RISK FACTORS ASSOCIATED WITH RELAPSE FOLLOWING TREATMENT OF THE FIRST EPISODE OF SUBSTANCE INDUCED PSYCHOSIS: A REVIEW OF SECONDARY DATA AT MATHARI NATIONAL AND REFERRAL HOSPITAL.

By

Emmanuel A. Amadi [H58/12250/2018]

A research project submitted for the Program Master of Medicine in Psychiatry.

School of Medicine, Department of Psychiatry

University of Nairobi

DECLARATION FORM

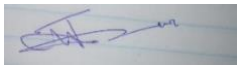
The work I have submitted is my own effort. I certify that all the material in this Research project, which is not my own work, has been identified and acknowledged. No materials are included for which a degree has been previously conferred upon me.

Signed  Date

Emmanuel Amadi 30th July, 2021.

Supervisor (s)

Dr. Fredrick R. Owiti Signed 

Dr. John M Mburu Signed 

DEDICATION

I dedicate this work to my family, friends and colleagues.

ACKNOWLEDGEMENTS

I express my gratitude to the Almighty God for granting me the strength and good health while undertaking this research.

I also wish to extend my sincere gratitude to my supervisor, Dr Fredrick Owiti and Dr John Mburu for their professional support and guidance offered me through the whole process.

I will forever be indebted to my family, Ebenezer Amadi, Esther Alenga and Edward Alenga, and friends who more or less family, The Ololia's and the Dundo's family who made it possible through their great and unwavering support. To Joy Nyabuto, your support was special, I'm forever grateful.

In addition, I thank all Lectures in all modules; they were all instrumental in moulding and refining my skills to even be an astute student in life.

Finally, I thank all my course colleagues for their encouragement, team work and moral support.

LIST OF ABBREVIATIONS

AIPD - Alcohol-induced Psychosis Disorder

DALYs - Disability Adjusted Life Years

FEP - First episode psychosis

MNTRH - Mathari National Teaching and Referral hospital

PPD - Primary psychotic disorders

SIP - Substance-induced psychosis

SIPD- Substance-induced psychosis Disorder

THC - Tetrahydrocannabinol

UNODC – United Nations Office on Drugs and Crime

WHO - World Health Organization

OPERATIONAL DEFINITIONS

- First Episode Psychosis is a perceptual derangement that occurs for the first time associated with substance use.

- Substance induced psychosis are hallucinations and/or delusions caused by intoxication or withdrawal from a substance.

- A Relapse was considered as to have occurred by the number of admissions one has due to substance induced psychosis.

Table of Contents

ABSTRACT

Introduction: Sustained use of substances increases the risk of developing psychosis distinct from primary psychotic illnesses making it a unique challenge that is tangible due to addiction. Certainly, the necessity to arrest this menace at the first episode is crucial to the mental health of the patient because of the complexities that arise with relapses. The addictive nature of the illness and the complications thereof such as psychosis have had an impact not only on the patient but as well as the caregivers and the health workers. Whilst the first psychotic episode's course may not be too severe, a relapse may lead to a non-remission of the psychosis exposing one to a more severe form of psychosis such as schizophrenia.

Aim: The study's aim was to assess factors associated with relapse of substance-induced psychosis following treatment of the first episode psychosis.

Method: This was a retrospective study of secondary data with a targeted population of 191 respondents' files at Mathari National Teaching and Referral hospital records, admitted for the treatment of substance induced psychosis over the period of 3 years between 2018 January to December 2020. The researcher designed a questionnaire checklist used to collect data.

Data Analysis: SPSS version 25 was used to provide both descriptive and inferential statistics with confidence interval of 95% and a significant p value set at < 0.05.

Results: Majority of the relapsed patients were male (81.9%), single 69.8% and 43.4% had attained secondary level of education and below. Education *($p=0.013$)* and type of antipsychotic used *($p=0.021$)* were the statistically significant risk factors for relapse.

Conclusion: The risk of relapse of SIP is multifactorial however this study concludes that the level of education and first generation antipsychotic use are factors that would likely increase ones probability to relapse.

CHAPTER ONE

1.0 Introduction

The global burden of substance abuse is enormous with the United Nations reckoning that at least 35 million people suffer from drug use disorders and require care (WHO, 2019). Sustained use of substances increases the risk of developing psychosis distinct from primary psychotic illnesses making it a unique challenge that is tangible due to the addiction aspect of it. The psychotomimetic effects of substances that thereafter lead to psychosis are debilitating to the extent that one's function is grossly impaired to be productive (Fiorentini et al., 2011).

The study aimed at assessing factors associated with relapse of substance-induced psychosis following treatment of the first episode psychosis. A key presumption is that, during treatment, patients are psycho-educated on the demerits of substance use not only to the physical health but, as well as the mental health (Alvarez-Jimenez et al., 2012).

Certainly, the necessity to arrest this menace at the first episode is crucial to the mental health of the patient because of the complexities that arise with relapses. The addictive nature of the illness and the complications thereof such as psychosis have had an impact not only on the patient but as well as the caregivers and the health workers.

The time taken to treat or manage one patient is indeed lengthy and the uncertainty of outcomes can also be frustrating considering that often than not, the prognosis is largely pegged on the commitment of the patient. Further, the patient's emotional distress and functional impairment due to the psychosis are debilitating, especially in the FEP. The need to halt the relapse of such is vital not only to the patient but also to the caregivers' inconsiderate proportion (Roberto, 2016).

Therefore, the necessity to arrest this menace at the first episode is crucial to the mental health of the patient because of the complexities that arise with relapses; which include but not limited to a permanent psychotic disorder that would confine one to a less productive life, an increased burden of care to family or caregivers and as well as the healthcare system; yet it's preventable (De Oliveira et al., 2016).

Therefore, when certain risk factors are made apparent and could, to a considerable extent determine outcomes, this would be a game-changer on the tactics applied towards a patient's therapy, environment, and considerable efforts towards care to facilitate a long term remission. To this end, the study sought to add to the knowledge on risk predictors of relapses as well as techniques on management that would offer a higher chance in successful treatment strategies.

1.1 Background

Globally statistics indicate that more than 180,000 mortalities are directly linked to drug use disorder (GHE, 2020). Further, persons of the ages between 15 and 64 years have used drugs. This statistics is estimated to account for 271 million people translating to 5.5 percent of the population worldwide (UNODC, 2020). The COVID-19 pandemic has indeed made it worse, as the numbers are estimated to upsurge due to the rise in unemployment and lack of opportunities as the disadvantaged are more likely to engage in harmful behavior (UNODC, 2020).

Worldwide, the most commonly used drug is cannabis, and with about 192 million people have used it; Opioids are, however, considered to be the most lethal, with an estimated 58 million persons having used it (UNODC, 2020).

UNODC (2019) posits that plant derivatives psychoactive substances have mainly been trafficked and abused, such as cannabis, heroin, and cocaine; however, in recent times, synthesized psychoactive substances are in the market and consumed around the world. Unlike in the past, drug abuse was connected to the trafficking route or areas cultivating the substance. Now, the substance's availability does not hinge on such but rather anywhere in the world, where risk factors such as poverty, limited education, and social marginalization heavily influence (UNODC, 2020).

Substance use disorder in sub-Saharan Africa is anticipated to soar over and above 130% by 2050 while its treatment gap increase by 87%. In Kenya, the need for effective treatment and prevention of substance use disorder is dire, with about 10% of persons between the ages of 15 to 65 have an alcohol use disorder, with 60% of them being the severe form (Jaguga et al., 2020).

Kenya has Africa's highest Disability Adjusted Life Years (DALYs) of 54,000 from alcohol use disorders. Kenya's median age for at least one substance debut use is 11 years, unlike ages 16 to 19 years worldwide (Jaguga et al., 2020). This then paints a dire picture of substance-induced psychosis.

"A substance-induced psychosis is a psychotic state occurring during intoxication or withdrawal and lasting at least 48 hours" (Starzer et al., 2018). The recreational use of substances does produce psychotic features, especially during the intoxication and withdrawal phase, and has also remained a risk factor to developing a stable psychotic condition (Rognli et al., 2015).

The need to address relapse of substance use has always posed a challenge amongst health workers. The cycle of addiction affects everyone involved and not just the addict in care. Indeed the danger of developing a psychotic illness such as schizophrenia following an episode of substance-induced psychosis is real, but that does not seem to deter those prone to such to stop and detest from substance use (Jones et al., 2020; Schoeler et al., 2017).

Although there have been studies to suggest the genetic component of psychosis, the psychotomimetic composition of substances has a role in substance use psychosis, and it is deemed a function of severity and dependence on the substance (Fiorentini et al., 2011). Lo, et al. (2020) advances the chronicity of substance abuse and rightly so termed it as the "chronic relapsing disease," with rates of about 56.8% to 81.8%; therefore, the need for a prevention and treatment strategy used against the vice is paramount.

Rognli (2015) equally reiterates that the sustained use of substances increases the risk of developing psychosis distinct from primary psychotic illnesses is a unique challenge that is tangible due to addiction. Indeed, the prevention of relapse from the first episode psychosis (FEP) induced by substance use then becomes imperative, a challenge that is no small fete keeping in mind that substance use is not pegged on illicit substances such as cannabis alone, but also legal commodities such as alcohol (Kamenderi et al., 2017).

Besides, seeking care in mental institutions is a challenge, primarily due to societal and self-stigma and secondly, due to limited access to mental health facilities (Meyer et al., 2016; MoH, 2020).

Inevitably, substance use disorder has ravaged and destroyed much potential among the youth, especially those meant to be productive either in school, career, or business (Lo et al., 2020). The addictive nature of the illness and the complications that ensue, such as psychosis, have impacted the patient, the caregivers, and the health workers (Tibbo et al., 2014).

