REPUBLIC OF KENYA

NACADA

FOR A NATION FREE FROM ALCOHOL AND DRUG ABUSE

AJADA

African Journal of Alcohol & Drug Abuse

@NACADAKenya

Nacada Kenya

info@nacada.go.ke

www.nacada.go. ke

VOLUME 6 : DEC 2021

ISSN Online: 2664-0066

ISSN Print: 2664-0058

Copyrights

Editorial Committee

Editor- in Chief

For submissions, please visit the NACADA website (www.nacada.go.ke) or write to us via submissions.ajada@nacada.go.ke

CONTENTS

Effectiveness of Treatment and Rehabilitation Programs for Drug and Substance Dependence in Mombasa County, Kenya	3
Efficacy of Peer-led Interventions on Substance Use among Female Undergraduate Students in Universities in Nairobi County, Kenya.	15
New Consumption Patterns of Marijuana and Their Implications for Law Enforcement in Kenya	27
Prevalence and Risk of Alcohol Use among Palliative Care Patients in Kenya: Case Study of Coast Region	41
Sociodemographic, clinical profile and the association with retention in treatment among patients receiving methadone treatment in Nairobi, Kenya	51
Socio-Economic and Health Consequences of Drugs and Substance Use in Gachie, A Peri-Urban Town on the Outskirts of Nairobi	67
Student Perceptions on Factors and Effect of Drug and Substance Abuse: A Case of United States International University - Africa	81
Substance Use, Emerging Substances and Poly Drug Use among Undergraduate Students in Universities in Kenya	92
Policy Brief on the Narcotics, Drugs and Psychotropic Substances (Control) Amendment Bill	105

Effectiveness of Treatment and Rehabilitation Programs for Drug and Substance Dependence in Mombasa County, Kenya

Fatuma Kuyeya*

*Department of Epidemiology & Biostatistics, School Of Public Health, Moi University, Kenya

Email Address: fnsumba13@gmail.com

Submitted: 21st November 2021

Published: 31st December 2021

Abstract

Drug and substance abuse is a major public health problem worldwide especially in developing countries with Kenya being among the most affected countries in Africa. Research reveals high prevalence of substance use in the country with Mombasa leading in the Coast region. The associated detrimental effects in almost every aspect of life development necessitates for effective prevention, treatment and rehabilitation. An effective treatment should respond to mental, medical, legal, financial and family needs. The study strived to examine the effectiveness of treatment and rehabilitation programs for drug and substance dependence in Mombasa County, Kenya. A cross-sectional design was employed to evaluate three facilities with a sample size of 80 participants. Data was collected using questionnaires, in-depth interview and observation. Descriptive analysis was used for quantitative data while qualitative data was analysed thematically with logistic regression and paired sample t-test at CI 95% and p-value of <0.05 was considered significant. Findings revealed the programs had both pharmacological and non-pharmacological services with management of co-morbidities reported at 57.7% and vocational training (15.4%). Most of the service providers (80.8%) were trained on counselling. A 38.9% relapse rate was ascertained and among the associated factors was not being in support groups (OR=3.25, p-0.04). The programs were effective in improving the health, social and legal problems associated with substance use. It was established that the programs were mainly offering open access services and adhering to the recommended National and International Standards of substance use treatment. However, the study found that relapse rate was still high which is in line with other previous studies done in the Country. The study recommends the County government to establish a structured treatment facility and incorporate vocation training in recovery plan to ensure meaningfully engagement of the substance users and avoid idleness.

Keywords: Substance use, Relapse, Effectiveness, Treatment & Rehabilitation.

Introduction

Drug and substance abuse is becoming a disaster worldwide, Kenya being among the most affected countries in Africa (African Union, 2011). This has become a concern to various sectors within nations due to its detrimental effects in almost every aspect of life and development (Jones, 2011). There is therefore a need for prevention, effective treatment and rehabilitation so as to reverse the trends. In 2017, an estimated 271 million people worldwide aged 15 – 64 years had used drugs at least ones in the previous year (UNODC, 2019). This corresponds to 5.5% of the global population aged 15 – 64 years. Like-wise, in Africa, the prevalence of the use of opiates was estimated to be 0.9% corresponding to 6.1 million of the population. A rapid assessment survey on the status of drug and substance abuse done in Kenya by National Authority for the Campaign against Alcohol and Drugs Abuse (NACADA) in 2012 revealed that 37.1% of people aged 15–65 years and 3% of those aged 10-14 years reported to have ever used a substance of abuse at least once in their life time. In 2017, the authority reported a prevalence of 18.2% of Kenyans aged 15 – 65 years using at least one drug or substance of abuse (NACADA, 2019). A Coast baseline survey on alcohol, drug and substance use showed that Coast region had a prevalence of 29.3% with Mombasa County leading at 34.4% followed by Lamu 32.0%, Tana River 31.1%, Kilifi 29.7%, Kwale 26.0% and Taita Taveta 20.7% (NACADA, 2016).

The accessibility, affordability, and consumption of abused drugs have attracted great concern among public health personnel. In Kenya, the alcohol and drug abuse problem presents a significant concern to health, economy, and security in attainment of national development goals (NACADA, 2012). Some of the health effects associated with drug and substance abuse as documented by Jones. et al, 2011 and Africa Union, 2011 are psychiatric disorders, liver cirrhosis, hepatitis, TB, Ulcers and HIV/AIDS.

The World Health Organization (WHO) stated that by the year 2020, mental and substance use disorders will surpass all physical diseases as a major cause of disability worldwide (Kemei, 2014). In support for this, high rates of substance use have been reported among inpatient psychiatric population in Kenya and Tanzania (Salwan, 2014). Apart from drugs being a grave threat to health of all mankind, it also affects the independence of states, democracy and stability of nations, the structure of all societies and the dignity and hope of millions of people (Kemei, 2014). All these findings warrant the need for every country to have in place mechanisms for dealing with the global problem of drug and substance abuse. Most importantly, there should be establishment of effective treatment and rehabilitation programs within nations.

Most African countries' national health-care systems are unable to meet the needs of their citizens with regard to the treatment and rehabilitation of drug-dependent persons. This is because the national medical facilities for such treatment and rehabilitation are often seriously inadequate or simply non-existent (Kasirye, 2009). Kasirye further stated that, treatment and rehabilitation of drug dependent persons in Africa often depend on assistance from relevant international organizations, such as WHO, UNODC and non-governmental organizations.

Addiction treatment and rehabilitation in Kenya is largely a private sector and NGO affair dating back to 1978. Due to the rising demand, in 2003 the Kenyan first public facility for treatment of drug and substance disorder (Mathari) was established through a collaborative effort of the Ministry of Medical Services and the UNODC (African Union, 2011). The treatment centre provides detoxification, rehabilitation and treatment of co-morbid psychiatric disorders incorporating a well-refined referral system to those with physical illnesses or those in need of specialized treatment. Currently the country has four public treatment and rehabilitation centres with several private and community based facilities totalling to almost 48 centres but still the problem of drug and substance dependence persist.

All treatment and rehabilitation programs are encouraged to be based on the existing national principles and standards, and effective program should incorporate concepts that promote individualized cost-effective treatment. These concepts involve comprehensive assessment and treatment to address patients' physical, psychological and social needs (WVDHHR, 2011). The concept conforms to the Kenyan principles of addiction treatment with the addition of after care or recovery management. The recovery management is meant to reduce the risk of relapse by supporting change in ones' social functioning, personal wellbeing as well as that of their place, community and the wider society (MOH, 2017). According to the United Nations treatment guide (UNODC, 2003), there are two modalities of treatment which are open access and structured services. Open access are informal services acting as important points of first contact for people with drug-related problems while structured services are integrated comprehensive programs characterised by a formal assessment with development and monitoring of individualised plan of care.

Researchers found that factors such as, treatment status (mandatory/voluntary, residential/non-residential), self-awareness of the problem and severity of addiction do impact on the effectiveness of a program by mediating the motivation of the participants (Regine, 2008). Another factor found to impact effectiveness within centres was a structured environment (Burgess, 2005).

According to Burgess, long term and short-term residential programs are both successful but individuals participating in long term treatment (up to a year) have higher level of abstinence compared to those in short term (up to 3 months).

The study further states that three out of four respondents indicated that aftercare program was the primary reasons for their abstinence. This was due to the fact that, aftercare assisted in the avoidance of triggers that could cause relapses, taking up new hobbies and exploration of individual spirituality. This conforms to a study in Kenya where majority of the rehabilitation centres (91.4%) in Kisii offers after care services (Sereta, 2016). The study further established that, after care services were effective in assisting recovering users in maintaining sobriety and enabling emotional healing.

It was found that effectiveness of treatment and rehabilitation program in Nairobi is hindered by factors such as; Lack of qualified personnel, lack of community participation, lack of medicinal drugs and lack of aftercare services (Kairanya, 2010). These factors somehow conform to those documented by Sereta and others (2016) who found that some of the challenges faced by Kisii treatment and rehabilitation centres were; Inadequate financing, lack of staff and overburdened staff, lack of medication and irregular follow up services.

According to a report on Adolescent Relapse Prevention, 78% of those undergoing treatment and rehabilitation do relapse during the first six months of recovery (Gorski, 2001). A study in Kerman (a Province in India) identified environmental factors such as peer group and availability of drugs and substances of abuse to be the causes of relapse among adolescents (Golestan, 2010). The study emphasised on the need for self-help groups which give support to the addicts and help family members understand addiction hence, avoid relapse.

An analysis report on the outcome of treatment among adults and adolescents in Philadelphia shows a 60% - 80% relapse rate within 90 days after treatment and a 34% relapse rate within 3 days after treatment (White, 2012). Based on these outcomes, it was suggested that upon completing treatment, all individuals should be provided with assertive mechanisms of post treatment monitoring and support.

In South Africa, the relapse rate was found to be dependent on the type of facility (in-patient or out-patient) and location of the facility (in small or bigger towns). The relapse rate was 50% for cannabis, 33% for alcohol and 65% for harder drugs such as cocaine and heroin. High relapse rates were reported from outpatient facilities since they have little control over their patients. This is according to a report on epidemiology of drug abuse treatment in South Africa (Ramlagan, 2010). These relapse statistics somehow conform to Kenyan findings from various studies with regard to effectiveness of the existing treatment and rehabilitation programs. Among inpatient alcoholics in Nairobi, it was found that 39.2% of them were readmitted to hospital within the first year after treatment (Githae, 2016). This was found to be related to family members being over caring for the recovering drug users which later leads to relapse

An estimated long-term relapse rate was found to vary between 20% and 80% among persons with alcohol dependence after a community-based treatment within some of the rehabilitation centres in Nairobi (Kuria, 2013). Apart from the earlier mentioned causes of relapse, other factors seen to be associated with this problem in Kenya are, high rates of unemployment, family and community stigma, lack of social support and poor or no follow up care (African Union, 2011).

In efforts to address the high rates of substance use relapse within the country, four community based organizations that include Nairobi Outreach Services Trust (NOSET), Reach out Centre Trust, Muslim Education and Welfare Association (MEWA) and The Omari Project (TOP) among others with support from the United Nations Office on Drugs and Crime (UNODC) were established to provide a basic package for drug abuse prevention, care, and treatment to people who use drugs including injecting drug users in Nairobi, Mombasa and Malindi. Hence, it is in light of these efforts and the prevailing substance use and relapse statistics that this study seeks to assess the effectiveness of the treatment and rehabilitation programs for drug and substance dependency in Mombasa County. This was done by responding to the following specific objectives;

a) Examining the nature/level of treatment

and rehabilitation programs utilized in the treatment and rehabilitation centers.

b) Determining the rate of treatment relapse in the selected rehabilitation centers.

c) Assessing the factors associated to relapse in the selected rehabilitation centers.

d) Establishing adherence to recommended national/international requirement for rehabilitation and treatment of drug and substance dependency.

Methodology

The study was conducted in Mombasa County which is one of the six counties in Coast region and among the 47 counties of Kenya. The county serves as the major centre for tourism industry due to its largely distributed sea shore and ancient buildings. This flourishing tourism industry together with the port harbour plays a greater part in predisposing the youths in the county to not only consumption but also trafficking of drugs (NACADA, 2011). The county also has two major initiation and habituation factors to drug and substance abuse which are, idleness and unemployment where only 1.5% of the unemployed poses formal education beyond secondary level (Gituma, 2015).

The study adopted a cross sectional design that collects information at the same point in time from a sample drawn from predetermined population. The population comprised of individuals aged 18 years to 65 years drug and substance users undergoing treatment and rehabilitation in the selected centres. The study also included the service providers within the centres and some of the drug users care takers.

Limitations involved were; the time duration following discharge for those on follow up and those re-admitted as it may contribute to recall bias among the clients. Second limitation was related to generalizability of the findings reasons being that, demographic and socioeconomic characteristics of the clients attending treatment centres might be different from those who do not attend the centres in attempt to abstain. Finally, relapse is recognized as a product of interaction of many more factors than the relatively few factors considered by this study. Hence, the findings are applicable only to those attending drug treatment centres to quit and applicable only to Mombasa County and other areas with similar characteristics in regards to effectiveness of the rehabilitation programs in place. To reduce recall bias, the study did not include those on follow up for more than 6 months after discharge.

The participants were informed on their right to withdraw at any time during the study. Permission to conduct the study was obtained from the Moi University Institutional Research and Ethics Committee and from the treatment centres administrators.

A sample sizes of 97 inclusive of 10% increase was calculated using Epi Info 7 at 95% CI, a power of 80% and a ratio1. Convenient sampling was used to select treatment centres, purposive sampling was used to identify the service providers while the clients were selected randomly. Data was collected using questionnaires, in-depth interviews and observation.

Table 1

Category	MEWA	Reach Out	Eden	Total
Service providers	12	15	6	33
Clients	27	28	9	64
Total	**39**	**43**	**15**	**97**

Sampling Table

The study employed both quantitative and qualitative methods. Descriptive statistics were used for quantitative data and presented using frequency tables, charts and graphs. Qualitative data was categorized and thematic content analysis done where a constant comparative method was used to enable comparison with previous findings on same issues. Binary logistic regression and a paired sample t–test statistics were used to ascertain the association between relapse and the various predictors, the effectiveness of the programs and the significance of the outcome.

Results

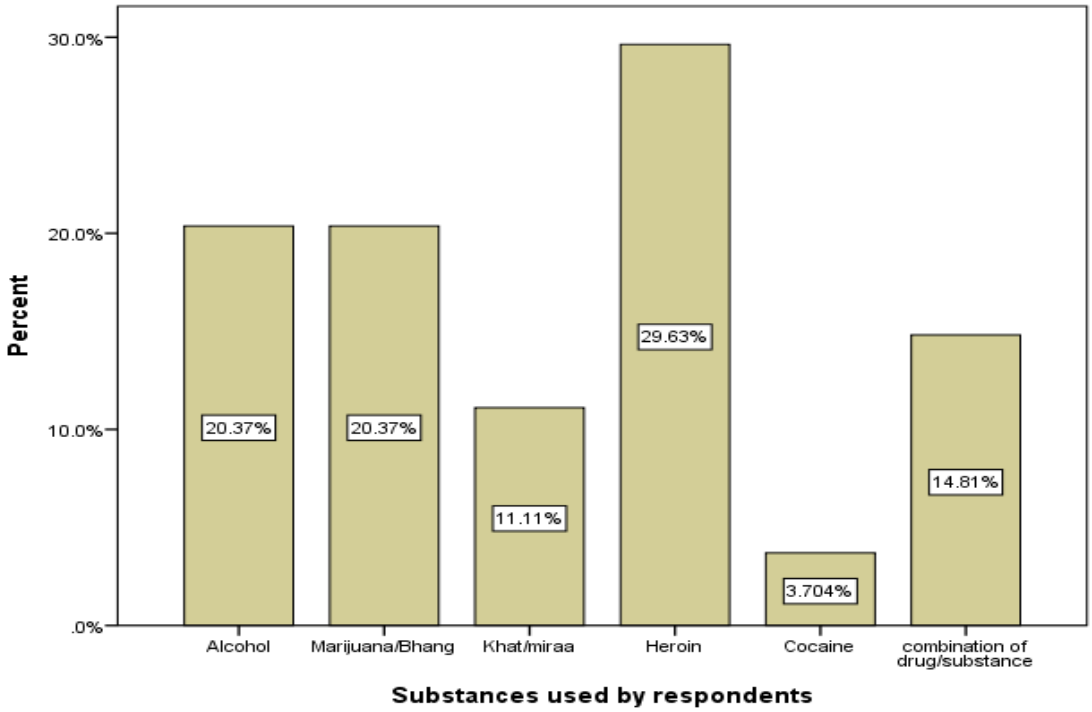
Data was analysed from 80 participants out of the 97 earlier sampled, a response rate of 82%. This comprised of 54 clients and 26 service providers. 63% of the clients were male with majority (53.7%) being in the age category 29-39 years. Majority of the clients had attained primary (37%) and secondary (31.5%) education with very few (7.4%) having degree. Most of the clients had stayed in treatment for 1 – 3 months and 4 – 6 months both at 35.2% with those who have stayed for more than 6 months being 29.6%. Out of the 26 services providers, 42.3% were diploma holders with 7.7% having attained degree level and only 3.8% having masters. Notably, 73% of the service providers were trained on treatment of drug and substance dependence where 80.8% were trained on counselling, 96.2% on risk management and 11.5% were trained on psychiatry. Majority of them were counsellors, with 2 clinical officers, 2 nurses and 1 counselling psychologist.

Table 2

Characteristics of clients	F	%	Characteristics of service providers	F	%
Gender			**Education level**		
Male	34	63.0	Secondary	5	19.2
Female	20	37.0	Certificate	7	26.9
Age			Diploma	11	42.3
18 – 28	14	25.9	Degree	2	7.7
29 – 39	29	53.7	Masters	1	3.8
40 – 50	4	7.4	**Trained on treatment of SUD**		
51 – 61	7	13	Yes	19	73.1
Education level			No	7	26.1
Primary	20	37.0	**Type of training**		
Secondary	17	31.5	Psychiatry	3	11.5
Certificate	7	13.0	Counselling	21	80.8
Diploma	6	11.1	Addiction counselling	10	38.5
Degree	4	7.4	NACADA training	5	19.2
Treatment Period			Risk management	25	96.2
1 – 3 months	19	35.2	Overdose management	19	73.1
4 – 6 months	19	35.2			
>6 months	16	29.6			

General Characteristics of Participants

Prevalence of the substances used



Substances Used By Respondents

Majority of the clients were heroin users, 29.63% followed by alcohol users, 20.37% with very few of them 3.7%, having been using cocaine.

Level/nature and type of services provided

Two of the three sampled centres had out-patient, residential, non-residential and aftercare programmes while one centre had residential and aftercare programs only. Out-patient services were mainly provided as individual counselling, routine clinical, community outreach and street services. It was also observed that two of the centres had high number of clients with opioid use problem and they provided a conducive environment where the clients could pass by at any time for meals, shower and management of minor illnesses (drop in centre). The centre with residential and aftercare programs mainly had clients with alcohol use problem and it was located in a very closed and serene environment away from the general community.

Table 3

Services provided	Percentage
Detoxification	100.0
Psychosocial support	100.0
Family therapy	84.6
Behavioural counselling	42.3
12 steps program	100.0
Vocational training	15.4
Medical Assisted Therapy	84.6
Life skills training	84.6
Linkage and referrals	57.7
Management of co-occurring diseases	57.7

Services Provided From The Centers.

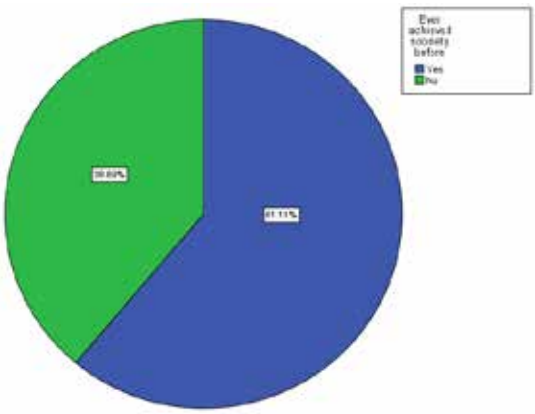
Services provided were mainly detoxification, psychosocial support and the 12-steps programme. Other services provided were Medical Assisted Therapy at 84.6%, management of co-morbidities at 57.7% and vocational training at 15.4%. Screening and assessment

were considered as pre-requisites for care in all the centres. The tools mainly used in both centres were ASSIST and ASI while AUDIT, CAGE and DAST were inconsistently used. Relapse prevention was stated to be incorporated in all the services provided and other measures used were legal aid to those with criminal cases and retaining some of the clients as service providers. Other relevant programs stated to be offered by the centres were Spiritual programs, Outreach programs where they visit the drug dens for counselling services, HIV testing, management of abscesses and overdose management in case of emergencies. It is also from this program that they get to enrol some of the clients to the main program. Income generating activities support groups were also established. It was observed that there were inadequate and inappropriate facilities for expectant and nursing mothers such as lack of separate accommodation, child care services, ante-natal and family planning services.

Relapse rate and its associated factors

This was ascertained through the sobriety state on the time of data collection.

Figure 2



Clients Who Had Achieved Sobriety

Among the 54 clients, 33 (61.11%) of them reported to have been able to stay away from drug and substance use (abstained) while 21 (38.89%) were still using (relapsed).

Factors associated to relapse

Logistic regression was employed to ascertain the association of the following factors to relapse.

Table 4

Predictors		Odds Ratio	CI (95%)	P-value
Not associating with those in recovery		3.250	1.039 – 10.162	0.043
Not receiving aftercare services		1.320	0.441 – 3.953	0.620
Being in an outpatient program		2.558	0.835 – 7.831	0.100
Sub-stance involved	Alcohol	1.389	0.216 – 8.916	0.729
	Heroin	2.143	0.376 – 12.197	0.390
	Cannabis	0.370	0.046 – 3.015	0.353

The Relationship between 'Relapse' and 'Predictors'

From the above table, not associating with those in recovery or not being in a support group had a significant association to relapse (OR 3.25, P<0.05) compared to lack of aftercare, outpatient program and category of the substance used. Although all the Odds Ratio (OR) for the assessed predictors lied between the upper and lower Confidence Interval (CI 95%), a P-value of less than 0.05 was considered significant. Other factors relating to relapse included environmental and community factors such as availability and ease of accessibility of the drugs and substances, peer pressure and idleness.

Adherence to recommended national/ international requirement for rehabilitation and treatment of drug and substance dependency.

The following thematic areas were looked into:

Table 5

Thematic areas	Common themes	Findings
Nature and type of the program	Level of services provided	Residential, Non-residential, outpatient and community outreach services
	Duration of treatment	Majority is 1 -3 months with few extending to 6 months and above for aftercare services
	Services provided	Mainly detoxification, MAT, Psychosocial support & 12-steps program. Assessment & screening as a prerequisite
Environment and facility set up	Facility location	Residential facilities for two of the three centres were in serene environment
	Adequacy	Inadequate accommodation for residential
	Special provision	One centre had expectant and nursing mothers with inadequate and inappropriate facilities
Service providers/ staffing	Qualification	Majority had diploma and certificates
	Category	Majority were counsellors with 2 Clinical Officers, 2 Nurses and one Counselling Psychologist

Adherence to Recommended National/International Standards

Effectiveness of the treatment and rehabilitation programs.

The following factors were stated by the clients which make them feel they have become responsible citizen following treatment and were also stated by the staff as the expected outcome of the programs. These factors were based on the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) and Addiction Severity Index (ASI) which are tools used for screening and assessment on patient admission. These are also among the outcomes of effective treatment according to UNODC, 2003 in the treatment guide.

Table 6

Effectiveness of the programs	Frequency	Percentage
Improved in education	18	33.3
Better legal status	23	42.6
Stopped/reduced drug use	36	66.7
Improve in employment	17	31.5
Family acceptance	31	57.4
Good health	32	59.3

Effectiveness of The Treatment And Rehabilitation Programs

Reduced/stopping drug was considered the main factor at 66.7%, improved health at 59.3% and family acceptance at 57.4%. Other factors were better legal status, improved education and employment.

To assess the effect of the program towards above mentioned outcomes, a paired t-test was employed to compare and ascertain the significance of the difference. This was on the client's response on failure to fulfil major responsibilities (missing work. failing to look after children properly, failing to maintain a relationship with partner etc.) and experiencing health, social, legal and financial problem at the time of the study and what was recorded during client admission based on the assessment and the screening tools. A Likert scale of 0 to 8 was used to ascertain how often was the use of substance leading to failure to fulfil major responsibilities and 0 to 7 for how often has one experiencing health, social, legal and financial problems due to substance use in the past 3 months.

Table 7

Pairs	Mean	Std D	Std.E	95% CI		T	df	P-value
				Lower	Upper			
Failure to fulfil major responsibilities	2.259	1.750	.238	1.782	2.737	9.485	53	.000
Experiencing health, legal, social or financial problems	3.352	2.103	.286	2.778	3.926	11.714	53	.000

Paired Sample T - Test for Programs' Effect on Problems Associated With Substance Use

The mean differences were lying between the upper and lower confidence interval with p-values of < 0.05 suggesting a significant difference hence, an improvement on the failure status to fulfil major responsibilities and experiencing health, social, legal and financial problems following treatment.

Discussion

The programmes provided were mainly out-patient, residential, non-residential and community outreach. This is in accordance with the recommended levels of care by the American Society of Addiction Medicine (ASAM) criteria and the Kenyan treatment and rehabilitation protocol (MOH, 2017). Based on the services provided, Therapeutic community (TC) model was utilized which is characterised by 24 hour residential program with planned length of stay of up to 12 months (NIDA, 1999). This model was established to be successful in terms of efficacy both short term and long term programs (Burgess, 2005). Use of behaviour change models such as Community Reinforcement Approach (CRA) was evident in both centres and this was through the out-patient, outreach and street services as a way of building trust with the clients.

A relapse rate of 38.89% was ascertained and although majority of the clients were opiates users, these findings closely replicate the findings in a study among alcoholic in-patients in Nairobi which had a relapse rate of 39.2% (Githae, 2016). In relation to research findings outside the Country, the rate is a bit low than the 60% -80% among adults and adolescents in Philadelphia (White, 2012). Majority of the clients were heroin users and heroin was found to be strongly associated to relapse (OR 2.143) compared to the other substances. Although the significance of association was low in this study, the findings were in line with previous studies in South Africa which found a relapse rate of 33% for alcohol and 65% for harder drugs such as cocaine and heroin (Ramlagan, 2010). Outpatient programme was strongly associated with relapse (OR 2.558). These findings are in line with what was stated on abstinence rate for problem drinkers where a 29% abstinence rate was found with outpatient treatment. This was lower compared to 52% abstinence rate with inpatient treatment (White, 2012). It was also found in South Africa that out-patient programs have high rates of relapse due to service providers having less control on the patients (Ramlagan, 2010). The study found that not being in support groups had a significant association to relapse (OR 3.250, P 0.043). This is in line with previous findings in South Africa where high relapse rate was found among those who were not in support groups and 73.3% of those in recovery reported that being in support groups was the main reason for their abstinence (Burges, 2005). Other associated factors were environmental and community factors concurring with findings in India by Golestan, 2010.

Clients assessment and screening was considered a pre-requisite in all the centres before a client is admitted to the program and all the centres were using ASSIST and ASI as there standard tools. This is a standard requirement by both NACADA and NIDA to ensure that there is individualised

treatment plan that will comprehensively address the needs of the clients although, the centres had limited capacity for clients with special needs such as expectant and nursing mothers. Services provided were pharmacological mainly for detoxification and non-pharmacological services such as psychosocial support and incorporating some vocational training. This conforms to the Kenyan National treatment protocols and the NIDA treatment guidelines. With regards to period of treatment and rehabilitation, majority had been in the program for a period of 1-3 months and 4-6 months. These findings suggested that the facilities were adhering to the recommended minimum 3 months of treatment stated by National and International protocols. Majority of the service providers had diplomas with few having degree and masters. Each centre had Addiction counsellors, social workers, clinical officer and nursing officer but there was no occupational therapist in any of the centres. This conformed to the treatment criteria provided by the Ministry of Health in Kenya (MOH, 2017) and supported by NACADA guidelines. According to NACADA guidelines on hospital or residential settings, the essential staff requirements are Medical Officer/Clinical Officer, Nursing Officer, Addiction Counsellors, Medical Social Workers and Occupational Therapist.

Conclusion and Recommendations

The treatment and rehabilitation programs in Mombasa County were found to be mainly open access services with little incorporation of structured treatment services. The effectiveness of the treatment and rehabilitation programs in place based on the input processes and the expected outcome was that;

Models of treatment provided and the services delivered were in accordance to the recommended scientific based models of treatment and services by the National and International Standards based on the nature/level of the program. All the sampled centres were adhering to most of the stipulated treatment protocols although pharmacological services provided were mainly for detoxification and vocational training was minimally considered. Majority of the service providers had the minimal recommended qualifications of a diploma and at least every centre had a qualified health care officer. Although, there were no occupational therapist and provisions for clients with special needs such as expectant and nursing mothers was limited. With regards to the duration of treatment, the programs were adhering to the recommended minimum period of three months but less concern was given to after care services.

On the expected outcome of the program, the abstinence rate was high however, the relapse rate was also still high and in line with findings of previous studies within the Country. Although there were variations among the predictors. With regard to failure to fulfil major responsibilities such as household, family, community and work responsibilities which are usually affected with drug and substance dependence, there was an improvement in terms of frequency from the pre and post status analysis suggesting a positive program outcome. A pre and post status analysis for any health, social, legal and financial problems due to the drug and substance dependence also suggested a reduced frequency in experiencing these problems after treatment and rehabilitation. These findings suggest that the improvement in fulfilling major responsibilities and reduced health, social, legal and financial problems was strongly contributed by the treatment and the rehabilitation program.

Based on the findings, the study recommends that:

The management of drug and substance dependence in the open access centres should not be limited to detoxification as it is in most of the centres but emphasis should be given on management of co-morbidities, family interventions and aftercare service through consistent follow ups either through home visits, phone calls or at the centre.

The County health department in partnership with other responsible agencies should ensure routine inspection of the treatment centres and ensure enforcement measures so as to ensure adherence to the recommend treatment protocols and uniformity.

Statutory institutions mandated for control and regulations on treatment and rehabilitation of people with drug use disorders should advocates for more research on effectiveness that captures large sample size and incorporates diverse predictors of relapse for better understanding hence, better strategies for the problem

References

African Union, 2011. Let the Continent Speak Out; *Drug News Africa*

Burgess, 2005. *Efficacy of long-term and short-term residential substance abuse treatment modalities;* Alabama

Golestan, 2010. Environmental Factors Influencing Relapse Behavior among Adolescent Opiate Users in Kerman (A Province in India); *Clobal Journal of Human Social Science*

Githae, 2016. *Family Emotional Over-involvement and Relapse Among Inpatients Alcoholic in Nairobi, Kenya;* Nairobi

Gituma, 2015. *The Drug Menace at the Kenyan Coast.* The Cradle; Promoting Justice for Children

Gorski, 2001. Adolescent Relapse Prevention; *Mental Health, Substance Abuse, & Terrorism*

Jones, 2011. *A summary of the health harms of drugs;* LiverpoolLiverpool John Moores University

Kairanya, 2010. *Factors hindering treatment of drug abusers in selected drug treatment and rehabilitation centers in Nairobi Province, Kenya;* Nairobi

Kasirye, 2009. *Drug Abuse trends, magnitude and response in East African region;* WAFAD

Kemei, 2014. *Effectiveness of Drug and Substance Abuse Prevention Programs in Selected Public and Private Universities in Kenya,* Nairobi

Kuria, 2013. Factors associated with relapse and remission of alcohol dependent persons aftercommunity based treatment; *Open Journal of Psychiatry*

MOH, 2017. *The National Protocol for Treatment of Substance Use Disorders in Kenya.;* Nairobi

NACADA, 2011. *"Promotion of Evidence-Based Campaign" National Alcohol and Drug Abuse Research Workshop;* Nairobi

NACADA, 2012. *Rapid Situational Assessment of the Status of Drug and Substance Abuse in Kenya;* Nairobi

NACADA, 2013. *National Standards for Treatment and Rehabilitation of Persons with substance Use Disorders;* Nairobi

NACADA, 2016. *Status of Alcohol and Drug Abuse in the Coast Region, Kenya;* Nairobi

NACADA, 2019. *Tenth (10th) Edition of Biannual Report of the Status of Alcohol and Drug Abuse Control in Kenya;* Nairobi.

NIDA, 1999. *Principles of Drug Addiction Treatment: A Research - Based Guide;* United States. National Institute of Health

Ramlagan, 2010. *Epidemiology of drug abuse treatment in South Africa*

Regine, 2008. Mandatory treatment and Perception of treatment effectiveness; *Research & Issues Paper Series*

Salwan, 2014. A Review of Substance Use Disorder Treatment in Developing World Communities; *Reviews and Perspectives*

Sereta, 2016. An Assessment of Effectiveness of Drug Rehabilitation Programs in Kisii County-Kenya; *Journal of Health Education Research & Development*

UNODC, 2003. *Drug Abuse and Treatment Rehabilitation: A practical planninng and implementation guide;* Vienna United Nations.

UNODC, 2019. *Global Overview of Drug Demand and Supply.* World Drug Report; Vienna United Nations.

White, 2012. *Recovery/Remission from Substance Use Disorder.* Philadelphia; Department of Behavioral Health and Intellectual disAbility Servicces and the Great Lakes Addiction Technology Transfer Center

WVDHHR, 2011. West Virginia Department of Health and Human Resource. *Comprehensive Substance Abuse Strategic Action Plan.*West Virginia; Bureau for Behvioral Health and Health Facilities

Efficacy of Peer-led Interventions on Substance Use among Female Undergraduate Students in Universities in Nairobi County, Kenya.

Wangechi Mureithi, PhD *

* Laikipia University. Kenya

Email Address: wmureithipj @gmail.com

Submitted: 18th November 2021

Published: 31st December 2021

Abstract

Substance use has been on the rise among undergraduate students in universities in Kenya. This has raised concerns bearing in mind that universities in Kenya have put in place psychosocial interventions in a bid to address the menace. This study sought to evaluate the efficacy of peer-led intervention programmes on substance use among female undergraduate students in universities in Nairobi County. The study was guided by Bandura's Social Learning Theory. An *expost facto* research design was employed in the study. The target population comprised of all female students in universities in Nairobi County. Proportionate random sampling technique was employed to select the sample. A sample of 351 female undergraduate students was selected for the study from a target population of 40,647 female undergraduate students. One (1) student counsellor from each of the 16 universities in Nairobi County also participated in the study. A semi-structured research questionnaire and an interview guide was used to facilitate collection of data. The content and face validity of the research instrument was determined by research experts in the School of Education at Laikipia University. The questionnaire was pilot-tested in one public and one private university in Machakos County, Kenya prior to its use in the main study with the view of determining its reliability. Cronbach's alpha was used to estimate the reliability of the research instrument which yielded a coefficient greater than .7. Data was analyzed using descriptive and inferential statistics. Specifically, null hypothesis was tested using simple linear regression analysis at .05 level of significance. Qualitative data was analyzed thematically. The study findings established that universities encouraged peer to peer counselling managed by peer leaders with the peer leaders first trained on substance use and the adverse consequences of substance use.

Keywords: Peer-led programmes, peer leadership, substance use, undergraduate students, universities

Introduction

Substance use amongst university students has been escalating at an alarming rate despite having preventive strategies set to curb the situation across the world. There are many intervention programmes employed to address the menace of substance use among the young people. Substance use intervention programmes are tools designed to enable users avoid or decrease unhealthy drug use through focusing on different motivations that individuals have for using and abusing specific drugs at different ages (Insel et al., 2012). According to United Nations Educational Scientific and Cultural Organisation (UNESCO 2017), substance use prevention is described as the programmes and policies aimed at preventing or delaying the initiation of substance use and the transition to substance use disorders thus ultimately reducing substance use, as well as its health and social consequences. United Nations Office on Drugs and Crime (UNODC, 2017), states that 29.5 million people globally suffer from drug use disorders. This population, whose majority are young adults engage in problematic use and suffer from the adverse effects of drug abuse. The World Health Organization (WHO, 2008) stated that by the year 2020 mental and substance use disorders will surpass all physical diseases as a major cause of disability worldwide. WHO (2013) emphasizes that at least 15.3 million individuals have drug use disorders and drug abuse is associated with significant health and social problems. World Health Organisation (2018) asserts that alcohol is the 5th highest contributor to the global burden of disease for young people aged between 15

-19 years. According to WHO, this youthful population is mostly found in tertiary institutions which include colleges and universities where the prevalence rate is higher, and thus they are at risk for alcohol use disorder as well as social, economic and psychological problems.

According to UNODC (2013), undergraduate students face a myriad of problems. Some students may face intense academic pressures, forming new social groups, problems with keeping a balance of social engagements with academic and other life responsibilities. In addition, the students may be exposed to normative values valued by the youth culture that differ from parental values. Further, UNODC postulates that these perceived norms motivate the youth to indulge in unhealthy behaviours such as smoking and alcohol and drug use. Amelia et al. (2017) posits that drug use is prevalent among college students, and drug use persists among young adults even after many have graduated from college.

Amelia *et al*. indicated that more attention therefore, should be directed at identifying and intervening with students at risk for drug use to mitigate possible academic, health, and safety consequences. The National Centre on Addiction and Substance Abuse (CASA) at Columbia University reported that almost half of all full time college students binge drink and use prescription drugs or other substances each month and nearly one in every four college students met the diagnostic criteria for substance use disorder (CASA, 2007). The reasons advanced by students why they drink and drug themselves are varied. CASA (2007) noted that the students used substances to relieve stress, relax, have fun, forget their problems and be one of the gang. College women in focus groups in the study said they wanted to keep up with the guys so they went for a drink with them the college females in the study also said they were under enormous pressure to have sex and they used alcohol as a disinhibitor.

