*RELATIONSHIP BETWEEN CANNABIS USE AND PSYCHIATRIC DISORDERS IN PATIENTS ADMITTED AT DR GEORGE MUKHARI HOSPITAL PSYCHIATRY UNIT*

 BY

*DR L.N. MODISANE*

Submitted in partial fulfilment of the requirement for the degree M Med Psychiatry in the Department of Psychiatry at the University of Limpopo (Medunsa Campus)

Date Submitted : October 2010

MEDUNSA CAMPUS, Pretoria

Main Supervisor: PROF S.T RATAEMANE

 HOD

 DEPARTMENT OF PSYCHIATRY

 MBCHB (Natal), FC PSYCH (SA)

 DIPLOMA. CHILD PSYCH (LONDON)

Co-Supervisor: DR N.M MASILO

 MBCHB (MEDUNSA) M MED PSYCH (MEDUNSA)

**DECLARATION**

I, Dr L.N Modisane hereby declare that the work on which this research is based is original (except where acknowledgments indicate otherwise)and that neither the whole work nor any part of it has been or is to be submitted for another degree at this or any other university.

Signature:…………………….

Date: October 2010

ACKNOWLEDGEMENTS

I hereby acknowledge my supervisor Prof ST Rataemane for guiding me from the start throughout to the end of my research. He encouraged me a lot. Not forgetting my co-supervisor Dr N Masilo who had been very helpful.

Furthermore I would like to extend my gratitude to the Chief Executive Officer of Doctor George Mukhari Hospital for granting me permission to conduct the study on Mental Health Care Users in his institution.

I also acknowledge the Research Ethics and Publications Committee of Faculty of Medicine, University of Limpopo (Medunsa Campus) for the approval of the protocol

Last but not least the staff of pharmacology lab, University of Limpopo (Medunsa Campus) is acknowledged for assisting me with testing of specimens.

DEDICATION

This project is dedicated to my mother and brother who had been very supportive throughout my study career.

LIST OF ACRONYMS

DSM IV TR: Diagnostic and Statistical Manual of Mental Disorders 4th edition, text

 revised

COMT: Cathecol-O-methyl transferase

ASP: Antisocial personality disorder

CD: Conduct Disorder

BD: Bipolar Disorder

NHLS: National Health Laboratory Services

MEDUNSA: Medical University of Southern Africa

CB1: Cannabinoid -1-receptor

DEFINITION OF TERMS

NYAOPE: Combination of cannabis and heroine

LIST OF TABLES PAGE

Table 1. Biographical Information 23

Table 2. Thirty days prevalence rates of substance use before interview 26

Table 3. Frequency of use cannabis 30 days prior to the interview 27

Table 4. Screening for pattern of cannabis use 28

Table 5. Diagnosis distribution 29

Table 6. Test distribution 30

Table 7. Diagnosis and test 31

Table 8. Correlation between participants and cannabis use 31

Table 9. Correlation between psychiatric disorder and cannabis use 32

Table 10. Correlation between psychiatric disorder and cannabis use 32

LIST OF FIGURES PAGE

Figure 1 Distribution of the highest standard completed 25

Figure 2 Job distribution 25

Figure 3 Distribution of where they stay 25

Figure 4 Cannabis first tried distribution 25

Figure 5 Motives for smoking cannabis distribution 25

ABSTRACT

BACKGROUND

Cannabis is the commonly used illicit drug of choice in South Africa and throughout the world. The majority of individuals who use cannabis do not report adverse reactions to it, however a minority of heavy users will develop problems. A substantial number of patients admitted at our psychiatry unit seem to be using cannabis.

AIMS

 The aim of the study was to assess the relationship between cannabis use in psychiatric disorders in patients admitted in George Mukhari Hospital Psychiatry Unit, to determine the pattern of cannabis use, to identify the common psychiatric disorders in patients using cannabis, to determine the socio-economic factors that may lead to cannabis use.

METHODS

A total of 75 participants admitted at Doctor George Mukhari hospital and diagnosed with psychiatric disorders according to the diagnostic and statistical manual of mental disorders fourth edition text revised were interviewed using a structured questionnaire and had urine specimens collected for analysis. Out of 75 participants a control group of 34 participants who tested negative for urinary cannabinoids were interviewed. The participants had signed a written informed consent in their language of preference. The study had been approved by the Research Ethics and Publications Committee of the University of Limpopo (Medunsa Campus).Data was analysed with the help of the statistician and reported on graphs, pie-charts and tables.

RESULTS

16(39%) of participants who tested positive were diagnosed with schizophrenia, 7 (17%) of those who tested positive were diagnosed with cannabis induced psychotic disorder, 5(12%) of those tested positive were diagnosed with psychosis due to GMC (HIV) and 6(15%) were diagnosed with psychosis due GMC (epilepsy). 8(24%) of those who tested negative were diagnosed with schizophrenia, 15(44%) of those tested negative were diagnosed with cannabis induced psychotic disorder, 2(6%) were diagnosed with psychosis due to GMC (HIV) and to 2(6%) of those who tested negative were diagnosed with psychosis due to GMC (epilepsy). Majority 24 (32%) smoked cannabis using pipes 4-5 times, 19 (25%) used zols 4-5 times, 12(16%) used pipes 2-3 times, 11(14%) used 1 zol in the 30 days prior to the interview. Most of the participants were of low socio-economic status and had started using cannabis early in their lives.

CONCLUSION

Cannabis use is related to a number of psychiatric disorders in patients admitted at Dr George Mukhari Hospital. Schizophrenia, cannabis induced psychotic disorder, psychosis due to GMC (HIV), psychosis due to epilepsy were the commonest identified disorders.