1.2 Problem Statement

Studies propose that the propensity of substances such as cannabis, increase the risk of developing a more severe form of psychosis especially when used consistently. Indeed, the psychotomimetic effects of substances that thereafter lead to psychosis are debilitating to the extent that one's function is grossly impaired to be productive in any way. Whilst the first psychotic episode's course may not be too severe; a relapse may lead to a non-remission of the psychosis, exposing one to a more severe form of psychosis such as schizophrenia Besides, the cost of treating psychotic illness is high, both direct and indirect costs. Therefore, the need to prevent a relapse from a FEP is paramount to ease the burden on the health care system that is already overburdened and struggling with financing. Consequently, this study sought to add to the knowledge on risk predictors of relapses and techniques on management that would offer a higher chance in successful treatment strategies and averting these relapses altogether.

1.3 Aim of the Study

The study sought to assess factors associated with relapse of substance-induced psychosis following treatment of the first episode psychosis.

1.4 Objectives

Below is a list of the objectives which informed the research project. The goals are intended to enable the researcher to obtain a comprehensive understanding of the phenomenon being studied.

1. To assess factors that would increase the risk of a relapse of substance-induced psychosis.
2. To identify techniques for management of first-episode substance-induced psychosis.

1.5 Research Questions

Below is a list of the research questions and hypotheses. The researcher utilized the questions to obtain an in-depth definition of the phenomenon being studied, as well as determine other essential steps involved in the study. In addition, the researcher used hypotheses to establish the relationship between the variables that informed the research.

1. What factors increase the risk of a relapse of substance-induced psychosis among first episode substance-induced psychosis patients?
2. How can medical personnel manage first episode SIP to prevent relapses?

1.6 Hypothesis

1.6.1 Null Hypothesis

A relapse of first episode substance-induced psychosis is a random occurrence with no unique risk factors

1.6.2 Alternative Hypothesis

There are unique risk factors that increase the likely hood of relapse in first-episode substance-induced psychosis

1.7 Assumptions and Limitations of the Study

Some of the key assumptions of the study relate to the inclusion criteria. In particular, the study assumed that the inclusion criteria used to select scholarly work to be utilized in obtaining information about the phenomenon were appropriate. The same assumption was made concerning the selection of the sample involved in the study. Also, the researcher assumed that the respondents provided honest responses to the doctors during their interview during clerkship. Regarding limitations, the instrument used in the study could only gather that which was in the files. Furthermore, the highly subjective nature of the responses provided by the participants during clerkship resulted in the data being subject to the interpretation of the respondents.

1.8 The significance of the Study

Substance use disorder in sub-Saharan Africa is anticipated to soar over and above 130% by 2050 while its treatment gap increase by 87% (Jaguga et al., 2020). Substance use has always posed a challenge due to its addictive nature hence the recurrence or rather relapses (Fiorentini et al., 2011). Sustained use of substances increases the risk of developing

psychosis distinct from primary psychotic yet it is preventable (Rognli, 2015). The significance of this study was to seek out predictors to relapse and better techniques in management. This would inform health workers involved in management of such patients of the pitfalls experienced and offering management techniques that might provide long remissions. This study may also assist in framing policy or programs in the Ministry of Health and other government agencies such as National Authority for the Campaign against Alcohol and Drug Abuse (NACADA).

1.9 Summary

The research project sought to add to the knowledge on risk predictors of relapses and techniques on management that would offer a higher chance in successful treatment strategies to FEP substance induced psychosis. The prevention of relapse from the first episode psychosis (FEP) induced by substance use has becomes imperative, a challenge that is no small fete keeping in mind that substance use is not pegged on illicit substances such as cannabis alone, but also on legal commodities such as alcohol, considering that sustained use of substances increases the risk of developing psychosis distinct from primary psychotic. Chapter one provides background information about the study, as well as its purpose, an overview of the research questions, and the significance of the project.

Chapter two provides a review of the existing literature related to substance induced psychosis, risk of relapse from FEP and the conceptual framework. The section provides details highlighted by different scholars regarding some of the factors that contribute to substance induced psychosis and the risk to relapse after the FEP.

Chapter three provides information about the research methods that were used to collect data. The section discusses the variables that inform the study, alongside the design of the instrument that was used to obtain data and the methods used to select the study's participants.

Chapter four provides a description of the study's results and an analysis of the findings.

Chapter five entails a discussion of the study's findings, their implications, and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This literature review focuses on risk factors associated with relapse of substance-induced psychosis following the treatment of first-episode psychosis. Beckmann et al. (2020) defined substance-induced psychosis (SIP) as "hallucinations and/or delusions caused by intoxication or withdrawal from a substance." The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (2020) defines SIP as the presence of delusions and/or hallucinations that arise and persist in the context of acute intoxication or withdrawal from a substance and are not exclusively attributable to delirium.

The diagnosis requires a lack of insight and remission of symptoms following abstinence from the substance for a month. However, the symptoms can linger even after the month-long asceticism (Beckmann et al., 2020).

Psychotomimetic capability in cocaine, cannabis, amphetamines, and so on would elicit psychotic symptoms when used or abused to the extent of resembling a primary psychotic disorder (PPD) (Fiorentini et al., 2011). Lately, the use and misuse of drugs have increased drastically, especially amongst the young generation, and those that indulged are of very tender age, with the debut age decreasing significantly over the years (Jaguga et al., 2020).

Beckmann et al. (2020) postulate that although SIP symptoms abate more rapidly with the stoppage of the culprit substance, there are instances as well where the cessation of the substance does not have a commensurate rapid symptom remission; and exhibits considerably less improvement of hallucinations from the baseline to follow-up in comparison to patients with primary psychotic disorders (PPD). Certainly, this indicates how intricate the treatment of SIP is; and how much more complex the process is than just the cessation of substance misuse.

Further, Alvarez et al. (2012) advances that the first episode psychosis (FEP) responds well to treatment; however, up to 80% of them relapse, and this has a considerable burden to the caregivers and halts the life progression of the patients besides their long term psychological development. Indeed, the consolidated progress achieved during a long remission period is worth protecting and riding on (Tibbo, 2014). On this background, the research seeks to

unearth risk factors to the relapse of FEP of SIP following its treatment, considering that there is paucity on the outcomes of SIPs.

2.2 Substance-Induced Psychosis

SIPs have better outcomes and often not given the due attention it deserves in its management. The Severity of SIP has not been well articulated or understood by both the patient and healthcare worker (O'Connell, 2019). This is partly true because SIPs are transient and can quickly be resolved or reversed should the addiction to the causative substance addressed, as opposed to PPDs, which are chronic in nature, and yet, their management, especially at the initial stages, might be similar (Weibell, 2016). Even though this might partly be true Starzer, (2018) elucidates that the dynamics of the SIP converting to any spectrum of a PPD, ranging from affective disorders to the more severe form such as schizophrenia, is a reality.

Consequently, the development of psychosis while using a substance is a function of the severity of use and dependence on the substance. Undeniably the psychotomimetic capabilities of the substance in question have a significant role; however, the frequency and reliance on it determine whether the psychosis induced will be short-lived or persistent thereafter (Fiorentini et al., 2011).

This section shall highlight a few specific substance-induced psychoses such as alcohol, cannabis, and Khat concerning the risk factors of relapse of substance-induced psychosis.

2.2.1 Cannabis Induced Psychosis.

The psychotomimetic capabilities of cannabis are, without question, potent; nevertheless, the medicinal use of marijuana in a specific jurisdiction and its prevalent use even in those jurisdictions that it's prohibited has led to the increase in incidences of cannabis-induced psychosis (Beckmann, 2020).

Of note is that the potency of cannabis has increased over the years; hence, the propensity for developing psychosis is higher (UNODC, 2020). Indeed Di Forti et al. (2015) postulates that the higher the potency of a substance, in this case, cannabis, the greater the risk of developing psychosis. Indeed, a strong link between cannabis use and psychosis has been established (Beckmann, 2020).

Among the various substances, cannabis has been implicated in causing most FEP (Di Forti et al., 2015). Consequently, relapses by it are also more frequent and debilitating to the extent

of its implication as a significant precursor to developing a primary psychotic disorder (Rognli et al., 2015).

In the same breath, Di forti (2015) also argues that the prodromal state of psychosis can cause the user to sort after cannabis that is high in tetrahydrocannabinol (THC), making it more potent to self-medicate. Therefore, this does not make it straightforward on what comes first. It does then beg the question; the chicken or the egg? Is it the prodromal state of psychosis or cannabis use? Nonetheless, there is an implication that cannabis use is a strong predictor of a psychotic illness relapse, with no bearing on its outcome (Bergé et al., 2016).

2.2.2 Alcohol-Induced Psychosis

Alcohol is a social beverage in many communities and has the allure of not being so bad after all as it is a socially acceptable vice and therefore the addiction that ensues is one that becomes difficult to manage and frustrating to the health care system and the patient as well (Herring, 2014).

Jordaan (2014) advances that Alcohol-induced Psychosis Disorder (AIPD) in the general populous has a lifetime prevalence of 0.4%, while amongst alcohol dependents, it's at 4.0%. Indeed Soyka (2013) considers that although the prevalence might not be so high, the readmission rates, or rather what we might regard as relapses, are incredibly high, indicating a chronic course with a poor prognosis.

Perälä et al. (2010) elucidates the risk factors to AIPDs were persons who never married, had low income, unemployed, and had paternal alcohol dependence. Stankewicz (2020) further postulates that persons with AIPDs often had comorbid mental health disorders and, besides, had a 5 to 30% risk of developing a chronic mental illness such as schizophrenia.

