnia, vomiting, cold flashes with goose bumps, depression, itchiness and collapsed veins (Juergens, 2019). This is due to the reduced postsynaptic receptors and endorphins, the natural pain killers in the body.

Availability

A study by Tyree et al. (2020) on the trajectory of initiation for heroin-based drugs provide qualitative evidence from South Africa. The study found that the availability of alcohol and use of alcohol in the environment precedes the initiation of cannabis and use of heroin. Considering a sample of 30 men participants in residential heroin addiction treatment, semi-structured interviews were used to assess experiences of polydrugs of alcohol, cannabis, cigarette and heroin. The study implicates environmental and social structural influences on polydrug use initiation. With cigarettes and cannabis available within the environment, the participants who smoked cigarettes and cannabis were in close contact. Some distributed heroin, leading to the smoking of heroin and later influenced heroin polydrug use through injection.

In another study that used an online sample of 711 adults with past use of cannabis and alcohol, Dolan et al. (2020) found that alcohol is available, legalised and used in most societies. The study used identification tests for alcohol (AUDIT) and cannabis (CUDIT). Alcohol and cannabis were identified as complements to each other, and each has an independent use. When the price of one is increased, consumption of the two decreases. More so, when one price is fixed or lowered, the consumption of both is increased; hence polydrug use disorder is likely to occur (Dolan et al., 2020). Therefore, reducing the prices of polydrug used substances increase availability and use among patients undergoing MAT, while for complementary polydrugs, fixing the price in one or lowering the price in one increases the use of both. Therefore, concerted efforts are needed to control the availability, pricing and polydrug service.

Environmental factors

Jongenelis et al. (2019) assessed factors associated with polydrug use in adolescents. The study considered 1661 adolescent participants aged 15-18, 50.9% of whom were males. Data was collected with survey polydrug use over 30 days, with analyses done using weighted multiple-level logistic regression. The study established that environmental factors are risk factors influencing the initiation of alcohol, tobacco and cannabis polydrug use among adolescents. The major cause of polydrug use is the environment linked to polydrug use experience

(Keyes et al., 2020) on orchestrating opiate-associated memories in thalamic circuits in the United States. The study demonstrated that polydrug use environmental cues have memories and experiences associated through projections to the central nucleus of the amygdala and nucleus accumbens, which are part of the brain's limbic system. According to this study, the polydrug use is associated with memories which are formed and recalled by linked neural networks.

Relationship dynamic

Felitti et al. (2019) found the relationship between childhood abuse and house dysfunction in many of the leading causes of death in adults in Europe and adult risk behaviour of polydrug use. From the logistic regression analysis, findings indicate that the more the polydrug user experienced childhood abuse in many categories, they showed 4a to 12 folds increase in risk of polydrug use. Furthermore, the evaluated adverse childhood experiences are closely linked, and the more they experience the healthier risk factors in adulthood.

The study on the relationship dynamic in the context of polydrug use by Mimiaga et al. (2019) in the United States, found that individual relationships and structural level factors cause polydrug use. The study had 320 participants aged 18 to 68 years with a mean age of 35.9 years, same-sex couples, baseline data and an audio computer-assisted self-interview system during baseline enrollment visits. The data focused on social demographic, polydrug use and individual relationship quality and analysed Multinomial logic regression for which 62.2% reported polydrug use, cannabis included. Same-sex couples require support to reduce polydrug use and improve mental health.

In another study by Gilchrist et al. (2019) on the interplay between polydrug use and intimate partners' violence perpetration, a meta-ethnography, United Kingdom, it was found that partners' violence perpetration has contextual levels and has individual differences among perpetrators and survivors. The study used a qualitative method, screening 7654 abstracts with an indicator of heterosexual; 26 qualitative studies used 219 male perpetrators and 365 female survivors. The data were synthesized to develop a ground theory to help categorize them into interpretative order based on differences and similarities. The six themes formed risk factors thus: withdrawal and addiction, psychological vulnerabilities, intoxication, power and control, and impact on the relationship. The survivors cited their partners' experience of irritability and frustration during withdrawal due to craving heroin, alcohol, and stimulants. The study established that violence emerges when money is unavailable to support polydrug use. Therefore, survivors may procure money to support polydrug use to reduce intimate partners' violence resulting in increased polydrug use and addiction.

Socio demographics

The patterns of alcohol use among MAT patients for cocaine and heroin in England, Spain and Brazil (Radcliffe et al., 2019) identified various demographics associated with harmfully polydrug alcohol use. This included homelessness, unemployment or receiving benefits. In addition, a study by Barocas et al. (2019), conducted on socio-demographic factors and social determinants associated with toxicology, confirmed polydrug opioid-related deaths in the United States. The study found that multiple socio-demographic characteristics are linked to the ends. The study results reported 2244 opioid-related deaths among those aged 24

and older due to toxicology. The multinominal logical regression model identified the deaths because of polydrug use with opioids only, opioids and stimulants and other non-stimulants polydrugs. The associated factors were non-rural, co-occurring disorders, homeless, barriers to healthy and lack of social determinants of health.