In Kenya, the problem of substance use is considerably rampant in universities with an increasing trend over the years. Atwoli et al. (2011) indicated that the prevalence of substance use among college and university students is high and causes significant physical and psychosocial problems in this population. This is as evidenced by a study carried out in one of Kenya's private universities which revealed percentages of lifetime rates of commonly used substances at; tobacco 54.7%, alcohol 84.2 %, cannabis 19.7% and inhalants 7.2% (Atwoli *et al.,* 2011). A national survey by the National Agency for the Campaign against Drug Abuse (NACADA) revealed that 10.6% respondents smoke bhang, while over 11% of Kenyan youth use *Miraa* (NACADA, 2009).

According to a study by K'okul (2010), the findings indicated that drug abuse is a major contributing factor to riots in universities. It was reported that the use of substances such as marijuana, heroin as well as heavy consumption of various types of alcoholic drinks by students in Kenyan public and private universities has become high. With respect to undergraduate college students, most of the evidence indicates that males use alcohol and drugs more frequently than females (Robinson et al., 1993). Perkins (1992), however, suggested that college females who abuse alcohol are not the rarity that they once were, and in fact, are catching up to men in terms of negative alcohol related consequences. According to the National institute on Drug Abuse (NIDA), women may face unique issues when it comes to substance use, in part influenced by sex differences based on biology and gender differences based on culturally defined roles for men and women (NIDA, 2017).

A study by Bukoski (2007) recommends that prevention programmes for students should include integrative methods such as peer discussion groups and not just didactic teaching techniques. Bukoski supports programmes that integrate skills which enable students resist drugs when offered, strengthen personal commitment against drug use and increase social competency of assertiveness and self-efficacy.

A study by Perkins (2002) on consequences of alcohol misuse in college populations indicated damages occasioned by uncontrolled use of alcohol. The study adopted a survey research design where relevant studies conducted in the past two decades were analyzed. Misuse of

alcohol was found to result in significant damage and costs to institutions of higher education. The study revealed that peer leadership is vital in demonstrating the shared concerns among students in respect of prevention programmes. This was based on the argument that students are inclined to the beliefs of their peers. However, the features of peer leadership programmes have not come out clearly; neither has the study contextualized peer leadership to substance use.

Parent (2010) conducted a similar study on effects of a comprehensive substance use prevention programme where the focus was on urban adolescents. In particular, the study evaluated programmes that included peer leadership in regard to their effectiveness in influencing peer norms. The study involved a sample of 129 male and female students drawn on an urban, low-income school district. Participants were randomly put into groups; that is, treatment condition and no-treatment, minimal-contact condition. A multiple analyses of covariance was employed to evaluate the effects of the programmes. The study found that there were no statistically significant differences between the treatment and control conditions on substance use and behavioural outcomes. Though the study has examined how peer leadership influences peer norms, there is no empirical evidence regarding the relationship between peer leadership and substance use.

The goal of Golonka et al. (2017) study conducted in the United States sought to evaluate the feasibility of combining social influence, cognitive dissonance and self-persuasion principles in order to harness the influence of peers focusing primarily on changing the behaviours and attitudes of the most influential students. The study employed the help of natural adolescent leaders of the various cliques in the participating schools with the view of recruiting them to deliver anti-drug use messages to other students at their schools. A total of 324 students were randomly selected and divided into two groups: control and experiment groups. The researchers collected data using survey questionnaires that were self-administered before and after the intervention. After the intervention measures, pre-test and post-test data were analysed. It was found that using the natural leaders as agents of change was significantly successful in appealing to the other members of their group. This shows that intervention programmes focusing primarily on the social leaders can be successful in combating substance use in the school settings.

The aim of Hasel et al. (2016) quasi-experiment was to analyse the effectiveness of peer-led education programmes on drug use prevention among the students. The participants were drawn from three girls' schools and four boys' schools with a total of 500 students selected to participate in the study. These participants were assigned in equal proportion to the experiment group and the control group. They completed self-administered drug use questionnaire before the test and after the test. A comparison of the data collected from the two sets of participants after the intervention measures found that peer-led programmes significantly reduced the drug use rates among the students. This implies that peer led programmes are effective methods of drug use prevention.

The objective of Chireshe (2013) study was to evaluate the status of peer counselling in selected Zimbabwean secondary school from the perspective of the school teachers. Analysis of the data disclosed that few schools had peer counselling and that the peer counsellors in these schools had been selected based on good characters. It also disclosed that the peer counsellors experienced a number of challenges including ill equipped to help other students, low level trust by other students, and shortage of time. Moreover, it demonstrated that it is imperative for schools to equip the students to improve the efficacy of the peer leadership programmes.

The influence of peer leadership on substance use among university students in Sudan was one of the issues that Osman et al. (2016) investigated. The study was conducted at a private university in Sudan where a sample of 500 students was randomly selected from the lecture halls. The survey used a World Health Organization drug survey for students, which was self-administered among the selected participants. Analysis of the responses received from the students found that cannabis was found to be more prevalent in comparison to

alcohol, which is not shared among the students because of its illegality in Sudan. Furthermore, it established that temptation by peers was one of the main factor that had pushed most students into the consumption of alcohol and marijuana. It was also established that peer role models can be effective for substance use invention programmes.

Chege (2014) conducted an empirical study on assessment of youth participation in decision-making processes in community development programmes. The study which was conducted in South Africa, focused on a case of Spes Bona High School Dream2Be Peer Education Programme. The study acknowledged that on a global scale, peer education programmes have revolved around fundamental issues including drug and substance abuse education. In the study, it is noted that peer education programmes are advocated in sub-Saharan Africa as complementary or optional psychosocial interventions that champion for positive youth development devoid of such vices as substance use. This study had two major setbacks. First it did not explicitly address the subject of peer leadership vis-à-vis substance use. Secondly, it did not focus on university students.

A descriptive study by Kamore and Tiego (2015) evaluated the factors that were limiting the efficiency of peer counselling programmes in Kenyan high schools. The study established that there were no coordinated criteria through which the peer counsellors were selected, no supervision of the peer counsellors, inadequate training of the peer counsellors and the programmes were rarely evaluated.

A study by Njagi (2014) found that peer counselling was a more popular solution in comparison to guidance and counselling with some students identifying the peer counsellors as individuals they approached first in case of a drug related problem. This study shows that peer counselling is a commonly used tool in the fight against drug abuse in the secondary school settings.

In Kenya, NACADA founded in 2001 with a mandate to prevent substance abuse collaborates and partners with universities. It has provided empowerment to youth and general public on how to counter drug use in learning institutions including universities. NACADA carries out training of counsellors to help in the prevention of substance abuse (NACADA, 2012). Other programmes are offered by the media, Non-Governmental Organizations (NGOs) and spiritual leaders, all of which make attempts to prevent substance abuse in Kenyan institutions including universities through provision of life skills, dissemination of information and skill development (Kemei, 2014). In addition, the implementation of alcohol and drug abuse policy in learning institutions is part of the intervention measures taken by universities to curb the menace of substance use. Most strategies entail dissemination of information about drug use and its consequences and empowerment on social skills for resisting drug use and abuse (Kemei, 2014).

According to Wilson and Kemei (2017), prevention programmes have been put in place to curb the problem of drug abuse in universities in Kenya. The universities make use of diverse methods to implement intervention programmes. These include talk shows, brochures, drug abuse days and posters. However, the ability of these psychosocial intervention programmes to effect a positive change to drug abuse is determined by several correlates to drug abuse prevention

Kamanja (2010) reports that at Kenyatta University, the peer education programme aims to reduce irresponsible sexual behaviour, unwanted pregnancies, sexually transmitted infections (STIs) including HIV/AIDS and drug abuse by enhancing the quality of counselling and service delivery for students. Further, the peer outreach and extension programme trains university students to promote responsible behaviour among their peers. Through peer counselling programme, students obtain information on drugs and referrals for better help from trained counsellors are done for students with complicated drug abuse cases.

Pere and Yatich (2017) indicate that despite the fact that most universities and colleges in Kenya have instituted drug reduction strategies including peer led interventions, the substance use menace among university and college students is on the increase. The purpose of this study was therefore to examine the efficacy of peer-led intervention

programmes on substance use among female undergraduate students in universities in Nairobi County, Kenya.

Objective of the Study

The main objective of this study was to examine the efficacy of peer-led intervention programmes on substance use among female undergraduate students in universities in Nairobi County, Kenya.

Methodology

This study adopted *ex-post facto* research design. From a list of the universities in Nairobi County, a total of 40,647 female undergraduate students were projected to participate in the study. From this figure, 23,010 constituted public university students whereas the rest (17,637) were drawn from private universities. It is imperative to note that all the female students in these institutions were considered in the study. Krejcie and Morgan Table (1970) was used to determine the sample size. From a total population of 40,647, a sample of 367 participants (351 female undergraduate students and 16 student counsellors) was selected. Sixteen counsellors (One (1) from each university) were purposively selected. Both semi-structured questionnaire and interview guide were used to aid in data collection. This was supported by the fact that the study was a survey and the data sought was mixed which comprised of quantitative (categorical) and qualitative data. The questionnaire was semi-structured in that it consisted of both open-ended and close-ended questions. The questionnaire further sought to facilitate collection of data on a Likert scale. An in-depth interview was conducted among the university counsellors to find out the efficacy of peer led prevention intervention measures in mitigating against substance use among female undergraduate students.

Data collected was analyzed using mathematically-based methods with the help of the Statistical Package for Social Sciences (SPSS) Version 26. 0. The analysis encapsulated both descriptive and inferential statistics.

Descriptive statistics included measures of distribution (frequencies and percentages), measures of central tendencies (means), and measures of dispersion or variation (standard deviations). On the other hand, inferential statistics that aided in drawing inferences (conclusions) was in the form of Pearson's Product Moment Correlation Coefficient, and both simple linear and multiple regression analyses.

Results and Discussion

This study obtained information from 268 female undergraduate students from 16 universities in Nairobi county Kenya. 14 student counsellors were interviewed by the researcher. Two student counsellors were unavailable to grant the interviews. The study analyzed the views of female undergraduates in public and private universities in Nairobi County with regard to peer leadership programmes. The views to this effect are presented in Table 1. The scale used ranged from Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), to Strongly Disagree (SD)

Table 1
Descriptive Statistics for Efficacy of Peer-to-Peer Leadership Programmes

	SA n(%)	A n(%)	U n(%)	D n(%)	SD n(%)	Mean	Std. Dev
New peer leaders are trained on substance use and the adverse consequences.	44(15.9)	105(38.0)	94(34.1)	14(5.1)	11(4.0)	3.59	.962
The university encourages peer counselling overseen by selected peer leaders.	41(14.9)	103(37.3)	81(29.3)	34(12.3)	9(3.3)	3.50	1.007
Peer leaders in my university present factual and balanced view of substance use and the consequences.	33(12.0)	92(33.3)	103(37.3)	31(11.2)	9(3.3)	3.41	.961
Peer leaders model behaviour that can be imitated by their peers.	38(13.8)	108(39.1)	63(22.8)	35(12.7)	23(8.3)	3.39	1.143
Behaviour change groups led by peer leaders have positively changed lives of many students.	42(15.2)	83(30.1)	92(33.3)	32(11.6)	19(6.9)	3.36	1.101
Peer leaders are chosen based on their past and existing ethical and leadership record.	50(18.1)	80(29.0)	83(30.1)	25(9.1)	30(10.9)	3.35	1.211
Peer leaders are able to effectively share information on substance use	41(14.9)	92(33.3)	65(23.6)	47(17.0)	23(8.3)	3.30	1.178
Peer leaders have helped me stand against peer influence.	57(20.7)	71(25.7)	58(21.0)	47(17.0)	35(12.7)	3.25	1.325
Peer leaders have helped me deal with risky situations.	49(17.8)	73(26.4)	63(22.8)	50(18.1)	33(12.0)	3.21	1.283
Peer leaders have helped me avoid use of substances.	54(19.6)	77(27.9)	43(15.6)	46(16.7)	48(17.4)	3.16	1.401
Peer leaders have helped me reduce intake of substances.	52(18.8)	68(24.6)	46(16.7)	45(16.3)	57(20.7)	3.05	1.433
The peer leaders closely monitor the interactions between students already abusing drugs and at-risk students.	26(9.4)	68(24.6)	95(34.4)	47(17.0)	32(11.6)	3.03	1.140
I often seek advice from peer leaders on substance use.	39(14.1)	66(22.5)	40(14.5)	70(25.4)	56(20.3)	2.84	1.378

The analysis of the opinions of the respondents in line with efficacy of peer-to-peer leadership programmes as illustrated in Table 1 showed that 53.9% of the respondents admitted that new peer leaders were trained on substance use and their adverse consequences. These results were closely related to a study conducted by Maithya (2009) which acknowledged the need for peer leaders to be trained for a given duration of time. A total of 52.2% of the students agreed to the view that the university encouraged peer counselling overseen by selected peer leaders. In view of the argument that peer leaders in the respondent's respective university present factual and balanced view of substance use and the consequences, majority (37.3%) of the respondents were unsure of the proposition.

It was further noted that 52.9% of the respondents concurred that peer leaders modelled behaviour that could be imitated by their peers while 22.8% were unsure of the foresaid proposition. It was also observed that more than half (54.3%) of the respondents behaviour change groups led by peer leaders have positively changed lives of many students. On the same breadth, 41.7% of the students agreed that peer leaders were chosen based on their past and existing ethical and leadership record. A significant number (48.2%) of the sampled respondents were of the view that peer leaders were able to effectively share information on substance use. Regarding the assertion that peer leaders had helped the students stand against peer influence, most of the respondents (46.4%) agreed to the assertion. It was also ascertained that a significant number (44.2%) of students agreed that peer leaders had helped them deal with risky situations. Accordingly, 47.5% of the undergraduate students concurred that peer leaders had helped them avoid use of substances. The study, further, established that 43.4% of the respondents admitted that peer leaders had helped them reduce intake of substances. However, 37.0% of the respondents disagreed with the view. Majority of the respondents 45.7% disagreed with the argument that the peer leaders closely monitored the interactions between students already abusing substances and at-risk students. Consequently, most of the respondents (45.7%) also disagreed that they often sought advice from peer leaders on substance use.

The results also established that in general the students were in admission that new peer leaders were trained on substance use and their adverse consequences (mean=3.59); and that the university encouraged peer counselling overseen by selected peer leaders (mean=3.50). The views of respondents in reference to the foregoing assertions were largely diverse (std dev>1.000). The respondents on average were unsure whether peer leaders in their universities present factual and balanced view of substance use and their consequences (mean=341); peer leaders modelled behaviour that can be imitated by their peers (mean=3.39); and that behaviour change groups led by peer leaders had positively changed lives of many students (mean 3.36). Additionally, the respondents were generally unsure pertaining the propositions that peer leaders are chosen based on their past and existing ethical and leadership record (mean=3.35); peer leaders were able to effectively share information on substance use (mean=3.30); and that peer leaders had helped students stand against peer influence (mean=3.25). Similarly, the respondents were generally not sure whether peer leaders had helped them deal with risky situations (mean=3.21); peer leaders had helped them avoid use of substances (mean=3.16) and that peer leaders had helped them reduce intake of substances (mean=3.05).

Moreover, it was revealed that respondents on average concurred that peer leaders closely monitored the interactions between students already abusing drugs and at-risk students (mean=3.03) and that they often sought advice from peer leaders on substance use (mean=2.84). In reference to all the foregoing assertions the respondents opinions were largely diverse (std dev>1.000). This meant that, there was a considerable number of respondents who concurred with propositions put across regarding peer-to-peer leadership programmes. At the same time, an almost equal number of respondents disputed the aforesaid assertions.

Moreover, university counsellors indicated their views regarding efficacy of peer leadership programmes. It was observed that some

universities had peer leadership programmes. These universities recognized that peer leaders are very useful in mobilization and identifying new cases of substance use among students. These leaders were tasked with sensitizing their colleagues on consequences of substance use through peer counselling. These results were in agreement with Osman et al. (2016) which postulated that peer role models can be effective for substance use intervention programmes. However, in some institutions, peer leadership was not actualized; rather it existed only on paper. Others did not have peer leadership programmes at all. Chireshe 2013 agrees with this findings noting that only a few schools had peer counselling programmes.

In institutions where peer leadership programmes were in existence, recruitment of peer leaders was effected through advertisement for vacancies. The Dean of Students worked closely with the student leadership in recruitment of peer leaders. The process involved putting up a notice for interested persons to attend interviews which were conducted face-to-face. In other universities, the positions for peer leaders are advertised upon the recommendation and approval of the pertinent Department. However, the response to the advertisement was found not to be good. Upon recruitment, there is extensive training. The chosen peer leaders worked closely with the student counsellor.

In line with peer leadership, the counsellors viewed that some peer leaders only joined the programme with the aim of improving their curriculum vitae and not as passion, hence required a bit of pushing. In some universities, peer leadership was found to be either fair or excellent in addressing substance use among female undergraduate students. In these institutions, this leadership was established to be quite productive since students enjoyed peer-to-peer interactions. These findings are in agreement with a previous study finding by Hasel et al. which indicated that peer-led programmes significantly reduced substance use rates among the students

Regarding involvement of female undergraduate students in peer leadership programmes, there was recommendation to train both male and female students in order to prepare them to take up the leadership role. It was also found that in a number of universities female and male students were balanced at a ratio of 1 to 1 with regard to their training as peer leaders. The selected students were trained extensively on all areas including personality development, temperament, communication skills, and etiquette with the expectation they would pass on the insights to their peers within the university. In some institutions, peer leaders were found to be mostly female.

An analysis on the relationship between peer leadership and substance use was carried out. The results of Pearson's Product Moment Correlation Coefficient is presented in Table 2.

Table 2

Correlation between Peer to Peer Leadership and Substance Use

		Substance Use
Peer to Peer Leadership	Pearson Correlation	-.077
	Sig. (2-tailed)	.212
	N	268

The study revealed that, the relationship between peer-to-peer leadership and substance use among female undergraduate students was negative, weak and not statistically significant ($r = -.077$; $p = .212$). The results were interpreted to mean that the more peer-to-peer leadership was enhanced in local universities, the higher (though slight) the chances that substance use among students would be reduced. The reduction was, however, not noticeable. This could have been attributed to little or no trust of students in their colleagues regarding sensitive issues such as use of drugs. There was the possibility that students who used substances only confided in those students who, to their knowledge, also used the substances. The findings implied that it was imperative to consider other mechanisms of addressing use of drugs by female undergraduate students instead of focusing so much on leadership among peers. The results of the study were in line with those of a past empirical study conducted by Perkins (2002) which revealed that peer leadership was vital in demonstrating the shared concerns among students in respect of substance use prevention

programmes.

Simple regression analysis was employed to establish the strength of the effect of peer to peer leadership on substance use. To achieve this objective, the following null hypothesis was formulated:

H_{01}: Peer-to-peer leadership programmes have no statistically significant effect on substance use among female undergraduates in Nairobi County, Kenya.

The null hypothesis presumed that peer leadership programmes offered in private and public universities in Nairobi County were not so important in addressing substance use among female undergraduate students. To ascertain the truth in this proposition, simple linear regression analysis was carried out. The pertinent results are illustrated in Tables 3 and Table 4.

Table 3

Model

Model	r	r Square	Adjusted r Square	Std. Error of the Estimate	Sig.
1	-.077[a]	.006	.002	1.06418	.212
a. Predictors: (Constant), Peer to Peer Leadership					

The study revealed as shown in Table 3 that the relationship between peer-to-peer led programmes and substance use among female undergraduates was negative and statistically not significant ($r = -.077$; $p = .212$) at .05 level of significance. The results of coefficient of determination ($r^2 = .006$) indicated that only a negligible proportion (0.6%) of variance in substance use amongst female undergraduate students could be explained by peer-to-peer leadership. The findings meant that peer to peer leadership in student circles was hardly relevant in addressing the menace of substance use amongst the aforesaid university students. Therefore, it was imperative to consider other measures of mitigating substance use. The results of simple linear regression analysis of the effect of peer-to-peer leadership on substance use are presented in Table 4.

Table 4

Simple Regression Analysis of Peer-to-Peer Leadership Programmes on Substance Use

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.776	1	1.776	1.569	.212[a]
	Residual	301.237	266	1.132		
	Total	**303.013**	**267**			
a. Predictors: (Constant), Peer to Peer Leadership						
b. Dependent Variable: Substance Use						

In concurrent to the results shown in Table 3, the results of F-statistics presented in Table 4 indicated that the effect of peer-to-peer leadership on substance use was not statistically significant ($F (1, 266) = 1.569$; $p = .212$). Therefore, the null hypothesis which stated that: Peer-to-peer leadership programmes have no statistically significant effect on substance use among female undergraduates in Nairobi County was accepted.

These results are consistent with Parent (2010) who also found that there was no statistical significance difference between the control and intervention groups in relation to the use of peer leadership. The outcome of the current study is in disagreement with a number of studies (Maithya, 2009; Hasel, et al., 2016; and Golonka, et al., 2017) that had identified peer leadership as an effective way through which teachers could use to fight substance abuse among secondary school students.

The current study has established that this approach is not effective for female university students. It is also in disagreement with Osman, et al. (2016) that found that peer leadership was associated with increased consumption of marijuana in Sudan. The current study did not identify peer leaders as individuals that encouraged or pushed other students into the consumption of drugs. It is evident from the current study and the previous studies that researchers are yet to agree on the impact of peer leadership in learning institutions.

It is imperative to observe that the mixed findings in regard to the efficacy of peer to peer leadership can be attributed to the design of the peer leadership programmes. Golonka et al. (2017)

study used natural leaders as the agents of change and found significant levels of success between the control and experiment groups. Consequently, it argued that success in peer leadership will only be achieved when the natural leaders are selected because they appeal to the other members of their groups, which encourages them to follow in these leaders' footsteps. Hasel et al. (2016) quasi-experiment also found a significant reduction in the levels of drug use among students as a result of peer leadership programmes even though it was conducted in boys' and girls' secondary schools. In this case, the peer leaders were used to educate the other members of their groups.

This high level of variation shows that there is need for researchers and practitioners to agree on a structure for peer leadership. The high level of agreement between the studies that involved experiments (Golonka, et al., 2017; and Hasel, et al., 2016) is an indicator that the weakness of the peer leadership as constituted in this study and similar studies such as Parent (2010) is that the peer leaders were incorrectly identified or their influence were under appreciated by the respondents. These findings agree with an earlier study conducted by Kamore and Tiego (2015) which established that there were uncoordinated criteria through which the peer counsellors were selected.

Furthermore, it is imperative to observe that there were significant weaknesses associated to peer leadership programmes in the universities involved, which were also present in some of the previous studies. This study identified poor selection of peer leaders, ineffectiveness of the peer leaders, unqualified peer leaders, and inadequate training, and inadequate assistance from the peer leaders as some of the challenges these programmes faced. This is consistent with previous studies that peer leaders were ill equipped (Chireshe, 2013), inadequate training (Kamore & Tiego, 2015), and low level of trust from other students (Chireshe, 2013). Therefore, efforts to increase peer review should focus on providing adequate training and equipment while helping them gain the trust of the other students. Furthermore, it is imperative that administrators identify the individuals that are most influential when identifying the peer leaders and ensuring that these individuals have been educated on the ills of substance abuse.

Conclusion

This study which investigated the efficacy of peer-led programmes in mitigating substance use established that universities encouraged peer counselling managed by peer leaders who had to undergo training on substance use and the adverse consequences of substance use. In addition, the study established that peer leaders are very useful in mobilization and identifying new cases of substance use among students. Peer counsellors were tasked with sensitizing their colleagues on consequences of substance use.

However, this study established that there were significant weaknesses associated with peer leadership that rendered it ineffective. This included poor selection of peer leaders, unqualified peer leaders and inadequate training among others. Moreover, the study established that peer-led approach is not an effective approach as a standalone method. It is imperative that universities combine this approach with other psychosocial intervention measures in order to address the menace of substance use among female undergraduate students.

References

Amelia M. A. Kimberly M. C., Hannah K. A., Brittany A. B., Kathryn B. V., & Kevin E. O. (2018). Prevalence and incidence of drug use among college students: an 8-year longitudinal analysis. *The American Journal of Drug and Alcohol Abuse, 43*, 711-718.

Atwoli, L., Mungla, P., Ndungu, M., Kinoti, K. & Ogot, E. M. (2011). Prevalence of substance use among college students in Eldoret, Western Kenya. *BMC Psychiatry* 11 (2), 1-6.

Bukoski (2007) *Meta analysis of drug abuse prevention programmes.* Rockville, M.D: US Department of Health and Human Services.

CASA. (2007). *Wasting the best and the brightest: Substance abuse at America's colleges and universities.* New York, NY: CASA.

Chege, S.E.W. (2014). *Assessing youth participation in decision making processes in community development programmes: A case study of the Spes BonaHigh School Dream2Be Peer Education Programme.* (Unpublished Master's Thesis). University of the Western Cape, Cape Town.

Chireshe, R. (2013). Peer counselling in Zimbabwean secondary schools. *International Journal of Science Education, 5(4), 349-354.*

Golonka, M. M., Peairs, K. F., Malone, P. S., Grimes, C. L., & Costanzo, P. R. (2017). Natural peer leadership as substance use prevention agents: The teens' life choices project. *Prevention Science, 18*(5), 555-566.

Hasel, M. K., Besharat, M. A., Ejeyeie, J., Hejazi, E., & Hakimadeh, R. (2016). Effectiveness of peer-led media education program for drug prevention among students. *European Journal of Forensic Sciences, 3*(3), 11-14.

Insel, P.M., Roth, W.T., Rollins, L.M. & Petersen, R.A. (2012). *Core concepts in health*. Canadian Edition. Oshwa, ON: McGraw-Hill Ryerson Academy.

K'okul, F. S. (2010). *Perceptions of students on the status of guidance and counselling in selected universities in Kenya for minimizing students' riots* (Unpublished PhD Thesis). Kenyatta University, Nairobi.

Kamanja, J.N. (2010). *Peer counselling to develop tomorrow's leader*. Nairobi: Kenyatta University. Kenya.

Kamore, S. K., & Tiego, P. M. (2015). Four pillars of effectiveness of peer counselling programs in Meru South District high schools, Kenya. *International Journal of Humanities and Social Sciences, 5*(2), 254-262.

Kemei, C.R. (2014). *Effectiveness of drug and substance abuse prevention programs in selected public and private universities in Kenya*. (Unpublished PhD Thesis in Counselling Psychology). Kenyatta University, Kenya.

NACADA (2009) *Rapid situation assessment of the status of drug and substance abuse in Kenya*. NACADA

NACADA (2012) *Rapid situation assessment of the status of drug and substance abuse in Kenya*. NACADA.

NACADA (2016). *National Survey on alcohol and drug abuse among secondary school students in Kenya. NACADA.*

NIDA. (2017). *Substance use in women.* Retrieved from https://www.drugabuse.gov/publications/drugfacts/substance-use-in-women on March 23 2018

Njagi, M. M. (2014, March). *Strategies used by secondary school principals to curb the effect of drug abuse on academic*

performance in Naro Moru Division, Nyeri County, Kenya. Retrieved from The Catholic University of Eastern Africa Library: http://ir.cuea.edu/jspui/bitstream/1/119/1/Margaret%20Mary%20Njagi%20%28Sr%29_FINAL_THESIS.pdf

Osman, T., Victor, C., Adulmoneim, A., Mohammed, H., Abdalla, F., Ahmed, A. & Mohammed, W. (2016). Epidemiology of substance use among university students in Sudan. *Journal of Addiction,* 1-8. doi:10.1155/2016/2476164.

Parent, A.P. (2010). *Effects of a comprehensive substance use prevention programme with urban adolescents*. (Doctor of Psychology Dissertation). The University of New Jersey, New Jersey.

Pere J. & Yatich E. (2017). Challenges hindering effective reduction of drug abuse among undergraduate students in public universities in Kenya. *African Research Journal of education & Social Sciences 4(2), 11-17.*

Perkins, H.W. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol, Supplement* No. 14, 91-139.

Shelly, F. G., Sudie E. B, Katie L., & Kathleen T. B., (2010) *Substance* Abuse in Women. *PsychiatrClin North Am, 33(2), 339-355.*

United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2017). *Educational sector responses to the use of alcohol, tobacco and drugs.* Paris, France: UNESCO

UNODC (2013). *World Drug Report*. New York: United Nations

UNODC (2017). *World Drug Report*. New York: United Nations

Wilson A.P., & Kemei C. R. (2017) Drug and substance abuse prevention programs' implementation methods in selected public and private universities in Kenya. *International Journal of Novel Research in Humanity and Social Sciences, 4*(3), 44-49.

World Health Organization (WHO), (2008). *Closing the gap in a generation health equity through action on the social determinants of health: Commission on Social Determinants of Health final report*. Geneva: World Health Organization.

World Health Organization (WHO), 2014). *Global status report on alcohol and health.* Geneva: World Health Organization.

World Health Organization (WHO), 2018). *Global status report on alcohol and health.* Geneva: World Health Organization.

New Consumption Patterns of Marijuana and Their Implications for Law Enforcement in Kenya

Charles Owuor Olungah[1*] and Geoffrey Otieno Muga[1]

* Institute of Anthropology, Gender and African Studies, University of Nairobi, Nairobi, Kenya

***Corresponding Author:**

Charles Owuor Olungah

Institute of Anthropology, Gender and African Studies, University of Nairobi, Nairobi, Kenya

Email Address: owuorolungah@uonbi.ac.ke

Submitted: 2nd November 2021

Published: 31st December 2021

Abstract

New consumption patterns of marijuana have emerged in the recent past alongside the conventional ones. In the jurisdictions like Kenya where marijuana is outlawed, these new patterns of consumption comprise the edibles and have posed detection challenges to law enforcers leaving them open to possible abuse and attendant health risks. This manuscript set out to uncover the new patterns of marijuana consumption and their implications on law enforcement in Kenya. The study adopted a mixed methods design to collect data in Siaya and Vihiga counties of Western Kenya. Convenience and purposive sampling techniques were used to identify 327 survey respondents, 20 key informants and 8 FGD participants at the community level. The FGDs included women and men of different age groups while the key informants were different State and Non-State actors at the national and county levels. Semi-structured interview guides were used to collect data from FGDs and key informants. Findings suggest that consumption patterns are changing and new patterns of substance preparations and administration have emerged alongside the conventional ones. Top among the new patterns include using marijuana as an ingredient in cakes and other confectioneries, boiling and blending it into juice, and using it as tea leaves and additive in other alcoholic beverages. A majority of the young people were found to use the drug currently and with no limitation of time for its use contrary to the past when the old were the majority partakers with self-regulation capacity and norms around time, place and occasion of use. Finally, the study unveiled that the law enforcement agencies lack the capacity and tools to detect the new consumption patterns and there is a tendency to over-focus on the low-end traditional consumers and traffickers. The study concludes that there is need for more studies to unravel the new consumption patterns especially in urban centres and train and resource the law enforcement agencies on their detection mechanisms.

Keywords: New consumption patterns, marijuana, cannabis sativa, law enforcement, conventional and edibles.

Introduction

The latest World Drug Report (2021) indicates that 275 million (5.5%) people used drugs worldwide in the last year up by 22% from 2010. Out of this number, roughly 200 million used cannabis in 2019 representing 4% of the global population. Furthermore, the users have increased by 18% over the past decade, with most countries having reported a rise in the use of cannabis during the pandemic (UNODC, 2021).

In Africa, the number of drug users is projected to rise by 40% from 60 million to 86 million by 2030 for the 15-64 year olds. This increase is because of the continent's younger population and the accompanying high consumption rates of the drugs in the said population. The World Drug report of 2007 had indicated that about 38.2 million (7.7%) of the African population were consumers of cannabis which was far higher than the world's 3.8% (UNODC, 2007).

Cannabis is the most widely used illicit substance globally with 5.6% of adults and youth reporting

use (UNODC, 2018). For centuries, the drug has been used across cultures for medicinal, recreational and sacramental purposes (Duvall, 2019; Abel et al., 2011).

In Kenya, the current prevalence of bhang has been indicated at 1% among the 15-65 year olds (NACADA, 2012). Marijuana is reported to be the most widely used narcotic with the prevalence stabilizing in the ten year period between 2007 and 2017 (Kamenderi et al., 2019a). There exist regional differences in the prevalence with the Nyanza region leading at 1.7%, followed by Nairobi at 1.3% and Coast at 1.3%, North Eastern at 1.1%, Central at 1.1% and Rift Valley at 0.9% (NACADA, 2015). The younger generation that is in the ages of 15-35 year olds has a high prevalence of 1.1% compared to the 15-65 year olds that report 1% indicating a higher consumption rates compared to the older generation (Kamenderi et al., 2019a). In a survey among the secondary school students, marijuana accounted for 7.5% of the overall drug consumption (Kamenderi et al., 2019b).

This high consumption of marijuana and other drugs happens even though the Narcotic Drug and Psychotropic Substances (Control) Act 1994 prohibits possession of, and trafficking in narcotic drugs and psychotropic substances. In it, trafficking in drugs is punishable with life imprisonment under the Act. It also provides for money laundering and forfeiture of proceeds derived from drugs, rehabilitation of addicts, international assistance in drug investigation and proceedings. Kageha (2015) notes that the rationalization of the criminalization of drug laws in Kenya is deterrence and in spite of the "war on drugs" policy, drugs are readily available everywhere in the community.

As part of the efforts to combat the illicit trade and consumption of narcotics, the government of Kenya formed the Anti-Narcotics Police Unit (ANU) in 1983. This was after the realization that Kenya was increasingly becoming a transit point for narcotics destined for other world markets (NACADA, 2015).

Due to technological advancement and the need to camouflage and hide from the authorities in jurisdictions where cannabis is criminalized such as Kenya, many new patterns of consumption different from the conventional ones have emerged especially among the youth. For example, Moltke and Hindocha (2021) found that 8.5% of their study respondents used edibles as the route of administration. Not only have these new patterns been under documented and therefore, remained unknown to most of the public but also there is a gap as to whether the law enforcers are well capacitated to detect them and what this means for the enforcement of the anti-drug laws. This state of affairs poses serious regulatory flaws and health risks as the possibility of the drugs getting into the hands of those unintended and unaware of such methods becomes high. Focusing on two counties of Kenya (Vihiga and Siaya), this article unveils the new consumption patterns and their implications on law enforcement in Kenya.

Methodology

The data for this paper was generated from an ethnographic study conducted in Siaya and Vihiga Counties in Western Kenya in 2020. These counties were purposively sampled based on media and research reports that marijuana consumption is prevalent among the communities. For example, a study by Mwenesi (1995) found out that Kakamega, Vihiga and Busia districts lead as the counties where the drug is prevalent in Western region. This study was specifically anchored in Gem, Alego and Ugunja sub-Counties of Siaya and Luanda and Emuhaya sub-Counties of Vihiga (Fig.1).

The research design was ethnographic and cross-sectional in nature combining both quantitative and qualitative approaches. It involved both men and women of different ages (the old men, old women, young men and young women). The study objective was to document the new consumption patterns of marijuana and their implications for law enforcement in Kenya. The data collection process started with the survey using questionnaire then followed by the Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) which used semi-structured interview guides to enable qualitative probe into gaps identified in the survey. The research assistants were selected from

a group of graduates who besides being speakers of the Luo and Luhya languages were residents of the localities where the study was anchored. Gender composition was observed to ensure that the respondents were free to talk without cultural hindrances and possible bias.

The study applied purposive, convenient and stratified sampling strategies. A total of 327 (210 men and 117 women) were involved in the survey. Vihiga County had a total of 167 respondents (105 men and 62 women) with Siaya having 160 respondents (105 men and 55 women).

Besides the respondents, the study also conducted eight FGDs consisting of young women and men aged 18-34 years and older men and women aged 35 years and above. Each county had 4 FGDs (one each for the different cohorts). There were also 20 key informants interviewed with 8 from Vihiga, 9 from Siaya County. These comprised County Education Officers, Police Officers, teachers, human rights activists and County Government Officials among others. In addition, 3 informants from the National level actors including government officials and staff of the National Authority for Campaign Against Alcohol and Drug Abuse (NACADA) also participated in the study.

Secondary data review has formed a critical component of this paper. Several sources among them textbooks, journals, reports, newspapers and periodic reviews as well as internet and web based literature were reviewed. The reports by NACADA were found useful in contextualizing the problem of drug consumption.

In terms of data analysis, quantitative data was analyzed using STATA 14.2 whereas for qualitative data, inductive analysis has been used to identify themes and patterns and construct typologies. Codes corresponding to themes and constructs have been used to organize data for refined thematic content analysis.