This could be attributed to the high chances of relapses through readmissions that stood at 68% (Stankewicz et al., 2020). Indeed the challenge amongst AIPDs is abstinence from alcohol; if achieved, one can be in remission for a long time. However, the addiction propensity will drive one to a relapse that could potentially lead to a more severe psychiatric disorder (Jordaan et al., 2014; Stankewicz et al., 2020).

2.2.3 Khat Induced Psychosis

Khat, scientifically known as *Catha edulis*, has a lifetime prevalence use of about 44%, and it's vastly popular among communities that grow it as a cash crop for export (Ongeri et al., 2019). The debut use of Khat is low, about 15 years, and it's common among males (Ongeri et al., 2019).

Tesfaye (2020) notes that Khat is equally a substance that induces psychosis, primarily when used over a while consistently. Its use is largely in groups, and the 'chewing session ceremony' can last between 3 to 7 hours. Tefaye (2020) observes that those who have Khat-induced psychosis are homicidal and suicidal, often preceded by a bout of binge chewing.

Ongeri 2019 also notes that the psychosis may resolve should Khat use be withdrawn. However, those that indulge end up spending much time in the 'chewing session ceremony,' neglecting their families and consequently estranging relations with their wives, leading to divorce, thus using the ceremonies as an escape.

The availability and acceptance in society as a cash crop have made it challenging to regulate Khat use. This, therefore, exposes the youth to it and its psychotomimetic properties are viable yet, its use has no age restriction (Ongeri et al., 2019).

Khat-induced psychosis relapses are a precursor to primary psychotic diseases such as affective disorders and even schizophrenia (Tefaye, 2020). The addictive nature of Khat and its societal acceptance as a pass-time activity for bonding sessions among peers makes it easy for relapses to occur (Ongeri et al., 2019).

2.3 Risk Factors to Relapse in FEP

“The annual incidence of first-episode psychosis (FEP) ranges from 24.6 to 40.9 per 100,000 inhabitants per year among person ages 16 to 64, (Bergé et al., 2016)." The DSM-V reckons that potentially persons between 7% and 25% present with an initial episode of psychosis suffer from SIPD due to substance use.

The term FEP would then insinuate a probable repeat of the psychosis, inferring a relapse. Therefore, Alvarez et al. (2012) posit that several factors would lead to a relapse in a FEP and would include and are not limited to non-adherence to medication, poor premorbid adjustments, substance use disorder, and carer’s critical comments.

On the one hand, it is certainly interesting to note that Alvarez (2012) underscored the carer's critical comments and hostility to be deemed a significant risk factor to a psychotic relapse. It followed that criticism was significantly linked to repeated psychotic episodes. The impact of those around a patient is enormous. Their opinion is valued and greatly forms the premises of their thought process. This will, therefore, significantly Impact their self-esteem that has a bearing on their choices that form their habits. On the other hand, the association of social support and a reduced threat to relapse is significant.

SIP patients have a higher level of depressive symptoms attributed to poor coping skills leading them to use substances as a coping mechanism. This will indeed be deemed a likely risk factor to relapse on substance use and consequently SIP (Thompson et al., 2016). Undeniably, the association with critical comments would also facilitate depressive symptoms that would, in turn, lead to a relapse.

Further, Alvarez et al. (2012) posit poor premorbid adjustment as a strong predictor of relapse following FEP. Indeed the tenacity to keep going after recovery from a FEP takes many adjustments to keep off substances which might be a tall order for one whose challenge is adjusting to a new norm.

Studies implicate cannabis as a valid predictor of relapse of psychosis. Indeed, persons who had a FEP and later began smoking cannabis after treatment relapsed (Bergé et al., 2016). Surely, this would play a considerable role in SIPD, especially among persons abusing cannabis. Indeed, its role may need to be ascertained and compared with other substances such as alcohol.

Although gender has not been highlighted so much regarding SIP relapse, there is a view that the male gender is a risk factor to relapse after a FEP (O'Connell, 2019). Bergé (2016) reiterates that the male gander predicts a worse functioning after FEP hence at risk of a relapse. In the same breath, Ongeri (2019) notes that the males use substances in social gatherings where they have male social support; hence the likelihood of relapse is high should they go back to the same social circles.

2.4 Substance-Induced Psychosis vs. Primary Psychotic Disorder

Thompson et al. 2016 note no difference in the quality of life, functioning, relapses, and recovery rates between primary psychotic patients and substance-induced psychotic patients.

Indeed, delineating between the two disorders clinically is still a challenge. Nonetheless, the conundrum of the clinical similarity does not make it impossible to make the difference, but in any case, patients and corroborative history will give the direction on the diagnosis. Further, the management of each disorder in clinical practice may not be entirely different save for the management of addiction (Fraser, 2012).

Often, SIP and PPD may seem to have the chicken and egg situation; which came first? There are various schools of thought; on the one hand, the premise holds that SIP leads to PPD while suggesting that the prodromal state of PPD leads to SIP. Indeed, the conundrum therein makes it a challenge to manage these disorders, particularly given the comorbidity of substance use, which would otherwise cause a delay in the management of a PPD (Goerke et al., 2013; Tibbo et al., 2014).

Nonetheless, the chronic nature of psychosis is apparent, and therefore the risk of relapse is a challenge that requires apt and concise remedy to sustain remission periods that provide tranquility to both the patient and caregivers (Tibbo et al., 2014).

2.5 Conceptual Framework

The literature review did reveal studies that alluded to risk factors that would lead to a relapse of substance-induced psychosis. Certainly, the factors were multifactorial and were not one cut fit for all. There were multiple aspects through which these factors would put one at risk of relapse in this case due to substance-induced psychosis. Below is a conceptual framework that emanates from the empirical literature review and purely relates to the risk factors rather than instigating a cause of the relapse.

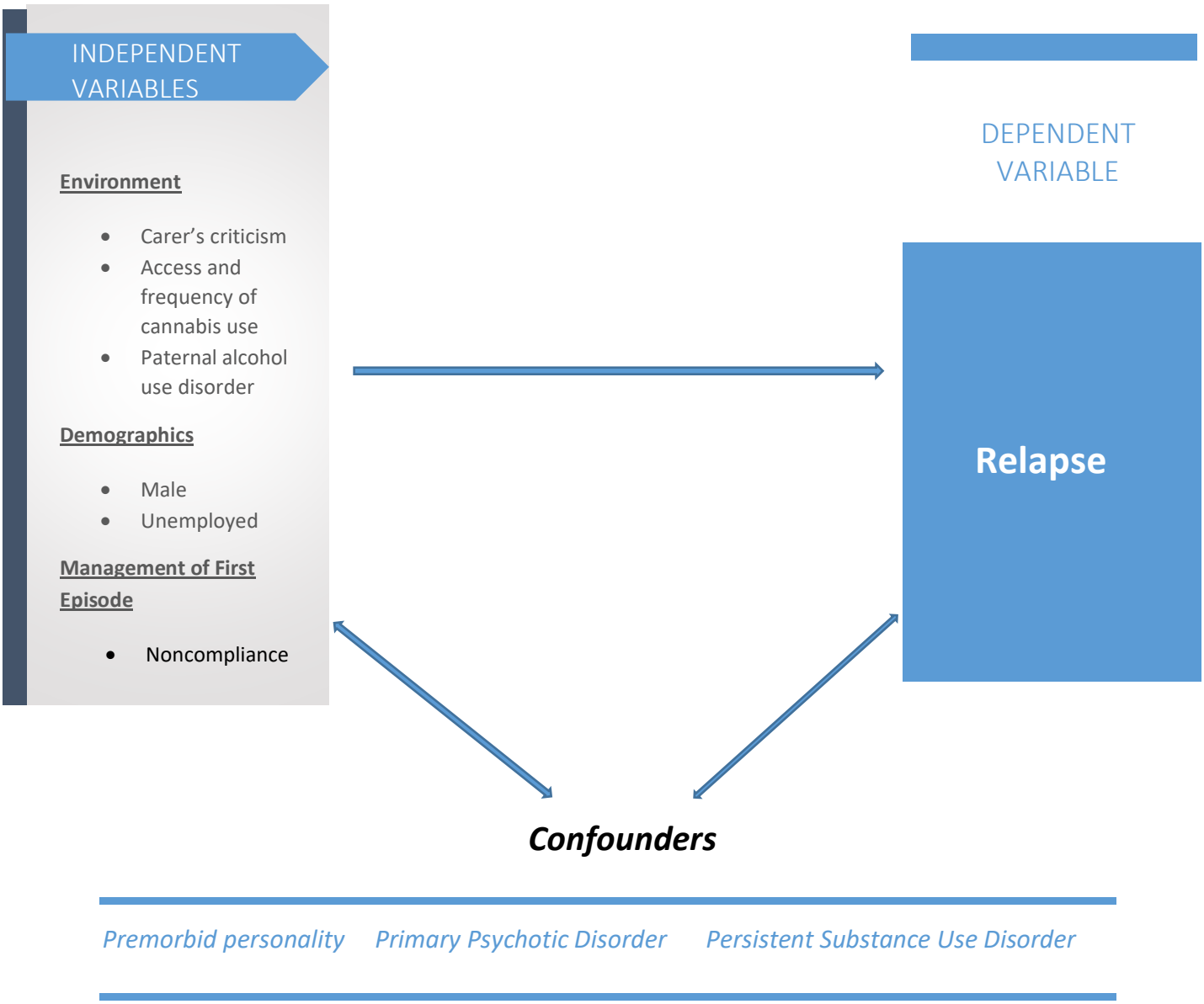


Figure 1. Conceptual Framework on Risk factors of a relapse of a SIP following a FEP.