In another study, the modifiable socio-demographic factors associated with uptake MAT among 110 study participants in low-income urban settlements, Kenya, included age 21-67 years, mean age 36.1years with 73% men representation, 72% unmarried respondents, 58% having a primary level of education 55% unemployed (Wambugu, 2019). The study used binary logistic regression to analyse demographic factors associated with PDU and MAT uptake. The findings revealed age, gender, marital status, education level and employment status at P<005. According to Kelly et al. (2018), demographics influencing polydrug use, age, gender, occupation, current types of polydrug use, frequency of use, mode of use and relapse history were the significant factors.

Adulteration of psychoactive drugs

Adulteration of illegal psychoactive substances in the illicit market has evidenced statistical trends. The practice is changing with the New psychoactive substances (NPS) being used as adulterants (Minutillo et al., 2019). The study speculates that the adulated NPS leads to increased toxicity in the illicit market. Zaami's (2019) findings on the new NPS support cooperation and common legislative answers for stemming a growing health hazard in Italy. According to the study, the availability of legal NPS at the time of distribution in the illicit markets poses a health threat to polydrug users. The NPS poses threat due to toxicity in a minimal quantity. There is a need for concerted efforts and common legislative answers to overcome the fight against NPS due to the growing health hazard.

Spiritual and Existential well -being

In a study conducted by Jongenelis et al. (2019), it was found that depression and anxiety disorder co-occur with polydrug use. Quality of life is lost due to polydrug use's harmful and addictive nature (American Addiction Center, 2020a). Hiebler-Ragge et al. (2020) found a relationship between existential wellbeing and mood-related psychiatric disorders. The cross-cultural validation study found the importance of attachment and spirituality for mental health. Study participants were 443 (31%) females with an age range of 18-30 years randomly sampled. Using a structured questionnaire, data were collected, after which a regression analysis depicted socialization as influencing the development of attachment and spirituality and existential. The study cites existential well-being as hope for a better future, forgiveness and experience of sense and meaning. The virtual lack in life has a compensatory relationship between mental illness and attachment. Therefore, spiritual and existential factors such as avoidant and anxious attachment, religious, existential well-being, mood, psychiatric burden, depression and anxiety influence relationship and wellbeing (Hiebler-Ragger et al., 2020).

Perceived experiences of polydrug use

A recent study by Tarlor (2020) on concurrent polydrug use behaviour among Opioids using adults for perceived life satisfaction and influencers in India showed a significant positive relationship between adverse childhood experiences, employment and education status

and concurrent polydrug use. The study used a cross-sectional design, a self-reported survey with 538 emerging adults under opioid use. The study-controlled socio-demographic, mental diagnosis, adverse childhood experience, and other covariates and results were analysed through binary logic models to assess the emerging adult's life satisfaction, parental and peer life influencers. Young adults with low levels of perceived happiness and life enhancers used one other substance, opioids and 3 gateway drugs, while those with high levels use opioids and 3 gateway drugs. Low levels of life satisfaction were associated with homosexual orientation, and adverse childhood experiences, and increased concurrent polydrug use (Tarlor, 2020). Therefore, case management among patients in MAT needs to address various aspects of the MAT patients' life to reduce polydrug use.

Quality of life and polydrug use

Polydrug use changes physical structure and the physiology of the brain (NIDA, 2019). This creates an imbalance in the central nervous system in the neuronal and hormonal systems that are not easily reversed. Heroin addiction affects the brain's white matter, which may affect decision-making abilities, ability to regulate behavior and stress tolerance. Patients with polydrug use addiction give up other things in their life. Additionally, the use impacts health, and their relationship and life revolve around the use. Heroin polydrug use affects the MAT patients' physical and mental health, resulting in social and legal consequences and loss of quality of life due to its harmful and addictive nature (American Addiction Center, 2020a). The polydrug user who injects heroin risks getting blood-borne virus infection, HIV, hepatitis B and C and some die due to overdoses (National Center for Biotechnology Information, 2020a). Some side effects include nausea and vomiting, grogginess, confusion, dry mouth, itched skin, miotic or constricted pupils, light sensitivity, lower body temperature, slowed respiration and heart rate and cyanotic or bluish hands and feet lips. Suicidal ideation is associated with a combination of opioids and alcohol use (Winstanley et al., 2020).