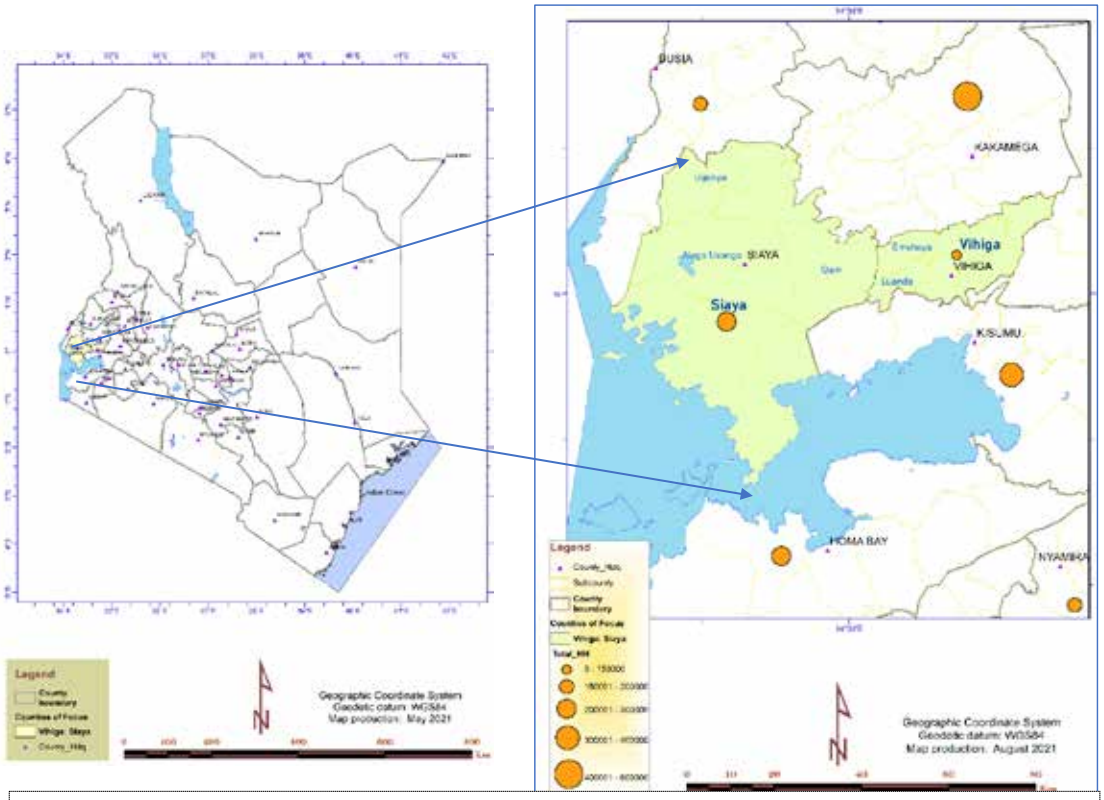


Fig1: Spatial contexts of the study areas in western Kenya (left) and within the counties. Relative household sizes according to the Kenya 2019 census mapped. Source: Authors

All the respondents were recruited based on informed consent and free will to participate. The following information was openly availed to all the respondents: The aim of the study and methods to be used; institutional affiliations of the research; anticipated benefits and potential risks and follow-up of the study; duration of the study; compensation; any discomfort it may entail; right to abstain from participating in the study or to withdraw from it at any time without reprisals and assurance of confidentiality and anonymity.

All the research subjects were adults of sound mind and above the age of 18 years. All the possible risks and attendant benefits of the research were duly explained to the participants and everyone allowed to ask questions. Research permit for the study was obtained from the National Commission of Science, Technology and Innovation (NACOSTI/P/20/4719) in Kenya.

Results

Demographic profile of respondents

Table 1 shows the demographic characteristics of the survey respondents. Interviews were conducted with a total of 327 respondents. Close to two thirds (64%) were males while 36% of the sample was females. In terms of age categories, the study reached out to a wide spectrum of individuals including the young, middle aged as well as the old. In total, 50% of the respondents were young people aged 18-35 years and 30% were 36-53 years while 20% were over 53 years old. Those aged above 35 years provided information on the traditional/conventional consumption practices in their communities from their own past practices and what they observed and heard from the generations ahead of them.

In terms of educational achievement, more than a third (35%) had secondary education, 27% had primary education while close to a fifth (20%) had university education. Hence close to 82% of the respondents could provide information on consumption practices for school and college going students. The diversity in gender, age ranges and education levels in the study sample brings in different shades of opinion on the subject matter which enriches the ethnographic data presented.

Table 1: Demographic Characteristics of respondents

	Vihiga	Siaya	Total
	167 (51.1)	160 (48.9)	327 (100.0)
Gender of respondent			
Male	105 (62.9)	105 (65.6)	210 (64.2)
Female	62 (37.1)	55 (34.4)	117 (35.8)
Age			
18-35	84 (51.2)	78 (48.8)	162 (50.0)
36-53	48 (29.3)	48 (30.0)	96 (29.6)
Above 53 years	32 (19.5)	34 (21.3)	66 (20.4)
Highest level of completed education			
Pre-primary	2 (1.2)	7 (4.4)	9 (2.8)
Primary	40 (24.4)	47 (29.4)	87 (26.9)
Secondary	64 (39.0)	50 (31.3)	114 (35.2)
Tertiary	25 (15.2)	22 (13.8)	47 (14.5)
University	32 (19.5)	31 (19.4)	63 (19.4)
Other	1 (0.6)	3 (1.9)	4 (1.2)

Conventional and new consumption patterns of Cannabis Sativa

Consumers, time, location and occasions for Cannabis use in the past and present generations

Survey data revealed significant disparities in the consumers, time, locations and occasions when bhang was consumed in the past and present in the two communities. In the past, consumption mostly happened in the evenings according to half of the respondents (50%) suggesting that its use was controlled by the elderly partakers to occur after work and mainly for recreational purposes. Still, 35% of those surveyed said it was used in the morning. Only 23% of the respondents said it was consumed any time in the past. However, a majority (87%) reported that presently, new consumption patterns have emerged in the two communities. Its consumption takes place at any time (Table 2), a change that probably marks a shift in the reasons for its use as well as norms governing the use. The lack of self-regulation in the present times could be part of the push factor leading to its abuse among the current generation in the study population.

Table 2: Consumers, Timings, Location and Occasions of consumption of bhang

	Vihiga	Siaya	Total
Who were the consumers of bhang in the traditional society?			
Old men	110(67.1)	120(75.0)	230(71.0)
Warriors	34(20.9)	55(34.4)	89(27.6)
Young men	45(27.6)	33(20.6)	78(24.1)
Old women	20(12.3)	32(20.0)	52(16.1)
Young women	8(4.9)	15(9.4)	23(7.1)
Others	15(9.2)	20(12.5)	35(10.8)
Who are the consumers of bhang in the present day society?			
Old men	34(21.0)	54(33.8)	88(27.3)
Warriors	19(11.7)	25(15.6)	44(13.7)
Young men	151(92.1)	153(95.6)	304(93.8)
Old women	20(12.3)	31(19.4)	51(15.8)
Young women	70(43.2)	121(75.6)	191(59.3)
Others	15(9.3)	16(10.0)	31(9.6)
Time when bhang was consumed in the past			
Morning	55 (33.5)	58 (36.3)	113 (34.9)
Afternoon	8 (4.9)	17 (10.6)	25 (7.7)
Evening	65 (39.9)	96 (60.0)	161 (49.8)
Anytime	50 (30.7)	25 (15.6)	75 (23.2)
Others	17 (10.4)	24 (15.0)	41 (12.7)
Time when bhang is consumed presently			
Morning	6 (3.7)	15 (9.4)	21 (6.5)
Afternoon	4 (2.5)	5 (3.1)	9 (2.8)

Evening	8 (4.9)	23 (14.4)	31 (9.6)
Anytime	153 (93.3)	130 (81.3)	283 (87.3)
Others	9 (5.5)	6 (3.8)	15 (4.6)
Occasions when bhang was consumed in the past			
Visitation/Welcoming guests	8 (4.9)	29 (18.2)	37 (11.5)
Wedding and marriage	7 (4.3)	26 (16.3)	33 (10.2)
Burials	36 (22.1)	43 (26.9)	79 (24.5)
Parties	72 (44.2)	55 (34.4)	127 (39.3)
Others	59 (36.2)	78 (48.8)	137 (42.4)
Occasions when bhang is consumed today			
Visitation/Welcoming guests	5 (3.1)	29 (18.1)	34 (10.5)
Wedding and marriage	10 (6.1)	30 (18.8)	40 (12.4)
Burials	50 (30.7)	52 (32.5)	102 (31.6)
Parties	83 (50.6)	95 (59.4)	178 (54.9)
Others	70 (42.9)	77 (48.1)	147 (45.5)
Location where bhang consumption was done in the past			
At home	49 (30.2)	36 (22.5)	85 (26.4)
In the bush	47 (28.7)	43 (26.9)	90 (27.8)
In special huts	91 (55.8)	109 (68.1)	200 (61.9)
Others	18 (11.0)	32 (20.0)	50 (15.5)
Location where bhang consumption is done currently			
At home	47 (28.8)	60 (37.5)	107 (33.1)
In the bush	80 (48.8)	85 (53.1)	165 (50.9)
In special huts	22 (13.5)	34 (21.3)	56 (17.3)
Others	80 (49.1)	109 (68.1)	189 (58.5)
Was the consumption of bhang a public event in the past?			
Yes	34 (21.0)	28 (17.5)	62 (19.3)
No	108 (66.7)	104 (65.0)	212 (65.8)
Don't Know	20 (12.3)	28 (17.5)	48 (14.9)
Is consumption of bhang a public event currently?			
Yes	47 (29.9)	37 (23.1)	84 (26.5)
No	106 (67.5)	121 (75.6)	227 (71.6)

The survey findings on time for bhang consumption were also corroborated with qualitative data. According to key informants and focus group discussants, the use of bhang was highly controlled in the traditional society as opposed to the present times. In the past, bhang was mainly consumed in the evening after work for recreational purposes. It was also used sparingly in the morning when men needed energy for the day's work.

In terms of consumers, data revealed that traditional norms only allowed adults to partake of the substance. This emerged from FGD participants who said that: *"Only elderly men, grandparents and above were allowed to consume bhang"*. Table 2 indicates that in the olden days, consumers of bhang were old men (71%) while 28% said it was the warriors. The mention of the warriors as consumers could imply that the substance was found useful in inducing energy and courage to the young warriors. In the present-day society however, the consumers as mentioned include young men (94%) and young women at close to 60%. Others mentioned include old men (27%), old women (16%) and warriors at 14%.

Regarding the occasions for consumption, 39% and 24% of respondents in both counties affirmed that consumption of bhang in the past mostly happened during parties and burials respectively. A similar pattern was also seen in the present-day society where a majority (55%) said bhang is used during parties while 32% said it is used during burials. In the past, most of the smoking was done in special huts for the elderly (62%), bush (28%) and in the home (26%). In the present-day however, the most common place for smoking bhang is in the bush (51%) followed by the home (33%), a finding that may be attributed to its criminalization. Moreover, 66% of the respondents did not think consumption of bhang was a public event in the past. Similarly, 72% of the respondents did not think bhang consumption is currently a public event.

Qualitative data supported the survey findings above on occasion and location for bhang smoking in the past and present times. According to key informants and focus group discussants, bhang was smoked during special occasions such as visits by close friends in which case it was consumed in the special hut of the host where they would not only advise each other but also talk, laugh and taunt each other. It was also used during communal meetings of the elders, burials, bride-wealth negotiation, rituals and memorial celebrations. A few women took the drug but in the company of their husbands. Self-regulation was observed by the consumers and there were few cases of abuse and misbehaviour as revealed by the verbatim quote below:

> *"In the past, anyone seen misbehaving after consumption was stopped, sanctioned and taken home. Today, all people ....men, women, boys and girls of all ages use the drug. They are not even aware of how much they have consumed"* (A key informant in Vihiga County).

Consistent with survey findings, the above qualitative information further emphasizes self-regulation that characterized bhang consumption in the past. Today, FGD participants expressed that it has no specific time for use as it is consumed anytime 'like a cigarette'. Moreover, there are no age and gender limitations as everybody the young and the old, women and men alike partake of it. There was also consensus that today, more women use the drug among the young compared to the past when fewer women used it among the older age group under the close watch of their husbands.

Consumption of Cannabis in designated places mainly the special huts of the elderly underscores the desire of the past generation to control both its use and purpose for consumption. This normative practice perhaps is what explains why 'abuse' of the drug in the past was minimal. On the other hand, consumption in the bush as done by the younger generation today has emerged due to criminalization of the drug in Kenya and hence fear of arrest. All study participants were unanimous that in both past and present generations, consumption of the substance has never been a public event pointing at the effects of criminalization and the need for underground behaviour to avoid possible arrests by the authorities. It was also noted that the present consumers in most cases subject members of their households to secondary consumption since the smoking is done in the houses with children and other vulnerable members as opposed to the past where special huts existed where consumption took place.

Data on the consumers in past and present has shown that consumption patterns have changed as more young men and women (94% and 60% respectively) than old men and women (27% and 16% respectively) consume the substance today

contrary to the past. This situation may be partly attributed to criminalization of bhang which has left the young who are more risk averse as the majority consumers. It can also be argued that the traditional norms which restricted the consumption time and age of consumers functioned to reinforce self-regulation of its use as opposed to today when the pervading permissive society and globalization forces such as the mass media and role models catalyse the consumption among the young people. On top of these, commercialization where the traders and those in the value chain use it as a source of income has further increased its use among the young people today. Worse still, it is one of the only available forms of entertainment accessible to the poor youth since it is available, accessible and affordable.

Methods of Cannabis consumption in the past and present generations

Smoking, chewing, vaporization and hand-pipes

The study unveiled four main modes of consumption of Cannabis as smoking, chewing, vaporization and hand-pipes among others (Table 3). These are used by both past and present generations. Smoking accounted for 97.5% of the respondents while chewing, vaporization and hand-pipes accounted for 16%, 10% and 7% respectively. Traditionally in both communities, vaporization was done by the use of traditionally made earthenware that contained sand, fire and water to allow vaporization to occur. This earthenware was called *'Nyaloo'* among the Luo and *"Oluchekhe"* among the Luhya.

Table 3: Methods of consumption and preparations of Cannabis for both past and present generations

Category of information	Vihiga	Siaya	Total
How is bhang consumed in your community?			
Smoking	159 (97.0)	157 (98.1)	316 (97.5)
Chewing	23 (14.1)	29 (18.1)	52 (16.1)
Vaporization	12 (7.4)	21 (13.1)	33 (10.2)
Hand pipes	15 (9.2)	8 (5.0)	23 (7.1)
Others	13 (8.0)	16 (10.0)	29 (9.0)
How is bhang prepared for consumption in your community?			
Sun dried	155 (94.5)	146 (91.3)	301 (92.9)
Pounded	15 (9.2)	53 (33.1)	68 (21.1)
Boiled/vaporized	19 (11.7)	25 (15.6)	44 (13.6)
Chewed raw	16 (9.8)	8 (5.0)	24 (7.4)
Others	3 (1.8)	15 (9.4)	18 (5.6)

According to the key informants, when dried Cannabis was vapourised with the use of *"nyaloo"* that was connected via a pipe to a water compartment, it was called *"Poko* or *Puga"*. This type of smoking was believed to purify the substance and make it less harmful before the vapour could be inhaled.

> *"Smoking was done either through the vapourization pipe (Oluchekhe) or a small pipe called Olukata"* (Key Informant, Vihiga).

A further 9% of the respondents reported other new methods of cannabis administration as follows; sniffing, boiling and blending into juice (*"Jah Juice"*), baking into weed cookies and adding it to sweets and mints. On further probing, key informants stated that advancement in technology has led to these modern innovative ways of consuming bhang. Illegalization of the substance may have also played a role in such innovations as the people try to find ways of camouflaging the drug for fear of legal consequences. The verbatim quotes below from key informants and

FGD participants further unpacked these new methods of consumption:

> *"There are people who consume peeled marijuana, others consume the one that is filtered with water and others consume the ones already wrapped with paper while other people chew the seeds one by one"* (Except from young men's FGD Siaya).

> *"Today it is boiled and blended with juice. This is called Jah Juice by the present youth".* (Excerpt from Young women's FGD Siaya).

> *"The seeds can be baked into either cakes or cookies".* (Excerpt from Young men's FGD Vihiga).

> *"Green raw bhang is pounded and the green liquid added into busaa- a traditional brew. One full tin of 1 kg of busaa would have 2-3 of the pure bhang liquid.* (Key informant, Vihiga).

Fig. 2: Marijuana being baked into cookies and other confectioneries at home.

Source: Daily Nation of February 02 2021.

> *"Today, one of the best methods of consuming bhang is through edibles. We just make cookies and bake cakes and since no one suspects, you have your peace and rarely do you get troubled by the authorities"* (Excerpt from young women's FGD in Siaya).

> *"While in college, we used to get supplies of cookies and since it was trendy and most girls preferred it, I got addicted and I have continued to bake them and sell to make some income. The best thing about it is that apart from your known clients, no one else suspects you. There is no smell to attract the police or designated consumption joints to raise any suspicions"* (Key Informant in Vihiga).

> *We realized recently that most of the policemen do not even know how bhang looks like. They simply arrest those who smoke or big peddlers who trade in large volumes. Have you ever heard of any one arrested with cookies or any confectioneries? Police simply do not know them and consumers are safe"* (Excerpt from young men FGD in Luanda).

> *"Unlike smoking which can usually be smelt from afar, cookies attract no attention and no one has ever been arrested to the best of my knowledge"* (Excerpts from young women FGD in Siaya).

Other new methods according to study participants include using it in tea; the leaves are extracted and used like tea leaves or in powder form and boiling and adding it to the water used for preparing *ugali*.

Study findings indicate that the modern methods have evolved as a result of new technological developments, demands of the new millennials and legal environment in Kenya. Among the modern methods that are of interest in this paper are the edibles and how that mode of consumption is undetectable by the law enforcement officers and its possible implications for the enforcement of the Narcotics and Psychotropic Substances Act of 1994.

Capacity of the anti-drug enforcers to enforce the law

According to the study, the young consumers opined that the authorities particularly the police are not well trained to detect bhang in mints and confectionaries. They note that these new consumption patterns also ensure that they are not suspected by their parents since the smell is also reduced substantially.

The new consumption patterns and the attendant voices of the young consumers above lead us to ask fundamental questions regarding the drug policing and whether the authorities understand and are able to police the new methods. A review of the newspaper headlines regarding cannabis trafficking, consumption and arrests just in 2021 alone, the following headlines are registered:

"Secret recipe; Why women are taking bhang" (Daily Nation 02/02/2021).

"Nairobi's "ganja babies", In Kenya, a puff a day keeps the doctor away" (Daily Nation 11/02/2021).

"Police seize shs 16million bhang hidden in water truck" (Daily Nation 18/03/2021).

"Migori police arrest man, seize six sacks of bhang worth 2.9 million" (Daily Nation 13/04/2021).

"Police nab bhang disguised as fish fingerlings in Malindi" (Daily Nation 24/04/2021).

These newspaper headlines just in the months of February, March and April 2021 alone reveal that all the arrests and police action are based on visible physical consignment of drugs and most of them are large volumes. There have also been news from the courts on those convicted and sentenced to various long term sentences as a result of either bhang trafficking or consumption based on the traditional smoking. Recently, a Meru couple was jailed for life for trafficking shs 3 million worth of marijuana (Wanyoro, 2021). In another case involving even less amount of bhang, it was reported in 2018 that a man had been sentenced to life imprisonment for trafficking bhang worth shs 23,250 or 155 rolls (Mwawasi, 2018). In yet another case that caused uproar, a woman was jailed for 30 years for trafficking bhang worth shs 2,820 without an option of a fine (Wangari, 2019).

In all the cases and newspaper headlines mentioned above as well as the interviews with the respondents in Siaya and Vihiga involving all the cases of arrests and incarceration, none involved the case of edibles or cookies. People arrested and either jailed or remanded were majorly those found smoking or peddling bhang. This implies that the confectionery industry is either unknown or their methods have not been able to attract the attention of the law.

Discussion

The study has unveiled both traditional and new consumption patterns of cannabis sativa in the two counties of Vihiga and Siaya. The new consumption patterns include using it as ingredient in baking cakes and other confectioneries and boiling and blending it into juice. Still others are using its leaves in tea or in powder form and boiling it and adding it into water used to prepare *ugali* as well as adding it directly into busaa- a traditional brew and other alcoholic beverages. Most of these new consumption methods are either made commercially or at home. We opine that because the two research sites are predominantly rural, these new patterns of consumption are not as pronounced as in urban areas. Other scholars like Lindsay et al. (2021) also found out that cannabis is used as foods in a wide range of products such as candies, baked products, lozenges and beverages. The topical cannabis administration utilizes full cannabis extract- a thick oil that has been decarboxylated to activate cannabinoids. Once cannabinoids are activated, they can be absorbed through the skin (Lindsay et al., 2021).

The global cannabis edible market has seen significant growth in recent years and is projected to grow substantially over the next years (Lindsay et al., 2021). As the trend becomes more popular, an extensive array of edibles that are either commercially prepared or homemade have become available on the market (Barrus et al., 2016; Budney et al., 2015; Schauer et al., 2016).

The survey by NACADA (2015) observes that one of the emerging trends of concealing narcotic drugs is lacing with confectioneries where drugs are used as ingredients when baking cookies and cakes. They note that this new consumption patterns is popular among the youth with more women preferring the method. The modes of marijuana consumption may have implications for initiation of use; repeat use and the development of use disorders; and timing, length and severity of intoxication (Johnson et al., 2016).

Several factors have been credited with the expansion of the edible market: they can be produced at home, they are convenient to transport and use and there is a perception that edibles are more relaxing than inhaled cannabis. There are those who generally believe that edibles do not present the same health challenges as does smoking and there is a longer duration of

action associated with the use of edibles (Vandrey et al., 2015).

The lack of distinctive smell of the narcotic laced confectioneries makes it more difficult to tell the difference between the ordinary baked foods or confectioneries and the illegal narcotic laced products making them very attractive to the youth (NACADA, 2015). Because edibles have no odor, they are largely undetectable to parents as well as law enforcers and others (Johnson et al,. 2016). In many jurisdictions, producers of edibles have been able to circumvent regulatory systems and this pose challenges to policy makers worldwide (Barrus et al., 2016). Additionally, targeted marketing strategies have led to an increase in popularity among the youth (Borodovsky et al., 2017).

This rising popularity of edibles has resulted in an increase in incidences of unintentional cannabis exposure in children (Wang et al., 2014; NACADA, 2015 and Lindsay et al., 2021). This is exacerbated by the fact that in other world markets, there are limited or no laws in place governing the production, labeling and safe use of edibles while in Kenya, the knowledge of the existence of the edibles is limited and the producers are home based in an environment of secrecy. In fact, NACADA (2015) sums this up by observing that "the country lacks factual evidence to prove the existence and use of narcotic laced confectioneries".

The study results are also a clear testimony to the fact that the emerging consumption patterns of bhang are either not known to the authorities or it is not easily detectable by them. As Kageha (2015) observed, bhang users through the conventional methods face arbitrary police swops, beatings, harassment, and bribery are constantly suspected even when they are innocent. In the community, the conventional drug users' encounter police in the drug dens, they are flushed out of streets, houses or other places they frequent. However, those in the edible industry seem to be going on with their businesses unperturbed and the consumers of their products are not even known by the authorities.

The NACADA (2015) exploratory survey on the use of narcotics in the production of confectioneries reported a high consumption of weed cookies, weed cakes and *kaimatis* and lollipop sweets among the youth and particularly those in institutions of learning. These spaces are not very easy to police and in most cases, the drug consumption is not noticeable. As observed by one of the makers of the edibles;

> *"It all started in college and after school, my clients kept asking for the stuff and as someone in business, you have to give them what they want. I bake the cakes in the evening and send a rider to deliver whenever the clients place an order. Most of my deliveries are in Kileleshwa, Kilimani and Lavington"* (Reported by Kabale, 2021).

She further notes that she gets her clients through word of mouth and some of her loyal customers have been with her for the last five or so years. She observes that her clients prefer edibles because they are more discreet and do not have the smell that comes with smoking.

The confessions in the young people's FGDs show that the consumers of edibles are well aware that the authorities have no capacity to police them adequately. The only way for the law enforcers to tell whether the cookies are laced with narcotics is to taste them. The cookies are also not very different from the ordinary ones and telling the difference is not a walk in the park unless one is himself or herself a consumer.

The rapid technological innovation, combined with the agility and adaptability of those using new platforms to sell drugs and other substances, is likely to usher in a globalized market where all drugs are available and accessible everywhere. As observed by UNODC (2021), the technologization of drug distribution through service hotlines, mobile telephone, internet based services, contactless services, vending machines, mail services have all changed the face of drug distribution and availability. This requires a deeper reflection and new thinking in the way drug policing is undertaken. Kafeero (2021) reporting for Uganda notes that Tasha Cookies and Stash is using Twitter and Instagram to market its edibles and pills, and WhatsApp to connect with buyers

for deliveries. Ubuy Uganda, an e-commerce store, also imports cannabis cosmetic products from the USA and other markets for its customers in the Country.

Conclusion

The new consumption patterns particularly edibles that are difficult to monitor and pin down have presented a nightmare for law enforcers. The fact that narcotics remain illegal, the innovative ways to monitor misuse cannot be put in place. In jurisdictions where decriminalization has been undertaken and consumption of cannabis legalized such as Canada, Netherlands, Portugal and some parts of the United States such as Oregon, there are regulations for edible cannabis packaging and labeling requirements which include: child resistant packaging, tamper proof features, list of allergies, list of ingredients, nutritional fact, storage requirements, health warning messages, standardized cannabis symbol, milligrams of THC and CBD per serving and maximum THC per serving as reported by Lindsay et al. (2021).

This observation implies that the consumption of edibles is not just a law enforcement issue but also a health concern given the fact that most edibles have high concentration of narcotics and may pose unknown health risks. The authorities are therefore, called upon to both appreciate the new realities and retrain the police and other law enforcers on the new consumption trends, or the fight against drugs particularly the low level consumers through edibles and other beverage concoctions will continue unabated. The biggest danger is the reportedly high consumption rates in the institutions of learning and the possibilities of underage consumption as noted.

Declarations

Ethics approval and consent to participate

The research team explained the objectives of the study to the participants and those who voluntarily expressed willingness to be interviewed were issued with consent forms for signing before participating in the study. The explanations included making the participants aware that the study would lead to publications in scientific journals and disseminations in conferences. Research permit for this study was obtained from the National Commission of Science, Technology and Innovation (NACOSTI/P/20/4719).

Consent for publication -Not Applicable

Availability of data and materials

All relevant data are within the manuscript and the raw data still in the custody of the investigators and will be discarded after three years.

Competing interests

The authors have declared that no competing interests exist

Funding

This research was funded by the Open Society Initiative for Eastern Africa (OSIEA)), Grant Number: IN 2019-64383 (December 1st 2019-November 30th 2020) (COO). The funders had no role in study design, data collection, and analysis, decision to publish or preparation of the manuscript.

Acknowledgements

We are sincerely grateful to the communities of Siaya and Vihiga Counties and staff of national and county government departments who gave us valuable information during field data collection phase. We also appreciate the support of field assistants who made great efforts in collecting data for the study. Finally, many thanks to the reviewers at the University of Nairobi who have given technical ideas which shaped the manuscript.

References

Abel, W. D., Sewell, C., Eldemire-Shearer D. (2011). Decriminalization of marijuana: is this a

realistic public mental health policy for Jamaica? *West Indian Med Journal*. 60(3):367–70.

Barrus, D. G., Capogrossi, K. L., Cates, S. C., Gourdet, C. K., Peiper, N. C., Novak, S. P., et al. (2016). Tasty THC: promises and challenges of cannabis edibles: Methods report (RTI Press), Found at https://doi.org/10.3768/rtipress.2016.op.0035.1611. Accessed on 17th October 2021.

Budney, A. J., Sargent, J. D., & Lee, D. C. (2015). Vaping cannabis (marijuana): Parallel concerns to e-cigs? *Addiction, 110,* 1699–1704.

Borodovsky, J. T., Lee, D. C., Crosier, B. S., Gabrielli, J. L., Sargent, J. D., Budney, A. J. (2017). U.S. cannabis legalization and use of vaping and edible products among youth. *Drug Alcohol Dependency*: 177:299–306.

Duvall, C. S. (2019). *The African Roots of Marijuana*. Durham, N. C.: Duke University Press

Grotenhermen, F. (2003). Pharmocokinetics and pharmocodynamics of cannabinoids. *Clinical Pharmacy;* 42(4):327–60.

Grotenhermen, F. (2007). The toxicology of cannabis and cannabis prohibition. *Chemical Biodiversity*: 4(8):1744–69.

Government of Kenya (2019). *Population and Housing Census 2019*. KNBS-Kenya

Government of Kenya. 2010. The Constitution of Kenya (Kenya). 2010.

Government of Kenya: Act No. 4 of 1994. The Narcotic and Psychotropic Substances (Contro) Act 1994 (Kenya).

Johnson, M. R.. Brooks-Russell A, Ma M, Fairman, J. B., Tolliver, L. R. and Levinson, H. A. (2016). Usual Modes of Marijuana Consumption Among High Scholl students in Colorado. *Journal of the Study of Alcohol and Drugs*. 77, 580-588.

Kabale, N. (2021). Street recipe: Why more women are taking bhang. Daily Nation of 2nd February 2021.

Kafeero, S. (2021). Africa's Cannabis Industry is set to boom due to Legalization found at www.qz.com/africa/2028012/africas-cannabis-industry-is-set-to-boom-due-to-legalization July 2nd 2021 Accessed on 12th October 2021.

Kageha, E. (2015). Drug Laws and Human Rights in Kenya: Disharmony in the Law and Training Recommendations to Law enforcement. Mainline.

Kamanderi, M., Muteti, J., Okioma, V., Kimani, S., Kanana, F., Kahiu, C. (2019a). Status of Drugs and Substance Abuse Among the General Population in Kenya. *African Journal of Alcohol and Drug Abuse*: Edition 1; 54-59.

Kamanderi, M., Muteti, J., Okioma, V., Nyamong, I., Kimani, S., Kanana, F., Kahiu, C. (2019b). Status of Drugs and Substance Abuse Among Secondary School Students in Kenya. *African Journal of Alcohol and Drug Abuse*: Edition 1; 1-7.

Kayla, W. (2014). Different ways to Smoke and Consume Cannabis found at www.leafly.com/news/cannabis-101/the-complete-list-of-cannabis-delivery-methods accessed on 10th September 2021.

Lindsay, M. C., Abel, D. W., Jones Edwards, E. E., Brown, D. P. Bernard, K. K., and Taylor, T. T (2021). Form and Content of Jamaican Cannabis Edibles. *Journal of Cannabis Research* 3:29

MacCallum, C. A., Russo, E. (2018). Practical considerations in medical cannabis

administration and dosing. *European Journal Int Med*. 49:12–9.

Moltke, J. and Hindocha, C. (2021). *Journal of Cannabis Research* 3:5

Mwawasi, M. (2018). Man Sentenced to Life Imprisonment for Trafficking bhang worth shs 23,250. The Standard Newspaper of 16th May.

Mboya, Paul (2001). *Luo Kitgi Gi Timbegi*. A translation in English by Jane Achieng-1938 Version. Nairobi, Atai Joint Ltd.

NACADA (2012). Rapid Situation Assessment of the Status of Drugs and substances Abuse in Kenya, 2012. National Authority for the Campaign Against Alcohol and Drug Abuse (NACADA), Nairobi-Kenya

NACADA (2015). *Exploratory Survey Report on the Use of Narcotic Drug in the Production of Confectioneries in Kenya*. NACADA, Nairobi-Kenya.

Oshi, D. C., Ricketts-Roomes, T., Oshi, S. N., Campbell-Williams, K. A., Agu, C. F., Mitchell, G., et al. (2019). Factors associated with awareness of decriminalization of marijuana in Jamaica. *Journal of Substance Abuse;*25(2):152–6.

Shrivastava, A., Johnston, M., Tsuang, M. (2011). Cannabis use and cognitive dysfunction. *Indian Journal of Psychiatry*. 53(3):187–91.

Schauer, G. L., King, B. A., Bunnell, R. E., Promoff, G., & McAfee, T. A. (2016). Toking, vaping, and eating for health or fun: Marijuana use patterns in adults, U.S., *American Journal of Preventive Medicine,* 50:1–8.

Taura, F., Sirikantaramas, S., Shoyama, Y., Yoshikai, K., Shoyama, Y., Morimoto, S. (2007). Cannabidiolic-acid synthase, the chemotype-determining enzyme in the fiber-type Cannabis sativa. *FEBS Lett.* 581(16):2929–34.

UNODC (2007). *Cannabis in Africa: An Overview*. United Nations Office on Drugs and Crime, UN: Geneva.

UNODC (2018). Executive summary – Conclusions and policy implications. World Drug Report. 2018:1–31.

UNODC (2021) *World Drug Report 2021*. United Nations Publication found at www.unodc.org/unodc/press/releases/2021/june/unodc-world-drug-report-2021 Accessed on 23rd October 2021.

Vandrey, R., Raber, J. C., Raber, M. E., Douglass, B., Miller, C., Bonn-Miller, M. O. (2015). Cannabinoid dose and label accuracy in edible medical cannabis products. *JAMA*. 13(24):2491-2493.

Wang, G. S., Roosevelt, G., Le Lait, M-C., Martinez, E. M, Bucher-Bartelson, B., Bronstein, A. C. et al. (2014). Association of unintentional pediatric exposures with decriminalization of marijuana in the United States. *Annals of Emerging Medicine*. 63(6):684–689.

Wangari, S. (2019). Why Small Amount of Bhang Earned Woman 30-year Sentence found at www.kenya.co.ke/news39924-ksh2k-bhang-earns-woman-30-year-sentence Accessed on 29th September.

Wanyoro, C. (2021). Kenya: Meru Couple Jailed for Life for Trafficking Kshs 3 million Marijuana. Daily Nation 30th September.

Wilkinson, T. S., Radhakrishan, R. and D'Souza, C. D. (2014). Impact of Cannabis Use on the Development of Psychotic Disorders. *Current Addiction Rep* 1(2): 115-128.

Prevalence and Risk of Alcohol Use among Palliative Care Patients in Kenya: Case Study of Coast Region

Phelista Musili, PhD [1*], Susan K. Kimotho[1], Caroline Ouma[1], Eric Amisi[2], Asaph Kinyanjui[3] and Stephen Muchiri[4]

1* Department of Psychology, Kenyatta University, Kenya.

2 Coast Hospice

3 Nairobi Hospice

4 Blessed Talbot Medical Centre limited

***Corresponding Author:**

Phelista Musili, PhD

Department of Psychology, Kenyatta University, Kenya

Email Address: musili.phelista@ku.ac.ke

Date submitted: 15th October 2021

Date published: 31st December 2021

Abstract

Alcoholism is a health concern in the general public, which is likely to affect special populations including those in palliative care settings. Alcohol use among Persons Living with Palliative Care Needs (PLWPCNs) can pose a major challenge in pain and symptom management. However, the frequency of alcohol use in this population is under-recognized and has not been adequately addressed in Kenya. The study aims to assess the risk factors and frequency of alcohol consumption among PLWPCNs; as well as determine the effects of alcohol use among patients and families in outpatient palliative care settings in Kenya. Information of 150 patients referred to the outpatient hospice facility in the Coast region of Kenya was retrospectively reviewed. Additionally, an interview schedule was administered to the hospice care providers to determine the prevalence and risk factors of alcohol use among the patients. The results indicated that the majority of the participants were using alcohol. The study recommends appropriate assessment for risk of current or past alcoholism as well as the use of comprehensive interventions to improve the quality of life of these patients and their families.

Keywords: Alcoholism, Alcohol Use, and Abuse, Hospice, Palliative Care, Persons Living with Palliative Care Needs (PLWPCDs)

Introduction

Global trends indicate that alcohol is the most widely abused substance in most countries, including African countries such as Kenya. Alcohol use disorder (AUD) continues to be a major global burden. According to the Diagnostic and Statistical Manual for Mental Disorders (DSM 5), 3.6% of the world population suffers AUD (American Psychiatric Association, 2013), while over 80% of adults in the United States of America (USA) report having consumed alcohol at some point in their lifetime (SAMHSA, 2015). About 25% of all the alcohol consumed globally is unrecorded (World Health Organization, 2018). The increasing trend has also been observed in Africa, within the late twentieth century (Mungai & Midigo, 2019). In Kenya, alcohol consumption has increased tremendously among the younger and older population. According to the National Authority for the Campaign against Alcohol and Drug Abuse (NACADA), alcohol abuse is high compared to other substances. Statistics indicate that 16% of the persons between 15-65 years of age have been reported to be either moderate users, abusers, or dependent on alcohol (Kiemo, 2016). Additionally, Bali Beginnings Rehab (2018) indicates that although most drug abusers in Kenya use various substances, the most commonly abused is alcohol.

In the recent past, there has been a growing concern about alcohol and substance abuse in special populations. A study in Kenya reported that about 28.2% of persons with disabilities (PWDs) have used alcoholic beverages (Kathungu, Mwaura, & Wambugu, 2015). There is a likelihood that alcoholism and other substance use is also affecting clinical settings such as Hospices and Palliative Care Units (H&PCU)

facilities. In their interactions with patients, palliative care providers encounter multiple issues including drug and alcohol-related problems. However, the prevalence of alcohol dependence in H&PCUs is not very clear with various studies showing inconsistent results. Some statistics in the United States show base rates of 6-15% of alcohol and substance abuse in palliative care while others show a range of alcohol dependence as 3-19% (Webber, Davies, Leach & Bradley, 2020). Other estimates indicate 28% of alcohol use in palliative care (MacCormac, 2017). In addition, some of the studies conducted on the prevalence of alcohol dependence in patients with advanced cancer have reported varying results depending on the type of tools used. For instance, a study carried out in the UK using the CAGE questionnaires showed that 11% of the cancer patients screened positively for alcohol dependence while Alcohol Use Disorders Identification Test (AUDIT) showed a prevalence of 5% (Webber, et al., 2020). Alcohol use and abuse in palliative care have been attributed to some specific needs associated with the distress that comes with terminal conditions, comorbidities as well as inadequate social support networks (MacCormac, 2017).