CHAPTER THREE

STUDY DESIGN AND METHODOLOGY

3.0 Introduction

This chapter presents a treatise to the research design, methodology, analysis plan, and ethical considerations for this study. The purpose of the study shall be to assess factors that would predict a relapse of substance-induced psychosis after-treatment of the FEP.

The study shall utilize a quantitative research approach using a critical realism paradigm to realize what risk factors are associated with relapse of substance-induced psychosis following treatment of the first episode psychosis.

3.1 Research Design and Rationale

The study employed a retrospective study design using both descriptive and inferential statistics to address the research questions in addition to rejecting or failing to reject the null hypothesis posed (Field, 2013; Jacobsen, 2014).

Other studies have identified certain factors that would lead to a relapse; however, not much has been put forward regarding the prediction of relapse and whether there are unique factors that increase the likelihood of relapse in first-episode substance-induced psychosis. This is an important puzzle to solve in the management of SIPs.

The deductive research approach in this study did provide the opportunity for the hypothesis, that there are no unique factors that increase the likelihood of relapse in first-episode substance-induced psychosis (Blaikie, 2010).

3.2 Methodology

3.2.1 Population

The study employed a secondary data analysis from the Mathari National Teaching and Referral hospital records of Patients Files with a diagnosis of Substance Induced Psychosis between 2018 January to December 2020. The study had a 95.3% response rate, having obtained 182 response files of the said period with a targeted population of 191 respondents' files.

3.2.2 Selection Criteria and sampling procedure

The sampling approach was a stratified sampling method of preselected files with a SIP diagnosis and later screened to identify relapse cases set aside until the total sample number is achieved.

Should the selected files from each ward be lower than the allocated sample size, the researcher will recruit all files. Should the number of files chosen exceed the sample quota, then the sample required shall be divided by the total number of files with the sample needed to get the skip interval.

3.2.3 Procedure for data collection checklist

Preselected files with Substance-Induced Psychosis, following a stratified sampling method with a data checklist, were recruited to obtain the requisite information needed to answer the research questions.

3.2.4 Inclusion Criteria

Relapsed cases of First episode psychotic patients with substance-induced psychosis at Mathari National Referral and Teaching Hospital between the years 2018 to 2020.

3.2.5 Exclusion Criteria

All first-time patients at Mathari National Referral and Teaching Hospital

3.3 Data analysis plan

Data collected through a data check list questioner from the Mathari National Referral and Teaching Hospital file records was keyed in and coded into the SPSS software for analysis. Both descriptive and inferential statistics were performed. Descriptive statistics were central tendencies such as mean and mode of aspects such as type of substance use, level of education, and age. The inferential statistics demonstrated the level of association between education, antipsychotic used and relapse of substance-induced psychosis. The use of Chi-square did accord the researcher an avenue to either reject or fail to reject the null hypothesis through the p-value generated. The confidence interval set at 95% and an alpha of 0.05. (Ken State University, 2014).

3.4 Threats to validity

3.4.1 Data Reliability and Validity

The reliability and validity of the secondary data obtained was crucial to this study. Indeed, the data obtained from the MNTRH Records office was reliable and would otherwise provide the same information in MNTRH Records files.

3.4.2 Ethical Consideration

The ethical challenges that secondary analysis provides are unique. Tripathy (2013) proposes that there are no guidelines for obtaining consent a second time. The assumption is that the original consent stands and that earlier communication to the subjects covered subsequent secondary use.

The other ethical concern is regarding the re-use of data available at the MNTRH Records office, exposing specific details of the subjects, including and not limited to the name, sex, and age. Indeed, safeguarding such data is paramount to consistently and religiously guard the subjects' privacy by using password protected laptop and files to secure the data (Tripathy, 2013).

The contents in this research paper have been tested for plagiarism and the similarity index has been maintained below the minimum university threshold. All works attributable to other researchers have been appropriately cited. Respondent’s personal details and responses have not been shared to any third parties except with an interest in this paper; namely the university, its supervisors and the researcher in order to safeguard their identity.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

4.0 Introduction

This chapter entails the analysis of retrospective data obtained from Mathari National Teaching and Referral hospital data base on patients admitted for treatment for second episodes or recurrent substance induced psychosis over the period of 3years (January 2018-December 2020).

The study findings are presented according to the study objectives which were:

1. To assess factors that would increase the risk of relapse of substance induced psychosis
2. To identify the techniques for management of the first episode substance –induced psychosis.

4.1 Accumulated Cases for Data Extraction

The targeted population was 191 respondents' files, however 9 files from this specified duration of admission were not available for data extraction. Therefore, the total number of files that were analyzed were 182 (95.3%).

4.2 Respondents' Socio Demographic Profiles

Table 4.1 presents socio-demographic characteristics of the respondents who were patients admitted after relapse of substance induced psychosis. The mean age of the patients 30.12 yrs (SD ±8.526). The mode was 23yrs while the median was 28yrs. Three respondents were below the age of 18yrs.

Majority of the relapsed patients were male (81.9%). With regards to marital status, 69.8% were single while married patients were only 17%. Forty-three point four percent (43.4%) of the respondents had either reached or completed their secondary education, 17% were either

in or had completed their University education and 2.2% of the respondents had no formal education. Majority (86.8%) of the respondents were Christians while only 9.9% were Muslims. Most (36.3%) of the respondents were also unemployed.

Table 4. 1

Respondents Socio-Demographic Profiles

Variable		**Outcome 182/100%**	
		Frequency (n)	Percentage (%)
Gender	Male	149	81.9%
	Female	33	18.1%
Age (years)	≤20yrs	14	7.7%
	21-30yrs	81	44.5%
	31-40yrs	58	31.9%
	41-50yrs	23	12.6%
	≥51yrs	6	3.3%
Marital Status	Single	127	69.8%
	Married	31	17.0%
	Separated/Divorced	19	10.4%
	NR	5	2.7%
Level of education	No Formal Education	4	2.2%
	Primary	33	18.1%
	Secondary	79	43.4%
	Tertiary College	25	13.7%
	University	31	17.0%

	NR	10	5.5%
Religion	Christian	158	86.8%
	Muslim	18	9.9%
	Atheist	1	0.5%
	NR	5	2.7%
Living Arrangement	Self	53	29.1%
	Family	35	19.2%
	Nuclear	60	33.0%
	Extended	7	3.8%
	NR	22	14.8%
Occupation Status	Unemployed	66	36.3%
	Employed	27	14.8%
	Student	44	24.2%
	Self employed	33	18.1%
	NR	12	6.6%

4.3 Pattern of Drug/Substance Induced Psychosis Relapses in the stated Period (Jan2018- Dec 2020)

As shown in Fig 4.1, there was a considerable drop in readmission attributed to substance induced psychosis in the period between 2019 February to December 2020 compared to the period between 2018 January to January2019. Overall percentage calculated based on the total number of accumulated cases for data extraction for this study indicated that almost 60% (109) of the patients were admitted in 2018-2019 period. Forty point one percent were admitted in the subsequent period of study.

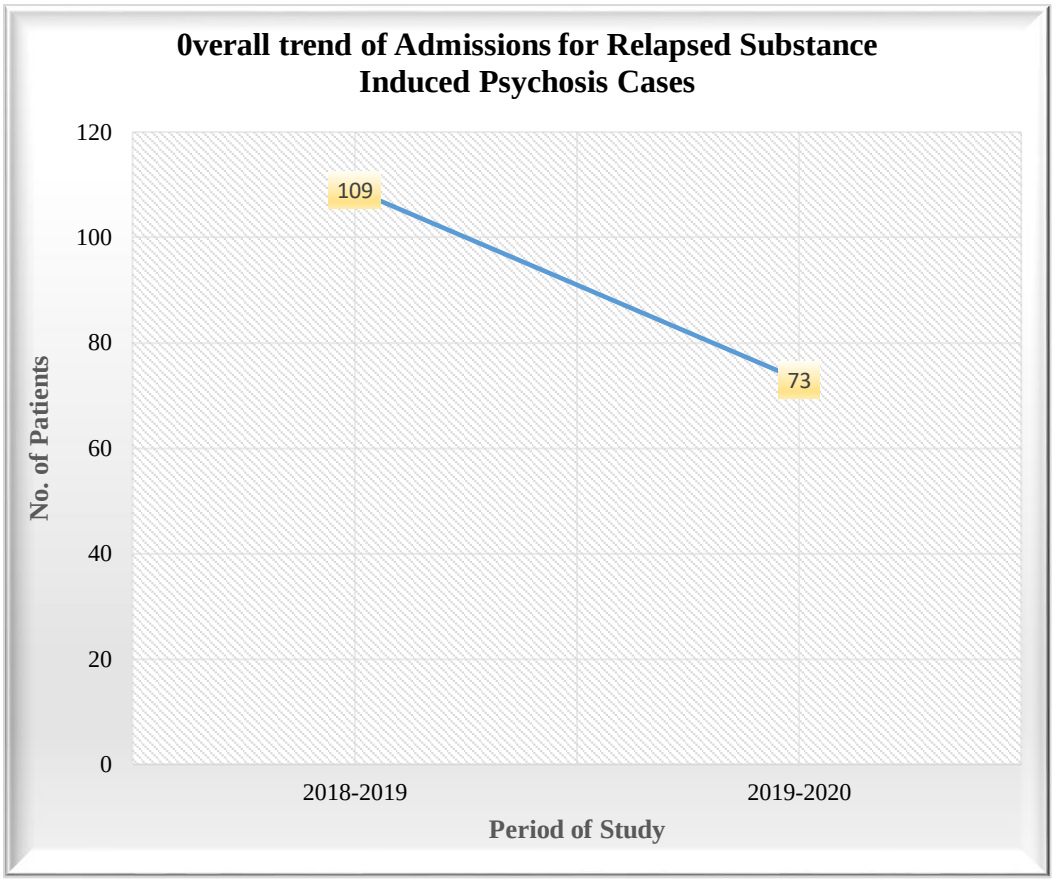


Figure 4. 1: Overall Trend of DIP cases (2018-2020)

4.4 Pattern of Drug/Substance Use

As indicated in fig 4.2, cannabis was the most commonly use substance among the relapsed patients, 79.1% of them indicated that they smoked it daily. Sixty-one point five percent (61.5%) indicated that they consumed alcohol as well. The figure further summaries the pattern of use each calculated as a percentage of the total number of respondents.