Medical condition and polydrug use

The study findings by Radcliffe et al. (2019) suggest that MAT patients' history of hepatitis C and seropositive health issues were the causal factors for the harmful polydrug alcohol use in England, Spain and Brazil). The study findings agree with Mimiaga's et al. (2019) results on the strong relationship between polydrug use and HIV among men who have sex with men. Post-operative administration can potentially cause opioid polydrug dependency despite the augmented solid and weak properties (Heiskanen et al., 2019). In the medical setting and licensed drug outlets, poor opioid stewardship results in diversion and is associated with opioid dependence in the community. Opioids are administered to target the endogenous opioids system, which regulates pain and pleasure. It also impacts mood regulation, increases positive mood, and reduces negative feelings of fear and anger. Hence, short-term use of opioids like remifentanil increases emotional response to external stimuli, which emotional arousal remains unchanged (Heiskanen et al., 2019). This study's findings provide insight on how first opioid use experience during postoperative results in OUD and polydrug use.

Co-occurring Mental Disorders

According to SAMHSA (2020), patients with Polydrug use disorder (PUDs) are more likely than those without PUDs to have a co-occurring mental disorder (CODs).

During MAT intervention encountering patients with CODs is expected as most co-occur with addiction. The mental disorders co-occurring with addiction include posttraumatic stress disorder, depressive disorders, Bipolar 1 disorders, personality disorders, anxiety disorders, Schizophrenia and other psychotic disorders, attention deficit hyperactive disorder, and feeding and eating disorders. In a study carried out by Jongenelis et al. (2019), it was found that depression is a co-occurring disorder with polydrug use. Furthermore, the study identified conduct disorder as a co-occurring disorder among adolescents in polydrug use.

A study by Maremmani et al. (2019) on MAT of dual disorder among heroin use disorder patients in Italy proposed that what should be treated first is Polydrug use or co-occurring Mental illness. Co-occurring mental illness (COD) provides a protocol for treating CODs and correlated risk factors from a neuroscience perspective for creating awareness and shared understanding. Data collected from dual disorder patients in MAT formed six themes: personality, anxiety, psychotic, mood, alcohol, and violence treatment. The study findings suggest treating the polydrug use disorder to stabilise MAT patients; thus, anti-depressant use as ancillary to MAT, antipsychotic use to acute phase only and use of mood stabilizers and no use of benzodiazepine. Comorbid psychiatry disorders influence MAT treatment outcomes (MacNeill et al., 2019).

Methadone dosage

As indicated by Wagner et al. (2018), after following up, without secondary polydrug use, MAT treatment was associated with reducing primary drug use. When the MAT client missed the methadone dose, the secondary polydrug use of cocaine and methamphetamine was associated with increased primary heroin use. According to Wang et al. (2017), secondary polydrug use modifies and challenges MAT treatment outcome and its effectiveness for OUD among primary heroin, cocaine, and methamphetamine users. Therefore, MAT patients require periodic close screening and assessment for non-prescribed benzodiazepines, fentanyl, and cannabis (Wambugu, 2019). Polydrug abuse among opioid maintenance in MAT patients is related to the inadequate dose of maintenance treatment medicine (Heikman et al., 2017). The study conducted in Finland used 60 patients, through a retrospective register-based, undergoing Methadone or buprenorphine /naloxone treatment to assess adequate or inadequate dosing experiences by patients with the exact same dosing. Polydrug use was identified through urine screening, and results indicated that insufficient dosage was associated with withdrawal and carvings for opioids.

Furthermore, the study found benzodiazepine, opioids, Cannabis, NPS, amphetamines and psychoactive medicines with no prescription. It is worth noting that inadequate dosing increases benzodiazepines and amphetamine polydrug use, and NPS and other non-medical psychoactive substances (Heikman et al., 2017). Consequently, individual differences occur with standardized dosing; hence individual dosage titration is necessary for an individualized pharmacological standardization and therapeutic experience.

Coronavirus disease (COVID -19) and polydrug use

MAT patients, especially those who receive their therapy daily, are affected by the current Covid-19 Pandemic. Field Alexander et al. (2020) review on novel coronavirus (COVID -19) and MAT posits that COVID-19 has affected American life and other patients

worldwide despite the social distancing, lockdown, isolation, quarantine rules and regulations. According to Alexander et al. (2020), the patient surrogate may occur among MAT patients with persistent polydrug and severe mental illness. With the patients' consent and vetted by the MAT staff for pick, secure, supervision and home dosing, automating daily dosing and visual recording through technology may help. Case management and linkages are needed during and post COVID-19 to mitigate social and economic constraints, dropout, and reduce polydrug use and relapse. Though the impact has affected everyone, a more significant impact has been felt by millions of American patients with OUD. These patients are vulnerable and marginalized in MAT as they depend on face-to-face dosing in the designated clinics. COVID-19 threatens the disruptions of MAT access and care on daily observed dosing. SAMHSA has mitigated the COVID 19 challenge by giving new guidelines that allow MAT patients to access and use take-home MAT Protocols and remote services. The new SAMHSA guideline may, however, risk an increase in non-medical use of methadone and polydrug and lead to death due to overdose. Consequently, there is a need for prescribed naloxone, increased telehealth services and discretion when sharing protected MAT health information with other mental health providers.