Despite all these statistics, alcoholism is unrecognized, underdiagnosed, and therefore undertreated among patients in palliative care settings in Kenya. This may be attributed to the fact that alcohol drinking has a socio-cultural significance attached to it particularly in Africa making it difficult to see or question the negative effects in increasing the disease burden (Ferreira-Borges, Parry & Babor, 2017). In addition, although substantial documented palliative care research has been conducted in Kenya, most of it has focused mainly on issues related to patient care, palliative guidelines, and symptom management. As a result, not much has been done in the area of alcohol use and abuse in H&PCUs. The purpose of this study is to find out the prevalence and risks of alcohol abuse in palliative care settings and determine the need for screening and appropriate interventions.

The main focus of palliative and hospice care is to offer a holistic approach that provides patients with relief from symptoms, pain, and stress of life-threatening conditions. In Kenya, palliative care is offered mainly in stand-alone hospice facilities and other palliative care units which are commonly found within main hospitals. This study focused on an outpatient hospice facility in the coastal region of Kenya which supports mainly patients and their families facing life-limiting illnesses. The majority of the patients seen in Kenyan hospices suffer from either cancer (78%) or HIV/AIDS (30%) related conditions (Ministry of Health, 2021). To offer quality services to its clients, the hospice employs a holistic approach using a multidisciplinary team. The main challenge is that majority (80%) of the patients visiting the hospice present with advanced incurable disease conditions (Ali, 2016). Consequently, they suffer a myriad of symptoms with about 75% experiencing intense pain (Ministry of Health, 2021) which may call for a constant increase in medication dosage to control the pain. Hence, the use of alcohol and other substances in terminally ill patients within the hospice can result in numerous challenges. This may become more complex given that most hospices in Kenya operate with very limited resources.

A major challenge posed by alcohol use in palliative care relates to pain and symptom management. Alcoholism has been associated with poor pain control. Most of the medication used to manage pain includes opioids. Some of the patients with a history of alcohol use may tend to fear using opioids even though they may be experiencing intense pain, making it more difficult for the care providers to effectively control their pain (Ebenau, Dijkstra, Ter Huurne, Hasselaar, Vissers, & Groot, 2020). Literature reveals that sometimes use of opioids does not adequately control pain and that half of the patients do not respond at all (Ebenau et al., 2020). Therefore, most of these patients become frustrated and unable to cope with the unbearable pain. To manage the pain and cope with these frustrations, they may resort to increased consumption of alcohol which can lead to other risks such as alcoholism and increase the disease burden.

Persistent alcohol use can result in several consequences including nausea, bloating,

gastritis, liver cirrhosis as well as adverse emotional effects like feelings of sadness, irritability among others (APA, 2013). Alcohol use has been reported to be a major cause of morbidity and mortality worldwide (Rehm & Shield, 2019). The WHO Report (2018) estimates that 7.2% of all premature global deaths in the year 2016 resulted from alcohol consumption. It also contributes to more than 200 diseases and injury-related health conditions such as alcohol dependence, liver cirrhosis, cancers, and injuries (Rehm & Shield, 2019). Moreover, alcohol consumption has been identified as carcinogenic for the majority of categories of cancer including but not limited to oral cancers, colon, liver, breast as well as pancreatic cancer (National Cancer Institute, 2015). Other possible complications that could result from excessive consumption of alcohol include a variety of conditions such as vascular and Alzheimer's disease (Rehm, Hasan, Black, Shield, & Schwarzinger, 2019). This implies that alcohol use or abuse can expose these patients who are already suffering from cancer-related complications to more risks, thus reducing their quality of life.

Patients who have a history of alcoholism may be more susceptible to addiction and are poorly compliant with treatments. Findings from a study on the frequency of alcoholism in patients with advanced cancer admitted in a palliative care unit and home care program revealed that 3.83% were high alcohol consumers or had a history of alcoholism and expressed symptoms of distress (Mercadante, Porzio, Caruselli, & Aielli, 2015). Due to the psychological distress that comes with the diagnosis and treatment of cancer, some patients may start consuming alcohol to relieve the pain and stress or increase the intake which becomes more detrimental and affects the pain management process. For instance, a study on alcohol consumption and survival of colorectal cancer patients in Germany indicated that 10% of the patients who were still alive five years after diagnosis increased their alcohol consumption (Walter, Jansen, & Brenner, 2016). This could also be attributed to the fact that alcoholism is likely to affect their social support system like the relatives and the community at large and it may weaken their coping mechanisms.

The Kenya Hospices and Palliative Care Association (KEHPCA) focuses on promoting and supporting affordable quality palliative care all over the country (KEHPCA, 2015). The goal is to enhance the quality of life for this population. This is in line with Universal Health Coverage (UHC) and Sustainable Development Goal (SDG) 3. Alcohol consumption is targeted in the health SDG 3 which emphasizes the prevention and treatment of substance use, narcotic drug abuse, and harmful use of alcohol (WHO, 2018). These goals may not be realized if alcohol abuse in HPCs is not adequately assessed and addressed. The Government of Kenya has documented alcohol and other drug abuse as a major threat to the lives of her citizens (Ministry of Interior and Coordination of National Government, 2018). This includes persons living with life-threatening conditions such as the patients seeking services in hospices. This, therefore, calls for more attention in matters relating to alcohol consumption among patients in palliative care.

Objective of the Study

The study aimed at assessing the prevalence, risk factors, and frequency of alcohol consumption among patients in hospice care settings in Kenya; and to determine the strategies that can be used to address alcohol abuse in hospice care settings.

Methodology

This study adopted a cross-sectional descriptive design and was conducted at the outpatient Hospice care facility located in Mombasa County which is within the coastal region of Kenya. Data of 112 patients who were purposively sampled; and had visited the facility between 2017 and 2019 was reviewed and summarized. Only information of patients with a history of alcohol and other substance use was selected and included in the analysis of the study. The research instruments used a questionnaire, for demographic information, medical history as well as individual and family history of substance use. Assessment of alcohol use was done using the CAGE questionnaire by Mayfield, McLeod, and Hall (1974). It contains four questions about lifetime alcohol consumption. A cut off score of 2 or more positive answers was used to determine

alcohol dependence. Additionally, an interview schedule was purposively administered to all the nine hospice care providers to determine the risks for alcohol use among the patients. The collected data were analyzed using descriptive statistics in form of frequencies and percentages and presented in tables and pie charts.

Permission was sought from the facility administration and informed consent was included on the first page of the questionnaire with details of the procedure, possible risks, and benefits as well as the patients' willingness to participate. Only willing participants were included in the study.

Results

The purpose of the study was to assess the prevalence and risk of alcohol consumption among palliative care patients, with a focus on the coastal region. The demographic characteristics of the participants are presented in Table 1. Majority (58%) of the participants were males compared to their female counterparts (42%). With regards to age, those who were 61 years and above accounted for 34%, followed by 27% who were aged between 51 and 60 years. Only a small percentage of the participants (4%) were aged between 20 and 30 years. In terms of the type of cancer, a majority (39%) of the participants suffered from oral cancer, followed by cancer of the reproductive organs (21.4%) while 10% had gastrointestinal cancer. Abdominal and skin cancer accounted for 8% each and breast cancer was 6%. These findings suggest that there is a relatively high number of men suffering from various types of cancer as compared to women in Mombasa County, whether this is a reflection of the situation in the country is a matter of further study. Additionally, the findings reveal that older persons are more affected by cancer than young people. These findings suggest that the risk of getting cancer increases with age as mentioned by past researchers like Trabert, Tworoger, and O'Brien (2020). This may be the reason medics advocate for regular screening beginning at an early age.

Prevalence of Alcohol Use among Patients

The study results showing the trends of alcohol use as well as other substances were presented in Figure 1. In the general prevalence of substance use, the study found that the majority(64%) used alcohol while 36% used other substances such as tobacco, bhang, khat, betel nuts, and artane. It is worth noting that the study findings showed that the majority of the respondents who used alcohol also used tobacco. These findings reveal a trend that should give concern to the medics and caregivers of these patients. The use of drugs and substances can interfere with treatment measures offered to these patients hence their overall wellbeing. The findings might be an indication of psychological issues the patients are trying to handle like; anxiety, fear of the unknown or even depression brought about by cancer.

Gender Differences in Alcohol Use

Alcohol use according to gender was analyzed and summarized in table 2. Out of the total participants who used alcohol (N=70), the findings showed that a higher percentage of male patients (62%) used alcohol compared to their female counterparts (38%) respectively. These findings confirm the existing fact that there is a high alcohol use among males than females. However, in regards to the current study, it might mean that women have better ways of handling stress, anxiety, fear, and other issues that come with cancer than men, and hence more men turn to alcohol and drugs to deal with their feelings.

Age and Alcohol Use

Analysis of alcohol use was done based on age and results were summarized in figure 2. The results showed that alcohol use was more dominant in patients of 51-60 years of age accounting for 31.3%, followed by patients who are 61 & above years (28.1%) and 18.8% for patients aged 31-40 respectively. 6.3% of patients aged 20-30 used alcohol while 15.6% were between ages 41-50. These results indicate that there is a higher alcohol use among the aged patients compared to the younger ones. These findings may be attributed to a number of factors. It is possible that older individuals are overburdened in terms

of the stress that comes with the disease, worrying about family, hospital bills and other related expenses, hence turning to alcohol as a way of self-medication. There is a likelihood that the older persons were already using drugs and substances before the illnesses. The younger people may be cushioned to some extent because they rely on their parents or relatives for support.

Type of Cancer and Alcohol Use

Alcohol use was found to be more predominant among patients with oral (31%) and reproductive organs (23%) cancers as shown in Table 3. The findings also indicated that 14% suffered from gastrointestinal-related cancer while 9% had abdominal and the other 9% suffered from skin cancer respectively. Additionally, 6% of the patients had breast cancer while 3% were suffering from cancer of the pulmonary region. Only 1% of the participants who suffered from cancer of the eye, and blood cancer (1%) consumed alcohol.

Risk Factors of Alcohol Use in Hospice Patients

An interview schedule was administered to nine care providers working within the hospice facility to determine the possible risk factors for alcohol use among patients. From the perspectives of the care providers, several factors put the patients at risk for continued use of alcohol. History of alcoholism among patients was cited as a major risk for alcohol dependence among patients. Moreover, seven out of the nine care providers interviewed; reported that most patients who experienced difficulties in controlling alcohol consumption included: those who were dependent before they were diagnosed with the disease; and patients living with family members who struggle with alcoholism. This made it more challenging for them to reduce or stop taking alcohol, thus exposing them to further risks. According to the DSM 5, the rate of alcohol use disorder is three or four times higher in close relatives of individuals with the same disorder (Gowin, Sloan, Stangl, Vatsalya, & Ramchandani, 2017).

Anxiety and fear of the unknown, as well as fear of death, were also cited as factors that predispose patients to risks for consumption of alcohol and other substances. According to the patients, the nature of the illness created some uncertainties especially when they received the news of the cancer diagnosis. To deal with these anxieties and fears, individuals resort to alcohol consumption without considering the risks involved.

This notwithstanding, the stress associated with the illness is immense not only to the individual patient but also to the significant others. The physical, psychological, and emotional distress that comes with life-threatening illnesses such as cancer, may weigh down the coping mechanisms of these patients as well as their caregivers. Consequently, this could pose a risk for maladaptive coping including increased use of alcohol or other substances to relieve the stress.

In addition, inadequate management of pain and symptoms was cited as a risk factor for alcohol use. When patients suffer prolonged pain, they are likely to use alcohol or other substances as a way of self-medication to try and relax their pain. Subsequently, there is a risk for developing tolerance which may result in dependence on alcohol for pain management.

Discussion

The findings of the study have shown that alcohol consumption is a concern among patients in hospice and palliative care. The results established that a higher percentage of patients used alcohol. Of major concern is the fact that many of these patients suffer life-limiting conditions with heavy symptoms, and thus alcohol use may increase the disease burden. Consequently, this makes them more vulnerable to other alcohol-related health hazards such as liver diseases, accidents, injuries, higher death tolls, increased risk of cancers of the mouth, liver, and breast (Rehm & Shield, 2019); as well as subsequent cancer incidence among cancer survivors (KEHPCA, 2015).

The study found that more males (62%) used alcohol compared to females (38%) which is similar to the global trends. Regarding alcohol intake, the current results concur with past studies which have shown that men are more likely to develop alcoholism than women (National Cancer Institute, 2015). Moreover, several studies

also show that women are more likely to experience lifetime abstention as compared to men (Li, Chen, & Ye, 2019). This tendency has been attributed to various factors ranging from sociocultural to biological factors. In some cultures, including the African communities, alcohol consumption among women is more restricted; this probably explains why more men rather than women could be using alcohol. In these cultures, there is a general view of women as homemakers or caregivers and their role of rearing children is key, and therefore they may spend more time in these roles leaving no time for fun which is more associated with alcohol drinking. However, some studies have shown that there is a gradual shift from these social norms that view women as homemakers leading to the narrowing of the gender gap difference in alcohol consumption and the resultant consequences (Tabuchi, Ozaki, Loka, & Miyashiro, 2015). This new trend is likely to be seen within the African cultures as well.

With regards to age, the study results indicated that alcohol use was predominant (80%) in patients aged above 41 years. The majority (65%) of these patients have been consuming alcohol since their young adulthood period. This implies that there exists more alcohol users in older patients, a trend that may cause concerns given the higher chances of negative health consequences due to alcohol consumption in this age group (Tabuchi et al., 2015; Trabert et al., 2020). The study findings showed that alcohol consumption was more among patients with oral and reproductive organs cancer. The American cancer society has linked most oral cancers such as cancer of the mouth, throat, voice box, and esophagus with alcohol use (Delker, Brown, & Hasin, 2016). However, several studies have shown inconsistent findings on the link between alcohol use and cancer of the reproductive organs (Aryal et al., 2015). Nonetheless, high consumption of wine may lead to ovarian cancer (American Cancer Society, 2017).

The results indicate a relatively high prevalence (64%) of alcohol consumption among patients in hospice care, an indication that this may be an issue of concern. Consequently, this calls for appropriate measures to be put in place to curb the problem as part of the holistic care that HPCs aim to achieve. These strategies may probably help in the enhancement of the patients' quality of life; a goal that is part and parcel of hospice care. Appropriate policies could be formulated as well as practical intervention programs tailored to suit this vulnerable population.

Recommendations

During the interview, all the care providers gave their perspectives of the possible strategies that could address the issue of alcohol use and possible abuse by the patients under their care. These include:

- Interventions such as detoxification, encouraging controlled alcohol use, as well as treating patients experiencing alcohol withdrawal.
- Good practice in the management of patients who were cited as critical in hospice care. This could involve offering quality services, a holistic approach in treatment interventions as well as comprehensive assessment.
- The need to use a biopsychosocial approach which ensures that the physical, psychological, emotional, and social needs of the patients are adequately addressed.
- Mental health and additional counseling could be incorporated in caring for both patients and their families suffering from alcoholism.
- Support from the family which is viewed as necessary and a vital component of care and enhancing of quality of life of the patients.

Conclusion

In conclusion, alcoholism is a challenge among PLWPCNs and has a negative physical, social and psychological impact on both the patient and the family. Health care workers should evaluate misuse of alcohol among their patients and address it using a multidisciplinary approach. PLWPCNs should be empowered to have better coping mechanisms to reduce cases of alcoholism. Palliative care is a unique field and patients in need of palliative care have a myriad of challenges, therefore there is a need to

undertake interventional research to identify which approaches are suitable for this field. The research should focus mostly on Low and Middle-Income Countries where there are limited resources and diverse cultural factors that affect conventional interventions.

Study limitations

This study was conducted in Mombasa County and therefore the findings of this study might not reflect the situations in other parts of the county. The sample size was limited and the use of the self-report tool raises the possibility of bias. Therefore, future studies should incorporate more regions and have a bigger sample population for the generalizability of results. In addition, the researchers were unable to continue collecting data in the year 2020 due to COVID-19 restrictions and fewer patients were accessing the hospice facility for care.

TABLES

Table 1: Demographic characteristics of respondents

Characteristic	Frequency	Percentage
Gender:		
Male	65	58
Female	47	42
Age in years:		
20-30	5	4
31-40	12	11
41-50	27	24
51-60	30	27
61 and above	38	34
Types of Cancer		
Abdominal	9	8
Bone\Muscle	2	1.8
Breast	7	6
Eye	1	0.9
Gastrointestinal	11	10
Oral	44	39
Pulmonary	4	4
Reproductive organs	24	21.4
Skin	9	8
Blood	1	0.9
TOTAL	**N=112**	**100**

Table 2: Gender and Alcohol Use

Gender	Frequency	Percentage
Male	47	67
Female	23	33
Total	**70**	**100**

Table 3: Type of Cancer and alcohol Use

Type of Cancer	Frequency	Percentage
Abdominal	6	9
Bone/muscle	2	3
Breast	4	6
Eye	1	1
Gastrointestinal	10	14
Oral	22	31
Pulmonary	2	3
Reproductive organs	16	23
Blood	1	1
Skin	6	9
Total	**70**	**100**

FIGURES

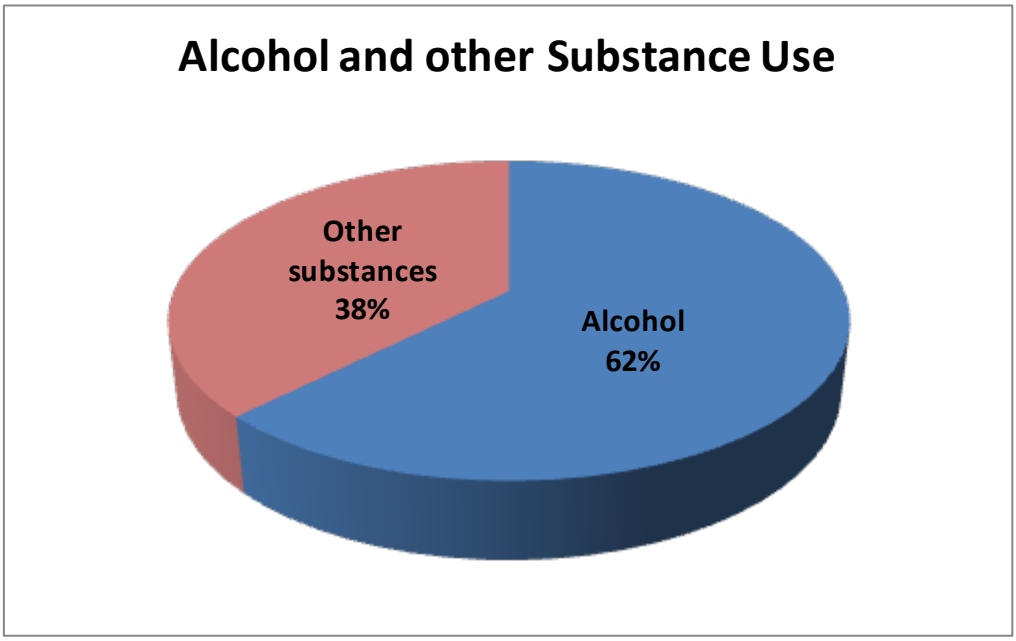


Figure 1: Alcohol and Other Substance Use among Patients

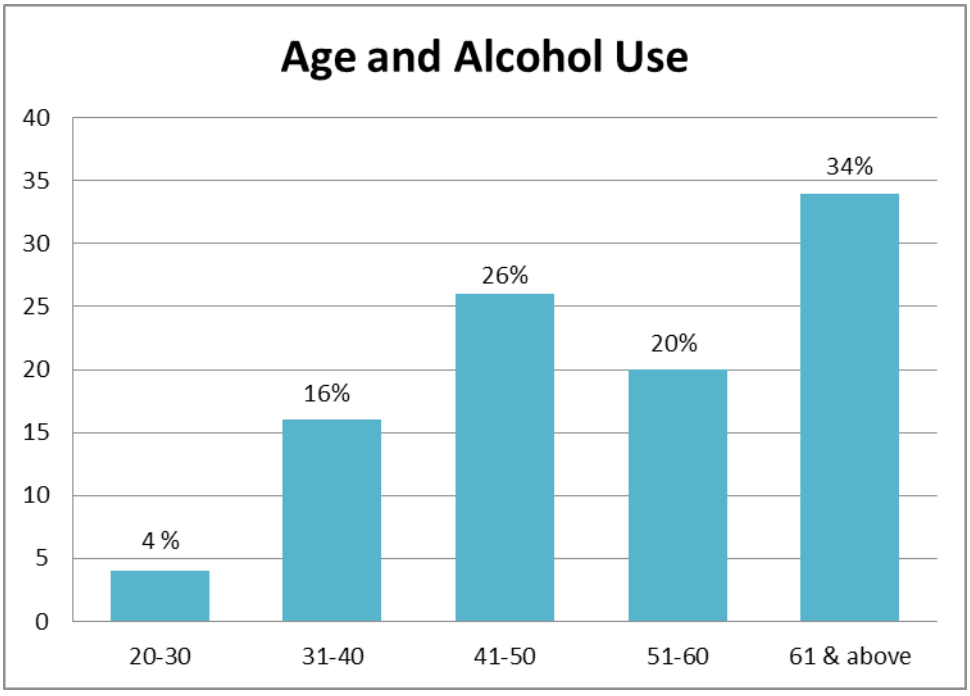


Figure 2: Age and Alcohol Use

References

Ali, (2016). Kenya Hospices and Palliative Care Association: integrating palliative care in public hospitals in Kenya. *ecancermedicalscience*, *10*.

American Cancer Society (ACS) (2017). Alcohol Use and cancer, Retrieved from *www.cancer.org/latest-news/alcohol use-and-cancer.html*.

Aryal, K. K., Thapa, P., Mehata, S., Vaidya, A., Pandey, A. R., Bista, B., & Karki, K. B. (2015). Alcohol Use by Nepalese Women: Evidence from NonCommunicable Disease Risk Factors STEPS Survey Nepal 2013. *Journal of Nepal Health Research Council*, *13*(29), 1-6.

Bali Beginnings Rehab (2018). Drugs and alcohol Stats in Africa. Retrieved on 10/4/2018 from: https://rehabbali.com/resources/drug-alcohol-stats-kenya/

Daher, M. (2016). *Pain and Drugs: Substance Use in Palliative Care*.

Del Fabbro, E. (2014). Assessment and management of chemical coping in patients with cancer. *Journal of Clinical Oncology*, *32*(16), 1734-1738.

Delker, E., Brown Q., & Hasin, D. (2016). Alcohol Consumption in Demographic Subpopulations: An Epidemiologic Overview. *Journal of the National Institute of Alcohol Abuse and Alcoholism* (NIAAA) Alcohol Research: Current Reviews 38:1.

Ebenau, A., Dijkstra, B., Ter Huurne, C., Hasselaar, J., Vissers, K., & Groot, M. (2020). Palliative care for patients with substance use disorder and multiple problems: a qualitative study on experiences of healthcare professionals, volunteers, and experts-by-experience. *BMC palliative care*, *19*(1), 1-13.

Ferreira-Borges, C., Parry, C. D., & Babor, T. F. (2017). Harmful use of alcohol: a shadow over sub-Saharan Africa in need of workable solutions. *International journal of environmental research and public health*, *14*(4), 346.

Gowin, J. L., Sloan, M. E., Stangl, B. L., Vatsalya, V., & Ramchandani, V. A. (2017). Vulnerability for alcohol use disorder and rate of alcohol consumption. *American Journal of Psychiatry*, *174*(11), 1094-1101. Health Organization. https://apps.who.int/iris/handle/10665/274603.

Kenya hospices and palliative care association annual report (KEHPCA, 2015). Retrieved from http://www.kehpca.org/hospices/.

Kiemo, K. (2016). Drugs and drug control in Kenya. In *Pan-African Issues in Drugs and Drug Control* (pp. 61-86). Routledge.

Li, J., Chen, P., Han, X., Zuo, W., Mei, Q., Bian, E. Y., & Ye, J. (2019). Differences between male and female rats in alcohol drinking, negative affects, and neuronal activity after acute and prolonged abstinence. *International journal of physiology, pathophysiology, and pharmacology*, *11*(4), 163.

MacCormac, A. (2017). Alcohol dependence in palliative care: a review of the current literature. Journal of palliative care, 32(3-4), 108-112.

Mercadante, S., Porzio, G., Caruselli, A., Aielli, F., Adile, C., Girelli, N., & Casuccio, A. (2015). The frequency of alcoholism in patients with advanced cancer admitted to an acute palliative care unit and a home care program. *Journal of Pain and symptom management*, *49*(2), 254-257.

Ministry of Health (2021). Kenya Palliative Care Policy (2021-30). Retrieved from: https://www.health.go.ke/wp-content/uploads/2021/10/Kenya-Palliative-Care-Policy-2021-2030.pdf.

Ministry of Interior and Coordination of National Government (2018). National Alcohol and Drug Abuse Policy. Retrieved

from: https://www.nacada.go.ke/sites/default/files/2019-10/The%20National%20Alcohol%20and%20Drug%20Abuse%20Policy-%20September%202018_0.pdf.

Mungai, D., & Midigo, R. (2019). Social and cultural determinants of health; understanding the persisting Alcohol Use Disorder (AUD) in the rural populations in central Kenya. *AIMS public health*, *6*(4), 600.

National Cancer Institute (2015), *Alcohol Consumption*, November 2015 update. Retrieved from: http://www.progressreport.cancer.gov/prevention/alcohol. Accessed 9/04/18.

Rehm, J., & Shield, K. D. (2019). Global burden of alcohol use disorders and alcoholic liver disease. *Biomedicines*, *7*(4), 99.

Rehm, J., Hasan, O. S., Black, S. E., Shield, K. D., & Schwarzinger, M. (2019). Alcohol use and dementia: a systematic scoping review. *Alzheimer's research & therapy*, *11*(1), 1-11.

Substance abuse and mental health services administration (SAMHSA, 2015). National Survey on Drug Use and Health (NSDUH).

Tabuchi, T., Ozaki, K., Loka, A. & Miyashiro, I. (2015). Joint and independent effect of alcohol and tobacco use on the risk of subsequent cancer incidence among cancer survivors: A cohort study using cancer registries. *International Journal of Cancer, 137, 2114-2123.*

Trabert, B., Tworoger, S. S., O'Brien, K. M., Townsend, M. K., Fortner, R. T., Iversen, E. S., & Wentzensen, N. (2020). The risk of ovarian cancer increases with an increase in the lifetime number of ovulatory cycles: an analysis from the Ovarian Cancer Cohort Consortium (OC3). *Cancer Research*, *80*(5), 1210-1218.

Walter, V., Jansen, L., Ulrich, A., Roth, W., Bläker, H., Chang-Claude, J., & Brenner, H. (2016). Alcohol consumption and survival of colorectal cancer patients: a population-based study from Germany. *The American journal of clinical nutrition*, *103*(6), 1497-1506.

Wambugu, B., Kathungu, B., & Lydia, Mwaura, L., (2015). Extent and patterns of drug use among persons with disabilities in Kenya.

Webber, K., Davies, A. N., Leach, C., & Bradley, A. (2020). Alcohol and drug use disorders in patients with cancer and caregivers: effects on caregiver burden. *BMJ supportive & palliative care*, *10*(2), 242-247.

World Health Organization (2018). Global status report on alcohol and health 2018.

Sociodemographic, clinical profile and the association with retention in treatment among patients receiving methadone treatment in Nairobi, Kenya

Sarah Kiburi*

*Department of psychiatry, Ngara Methadone Treatent clinic, Narobi Metropolitant Services Kenya.

Email Address: sarahkiburi@gmail.com

Date submitted: 15th October 2021

Date published: 31st December 2021

Abstract

Opioid use disorder is a common condition worldwide and is associated with a significant disease burden. There is limited research on factors that influence retention in methadone treatment in Kenya. This study aimed to assess patients' sociodemographic and clinical profiles and the association of these factors with retention in methadone treatment at a clinic in Nairobi. This study used a cross-sectional descriptive design that involved retrospective abstraction of data from records of patients on methadone treatment. The data collected included: sociodemographic variables and clinical profiles of patients. The mean age was 32.9 (17-71) years, and 92.8% were males, of which 54% were actively retained in treatment. Ninety-nine percent used heroin at the start of treatment with predominant polysubstance use and early age of onset of substance use. Depressive symptoms were reported by 4.9%, anxiety symptoms by 3.2%, suicidal thoughts by 9.5%, violent behavior by 17.1%. Fifty-four patients were currently being treated for comorbid psychiatric illnesses. Physical abuse was reported by 51.7%, emotional abuse by 55.1%, and sexual abuse by 2.1%. Factors associated with retention in treatment were occupation, treatment duration, outpatient treatment attendance before starting methadone treatment, and continued use of opioids and cannabis during methadone treatment. Most participants receiving care at the methadone clinic have early onset of susbstance use and polysubstance use and, as such, are likely to present with numerous medical and psychiatric co-morbidities. Understanding the sociodemographic characteristics and treatment outcomes for clients on methadone treatment can guide opioid use prevention and treatment interventions both in schools and in the communities. Further studies are needed to identify and respond to barriers that clients on methadone treatment face that hinder the realization of positive treatment outcomes.

Keywords: Sociodemographic, clinical, opioid use disorder, retention, methadone treatment, Kenya

Introduction

Opioid use is prevalent globally with a global prevalence of 1.2% among those aged 15-64 years in 2019 and has significant public health impact due to the high burden of disease attributed to opioid use (Degenhardt et al., 2019; United Nations Office on Drug and Crime (UNODC), 2021). Opioid use disorder is an emerging problem in Africa and Kenya (Kurth et al., 2018), with the lifetime prevalence of the opioid disorder in Kenya varying depending on the population studied, including the general population (0.1%), secondary school students (1.2%) and among inpatients with substance use disorder (8%) (Kamenderi et al., 2019a: Kamenderi et al., 2019b; Kiburi et al., 2018). Opioid use contributes significantly to the burden of diseases such as increased HIV and hepatitis risk (Akiyama et al., 2019; Ayon et al., 2019).

The recommended treatment for opioid use disorder involves pharmacologic and psychosocial interventions (Hawk et al., 2015; Rhodes et al., 2015). Whilst both methadone and buprenorphine are the commonest medications for opioid use disorder (MOUD), methadone is more commonly used (Ayanga et al., 2016; Zippel-schultz et al., 2016). Retention in MOUD treatment is associated with better outcomes, including less risk of relapse, reduced risky behaviors such as needle

sharing, less involvement in the criminal justice system, and improved social function (Cox et al., 2013; Fu Lee et al., 2017). Short-term treatment is associated with increased risk of opioid overdose and mortality risk (Thomas et al., 2015). The average retention in MOUD treatment in lower-and middle-income countries is 54.3% (46.2-63.7%) at 12 months (Feelemyer et al., 2014).

Factors associated with retention to treatment include sociodemographic characteristics, living environment, route of drug use, co-occurring psychiatric disorders, polysubstance use, number of treatment episodes and readiness for treatment, route of drug use, methadone dose, and concurrent psychosocial treatments (Cox et al., 2013; Fathollahi et al., 2016; Fu Lee et al., 2017), patient perception of treatment and the clinic environment (Grønnestad & Sagvaag, 2016) and factors related to the methadone program (Simpson 2004). Due to the variations in outcomes for methadone treatment, there is a need to assess the impact of modifiable factors and the use of targeted interventions to improve treatment outcomes among individuals with opioid use disorder (Rosic et al., 2021).

MOUD treatment in Kenya was started in 2014, with methadone currently being offered in eight public facilities. At the methadone treatment clinic, individuals receive other psychosocial interventions and treatment for medical and psychiatric co-occurring illnesses in addition to the daily methadone dose. Studies show that when MOUD is combined with psychosocial interventions, the treatment outcomes tend to be better than MOUD alone (Rice et al., 2020; Zerden et al. 2020).

Therefore, this study aimed to assess the sociodemographic and clinical profile and the association with retention in methadone treatment at Ngara Methadone clinic in Nairobi, Kenya. This study's findings will help fill the knowledge gap, inform healthcare providers and policymakers on the factors that affect retention in methadone treatment, and help develop strategies for improving treatment outcomes for individuals with opioid use disorder.

Methodology

This was a retrospective cross-sectional study using medical records of individuals receiving treatment at a methadone treatment clinic in Nairobi, Kenya, whereby data was retrospectively extracted from patients' records. During enrolment to the treatment program and follow-up, patient information is routinely collected and stored in an electronic database and physical records. In this study, data collected during the start of methadone treatment will be referred to as baseline data. In contrast, the data collected as participants continued treatment is referred to as data during the follow-up phase. During the follow-up phase, a urine drug screen (UDS) is done every three months. The last UDS at the time of this study was used to assess current substance use.

The inclusion criteria for the study were (1) medical records of individuals enrolled for methadone treatment between February 2017 and July 2019 (2) records that had complete information in the variables of interest contained in the data abstraction tool. The study excluded those records that had missing data in most variables in the data abstraction tool, such as data on sociodemographic characteristics and substance use history.

As shown in Figure 1, eight hundred (800) patients had been enrolled for methadone treatment during the study period. From them, 23 had missing data in most of the variables of interest (listed below); hence, they were excluded, leaving a sample of 777 for which baseline data was available. In the second analysis that involved analysis of those active and not active in treatment, we excluded those that had been transferred to another methadone clinic (n=49), those who had been deceased (n=29), and clients who had completed methadone treatment (n=8). Therefore, data from 691 participants were abstracted for sociodemographic and clinical factors associated with retention in treatment.

The researchers designed the data abstraction tool based on a priori theoretical understanding of the topic being studied and data recorded in clinical files at the methadone treatment clinic. The data variables abstracted included; a) socio-

demographic variables: age, gender, education, marital status, employment, housing, and occupation; b) substance use history (number of substances used and duration of use): age of onset of drug use, family history of substance use c) clinic engagement: date of enrolment; d) biomedical markers- toxicology screens results for the duration of the study (the toxicology screen done at start of treatment and the last one done before the study); e) medical and mental health conditions: co-occurring disorders and; f) methadone dose. This data abstraction tool has been attached as supplementary material.

Data analysis was done using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics were used to describe sociodemographic characteristics and clinical profiles of study participants, whereby categorical variables are presented as frequencies and percentages. The continuous data were presented as means with standard deviation or median with interquartile range. Multivariate logistic regression was used to determine the associations between sociodemographic characteristics, clinical profiles of clients, and retention to treatment with the use of Independent t-tests, Fisher's exact test, and chi-square tests. Odds ratio and 95% confidence interval were calculated where applicable with the threshold for statistical significance set at a p-value < 0.05.

Ethics approval was obtained from the University of Nairobi/ Kenyatta National Hospital Ethics Research Committee. Also, operational approval was obtained from the Nairobi County Research Committee and the head of the methadone treatment clinic.

Results

Participants Characteristics

Out of the 777 records abstracted for analysis, 373 were in active treatment, 49 were transferred to other clinics, 29 were deceased, three discontinued treatments, eight had completed treatment, and 315 were lost to follow-up. The mean age of the participants enrolled in the study was 32.9 and ranged from 17-71 years, and the majority (92.8%) were males. The mean methadone dose was 61.3 (SD 20.6), and the median was 60.0 (IQR 50.0 – 75.0). The majority of participants (66.7%) received a dose between 40-80mg, with less than one percent receiving more than 120mg of methadone. Table 1 is a breakdown of the sociodemographic characteristics of the participants.

Substance use at baseline during start of methadone treatment

As shown in Table 2, almost all the participants sought treatment because of heroin use, and 451 reported injecting drug use. Among the 451 who reported injection drug use, 331 (73%) had initiated injection drug use before turning 30 years. Polysubstance use was predominant among those seeking treatment for opioid use disorder. Individuals reporting more than five substances of abuse at the start of treatment were the majority comprising 30.7%, and a majority of the clients (80.8%) had a clinical opioid withdrawal score of less than or equal to 10. Based on toxicology results, 696 (89.6%) participants were using cannabis when starting methadone treatment. Table 2 summarizes the substance use history and the participants' clinical opioid withdrawal symptoms (COWS) scores at the time of starting methadone treatment.

Age of substance use onset and type of substance used

Table 3 summarizes the age of exposure to a substance and the frequency of use which shows that cannabis and benzodiazepines were the two drugs that participants were exposed to earliest, at the age of five years, followed by alcohol at the age of 6 years. Almost all the participants (n=776) had used heroin with a mean age of onset of heroin use at 21.8years.

Mental health and social history at methadone treatment enrolment

At the start of methadone treatment, depressive symptoms were reported by 4.9% (n=38); anxiety symptoms by 3.2% (n=25); suicidal thoughts by 9.5% (n=74), violent behaviour by 17.1% (n=133) while 54 patients were currently being treated for a comorbid psychiatry illness namely: major depressive disorder (33.3%), psychotic disorders

(16.7%), posttraumatic stress disorder (11.1%) bipolar disorder 5.6%, personality disorders (8.4%) and attention deficit hyperactivity disorders (5.6%). More than half of the participants (51.7%, n= 402) reported being subjected to physical abuse, emotional abuse by 55.1% (n=133), and sexual abuse by 2.1% (n=16). 3.1% (n=44) reported having a partner using substances, and 2.2% had a partner in recovery for substances use disorder. 1.3% (n=10) reported substance use by parents and 8% (n=62) reported substance use by other family members, and 50.3% reported growing up with no parents.

Current substance use

There was contined susbstance use during methadone treatment as reflected from the routine urine drug screening done. Cannabis was used by 66.3%, opioids by a third (33.2%) and benzodiazepines by 14.2%. This is shown in Table 4.