TABLE OF CONTENTS PAGE

DECLARATION 1

ACKNOWLEDGEMENTS 2

DEDICATION 3

LIST OF ACROMYNS 4

DEFINITION OF TERMS 5

LIST OF TABLES 6

LIST OF FIGURES 7

ABSTRACT 8-9

Chapter 1: INTRODUCTION 12-13

Chapter 2: LITERATURE REVIEW 14-17

Chapter 3: METHODOLOGY

3.1 Study Design 18

3.2 Study Population 18

3.3 Sample 18

3.4 Data Collection 19

3.5 Data Analysis 19

3.6 Reliability 20

3.7 Validity 20

3.8 Bias 20

3.9 Ethical Issues 20

Chapter 4: RESULTS

4.1 Introduction 21

4.2 The Research Instrument 21

4.3 ` Demographic Profile of Respondents 21-22

4.4 Cannabis Use Information 26

4.5 Correlation 30

Chapter 5: DISCUSSION 33-35

Chapter 6: CONCLUSION

6.1 Conclusion from the Study 36

6.2 Limitation of the Study 36

REFERENCES 37-38

APPENDICES 39-44

*CHAPTER 1*

**INTRODUCTION**

Cannabis is the commonly used illicit drug of choice in South Africa and throughout the world (1, 5, and 8). Cannabis is derived from cannabis plant and chemically similar synthetic compounds. The main psychoactive ingredient of cannabis is delta 9 – tetrahydrocannabinol (THC) whose psychological effects stem from activation of CB1 receptors found in hippocampus, cerebellum, basal ganglia, cerebral cortex, amygdala and certain brainstem nuclei1. Synthetic delta 9 – tertrahydrocannabinol has been used for certain general medical conditions (e.g. nausea and vomiting caused by chemotherapy, for anorexia and weight loss in individuals with acquired immune deficiency syndrome10).

 The majority of individuals who use cannabis do not report adverse reaction to it; however a minority of heavy user will develop problems. During my training as a registrar in psychiatry at Dr George Mukhari Hospital, I have observed that a substantial number of patients admitted at our psychiatry with psychiatric disorders seem to be using cannabis. The research will highlight the association between these psychiatric disorders and cannabis use so as:

1. To increase awareness about the relationship between cannabis use and psychiatric disorders.
2. To develop effective intervention strategies to manage psychiatric disorders associated with cannabis use.

**AIM**

To assess the relationship between cannabis use and psychiatric disorders in patients admitted at Dr George Mukhari Hospital psychiatry unit.

OBJECTIVES

1. To determine the pattern of cannabis use
2. To identify the relationship between cannabis use and psychiatric disorders.

3. To identify the common psychiatric disorders in patients using cannabis.

4. To determine the socio-economic factors that may lead to cannabis use.

RESEARCH QUESTION

What is the relationship between cannabis use and psychiatric disorders in patients seen at Dr George Mukhari Hospital psychiatry unit?

**CHAPTER 2**

**LITERATURE REVIEW**

Marta D.F et al in their study found that heavy cannabis use in adolescents can later increase the risk of schizophrenia- like psychosis1. They found that cannabis in combination with other factors particularly genetic predisposition could lead to schizophrenia, for example possession of the COMTVAL/VAL genotype, heavier use and starting use early in life increase the risk further1. A review by Fillip Smit et al. 2003 explored the role of cannabis use in the onset of symptoms and disorders in the schizophrenia spectrum3. They reviewed five populations – based, longitudinal studies on the relationship between cannabis use and problems reigning from the experience of psychotic symptoms to hospitalization with a confirmed diagnosis of schizophrenia. Several hypotheses that may explain this relationship were examined including:

* Self medication
* Effects of other illicit drugs
* Confounding
* Stronger effect in predisposed people and Aetiological hypothesis

They also found out that cannabis use does indeed increase the risk of schizophrenic and other psychotic disorders and this conclusion applies throughout the range of symptoms and full-blown disorders in the schizophrenic spectrum3.

Louisa D et al. in their study tested four hypotheses which were:

* Cannabis use causes psychosis
* Cannabis use precipitates psychosis among vulnerable individuals
* Cannabis use worsens the prognosis of persons with schizophrenia
* Regular cannabis use is more likely among persons with psychosis

They concluded that cannabis use does not appear to be causally related to the incidence of schizophrenia but its use may precipitate disorders in persons who are vulnerable to developing psychosis and worsen the disorder among those who have already developed it9. A study by Theresa H.M.Moore et al found consistent association between cannabis abuse and psychotic symptoms including disabling psychotic disorders8.

They found less evidence for affective disorders associated with cannabis use than there is for psychosis8. Louisa D et al in their study concluded that rates of depression were elevated in those who use cannabis frequently or those who are cannabis dependant2. There does not appear to be an increased risk of depression associated with infrequent cannabis use. In their study they also found out that there is a modest association between early-onset regular or problematic cannabis use and later depression in several well-designed longitudinal studies2.

 They found that there have been a variety of different ways in which depression had been assessed. Some studies have assessed major depression as defined by DSM whilst others have used measures of depressive symptoms2. In a study by Cecelia H et al it was found that use of cannabis increase the risk for subsequent manic symptoms4. Their study was to explore cannabis use and the expression of mania in the general population.

Marta D.F et al also found that cannabis use in girls under the age of 15 years raised the risk of subsequent suicidal ideation and attempt in the following15 years significantly.

Study by Marta D.F et al focussed on the effects of cannabis on mental health and on cognition. They found that cannabinoids suppress glutamate release in the hippocampus thereby preventing long - term potentiation at excitatory synapses and impairment in hippocampal - dependent learning and memory1.In their study Marta D.F et al also found persisting deficits in decision-making and brain activity among heavy cannabis users who had abstained for 25 days1. One possible explanation for some of the contradictory findings concerning memory is that as for psychosis the effects of cannabis on cognition may be dependent on the age when use began1. Many studies have shown a link between onset of psychotic disorders and cannabis use and few have shown a link between cannabis use and affective disorders.

Vito Agosti et al (11) observed that ASP and CD had the strongest relationship to lifetime cannabis dependence. They also observed that cannabis dependence was associated with an approximate two-fold risk of having a mood or anxiety disorder for both lifetime and past month assessments. The aim of their study was to describe the prevalence of psychiatric disorder among individuals with cannabis dependence in the National Co-morbidity Survey.

Leslie Iversen (12) in his review article on long term effects of exposure to cannabis indicated that cannabis may precipitate Schizophrenic illness earlier in vulnerable people who exhibit “Schizophreniform” tendencies. His conclusion supported by results of a study of 22 newly admitted Schizophrenic patients in the Netherlands, which showed a strong association between use and the age of onset of the first episode of psychosis in men, with users experiencing their first psychotic episode 6, 9 years earlier than non users. He also noted a strong association of daily cannabis use and depression as was reported by one longitudinal study in Australia about teenage girls in Australia who used cannabis daily.