III. METHODS

In addressing the main aim of this study, a quasi-experiment research design was utilized for control and experimental groups. Data collection was done through a mixed methods approach which utilized employed quantitative and qualitative data (Nardi, 2018) from the MAT patient respondents. The independent variables in the treatment group were manipulated against dependent variables, measurement, comparison, and control group in the selected MAT treatment clinics, where patients seek daily MAT health care. The strategy controlled confounding variables that could influence the independent and dependent variables. The quasi-experimental research design entailed a pre-and post-test approach in which the dependent variable (polydrug use) was measured once before a Motivational Interviewing (MI) treatment and after implementing the MI treatment. The study design facilitated the identification of differences between treatment and control with a homogeneous group of participants. Consequently, relatively small sample size was used.

The study was carried out in selected MAT clinics A and B in Nairobi County, with a high rate of opioid use prevalence (Rhodes & Rhodes, 2018; Nation newsplex, 2018). The study targeted 2121 patients with opioid addiction and Polydrug use under MAT treatment. MAT Clinic A produced 1207 and B 914 MAT (Study sites clinical records (2020). Participants were then selected through secondary MAT clinical records for demographic, polydrug use history, medical and family, and personal polydrug use history, after which a psychometric tool for quantitative data and MI in a representative sample from the MAT population were administered. The study sample was identified from the clinical records drawn from study sites A and B, 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)

n=2121/ (6.3025)

n=336

The sample size of 336 MAT patients was obtained from both study sites 1 and 2. However, the inclusion and exclusion criterion depicted in Table 1 was followed to include only patients who meet the study inclusion criteria. Through systematic random sampling at an interval of eight patients, the respondents were selected from the desired sample size of 336 to attain the study sample size n = 120 at a 95% confidence interval. Questionnaires (Time follow-back (TLFB) psychometric tool) were used for data collection. Data analysis was conducted using the Statistical package for social sciences (SSPS) and presented descriptively in the form of charts.

This paper assesses the causes of polydrug use among patients undergoing Methadone Assisted Therapy. These causes were identified from the Bio-psychosocial spiritual factors, family social histories, personal histories, spiritual and existential factors, self-determination factors, and social learning factors.

IV. RESULTS

A. Causes Of Polydrug Use from MAT Patients Clinical Record

The study established causes of polydrug use among patients undergoing Methadone assisted Therapy cut across biological and genetic factors, family social histories, Personal histories and spiritual and existential factors. The findings are shown on table 1 below.

Table 1:

Causes of Polydrug Use

Biological and genetic
Evidence of MAT patients on Psychiatry medication
Evidence of any chronic illness
Evidence of not going through planned psychotherapy
Evidence of MAT patients ever been tested for polydrug use
Family Social Histories
Who do the MAT patients live with
One Parent
Both Parents
Guardian
Partner and Children
Alone
History of polydrug use in the family
Any of the siblings in MAT?
Any of the Siblings in polydrug use?
Legal History in the family
Personal Histories
If married is the partner in MAT
If married is the partner in polydrug use
Does the MAT patient have any children
Good evidence of MAT support from MAT patients' significant others
Spiritual and Existential
How did the MAT patient get into MAT?
Referral from drop-in centers
Seek treatment through drop-in centers
MAT patient Forensic history

B. MAT Patients Biological /Genetic Factors and Polydrug Use

Correlation of Biological/Genetic factors

A Pearson correlation was performed to determine if there is a significant relationship between polydrug use and biological, genetic factors. The results showed that there is a significant correlation at the 0.05 level (2-tailed) between polydrug use and biological genetic factors. This is an indication that biological/genetic factors significantly affect polydrug use. The results are shown in Table 2.

Table 2:

Correlation Analysis of Polydrug Use and Biological Factors

		Biological	Polydrug Use
Biological	Pearson Correlation	1	**-.195***
	Sig. (2-tailed)		.033
	N	119	119
Polydrug Use	Pearson Correlation	**-.195***	1
	Sig. (2-tailed)	.033	
	\N	119	120

*. Correlation is significant at the 0.05 level (2-tailed).

C. Regression Analysis Between Polydrug Use and Biological Factors

A linear regression analysis was done to find out the extent to which biological factors influence polydrug use among MAT patients. The results from model summary show that R square is 0.038, meaning that the independent variables could only explain 3.8% of the variation in Polydrug use. The results are as shown in Table 3.

Table 3:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.195[a]	.038	.030	.23272

a. Predictors: (Constant), Biological

D. Biological/Genetic Factors and Polydrug Use

The results MAT patients biological, genetic factors and polydrug use from the ANOVA table are shown in Table 4. The ANOVA Table further showed that the independent variable, biological factors have a significant linear relationship with the polydrug use (p = 0.033).