Treatment retention

Treatment retention at the time of this study was 54%, whereby the mean duration of treatment of those who dropped from treatment was 13 months and 30.6 months for those who were active in treatment. Table 6 summarises factors that were associated with treatment retention. The factors that had statistically significant association wit treatment retention include: occupation whereby those with unskilled manual labor had a lower risk of loss of retention to treatment (OR=0.6 (0.3 – 0.9, p=0.041); duration of treatment with longer duration associated with retention in treatment; attendance of outpatient clinic before starting methadone reduced the risk of dropping out of treatment; continued use of opioids increased risk for dropping out of treatment and; cannabis use which was associated with reduced risk of dropping out of treatment.

Discussion

This study assessed the sociodemographic and clinical profiles of patients receiving methadone treatment at a clinic in Nairobi and their association with retention in treatment.

The majority of participants were males comprising 92.8%, a finding similar to regional studies among patients on methadone treatment in South Africa and Tanzania (Gloeck et al., 2020; Lambdin et al., 2014; Scheibe et al., 2020). Past research shows that men tend to use the substance more than women. However, women tend to develop a substance use dependence faster than men and present to treatment earlier (McHugh et al., 2018; Tuchman, 2010). While this may be due to differences in sociodemographic, biological, and clinical factors between the two genders (Tuchman, 2010), it may also reflect a difference in drug use opportunities due to social and cultural perception such as stigma and role of women in the society (UNODC 2021) and availability of substances (Bawor et al., 2015). On the other hand, recent studies show a reducing gap in substance use between males and females (McHugh et al., 2018). This gender variation can be attributed to access to substances, ability to procure them, social environments, and age of substance initiation.

This study found that most participants (80.6%) were aged between 20-40 with an early mean age of initial substance use (heroin at 21 years and cannabis at 17 years). In addition, a minimum age of 5 years was reported for initial substance use for cannabis and benzodiazepines. Injection drug use (IDU) was also reported to occur early, 38.5% reporting to have started IDU when younger than 20 years of age. This reflects early age of onset of substance use, as seen in a study among primary school students whereby a fifth reported lifetime substance use (Lelei et al., 2020). The young age of onset of substance use is associated with polysubstance use, more severe substance use disorder, and worse outcomes (Lynskey and Hall 1998; Rosic et al., 2021)). There is a need to implement primary prevention strategies, especially among the youth (Afuseh et al., 2020; Compton et al., 2019). Recognizing this need, the National Authority for Campaign against Alcohol and Drug Abuse (NACADA) has developed guidelines on substance use prevention (NACADA 2021a) with specific guidelines for prevention and management of substance use in elementary schools (NACADA 2021b). If implemented, these school-based prevention strategies may help alleviate the early onset of substance use. In addition, early referral to methadone treatment

should be enhanced to improve the effects of treatment (Hadland et al., 2018).

Exposure to substances had a significant impact on socioeconomic status, including education, marital status, and secure gainful employment. Given that less than a tenth (9.4%) had acquired tertiary education, most participants (59.6%) worked in informal sectors as unskilled manual laborers. The majority of participants (42.1%) were either separated or divorced. Although not explicitly stated in the clients' records, this may imply opioid use as a cause of family breakdown and dysfunction. Family plays an essential role in the onset and development of opioid use and the recovery process (Fu Lee et al., 2017; Pettersen et al., 2018), and patients with dysfunctional families may lack the support system that is required to support treatment and recovery from opioid use (Pettersen et al., 2019). Therefore prevention and early treatment for opioid use disorder can help mitigate the associated dysfunction in occupation and relationships (Pettersen et al., 2018).

Almost all participants (99.1%) used heroin, with only one participant reporting prescription opioids. This may be due to the nature of clients enrolled in the methadone program, with the main target being key population individuals with injection drug use (Guise et al., 2019; Rhodes et al., 2015). This provides a gap for further research to assess the use of other opioids in Kenya.

At the time of starting methadone treatment, findings from our study show that cannabis was the commonly used substance (89.6%) followed by nicotine (88.8%), benzodiazepines (54.6%), and alcohol (52.8%), a pattern that is reported in other populations (Morgan et al., 2019). This may reflect these substances' easy availability and costs in our setting. While cannabis is reported as a gateway drug to other substance use, cannabis, alcohol, and cigarette use have been reported to precede heroin use (Morgan et al., 2019); hence screening and early treatment for other substance use may help in the prevention of opioid use.

A pattern of polysubstance use was observed, with the majority (30.7%) using more than five substances at the start of treatment compared to only 1.3% who used opioids only. This is a pattern reported among patients with opioid use disorder (Carlsen & Lunde, 2020; Morgan et al., 2019; Shams et al., 2019). Factors contributing to this polysubstance use could be genetic, environmental factors, and possible synergistic effects of drugs (Shams et al., 2019). This indicates the need to incorporate integrated treatment for other substances during methadone treatment for optimal outcomes for patients (Carlsen & Lunde, 2020).

There was continued substance use during follow-up whereby based on urinary drug screen, opioids, cannabis, and benzodiazepines were the commonest substances that were still being used by 33.2%, 66.3%, and 14.2% of participants, respectively. Continued substance use during methadone treatment has been reported in other areas and can be attributed to several factors (Morgan et al., 2019). This continued substance use is associated with poor retention and other adverse outcomes during methadone follow-up (O'Connor et al., 2019; Klimas et al., 2019).

At the start of treatment, symptoms of depression, anxiety, suicidal thoughts, and violent behavior were commonly reported by 4.9%, 3.2%, 9.5%, and 17.1%, respectively. In addition, 6.9% were on treatment for dual diagnosis during follow-up. Psychiatry co-morbidity is common among patients with opioid use disorder, with the commonest diagnosis being depression, posttraumatic stress disorder, personality disorders, and other substance use (Kidorf et al., 2004; Yang et al., 2015). There could be shared environmental and genetic risk factors for co-morbidity between psychiatric illness and opioid use, psychiatry co-morbidity arising from neuroadaptation that occurs with chronic opioid use, or opioid used for negative reinforcement to self-medicate for symptoms of anxiety and depression (Rizk et al., 2021). Psychiatry co-morbidity affects outcomes of patients on methadone treatment; hence there is a need to integrate the management of psychiatry illness among patients on treatment for opioid use disorder (Yang et al., 2015).

In this study, participants reported emotional abuse (55.1%), physical abuse (51.7%), and sexual abuse (2.1%). In addition, parental substance use was reported by 1.3%, while growing up with

one or no parents by reported 41.3%. Although this data was missing for some participants (Table 5), this is significant since the above adverse childhood experiences have increased risk for opioids and other substance use (Afuse et al., 2019; Guarino et al., 2021). A study in South Africa also found a prevalence of physical abuse and sexual abuse 13% and 2%, respectively, among individuals presenting for opioid use disorder treatment (Scheibe et al., 2020), while in the study by Lambdin et al.(2014) sexual abuse was associated with risk of attrition for treatment. This shows the need for continued screening and having strategies to prevent abuse in childhood which can be through strategies targeted at the family level as a prevention strategy to reduce risk factors for substance use (Compton et al., 2019).

At the time of the study, there was a 54% retention to treatment. Similar studies such as one in Tanzania (Lambdin et al., 2014) and a systematic review by (Feelemyer et al., 2014) indicate one-year retention of slightly over 50% after one year in treatment. Duration of treatment was significantly associated with retention, whereby the mean duration of treatment for those active in treatment was 30 months compared to 13 months for those not in active treatment. This shows the importance of a longer duration of treatment.

As shown in Table 6, occupation was the only sociodemographic factor significantly associated with treatment retention. Those with unskilled manual labor had a reduced risk of being inactive in treatment. This could be because the unskilled manual was the most common occupation (reported by 59.6%); hence may imply some form of economic earning could be protective against dropping out of treatment. Previous research has shown other sociodemographic factors such as age, gender, and marital status to influence retention in treatment which were not significant in our study (O'Connor et al., 2019). This may arise due to the differences in study designs, setting, and how the assessments have been carried out.

In this study, continued substance use was significantly associated with retention in treatment, as shown in Table 6. Opioid use was associated with was increased risk of dropping out of treatment. Previous research has reported this (Klimas et al., 2018; Rosic et al., 2021). An interesting finding was that cannabis use during follow-up was associated with a reduced risk of dropping out of treatment. Cannabis use during methadone treatment has had mixed findings in previous studies (Lake & Pierre, 2020; McBrien et al., 2019), with some studies reporting positive effects such as reduced opioids use and better retention (Scavone et al., 2013; Socías et al., 2018) while others report adverse effects such as poor retention and continued opioid use (Franklyn et al., 2017; Zielinski et al., 2017). There is a need for further research to assess this association between cannabis use during opioid use disorder treatment.

Study limitations

This was a retrospective study based on medical records of patients; hence may have missed data that could not be retrieved from the patients' records. Second, most of the data recorded in the patients' records were based on self-report at the start of treatment which is subject to bias such as recall and reporting bias due to social desirability. Third, continued substance use was based on the last urinary drug screen in the patient's records, which may not be accurate since it left out other substances not assessed in the drug screen, such as alcohol. Fourth, this study was based on analysis of data from one methadone clinic hence these findings may not be generalizable to the other clinics in other areas.

Conclusion

Majority of the clients whose records were included in this study come from lower socioeconomic backgrounds and more than a quarter of the clients initiated heroin use before they turned 20 years. Heroin was the commonest opioi used and alcohol and marijuana are two main substances that were used alongside heroin. The impact of chronic polysubstance use is manifested by the co-morbidities that participants presented at the time of starting methadone treatment, histories of abuse, and interaction with the criminal justice system. Treatment retention of 54%, though modest, brings to perspective the socioeconomic challenges that individuals face in their bid to recover from opioid use disorder.

This study has several implications for practice. First, considering the age of substance use initiation and the sociodemographic profiles of clients receiving care at the methadone treatment clinic, there is an urgent need to invest in substance use prevention interventions among the at-risk demographic population. Secondly, given that most clients with opioid use disorder started using the drug aged 30 and below, interventions need to be initiated in elementary and secondary schools. Stakeholders in the schools and communities where these clients dwell need to be informed about the early signs of substance use. Further analysis is required to understand the geographical catchment areas for these clients to develop collaborative interventions with health care providers in these settings.

Thirdly, alcohol and cannabis are two main substances used alongside opiate use disorders. Although alcohol is legal in Kenya, cannabis is not. Nevertheless, it is a widely available substance that youth have access to. Providing education to the general public about the relationship between the use of these two drugs and other illicit drugs can be an effective prevention strategy to delay the initiation of use of heroin.

Fourthly, there is need for further research to assess factors associated with retention in methadone treatment in other settings for comparison and to allow generalization of findings. In addition future studies need to use longitudinal study designs that involve follow up of patients in treatment as well as qualitative studies to understand barriers that clients on methadone treatment face that could hinder their engagement with care in order inform policies on developing support interventions that increase access to and retention in methadone treatment.

Funding source

There was no external funding received for this study.

Conflict of interests

The authors have no conflict of interest to declare.

Tables and figures

Table 1

Sociodemographic characteristics of the participants at the time of starting methadone treatment

Characteristic	Frequency (n=777)	Percentage (%)
Gender		
Male	721	92.8
Female	56	7.2
Age (years)		
≤20	12	1.5
21-30	333	42.9
31-40	293	37.7
41-50	118	15.2
>50	21	2.7
Educationlevel		
None	15	1.9
Primary	341	43.9
Secondary	348	44.8
Tertiary	73	9.4
Marital status		
Single	272	35.0
Married	163	21.0
Separated/Divorced	327	42.1
Widowed	15	1.9
Housing arrangement		
Living in a rental house	195	25.1
Living with relatives or friends	424	54.5
Living on the street	144	15.3
Occupation		
Business or formal employment	106	13.6
Unemployed	79	10.2
Skilled manual laborer	113	14.5
Unskilled manual laborer	463	59.6
Student	16	2.1

Table 2

Substance Use History at start of treatment based on self-report

Substance used	Frequency	Percentage
Heroin	776	99.1
Alcohol	410	52.8
Cannabis	696	89.6
Cocaine	78	10.0
Nicotine	690	88.8
Benzodiazepines	424	54.6
Khat	334	43.0
Amphetamines	22	2.8
Barbiturates	44	5.7
Glue	56	7.2
Other drugs	4	0.5
Withdrawal Symptoms (COWS Score)		
<=10	628	80.8
11-20	121	15.6
21-30	26	3.3
31-40	1	0.1
Not reported	1	0.1
Injection drug use		
Yes	451	58.0
No	326	42
Initial Age of IV Drug Use (N=451)		
<=20	174	38.5
21-30	157	34.8
31-40	22	4.9
41-50	3	0.7
Not reported	95	21.1
Number of substances used		
1	9	1.3
2	42	6.1
3	141	20.4
4	143	20.7
5	144	20.8
>5	212	30.7

Table 3

Summary of the age of onset of each substance used

	Mean age	Minimum age	Maximum age	Total	%
Cannabis	17.54	5	45	696	89.6
Benzodiazepines	23.17	5	51	424	54.6
Alcohol	19.02	6	48	410	52.8
Khat	19.51	6	47	334	43.0
Heroin	21.86	7	50	776	99.9
Nicotine	18.41	7	40	690	88.8
Cocaine	23.04	10	45	78	10.0

Table 4

Current substance use based on latest toxicology screen report N=691

	Yes, N (%)	No, N(%)
Cannabis	458 (66.3)	233 (33.7)
Opiates	230 (33.2)	461 (66.7)
Benzodiazepines	98 (14.2)	593 (85.8)
Phencyclidine	4 (0.5)	687 (99.5)
Barbiturates	1 (0.1)	690 (99.9)

Table 5

Summary of mental health symptoms and social history of participants

Variable	Number	Percentage
Depression	38	4.9
Anxiety	25	3.2
Suicidal thoughts	74	9.5
Violent behavior	133	17.1
Currently on treatment for comorbid psychiatry disorder	54	6.9
Physical abuse	402	51.7
Sexual abuse	16	2.1
Emotional abuse	428	55.1
Inpatient treatment attendance	89	11.5
Outpatient treatment attendance	727	93.6
Partner abusing substances	44	3.1
Partner in recovery	17	2.2
Parents using substances	10	1.3
Other family members using substances	62	8.0
History of incarceration	443	57.0
Grew up without one or both parent	321	41.3

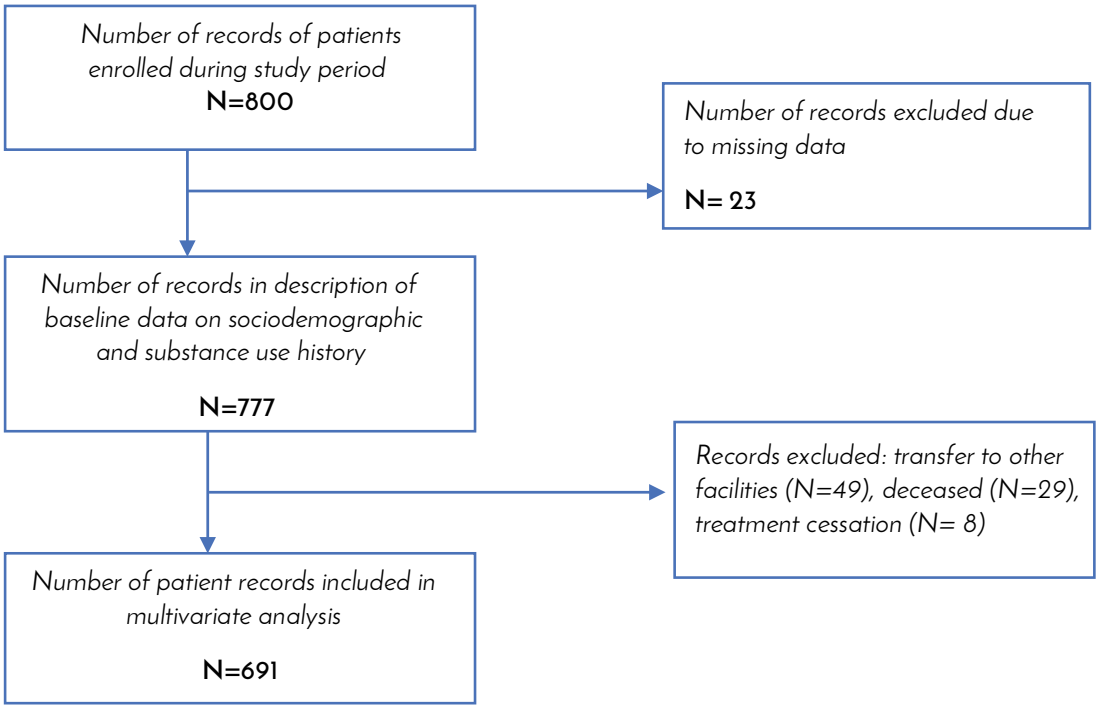
Table 6

Factors associated with retention in treatment on multivariate analysis

	n	Not active, *n=318 (%)*	Active, *n=373 (%)*	OR (95% CI)	p-value
Sociodemographic factors					
Sex					
Male	647	300 (94.3)	347 (93.0)	1.2 (0.7 – 2.3)	0.483
Female	44	18 (5.7)	26 (7.0)	Reference	
Age					
≤20	12	6 (1.9)	6 (1.6)	Reference	
21-30	299	131 (41.2)	168 (45.0)	0.8 (0.2 – 2.5)	0.673
31-40	264	133 (41.8)	131 (35.1)	1.0 (0.3 – 3.2)	0.980
41-50	99	41 (12.9)	58 (15.5)	0.7 (0.2 – 2.3)	0.571
>50	17	7 (2.2)	10 (2.7)	0.7 (0.2 – 3.1)	0.638
Education					
None	12	5 (1.6)	7 (1.9)	Reference	
Primary	302	138 (43.4)	164 (44.0)	1.2 (0.4 – 3.8)	0.784
Secondary	312	142 (44.7)	170 (45.6)	1.2 (0.4 – 3.8)	0.793
Tertiary	65	33 (10.4)	32 (8.6)	1.4 (0.4 – 5.0)	0.564
Marital status					
Single	237	112 (35.2)	125 (33.5)	Reference	
Married	147	62 (19.5)	85 (22.8)	0.8 (0.5 – 1.2)	0.331
Separated/Divorced	294	139 (43.7)	155 (41.6)	1.0 (0.7 – 1.4)	0.996
Widowed	13	5 (1.6)	8 (2.1)	0.7 (0.2 – 2.2)	0.538
Housing arrangement					
Rented house	181	83 (27)	98 (26.3)	Reference	
Family house	342	158 (51.5)	184 (49.5)	1.0 (0.7 – 1.5)	0.940
Streets/Unstable	125	54 (17.6)	71 (19.1)	0.9 (0.6 – 1.4)	0.646
Friend's house	31	12 (3.8)	19 (5.1)	0.7 (0.3 – 1.6)	0.461
Occupation					
Business	65	36 (11.3)	29 (7.8)	Reference	
Formal employment	21	9 (2.8)	12 (3.2)	0.6 (0.2 – 1.6)	0.320
Unemployed	69	32 (10.1)	37 (9.9)	0.7 (0.4 – 1.4)	0.298
Skilled manual	101	57 (17.9)	44 (11.8)	1.0 (0.6 – 2.0)	0.894
Unskilled manual	419	175 (55.0)	244 (65.4)	0.6 (0.3 – 0.9)	0.041
Student	16	9 (2.8)	7 (1.9)	1.0 (0.3 – 3.1)	0.950
Clinical and social profile factors					
Duration of treatment, ***mean (SD)***		13.3 (10.4)	30.2 (6.6)	0.8 (0.7 – 0.9)	<0.001
Attended inpatient treatment	67	38 (11.9)	29 (7.8)	1.6 (0.9 – 2.7)	0.064
Attended outpatient treatment	647	290 (91.2)	357 (95.7)	0.5 (0.2 – 0.9)	0.023
Psychiatry diagnosis	46	20 (6.3)	26 (7.0)	0.9 (0.5 – 1.6)	0.720

Grew up with one/ no parent	353	155 (53.6)	198 (57.7)	0.8 (0.6 – 1.2)	0.302
Physical abuse	356	155 (48.7)	201 (53.9)	0.8 (0.6 – 1.1)	0.178
Sexual abuse	14	8 (2.5)	6 (1.6)	1.6 (0.5 – 4.6)	0.399
Emotional abuse	374	162 (50.9)	212 (56.8)	0.8 (0.6 – 1.1)	0.121
Substance use-related factors					
Injecting drug use at baseline	398	183(57.5)	215(57.6)	1.0 (0.7 – 1.3)	0.980
Current cannabis use	458	177 (55.7)	281 (75.3)	0.6 (0.4 – 0.8)	0.003
Current opioids use	230	118 (37.1)	112 (30.0)	1.9 (1.3 – 2.6)	<0.001
Current benzodiazepine use	98	51 (16.0)	47 (12.6)	1.4 (0.9 – 2.2)	0.105
Number of substances at baseline					
1	9	3 (0.9)	6 (1.6)	Reference	
2	42	19 (6)	23 (6.2)	1.7 (0.4 – 7.5)	0.515
3	141	57 (17.9)	84 (22.5)	1.4 (0.3 – 5.6)	0.675
4	143	64 (20.1)	79 (21.2)	1.6 (0.4 – 6.7)	0.507
5	144	73 (23.0)	71 (19.0)	2.1 (0.5 – 8.5)	0.321
>5	212	102 (32.1)	110 (29.5)	1.9 (0.5 – 7.6)	0.391

Figure 1



Flow chart showing the excluded records and sample size used in the analysis

References

Afuseh, E., Pike, C. A., & Oruche, U. M. (2020). Individualized approach to primary prevention of substance use disorder : age- related risks. *Substance Abuse Treatment, Prevention and Policy*.7, 1–8.

Akiyama, M. J., Cleland, C. M., Lizcano, J. A., Cherutich, P., & Kurth, A. E. (2019). Prevalence, estimated incidence, risk behaviours, and genotypic distribution of hepatitis C virus among people who inject drugs accessing harm-reduction services in Kenya: a retrospective cohort study. *Lancet Infectious Diseases*, *19*(11), 1255–1263. https://doi.org/10.1016/S1473-3099(19)30264-6

Ayanga, D., Shorter, D., & Kosten, T. R. (2016). Update on pharmacotherapy for treatment of opioid use disorder. *Expert Opinion on Pharmacotherapy*, *17*(17), 2307–2318. https://doi.org/10.1080/14656566.2016.1244529

Ayon, S., Jeneby, F., Hamid, F., Badhrus, A., Abdulrahman, T., & Mburu, G. (2019). Developing integrated community-based HIV prevention, harm reduction, and sexual and reproductive health services for women who inject drugs. *Reproductive Health*, *16*(1), N.PAG-N.PAG. https://doi.org/10.1186/s12978-019-0711-z

Bawor, M., Dennis, B. B., Varenbut, M., Daiter, J., Marsh, D. C., Plater, C., Worster, A., Steiner, M., Anglin, R., Pare, G., Desai, D., Thabane, L., & Samaan, Z. (2015). Sex differences in substance use, health, and social functioning among opioid users receiving methadone treatment: A multicenter cohort study. *Biology of Sex Differences*, *6*(1), 1–11. https://doi.org/10.1186/s13293-015-0038-6

Carlsen, S. L., & Lunde, L. (2020). *Opioid and Polydrug Use Among Patients in Opioid Maintenance Treatment*. 9–18.

Compton, W.M., Jones, C.M., Baldwin, G.T., Harding, F.M., Blanco, C., Wargo, E.M.

(2019). Targeting Youth to Prevent Later Substance Use Disorder: An Underutilized Response to the US Opioid Crisis. *AJPH,*: Supplement 3 Vol 109, No. S3

Cox, J., Allard, R., Maurais, E., Haley, N., & Small, C. (2013). Predictors of methadone program non-retention for opioid analgesic dependent patients. *Journal of Substance Abuse Treatment*, *44*(1), 52–60. https://doi.org/10.1016/j.jsat.2012.03.002

Degenhardt, L., Grebely, J., Stone, J., Hickman, M., Vickerman, P., Marshall, B. D. L., Bruneau, J., Altice, F. L., Henderson, G., Rahimi-movaghar, A., & Larney, S. (2019). Series Drug Use 1 Global patterns of opioid use and dependence : harms to populations , interventions , and future action. *The Lancet*, *394*(10208), 1560–1579. https://doi.org/10.1016/S0140-6736(19)32229-9

Fathollahi, M.S.,Torkashvand,F., Najmeddin, H. and Rezaeian, M. (2016). Predictors of One-Year Retention in Methadone Maintenance Treatment (MMT) in Iran, Rafsanjan. *International Journal of High-Risk Behaviors*. 5 (3);

Feelemyer, J. P., Jarlais, D. C. Des, Arasteh, K., Phillips, B. W., & Hagan, H.(2014). Retention of participants in medication-assisted programs in low- and middle-income countries: an international systematic review. *Addiction, 109* (1)20-32

Franklyn, A. M., Eibl, J. K., Gauthier, G. J., & Marsh, D. C. (2017). The impact of cannabis use on patients enrolled in opioid agonist therapy in Ontario, Canada. *PLoS ONE*, *12*(11), 1–11. https://doi.org/10.1371/journal.pone.0187633

Fu Lee, J., Mao Lo, S., Hsuan Chang, Y., Chang, Y. C., Yu Lee, S., & Band Lu, R. (2017). Factors associated with retention in a methadone maintenance treatment program in heroin-dependent Han Chinese in Taiwan. *Neuropsychiatry*, *07*(03), 204–211. https://doi.org/10.4172/neuropsychiatry.1000199

Gloeck, N. R., Harris, B. N., Webb, E. M., & Scheibe, A. (2020). Factors predicting 6-month retention among people with opioid use disorders accessing outpatient methadone maintenance therapy in Tshwane, South Africa. *South African Medical Journal*, *111*(1), 68–73. https://doi.org/10.7196/SAMJ.2020.V111I1.14884

Grønnestad,T.E., & Sagvaag, H. (2016). Stuck in limbo: illicit drug users' experiences with opioid maintenance treatment and the relation to recovery. *International Journal of Qualitative Studies on Health and Well-being*; 11: 31992 - http://dx.doi.org/10.3402/qhw.v11.31992

Guarino, H., Mateu-Gelabert, P., Quinn, K., Sirikantraporn, S., Ruggles, K.V., Syckes C, et al. (2021). Adverse Childhood Experiences Predict Early Initiation of Opioid Use Behaviors. *Front. Sociol.*; 6:620395. doi: 10.3389/fsoc.2021.620395

Guise, A., Ndimbii, J., Igonya, E. K., Owiti, F., Strathdee, S. A., & Rhodes, T. (2019). Integrated and differentiated methadone and HIV care for people who use drugs: A qualitative study in Kenya with implications for implementation science. *Health Policy and Planning*, *34*(2), 110–119. https://doi.org/10.1093/heapol/czz002

Hadland, S. E., Bagley, S. M., Rodean, J., Silverstein, M., Levy, S., Larochelle, M. R., Samet, J. H., & Zima, B. T. (2018). Receipt of Timely Addiction Treatment and Association of Early Medication Treatment With Retention in Care Among Youths With Opioid Use Disorder. *JAMA Paediatr.*172(11)1029–1037. https://doi.org/10.1001/jamapediatrics.2018.2143

Hawk, K. F., Vaca, F. E., & D'Onofrio, G. (2015). Reducing fatal opioid overdose: Prevention, treatment and harm reduction strategies. *Yale Journal of Biology and Medicine*, *88*(3), 235–245.

Kamanderi, M., Muteti, J., Okioma, V., Kimani, S., Kanana, F., Kahiu, C., (2019a). Status of drugs and substance Abuse among the general population in Kenya. African Journal of Alcohol and Drug Abuse. Edition 1, 54-59.

Kamenderi, M., Muteti, J., Okioma,V., Nyamongo, I., Kimani, S., Kanana, F., & Kahiu, C. (2019b).Status of Drugs and Substance Use among Secondary School Students in Kenya. African Journal of Alcohol and Drug Abuse. Edition 1, 1-7.

Kiburi, S.K., Molebatsi, K., Obondo, A., Kuria, M.W. (2018). Adverse childhood experiences among patients with substance use disorders at a referral psychiatric hospital in Kenya. *BMC Psychiatry*;18(1):1–12.

Kidorf, M., Disney, E. R., King, V. L., Neufeld, K., Beilenson, P. L., & Brooner, R. K. (2004). Prevalence of psychiatric and substance use disorders in opioid abusers in a community syringe exchange program. *Drug and Alcohol Dependence*, *74*, 115–122. https://doi.org/10.1016/j.drugalcdep.2003.11.014

Klimas, J., Fairgrieve, C., Tobin, H., Ca, F., Csm, O. G., Lg, G., Keenan, E., Saunders, J.,

Dunne, C., Cullen, W.(2018). Factors associated

with discontinuation of methadone maintenance therapy (MMT) among persons who use alcohol in Vancouver, Canada.

Drug Alcohol Depend.; 186: 182–186. doi: 10.1016/j.drugalcdep.2018.01.027. https://doi.org/10.1002/14651858.CD009269.pub4.www.cochranelibrary.com

Kurth, A. E., Cherutich, P., Conover, R., Chhun, N., Bruce, R. D., & Lambdin, B. H. (2018). The Opioid Epidemic in Africa And Its Impact. *Current Addiction Reports*, 5(4), 428–453. https://doi.org/10.1007/s40429-018-0232-9

Lake, S., & St. Pierre, M. (2020). The relationship between cannabis use and patient outcomes in medication-based treatment of opioid use disorder: A systematic review. *Clinical Psychology Review*, *82*, 101939.https://doi.org/10.1016/j.cpr.2020.101939

Lambdin, B. H., Masao, F., Chang, O., Kaduri, P., Mbwambo, J., Magimba, A., Sabuni, N., & Bruce, R. D. (2014). Methadone treatment for HIV prevention-Feasibility, retention, and predictors of attrition in Dar es Salaam, Tanzania: A Retrospective cohort study. *Clinical Infectious Diseases*, *59*(5), 735–742. https://doi.org/10.1093/cid/ciu382

Lelei, K., Muteti, J., Okioma, V., Njenga, A. (2020). Policy brief on status of drugs and substance abuse among primary school pupils in Kenya. *African Journal of Alcohol and Drug Abuse,* 3, 26-29.

McBrien, H., Luo,C., Sanger, N., Zielinski, L., Bhatt, M., Zhu, XM., Marsh, DC., Thabane,

L., Samaan, Z. (2019). Cannabis use during methadone maintenance treatment for opioid use disorder: a systematic review and meta-analysis. *CMAJ Open,* 7(4), e655-673

McHugh, R. K., Votaw, V. R., Sugarman, D. E., & Greenfield, S. F. (2018). Sex and gender differences in substance use disorders. *Clinical Psychology Review*, *66*, 12–23. https://doi.org/10.1016/j.cpr.2017.10.012

Morgan, N., Daniels, W., & Subramaney, U. (2019). A prospective observational study of heroin users in Johannesburg, South Africa : Assessing psychiatric co-morbidities and treatment outcomes. *Comprehensive Psychiatry*, *95*, 152137 https://doi.org/10.1016/j.comppsych.2019.152137

National Authority for the Campaign Against Alcohol and Drug Abuse, (2021a) *National Guidelines on Alcohol and Drug Use Prevention* . https://nacada.go.ke/sites/default/files/2021-07/National Guidelines on Drug Use Prevention 2021.pdf

National Authority for the Campaign Against alcohol and Drug Abuse, (2021b) *National Guidelines for Alcohol and Substance Use Prevention and Management in Basic Education Institutions.* https://nacada.go.ke/sites/default/files/2021-07/National Guidelines for Alcohol and Substance Use Prevention and Management in Basic Education Institutions 2021.pdf

O'Connor, AM., Cousins, G., Durand, L., Barry, J., Boland, F. (2020). Retention of patients in opioid substitution treatment: A systematic review. *PLoS One*. 14;15(5):e0232086. doi: 10.1371/journal.pone.0232086. PMID: 32407321; PMCID: PMC7224511.

Pettersen, H., Landheim, A., Skeie, I., Biong, S., Brodahl, M., Benson, V., & Davidson, L. (2018). Why Do Those With Long-Term Substance Use Disorders Stop Abusing Substances ? A Qualitative Study. https://doi.org/10.1177/1178221817752678

Pettersen, H., Landheim, A., Skeie, I., Biong, S., Brodahl, M., Oute, J., & Davidson, L. (2019). How Social Relationships Influence Substance Use Disorder Recovery : A Collaborative Narrative Study. https://doi.org/10.1177/1178221819833379

Rhodes, T., Guise, A., Ndimbii, J., Strathdee, S., Ngugi, E., Platt, L., Kurth, A., Cleland, C., & Vickerman, P. (2015). Is the promise of methadone Kenya's solution to managing HIV and addiction? A mixed-method mathematical modelling and qualitative study. *BMJ OPEN*, *5*(3). https://doi.org/10.1136/bmjopen-2014-007198

Rice, D., Corace, K., Wolfe, D., Esmaeilisaraji, L., Michaud, A., Grima, A., ... & Hutton, B. (2020). Evaluating comparative effectiveness of psychosocial interventions adjunctive to opioid agonist therapy for opioid use disorder: A systematic review with network meta-analyses. *PloS one*, *15*(12), e0244401.

Rizk, M. M., Herzog, S., Dugad, S., & Stanley, B. (2021). Suicide Risk and Addiction: The Impact of Alcohol and Opioid Use Disorders. *Current addiction reports*, 1–14. https://doi.org/10.1007/s40429-021-00361-z

Rosic, T., Kapoor, R., Panesar, B., Naji, L., Chai, D. B., Sanger, N., Marsh, D. C., Worster, A., Thabane, L., & Samaan, Z. (2021). The association between cannabis use and outcome in pharmacological treatment for opioid use disorder. *Harm Reduction Journal*, *18*(1), 1–9. https://doi.org/10.1186/s12954-021-00468-6

Scavone, J. L., Sterling, R. C., Weinstein, S. P., & Van Bockstaele, E. J. (2013). Impact of cannabis use during stabilization on methadone maintenance treatment. *American Journal on Addictions*, *22*(4), 344–351. https://doi.org/10.1111/j.1521-0391.2013.12044.x

Scheibe, A., Shelly, S., Gerardy, T., Homeyer, Z. Von, Schneider, A., Padayachee, K., Naidoo, S. B., Mtshweni, K., Matau, A., Hausler, H., & Marks, M. (2020). Six - month retention and changes in quality of life and substance use from a low - threshold methadone maintenance therapy programme in Durban , South Africa. *Addiction Science & Clinical Practice*, 1–11. https://doi.org/10.1186/s13722-020-00186-7

Shams, I., Sanger, N., Bhatt, M., Rosic, T., Luo, C., Shahid, H., Mouravska, N., Tam, S. L., Hillmer, A., Chawar, C., D'Elia, A., Hudson, J., Marsh, D., Thabane, L., & Samaan, Z. (2019). The association between health conditions and cannabis use in patients with opioid use disorder receiving methadone maintenance treatment. *BJPsych Open*, *5*(6), 1–8. https://doi.org/10.1192/bjo.2019.78

Simpson, D. D.(2004). A conceptual framework for drug treatment process and outcomes. *J Subst Abuse Treat.* 27(2), 99-121 https://doi.org/10.1016/j.jsat.2004.06.001

Socías, M. E., Wood, E., Lake, S., Nolan, S., Fairbairn, N., Hayashi, K., Shulha, H. P., Liu, S., Kerr, T., & Milloy, M. J. (2018). High-intensity cannabis use is associated with retention in opioid agonist treatment: a longitudinal analysis. *Addiction*, *113*(12), 2250–2258. https://doi.org/10.1111/add.14398

Thomas, F. K., Melinda, C., Jinhee, L., Mitra, A., & Robert, L. (2015). Reducing Mortality of People Who Use Opioids through Medication Assisted Treatment for Opioid Dependence. *Journal of HIV and Retro Virus, 1*(5), 1-5.

Tuchman, E. (2010). Women and addiction: The importance of gender issues in substance abuse research. *Journal of Addictive*

Diseases, 29(2), 127–138. https://doi.org/10.1080/10550881003684582

United Nations Office on Drug and Crime (UNODC), (2020). World Drug Report 2020: Drug use and health consequences. *United Nations publication. https://wdr.unodc.org/wdr2020/index2020.html*

United Nations Office on Drug and Crime (UNODC), (2021). World Drug Report 2021: Drug use and health consequences. *United Nations publication. https://www.unodc.org/unodc/en/data-and-analysis/wdr2021.html*

Yang, M., Liao, Y., Wang, Q., Chawarski, M. C., Hao, W. (2015). Profiles of psychiatric disorders among heroin dependent individuals in Changsha, China. *Drug Alcohol Depend*, 149, 272–279. https://doi.org/10.1016/j.drugalcdep.2015.01.028.Profiles

Zerden, L. D. S., Guan, T., Lombardi, B. M., Sharma, A., & Garcia-Rico, Y. (2020). Psychosocial interventions in office-based opioid treatment: A systematic review. *Journal of the Society for Social Work and Research,* 11(1), 103-131.