P.K. Mcguire (22) et al in their study concluded that cannabis use may “trigger” the development or re-emergence of a “functional” psychosis in predisposed individual, rather than producing a specific “cannabis psychosis”. They noted that as cannabis probably acts on the brain through specific cannabinoids receptors, this effect may involve an interaction between its efficacy at such sites and the user’s genetic diathesis for Schizophrenia.

Mikkel Arendt et al (24) noted that psychiatric disorders are frequent among heavy cannabis users. The highest prevalence of most disorders was found among cannabis users not using hard drugs, compared with cannabis users also using hard drugs and primary hard drugs. After adjustment for possible confounding factors, cannabis use remained significantly associated with depression, personality disorders and Schizophrenia.

Suresh Sundram (18) in his review article came to the conclusion that in adolescents, relationship between early cannabis use and Schizophrenia, depressive disorders, substance use disorders and cognitive impairment are even stronger but remain associational in nature and cannot exclude intervening genetic and environmental variables.

F. Markus Leweke et al (15) in their review article found that BD has the highest rate of substance abuse co-morbidity of any Axis I disorder (clinical psychiatric disorders, including major mental disorders according to DSM-IV categorical classification system). They also noted that although cannabis use is common in patients with BD, little is known about its role as a risk factor for BD. They also highlighted the fact that cannabis is the most commonly abused drug in individuals with BD, mirroring the relative rates of drugs of abuse in the general population. They noted that cannabis is viewed as the drug of choice in BD, with up to 22% of BD patients using cannabis at any one time and up to 64% of patients having used cannabis in their lifetime, compared with 34% of the general population. They also found that frequent cannabis consumption is associated with increased anxiety in young adults independent of additional use of other illicit drugs.

Brook, J.S. et al (19) in their longitudinal study of 2226 Colombian adolescents found a clear connection between marijuana use and elevated levels of anxiety and depression. Marijuana use, especially during early adolescence, can predict late adolescent distress.

Brook, D.W. et al (20) in their longitudinal research of co-morbid disorders found that early cannabis use during childhood and adolescence increased the risk of Major depression by 17%.

Patton, G.C. et al (25) in their study found that early use of cannabis among girls increased the risk of depression five times. Weekly or more frequent marijuana use in teenagers doubled the risk of depression and anxiety.

Drewe, M et al (21) in his literature review concludes that cannabis use is connected with Schizophrenia and depression and came to the following conclusion: cannabis consumption affects dopamine concentration in the brain and can induce or modulate the development of psychotic symptoms, including Schizophrenia, and that young age of cannabis use is an additional risk factor for psychosis. Cannabis consumption can also lead to other psychiatric disorders, including depression and cognitive disturbances.

Rey, J et al (23) in his review of literature from the past decade concludes that weight of evidence points to regular and early cannabis use associated with later increases in depression, suicidal behavior and Schizophrenia.

**CHAPTER 3**

**RESEARCH METHODOLOGY**

3.1 STUDY DESIGN

This was a prospective study of patients seen at Dr George Mukhari Hospital (Psychiatric Unit) with his history of cannabis use and a recognized psychiatry disorder. The study was conducted for the period of three months following the approval of protocol by Research, Ethics and Publication Committee of Faculty of Medicine, University of Limpopo (Medunsa Campus). Standardized structured questionnaire was used for the purpose of the study (Appendix 3)

A control group consisting of patients with psychiatric disorders who tested negative for urinary cannabinoids was included in the study.

3.2 STUDY POPULATION

 For the purpose of the study all patients admitted at Dr George Mukhari psychiatric unit in a three month period following the approval of a protocol by the Ethics Committee were interviewed. The total number of participants interviewed was 75 which included a control group of 31.

3.3 SAMPLE

The actual sample size was of those who tested positive for urinary cannabinoids using quantitative method employed at NHLS. The subjects were diagnosed as having psychiatric disorders according to DSM – IV TR.

Inclusion Criteria

* Both males and females
* Age range 15 – 50 years
* Subjects diagnosed with mental disorder according to DSM IV-TR
* Subjects who tested positive for urinary cannabinoids
* Subjects having a clear sensorium and capable of giving a written informed consent (Appendix 1)
* A control group of those who tested negative for urinary cannabinoids was included

Exclusion Criteria

* Participants without a recognized mental disorder according to DSM – IV TR
* Participants not capable of giving a written informed consent.

3.4 DATA COLLECTION

The aims and objectives of the study were explained to the participants before the study was commenced. Written informed consent was obtained from the participants. (Appendix 1)

The researcher conducted interview with the participants once they were mentally stable. Diagnoses was verified by analysing patients’ files to check if DSM – IV TR Criteria were met. Copy of NHLS lab report was obtained to verify the results.

3.5 DATA ANALYSIS

Data was analyzed by the researcher in consultation with the Biostatistician at National School of Public Health (University of Limpopo, Medunsa Campus) (Appendix 2). Data was captured and analyzed using EXCEL, STATISTICA, SAS or SPSS.

Mostly descriptive analysis was adopted. This included presentation of data in tabular and graphical forms and computations of mean and standard deviations. More advanced statistical techniques (Analysis of variance and correlations) were employed for hypothesis between cannabis use and psychiatric disorders. P-value of less than 0.05 was used for significance.

3.6 RELIABILITY

The study is reliable because it can be re-conducted after a certain period using the same subjects under the same condition in the same institution and the results will be similar. The recognised test for urinary cannabinoids used by the NHLS will be similar in all the subjects.

3.7 VALIDITY

The study is valid because the subjects had been diagnosed according to using the DSM IV-TR, recognised test for urinary cannabinoids by NHLS in South Africa and a standardized structured questionnaire was used in all the subjects (Appendix 3). All subjects were interviewed by the researcher.

3.8 BIAS

Selection bias was avoided by selecting all patients who tested positive for urinary cannabinoids admitted at Dr George Mukhari Hospital with mental illness and cannabis abuse. All subjects were interviewed by the same interviewer using the same questionnaire. There might have been bias because those with a history of cannabis use might have not tested positive for urinary cannabiniods according to the methods used at NHLS.