Table 4:

Biological /Genetic Factors and Polydrug Use

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.252	1	.252	4.646	.033[b]
	Residual	6.337	117	.054		
	Total	6.588	118			

a. Dependent Variable: Polydrug Use
b. Predictors: (Constant), Biological/genetic

E. Regression Analysis of Biological Factors and Polydrug Use

The analysis of the coefficients was done to indicate the actual effects of the independent variables on polydrug use. The results on biological factors are shown in Table 5 below. The analysis performed for the coefficients indicates the effect of the independent variables on polydrug use; thus, Y = 1.426 + 0.172 X1. The model shows that by increasing biological factors by one unit, polydrug use increases by -0.238 units. The t-test further

reveals that the negative effect of biological /genetic factors on polydrug use is statistically significant (t = -2.155, p = 0.033).

Table 5:

Regression Coefficients Result in Biological Factors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.426	.172		8.310	.000
	Biological	-.238	.110	-.195	-2.155	.033

a. Dependent Variable: Polydrug Use

F. Family Social Histories

Correlation between Polydrug use and Family Social Histories

A Pearson correlation test was done to investigate if there is a significant relationship between polydrug use and family social histories. The results are presented in Table 6. The results showed no significant relationship between polydrug use and family social histories. This means the MAT patients family social histories alone does not influence polydrug use.

Table 6:

Correlation Between Polydrug Use and Family Social Histories

		Family Social Histories	Polydrug Use
Family Social Histories	Pearson Correlation	1	.108
	Sig. (2-tailed)		.457
	N	50	50
Polydrug Use	Pearson Correlation	.108	1
	Sig. (2-tailed)	.457	
	N	50	120

G. Personal Histories

Correlation between Polydrug use and Personal Histories

A Pearson correlation test was done to investigate if there is a significant relationship between polydrug use and personal histories, as presented in Table 7. The results showed no significant relationship between polydrug use and personal histories. This means the MAT patients personal histories alone does not influence polydrug use.

Table 7:

Correlation Between Polydrug Use and Personal Histories

		Personal Histories	Polydrug Use
Personal Histories	Pearson Correlation	1	-.273
	Sig. (2-tailed)		.107
	N	36	36
Polydrug Use	Pearson Correlation	-.273	1
	Sig. (2-tailed)	.107	
	N	36	120

H. Spiritual and Existential Factors

Correlation Between Polydrug Use and MAT Patient Forensic History

A Pearson correlation was done to investigate if there is a significant relationship between polydrug use and MAT patient forensic history. The results showed a significant correlation at the 0.05 level (2-tailed). This indicates that MAT patients' forensic history significantly affects polydrug use. The results are shown in Table 8.

Table 8:

Correlations Between Polydrug Use and MAT Patient Forensic History

		MAT patient Forensic History	Polydrug Use
	Pearson Correlation	1	.234*

MAT patient Forensic History	Sig. (2-tailed)		.012
	N	114	114
Polydrug Use	Pearson Correlation	.234*	1
	Sig. (2-tailed)	.012	
	N	114	120

*. Correlation is significant at the 0.05 level (2-tailed).

I. Regression Analysis Between Polydrug Use and MAT Patient Spiritual/Existential

A linear regression analysis was done to investigate the extent to which biological factors affect polydrug use. The results from the model summary shows that the R square is 0.055, meaning that the independent variables could only explain 5.5% of the variation in polydrug use. The results are shown in Table 9.

Table 9:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.234[a]	.055	.046	.23546

a. Predictors: (Constant), MAT patient Forensic History

J. MAT Patients' Forensic History on Polydrug Use

The ANOVA test was done to show further the significance of the relationship between MAT patients' forensic history and polydrug use, as depicted in Table 10. The ANOVA table showed that the independent variable, MAT patients' forensic history has a significant linear relationship with polydrug use (p = 0.012).

Table 10:

ANOVA Test Results of MAT Patients' Forensic History on Polydrug Use

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.360	1	.360	6.502	.012[b]
	Residual	6.210	112	.055		
	Total	6.570	113			

a. Dependent Variable: Polydrug Use
b. Predictors: (Constant), MAT patient Forensic History

K. Regression Coefficient Results for Patients' Forensic History

The analysis of the coefficients was done to indicate the actual effects of the independent variables on polydrug use. The analysis on the coefficients table indicates the effects of the independent variables on polydrug use as shown below: Y = 0.887 + 0.072 X1. The model suggests that increasing MAT patients' forensic history by one unit increases polydrug use by 0.113 units. The t-test further reveals that the positive effect of MAT patients' forensic history on polydrug use is statistically significant (t = 2.550, p = 0.012). The results are shown in Table 11.