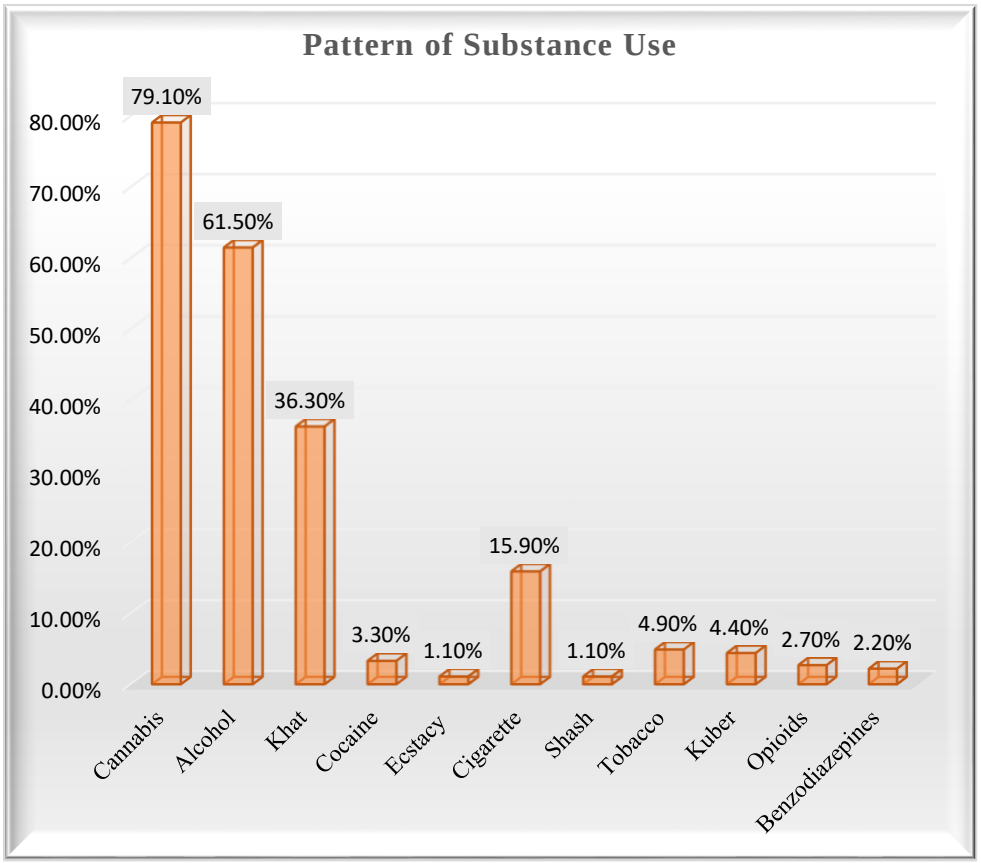


Figure 4. 2: Overall Trend of substance Use/Abuse

4.4.1 Types of Substance Induced Psychosis

Table 4.2, illustrates that most patients suffered from polysubstance induced psychosis (57.2%), while 22% and 17.6% of the participants had cannabis and alcohol induced psychosis. Only 3.3% had khat induced psychosis.

Table 4. 2 Substance Induced Psychosis

	Frequency	**Percent**
Cannabis Induced Psychosis	40	22.0
Alcohol Induced Psychosis	32	17.6
Khat Induced psychosis	6	3.3
Polysubstance Induced psychosis	104	57.2
Total	182	100.0

4.4.2 Debut of Substance Use

The debut of use among patients was summarized with central measures of tendency. The mean age at which the patients started using any substance was 21 (SD ±5.556), the median was 20 and mode 18.

Table 4. 3 Debut of Substance Use

Mean	21.00
Median	20.00
Mode	18
Std. Deviation	5.556

4.4.3 Frequency of Use

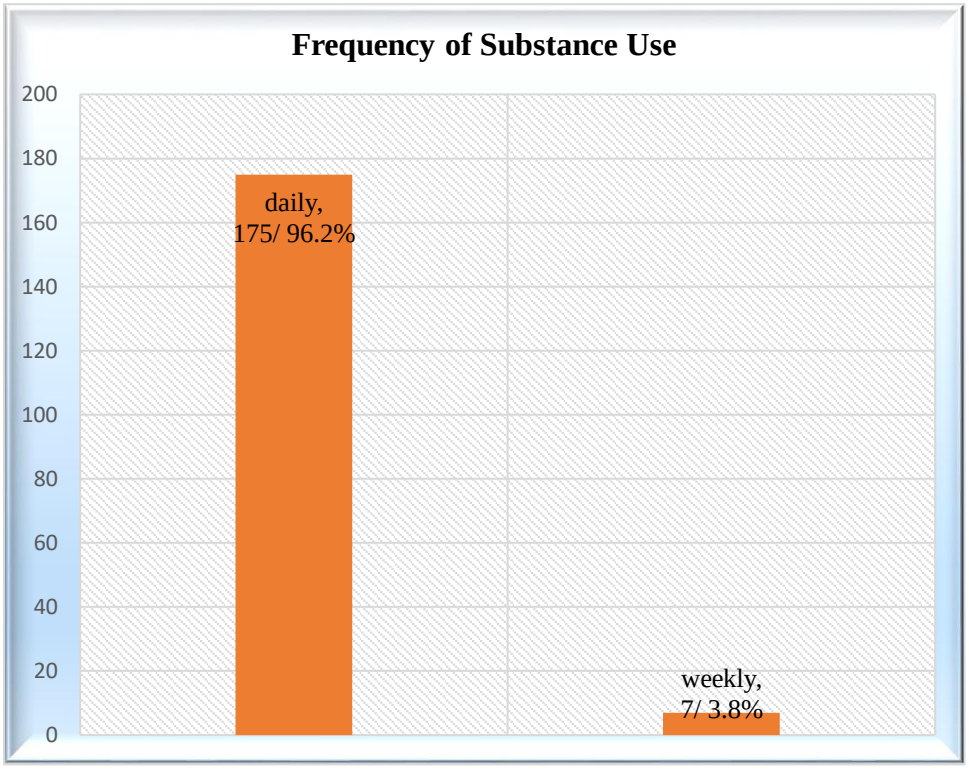


Figure 4. 3: Frequency of Drug Use

As illustrated; 96.2 % of the patients used their preferred substance daily. The remaining 3.8% used the substances weekly.

4.5 Frequency of Admission due to Relapse of Substance Induced Psychosis

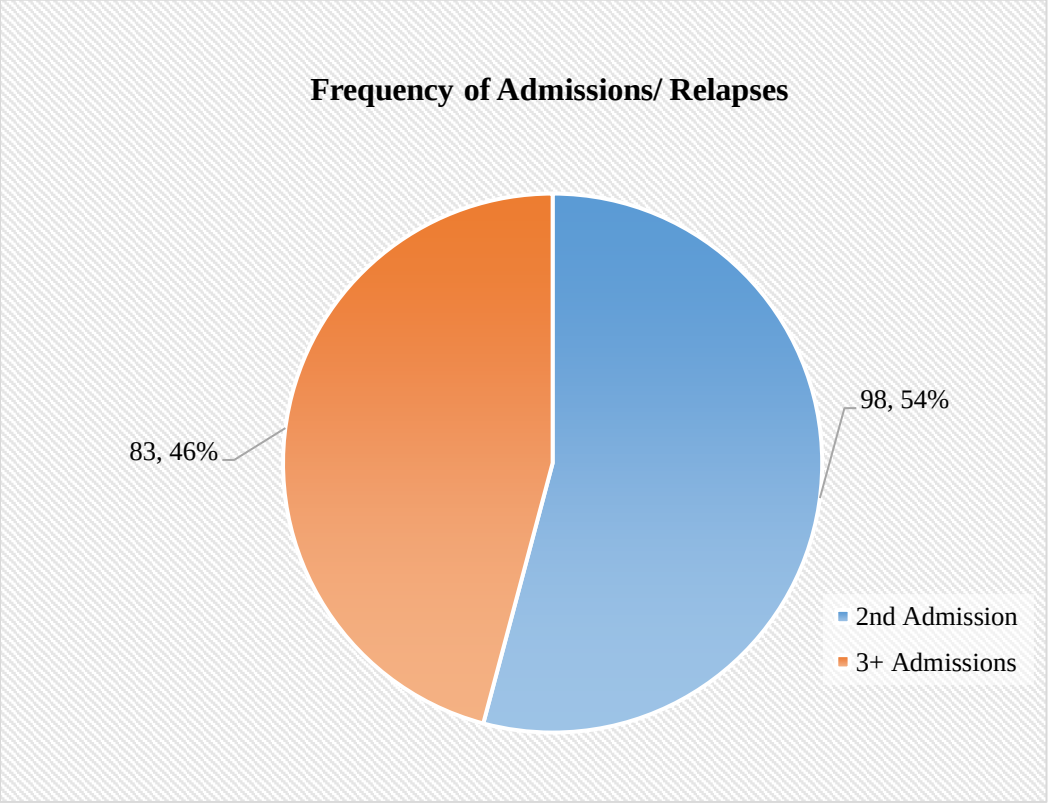


Figure 4. 4: Frequency of Admissions

Fig. 4.3 illustrates the number of patients had been admitted after the first relapse and those that had been admitted for recurrent relapses of substance induced psychosis. 54% of the patients had been admitted after the first relapse hence it was their second admission. The remaining 46% had relapsed 3 or more times.