3.9 ETHICAL ISSUES

* Consent was obtained from the Head of Health Establishment at Dr George Mukhari Hospital to conduct the study
* Written informed consent was obtained from the patients before the study was conducted
* Patients confidentiality was maintained
* Information obtained from the patients was only used for the purpose of the study
* The study was designed not to affect routine management and treatment of patients involved
* Permission from Research Ethics and Publication Committee of Faculty of Medicine, University of Limpopo, Medunsa Campus was obtained before the commencement of the study

**CHAPTER 4**

**RESULTS**

Data Analysis

# Introduction

The study aimed to assess the relationship between cannabis use and psychiatric disorders in patients admitted at Dr George Mukhari Hospital psychiatry unit.

The objectives were to determine the pattern of cannabis use, identify the relationship between cannabis use and psychiatric disorders, identify the common psychiatric disorders in patients using cannabis and determine the psychosocial-economic factors that may lead to cannabis use.

4.2 The Research Instrument

Data were collected through a questionnaire which was formulated by the researcher based on literature review and statistician. The questionnaire was divided into two sections, section 1,comprised questions which were aimed at eliciting respondents’ biographic profile e.g., race, gender and rank in which were relevant to the objectives of the study and section 2 cannabis use information

4.3 Demographic Profile of Respondents

Total number of subjects was 75 which included control group of 34 subjects with 56 males and 19 females

The majority of the respondents 31(41.3%) were between the age of 16 – 25yrs, followed by age distribution between 26 – 34yrs, 26(34.7%), between the age of 35 – 43yrs were 15(20%) and 3(4.0%) were between the age of 44 – 49yrs with the ( mean = 28.9,SD = 7.9). Male were 56(74.7%) and female were 19(25.3). Majority of the respondents 25(33.3%) completed their matric or high school equivalent diploma. Fifty nine (78.7%) of the participants were never married.

 Of the 75 respondents, majority 40(53.3%) were unemployed, not seeking work and 20 (26.7%) were unemployed seeking work. When asked about their type of job they currently had 60(80%) were not working and 47(62.7%) stay with their parents. Majority 51(68.0%) does not have any criminal record. There was no history of mental illness in the families of 64% (47) of respondents.

 51(61%) of participants 51(61%) had been referred to a counselor/doctor/psychiatrist for any psychiatric disorder and 47(62.7%) had been admitted to hospital for psychiatric disorder.

There was no alcohol or drug problem in 56% (42) of participants families. See table 1.figure 1, 2, and 3 below for details.

# Table 1: Biographical Information

|  |  |  |
| --- | --- | --- |
|  Characteristics | Number | Percentages |
| **Age** |
| 16 – 25 | 31 | 41.3 |
| 26 – 34 | 26 | 34.7 |
| 35 – 43 | 15 | 20 |
| 44 – 49 | 3 | 4.0 |
| **Gender** |
| Male | 56 | 74.7 |
| Female | 19 | 25.3 |
| **Marital status** |
| Married | 6 | 8.0 |
| Living with someone | 4 | 5.3 |
| Widowed | 3 | 4.0 |
| Divorced | 3 | 4.0 |
| Never married | 59 | 78.7 |
| **Current employment** |
| Full time | 9 | 12.0 |
| Part time | 5 | 6.7 |
| Unemployed seeking work | 20 | 26.7 |
| Unemployed not seeking work | 41 | 54.7 |
| **Any criminal** |
| Yes | 22 | 29.3 |
| No | 52 | 69.3 |
| **Family ever had mental illness** |
| Yes | 26 | 34.7 |
| No | 48 | 64.0 |
| **Referred to a counselor/doctor/psychiatrist** |
| Yes | 51 | 68.0 |
| No | 24 | 32.0 |
| **Family ever had an alcohol or drug problem** |
| Yes | 33 | 44.0 |
| No | 42 | 56.0 |

**Figure 1 Distribution of the highest standard completed**

**Figure 2 Job distribution**

**Figure 3 Distribution of where they stay**

**Figure 4 Cannabis first tried distribution**

**Figure 5 Motives for smoking cannabis distribution**

**4.4 Cannabis use information**

Of the respondents 17(22.7%) tried cannabis for the first time at an early age of less than 15, 13 (17.3%) were between the age of 15 – 17 yrs, between 18 – 20 years were 10(17.3%), 2( 2.7%) were between the age of 24-26yrs and above 26 years. Thirty one (41.3%) did not respond. Their motives for smoking cannabis were enjoyment/fun 17(22.7), 11(14.7%) were to relieve stress, 14(18.7%) were to hang out with friends, 1(1.3%) were to alleviate physical pain and to relax, helps them to sleep. For more details see figure 4 and 5.

 **Table 2 Thirty days prevalence rates of substance use before interview**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **0 day** | **1-2 days** | **3-5days** | **6-9days** | **10-19days** | **20-29days** | **All 30days** |
| **Alcohol** | 19(25.3%) | 2(2.7%) | 6(8.0%)) | 12(16.0%) | 6(8.0%) | 2(2.7%) | 3(4.0%) |
| **Cigarettes** | 8(10.7%) | 2(2.7%) |  | 1(1.3%) | 5(6.7%) | 9(12.0%) | 25(33.3%) |
| **Cannabis** | 23(30.7%) | 2(2.7%) | 1(1.3%) | 2(2.7%) | 6(8.0%) | 4(5.3%) | 11(14.7%) |
| **Heroin** | 44(58.7%) | 0 | 1(1.3%) | 0 | 0 | 0 | 1(1.3%) |
| **Cocaine** | 45(60.0%) | 0 | 0 | 0 | 0 | 0 | 1(1.3%) |
| **Nyaope** | 40(53.3%) | 2(2.7%) | 2(2.7%) | 0 | 0 | 0 | 1(1.3%) |
| **Other** | 18(24.0%) | 0 | 0 | 1(1.3%) | 4(5.3%) | 0 | 0 |

Table 2 above shows that for all 30days majority 25(33.3%) smoke cigarettes, 11(14.7%) cannabis, 1(1.3%) use heroin, cocaine and nyaope .between 20-29 days were 9(12.0%) smoke cigarette,4 cannabis and 2 drink alcohol. 10 – 19days were 6(8.0%) use cannabis and drink alcohol, 5 drink alcohol and 4 (5.3) use other ………. Twelve (16.0%) drink alcohol between 6 - 9 days, 1(1.3%) use cigarette and 2(2.7%) cannabis. Between 1 – 5days, 8(10.7%) drink alcohol, 4(5.4%) use nyaope and 3(4.0%) use cannabis.