Table 11:

Regression Coefficient Results for Patients' Forensic History

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	.887	.072
	MAT patient Forensic History	.113	.044

a. Dependent Variable: Polydrug Use

L. Correlation Between Polydrug Use and Self-Determination

A Pearson correlation test was done to establish a significant relationship between polydrug use and self-determination. The results are presented in Table12.

Table 12:

Correlation Between Polydrug Use and Self-Determination

		Self determination	Polydrug Use
Self determination	Pearson Correlation	1	**-.014**
	Sig. (2-tailed)		.900
	N	83	83
Polydrug Use	Pearson Correlation	**-.014**	1

	Sig. (2-tailed)	.900	
	N	83	120

M. Correlation Between Polydrug use and Demographic Variables

A Pearson correlation was done to investigate if there is a significant relationship between polydrug use, missing MAT dosage and history of polydrug use within the MAT patient family. The results showed a significant correlation at the 0.05 level (2-tailed) between polydrug use, missing MAT dosage and history of polydrug use. This indicates that MAT dosage and history of polydrug use within the MAT's patient family significantly influence polydrug use.The results are shown in Table 13.

Table 13:

Correlation Between Polydrug Use and Demographic Variables

		Polydrug use?
History of polydrug use within MAT patient's family	Pearson Correlation	.152
	Sig. (2-tailed)	.134
	N	99
Missed MAT dosage	Pearson Correlation	.234*
	Sig. (2-tailed)	.019
	N	101

***. Correlation is significant at the 0.05 level (2-tailed).**

N. Regression Analysis Between Demographic Variables and Polydrug Use

A linear regression analysis was done to investigate the extent to which demographic variables affect polydrug use. The results from the model summary show that the R square is 0.068, meaning that the independent variables could only explain 6.8% of the variation in polydrug use. The results are shown in Table 14.

Table 14:

Regression Analysis between Demographic Variables and Polydrug Use

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.260[a]	.068	.046	.26301

a. Predictors: (Constant), MAT patient miss Methadone dosage at times due to polydrug use, History of polydrug use within MAT patient's family

O. ANOVA Test Was Done to Show the Relationship Between MAT Patient Missing Methadone Dosage at Times on Polydrug Use

The ANOVA table further showed that the independent variable, MAT patient missing Methadone dosage at times due to polydrug use and history of polydrug use within MAT patient's family have a significant linear relationship with polydrug help (p = 0.047). The results are shown in Table 15.

Table 15:

ANOVA test Result of MAT patient missing Methadone dosage at Times on Polydrug Use

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.775	.137		5.680	.000
	History of polydrug use within MAT patient's family	.077	.068	.120	1.138	.258
	MAT patients miss Methadone dosage at times due to	.134	.066	.212	2.019	.047

	polydrug use

a. Dependent Variable: polydrug use

P. Effects of MAT Patients Missing Methadone Dosage on Polydrug Use

The analysis on the coefficients table indicates the effects of the independent variables on polydrug use as below: Y = 0.775 + 0.137 X1. The model suggests the following: increasing the history of polydrug use within a MAT patient's family by one unit increases polydrug use by 0.077 units; increasing missing MAT dosage by one team increases Polydrug use by 0.134 units. The t-tests further reveal that the positive effect of history of polydrug use within MAT patients' families and missing MAT dosage on polydrug service is statistically significant (t = 1.138 and p = 0.258, t = 2.019 and p = 0.047), respectively. Methadone-assisted Therapy patients self-report revealed the following reasons as to why they use polydrug as listed by the respondents: "to prevent withdrawals (arosto), to reduce cravings, to relax, to sleep very easily, to increase appetite, to relieve stress, to stay calm, to get high, a habit, idleness/boredom, to calm down." When asked the same question, one respondent stated, "After MAT, there is always a gap that has to be filled either by heroin or marijuana/cannabis whereby if it is not done, withdrawals (arosto) will remain with you." When the respondents were asked what causes them to start using polydrugs once more after attempting to stop, the following reasons were highlighted: cravings, lack of sleep, withdrawal symptoms such as headache, stress, trauma, losing a source of income, family-related problems, separation from the significant other, influence from friends and significant other. One respondent highlighted, "unavailability of counselling as planned psychotherapy rarely takes place contributes to substance use and abuse." The researcher also noted: that MAT patients living alone highlighted legal history in the family, missed MAT dosage and had significant others in the MAT program who were heavily involved in polydrug use. The results are shown in Table 16.

Table 16:

Regression Coefficient Results of MAT patient missing Methadone dosage

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	.775	.137
	History of polydrug use within MAT patient's family	.077	.068
	MAT patients miss Methadone dosage at times due to polydrug use	.134	.066

a. Dependent Variable: polydrug use

V. DISCUSSION

Based on this objective, the study findings revealed that MAT patients' biological factors, spiritual and existential factors, history of polydrug use within MAT patients' families and MAT patients' missing Methadone dosage due to were statistically significant; hence causes of polydrug use.