4.5.1 Multiple Linear Regression Analysis Determining Predictors of Relapse

Multiple linear regression was performed to ascertain the effects of age, marital status, education, employment, debut of use, rehab utilization, paternal substance use, type of antipsychotic and parental support, on the likelihood that patients would be readmitted after substance induced psychosis relapse.

The regression model was statistically significant at *p* value = 0 .045.

Table 4. 4

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.698	12	1.808	1.859	.045[b]
	Residual	134.236	138	.973		
	Total	155.934	150			

a. Dependent Variable: Frequency of Admissions

b. Predictors: (Constant), Religion, Gender, Age, Rehab Utilization , Paternal Substance Use , Education, Type Of Antipsychotic Patient Was On, Family Support, Employment, Marital Status, Debut of use

As per the model summary, Adjusted R square of 0.064, implies that only 6.4% of the variance in frequency of admissions is explained by the predictors (independent variables).

Table 4. 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.373[a]	.139	.064	.986

a. Predictors: (Constant), Religion, Gender, Age, Rehab Utilization , Parental Substance Use , Education, Type Of Antipsychotic Patient Was On, Family Support, Employment, Marital Status, Debut of use , Education

Table 4. 6 indicates that, Education *(p=0.013)* and type of antipsychotic used *(p=0.021)* were risk factors for relapse hence increased frequency of admission.

Table 4. 6

Multiple linear regression Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.621	.856		3.061	.003
	Age	.024	.016	.180	1.457	.147
	Debut of Use	-.029	.020	-.152	-1.420	.158
	Gender	-.315	.234	-.113	-1.347	.180
	Employment	-.062	.187	-.029	-.331	.741
	Education	-.478	.191	-.445	-2.509	.013
	Marital status	.223	.256	.080	.871	.385
	Rehab utilization	.006	.219	.002	.029	.977
	Parental substance use	-.345	.190	-.152	-1.813	.072
	Type of Antipsychotic patient was on	-.486	.209	-.195	-2.326	.021
	Family support	-.124	.119	-.088	-1.046	.298
	Religion	.209	.319	.056	.656	.513

a. Dependent Variable: Frequency of Admissions

4.6 Management of the First Episode Substance Induced Psychosis

4.6.1 Pharmacological Treatment

As indicated on table 4.7, majority of the patients (80.8%), were prescribed/ on 1st generation antipsychotics while the remaining 19.2% were on second generation antipsychotics.

Table 4. 7

Antipsychotic Treatment

Variable		Outcome 182/100%	
		Frequency (n)	Percentage (%)
Treatment	1st Generation Antipsychotics	147	80.8%
	2nd Generation Antipsychotics	35	19.2%

4.6.2 Association & Correlation between Frequency of Admission and Treatment Regimen

There was a significant association between frequency of admission or relapses and the treatment that the patients were taking at a P=0.033. Table 4.8 shows that whereas nearly equal numbers/ ratio (1.01:1) of patients on 1st generation antipsychotics had indicated that they had 2 or 3+ more relapses, it was notable that fewer patients on second generations had suffered 1 relapse the ratio being (2.4: 1).

Both variables being binominal/ dichotomous, the phi-coefficient statistic was used to measure the strength of association between the variables. There was a weak negative relationship between antipsychotic treatment and frequency of admission/relapse, at a value of $\varphi = -0.159$. This meant that as patients continued to be 1st generation antipsychotics, the higher the chances that they were admitted for 3 or more times, hence, more relapses. On the other hand, 2nd generation antipsychotics meant mostly 2nd admissions hence experiencing their first relapse.

Table 4. 8

Type of Antipsychotic Patient Was On * Frequency of Admission

Type of Antipsychotic patient was on		Frequency of Admission		Total	Chi Square (P Value)	Correlation statistics (Phi-Coefficient)
		2nd Admn	3rd + Admn			
1st Generation	Count	74	73	147	X^2=*4.560*	φ=*-0.159*
	% within type of Antipsychotic	50.3%	49.7%	100.0%	*Df=1*	
	% of Total	40.9%	40.3%	81.2%	*P=0.033*	
2nd Generation	Count	24	10	34		
	% within type of Antipsychotic	70.6%	29.4%	100.0%		
	% of Total	13.3%	5.5%	18.8%		
Total	Count	98	83	181		
	% within type of Antipsychotic	54.1%	45.9%	100.0%		
	% of Total	54.1%	45.9%	100.0%		

4.6.3 Behavioral Management of Substance Use Induced Psychosis

As for behavioral management, majority of the patients (79.7%) reported never going to rehabilitation for their substance use disorders. Rehab use was not significantly associated with relapses/ frequency of admission.

Table 4. 9

Behavioral Management

Rehab utilization	Yes	35	19.2%
	No	145	79.7%
	NR	2	1.1%

As indicated in Table 4.10, most patients (70.3%) indicated nil paternal substance use. As for the level of family support, 45.6% indicated that the support was average. A considerable number (34.1%) indicated that family support was strong.

None of these variables were significantly associated to frequency of relapse/ admissions.

Table 4. 10

Psychosocial factors related to Substance Induced Psychosis treatment

Variable		Outcome 182/100%	
		Frequency (n)	Percentage (%)
Paternal Substance use	Yes	54	29.7%
	No	128	70.3%
Family support	Strong	62	34.1%
	Average	83	45.6%
	Weak	37	20.3%

4.7 Correlation between Variables

Having multiple dichotomous/ binominal variables (other independent variables) and a continuous one (frequency of admission), a point biserial correlation test was done to determine the relationship between the variables.

As indicated in Table 4.11, there was a positive linear relationship between debut of use and age ($r = .637, p = \leq .001$). This meant that young patients indicated that they started using substances at a younger age. Therefore, as age increased, so did the age at which they started using substance.

There was a negative linear relationship between paternal substance use and frequency of admission ($r = -.211, p = .004$). This meant that most patients that indicated there was paternal substance use, also had more relapses hence increased frequency of admissions.

There was a negative linear relationship between type of antipsychotics and frequency of admission ($r = -.172, p = .020$). This meant that most patients that were 1st generation antipsychotics had more relapses hence increased frequency of admissions and vice versa for the second generation antipsychotics.

There was a positive linear relationship between type of antipsychotics and gender ($r = .205, p = .006$). This meant that most patients that were 1st generation antipsychotics were mostly males hence more females were on 2nd generation antipsychotics.

There was a positive linear relationship between marital status and age ($r = .404, p = \leq .001$); and marital status and debut of use ($r = .192, p = .010$); this meant that single patients were relatively young. It also explains the fact that early substance users, were single. The same trend was noted for employment/occupation.

There was a negative linear relationship between education and rehab utilization ($r = -.175, p = .024$). This meant that most patients with lower levels of education indicated that they had never been to rehabilitation facilities.

Table 4. 11

Correlations between Variables

		Age	Debut of Use	Gender	Admission frequency	Rehab utilization	Parental substance use	Marital	Employment	Education
Debut of Use	Pearson Correlation	.637**								
	Sig. (2-tailed)	.000								
	N	182								
Gender	Pearson Correlation	.054	.015							
	Sig. (2-tailed)	.469	.836							
	N	182	182							
Paternal substance use	Pearson Correlation	-.019	-.139	-.131	-.211**	.089				
	Sig. (2-tailed)	.794	.061	.077	.004	.232				
	N	182	182	182	181	180				
Marital	Pearson Correlation	.404**	.192*	.109	.030	.077	.004			
	Sig. (2-tailed)	.000	.010	.150	.689	.314	.963			
	N	177	177	177	176	175	177			
Employment	Pearson Correlation	.246**	.163*	-.094	.015	.122	-.134	.245**		
	Sig. (2-tailed)	.001	.034	.224	.847	.114	.081	.001		
	N	170	170	170	169	168	170	167		
Education	Pearson Correlation	-.058	-.114	.011	.086	-.175*	-.019	-.074	.000	
	Sig. (2-tailed)	.452	.141	.886	.272	.024	.812	.342	1.000	
	N	168	168	168	167	166	168	165	159	
Type of Antipsychotic patient was on	Pearson Correlation	-.125	-.030	.205**	-.172*	-.042	-.019	.002	-.031	-.010
	Sig. (2-tailed)	.094	.686	.006	.020	.572	.801	.982	.690	.893
	N	182	182	182	181	180	182	177	170	168

***. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed*)

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.0 Introduction

The purpose of this retrospective study was to assess factors associated with relapse of substance-induced psychosis following treatment of the first episode psychosis. This chapter includes discussion on major findings on factors that would increase the risk of a relapse of substance-induced psychosis as well as on techniques for management of first-episode substance-induced psychosis and its implication on relapses. The chapter then concludes with recommendations of management for substance induced first episode psychosis, limitations of the study as well as suggestion of further studies.

5.1 Discussion of Findings

Males were most affected as revealed by the study as majority of the respondent files were males. This was similar to Bhandari et.al, (2015) study although there was no significant association with the risk to relapse.