**Table 3 Frequency of use of cannabis 30 days prior to the interview**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Zols** | **Pipes** | **Both** |
| **1** | 11(14.7%) | 1(1.3) | 0 |
| **2 – 3** | 2(2.7%) | 12(16.0%) | 1(1.3%) |
| **4 – 5** | 19(25.3%) | 24(32.0)% | 0 |

Table 3 above shows the frequency of cannabis use. Majority 24(32.0%) smoke cannabis using pipes 4-5 times and 19(25.3%) use zols 4-5 times. 12(16.0% of participants used pipes 2 – 3 times and 11(14.7%) smoke only one zol. 2(2.7%) smoked cannabis using zols 2-3 times per day whilst 1(1.3%) smoked cannabis using 1 zol.

|  |  |  |
| --- | --- | --- |
| **TABLE 4****Screening for pattern of cannabis use**  |  |  |
| Variables | Number | Percentages |
| **Cut down on your cannabis use** |  |  |
| Yes | 35 | 46.7 |
| No | 9 | 12.0 |
| **Annoyed when questioned about your cannabis use** |  |  |
| Yes | 19 | 25.3 |
| No | 24 | 32.0 |
| **Feel guilty about your cannabis** |  |  |
| Yes | 25 | 33.3 |
| No | 19 | 25.3 |
| **Smoke cannabis first thing in the morning** |  |  |
| Yes | 11 | 14.7 |
| No | 33 | 44.0 |
| **Lost friends because of your smoking cannabis** |  |  |
| Yes | 13 | 17.3 |
| No | 30 | 40.0 |
| **Trouble at work because of smoking cannabis** |  |  |
| Yes | 2 | 2.7 |
| No | 41 | 54.7 |
| **Trouble at school because of smoking cannabis** |  |  |
| Yes | 12 | 16.0 |
| No | 32 | 42.7 |
| **Gotten into fight when under the influence of cannabis** |  |  |
| Yes | 8 | 10.7 |
| No | 36 | 48.0 |
| **Arrested for possession of cannabis** |  |  |
| Yes | 7 | 9.3 |
| No | 32 | 49.3 |

Majority of the respondents 35(46.7%) need to be cut down on their use of cannabis. 9(12.0%) not. Forty four did not respond. Participants were not easily annoyed when questioned about their cannabis use 24(32.0%) and 19(25.3%) felt easily to be annoyed.

Twenty five (33.3%) felt guilty about their cannabis use and 19(25.3%) did not feel guilty but 31(41.3%) did not respond. 33(44.0%) of respondents did not smoke cannabis in the morning and 11(14.7%) did smoke in the morning.

Majority 41(54.75) had no trouble at work because of smoking cannabis and only 2(2.7%) had trouble because of smoking cannabis. Respondents 32(42.7%) had no trouble at school, 12(16.0%) had trouble at school because of smoking cannabis and 32(41.3%) did not respond. Majority of respondents36 (48.0%) did not get into fights when under the influence of cannabis, 8(10.7%) got into fights and 44(58.7%) did not answer. Thirty seven (49.3%) had not been arrested for possession of cannabis, 7 were arrested and 44(58.7%) did not respond. See table 4 above

**Table 5 Diagnosis distribution**

|  |  |  |
| --- | --- | --- |
| Variables | Number | Percentages |
| Schizophrenia | 24 | 32.0 |
| Cannabis induced psychotic disorder | 22 | 29.3 |
| Psychosis GMC (HIV) | 7 | 9.3 |
| Polysubstance induced psychotic disorder | 2 | 2.7 |
| Psychosis GMC (epilepsy) | 8 | 10.7 |
| Psychosis head injury | 2 | 2.7 |
| BMD mania | 6 | 8.0 |
| MDD Psychotic features | 4 | 5.3 |
| Total | 75 | 100 |

Table 5 above demonstrated that majority of the participants interviewed had schizophrenia 24(32.0%) followed by these who had cannabis induced psychotic disorder 22(29.3)

**Table 6 Test Distribution**

|  |  |  |
| --- | --- | --- |
| Tests | Number | Percentages |
| Negative | 34 | 45.3 |
| Positive | 41 | 54.7 |
| Total | 75 | 100 |

Most of the patients tested positive 41(54.7%) and negative were 34(45.3%). See table 6 above.

**4.5 Correlation**

Correlation coefficient is used as a measure of the strength of the relationship between two sets of variables. The level of significance is 0.05%.The correlation analysis will be examined using the Cross-tabulation which entails the use of contingency tables to provide a visual comparison of summary data output related to two variables within a sample. The results are presented in a table.

Respondents with both schizophrenia and cannabis induced psychotic disorder the results were similar tested negative 23 (50%) and positive (50%), despite similarities between the results, some differences did emerge from these who had schizophrenia 8 patients were tested negative and 16 patients tested positive and 15 patients who had cannabis induced psychotic disorder were tested negative, 7 patients were positive with (= 11.3 and P <0.05) which is also significant.

Similar relationships existed when the result shows the bivariate odds ratios of increased cannabis involvement between cannabis uses with gender. With respect to cannabis use, the odds for cannabis use were approximately four times greater (OR = 4.4, (CI 1.3; 1.6)) among males than female with (OR = 0.4, (CI 1.6; 2.0)) and = 8.9 and P = 0.003.

| **Table 7 Diagnosis and test** |
| --- |
|  |  Test | Total |
| Diagnosis | Negative | Positive |
| Schizophrenia | 8 | 16 | 24 |
| Cannabis induced psychotic disorder | 15 | 7 | 22 |
| Psychosis GMC (HIV) | 2 | 5 | 7 |
| Polysubstance induced psychotic disorder | 2 | 0 | 2 |
| Psychosis GMC (epilepsy) | 2 | 6 | 8 |
| Psychosis head injury | 1 | 1 | 2 |
| BMD mania | 3 | 3 | 6 |
| MDD Psychotic features | 1 | 3 | 4 |
| Total | 34 | 41 | 75 |

| 41 of 75 participants tested positive majority of those were diagnosed with schizophrenia followed by cannabis induced psychotic disorder (7). See table 7 above. |
| --- |
|  |  |  |
|  |

**Table 8 Correlation between participants and cannabis use**

|  |  |  |
| --- | --- | --- |
| Variables | Correlation | Significance |
| Participants and age of first use | .42 | P<.05 |
| Participants and use in the past 30 days | .44 | P<.05 |

Table 11 indicates that both correlations are low and positive which shows that as the participants have more and more enjoyment of smoking, they tend to be younger when starting with cannabis and have more drugs use in the last 30days.