Zielinski, L., Bhatt, M., Sanger, N., Plater, C., Worster, A., Varenbut, M., Daiter, J., Pare, G., Marsh, D. C., Desai, D., MacKillop, J., Steiner, M., McDermid Vaz, S., Thabane, L., & Samaan, Z. (2017). Association between cannabis use and methadone maintenance treatment outcomes: an investigation into sex differences. *Biology of Sex Differences*, *8*(1), 1–10. https://doi.org/10.1186/s13293-017-0130-1

Zippel-schultz, B., Zippel-schultz, B., Specka, M., Cimander, K., Gölz, J., Maryschok, M., Nowak, M., Stöver, H., Helms, T. M., Scherbaum, N., Specka, M., & Cimander, K. (2016). Outcomes of Patients in Long-Term Opioid Maintenance Treatment Outcomes of Patients in Long-Term Opioid Maintenance Treatment. *Substance Use Misuse,* 51(11), 1493-1503 https://doi.org/10.1080/10826084.2016.1188946

Socio-Economic and Health Consequences of Drugs and Substance Use in Gachie, A Peri-Urban Town on the Outskirts of Nairobi

Josephine Nyaga [1*], Mwaura P.[1], Mutundu K.[2], Njeru D.[3], Juma G[4] and Were T.[5]

1* Department of forensic medicine, Mount Kenya University, Kenya

2 Department of Social Sciences, Mount Kenya University, Kenya

3 Department of Pathology, Mount Kenya University, Kenya

4 Department of Biochemistry, University of Nairobi, Kenya

5 Department of Medical Laboratory Science, Masinde Muliro university of Science and Technology, Kenya

***Corresponding Author:**

Josephine Nyaga,

Department of forensic medicine, Mount Kenya University,Kenya

Email Address:Josephine.nyaga@jkuat.ac.ke

Date submitted: 3rd November 2021

Date published: 31st December 2021

Abstract

Drug and substance abuse is a major socio-economic and health problem to the drug users, family and society and is reported to be on a steady global rise. In Kenya, drug abuse is a major societal problem especially in many cosmopolitan cities such as Nairobi and Mombasa and the surrounding immediate environs. The objective of this study was to evaluate the types of drugs, the socio-economic and health consequences of drug abuse among the inhabitants of Gachie Sub-Location, Kiambu County a town within the Nairobi suburbs. A snowballing sampling method was used to recruit a total of 246 study participants aged between 15-65years recruited into the study after consenting and meeting drug and substance use and dependence clinical evaluation according to UNCOPE criteria. Data on the type of drugs abused, socio-economic and health implications of drug use on both drug abusers and the community was captured using a structured questionnaire and the resulting data analysed using SPSS version 21. Over-the counter prescription drugs including, benzodiazepine, Cozepam ("ma-cc"), rohypnol ("ma-blue"), and benzhexol ("ma-white") as well as the traditional heroine were the major abused drugs reported in the study. Approximately 85% of the sampled drug abusers were men abusing mainly the licit over- the counter prescription drugs and heroine as a result of their easy affordability and accessibility. Failed marriages, conflictual family and communal relationships, unemployment, life of destitution and poverty were the main socioeconomic consequences of drug abuse reported in the study, corroborating reports of some previous studies. Participants's self-reported feeling of hyperactiveness and euphoria was the major health consequence repoted. This study thus indicates that drug use is slowly creeping into rural areas in the vicinity of major towns with prescription over the counter drugs taking a centre stage than the traditional hard drugs due to the associated low costs, availability and accessibility and can result in myriad socio-economic consequences in the society. This data provides an insight of the spread of drugs from the traditional cities to the surrounding town environments as these areas provide a safe haven for drug peddlers and thus should be of great focus by drug law enforcers as they strategize and seek to curb drug abuse problem. Future similar studies involving larger area are recommended to acquire more dynamics of this problem.

Keywords: Drug abuse, relationships, Socio-economic, Substance abuse, Poverty

Introduction

Drug and substance abuse is a significant public socio-economic and health concern with almost a

quarter billion of the global population especially the youths reported to be under the influence of alcohol, licit prescription and illicit drugs (Maithya, 2009). Africa is among the leading continents in abuse of psychoactive substances (Odejide, 2006). Substance use generally confers an undesirable bearing on community well-being and social growth and often results to dependency syndrome or addictive behaviour on individual abusers (Jeannin, *et al.,* 2013). The major psychoactive substances currently abused worldwide are the, illicit, and licit prescribed psychoactive medications (Odejide, 2006). Alcohol, tobacco, khat are some of the licit and controlled drugs, while marijuana, hashish, cocaine, opium, inhalants, hallucinogens, heroin are the prohibited drugs (Kassa *et al.,* 2014). Besides, benzodiazepines, opioid analgesics, sedatives, tranquilizers and stimulants are some of the common emerging and abused prescription drugs (Kassa *et al.,* 2014). Sub-Saharan Africa is reported to lead in opiate use with Kenya leading in heroin use in the East African region (Beckerleg *et al.,* 2005; as well as other substances including alcohol tobacco, cannabis and khat. Drug abuse is one of the current top problems confronting country especially among the youth. Incidences of drug and alcohol abuse and related anti-social behaviour have tremendously increased in recent years (Chesang, 2013). The main drug abuse hotspots in Kenya include major cosmopolitan urban cities such as Mombasa and Nairobi although phenomenal rise in drug and substance use has recently been reported in some smaller coastal towns such as Malindi and Lamu and some inland towns such as Nakuru, Kisumu and Kiambu (Gathu, *et al.,* 2013). Several societal and environmental factors such as increased youth population, affluence, and illicit drug trafficking and ready market for the drugs are major contributing factors to the tremendous increase in drug and substance abuse in Kenya. Although, conventional discourses treat drug abuse as an individual problem drug and substance abuse also greatly affect the family as well as the communal socio-economic and wellbeing (Manning *et al.,* 2013). For example, while substance abuse may affect individual's mental and physical functions, drug abuse can also confer major challenges to the criminal justice and health systems as well as the socio-economic aspects at the individual's, family, community and societal levels (Manning *et al.,* 2013). Poverty as demonstrated by among others, lack of basic essential commodities such as food, shelter, clothing and school fees are some of the major economic challenges previously associated with drug abuse (Johnston *et al.,* 2014). Thus, all these highlights the negative consequences of drug and substance abuse as a major global public health and socio-economic concern. Although, previous studies on drug and substance abuse problems have been extensively carried out in Kenya, most have been confined to major urban towns, with the magnitude and the resulting social-economic and health consequences being confirmed in peri-urban outfits otherwise considered as fertile grounds for drug and substance abuse being limited (Gathu *et al.,* 2013). The peri-urban villages are currently considered as major drug abuse hotspots due to population naivety to drugs, easy culpability due to poverty and the existing gaps in criminal justice system (Gathu *et al.,* 2013). Therefore, this paper provides an analysis of the magnitude of the health and socio-economic consequences, of drug abuse in a small peri-urban village in Kiambu on the outskirt of Nairobi.. Kiambu county and more specifically Gachie town has been reported to host many drug abusers (Matimu, 2010). The information obtained from this study will thus provide important data to community service provider, practitioners and policy makers.

Methodology

Study area, design and population

A cross-sectional study targeting persons of both gender aged between 15-65 years who confirmed to be drug users was carried out in Gachie, a peri-urban town of Nairobi in Kiambu County. Gachie town, lies 15km north of Nairobi and is bordered on the north by Karura, north east by Mahindi, east by Kagongo and on the west by Gathiga sub-location of Kiambu county. The objective of the study was to evaluate the types of drugs and determine the socio-economic and health consequences of drug abuse by the inhabitants of Gachie town. The study participants were inhabitants of the area as per their national

identification card documents, and reported to have lived in the area for at least three months and abused drugs and substances for at least one month preceding the study. First acquaintances to the ten initial and potential drug abusers in the community were tracked by the help of healthcare workers in Kihara Sub-county, a level-4 hospital. A purposeful respondent-driven, snowballing sampling method was then used to recruit other and similar study participants using the initial ten recruits. A total of 246 participants determined using Fischer's formula (Fisher, *et al.*, 1998) were thus finally recruited into the study. Excluded from the study were non-consenting individuals, those who failed the drug and substance use and dependence clinical evaluation criteria - UNCOPE (Hoffmann *et al.*, 2003) and those who showed obvious signs of compromised intellectual capability that could interfere with the understanding of the questionnaire. All the participants were appraised of their rights and all questions raised by the prospective participants about the study were explained. Prior to the final enrolment into the study, each recruited participant was subjected to drug and substance use and dependence clinical assessments based on UNCOPE criteria to ascertain their degree of drug and substance indulgence with the data obtained being scored on a scale of 2 or more to indicate any abuse OR dependence, Score of 4 or more to indicate dependence.

Questionnaire

The questionnaire interviews were conducted in Kihara -Subcounty level 4 hospital a public utility facility which is in close proximity and caters for the immediate health needs of the surrounding community. Following an informed consent, each participant completed a questionnaire that had four main sections with semi-structured questions which included demographic information, types of drugs and substances abused, the socio-economic and health consequences of drug use. The questionnaire was interpreted into Kiswahili by a Kiswahili language expert prior to its administration to lessen translational impartiality. In order to test for reliability and validation of the questionnaire tool, the questionnaire was pretested in a pilot study in Rongai an area with a similar population structure as the study area. The collected questionnaires were checked for accuracy and relevancy of the obtained data and categories of responses were identified and classified based on research questions and objectives while the socio-economic and health variables measured included sex, age, individual income and schooling level among many others.

Ethical approval

Ethical approval and research permit for this study were obtained from Ethics Review Committee of Mount Kenya University and the National Commission for Science, Technology & Innovation (NACOSTI) respectively. Drug and substances abusers who reported having abused drugs for at least one month prior to the study and who voluntarily consented and passed the clinical valuations tests were allowed to participate in the study. Each participant was kept anonymous while the information obtained was kept in strict confidence. All study participants benefitted from free well-being lessons on the individual drug abuse corrective and fitness measures, consequences of drug abuse and how to lead a more fruitful life for individual growth. The most severe cases were referred to Mathari mental hospital, a public rehabilitation facility for specialised management and rehabilitation.

Data analysis

We used Braun and Clarke's Thematic Analysis method (2006) to analyse the results of the questionnaire data as guided by the main themes initially recognized in the questionnaire. Similar participant responses were selected and organized according to their covert significance, resemblance and variance while the responses that best exemplified the acknowledged themes were grouped together. Structured questions were analyzed thematically based on the study objectives with the qualitative data being subjected to descriptive statistics whereas quantitative data involving percentages and frequencies were transcribed, entered into Microsoft excel datasheet and analysed using Statistical Package for the Social Sciences (SPSS-Version 21). Chi-square test was used to determine the relationships between independent and

dependent variables and the results considered significant at *p-value* $\leq$ 0.05 (p, $\leq$0.05). Finally, the association between categorical variables were determined using the Pearson Correlation coefficient, (PCC).

Results

Demographic characteristics of the study participants

A total of 246 drug and substance abuse participants were recruited in the study with males comprising the majority (85%). The youth and the middle-aged adults aged between 24-41 years contributed the highest percentage (71 %) of drug users, while the rest 29% were either in a much younger age bracket or above 42 years old. Although almost all participants (94%) had some form of formal education, (65%) had not acquired post primary level education with only few (35%) having gone beyond the lowest formal schooling level and barely (3%) having attained tertiary level education. Socio-economically, while only 28% of the drug addicts were engaged in some form of income generating activities such as employment or business, majority (72%) of the participants were either students or unemployed. For sustenance of drug dependence habits, 69 % of the participants engaged in activities including menial work and businesses while 31% supplemented their income with some non-conventional means of revenue generation such as stealing, prostitution, selling of drugs and misappropriation of school fees for student participants. Most of the participants (78%) who abused drugs were found to be in a single marriage union, having been separated, divorced, widowed or by choice as compared to few (22%) who were in satble marital unions. (Table 1.1).

Table 1.1: Socio-demographic characteristics and economic activities of the study participants (n=246)

Socio-demographic characteristics	*Occurrence, n*	*Proportion (%)*
Age(years)		
15-23	45	18.3
24-32	94	38.2
33-41	81	32.9
>42	26	10.5
Gender		
Male	209	85.0
Female	37	15.0
Marital status		
Married	54	22.0
Single	99	40.2
Separated	53	21.5
Divorced	36	14.6
Widowed	4	1.6
Education level		
Tertiary	7	2.8
Secondary	79	32.1
Primary	154	62.6
None	6	2.4
Employment status		
On employment	24	9.8
On business	45	18.3
Not employed	177	72
Source of income		
Menial jobs	113	45.9
Stealing	74	31
Business	51	20.7
Salaried	8	3.3
TOTAL	246	100

Presented are the number (n) and proportion (%) of participants in the study.

Types of drugs and substances abused by the study participants

Few illegal and some legal prescription drugs were abused by the study participants. Heroin ("kete") and cocaine ("cocoa") were the two illegal drugs reportedly abused by the study participants. Whereas, 40 % of the participants abused heroin, a paltry 0.4% abused cocaine. Besides, drugs including benzodiazepine, Cozepam ("ma-cc"), rohypnol ("ma-blue"), and benzhexol ("ma-white") a tremor and rigidity controller drug were the three main legal prescription drugs extensively abused by the study participants. Cozepam was abused by 18%, benzhexol by 13% while rohypnol was abused by 8 % of the participants. Other drugs including *Cannabis sativa* ("bhang") and Khat, ("miraa") an herb grown widely especially in the eastern part of Kenya was used by 12% and 4% respectively. Inhalants including wood glue and jet fuel were sniffed by 2 % and 1 % respectively of the participants, especially by street children and teenagers. Most of these drugs were used either singularly or in combination and were disguised using non-conventional annotation to avoid scrutiny from unsuspecting public and the law enforcers.

Drug abuse and the socio-economic consequences

In this study, many participants, reported conflictual family relationships (42%), failed marriages (32 %), communal isolation or social marginalisation (26 %) as a result of drug and substance use. An association existed between age of the participants and the drug abuse and some of the social consequences of drug abuse such as adverse family relationships, poor marital unions and poor education backgrounds. Many of the youth and middle-aged participants with less than thirty years of age reported to experience adverse family relationships while those above thirty years had unsustainable matrimonies (PCC, $x^2 = 22.294$, $df = 2$, $p = 0.0001$) as was the majority of those who lived in singlehood living arrangement including the widowed, divorced or separated drug abusers. Besides, all drug abusers whether single or married had significant adverse family relationships (PCC, $x^2 = 68.986$, $df = 4$, $p = 0.0001$) which was entirely blamed on drug abuse. Besides, the majority of participants with higher educational backgrounds of at least secondary level and above had stable marriages compared to those of lower levels who experienced both unstable marriages and had conflictual family relationships (PCC, $x^2 = 6.404$, $df = 2$, $p = 0.041$). Nevertheless, there was no significant

association between gender, occupation or individual's revenue with the adverse social consequences of drug abuse. (Table 1.2).

Table 1.2: Associations between demographic characteristics and social consequences of drug abuse in the study participants

Demographic characteristics	Unproductive marriages No.(%)	Societal rejection No.(%)	Bad family relationships No.(%)	x^2	*Df*	*p.*
Age:						
<30 years	28(35)	39(61)	72(70)	22.29[a]	2	0.0001
>30 years	51(65)	25(39)	31(30)			
Gender:						
Female	14(18)	9(14)	14(14)	0.66[a]	2	0.718
Male	65(82)	55(86)	89(85)			
Marital status:						
Not Married	56(71)	18(28)	19(18)			
Single	5(6)	32(50)	62(60)			
Married	18(23)	14(22)	22(21)	68.99[a]	4	0.0001
Education:						
≤Primary	60(76)	40(63)	60(58)	6.40[a]	2	0.041
≥Secondary	19(24)	24(38)	43(42)			
Occupation:						
Unstable[b]	51(65)	49(77)	77(75)	3.22[a]	2	0.200
Stable[c]	28(35)	15(23)	26(25)			
Income:						
Informal[d]	26(33)	20(31)	26(25)			
Business	13(17)	7(11)	21(20)	3.47[a]	4	0.482
Formal[e]	40(51)	37(58)	56(54)			

Demographic characteristics with superscript letters are used to define participants in each category: Unstable[b] occupation-unemployed, student; Stable[c] occupation-business, employed, peddlers; Informal[d] income-prostitution, drug peddling, selling of personal properties, stealing; Formal[e] income-salary, wage, student, menial work

Lack of basic life support essentials was the major adverse economic consequence reported with more than half (57%) of the participants reporting to live without basic life amenities while 29% were perpetually indebted. Job loss was a consequence suffered by 12% as a result of job dismissals due to absenteeism, violence at work place or working under the influence of drug and substances. A smaller proportion (2%) of the participants reported to engage themselves as street drug peddlers to economically sustain their living.

A significant negative relationship existed between the level of participants' educational and the economic status. Lack of basic social life support amenities was experienced by most of the participants across educational divide (PCC, $x^2 = 8.885$, $df = 2$, $p = 0.012$). Similarly, majority of the participants with unstable occupation experienced lack of these basic social amenities while those in stable occupation reported lack of basic amenities and indebtedness (PCC, $x^2 = 9.550^a$, $df = 2$, $p = 0.008$). However, there was no significant relationship between age, gender, marital status and individual's income with any of the economic consequences identified. (Table 1.3).

Table 1.3: Association between demographic characteristics and economic consequences of drug abuse on the study participants

Demographic characteristics	Indebted No.(%)	Job loss No.(%)	Poverty No.(%)	x^2	*Df*	*P*
Age						
<30 years	42(58)	21(72)	76(54)			
				3.41[a]	2	0.182
>30 years	30(42)	8(28)	65(46)			
Gender						
Female	9(13)	4(14)	23(16)			
				0.58[a]	2	0.749
Male	63(88)	25(86)	118(84)			
Marital status:						
Not Married	24(33)	8(28)	57(40)			
Single	35(49)	13(45)	51(36)			
				4.36[a]	4	0.360
Married	13(18)	8(28)	33(23)			
Education:						
≤Primary	38(53)	18(62)	103(73)			
				8.89[a]	2	0.012
≥Secondary	34(47)	11(38)	38(27)			
Occupation:						
Unstable[b]	43(60)	22(76)	112(79)			
				9.55[a]	2	0.008
Stable[c]	29(40)	7(24)	29(21)			
Income:						
Informal[d]	15(21)	10(35)	43(31)			
Business	18(25)	4(14)	19(14)	6.08[a]	4	0.193
Formal[e]	39(54)	15(52)	79(56)			

Demographic characteristics with superscript letters are used to define participants in each category:: Unstable[b] occupation-unemployed, student; Stable[c] occupation- business, employed; Informal[d] income- prostitution, drug peddling, selling of personal properties, stealing; Formal[e] income- salary, wage, student, menial jobs.

Associations between demographic characteristics and health consequences of drug abuse on the study participants

From the study, the age of drug users and some health consequences as self-reported by the study participants were positively correlated. Participants self-assessed feeling of hyper activeness upon drug intake was the major health consequence reported by all study participants (PCC, x^2 =20.79[a], df= 2, p =0.0001) and whether not or in marital unions (PCC, x^2 = 15.53, df= 4, p = 0.004). However, occupation, gender, income and educational status of the study participants were not significantly associated with the self-reported health consequences of drug abuse ($p \leq 0.05$) (Table, 1.4).

Table 1.4: Demographic characteristics and health consequences of drug abuse on the study participants

Demographic Characteristics	Hypoactivity No. (%)	Hyperactivity No. (%)	Poor health No. (%)	x^2	df	P
Age:						
<30 years	33(67)	102(61)	4(13)	20.790[a]	2	0.0001
>30 years	15(31)	64(39)	28(88)			
Gender						
Female	8(17)	26(16)	3(9)	0.953[a]	2	0.621
Male	40(83)	140(84)	29(91)			
Marital status:						
Not Married	12(25)	60(36)	21(66)			
Single	26(54)	67(40)	6(19)	15.531[a]	4	0.004
Married	10(21)	39(24)	5(16)			
Education						
≤Primary	34(71)	102(61)	24(75)	3.048[a]	2	0.218
≥Secondary	14(29)	64(39)	8(25)			
Occupation						
Unstable[b]	39(81)	113(68)	25(78)	3.899[a]	2	0.142
Stable[c]	9(19)	53(32)	7(22)			
Income						
Informal[d]	16(33)	52(31)	4(13)			
Business	7(15)	30(18)	4(13)	7.237[a]	4	0.124
Formal[e]	25(52)	84(51)	24(75)			

Demographic characteristics with superscript letters are used to define participants in each category:: Unstable[b] occupation-unemployed, student; Stable[c] occupation- business, employed; Informal[d] income-prostitution, drug peddling, selling of personal properties, stealing; Formal[e] income- alary, wage, student, menial jobs.

Discussion

Drug and substance abuse is a serious worldwide problem that affects several aspects of individual's health and the socioeconomic wellbeing (Raketic et al., 2017) as well as significantly impacting negatively either directly or indirectly on the family and the society (Jakovljevic *et al.,* 2015). The present study explored the socio-economic and health consequences of drug abuse among the inhabitants of a peri-urban community in the outskirt of Nairobi. Previously, a number of both illicit and licit drugs including heroin, cocaine (crack), hashish, marijuana, inhalants, hallucinogens, alcohol, tobacco and legal prescription type of drugs were reported as the major drugs abused globally (Gathu, *et al.,* 2013). Two illegal drugs; heroin and cocaine were reportedly abused by the study participants in this study due to its accessability and affordability. This clearly corroborated previous findings which indicated that heroin is the most abundant, readily available and widely distributed illicit drug in East Africa (Beckerleg *et al.,* 2005). In suburban and rural areas, heroin is more prevalent compared to other illegal drugs due to its affordability and accessibility (Evans-Brown *et al.,* 2011). Besides cocaine and its derivatives (crack) were minimally abused in this study. This is clearly associated to its high costs (Connock *et al.*, 2007) and thus it is not easily available to the drug abusers. Moreover, a substantial number of participants (38%) abused the alternative over-the counter prescription opioids such as cozepam, benzhexnol and rohypnol. The misuse of the alternative over the counter prescription drugs by a substantial number of participants in this study may be attributed to the comparative scarcity of illicit opioids in our study area as a result of the associated high costs beyond reach of poor rural drug abusers as well as strict and firm surveillance by law enforcers. Prescription drugs are licit, highly accessible, affordable and safe thus provide legalized substitutes for the much more expensive illegal opioids in most peri-urban settings (Sairam & Manchikantl, 2014). For, instance some prescription opioids and benzodiazepines are generally prescribed as pain and tension relievers especially in the elderly (Hawkins *et al.,* 2015) and are thus readily accessible in rural settings especially to the youths inclined to cope with boredom (Adlaf & Smart, 1995). Moreover, the current data and as previously reported, (NACADA, 2014), hard drugs such as heroin and cocaine which were previously considered to be limited to major cities as well as legal prescription drugs are slowly but steadily creeping into peri-urban villages further exacerbating drug abuse problems in the society.

An association between demographic, socio-economic and health consequences that correlate to drug and substance abuse in the peri-urban communities have been extensively reported (Van *et al.*, 2011; Goodman & Huang, 2002; Gathu *et al.*, 2013). While drug abuse problem in this study was widespread across all the age groups, being male with less education, living in singlehood arrangement and being unemployed had greater odds of drugs and substances abuse. This clearly indicated that demographic and socioeconomic characteristics of the participants significantly affected the abuse of psychoactive substances. Males were more inclined to abuse drugs compared to their female counterparts consistent with most of the previous study findings where males have grater odds of drugs and substance abuse than females (Briggs *et al.*, 2011; Cummings *et al.,* 2014; Nogueira *et al.*, 2013; Outlaw *et al.*, 2012, Li & Caltabiano, 2017). This can be partially explained by the fact that females generally possess an internalized form of repression that conceptualises women drug abusers as societal failures bound to threaten the traditional feminine upbringing (Galvao, 2018). These traditional gender norms and the associated stigma, have thus led women to self-marginalize or isolate themselves as regards to use of drugs and substances explaining the low number of female drug abusers reported in this study. Besides, contrary to most studies and public perception that opine that substance abuse is mainly confined to the youths (Goodman & Huang, 2002; Patrick *et al.,* 2012; Malta *et al.,* 2014), the present study indicated that drug and substance abuse problem is unlimited to a specific age group but cuts across all ages consistent with the findings of (Li &Caltabiano, 2017). Drug abuse in peri- urban settings generally starts at a very tender age (Jeannin *et*

al., 2013) as a result of social, educational and economic background disadvantages as well as other life stressors and continues to adulthood often resulting into addiction. This partly explains the prevalence of drug abuse problem across the participants age groups studied. Adverse family relationship was the most consistent and common social effect experienced across all age groups with all participants experiencing conflictual family relationships while those with the age of 30 years and above in addition, experienced unstable marriages. Adverse family relationships have been attributed to the drug abusers instigated frequent chaos and domestic violence due to abusers perceived frustrations, stigmatization, suffering and neglect which often results into strained family relationships. However, as a result of the physical and psychological suffering inflicted, families often retaliate as a form of payback to the drug and substance abusers (Paula *et al.,* 2014; Smith & Estefan, 2014).

As regards to living arrangements, participants who were in singlehood life arrangements, reported to be hooked on drug and substance abuse than those in marital unions though the difference between the two groups was quite insignificant. Similarly, a number of participants decried having been marginalised or isolated by their families and community. Singlehood living arrangement promotes loneliness with little social support due to family or communal isolation of the individual drug abuser. Social isolation and rejection have been previously reported as one of the risk factors for drug and substance abuse (Galvao *et al.,* 2018), as they both offer the opportunity for drug abuser to refrain from communal and social activities leading to loneliness (Briggs *et al.,* 2011; Outlaw *et al.,* 2012). In such circumstances, drug abusers generally take refuge in expeditious substance use to strategically manage the isolation, loneliness and other life stressors (Briggs *et al.,* 2011; Outlaw *et al.,* 2012). A negative correlation existed between drug use, educational status, marriage stability and family relationships. Participants with lower educational levels had higher odds of abusing drugs as compared to those with higher levels (post-primary) indicating that education status was a likely risk factor for drugs and substance abuse consistent with earlier studies (Quek *et al.,* 2013). Besides, participants with higher educational status had relatively stable marriages as compared to the less educated who both experienced unstable marriages and conflictual family associations. This can well be explained by the fact that high education drug abusers were relatively knowledgeable and conscious about the dangers of psychoactive substances and through this self-consciousness and evaluation prohibited themselves from unnecessary marriage and familial conflicts.

The economic consequences of drug and substances abuse are variable and have been previously reported to lead to poor quality of life due to unemployment, low education attainment, reduced work productivity, poor health, high disease transmission rates, social dysfunction, increased violence activities, poverty, homelessness, a lower disease recovery rates and poor diseases treatment outcomes (Jakovljevic *et al.,* 2015). Lack of basic social amenities and indebtedness or living in destitution were some of the major adverse economic challenges noted in this study with more than half of the participants reporting impoverished life or being perpetually indebted. Indulgent into drugs and substances use has been positively associated with poor educational performance (Adalbjarnardottir & Hafsteinsson 2001) with subsequent minimal employment opportunities. This corroborates well the findings in this study where most of the study participants reported to live without most of life's basic social amenities and indebtness. Low income which is an important indicator of socio-economic status has been previously reported as a precipitating factor for abuse of psychoactive substances (Goodman & Huang, 2002). Although, no empirical evidence linking income and drug abuse was found in this study, large number of participants with stable source of income were less likely to engage in drug abuse than those with unstable or informal source. This finding provides enough data to indicate that lower income earners are much more vulnerable to substance abuse compared to the counterparts with high income. Job losses as a result of dismissals due to absenteeism, violence at work place or working under the influence of drugs and

substances as well the unpredictability of the drug abusers were some other economic consequences reported by the participants and is consistent with most similar previous studies (Goodman & Huang, 2002). A significant positive correlation was observed between age of drug users and health variables. Healthwise, drug use generally impacts negatively on individual's health and proper cognitive function and may appear in the form of dependence, or as part of a wider spectrum of associated social problems and bad behaviour (Masih *et al.,* 2019). Self-assessed feeling of drug dependence and hyper activeness upon drug intake was the major health consequences self-reported by most of the study participants. Most drugs and substances especially the opioids and the stimulants affect the brain sensory mechanisms (Reichert *et al.,* 2021) interfering with the brain's capacity to produce body metabolites that confer control of individual self conciousnes, explaining the self-assessed feeling of hyper activeness and euphoria as drug abuse consequences reported by most of the drug abusers in this study.

A number of limitations were however associated with this study and thus warrant to be mentioned for similar future studies. The scope of the area covered limits the full overview of the current study findings which can only be overcome by collection of data on a much larger-size samples obtained from a large sampling area in various regions of the city suburbs. Similarly, cultural factors may play a role in the gender–substance abuse relationship (Li & Caltabiano, 2017) and therefore future work may warrant consideration of males irrespective of cultural background to be at much risk of substance abuse than females.

Conclusion

Despite worldwide concern and education about psychoactive substances, much information is yet to trickle to the rural areas of Kenya and few studies on the same have been carried out in these areas. Although drug abuse problem has been previously tagged to be limited to big cities and towns the types of drugs and the number of drug abusers is steadily increasing especially in peri-urban environments of major cities such as, Gachie, a town within the suburb of Nairobi city. The consequences of drug abuse results in immense negative socio-economic and health consequences to the individual drug abusers, family and society at large. This problem clearly mirrors the current drug abuse scenario in big cities where drug abuse problem is spread across the age groups with men gender being much more affected. This thus calls for concerted efforts that should focus on the peri urban towns as possible breeding grounds for drug abusers. Therefore, any strategy devised to fight and curb drugs and substance abuse problems by law enforcers and other practitioners should be modelled to target peri-urban environments which seem to offer a safe environments to drug abusers in terms of drugs affordability, accessibility and escape from law enforcers. Similarly, regulations involving sell and use of over- the counter drugs should be enforced to curb the overflow of these drugs to the non-authorised groups in the streets.

Competing interests

All authors declare that they have no conflict of interest associated with the publication of this manuscript.

Acknowledgement

We sincerely wish to acknowledge the Ministry of health under the auspices of Clinical Officers Council of Kenya for availing the research funds for this work. We also sincerely thank Miss Margret Kihato, for her immense support in recruiting the participants and performing the clinical evaluation to each of the study participant prior to enrolment into the study. Special thanks go to Mr Isaac Mwangi, a key informant in the study and who provided an important link to participants and guided through the research by providing the necessary support and platform that aided the study. We also appreciate the role of Ethical committee of Mount Kenya University and the National Commission for Science, Technology & Innovation (NACOSTI) for the necessary research approvals and permit, and to the research assistants who assisted in data collection and connected us to the respondents sometimes under difficult circumstances.

References

Adalbjarnardottir, S., & Hafsteinsson, L. G. (2001). Adolescents' perceived parenting styles and their substance use: Concurrent and longitudinal analyses. *Journal of Research on Adolescence*, *11*(4), 401-423.

Adlaf, E. M., & Smart, R. G. (1995). Alcohol use, drug use, and well-being in older adults in Toronto. *International journal of the addictions*, *30*(13-14), 1985-2016.

Beckerleg, S., Telfer M., Handt G.L. (2005). The rise of injecting drug use in East Africa: A case study from Kenya. *Harm Reduct Journal.* 2:12.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Briggs, W., Magnus, V., Lassiter, P., Patterson, A., & Smith, L. (2011). Substance use, misuse, and abuse among older adults: Implications for clinical mental health counselors. *Journal of Mental Health Counseling*, *33*(2), 112-127.

Chesang, R. K. (2013). Drug abuse among the youth in Kenya. *International journal of scientific & technology research*, *2*(6), 126-131.

Connock M, Juarez-Garcia A, Jowett S. (2007). Methadone and Buprenorphine for the management of Opioid Dependence: a Systemic Review and Economic Evaluation. Health Technology Assessment. Tunbridge Wells: Gray Publishing; pp 1-190.

Cummings, J. A., Jagannathan, L., Jackson, L. R., & Becker, J. B. (2014). Sex differences in the effects of estradiol in the nucleus accumbens and striatum on the response to cocaine: neurochemistry and behavior. Drug and alcohol dependence, 135, 22-28.

Evans-Brown, M., Bellis, MA, and McVeigh J., (2011). Should "legal highs" be regulated as medicinal products? British Medical Journal. 342:1101.

Fisher LD; Self-designing clinical trials. Statistics in Medicine, 1998; 17:1551-1562.

Galvão, A. E. O., Saavedra, L., & Cameira, M. (2018). Economic and sociocultural poverty in drug abuse: from individual to sociopolitical responsibility. Saúde e Sociedade, 27, 820-833.

Goodman, E., & Huang, B. (2002). Socioeconomic status, depressive symptoms, and adolescent substance use. *Archives of pediatrics & adolescent medicine*, *156*(5), 448-453.

Hawkins, E. J., Malte, C. A., Grossbard, J. R., & Saxon, A. J. (2015). Prevalence and trends of concurrent opioid analgesic and benzodiazepine use among veterans affairs patients with post-traumatic stress disorder, 2003–2011. *Pain medicine*, *16*(10), 1943-1954.

Hoffmann, N. G., Hunt, D. E., Rhodes, W. M., & Riley, K. J.(2003). UNCOPE: A brief screen for use with arrestees. Journal of Drug Issues, 33 (1), 29-44.

Jakovljevic, M. M., Lazarevic, M. M., Jurisevic, M. M., & Jovanovic, M. R. (2015). When cure becomes an illness—abuse of addictive prescription medicines. *Frontiers in pharmacology*, *6*, 193.

Jeannin, R., Reyre, A., Philippe, C., Borgne, A., Bonnet, N., Bacconi, L., & Dupuy, G. (2013). Usages de psychotropes à l'adolescence, des problématiques spécifiques? [Does the use of psychoactive drugs in adolescence create specific problems?]. *Soins. Pediatrie, puericulture*, (275), 32–36.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Miech, R. A. (2014). Monitoring the Future national survey results on drug use, 1975-2013:

Volume I, Secondary school students.

Kahuthia-Gathu, R.1., Okwarah, P., Gakunju, R., and Thungu, J.,(2013). Trends and Emerging drugs in Kenya: A case study in Mombasa and Nairobi County. *Journal Applied Biosciences.*

Kassa, A., Taddesse, F., & Yilma, A. (2014). Prevalence and factors determining psychoactive substance (PAS) use among Hawassa University (HU) undergraduate students, Hawassa Ethiopia. *BMC public health*, *14*(1), 1-7.

Li, W., & Caltabiano, N. (2017). Prevalence of substance abuse and socio-economic differences in substance abuse in an Australian community-dwelling elderly sample. *Health psychology open, 4(1), 2055102917708136.*

Maithya, R. W. (2009). Drug use in secondary schools in Kenya: Developing a program for Prevention and intervention. *Unpublished doctoral dissertation, University* of South Africa, Johannesburg, SA.

Malta, D. C., Mascarenhas, M. D. M., Porto, D. L., Barreto, S. M., & Morais, O. L. D. (2014). Exposure to alcohol among adolescent students and associated factors. *Revista de Saúde Pública*, *48*, 52-62.

Manning, M., Smith, C., & Mazerolle, P. (2013). The societal costs of alcohol misuse in Australia. *Trends and issues in crime and criminal justice*, (454), 1-6.

Masih, O. Z., Hussain, M., Afzal, M., & Emanual, S. (2019). Knowledge, Attitudes and Beliefs Regarding Drug Abuse among Male of Rural Community, Lahore, Pakistan. *International Journal of Social Sciences and Management*, *6*(1), 1-6.

Matimu, R., (2010). Drug abuse by the Matatu workers of KiambuCounty, Kenya. *College of Humanities and Social Sciences, University of Nairobi.*

NACADA. (2014). Trends and patterns of emerging drugs in Kenya: A case study of Mombasa and Nairobi counties. NAC/10/2014. Nairobi, Kenya: *National Authority for the Campaign against Alcohol and Drug Abuse.*

Nogueira, E. L., Cataldo Neto, A., Cauduro, M. H. F., Ulrich, L. E. F., Spanemberg, L., DeCarli, G. A., & Gomes, I. (2013). Prevalence and patterns of alcohol misuse in a community-dwelling elderly sample in Brazil. *Journal of aging and health*, 25(8), 1340-1357.

Office of National Drug Control Policy, UNDOC (2004). *The* Economic costs of drug abuse in the United States, 1992-2002 (*Publication no.* 207303). *Washington, DC: Executive Office of the President.*

Odejide, A. O. (2006). Status of drug use/abuse in Africa: A review. *International journal of mental health and addiction, 4(2), 87-102.*

Outlaw, F. H., Marquart, J. M., Roy, A., Luellen, J. K., Moran, M., Willis, A., & Doub, T. (2012). Treatment outcomes for older adults who abuse substances. *Journal of Applied Gerontology, 31(1), 78-10*

Patrick, M. E., Wightman, P., Schoeni, R. F., & Schulenberg, J. E. (2012). Socioeconomic status and substance use among young adults: a comparison across constructs and drugs. *Journal of studies on alcohol and drugs*, *73*(5), 772-782.

Paula, M. L. D., Jorge, M. S. B., Albuquerque, R. A., & Queiroz, L. M. D. (2014). Crack users in treatment: experiences, meanings and senses. *Saúde E Sociedade*, 23, 118-130.

Quek, L. H., Chan, G. C., White, A., Connor, J. P., Baker, P., Saunders, J. B., & Kelly, A. B. (2013). Concurrent and simultaneous polydrug use: latent class analysis of an Australian nationally representative sample of young adults. *Frontiers in public health*, *1*, 61.

Raketic, D., Barisic, J. V., Svetozarevic, S. M., Gazibara, T., Tepavcevic, D. K., & Milovanovic, S. D. (2017). Five-Factor Model Personality Profiles: The Differences between Alcohol and Opiate Addiction among Females. *Psychiatria Danubina*, *29*(1), 74–80. https://doi.org/10.24869/psyd.2017.74

Reichert, R. A., Silveira, K. M., Lopes, F. M., & De Micheli, D. (2021). Drug Abuse: Classifications, Effects and Risks. In *Behavior Analysis and Substance Dependence* (pp. 3-20). Springer, Cham.

