



LIFETIME PREVALENCE AND DETERMINANTS OF RELAPSE
AMONG PATIENTS WITH SUBSTANCE USE DISORDER AT ST.
PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

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Addis Ababa, Ethiopia

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ABSTRACT

Background: Substance use disorder is an interlinked biopsychosocial problem that affects millions of people in Ethiopia. The chronic nature of SUD makes relapse after successful treatment fairly common in both high- and low-income nations. Despite this, little is understood regarding relapse prevalence and risk factors among patients with SUD in Ethiopia. Hence, this study aimed to assess the lifetime prevalence of relapse and associated risk factors among patients with substance-use disorders receiving treatment at Saint Paulo's Hospital Millennium Medical College, Ethiopia.

Methods: A cross-sectional survey was conducted among 180 patients with SUD at SPHMMC. Convenience sampling techniques were used to include the study participants. An interviewer-administered questionnaire was used to collect data on the determinants of relapse. The data were analysed with descriptive statistics and logistic regression models. Multiple logistic regression analysis using SPSS version 20 were used to determine the factors associated with relapse among the patients with SUD.

Results: One hundred eighty patients with SUD have participated in the study, with a response rate of 100%. The findings of this study indicated that the majority (96.1%) of the participants were males. About 42% of relapsed participants were aged between 21 and 30 years. The results showed a higher lifetime prevalence of relapse among patients with SUD (80.6%). The multiple logistic regression analyses indicated that among the risk factors for relapse, difficulty controlling craving [OR= 5.32, 95% CI (1.19 - 23.68), P=.028], easy access to substances [OR= 3.47, 95% CI (.91 - 10.56), P= .04], peer pressure [OR= 4.05, 95% CI (.59 - 14.71), P=.031], and experiencing negative emotional states [OR= 5.51, 95% CI (1.49 - 20.41), P=.010] were independently associated with relapse in SUD patients.

Conclusions: This study showed a high lifetime prevalence of relapse among patients with SUD. Cravings, easy access to substances, peer pressure, and experiencing negative emotional states were variables that predicted the relapse of SUD patients. Clinicians are recommended to assess those factors that are most strongly associated with relapse risk. Future studies with a prospective multicenter study design could fill a knowledge gap with regard to relapse and associated risk factors among patients with SUD.

Keywords: Substance use disorder, Relapse, lifetime prevalence, Risk factors

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ACRONYMS

AMSH	Amanuel Mental Specialized Hospital
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th ed
MMT	Methadone maintenance treatment
OPD	Outpatient department
SPHMMC	Saint Paul's Hospital Millennium Medical College
SPSS	Statistical Package for Social Science
SUD	Substance use disorder

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1. Introduction

1.1 Background

Substance abuse is a global problem, and the United Nations Office on Substances and Crime (UNODC) estimated that in 2009, about 149-271 million people aged 15-64 years had used an illicit substance at least once(1). These estimates varied by geographic region and drug type. Cannabis was the most extensively produced and used illicit drug, causing dependence and other mental health issues. Because all negative effects are not taken into account, it is harder to determine the illness burden of illicit drugs, which includes drug overdose, hepatitis and HIV infections, and legal concerns.

According to the 2014 World Drug Report, 1 in 20 individuals between the ages of 15 and 64 took illicit drugs in the previous year. 12% of people who report using drugs are also thought to have a drug use disorder. The recent drug report also revealed growing cocaine and heroin use in the United States and cannabis as the most trafficked narcotic globally(2).

In Ethiopia, a community-based nationwide survey on substance use among adults in 2015 found the overall prevalence of current khat chewing at 15.8%, alcohol consumption at 40.7%, and tobacco use at 4.2%(3,4,5). Additionally, a study among university students in Ethiopia revealed a lifetime prevalence of at least one substance, reaching 62.4% (6).

Substance use disorder is an interlinked biopsychosocial problem, and relapse after drug addiction treatment is quite common. In terms of substance use disorder, relapse means a return to the previous substance use behaviors after treatment due to several psychosocial and other related factors(7).