The following tables show whether there is significant relationship between any psychiatric disorder and substance use.

**Table 9 Correlation between psychiatric disorder and cannabis use**

|  |  |  |
| --- | --- | --- |
| Variables | Correlation | Significance |
| counselor – alcohol | .39 | p<0.05 |
| counselor - cannabis | .40 | p<0.05 |
| counselor – heroin | .10 | p>0.05 |
| counselor – cocaine | .16 | P<0.05 |
| counselor – nyaope | .22 | P<0.05 |
| counselor – other | .06 | p>0.05 |

**Table 10 Correlation between psychiatric disorder and cannabis use**

|  |  |  |
| --- | --- | --- |
| Variables | Correlation | Significance |
| Hospital - alcohol | .33 | p<0.05 |
| Hospital - cannabis | .40 | p<0.05 |
| Hospital - heroin | .13 | p>0.05 |
| Hospital – cocaine | .17 | p>0.05 |
| Hospital – nyaope | .22 | P<0.05 |
| Hospital – other | .09 | p>0.05 |

Table 9 and 10 indicates that:

The correlations are positive and negative, meaning that the more they use alcohol, cannabis, cocaine and nyaope the more they become mentally disturbed and are referred to mental health care workers and hospital.

**CHAPTER 5**

**DISCUSSION**

Cannabis use seems to start in adolescent period. Majority of respondents seems to have first started using cannabis before their fifteenth birthday with a significant number falling in the age 15-20 years. Most of the participants started using cannabis before being diagnosed with mental illnesses and this in line with several studies, amongst them a study by Marta-D– f et al which found that cannabis use in adolescents can later increase the risk of schizophrenia – like psychosis. Another study by P.K MC Guire et al concluded that cannabis use may “trigger” the development or re-emergence of “functional” psychosis in predisposed individuals rather than producing a specific cannabis psychosis.

Most of the participants in our study who tested positive cannabinoids were diagnosed with psychotic illnesses that i.e schizophrenia, cannabis induced psychotic disorder and psychosis due to GMC (epilepsy and HIV) and this is in line with several studies which have shown that patients diagnosed with schizophrenia and another psychotic illnesses tend to abuse drugs with cannabis as a commonest drug of abuse. Out of 24 participants who were diagnosed with schizophrenia 16(67%) tested positive whilst 8(33%) tested negative. This might be a form of self medication and also to alleviate mood in those with apathy and avolution.

Interestingly 15 out of 75 of the respondents tested negative for cannabinoids but had diagnosis of cannabis induced psychotic disorder. It might be there were diagnosed whilst in a psychotic state, having given unreliable history. Laboratory results might also had played a role as there sometimes false negative results.

Several studies have reported the association between cannabis use and mood disorders (Major depressive disorder bipolar mood disorder) Louisa D et al in their study concluded that rates of depression were elevated in those who use cannabis frequently. Cecilia et al found that use of cannabis increase the risk of subsequent manic symptoms in our study six of the respondents with mood disorders (Major depressive disorder bipolar mood disorder) tested positive for cannabinoids. Out of six participants who were diagnosed with BMD-mania, three tested positive for cannabinoids and this is significant as it is known that the rate of illicit drug use tend to be higher in patience with BMD-mania. This is probably due to the fact that these patients tend to involve themselves in risk behaviours.

Out four participants who were diagnosed major depressive disorder majority (three) tested positive in cannabinoids, this might be that they were using cannabis to alleviate mood or as a form of self medication.

Looking at the screening tool which was used to determine the pattern of use, it seems cannabis abuse was the commonest use disorder. Majority of the respondents reported the need to cut down on their cannabis use and also felt guilty about it. This is a line with several studies which shown that psychiatric disorder related to cannabis use are common in patients with use disorders.

Cannabis is usually labelled as a gateway drug. Most people tend to start drug usage with cannabis and then go on and use other illicit drugs. A substantial number of respondents admitted to using other psychoactive drugs besides cannabis. These other drugs include nyaope, heroine, cocaine and alcohol.

A lot of patients who use many other substances have higher chance of developing mental illnesses and eventually be hospitalized as was evident in our study. Fillip Smith et al in his review article found several hypotheses that a relationship between psychotic symptoms during hospitalisation and cannabis use might be related to other illicit drugs.

Majority of the respondents were either living with their parents or at their parents home most had past grade 12 with no post matric education. A substantial number was below matric (grade 12) level. Majority were single, never married, unemployed and those employed were doing technical work. This is in line with several studies which have shown that people of low socio-economic status tend to abuse drugs and later develop mental illnesses.

**CHAPTER 6**

**CONCLUSION**

Out of seventy five participants interviewed thirty four still had psychiatric illnesses without evidence of cannabis use as compared to forty one who had cannabis use related psychiatric illnesses. This show that a substantial number of patients admitted in our psychiatric unit have psychiatric disorders related to cannabis use this confirms our hypothesis of that there is a relationship between cannabis use and psychiatric disorders. Cannabis dependence was the use disorder identified. Cannabis use was more prevalent in those with psychotic illnesses. Schizophrenia, cannabis induced psychotic disorder, psychosis due to GMC (HIV), psychosis due to GMC (epilepsy) were the commonest disorders in patients using cannabis Majority of participants who were diagnosed with psychiatric illnesses related to cannabis use were of low socio-economic status. There was a substantial number of participants who were using other drugs besides cannabis. This shows that cannabis is the gateway drug.

**LIMITATIONS OF THE STUDY**

The study might have been limited due to a smaller sample size, also the qualitative test was used to test the urine specimens instead of qualitative test and this might also have limited our study. Only DSM IV-TR Criteria was used in our study, this might have also limited our study as other criteria like ICD-10 could have also been considered.