Sairam Atluri, M. D., & Manchikantl, L. (2014). Assessment of the trends in medical use and misuse of opioid analgesics from 2004 to 2011. *Pain physician*, *17*, E119-E128.

Smith, J. M., & Estefan, A. (2014). Families parenting adolescents with substance abuse—Recovering the mother's voice: A narrative literature review. *Journal of Family Nursing, 20(4), 415-441.*

Van Nuijs, A. L., Mougel, J. F., Tarcomnicu, I., Bervoets, L., Blust, R., Jorens, P. G., ... & Covaci, A. (2011). Sewage epidemiology—a real-time approach to estimate the consumption of illicit drugs in Brussels, Belgium. *Environment international*, *37*(3), 612-621.

Student Perceptions on Factors and Effect of Drug and Substance Abuse: A Case of United States International University - Africa

Juliana Namada, PhD[1]* and James Karimi, PhD[1]

*United States International University- Africa – Nairobi, Kenya

***Corresponding Author:**

Juliana Namada, PhD

*United States International University- Africa – Nairobi, Kenya

Email Address: jnamada@usiu.ac.ke

Date submitted: 4th November 2021

Date published: 31st December 2021

Abstract

The main objective of the study was to explore students' perceptions on drug and substance abuse at USIU-AFRICA. Specifically, the study sought to investigate factors influencing drug and substance abuse and find out the effect of drug and substance abuse on university students. The study adopted mixed method approach. Multistage sampling was used to get representation from all the five schools within the university. In each school, 30% of the programmes was computed and rounded off to the nearest whole number. Simple random sampling was used to pick the number of courses in progrmmes. Snowball sampling technique was used to identify the drug and substance users who were targeted for focus group discussions. Quantitative data was analyzed using descriptive and inferential statistics while qualitative data was analyzed using common theming method. The study established that major factors influencing drug and substance abuse family background and upbringing. In terms of influence of drugs and substances, the results indicated that substance abuse impair student judgement, affect quality of sleep, and lower the performance of students both in class and outside class. The study recommended a turn round strategy by the university in dealing with drug and substance abuse to improve students' performance, their retention and completion rates to graduate with their respective degrees in their areas of specialization.

Keywords: Drug Abuse, Substance Abuse, Students, Student Performance, United States International University -Africa.

Introduction

Drug and substance abuse is a problem affecting universities. The consequences on the students are far reaching in their achievements of objectives. This has been aggravated by the rapid social and technological changes. Drug and substance abuse is a global problem, whose prevalence has remained unabated amongst youths (Hurst, 2019). Despite the proven dangers, drug use persists. Over the past year 2020, around 275 million people have used drugs, up by 22 per cent from 2010. Drug and Substances of abuse include pain relievers, stimulants, tranquilizers, sedatives, and all four drug classes combined (Oluwoye, Merianos & Nabors 2017). According to unodc.org glossary of terms, Drugs refer to psychoactive drugs and more specifically to illicit drugs.

Research has consistently reported that drug and substance abuse behaviors among students in institutions of higher learning commonly linked to already perceived norms. Ikoh Smah, Okwanya, Clement, and Aposhi (2019) identified factors such as peer pressure and media influence, need to release stress, desire to enjoy the drug, accessibility of drugs, desire to experiment, influence from guardians and siblings, poor parenting, having trouble in school as key factors influencing drug and substance abuse. Experts describe age 17 to 28 years old as the age of "window of vulnerability" because most youth are influenced into drug and substance abuse by their peers. The desire for social acceptance and the phobia of being sidelined and rejected by fellow peers has been proved to be a contributing factor to drug and substance abuse among youth (Ndegwa, 2017). Kiriru (2018) in a study found

out that drug awareness had helped some of the students stop abusing drugs.

Drug and substance abuse has impacted negatively on the academic, social, psychological, economical, and physiological development among the abusers (West & Graham, 2005). Studies have established a high prevalence of drug and substance abuse among the youths (Birhanu, *et al*, 2014). National Campaign Against Drug Abuse (NACADA) has come up with prevention strategies to reduce the prevalence (Ronoh, 2014; Maithya, 2009). However, the strategies have not reduced the number of those taking drugs. It is against this background that this paper seeks to explore the factors influencing drugs and substance abuse among students at USIU-AFRICA and find out the effects of drugs and substance abuse on university students. This research contributes to realization of two sustainable development goals of health and wellbeing and quality education.

The rationale for this study was to explore the factors and effects that influence drug and substance abuse among university students and make recommendations that the university management can use to make decisions.

Methodology

Mixed method design was used for the study. The study adopted descriptive survey design which is useful when collecting information about people's attitudes, opinions, and habits. This study collected student perceptions on factors and the effect of drug and substance abuse. The study targeted students in all the schools USIU-A university. The respondents were drawn from the five schools of business, school of humanities, school of science and technology, school of pharmacy, school of communication, cinematics and creative arts. The table below represents the number of programmes per school and the total number of courses in each school. According to Mugenda and Mugenda (2012), a sample size of 30 percent is adequate. In each school a 30% of the programmes being taught in the spring semester were randomly sampled and data collected from all the students who were present in that class on the data collection day. The number of sample courses was computed to the nearest whole number since the data was discrete. In total 27 courses were sampled in the whole university for the study.

ACADEMIC PROGRAMMES AT USIU-AFRICA IN SPRING 2018				
School	TOTAL programmes	Number of Courses	Percentage Sampled	Sample courses
Chandaria School of Business	9	45	30%	14
School of Humanities and Social Sciences	7	14	30%	5
School of Science and Technology	3	9	30%	3
School of Communication, Cinematics and Creative Arts	4	8	30%	3
School of Pharmacy and Health Sciences	2	6	30%	2
TOTAL	**28**	**82**	**30%**	**27**

The sampling frame comprised of all programmes 30% of all the programmes and data collected from courses in Spring Semester 2018. The total number of students in 27 courses targeted for the study was 723. Structured questionnaires samples classes. Snowball sampling technique was used to identify students affected by drug and substances who were targeted for focus group discussions. A total of 9 focus group discussions were conducted; 3 were from the school of business, 2 from school of humanities, 1 from science and technology,1 from communication, cinematics and creative arts while 1 was from school of pharmacy. 1 group comprised of masters students.

Quantitative data was analyzed using descriptive statistics, exploratory factor analysis and percentages. Exploratory factor analysis was preferred because factor reduction capability. This approach enables the

study to segregate factors with significant factor loadings. The results were presented in tables, graphs and figures. Perceptions on the effect was computed in percentages and presented in tables where the attributes with higher percentages were interpreted and discussed. Qualitative data was analyzed using common theming method and results presented narratively in terms of the key themes emerging from the focus group discussions.

Data Analysis and Findings

Response Rate

The study targeted 723 students from all the schools. The total number of the targeted students who returned the questionnaires were 612. Therefore, the response rate for the study was 84.6% which was a good response rate. Kumar (2019) noted that a 60% response rate is acceptable, and a response rate of greater than 70% is considered good.

Factors Influencing Drug and Substance Abuse

The first objective focused on factors which influence drug and substance abuse. The analysis was done using three faced approach. The first step involved descriptive analysis where mean, standard deviation, Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were carried out. The second step involved factor rotation where the factor loadings were established, lastly, extraction of the factors with eigen values above the threshold.

Table 1: Factors influencing Drug and Substance Abuse

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
Drugs are used to obtain desired effects	3.1350	1.64953	612
Drugs are used to change experiences	3.1409	1.54022	612
Physiological intolerance	3.1409	1.45377	612
Previous experience of drug	3.1742	2.73162	612
The setting for use influence drug abuse	3.0196	1.67555	612
Susceptibility of the time of use	3.0020	1.37556	612
The residence affects drug abuse	3.0744	1.47074	612
Peer pressure influences	3.2485	1.59867	612
Moral upbringings affect use of drugs	3.1918	1.52958	612
Amount of money at student disposal	3.1213	1.53551	612
Family background affect drug use	3.1546	1.50996	612
Misplaced priority affect drug use	3.1663	1.54340	612

The average mean across all the factors ranged between 3.0 - 3.2 which implies that the respondents seem to agree with different factors affecting the use of drugs and substance abuse. However, in terms of deviation, in terms of previous experience affecting drug and substance abuse the respondents had varying views which deviated from the mean by 2.7. This implies that on this factor ideas from the respondents varied significantly.

Table 2: KMO and Bartlett's Test of Factors influencing Drug and Substance Abuse

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.937
Bartlett's Test of Sphericity	Approx. Chi-Square	3748.581
	df	66
	Sig.	0.000

The KMO and Bartlett's Test shown above indicates sampling adequacy of .937 against a threshold of .500 which is very good. Test of sphericity is significant at 0 .000. This implies that the sampling of students at in all the schools were adequate for the study. Further the results were significant.

Table 3: Factor Extraction of Factors affecting Drug and Substance Abuse

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.786	56.547	56.547	6.786	56.547	56.547
2	.875	7.289	63.836	.875	7.289	63.836
3	.749	6.241	70.077	.749	6.241	70.077
4	.696	5.802	75.879			
5	.556	4.634	80.514			
6	.463	3.859	84.373			
7	.442	3.683	88.056			
8	.367	3.054	91.111			
9	.343	2.861	93.972			
10	.290	2.420	96.392			
11	.235	1.961	98.353			
12	.198	1.647	100.000			
Extraction Method: Principal Component Analysis.						

From the Table 3 above, one factor was extracted with Eigenvalue of 6.786 above the threshold is normally all the factors above 1(one). The factor extracted had 56.547 meaning that this factor explained the total variance 56.5% of all the factors considered in the study. This implies that the factor and the associated subcomponents influence drug and substance abuse among university students.

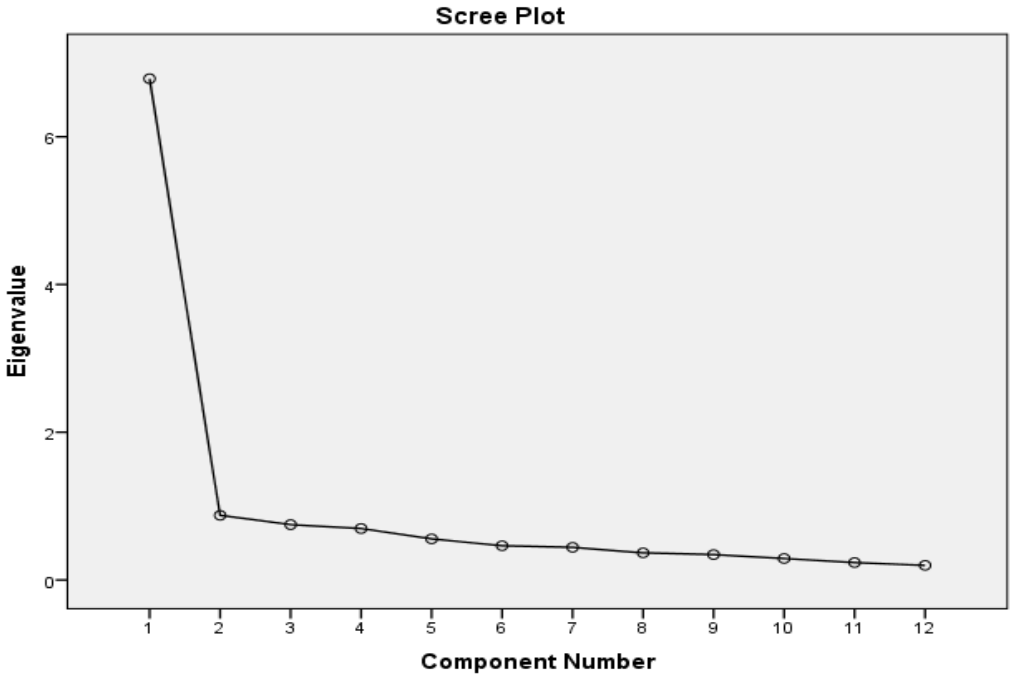


Figure 1: Scree plot of Factors influencing Drug and Substance Abuse

The scree plot shown indicates that one factor was 6.786 while the other nearest factors were 0.875 and 0.749 respectively. Therefore, only one factor out of a total number of 12 factors accounted for the considerable variance among the factors which influence drug and substance abuse among the students.

Table 4: Rotated Component Matrix of Factors affecting Drug and Substance Abuse

ROTATED COMPONENT MATRIX[A]			
	Component		
	1	2	3
Drugs are used to obtain desired effects (experience something uncommon)	.368	.785	.255
Drugs are used to change one's experiences	.271	.801	.267
Individual physiological intolerance leads to consumption of drugs	.359	.575	.400
Previous experience of drug influence drug abuse	-.025	.329	.707
The setting for use influence drug abuse	.314	.258	.653
Susceptibility of the time of use influence drug abuse	.490	.203	.675
The residence affects drug abuse	.530	.114	.648
Peer pressure influences drug abuse	.580	.568	.312
Moral upbringings affect use of drugs	.717	.347	.152
Amount of money at student disposal affect drug use	.731	.263	.217
Family background affect drug use	.790	.216	.265
Misplaced priority affects drug use	.698	.448	.201
Extraction Method: Principal Component Analysis. *Rotation Method: Varimax with Kaiser Normalization.*			
a. Rotation converged in 8 iterations.			

The rotated component matrix was able to identify one factor with various components which had loadings greater than 0.5. Factor one had six components which were student's residence, peer pressure, moral upbringing of the students, the amount of money at the student's disposal, family background and misplaces priorities on the part of the student. The study established that family background and upbringing contributed significantly to the indulgence of drug and substance abuse. The main attributes of this factor were the moral values of the family, the amount of money a student is given and the nature of the family.

Qualitative Data on Factors influencing Drug and Substance Abuse

Peer pressure and upbringing came out strongly from all the focus group discussions as among the key factors affecting drug and substance abuse. In terms of peer pressure, students sought to fit into specific social groups for a sense of belonging and communal. They pointed out that social life, friendship, and companionship were among key considerations of students engaging in illicit behavior.

One student described the factors in the following words *"trends of the moment, curiosity and simply wanting to try something new"*

Some added that trends of the moment, curiosity and simply wanting to try something new were among the key drivers. Students who were joining campus from different homes also felt a sense of too much freedom away from home especially those coming from a strictly supervised homes and those who had been closely monitored by parents and guardians.

Economic status of families and upbringing were mentioned as key catalysts to drug and substance abuse. Some of the students confessed having been brought up by absentee parents who were busy making money and not creating enough time for their children. Such parents to compensate for the absence gave lots of money to the students more than what was required for the campus upkeep. The result is that students used extra money to buy drugs and other illicit substances because affordability was not an issue.

Another described time factor in the following way *"too much time available for spending including the time between the classes and the weekends which are normally unoccupied with organized activities is normally filled up with experimenting with drugs and substances"*

Effects of Drugs and Substance Abuse on Student well being

The second objective focused on the influence of drug and substance abuse on the students. The analysis was done through descriptive statistics where mean, standard deviation and percentages. The findings were presented in Table 6 as shown.

Table 6: Descriptive Statistics of the influence of Drugs on the students

Descriptive Statistics			
	N	Mean	Std. Deviation
Users mental judgement is severely impaired	612	3.1228	1.63926
Addiction exposes the users to diseases	612	3.1874	1.61419
Drug abuse impairs persons thinking	612	3.1821	1.63196
Drug abuse potentially harm unborn baby and pregnancy	612	3.2674	1.72495
Impairment in attention, processing speed and sleep	612	3.1862	1.62200
Drug abuse increases risk of sexually transmitted infections	612	3.1385	1.61450
Drug abuse impairs participation and engagement in life	612	3.1800	1.59518
Drug abuse affects persons ability to think and communicate	612	3.1780	1.62458
Impairs performance in school, at work and to drive	612	3.2866	1.64267

Affects brain systems that are still maturing	612	3.1151	1.66064
Negative and lasting effects on their cognitive development	612	3.1875	1.64303
Drug users have negative and long-lasting effects on their cognitive development	612	3.1960	1.61249

As per the Table 6, the descriptive results indicated that there are very clear indications of what the effects of drug have on the students. This can be shown by the means presented on the Table of range 3.12 to 3.28. The most outstanding effect was "Impairs performance in school, at work and, make it dangerous to drive" with a mean of 3.286 and "Drug abuse potentially harm unborn baby and affect other pregnancy related issues" with a mean of 3.267 respectively.

Table 7:

Effects of Drug and Substance abuse on Student well being

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Users mental judgement	29.4%	8.1%	15.8%	14.2%	32.5%
Addiction exposes the users to diseases	25.8%	11.1%	15.2%	14.1%	33.8%
Drug abuse impairs persons thinking	27.8%	8.6%	14.6%	15.6%	33.4%
Drug harm unborn and pregnancy issues	29.8%	7.5%	10.7%	10.2%	41.8%
Impairment of speed and sleep quality	26.6%	10.3%	14.4%	15.1%	33.5%
Drug abuse increases diseases	27.5%	9.7%	16.1%	14.8%	31.9%
Drug abuse impairs engagement in life	25.0%	11.6%	16.5%	13.9%	32.9%
Impairs thinking, communication	27.3%	9.2%	14.9%	15.4%	33.2%
Impairs performance in school, work	26.1%	8.4%	14.2%	13.5%	37.8%
Affects brain systems	30.4%	7.2%	16.8%	11.5%	34.0%
Negative and long lasting effects on their cognitive development	27.3%	10.4%	13.5%	14.0%	34.9%

Out of the 612 respondents, 41.8% strongly agreed that "Drug abuse potentially harm unborn baby and affect other pregnancy related issues" followed by 37.8% who strongly agreed that, drugs "Impairs performance in school, at work and, make it dangerous to drive". This is a congruence of the mean results that indeed, the effects are dire. On the other hand, a small percentage of respondents between 10.7% and 17.5% had neutral observations which is also a worrying trend and shows ignorance of the situation languishing students in the university.

Qualitative Data on effect of Drug and Substance Abuse on Students well being

From the focus groups, the results reveal that the effects of substance abuse on the student's touches on affecting their physical, mental, emotional health. Most of the students tend to miss classes, do not submit assignments, and isolate themselves from the universities activities which make them end up in dropping from school. Other effects include low self-esteem, violence, hallucination and low thinking capacity which all this affect their well-being and consequently leads to higher rates of university drop out or take longer to complete.

One student described the effect as *"drugs and substance use causes short attention span making one not to complete assignments and group work"*

Discussions

The study established that family background and upbringing are among the main factors which influence drug and substance abuse.

These findings were like a study investigating the relationship between drug use and substance abuse and quality of sleep among colleges and university students in Yemen and Saudi Arabia (Fadhel, 2020). The researcher found out that cultural factor plays a significant role in drug use and substance abuse.

A study by Yusuf (2010) found out that parental love, quality time, consistency and role modeling were mentioned in a study as fundamental in defining a youth's involvement in drug and substance abuse. Children from separated households are more prone to various vices in the society such as drug and substance abuse because majority of them have lacked parental care and supervision from an early age. The findings resonate with Schlarb, Friedrich, and Claben (2017) who observed that that there is a significant evidence of sleep disorders and poor sleep quality among university students. Most of the sleep disorders are mostly linked to tobacco use and poor performance. They further explained that poor sleep quality had a significant effect on the level of drug use and abuse among University Students. Students who did not use drugs had a higher quality of sleep compared to students who used drugs who had poor quality of sleep more often. Some students in recent studies have confessed to taking stimulants such as Adderall, Ritalin, Dexedrine, Concerta, and Stratera to enhance their academic performance.

This study established that drug and substance abuse impairs performance in school, at work and, makes it dangerous to drive. In agreeing with the findings, DeSantis, Webb, and Noar (2008) noted that drug use and abuse these stimulants medications for both academic and recreational functions. For academic functions students believe that stimulants medication enables them to improve their GPA through helping them study and stay alert for long hours, enhance their concentration and focus and increase their energy level. For recreational function College and University Students it enables them get rid of fatigue and improve their social awareness

The findings of the research indicate that indeed drug and substance abuse affects students at USIU Africa and from other researches done in other regions globally there is a great corroboration of these findings. In this particular study, the results indicate that drug abuse impairs performance in school, at work and, make it dangerous to drive, there is a great potential for Drug abuse potentially harm unborn baby and affect other pregnancy related issues. These findings are reflected by research conducted by (Njeru& Ngesu, 2014), who asserts that drug abuse to students is tantamount to poor performance as the objectives of education to students are over run by aggressive behavior, violence and withdrawal. It becomes impossible for such students to concentrate on studies or even interact with fellow students or lecturers

On the other hand, drug and substance abuse increases risk of sexually transmitted infections among the students which end up making them risk their young lives. As well, drug abuse impairs participation and engagement in life, affects person's ability to think and communicate rationally, recognize reality sometimes resulting in dangerous behaviour. These results have a bearing from the research done by (Bryan, Schmiege, & Magnan, 2012) who reported that drug abuse increases the risk of sexually transmitted infections. Ultimately, substance use can also impair participation and engagement in life, and can have effects on the individual, family, and community levels (Stoffel & Moyer, 2004).

Conclusions

This study therefore, family background was found to be major factors influencing drug and substance abuse among USIU-Africa students. Drug and substance abuse of drug by the students directly affects and impairs academic abilities of the students which limit their academic performance. The study recommends a multi-approach where different stakeholders are involved to curb this vice from the parents, lecturers, peers, counselors to follows preventive interventions aimed at improving academic engagement and broaden their focus beyond drug use in students. Community and family risk factors should also be targets of intervention.

The university needs to come up with mechanisms of dealing with peer pressure amongst students

to reduce instances of drug and substance abuse. The university need to partner with parents and accommodation providers around campus to tighten the rules governing student accommodation as a way of reducing the menace. Counseling education should be heightened in campuses to revive those who have already been engaging in the act and also the Government should strictly enforce its existing laws through NACADA against drug abuse through its regulatory agencies

References

Asgedom, T. T. (2017). *Substance abuse among undergraduate students at a university in Ethiopia* (Doctoral dissertation, Doctoral thesis, UNISA).

Birhanu, A. M., Bisetegn, T. A., & Woldeyohannes, S. M. (2014). High prevalence of substance use and associated factors among high school adolescents in Woreta Town, Northwest Ethiopia: multi-domain factor analysis. *BMC public health*, *14*(1), 1-11.

Bryan, A. D., Schmiege, S. J., & Magnan, R. E. (2012). Marijuana use and risky sexual behavior among high-risk adolescents: trajectories, risk factors, and event-level relationships. *Developmental psychology*, *48*(5), 1429.

DeSantis, A. D., Webb, E. M., & Noar, S. M. (2008). Illicit use of prescription ADHD medications on a college campus: a multimethodological approach. *Journal of American college health*, *57*(3), 315-324.

Dixon, M. A., & Chartier, K. G. (2016). Alcohol Use Patterns Among Urban and Rural Residents: Demographic and Social Influences. Alcohol research : current reviews, 38(1), 69–77.

Fadhel, F. H. (2020). Exploring the relationship of sleep quality with drug use and substance abuse among university students: a cross-cultural study. *Middle East Current Psychiatry*, *27*(1), 1-9.

Gust, S. W., & McCormally, J. (2018). National Institute on Drug Abuse International Program: improving opioid use disorder treatment through international research training. *Current opinion in psychiatry*, *31*(4), 287.

Hawkins, J. D., Arthur, M. W., & Catalano, R. F. (1995). Preventing substance abuse. *Crime and justice*, *19*, 343-427.

Hurst, T. (2019). World drug report. *The encyclopedia of women and crime*, 1-2.

Ikoh, M. U., Smah, S. O., Okwanya, I., Clement, U. A., & Aposhi, Z. A. (2019). Factors affecting entry into drug abuse among youths in Lafia metropolis: implications on security. *Sage open*, *9*(1), 2158244018823428.

Jackson, K.M., Janssen, T. & Gabrielli, J. (2018) Media/Marketing Influences on Adolescent and Young Adult Substance Abuse. Current Addict Rep 5, 146–157 https://doi.org/10.1007/s40429-018-0199-6

Kasundu, B., Mutiso, M. M., Chebet, P. S., & Mwirigi, P. (2012). Factors contributing to drug abuse among the youth in Kenya: A Case of Bamburi Location. *Elixir International Journal*, *46*, 8259-8267.

Kiriru, A. (2018). Effect of awareness on substance abuse among university students in a selected private university in Kenya. *African research journal of education and social sciences*, *5*(2).

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (4th ed.) New York: SAGE Publications.

Maithya, R. W. (2009). *Drug abuse in secondary schools in Kenya: Developing a programme for prevention and intervention* (Doctoral dissertation, University of South Africa).

Mennis, J., Stahler, G. J., & Mason, M. J. (2016). Risky substance use environments and addiction: a new frontier for environmental justice research. *International journal of environmental research and public health*, *13*(6), 607.

Merz, F. (2018). United Nations Office on Drugs and Crime: World Drug Report 2017.

2017. *SIRIUS-Zeitschrift für Strategische Analysen*, *2*(1), 85-86.

Morojele, N. K., Parry, C. D. H., & Brook, J. S. (2009). Substance abuse and the young: Taking action. *MRC Research brief*, 6, 1-4.

Mofatteh M. (2020). Risk factors associated with stress, anxiety, and depression among university undergraduate students. AIMS public health, 8(1), 36–65. https://doi.org/10.3934/publichealth.2021004

Mugenda, O. M.,& Mugenda, A. G. (2012). *Research methods: Quantitative and qualitative approaches*, Acts Press, Nairobi, Kenya

Musyoka, C. M., Mbwayo, A., Donovan, D., & Mathai, M. (2020). Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and patterns. *Plos one*, *15*(8), e0238170.

NIDA (2019) whttps://www.drugabuse.gov/about-nida/noras-blog/2019/01/nidas-scientific-findings-achievements

Nyaoke, M. (2013) Determinants of the prevalence of drug and Substance abuse amongst youth in institutions of higher learning in Mombasa county Unpublished research project from School of continuing education university of Nairobi

O'Donnell, J., Hawkins, J. D., Catalano, R. F., Abbott, R. D., & Day, L. E. (1995). Preventing school failure, drug use, and delinquency among low income children: Long term intervention in elementary schools. *American Journal of Orthopsychiatry*, *65*(1), 87-100.

Oluwoye, O. A., Merianos, A. L., & Nabors, L. A. (2017). Nonmedical use of prescription drugs and peer norms among adolescents by race/ethnicity. *Journal of Substance use*, *22*(2), 199-205.

Oluwoye, O. A. (2017). The Inluence of Social Media and Culture on Sunstance Use among African and African American Male College Students. *A Journal On Balck Men, Vol. 6, No. 1*, 59-75.

Ronoh, K. C. (2014). *Effectiveness of drug and substance abuse prevention programs in selected public and private universities in Kenya*. Nairobi: Unpublished Phd Thesis.

Schlarb, A. A., Friedrich, A., & Claßen, M. (2017). Sleep problems in university students–an intervention. *Neuropsychiatric disease and treatment*, *13*, 1989.

Somani, S., & Meghani, S. (2016). Substance abuse among youth: A harsh reality. *Emerg Med (Los Angel)*, *6*(330), 2.

Stephen Ndegwa, A. M. (2017). factors influencing Alcohol Use among University Students in a Kenyan University. *African Journal of Clinical Psychology Vol. 1*, 102-117.

West, S. L., & Graham, C. W. (2005). A survey of substance abuse prevention efforts at Virginia's colleges and universities. *Journal of American College Health*, *54*(3), 185-191.

Yusuf, F. A. (2010). Factors influencing substance abuse among undergraduate students in Osun State, Nigeria. *African research review*, *4*(4), 330-340.

Substance Use, Emerging Substances and Poly Drug Use among Undergraduate Students in Universities in Kenya

Jane Ngure PhD [1*], Briston Omulema [2]; Peter Ngure [3] and Micah Chepchieng [2]

1* Africa Nazarene University, Nairobi, Kenya

2 Egerton University, Kenya

3 St. Paul's University, Kenya

***Corresponding Author:**

Jane Ngure PhD,

Email Address: jngure@anu.ac.ke.

Department of Counselling Psychology, Africa Nazarene University, Kenya.

Date submitted: 25th October 2021

Date published: 31st December 2021

Abstract

There is an increase in the use of substances and the peak levels of substance use are seen among young people aged between 18-25. Substance use presents a barrier to learning, it impairs cognitive ability and distorts judgment. There is limited information on the magnitude of substance use and a countrywide study has not been conducted to determine the extent of substance use, emerging substances and poly drug use among undergraduate students in Kenya. The purpose of this study was to determine the extent of substance use, emerging substances and poly drug use among the undergraduates in Kenya. A descriptive cross-sectional survey design was used for this study. The target population was 451,081 undergraduate students, where 390,456 were in public and 60,625 in private chartered universities. The sample size was 1,500 participants selected from seven public and five private universities, from ten counties across the country. A World Health Organization (WHO) questionnaire - Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was used to determine the extent of substance use, poly drug use and emerging substances among the undergraduate students. The key substances were alcohol, tobacco, cannabis and shisha among others. The findings revealed prevalence of lifetime substance use of 48.6% and the prevalence of current use of 37.9%. Public universities (M=.48, SD= .50) had higher prevalence of current use than private universities (M=.26, SD= .43) with t (1435) = 8.94, p<.05. Alcohol was the most commonly used substance and shisha was an emerging substance. Poly drug use was reported at 162 (11.3%) among the current users. The prevalence of substance use is high. There is a need for universities to develop and implement interventions for the emerging substances and poly drug use to mitigate the potential risk of developing substance use disorders.

Keywords: Substance use, lifetime use, current use, emerging substances, poly drug use, undergraduate students.

Introduction

The World Drug Report (2018) indicated that substance use has been increasing globally and the estimated total number of people who use substances have increased from 46% in 2008 to 52% in 2014 and 56% in 2016. The report also indicated that substance use and related health consequences were highest among the young people aged 18-25 years old. This has led to an increase in the number of people suffering from substance use disorders. The report further revealed that, increased use of substances led to 60% increase in deaths caused by substance use disorder. Some of the effects of substance use on university students include impaired cognitive ability, distorted judgment, poor academic performance, involvement in crime and risky behavior among university students.

Worldwide, studies have been done on the prevalence of substance use in universities (Arbor-Nicopoulos, Kwan, Lowe, Taman & Faulkner, 2010; Carter, Brandon, & Goldman, 2010; Akmartov, Mikolajczyk, Meier & Kramer, 2011; Chiauzzi, Donovan, Black, Cooney, Buechner

& Wood, 2011). The studies revealed a high prevalence of substance use, especially alcohol use. For instance in Europe, one-quarter of youth aged between 18-21 years reported having consumed an illicit drug in their lifetime. A survey conducted in Germany among university students revealed a high prevalence of alcohol use. A majority 80% of the students displayed heavy drinking, meaning that they would consume five alcoholic drinks on any one occasion. Students who displayed harmful drinking were at 20%, this means that alcohol consumption had affected physical and mental health of the students. A comparative analysis of alcohol consumption patterns among global university students revealed that alcohol consumption was higher among university students compared to the general population (Tse, 2011). A review conducted by Carter et al. (2010) indicated that a university student drank more frequently than non-university peers did in the United State of America.

In Africa, studies on substance use in Nigeria, Uganda, Ethiopia and South Africa, revealed high prevalence of substance use among the university students. In South Africa, a study conducted by Steyl and Phillips (2011) indicated that substance use was high among university students, with 54% of the respondents having used alcohol in the previous 30 days, 27.5% having smoked tobacco and 17.0% having used other substances. In Ethiopia for instance, prevalence of at least one substance was 62% among university students (Tesfaye, Derese & Hambisa, 2014). Another study conducted in Nigeria revealed that prevalence for mild stimulants among university students was 46.1% and for alcohol was 39.7% (Majanjuola, Abiodun & Sajo, 2014).

In Kenya, studies reveal high prevalence of substance use among university students. For instance, National Authority for the Campaign against Alcohol and Drug Abuse (NACADA, 2010) found that 60% of the youth had used alcohol and about half had developed alcohol use disorder. The rapid situation assessments by NACADA (2012) also revealed that the youth aged 15 to 24 years old had the highest prevalence of substance use. The prevalence of those who had used alcohol was 35.6%, tobacco was 37.1%, khat was 30.8%. The highest prevalence was cannabis at 44.4%. These substances are the gateway to other hard substances such as cocaine and heroin. Sometimes the young people mix substances, which can be detrimental to their health (Martin, 2008). According to Atwoli et al. (2011), the lifetime substance prevalence among students in universities in Eldoret was at 69.8%. This study reported prevalence of specific substances such as alcohol at 51.9%, cigarette at 42.8%, cannabis at 2% and cocaine at 0.6. In addition, Hassan (2010) reported an alcohol prevalence of 63.2% in the University of Nairobi. A similar study conducted at Kenyatta University on prevalence of lifetime use of substances revealed that alcohol stood at 92.1%, cannabis at 62.9%, tobacco at 51.5%, khat at 51.9%, and cocaine at 3.5% (Tumuti, Wangeri, Waweru, & Ronoh, 2014). Another study conducted in a private Christian University in Kenya revealed that the students who had consumed alcohol were at different levels of risk, 39.3% of the students were at high risk of alcohol use; 47% were at a moderate risk of alcohol use while 15.0% were at a low risk of alcohol use (Ndegwa, Munene & Oladipo, 2017).

A different study conducted on alcohol use among student- athletes at the University of Nairobi revealed that 50% of athletes were binge drinkers (more than 5 beers in a sitting). Some of the reasons given for the excessive drinking of alcohol were relaxation at 82%, followed by overcoming shyness and tension at 72.6%, and managing boredom at 66.4%. Some 57.5% consumed alcohol as a result of peer pressure (Rintaungu, Ng'etich & Kamande, 2012). Another study conducted by Magu, Mutugi, Ndahi, and Wanzala, (2013) among public university students in Kenya revealed that about 69.5% of students had used tobacco at some point, while 17.1% were current users.

Several studies show that most students start using substances way before joining the university, the studies demonstrate an increase in substance use among secondary school students (Ngesu, Ndiki & Masese, 2008; Oteyo & Kariuki, 2009; King'endo, 2011 Oteyo, Kariuki & Mwenje,

2013). Despite the effort made by NACADA, the Ministry of Education, institutions of higher learning and other groups to reduce the level of substance use by creating awareness and building the capacity of stakeholders, the prevalence rate of substance use is on the increase in Kenya (NACADA, 2012). Institutions of higher learning may be a platform for both protective and risk factors; such institutions have an opportunity to influence students' experiences either positively or negatively in relation to healthy behavior.

The studies discussed above, were based on findings from one university or universities in one county or region. Despite continued campaigns and counseling interventions offered by the universities against substance use, there is still a high prevalence of substance use thus revealing a gap in prevention strategies. There is a need to determine the extent of substance use, emerging substances and poly drug use among the undergraduate students in Kenya.

Methodology

The study employed a descriptive cross sectional survey design. The study was conducted in twelve chartered public and private universities selected from ten counties across the country, which were selected from urban, suburban and rural environments in five selected regions of Kenya. These regions were Coast, Western, Central, Rift Valley, and Eastern regions. The names of the universities were withheld because of the sensitivity of the subject area of study, therefore, PUB stood for public universities and PRI stood for private universities. The private universities were selected on the basis of sponsorship, that is, religious-sponsored institutions and the non- religious-sponsored institutions of higher learning in the five regions of Kenya. The seven public universities thus included University PUB A, PUB B, PUB C, PUB D PUB E PUB F and PUB G and five private universities thus included PRI A, PRI B, PRI C, PRI D and PRI E.

Population and sample size

The target population was 451,081 undergraduate students, where 390,456 were in chartered public universities and 60,625 in chartered private universities (CUE, 2016). Multi-stage sampling techniques were used to select participating universities. The first stage was the use of stratified sampling to categorize the public and private universities. The second stage was purposive sampling to facilitate the selection of the five regions in Kenya and the 12 universities from the ten counties in the five regions in Kenya. Purposive sampling was used in the selection of the main campuses. Proportionate sampling was used to determine the number of participating universities. From the accessible population of 145,906 students in public universities and 32,045 in private universities; the total sample size of respondents was 1500 students. A sample size of 821 in public universities and 679 in private universities.

Data collection procedure

The researcher obtained a research permit from the National Commission for Science, Technology, and Innovations (NACOSTI); the reference number NACOSTI/P/17/60109/16398. The researcher also obtained ethical clearance from an Ethical Review Board in the country and permission from the Vice Chancellors of each university selected for the study. The researcher met with the Director of Research of the selected universities and was introduced to the Dean of Student Affairs who in turn introduced the researcher to the university student counsellors and the students. The university registrar provided a timetable showing the classes available on that particular day and the researcher would select classes randomly from first year to fourth year. All students who were willing to participate in the study were given the questionnaires to fill. Participation in the study was voluntary and anonymous. The informed consent was obtained from all participants and participants were assured of confidentiality. The data was collected from September 2017 to April 2018.

Measuring the extent of substance use among university students

In order to gather data on lifetime, current use, poly drug use and emerging substance, a World Health Organization (WHO) questionnaire - Alcohol, Smoking, and Substance Involvement

Screening Test (ASSIST) was included (WHO, 2012). The ASSIST was validated in several countries including Kenya where the internal consistency of the different domains ranged between 0.77 and 0.94 (Humenuik et al. 2010; Onifade et al. 2014). The ASSIST measured the prevalence of current substance use, lifetime use, emerging substances and poly drug use. Lifetime use referred to the use of any of the substances at least once in a respondent's lifetime. The questionnaire consists of eight questions on lifetime use of the substance, substance dependency syndromes, and substance-related problems. Poly drug use was measured by identifying the number of substances a student had ever used or had used in the past three months.