Biological and genetic factors

There is a significant relationship between polydrug use and biological and genetic factors at P=0.033. The study established that craving is one of the top reasons behind MAT patients being on polydrug service while undergoing MAT. This means that the more MAT patients crave these drugs, the more they use polydrugs. The findings are supported by Navidian et al. (2016) on polydrug craving, who argue that objective experience denotes the desire for polydrug use and has psychological effects that generate the motivation for polydrug use. The study findings from one MAT patient's self-report revealed the use of polydrugs to 'kill

boredom,' the findings concur with Dingel et al. (2019) results that support that MAT patients' perceptions influence polydrug use. The genetic understanding of addiction is consistent with this study's findings that found a strong significant relationship between polydrug use and family social histories grounded by this study's bio-psychosocial theory.

The study findings established withdrawal (aristo) as one of the top reasons behind MAT patients' polydrug use while undergoing the MAT. The departure signals physiological polydrug use dependency of the chosen psychoactive drug. From the current study findings, one of the most common polydrugs used by both treatment and control groups is heroin to manage withdrawal. Results from NIDA (2019) provide an understanding of MAT patients' withdrawal experiences, that heroin intake stimulates the release of the neurotransmitter dopamine, influencing a reinforcement of heroin-taking behaviour. MAT patients' use of heroin inhibits the function of the endorphin in the brain and body. When the intake of opioids is reduced, MAT patients experience withdrawal symptoms. Juergens (2019) confirms this study's findings that MAT patient withdrawal due to the reduced postsynaptic receptors and endorphins, the natural pain killers in the body. Social learning theory (SLT) by Bandura (1977) explains this study's findings on the causes of MAT patients' polydrug use in the principles of reinforcement, extinction and shaping of polydrug use. When MAT patients experience withdrawal symptoms, they use polydrugs to reduce them, reinforcing the polydrug use behavior. Burger's (2015) findings support the current study findings that polydrug users' brain systems are noted to be highly motivated to seek out and achieve pleasurable goals. Therefore, the biological and genetic perspectives explain the cause of polydrug use among MAT patients. The study found a history of polydrug use within MAT patients' families at $p = 0.258$. Increasing history of polydrug use within MAT patient's family increases MAT patients' polydrug use. The findings are supported by Dingel et al. (2019). Different polydrug users have a background with geneticization effect of family history of opioid addiction. In this case, such MAT patients view their polydrug use from a genetic lens and those without family history use this claim to reject the notion. NIDA (2019) supports this study's findings on the science behind opioid addiction and cites genetic vulnerability with specific genes responsible for nucleus accumbens (NAc) regulated heroin addiction. Results on the history of polydrug use within the MAT family significantly influence MAT patients' family polydrug use through observation and modelling learning.

The social learning theory supports that polydrug use is learned through observation and modelling; hence MAT patients may observe polydrug use and polydrug use reduction behaviours from others with thin the family and adopt similar strategies. Therefore, the study advocates personalised therapy among MAT polydrug users with various polydrug addictions.

Spiritual and existential factors

Study finding established that MAT patients' forensic history of 43.30% ($n = 52$) have a significant linear relationship with MAT Polydrug use $p = 0.012$. This means that increasing MAT patients' rise in forensic history polydrug use. Findings from MAT patients' clinical records and self-reports of criminal activities are high, and polydrug-related incarceration is common. Polydrug use withdrawal influences illegal activities; one

participant self-report noted, "I need to build back trust with my community and avoid getting involved in criminal activities." The general feedback from MAT patients' self-reports reveals that "the demand to maintain the polydrug use is high against limited resources forcing them to steal to purchase polydrug of their choice." The current study found that two MAT patients from the control group with no MI did not participate in the online assessment and were under the legal systems. In support of these findings, criminal activity reduction is supported by SAMHSA (2020b), a report whose results indicate that MAT combined with MI reduce illegal activities and improves wellbeing.

The current study findings established that MAT patients worked on casual jobs, and when not engaged, they experience idleness/boredom; others mentioned trauma, losing their sources of income, having negative thoughts, family-related problems and separation, which trigger existential concerns and induce crisis and anxiety that further activate polydrug use.