Substance use disorder is a chronic illness with remitting and relapsing patterns. The relapse rates are in the range of 40–60%, and these rates are equivalent to those of other chronic medical conditions like type 1 diabetes (30–50%), hypertension(50–70%), and bronchial asthma(50–70%)(8). Although drug addiction recurrence is very likely, it can be somewhat avoided by identifying and treating the various factors contributing to relapse.

A meta-analysis study was conducted among individuals with alcohol and tobacco use disorders who were monitored for 1 year and onward to determine the effect of abstinence duration on relapse risk. The study emphasized that uninterrupted abstinence could forecast successful treatment outcomes and showed that the rate of relapse reduces over time(9).

Previous studies have shown that negative mood states, external pressure for use, family or social problems, low self-efficacy, a lack of coping skills, and drug availability were the main factors contributing to relapse(10,11).

Studies have demonstrated that neurobiological mechanisms, in addition to psychosocial factors, play a role in the onset of substance use disorder as well as relapse. The addiction cycle involves

first the instant activation of the brain's reward system by drugs, which stimulates further use, leading to dependence. The next stage would be when the person attempted to quit using the substance. Withdrawal effects make the individual more likely to relapse. Furthermore, the conditioned internal or external cues that were linked to previous substance use cause craving and, when not cognitively controlled, lead to a high likelihood of relapse(12).

1.2 Statement of the problem

In Ethiopia, substance use disorder is a serious public health problem that has an impact on people, families, and healthcare systems. A data from the 2016 Ethiopian Demographic and Health Survey showed that the current use of substances among young people aged 15-24 years was 46.74%(13).

Relapse in substance use is quite common after successful completion of the detoxification process. According to a study(14)on the prevalence of relapse that was conducted at Amanuel Mental Specialized Hospital in Ethiopia, there was a 48% prevalence, which showed one in every two patients with a substance use disorder would relapse. Several studies identified demographic variables and psychosocial factors as the determinants of relapse among patients with SUD.

Addiction relapse is a significant problem that interferes with an individual's psychological, physical, and social dimensions of functioning. Understanding the risk factors associated with relapse is important to develop strategies for the prevention of substance use relapse. For SPHMMC, however, there was no available information regarding risk factors and relapse rates among patients with SUD.

1.3 Significance of the study

The purpose of this study is to provide important information about the prevalence of relapse and associated psychosocial and demographic risk factors linked to relapse among patients with SUD at SPHMMC. Furthermore, by using the results of this study in the local context, practitioners will be able to identify and address the most important risks for relapse during the course of therapy. The findings of this study can also be used to develop guidelines for relapse prevention programs and as a baseline source for future research in the field.

2. Literature review

2.1: Global studies

A cross-sectional study was conducted among 60 participants in Bangladesh to investigate the psychosocial factors associated with addiction relapse. The data was collected and analysed using a semi-structured questionnaire and a logistic regression model. The study indicated that negative emotions were strongly associated with relapse, while peer pressure, lack of assertiveness, and self-efficacy contributed to relapse at a moderate level. The researchers

concluded that psychological factors were more strongly associated with substance abuse relapse than social factors(7).

Another study was carried out to identify factors leading to relapse in 104 patients at five Australian treatment facilities between November 2002 and March 2003. The effect of family dysfunction, mood states, the major drug of dependency, and demographic factors in relation to relapse episodes was studied using a self-report questionnaire. The findings demonstrated that relapse was associated with negative mood states (61.5%), external pressure to use (17.3%), and family dysfunction (8.7%), but not with the primary drug of dependency(15).

In Iran, a research study was conducted among 4175 patients to identify the factors that lead to relapse in individuals undergoing methadone maintenance treatments. The study found a relapse rate of 76.6%, and the factors that were identified included a younger age at first substance use, a lower cost for buying substances, and a frequency of methadone therapy. The researchers recommend that health care providers should be aware of these factors in order to improve outcomes for patients with substance-related disorders(16).

Another prospective study in Iran conducted a six-month follow-up on 436 patients with substance use disorders after treatment in a rehabilitation center. The predictor variables were the demographic, personal, and environmental characteristics of patients and were assessed with the chi-square test and logistic regression model. The study found that 64% of patients relapsed within the study period, and among the factors contributing to relapse were drug use in the family, being unemployed, and staying connected with drug user friends(17).