The data collected from the questionnaire was analysed using descriptive statistics that is frequencies, percentages, means and standard deviations. The ASSIST scores were used to identify non-users, lifetime users, current users and poly drug users. For inferential statistics, Student t-test was used to test whether there were significant differences between the two means of prevalence rate derived from public and private universities. Chi square analysis was performed to assess whether an association existed between the demographic characteristics and substance use, prevalence of poly drug use among students and the type of university.

Results

Demographic Characteristics of the Respondents

Out of 1500 questionnaires administered, 1438 questionnaires were completed, 781from public universities and 657 from private universities giving a response rate of 95.8%. Studies have shown that response rate of 70% and above is acceptable (Babbie, 2010; Nulty, 2014). Male respondents were 769 (53.5%) and female respondents were 653 (45.4%). The respondents age ranged from 17-33years, with the majority 1282 (89.2%) being in the age category of 17-24 years. The second year students were slightly more 420 (29.2%), followed by first years 376 (26.1%), third years 300(20.9%) and fourth years were 357(24.9%). Most of the respondents 593(41.4%) had modest pocket money of 20 USD and below. Respondents who indicated that their monthly pocket money was 21 to 40 USD were 382(26.7%); those who had monthly pocket money ranging from 41 to 60 USD were 180 (12.6%) as shown in Table1.

The study compared the following demographic characteristics against the use of substance among university students. This included; year of study, religious practice, family setting and amount of pocket money. The results revealed that 264 (40.4%) female and 431(56.0%) male students had ever used substances in their lifetime. While those who had used substances in the past three months were 198(30.3%) female and 342(44.5%) male. The study revealed that substance use increased with the level of study. The respondents who indicated that they had used substances in the past three months were as follows; first years 30.9%, second year 32.6%, third year 38.5% and fourth year 49.8%. This increase was statistically significant X^2 (5, N = 1430) =44.689, p<.05). The study revealed a significant relationship between religious practice and substance use X^2 (4, N = 1380) =34.803, p<.05). A majority 721(50.2%) of the students practiced their religion of preference once a week, followed by those who practiced their religion daily 509 (35.4%).

Family setting can be a determining factor of substance use among students. The findings revealed that the majority of the respondents 1007(70.1%) came from homes that had both parents. The results revealed a significant relationship between the type of family setting and the use of substance among university students X^2 (5, N = 1414) = 14.335, p<.05). Pocket money can be a factor that contributes to substance use among students. The results revealed that the more the pocket money, the higher the substance use. About 28.5% of students who had pocket money of 20 USD and below used substances in the past three months, compared to 42.7% of students with pocket money of 21 to 40 USD. Those who indicated that they had pocket money of 41 to 60 USD, 44.3% had used substances in the past three months, while those who had pocket money of 61 and above, 48.9% of the respondents had used substances. This shows an increment on

the percentage of students using substances in relation to increment in pocket money for current use. This increase was statistically significant X^2 (3, N = 1347) =38.575, p<.05).

The extent of prevalence of substance use was measured by use of three indicators; the frequencies of lifetime use, current use and polydrug use. The overall lifetime prevalence of substance use was at 699 (48.6%), in public universities 427 (54.7%) and in private universities 272 (41.4%) had used at least one substance in their lifetime. Figure 1 shows the findings of the lifetime prevalence of any of the substances. There was a significant difference in mean of public (M=.55, SD=.498) which was higher than private (M=.41, SD=.493) t (1435) p<.05.

The lifetime prevalence of specific substances was; alcohol 621(43.2%), Cannabis 204(14.2%), tobacco 187 (13%), shisha 256 (17.8%), kuber (chewed tobacco) 62(4.3%), cocaine (2.7%) amphetamine24(1.7%), inhalants 14(1.0%), sedatives 71(4.9%), hallucinogens 12(0.8%),opioids 19(1.3%), khat (Catha edulisforsk) 165(11.5%) and muguka (cathaedulis vahi) 116 (8.1%) as shown in Table 2.

Alcohol was the most commonly used substance, followed by shisha, then cannabis, and tobacco. One of the emerging substances shisha 256 (17.8%) was among the commonly used substances. Shisha use had more lifetime users than tobacco 187(13%), this would mean that shisha use is on the increase among the undergraduate students.

The overall prevalence of current use of substances was 545 (37.9%). Public universities had higher current prevalence of substance use 376 (48.1%) than private universities 167 (25.7%). This means that close to half of the respondents in public universities used substances more frequently than the private universities. There was a significant difference in mean comparison of public (M=.48, SD=.500) which was higher than private (M=.26, SD=.437) t (1435) = 8.936, p<.05 as shown in Table3.

The respondents who had used alcohol, tobacco and cannabis in the past three months before the study in both public and private universities were as follows; alcohol 440 (30.7%), Cannabis 255 (18.1%) and tobacco 200 (14.2%). A comparison of public and private universities revealed that public universities had higher prevalence of alcohol, cannabis and tobacco use than private universities. The difference was statistically significant. For public universities those who had used alcohol were 289 (37.2%) while in private universities 151 (23.0%). For cannabis the prevalence in public universities was 207 (27.4%) and 48 (7.3%) in public universities, while tobacco was 173(23.1%) in public universities and in private universities the prevalence was27 (4.1%). A comparison of prevalence of current use of substances in public and private universities was performed using the t-test.

Table 4 revealed that for alcohol prevalence, there was a significant difference in mean of public (M=.321, SD=.467) which was higher than private (M=.222, SD=.416) t(782) = 19.208, p<.05. For cannabis, the mean of public (M=.088, SD=.284) was significantly higher than private (M=.031, SD=.173) t(782) = 8.693, p<.05. Tobacco, the mean of public (M=.043, SD=.204) was significantly higher than private (M=.026, SD=.159) t(782) = 5.958, p<.05. Lastly, for Shisha, the mean of public (M=.082, SD=.274) was significantly higher than private (M=.044, SD=.206) t(782)= 8.343, p<.05.

There were cases of poly drug use, where respondents indicated that they had used more than one substance in their lifetime or in the past three months. Table 4 shows the frequency of non-users, single substance users, and poly drug users in both public and private universities. The prevalence of poly drug use for lifetime users was 424 (29.5%) while the prevalence of single substance users was 278 (19.3%) therefore; poly drug users were more than those who used one substance. However, of the current users, the poly drug users were 162 (11.3%) compared to291 (20.3%) who were single users. This shows reduction of poly drug prevalence from lifetime to current use. A comparison of poly drug use in public and private universities revealed that in public universities 120 (8.2%) of the respondents had used more than one substance in the past three months while 42 (2.9%) of those in private

universities had used more than one substance. When the Chi-square was calculated, there was a significant relationship found between the prevalence of poly drug use among students and the type of university X^2 (2, N = 1437) = 24.278 p<.05). The most common combination of poly drugs use was the use of alcohol with cannabis, alcohol, tobacco and cannabis, alcohol, *khat* and *muguka* or alcohol, shisha and cannabis.

Discussion

The study compared the following demographic characteristics against the use of substance among university students. This included; year of study, religious practice, family setting and amount of pocket money. The results revealed that 264 (40.4%) female and 431 (56.0%) male students had ever used substances in their lifetime. While those who had used substances in the past three months were 198(30.3%) female and 342(44.5%) male. The results are in line with global survey conducted by WHO (2017) and UNODC (2017), which revealed that males are generally at higher risk of using substances than females. Among university students, studies have shown higher prevalence of substance use among male students (Adeoti et al., 2010; Atwoli et al., 2011; Osman et al., 2016). However, a study conducted among the undergraduate students the University of Uyo in Nigeria showed the contrary, more females (37.7%) than males (18.2%) had used substances in (Johnson et al., 2017).

The study revealed that substance use increased with the level of study. The respondents who indicated that they had used substances in the past three months were as follows; first years 30.9%, second year 32.6%, third year 38.5% and fourth year 49.8%. This increase was statistically significant X^2 (5, N = 1430) = 44.689, p<.05). This would mean that the students in third and fourth year are familiar with the university environment and surroundings; they can easily use substances without being found out by university administration. Some studies indicate that students in third and fourth year are likely to use more substances than other years of study: Magu, et.al (2013); Tesfaye et al. (2014); Bago, (2017). For example, a study conducted among students of Hawassa revealed that; students in third year were 3.74 times and those in fourth year were 6.02 times higher odds of cigarette smoking as compared with those first year students Bago, (2017). Therefore, understanding the year of study that students use substances may help in coming up with interventions that address issues at every level of study.

The study revealed a significant relationship between religious practice and substance use X2 (4, N = 1380) = 34.803, p<.05). Religious involvement and beliefs are part and parcel of the faith based universities in Kenya. Therefore, students are more likely to participate in such activities and may not engage in the use of substances. Religion has previously been indicated as a factor that protects university students from using substances. A study conducted by the National Survey on Drug Use and Health [NSDUH], (2013) indicated that 29.8% of youths reported that they had attended religious services 25 or more times in the past year. The rate of substance use was lower for those who were involved in religious activities. According to Thompson (2017), encouraging religious involvement of students reduces alcohol use in universities.

The results revealed a significant relationship between the type of family setting and the use of substance among university students X^2 (5, N = 1414) = 14.335, p<.05). Studies have shown that substance use is likely to increase in the case of parental absence because of either divorce, separation or death. Absence of a parent or both parents can be a cause of emotional distress and can lead to substance use (Hemovich, 2009; Gorgulu et al 2016).

The results revealed that the more the pocket money, the higher the substance use. There was an increase in the percentage of students using substances in relation to increment in pocket money for current use. This increase was statistically significant X2 (3, N = 1347) = 38.575, p<.05). Several studies have shown that a lot of pocket money increases the chances of using substances among universities (Tesfaye et al. 2011; Osman, 2016).

The overall lifetime prevalence of any substance was 699 (48.6%). While the overall current use prevalence of any of the substances used in the past three months was 545 (37.9%). This means that close to half of the respondents in public universities had used substances more frequently in the past three months than the private universities. There was a significant difference between prevalence of substance use in public and private universities for students. Most of the private universities in this study were faith-based institutions; such institutions mostly admit students who are willing to adhere to their rules and regulations. Most of the faith-based universities have an emphasis on religious activities and student involvement is encouraged. In addition, most of the private universities are very strict and vigilant in checking substance use among students. Therefore, such institutions, especially the faith- based universities are likely to attract students who would comply with non-use of substance rule (Miller, 2013).

High prevalence of substance use among students in public universities has been cited in several studies, including (Hassan et al., 2010; Atwoli et al., 2011; Magu et al 2013, & Tumuti et al., 2014). The studies revealed that students in public universities had a higher prevalence of substance use, with alcohol being the most commonly used substance. However, a few studies conducted in private universities in Kenya revealed that there is high prevalence of substance use (Wachira, 2016; Ndegwa et al., 2017). These studies argue that students in private universities have higher economic status and can afford to purchase substances. Secondly, due to competitive market trends in regards to admission of students, private religious sponsored institutions admit all students irrespective of their backgrounds. The university environment has less supervision and restriction compared to a high school environment, thus students make the transition from restricted life monitored by parents and teachers to a more self-directed life influenced by the university environment (Osman et al., 2016).

The commonly used substances in lifetime and current use were; alcohol, shisha, cannabis and tobacco. This means that students' level of exposure to alcohol, shisha, cannabis and tobacco was high; these substances are cheap and readily available. According to WDR, 2018, alcohol, tobacco and cannabis are the most commonly used substances. Such substances also referred to as gateway substances, can lead to students use of harder substances like cocaine and heroin.

One of the emerging substances, shisha, at 256 (17.8%), was among the most commonly used substances, second only after alcohol. Shisha use had more lifetime users than tobacco 187(13%); this would mean that shisha use is on the increase among university students. Aslam (2014) indicates that shisha is more popular than cigarettes because people believe that it is less harmful and it is socially accepted. Studies conducted in the United States of America reported a high prevalence of shisha use in universities, ranging from 10% to 27%. For instance, a study conducted in two large public universities in the Midwest and on the West Coast of the USA revealed that the prevalence of lifetime use of shisha was 27.8% (Brockman, Pumper, Christakis, & Moreno, 2012). Another study conducted at the University of San Diego, revealed that the prevalence of shisha smoking among university students was 24.5%. The findings further revealed that shisha smoking was higher among university students compared to all adults, whose prevalence was 11.2% (Smith et al., 2011).

In Africa, a study conducted by Van der Merwe et al. (2013) in the University of Cape Town among Health Science students revealed a higher prevalence of lifetime use of shisha; those who had smoked shisha in their lifetime were 66% and the students who were currently smoking shisha were 18%. In Rwanda, a study conducted at Kigali University indicated that the prevalence of those who had ever smoked shisha was 26.1% and those that had smoked it in the last month (30 days) were at 20.8% (Omotehinwa et al., 2018). The study further revealed that students had poor knowledge about the effect of shisha on health; about 40% had a low level of knowledge about the effect of shisha and such students were significantly more likely to use shisha than those with adequate knowledge about shisha $p < 0.001$. Shisha use is, therefore, on the increase

and there is a need to create awareness on its harmful effects.

Determining poly drug use is important because it reveals the prevalence, type of substances used and it shows the group of substances used together (Nkyi, 2015). Poly drug users were fewer than those who had used one substance in the past three months. However, studies show that poly drug use leads to development of health related problems (Martin, 2008). The results agree with the WDR (2018) findings. However, a study conducted among university students in Sudan revealed that students who had used a single substance were 45.7% and poly drug user were more 54.3% (Osman et al., 2016). In France, 8.9% of university students used poly drug almost daily in a month (Tavolacci et al., 2013). According to UNODC (2018), cases of poly drug use among college students, aged 18-29 were on the increase. The report revealed that alcohol was the most commonly used substance that would be consumed with at least one other substance. The common poly drug use combinations were the use of tobacco with alcohol, cannabis and alcohol, cocaine and alcohol and tranquilizers and alcohol. Counselling interventions should consider strategies that target poly drug users.

Conclusion

The prevalence of substance use among students in both public and private universities in Kenya is high. This is both lifetime prevalence of substance use and current use. Poly drug users were more than students who used a single substance. Alcohol is the most commonly used substance because of its availability and affordability. *Shisha* is the second commonly used substance and it is an emerging substance. There is need for universities to use prevention strategies that will target the non-users who were the majority, therefore postponing early use of substances. There is need to develop and implement interventions that focus on poly drug users to mitigate the potential risk of developing substance use disorders.

Tables and Figures

Table 1: Demographic characteristics (A) of the Respondents

Variable	Public	Private	Overall
Year of study	n=781	n=657	n=1438
1st	213 (27.3)	163 (24.8)	376 (26.1)
2nd	177 (22.7)	243 (37)	420 (29.2)
3rd	160 (20.5)	140 (21.3)	300 (20.9)
4th	205 (26.2)	92 (14.5)	297(20.7)
5th	18 (2.3)	12 (1.8)	30 (2.1)
Age in years			
29-32	7 (0.9)	14 (2.1)	21 (1.5)
25-28	46 (5.9)	35 (5.3)	81 (5.6)
21-24	454 (58.3)	368 (56)	822(57.2)
17-20	242 (31.1)	218 (33.2)	460 (32)
Gender			
Female	335 (42.9)	318 (42.9)	653 (45.4)
Male	439 (56.2)	330 (50.2)	769 (53.5)
Marital status			
Divorced	10 (1.3)	16 (2.4)	26 (1.8)
Separated	25 (3.2)	11 (1.7)	36 (2.5)
Widowed	5 (0.6)	3 (0.5)	8 (0.6)
Married	17 (2.2)	11 (1.7)	28 (1.9)
Single	717 (91.9)	609 (92.7)	1326 (92.3)

Demographic characteristics (B) of the Respondents

Variable	Public n=781	Private n=657	Overall n=1438
Religious preference			
Hindu	10 (1.3)	11 (1.7)	21 (1.5)
Adventist	108 (14)	90 (13.7)	198 (13.8)
Muslim	18 (2.3)	32 (4.9)	50 (3.5)
Protestant	382 (49.4)	310 (47.2)	692 (48.4)
Catholic	234 (30.3)	198 (30.1)	432 (30.2)
Religious practice			
Once a day	255 (32.7)	254 (38.7)	509 (35.4)
Once a week	388 (49.8)	333 (50.7)	721 (50.2)
Once a month	52 (6.7)	29 (4.4)	81 (5.6)
Once a year	30 (3.9)	11 (1.7)	41 (2.9)
Family set up			
Living with both parents	540 (69.3)	467 (71.1)	1007 (70.1)
Guardian	11 (1.4)	15 (2.3)	26 (1.8)
Orphaned	27(3.5)	30 (4.6)	57 (4)
Single parent	102 (13.1)	90 (13.7)	192 (13.4)
Step parent	37 (4.7)	17 (2.6)	54 (3.8)
Parents separated	53 (6.8)	25 (3.8)	78 (5.4)
Monthly pocket money(USD)			
≤ 20	275 (35.5)	318 (48.4)	593 (41.4)
21-40	233 (30.1)	149 (22.7)	382 (26.7)
41-60	108 (14)	84 (12.8)	192 (13.4)
61 and above	103 (13.3)	77 (11.2)	180 (12.6)

Figure 1: Lifetime Prevalence of Substances Use

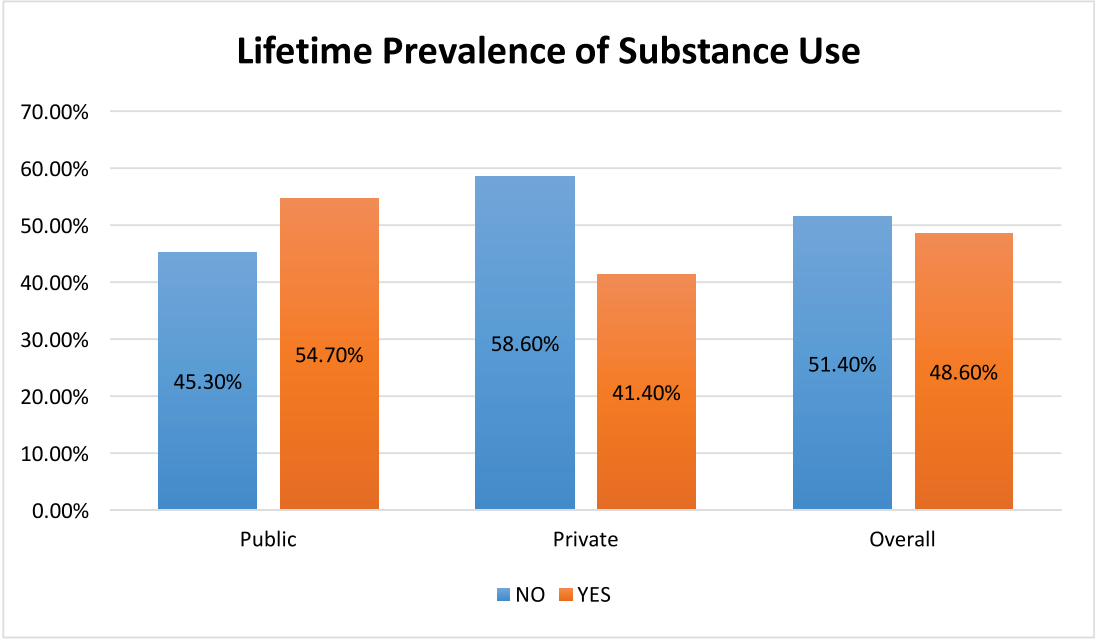


Table 2: Lifetime use of all substances

Variable	Public	Private	Overall
Tobacco	109 (14%)	78 (11.9%)	187(13.0%)
Shisha	149(19.1%)	107 (29%)	256 (17.8%)
Kuber	33(4.2%)	29(4.4%)	62(4.3%)
Alcohol	376(48.2%)	245(37.3%)	621 (43.2%)
Cannabis	121(15.5%)	83 (12.7%)	204 (14.2%)
Cocaine	28 (3.6%)	11 (1.7%)	39 (2.7%)
Amphetamine	19 (2.4%)	5 (0.8%)	24 (1.7%)
Inhalants	9 (1.9%)	5 (0.8%)	14 (1.0%)
Sedatives	34 (4.4%)	37 (5.6%)	71 (4.9%)
Hallucinogens	3(0.4%)	9(1.4%)	12 (0.8%)
Opioids	9(1.2%)	10(1.5%)	19 (1.3%)
Khat	100(12.8%)	65(9.9%)	165 (11.5%)
Muguka	63(8.1%)	53(8.1%)	116 (8.1%)

Table 3: *Current use prevalence of substance use in Public and Private Universities*

University Category	N	Mean	SD	Std. Error Mean	Mean Difference	T	Df	Sig. (2-tailed)
Public	780	.48	.500	.018	.22	8.936	1435	.000
Private	657	.26	.437	.017				

Table 4: Prevalence of Poly drug users – lifetime use and current users

	Lifetime users			Current users		
Responses	Public	Private	Combined	Public	Private	Combined
Non User	353 (24.6%)	382 (26.6%)	735 (51.1%)	497 (34.6%)	485 (33.8%)	982 (68.4%)
Single user	174 (12.1%)	104 (7.2%)	278 (19.3%)	166 (20.3%)	125 (8.7%)	291 (20.3%)
Poly users	253 (17.6%)	171 (11.9%)	424 (29.5%)	120 (8.4%)	42 (2.9%)	162 (11.3%)
Total	780 (54.3%)	657 (45.7%)	1437 (100.0%)	783 (54.6%)	652 (45.4%)	1435 (100.0%)

Reference

Akmartov, K., Mikolajczyk, T. Meier.S., & Kramer, A. (2011). Alcohol consumption among university students in North Rhine-West Phalia, Germany; results from a multicentre cross-section study. *Journal of American College Health, 59*(7), 620-626.

Arbour-Nicitopoulos, K., Kwan, Y., Lowe, D., Taman, S. & Faulkner, G. (2010). Social Norms of Alcohol, Smoking, and Marijuana use within a Canadian University Setting. *Journal of American College Health, 59*(3) 191-196.

Atwoli, L., Mungla, P., Ndungu, N., Kinoti, K., & Ogot, M. (2011). Prevalence of substance use among college students in Eldoret, Western Kenya. *BMC psychiatry Published online* 11(1), 34-42 doi: 10.1186/1471-244-11-34.

Aslam, M., Saleem, S., German, S., & Qureshi, W. A. (2014). Harmful effects of shisha: Literature review. *International Archives of Medicine*, 7(16), 7-16.

Ayala, E., Roseman, D., Winseman, J., & Mason, H. (2017). Prevalence, perceptions and consequences of substance use in medical students. *Medical Education Online,* 22 (1), 1392824.

Brockman, N., Pumper, A., Christakis, A., & Moreno, M. (2012). Hookah's new popularity among US college students: A pilot study of the characteristics of hookah smokers and their Facebook displays. *Bio-Medical Journal*, doi: 10.1136/bmjopen-2012-001709

Bago, B.J. (2017). Prevalence of cigarette smoking and its associated risk factors among students of Hawassa University, College of Medicine and Health Sciences. *Journal of addiction, Research and Therapy* 8 (4) 331-340

Carter, A. Brandon, K., & Goldman, M. (2010). The college and non-college experience: A review of the factors that influence drinking behaviour in young adulthood. *Journal of Studies on Alcohol and Drug,* 71, 742-750.

Chiauzzi, E., Donovan, E., Black, R., Cooney, E., Buechner, A., & Wood, M. (2011). A survey of 100 community colleges on student substance use, programming & collaborations. *Journal of America College Health,* 59(6), 563-573.

Görgülü, Y., Çakir, D., Sönmez, M. B., Köse Çinar, R., & Vardar, M. E. (2016). Alcohol and psychoactive substance use among university utudents in Edirne and related parameters. *Noro psikiyatri arsivi,* 53(2), 163-168.

Hemovich, V., & Crano, W. D. (2009). Family structure and adolescent drug use: an exploration of single-parent families. *Substance use & misuse,* 44(14), 2099-2113.

Humenuik, R., Ali, R., Babor, T., Farrell, M. & Formigoni, M. (2010). Validation of the Alcohol, Smoking and Substance Involvement Test (ASSIST). *Addiction* 103(6), 1039-1047.

Magu, D., Mutugi, M. & Ndahi, L., & Wanzala, P. (2013). Substance abuse among students in public universities in Kenya. *African journal of Health Sciences* 22(3).

Makanjuola, A., Daramola, T & Obembe, A. (2007). Psychoative substance use amongMedical students in a Nigerian university. *World Psychiatry* 6(2), 112-114.

Martin C. S. (2008). Timing of alcohol and other drug use. *Alcohol research & health: the journal of the National Institute on Alcohol Abuse and Alcoholism,* 31(2), 96–99.

Miller, K. (2013). The effects of college student spirituality on alcohol use and sexual behavior: A comparison of faith based & non-faith based institutional NCHA data (Published doctoral dissertation)

George Fox University. Retrieved from http://digitalcommons.Georgefox.ed/psyd/122.

Muriugi, K., Ndetei, D., Karanja, J., & Cyrus, W. (2014). Alcohol and substance abuse risk among students at the Kenya Medical Training College. *Mental Health and Substance Use: Dual Diagnosis,* 7(2), 125-133.

National Campaign against Alcohol and Drug Abuse. (2010). Drug and substance abuse in tertiary institutions in Kenya: A situational analysis. Nairobi: Author.

National Survey on Drug Use and Health: summary of national findings (2013). Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality.

Ndegwa, S., Munene, A., and Oladipo, R. (2017). Factors influencing Alcohol Use among University Students in a Kenyan University. *African Journal of Clinical Psychology*, 1:102-117.

Nkyi, A. (2015). Adolescents' Use of Alcohol, Tobacco, and Marijuana: The Gateway to Other Drugs. *International Journal of Psychology and Behavioural Sciences* 5(4): 158-168

Omotehinwa, O., Ogendi, J., Iyamuremye, J., & Habtu, M. (2018). Shisha use among students in a private university in Kigali City, Rwanda: Prevalence and associated factors. *Bio Medical Center Public Health*, 18, 713. doi.org/10.1186/s12889-018-5596-1

Onifade, P., Olubunmi, A., Adiodun, A., Sotunsa, J., Ladipo, O & Adesanya, O. (2014).

Psychometric properties of Alcohol, Smoking and Substance Involvement Screening Test (ASSIST V 3.0) Among University Students. *Journal of Addictive Behaviors, Therapy and Rehabilitation* doi.org/10.4172/232-90054.1000126.

Osman, T., Victor, C., Abdulmoneim, A., Mohammed, H., Abdalla, F., Ahmed, A., Ali, E. and Mohammed, W. (2016). Epidemiology of Substance Use among University Students in Sudan. *Journal of Addiction*, 1-9.

Smith, R., Edland, D., Novotny, E., Hofstetter, R., White, M., Lindsay, P., & Al-Delaimy, K: (2011). Increasing hookah use in California. *American Journal of Public Health, 101 (10):1876–1879.*

Steyl, T. and Phillips, J. (2011). Actual and perceived substance use of health science Students at a university in the Western Cape, South Africa. *African Health Sciences 11(3), 329 – 333.*

Tavolacci, M. P., Ladner, J., Grigioni, S., Richard, L., Villet, H., & Dechelotte, P. (2013). Prevalence and association of perceived stress, substance use and behavioral addictions: A cross-sectional study among university students in France, 2009–2011. *Bio-Medical Centre Public Health,* 13, 724.

Tesfaye, G., Derese, A., & Hambisa. (2014) Substance use and associated factors among University students in Ethiopia: A cross section throughout the life span. *Journal of addiction,* 8(96937), 18-34.

Thompson W. E. (2017). Social Support, Religious Involvement and Alcohol Use among Students at a Conservative Religious University. *Behavioral sciences (Basel, Switzerland),* 7(2), 34. doi:10.3390/bs7020034.

Tse, E. C. (2011). A comparative analysis of alcohol consumption pattern among global university students. International CHRIE Conference (pp. 1-11). Massachusetts: ScholarWorks@UMass Amherst.

Tumuti, S., Wangeri, T., Waweru, E., & Rono, A. (2014). Prevalence, Drug used, Sources & Awareness of curative and Preventive measures among Kenyatta University Students, Nairobi County,

Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies* 5(3), 352-361.

United Nations Office on Drugs and Crime (UNODC), World Health Organization (WHO). (2017). Good Policy and Practice in Health Education Booklet 10: Education Sector Responses to the Use of Alcohol, Tobacco and Drugs.

United Nations Office on Drugs and Crime, World Drug Report 2014 (United Nations Publication Sales No E.14.XI.7).

United Nations Office on Drugs and Crime, World Drug Report 2012 (United Nations publication, Sales No. E.12. XI.1).

Van der Merwe, N., Banoobhai, T., Gqweta, A., Gwala, A., Masiea, T., Misra, M., & Zweigenthal, V. (2013). Hookah pipe smoking among health sciences students. *South African Medical Journal,* 103(11), 847-849. doi:10.7196/SAMJ.7448.

World Drug Report (2018). United Nations publication (Sales No. E.18.XI.9).

World Health Organization (2017). Disease burden and mortality estimates, Global Health Estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015.

World Health Organization (2012). Management of substance abuse: Other psychoactive substances. Retrieved from the World Health Organization website: http://www.who.int.substance_abuse/facts/psychoactives/en/index.html.

Policy Brief on the Narcotics, Drugs and Psychotropic Substances (Control) Amendment Bill

Kirwa Lelei[1]*, John Muteti[1], Victor Okioma[1] and Adrian Njenga[1]

*National Authority for the Campaign against Alcohol and Drug Abuse, Kenya

***Corresponding Author:**

Kirwa Lelei,

Directorate of Research and Policy Development, National Authority for the Campaign Against Alcohol and Drug Abuse, Kenya.

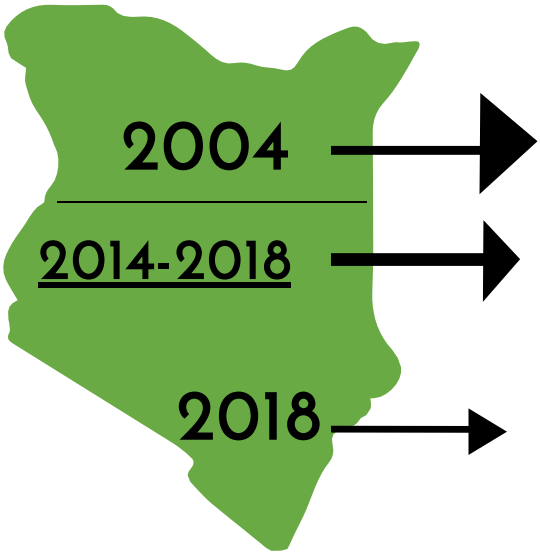
Email Address: kirwa@nacada.go.ke

Submitted: 14th December 2021

Published: 31st December 2021

Introduction

The Narcotics, Drugs and Psychotropic Substances (Control) Act No. 4 of 1994 provides the framework for combating abuse of narcotics, drugs and psychotropic substances in Kenya. The law provides the parameters on the control, possession, transportation, trafficking and use of narcotic drugs and psychotropic substances.



1000 kilogrammes of cocaine was seized in Kenya making it one of the biggest drug seizures in Africa.

Kenya was among the top **13** frequently mentioned countries of origin, departure and transit of trafficking in cannabis; and was one of the main countries that heroine was trafficked along the southern route to Western and Central Europe during that period.

1.5 tonnes of heroine was seized in Kenya making it one of the countries with seizure of the largest quantity of heroin.

Governance Impacts from Safety and Security, and Economic Perspectives:

In 2019, there were increasing gang attacks in the Coastal region of Kenya which the National Police Service attributed links with drug cartels. These increasing criminal attacks have had an adverse impact on the tourism sector and somewhat dent Kenya's image in terms of safety and security.

Negative Social Impact:

Type of Narcotic Drug and Psychotropic Substance	Available in school neighborhood (Total number of interviewed Students- 3907)		Available and taken in school (Total number of interviewed Students- 3907)	
	Frequency	%	Frequency	%
Cocaine	521	13.3%	268	15.3%
Heroine	498	12.8%	244	6.2%
Mandrax	440	11.3%	253	6.5%
Rohypnol	305	7.8%	170	4.4%

Source NACADA: Table 0.7 Drugs that are available and taken by students. (p.18)

Criminal Justice Sector Perspective:

There has been increase in cases heard and concluded by the Judiciary during the period 2016 to 2018 under the Narcotics Drugs and Psychotropic Substances (Control) Act No. 4 of 1994 that confirms the magnitude of the problem.

Category of Offences	2016	2017	2018	% of difference between 2017 and 2018
Dangerous Drugs	6160	5565	8021	44.1

Source: State of the Judiciary and the Administration of Justice Annual Report 2018/2019 (p.319)

Source	%
Friends	32.2%
Home	29.3%
Other students	25.7%
Bar near School	22%
Local brew den	19.1%
Kiosks/shop near school	16.9%
Relatives	16.7%
Non-teaching school workers	7.4%
Parents	5.3%
Teachers	4.8%

Most commonly mentioned source of substances abuse by school going children

Likelihood of Drug use among students	%
During weekends	30.4%
During Inter-school meetings	27.8%
During School outings	27.3%
During Entertainment in school	24.4%
During games	23.7%
During school trips	21.8%

Within the school environment, students are more likely to use drugs:

Drugs and substances are more likely to be used:

48.5% *During school holidays*

35.1% *On students' way to home*

Gaps and Challenges in Enforcement of the Law to Combat the Abuse of Narcotics, Drugs and Psychotropic Substances

1. Penalties imposed under the law are lenient. As a result, drug traffickers have paid the fines and continued with their illicit activities. The market value of the drugs informs the fines and imprisonment imposed on convicted persons; these keep on changing; hence the sentences vary. Due to uncertainty of the sentences prescribed under the law, over the span of 12 years (2007-2019), 2,480 cases were filed at the High Court by convicted persons, who successfully appealed against the fines and imprisonment sentences imposed on them at Magistrates' Courts.

2. The law is outdated and not alive to the current realties where drug traffickers use precursor chemicals to manufacture narcotic drugs. The law does not impose control over, and punish the unlawful use of precursor chemicals.

3. The law does not have specific provisions punishing law enforcement officers committing offences related to drug trafficking, which has become a global concern.

4. The law does not have specific provision to punish persons conspiring in Kenya or outside Kenya to commit offences related to trafficking. Therefore, drug traffickers have thrived on conspiring outside Kenya to commit drug trafficking offences in Kenya or conspired outside with persons to commit such related offences. Due to absence of stringent law punishing conspiracy related to drug trafficking, the crime has flourished. This is not only a Kenyan concern but also regional and global one.

5. Challenges in timely and effective investigations and prosecution as the law governing narcotics, drugs and psychotropic substances does not provide for securing crucial evidence through interception of communications amongst drug traffickers and conspirators; and for the request of information and evidence from foreigners who may have information.

6. The law does not have adequate punishment for the concealment of information by persons or failure to disclose information to aid in investigation and prosecution of offences related to drug trafficking has contributed to the crime

Proposals by the Narcotic Drug and Psychotropic Substances (Control) (Amendment) Bill, 2020

1. Enhance penalties on the offences relating to possession and trafficking in narcotics and psychotropic substances.

The proposals stipulate penalties per the weight of narcotic drugs and psychotropic substances. Therefore, the courts will have the parameters for imposing appropriate punishment in the form of fines and or imprisonment that deters potential perpetrators.

2. Define precursors and chemical substances that may be used in manufacture of narcotics.

The Bill proposes fine of not less than Kshs. 50 million, and imprisonment of not less than 20 years for manufacturing, possessing or transporting precursor chemicals for unlawful production of a narcotic drug.

3. Define a law enforcement officer and prescribes offences for law enforcement officers who aid or collude with persons suspected of committing offences under the law.

This proposed amendment seeks to address the gaps where law enforcement officers aid or collude with suspects committing offences related to possession and trafficking narcotic drugs and psychotropic substances.

4. Introduce the offence of conspiring with persons outside or inside Kenya to commit offences related to drug manufacturing, possession and trafficking in or outside Kenya.

The penalty for conspiracy is a fine of not less than **Kshs. 100 million** and imprisonment for life.

5. Introduce the offence of collecting, generating or transmitting information for use in committing offences under the law.

Proposed penalty is a fine of not less than Kshs. 5 million or imprisonment of not less than 5 years or both.

6. Enhance effective prosecution of offenses.

The Bill proposes to mandate the Director of Public Prosecution to request for information or evidence where a person including foreign governments or an entity alleges or has information that a person has committed offences under the Narcotic, Drugs and Psychotropic Substances (Control) Act.

7. Seeks to enhance effective investigation by police officers by providing for the power to intercept communication and production of that communication in court as evidence.

The Bill proposes that a police officer above the rank of chief inspector of police may apply to the High Court for an order to intercept communication. Prior to applying for the order to intercept communication, the police officer has to seek written consent from the Director of Public Prosecution.

Conclusion and Policy Recommendations:

The proposed Bill is undoubtedly a strong step in the right direction. Based on the above background the following concrete steps ought to be undertaken for the adoption of the Bill:

- Consolidate Efforts with Ongoing Amendments under Narcotic, Drug and Psychotropic Substances (Control) Act No. 4 of 1994.
- Multi-sectoral Engagement with Key Stakeholders.
- Media Engagement to Create Demand for Passage of the Bill.
- Integrate Proposed Amendments of the Bill in County Model Legislation.
- Enlist Public Support from the Office of the President.
- Enlists Proponents of BBI in Parliament to Pass the Bill.
- Engage Witness Protection Agency and the Director of Public Prosecution to provide input into the Bill.
- Integrate Proposal of the Bill into the Alcohol and Drugs Abuse Prevention Policy.

NACADA

NSSF Building 18th Floor, Eastern Wing, Block A
P.O. Box 10774 - 00100 Nairobi
Phone: +254 202721997
Email: info@nacada.go.ke
Website: www.nacada.go.ke