Cannabis was the most preferred substance of abuse and implicated in FEP. This was commensurate with other studies by Di Forti et al., (2015) that implicated cannabis as the most common cause of FEP. A majority of the respondents used it daily, an element that supports Fiorentini et al., (2011) views that SIP is a function of the severity of use and dependence on the substance. Certainly to curb relapse of SIP, management should therefore include strategies to reduce or discontinue use so as to improve outcomes (Schoeler et.al, 2017).

There was a negative linear relationship between paternal substance use and frequency of admission ($P = 0.004$), an indicator for relapse, meant that patients who had indicated paternal substance use, also had more relapses. This was congruent with a study by Perälä et.al, (2010) that showed that subjects whose fathers were alcoholics were prone to substance use disorders.

The factors that were likely to increase the risk of relapse of substance-induced psychosis among first episode substance-induced psychosis patients in this study were the level of education and type of antipsychotic used to manage the patient.

5.1.1 Risk of a relapse of substance-induced psychosis among first episode substance-induced psychotic patients

Education was statistically significant as a risk to relapse on linear regression however, there was no significant association with relapse of substance induced psychosis. This could be explained by the huge number of respondent files whose educational attainment was at the O' level and below. This finding was consistent with a study done in Bangladesh indicating a huge number of those that relapse in using substances after treatment were those of at least secondary level and below (Nabi et.al, 2020)

In addition the relation between low level of education and the lack of rehab utilization could shed light on how the level of education would be a predictor to relapse. Bhandari et.al, (2015) equally had a similar observation that those respondents with secondary level of education and below had a higher chance of relapse.

Certainly level of education as a risk factor would not necessarily directly correlate with relapse however, its impact on occupation, who largely would be unemployed would definitely increase the likelihood of substance use and relapse of the same.

This is congruent with the study in Nepal that highlighted that the level of education was associated with drug use relapse as well as respondents were largely students or unemployed, a finding that this study concurs with (Bhandari et.al, 2015).

The study revealed that the type of antipsychotic used would pose a risk to relapse. Patients on 1st generation antipsychotics had a minimum of two relapses while those on second generation antipsychotics had notably one relapse.

Indeed the efficacy of the 1st generation antipsychotic is under no scrutiny and its effectiveness is not in question rather, the extrapyramidal side effects are often than not more pronounced and hence hinder compliance. Alvarez et.al (2012) noted that non adherence or non-compliance to medication to be a risk to relapse.

Undeniably the relapse is not just directly from the non-compliance but the impact of psychosis occasioned by non-compliance leading to relapse of the substance use to ease the psychosis being experienced (Alvarez et.al 2012).

Consequently, it is also important to note that most of the substances abused have no 'antidotes' but rather coupled with antipsychotic treatment, cessation of use of the culprit substance is essential to the management of the substance induced psychosis (Beckmann et al., 2020).

5.1.2 Management technique of First episode SIP in preventing relapse

A majority of the respondents did not utilize the rehabilitation Centre as part of their management for the First episode SIP. Although there was no significant statistical association with relapse, there was a huge number that relapsed having not utilized a rehabilitation Centre. Chie et.al, 2016 equally found out that rehabilitation was essential to recovery and preventing relapse even under coercion to the extent that those that were admitted even without the intension of quitting substance use would eventually find their goals and change along the way.

Certainly the use of antipsychotic is integral however, compliance is a huge challenge that requires both the medical practitioner and patient to be in sync with the regimen proposed so as to encourage compliance and hence prevent a relapse.

5.2 Conclusions

5.2.1 Risk of SIP relapse following First episode treatment

The risk of relapse of SIP is multifactorial and may not necessarily have one fit for all kind of factor for relapse. Nonetheless, this study concludes that the low level of education and first generation antipsychotic use are factors that would likely increase ones probability to relapse.

5.2.2 Management Techniques

The need for adherence to medications is so integral in maintaining remission and prolonging such periods. Therefore it is important to capitalize with such insight through use of second generation antipsychotic in management of SIP so that, the propensity of reliving psychotic symptoms with substances is reduced considerably hence less relapse.

5.3 Recommendations

Provision of second generation antipsychotic at Mathari Teaching and Referral hospital to facilitate compliance of treatment.

Consistent rehabilitation utilization and psychotherapy to substance use patients that would include Motivational interviewing to address substance misuse and cognitive behavioral therapy for substance use disorder and psychosis

Mentorship programs for the youth at school, through religious institutions to inculcate values as well through communities especially during the rites of passage activities and ceremonies.

5.4 Limitation to the study

Obtaining data from the MTRH records was tedious. Patient file had no structured history forms and meant had to go through each file record to find out if it had adequate information for the study.

5.5 Suggestion for further Studies

The limitation that comes with conducting a retrospective study is the gaps in available data. This primarily brought about by missed information largely due to the poorly structured interviews and record keeping. This could easily lead to researcher bias where assumptions and conclusions are arrived at on behalf of the respondent by the researcher. Therefore, it would be beneficial should a similar research done as prospective study with mixed methods to have a much more an in-depth view of the study particularly on associations and correlation of relapse for SIP.

REFERENCE

Alvarez-Jimenez, M., Priede, A., Hetrick, S.E., Bendall, S., Killackey, E., Parker, A.G., McGorry, P.D. and Gleeson, J.F., 2012. Risk factors for relapse following treatment for first-episode psychosis: a systematic review and meta-analysis of longitudinal studies. *Schizophrenia Research*, *139*(1-3), pp.116-128.

American Psychiatric Association, 2020. Diagnostic and Statistical Manual of Mental Disorders.

Arunogiri, S., Foulds, J.A., McKetin, R. and Lubman, D.I., 2018. A systematic review of risk factors for methamphetamine-associated psychosis. *Australian & New Zealand Journal of Psychiatry*, *52*(6), pp.514-529.

Beckmann, D., Lowman, K.L., Nargiso, J., McKowen, J., Watt, L., and Yule, A.M., 2020. Substance-induced psychosis in youth. *Child and Adolescent Psychiatric Clinics*, *29*(1), pp.131-143.

Bergé, D., Mané, A., Salgado, P., Cortizo, R., Garnier, C., Gomez, L., Diez-Aja, C., Bulbena, A. and Pérez, V., 2016. Predictors of relapse and functioning in first-episode psychosis: a two-year follow-up study. *Psychiatric Services*, *67*(2), pp.227-233.

Bhandari, S., Dahal, M. and Neupane, G., 2015. Factors associated with drug abuse relapse: A study on the clients of rehabilitation centers. Hindu, 99, pp.86-84.

Blaikie, N., (2010) Designing Social Research, London: Sage Publications Chapter 4, 'Strategies for Answering Research Questions'

Chie, Q.T., Tam, C.L., Bonn, G., Dang, H.M. and Khairuddin, R., 2016. Substance abuse, relapse, and Treatment Program evaluation in Malaysia: Perspective of rehab Patients and staff using the Mixed Method approach. *Frontiers in psychiatry*, *7*, p.90.

Colizzi, M., Carra, E., Fraietta, S., Lally, J., Quattrone, D., Bonaccorso, S., Mondelli, V., Ajnakina, O., Dazzan, P., Trotta, A. and Sideli, L., 2016. Substance use, medication adherence, and outcome one year following a first episode of psychosis. *Schizophrenia Research*, *170*(2-3), pp.311-317.

De Oliveira, C., Cheng, J., Rehm, J. and Kurdyak, P., 2016. The economic burden of chronic psychotic disorders in Ontario. *J Ment Health Policy Econ*, *19*(4), pp.181-192.

Di Forti, M., Marconi, A., Carra, E., Fraietta, S., Trotta, A., Bonomo, M., Bianconi, F., Gardner-Sood, P., O'Connor, J., Russo, M. and Stilo, S.A., 2015. Proportion of patients in south London with first-episode psychosis attributable to use of high potency cannabis: a case-control study. *The Lancet Psychiatry*, *2*(3), pp.233-238.

Field, A., 2013. *Discovering Statistics Using IBM SPSS Statistics*. London: Sage Publications.

Fiorentini, A., Sara Volonteri, L., Dragogna, F., Rovera, C., Maffini, M., Carlo Mauri, M. and A Altamura, C., 2011. Substance-induced psychoses: a critical review of the literature. *Current drug abuse reviews*, *4*(4), pp.228-240.

Fraser, S., Hides, L., Philips, L., Proctor, D. and Lubman, D.I., 2012. Differentiating first episode substance-induced and primary psychotic disorders with concurrent substance use in young people. *Schizophrenia Research*, *136*(1-3), pp.110-115.

Global Health Estimates (GHE) 2020: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019. Geneva, World Health Organization; 2020.

Goerke, D. and Kumra, S., 2013. Substance abuse and psychosis. *Child and Adolescent Psychiatric Clinics*, *22*(4), pp.643-654.

Grady, D.G., Cummings, S.R. and Hulley, S.B., 2013. Research using existing data. *Designing Clinical Research*, pp.192-204.

Herring, R., Bayley, M., and Hurcombe, R., 2014. “But no one told me it’s okay to not drink”: a qualitative study of young people who drink little or no alcohol. *Journal of Substance Use*, *19*(1-2), pp.95-102.

Jacobsen, K. H., 2014. *Introduction to Health Research Methods: A Practical Guide*. Sudbury, MA: Jones Bartlett Learning.

Jaguga, F. and Kwobah, E., 2020. A review of the public sector substance use disorder treatment and prevention systems in Kenya. *Substance Abuse Treatment, Prevention, and Policy*, *15*(1), pp.1-9.

Jones, A.A., Gicas, K.M., Seyedin, S., Willi, T.S., Leonova, O., Vila-Rodriguez, F., Procyshyn, R.M., Smith, G.N., Schmitt, T.A., Vertinsky, A.T. and Buchanan, T., 2020. Associations of substance use, psychosis, and mortality among people living in precarious housing or homelessness: A longitudinal, community-based study in Vancouver, Canada. *PLoS medicine*, *17*(7), p.e1003172.