**REFERENCES**

* 1. Marta D. Fort et at. Cannabis use and psychiatric and cognitive disorders: the chicken or the egg? Current opinion in psychiatry 2007, 2 : 228-234
	2. Louisa Dagenhardt et al. Exploring the association between cannabis use and depression, 2003. Society for the study of Additional to alcohol and other drugs. Additional 98: 1493-1504
	3. Filip Smit et at. Cannabis use and the risk of later schizophrenia a review 2004 society for the study of Addiction. Addiction 99: 425-430
	4. Cecile Henquest et al. Cannabis use and expression of mania in general population Journal of Affective disorders 95 (2006) 103-110
	5. Michael Dennis et at. Changing the focus: the case for recognizing and treating cannabis use disorder: 2002 society for the study of Addiction to alcohol and other drugs. Addiction 97 (suppl) 4-15
	6. Andrew Johns – Psychiatric effects of cannabis. British Journal of Psychiatry (2001), 178: 116-122
	7. Charles Perkel. Cannabis – the debate continues: a South African Perspective. South African Psychiatry Review 2005, 8: 25-30
	8. Theresa H.M. Moore et al. Cannabis use and visit of psychotic or affective mental health outcomes: a systematic renew lancet 2007, 370: 319-328
	9. Louisa Dagenhardt et al. Testing Hypotheses about the relationship between cannabis use and psychosis. Drug and Alcohol dependence 71(2003) 37-48
	10. Diagnostic and statistical Manual of Mental Disorders IV Edition Text
	11. Revision (American Psychiatric Association) 234-241
	12. Vito Agosti et al. Rates of psychiatric co-morbidity among US residents with lifetime cannabis dependence: American Journal of drug and alcohol abuse, vol.28, No. 4, pp. 643-652, 2202.
	13. Leslie Inversen. Long-term effects of exposure to cannabis. Current Opinion in Pharmacology 2005, 5: 69-72
	14. Alfonso Troisi et al. Psychiatric symptoms in male cannabis users not using other illicit

 drugs. Society for the study of addiction to alcohol and other drugs (1998) 93(4), 487-492.

* 1. A.Dalman et al. Psychotic disorders among inpatients with abuse of cannabis,

amphetamine and opiates. Do dopaminergic stimulants facilitate psychiatric illness? European Journal of Psychiatry 1994; 14: 366-71

* 1. F. Markus Leweke et al. Cannabis and psychiatric disorders: It is not only addiction.

2008 Society for the study of addiction, 13, 264-275.

* 1. Gregor Katz et al. Cannabis abuse and severity of psychotic and affective disorders in

Israeli psychiatric inpatients. Comprehensive psychiatry XX (2009)XXX-XXX.

* 1. F. Markus Leweke et al. Cannabis-associated psychosis, current status of research. CNS

drugs 2004: 18(13) 895-910

* 1. Suresh Sundram 1, 2, 3. Cannabis and Neurodevelopment: Implications for psychiatric

disorders. Human psychopharmacology, Clin Exp 2006; 21: 245-254.

* 1. Brook, JS et al. The effects of early marijuana use on later anxiety and depressive

symptoms. NYS psychologist: 2001, 35-39.

* 1. Brook, DW et al. Drug use and the risk of Major depressive disorder, alcohol

dependence, and substance use disorders. Archives of General Psychiatry. 2002; 59: 1039-1044.

* 1. Drewe, M et al. Cannabis and risk of psychosis. Swiss Medical weekly, 2004; 134: 659-663.
	2. P.K. Mcguire et al. Morbid risk of Schizophrenia for relatives of patients with cannabis-

associated psychosis. Schizophrenia research 15(1995) 277-281

24. Rey, J et al. Is the party over? Cannabis and Juvenile psychiatric disorder: The past 10

years. Journal of the Academy of Child and Adolescent psychiatry. October 2004; 43:

1194-1205.

* 1. Mikkel Arendt et al. Heavy cannabis use seeking treatment. Prevalence of psychiatric

disorders. Society psychiatry epidemiology (2004) 39: 97-105

* 1. Patton, GC et al. Cannabis use and Mental health in young people: Cohort study. British

Medical Journal. 2002, 325: 1195-1198.

* 1. Zammit, S et al. Self reported cannabis use as a risk factor for Schizophrenia in Swedish

conscripts of 1969: Historical cohort study. British Medical Journal. 2002; 325: 1199-1201.

* 1. G. Kings et al. Can cannabis trigger recurrent panic attacks in susceptible patients?
	2. European Journal of psychiatry 1997; 12: 415-419.

# APPENDIX 1

|  |
| --- |
| **UNIVERSITY OF LIMPOPO (Medunsa Campus) CONSENT FORM** |

**Statement concerning participation in a Research Project.**

Name of Project

**Relationship between cannabis use and psychiatric disorders in patients seen at DR George Mukhari hospital psychiatry unit.**

I have read the information on the aims and objectives of the proposed project and was provided the opportunity to ask questions and given adequate time to rethink the issue. The aim and objectives of the project are sufficiently clear to me. I have not been pressurized to participate in any way.

I understand that participation in this Project is completely voluntary and that I may withdraw from it at any time and without supplying reasons. This will have no influence on the regular treatment that holds for my condition neither will it influence the care that I receive from my regular doctor.

I know that this Project has been approved by the Research, Ethics and Publications Committee of Faculty of Medicine, University of Limpopo (Medunsa Campus) / Dr George Mukhari Hospital. I am fully aware that the results of this results of this Project will be used for scientific purposes and may be published. I agree to this, provided my privacy is guaranteed.

I hereby give consent to participate in this Project.

............................................................ ........................................................

Name of patient Signature of patient

................................ .................................... ................................................

Place. Date. Witness

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Statement by the Researcher**

I provided written information regarding this Project

I agree to answer any future questions concerning the Project as best as I am

able.

I will adhere to the approved protocol.

....................................... .................................... ...............……

Name of Researcher Signature Date Place

**APPENDIX 2**

|  |
| --- |
| STATISTICAL ANALYSES |

The Chairperson,

Medunsa Campus Research Ethics Committee

Box 163

UNIVERSITY OF LIMPOPO

Medunsa Campus

Dear Sir/Madam

**STATISTICAL ANALYSES**

I have studied the research protocol of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

titled: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

and I agree to assist with the statistical analyses.