The study findings on MAT patients' negative experiences are hoed by Jongenelis et al. (2019) findings that depression and anxiety disorder co-occur with polydrug use. Hiebler-RaggeHiebler-RaggeHiebler-RaggeHiebler-RaggeHiebler-Ragge's et al. (2020) found a relationship between existential wellbeing and mood-related psychiatric diseases. Hiebler-Ragger et al. (2020) support this study's finding on existential well-being as hope for a better future, forgiveness and experience of sense and meaning. When the virtual is lacking in life, there is a compensatory relationship between a mental illness such as polydrug use and attachment. Current study findings agree with Field Hiebler-Ragge et al. (2020) findings that revealed that MAT patients living alone were n = 57, from self-reporting their homes at a tender age. Therefore, in support of this study Yalom (1980) echoes that MAT patient's polydrug use is an expression search for human freedom. Current study findings from MAT patient's self-report indicated that if they reduced polydrug use, they report they would experience "self-control, confidence, assertiveness and self-regulation." Yalom (1980) supports current findings that MAT patients need to reduce polydrug use to share their fullest potential in the here and now.

Missing MAT dosage

The study finding confirms that missing MAT dosage influence polydrug use. Wang et al. (2017) concur that when MAT patients miss methadone dose, it increases primary polydrug use. The current study found that MAT patients miss Methadone dosage at times due to polydrug use, and history of polydrug use within MAT patients' families has a significant linear relationship with polydrug help ($p = 0.047$). This means increasing the account of polydrug use within a MAT patient's family, increasing polydrug use and missing MAT dosage. At three months follow up, this study found a reduction in the number of MAT patients from the treatment group missing their MAT dosage associated with MI and an increase in several MAT patients from the control group missing their MAT dosage associated with no MI.

Missing MAT dosage results in polydrug use, which reduces the effect of MAT that is capable of addressing the withdrawal, craving, improved client, good grooming, appetite and sleep patterns (Center for Disease Control and Prevention [CDC], 2020b). The study findings established that apart from MAT missed dosage, an inadequate dose of MAT influences polydrug use among MAT patients, supported by Heikman et al.

(2017) findings. The study findings from MAT patients self-report when asked what they needed to achieve their plans of polydrug reduction from MAT clinic, one of the participants mentioned, "I need constant MAT dosing, guidance on MAT dosing and weaning off counselling." The study findings from the MAT patient self-report established a desire for "frequent polydrug use testing and screening" that formed part of the needed support plans for MAT patients to reduce polydrug use; the regular screening and assessment for polydrug use support plans are consistent with Wambugu's (2019) findings.

The study findings on the causes of polydrug use were drawn from MAT patients' clinical records. This was a challenge as some information was missing from biodata, family history, personal history, current psychosocial history, drug screening and testing history and brief engagement during MI. However, chronic illness, psychiatry illness and MAT dosage, cessation history, dropping out of MAT and loss to follow-up were currents. The study strategy limited the expression of the lived experiences on causes of polydrug use among MAT patients through interactive history taking, which could have yielded valuable data.

VI. CONCLUSION

The biological factors, spiritual and existential factors, history of polydrug use within MAT patients' families and MAT patients' missed Methadone dosage due to polydrug use were statistically significant. Factors that influence polydrug use include:

a) Genetic and biological influence and maintain MAT patients polydrug use psychoactive drugs that reduce craving and withdrawal, provide relaxation and induce sleep. History of polydrug use within MAT patients' families through genetic predisposition is a risk factor for polydrug use and social learning of polydrug use.

b) Spiritual and existential factors have a relationship with MAT patient forensic history about polydrug use, are linked to working as casuals, loneliness, and trauma associated with existential anxiety.

VII. RECOMMENDATIONS

Causes of Polydrug use among patients undergoing Methadone Assisted Therapy

a) Creating awareness and advocacy on the biological and genetic, social, personal, spiritual, and existential factors that risk MAT patients to polydrug use by the MAT clinicians to help them make rational decisions on polydrug use reduction

b) Reintegration to increase MAT patients' support system and regular monitoring and evaluation of patients' MAT dosage, MAT dosing, missing MAT dosage guided by the feedback from MAT patients' experiences and not a predetermined MAT dosing review date by the MAT clinicians to filtrate the individual MAT dosage to reduce polydrug use.

c) A policy to decriminalize MAT patients' forensic acts in pursuit of polydrug and subsequent incarceration instead of seeking MAT treatment by the justice system to reduce polydrug use, increase adherence and retention, increase MAT treatment positive outcomes, reduce criminal activities, increase employability opportunities through MAT Clinic partnership to promote the MAT patients on cessation and those weaned off by the Ministry of Health, County government, MAT Administrators, public and private organization, and small and medium-sized enterprises to reduce polydrug use.

VIII. SUGGESTIONS FOR FURTHER

a) A study evaluating polydrug use differences among MAT patients regarding their gender, age, level of education, employment, religion, marital status, wellbeing against MAT dosage, duration in MAT, the types, quantity, and frequency of polydrug use against gender and MAT partners should be conducted.

b) A study assessing causes of polydrug use through interactive history, the MAT patient individual differences among patients undergoing MAT and how personality trait is associated with the preferred types and continual use of polydrug.

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