Jordaan, G.P. and Emsley, R., 2014. Alcohol-induced psychotic disorder: a review. *Metabolic brain disease*, *29*(2), pp.231-243.

Kamenderi, M., Muteti, J., Okioma, V., Kimani, S., Kanana, F. and Kahiu, C., 2017. Status of Drugs and Substance Abuse among the General Population in Kenya. *African Journal of Alcohol & Drug Abuse,(1),* pp.54-59.

Kent State University, 2014. Chi-Square Available at http://libguides.library.kent.edu/SPSS

Lo, T.W., Yeung, J.W. and Tam, C.H., 2020. Substance abuse and public health: a multilevel perspective and multiple responses.

Meyer, A.C., and Ndetei, D., 2016, February. Providing sustainable mental health care in Kenya: a demonstration project. In *Providing Sustainable Mental and Neurological Health Care in Ghana and Kenya: Workshop Summary*. National Academies Press (US).

Ministry of Health Kenya, 2020. Mental health and wellbeing towards happiness & national prosperity. A report by the Taskforce on Mental Health in Kenya.

Misri, S.K., 2018. Paternal Substance Use: Finding Solace in Drugs and Alcohol. In Paternal Postnatal Psychiatric Illnesses (pp. 139-165). Springer, Cham.

Nabi, M.H., Masud, I., Humaira, T., Hussain, A., Naz, F., Chakraborty, P.A. and Hawlader, M.D.H., 2020. Reasons of relapse and pattern of drug use among the substance users in Bangladesh: A nationwide study. Journal of Ethnicity in Substance Abuse, pp.1-10.

Niemi-Pynttäri, J.A., Sund, R., Putkonen, H., Vorma, H., Wahlbeck, K. and Pirkola, S.P., 2013. Substance-induced psychoses converting into schizophrenia: a register-based study of 18,478 Finnish inpatient cases. *The Journal of clinical psychiatry*, *74*(1), pp.94-99.

O'Connell, J., Sunwoo, M., McGorry, P. and O'Donoghue, B., 2019. Characteristics and outcomes of young people with a substance-induced psychotic disorder. *Schizophrenia Research*, *206*, pp.257-262.

Ongeri, L., Kirui, F., Muniu, E., Manduku, V., Kirumbi, L., Atwoli, L., Agure, S., Wanzala, P., Kaduka, L., Karimi, M. and Mutisya, R., 2019. Khat use and psychotic symptoms in a rural Khat growing population in Kenya: a household survey. *BMC psychiatry*, *19*(1), pp.1-10.

Perälä, J., Kuoppasalmi, K., Pirkola, S., Härkänen, T., Saarni, S., Tuulio-Henriksson, A., Viertiö, S., Latvala, A., Koskinen, S., Lönnqvist, J. and Suvisaari, J., 2010. Alcohol-induced psychotic disorder and delirium in the general population. *The British Journal of Psychiatry*, *197*(3), pp.200-206.

Pierre, J.M., Gandal, M. and Son, M., 2016. Cannabis-induced psychosis associated with high potency "wax dabs." *Schizophrenia Research*, *172*(1-3), pp.211-212.

Roberto, A.J., Lorenzo, A., Li, K.J., Young, J., Mohan, A., Pinnaka, S. and Lapidus, K.A., 2016. First-episode of synthetic cannabinoid-induced psychosis in a young adult, successfully managed with hospitalization and risperidone. *Case reports in psychiatry*, *2016*.

Rognli, E.B., Berge, J., Håkansson, A. and Bramness, J.G., 2015. Long-term risk factors for substance-induced and primary psychosis after release from prison. A longitudinal study of substance users. *Schizophrenia Research*, *168*(1-2), pp.185-190.

Roncero, C., Daigre, C., Gonzalvo, B., Valero, S., Castells, X., Grau-López, L., Eiroa-Orosa, F.J. and Casas, M., 2013. Risk factors for cocaine-induced psychosis in cocaine-dependent patients. *European Psychiatry*, *28*(3), pp.141-146.

Schoeler, T., Petros, N., Di Forti, M., Klamerus, E., Foglia, E., Murray, R. and Bhattacharyya, S., 2017. Poor medication adherence and risk of relapse associated with continued cannabis use

in patients with first-episode psychosis: a prospective analysis. *The Lancet Psychiatry*, *4*(8), pp.627-633.

Soyka, M., Helten, B., Cleves, M. and Schmidt, P., 2013. High rehospitalization rate in alcohol-induced psychotic disorder. *European archives of psychiatry and clinical neuroscience*, *263*(4), pp.309-313.

Stankewicz, H.A., Richards, J.R. and Salen, P., 2020. Alcohol-related psychosis. *StatPearls [Internet]*.

Starzer, M.S.K., Nordentoft, M. and Hjorthøj, C., 2018. Rates and predictors of conversion to schizophrenia or bipolar disorder following substance-induced psychosis. American Journal of Psychiatry, 175(4), pp.343-350.

Tesfaye, E., Krahl, W. and Alemayehu, S., 2020. Khat induced psychotic disorder: case report. *Substance abuse treatment, prevention, and policy*, *15*, pp.1-5.

Thompson, A., Marwaha, S., Winsper, C., Everard, L., Jones, P.B., Fowler, D., Amos, T., Freemantle, N., Singh, S.P., Marshall, M. and Sharma, V., 2016. Short-term outcome of substance-induced psychotic disorder in a large UK first-episode psychosis cohort. *Acta Psychiatrica Scandinavica*, *134*(4), pp.321-328.

Tibbo, P., Malla, A., Manchanda, R., Williams, R. and Joober, R., 2014. Relapse risk assessment in early-phase psychosis: the search for a reliable and valid tool. *The Canadian Journal of Psychiatry*, *59*(12), pp.655-658.

Tripathy, J.P., 2013. Secondary data analysis: Ethical issues and challenges. *Iranian journal of public health*, *42*(12), p.1478.

United Nations Office on Drugs and Crime (UNODC), 2019. World Drug Report 2019: 35 million people worldwide suffer from drug use disorders while only 1 in 7 people receive treatment.

United Nations Office on Drugs and Crime (UNODC), 2020. World Drug Report 2020 (United Nations publication, Sales No. E.20.XI.6).

Wahyuni, D., (2012) ‘The Research Design Maze: Understanding Paradigms, Cases, Methods and Methodologies’, Journal of Applied Management Accounting Research, 10 (1) pp. 69-80

Weibell, M.A., ten Velden Hegelstad, W. and Johannessen, J.O., 2016. Substance-induced psychosis: conceptual and diagnostic challenges in clinical practice. In *Neuropathology of Drug Addictions and Substance Misuse* (pp. 50-57). Academic Press.

World Health Organization, 2019. World Drug Report 2019. *United Nations publication, Sales No. E, 19.*

APPENDIX I

QUESTIONER CHECK LIST

Diagnosis					
Demographics					
Age					
Gender					
Marital Status					
Employment					
Status					
Religion					
Level of Education					
Living arrangement	Self	Family	Nuclear	Extended	Friend
Premorbid Personality					
Type of substance Used					
Debut age of use					
Frequency of Use					
Family Support		**Strong**	**Average**	**Weak**	
Frequency of Admission					
Therapy combination					

Length of therapy					
Rehab Utilization		**Yes**	**No**		
Paternal Substance use					

APPENDIX II

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/232

30th June, 2021

KENYATTA NATIONAL HOSPITAL APPROVED 30 JUN 2021 KNH/UoN-ERC P.O. BOX 20723 - 00202 NAIROBI

Dr. Emmanuel Alenga Amadi
Reg. No. H58/12250/2018
Dept. of Psychiatry
School of Medicine
College of Health Sciences
University of Nairobi

Dear Dr. Amadi,

RESEARCH PROPOSAL: RISK FACTORS ASSOCIATED WITH RELAPSE FOLLOWING TREATMENT OF THE FIRST EPISODE OF SUBSTANCE-INDUCED PSYCHOSIS; A SECONDARY DATA REVIEW AT MATHARI NATIONAL TEACHING AND REFERRAL HOSPITAL (P279/04/2021)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 30th June, 2021 – 29th June, 2022.

This approval is subject to compliance with the following requirements:

i. Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
ii. All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
iii. Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
v. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (Attach a comprehensive progress report to support the renewal).
vi. Submission of an executive summary report within 90 days upon completion of the study.

Protect to discover

This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

For more details consult the KNH- UoN ERC website **http://www.erc.uonbi.ac.ke**

Yours sincerely,

PROF. M. L. CHINDIA
SECRETARY, KNH-UoN ERC

c.c. The Principal, College of Health Sciences, UoN
The Senior Director, CS, KNH
The Chair, KNH- UoN ERC
The Dean, School of Medicine, UoN
The Chair, Dept. of Psychiatry, UoN
Supervisors: Dr. Fredrick Owiti, Dept. of Psychiatry, UoN
Dr. John Mburu, Dept. of Psychiatry, UoN

MATHARI HOSPITAL

CLEARANCE TO UNDERTAKE RESEARCH IN MATHARI HOSPITAL

TO: I/C RECORDS DEPT. Date 1/7/2021

This is to inform you that (name/no. of students)

DR. ALENGA EMMANUEL AMADI

From (Name of training institution)

U.O.N

Has/have been cleared by the office of the Medical Superintendent to undertake research at Mathari hospital.

Please accord them/him/her the necessary support.

C.M.E.D. Date 1/7/2021 Signature

Thanks

In-Charge C.M.E.D