Yours sincerely,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: Statistician

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name in block letters

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date

**Appendix 3**

**Participant No:** \_\_\_\_\_\_\_\_\_\_\_

**Section 1: Biographical Information**

|  |
| --- |
|  |
| 1. Age
 |  |  \_\_\_\_\_ years old |
|  |
| 1. Gender
 |  | 1. Male 2. Female |
|  |
| 1. What is the highest standard/grade or year of school that you completed?
 |  | 1. No formal schooling2. Completed Std. 1 or 2 (Gr. 3 or 4)3. Completed Std. 3 or 4 (Gr. 5 or 6)4. Completed Std. 5 or 6 (Gr. 7 or 8)5. Completed Std. 7 or 8 (Gr. 9 or 10)6. Completed Std. 9 (Gr. 11) 7. Completed Matric (Gr. 12) or High School Equivalency Diploma8. Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |
| 1. What is your current marital status?
 |  | 1. Married2. Living with someone as if married3. Widowed4. Divorced5. Separated6. Never married |
|  |
| 1. What is your current employment status?

 *(Check only one category)* |  | 1. | Employed full time |
| 2. | Employed part time |
| 3. | Unemployed, seeking work |
| 4. | Unemployed, not seeking work *(homemaker, student, retired, etc.)* |
|  |
| 1. What type of job do you currently have?

*(If unemployed, indicate “None”)* |  | 1. | None |
| 2. | Professional or managerial *(doctor, teacher, manager, architect, engineer, etc.)* |
| 3. | Clerical or sales *(bookkeeper, office worker, salesperson)* |
| 4. | Skilled or technical worker *(mechanic, electrician, baker, carpenter, medical, technician, etc.)* |
| 5. | Semi-skilled worker *(construction, driving, general labour, etc.)* |
| 6. | Unskilled |
| 7. | Other (please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |
| 1. Where do you live presently?
 |  | 1. | Own house |
|  | 2. | Parents’ house |
|  | 3. | Apartment or rented house |
|  | 4. | Room |
|  | 5. | Institution |
|  | 6. | No fixed address (e.g., hotels) |
|  | 7. | Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |
| 1. Do you have any criminal record?
 |  | 1. Yes 2. No |
|  |
| 1. On a scale of 1 to 10, how would you rate your family relations
 |  | 1 2 3 4 5 6 7 8 9 10 |
|  |
| 1. Has anyone in your family ever had mental illness?
 |  | 1. Yes 2. No |
|  |
| 1. Have you ever been referred to a counsellor/doctor/psychiatrist for any psychiatric disorder?
 |  | 1. Yes 2. No |
|  |
| 1. Have you ever been admitted to hospital for any psychiatric disorder?
 |  | 1. Yes 2. No |
|  |
| 1. Has anyone in your family ever had an alcohol or drug problem
 |  | 1. Yes 2. No |
|  |

**Section 2: Cannabis Use Information**

|  |
| --- |
|  |
| 1. How old were you when you first tried cannabis?
 |  | 1. Less than 15years 2. 15 – 17 years 3. 18 – 20 years 4. 21 – 23 years 5. 24 – 26 years6. Above 26 years |
|  |
| 1. What is/are your motive(s) for smoking cannabis
 |  | 1. enjoyment/fun 2. relieve stress3. hang out with friends4. alleviate physical pain5. to relax, helps me sleep6. cultural beliefs7. other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

|  |
| --- |
|  |
| 1. During the past 30 days, on how many days did you have: (mark one for each line)
 |
|  | 0 days | 1 – 2 days | 3 – 5 days | 6 – 9 days | 10 – 19 days | 20 – 29 days | All 30 days |
| Alcohol  |  |  |  |  |  |  |  |
| Cigarettes |  |  |  |  |  |  |  |
| Cannabis  |  |  |  |  |  |  |  |
| Heroin  |  |  |  |  |  |  |  |
| Cocaine  |  |  |  |  |  |  |  |
| Nyaope |  |  |  |  |  |  |  |
| Other\_\_\_\_\_\_ |  |  |  |  |  |  |  |
|  |
| 1. How many of your best friends had used the following during the past year?
 |  |  | None | One | Two | Three | Four |
|  | alcohol | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  | cigarettes | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  | cannabis | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  | heroin | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  | cocaine | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  | nyaope | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  | other\_\_\_ | 🄋 | ➀ | ➁ | ➂ | ➃ |
|  |
| 1. How do you usually smoke cannabis? (Check one.)
 |  | 1. zols2. pipes3. both zols and pipes |
|  |
| 1. In the past 30 days, on a typical day when you smoked cannabis, about how much did you smoke?
 |  |  | zols | pipes | both |
| 1 |  |  |  |
| 2 - 3 |  |  |  |
| 4 – 5 |  |  |  |
| 6 or more |  |  |  |
|  |
| 1. Have you ever felt the need to cut down on your cannabis use?
 |  | 1. Yes 2. No |
|  |
| 1. Are you easily annoyed when questioned about your cannabis use?
 |  | 1. Yes 2. No |
|  |
| 1. Do you feel guilty about your cannabis use
 |  | 1. Yes 2. No |
|  |
| 1. Dou you smoke cannabis first thing in the morning?
 |  | 1. Yes 2. No |
|  |
| 1. Have you ever lost friends because of your smoking cannabis?
 |  | 1. Yes 2. No |
|  |
| 1. If employed, have you ever been in trouble at work because of smoking cannabis?
 |  | 1. Yes 2. No |
|  |
| 1. If at school, have you ever been in trouble because of smoking cannabis?
 |  | 1. Yes 2. No |
|  |
| 1. Have you gotten into fights when under the influence of cannabis?
 |  | 1. Yes 2. No |
|  |
| 1. Have you ever been arrested for possession of cannabis?
 |  | 1. Yes 2. No |
|  |
| 1. How difficult do you think it would be for you to obtain the following, if you wanted them?
 |
|  | Very easy | Rather easy | Rather difficult | Very difficult | Almost impossible |
| Alcohol |  |  |  |  |  |
| Cigarettes |  |  |  |  |  |
| Cannabis  |  |  |  |  |  |
| Cocaine  |  |  |  |  |  |
| Nyaope |  |  |  |  |  |
| Other\_\_\_\_\_\_\_ |  |  |  |  |  |
|  |