A cross-sectional study was conducted in Malaysia to assess the factors influencing drug relapse among 400 relapsed drug addicts. The study found that low self-efficacy, a negative attitude by the community, and a lack of family support were the main contributing factors to their relapse. The study concludes that despite effective treatment in the rehabilitation center, a lack of efficacy for solving life challenges and a lack of acceptance by the community may lead drug addicts to relapse(18)

The pattern of addiction and its relapse were assessed in a Lahore treatment center among 119 clients using a cross-sectional survey. The study revealed that the majority of clients started using substances before the age of 25 years old, and the causes of relapse were reported as peer pressure among 50 percent and an inability to control cravings among 30 percent of clients(19).

A cross-sectional study was conducted to identify the contributing factors to the relapse among clients attending the rehabilitation center in Dharan. The study included 72 respondents with a simple random sampling technique. The study found that lack of self-confidence, peer pressure, easy accessibility of drugs, and lack of acceptance by the community were the contributing factors to relapse. In addition, the results revealed that the majority of respondents relapsed within 90 days after abstinence(20).

A follow-up study conducted in the USA analysed the impact of social support on 748 patients after short-term inpatient treatment for cocaine and alcohol use disorders. The study revealed that, despite a significant reduction from their baseline rates of 69% and 15%, 22% of cocaine

users continued to use on a weekly or more frequent basis, while 9% of alcohol users drank at least three times per week. The most consistent factor associated with both substance use outcomes was identified as posttreatment social support networks(21).

Another follow-up study was conducted at Cedar Treatment Centre in Canada among 206 patients to determine the factors that affect relapse at a six-month follow-up. The study showed that 73.3% of patients were abstinent at six months post-treatment, with 19.4% experiencing 1-3 slips and 7.3% experiencing a full relapse. Among the factors, males were found to be more likely to remain abstinent compared to females. There was also a significant effect of 12-Step and other mutual self-attendance group participation post-treatment on abstinence. However, other factors such as the length of stay, age of patients, and primary drug of concern did not have a significant relationship with abstinence at six months post-treatment(22).

A three-month follow-up study among 249 patients was conducted in Norway to assess the role of mental distress and intrinsic motivation for relapse. The study revealed a prevalence of 37%, and factors such as younger age and having psychiatric comorbidity before treatments were associated with an elevated risk of relapse, while having inpatient treatment completed was associated with a reduced risk of relapse. But the study did not show any association between pretreatment motivation and relapse risk. The study concludes that identifying the treatment needs of young patients and co-morbid psychiatric diagnoses during and following inpatient substance use disorder treatment could reduce the risk of relapse(23).

In India, a study was conducted to evaluate the rates of relapse and related factors among 133 individuals with a dual diagnosis of severe mental disease. The study revealed that after receiving therapy in a residential setting, 68% of patients at 6 months and 52% of patients at 12 months of follow-up had sustained remission. Among the factors, older age and living in residential treatment programs were characteristics that were more strongly linked to 12-month remission maintenance. Other factors that had an association with the maintenance of remission were employment status and comorbid mental illness other than schizophrenia and schizoaffective disorder, with a modest level of significant relationship. The researcher concludes that this finding may be helpful with other research findings to implement treatment strategies and prevention plans for patients with dual diagnoses(24).

An observational study with a cross-sectional design was also done in India to assess the relapse risk factors among 284 clients. The study reported that the most common causes of relapse were peer pressure (77.8%), curiosity or acting out, and having psychiatric comorbidity. A regular follow-up with family support was recommended to prevent relapse(25).

2.2:Regional studies

In a study in Ghana on the precipitants of substance abuse relapse, data were collected through in-depth interviews with 15 relapsed cases who were previously treated at a psychiatric rehabilitation center. The study showed that negative or positive emotional reinforcement of drugs, significant personal loss, peer pressure, and interpersonal conflict at home or work are associated with a return to substance use after periods of abstinence. As a result, they emphasize

the importance of coping skills, assertiveness, and family support to prevent relapse among substance abusers(26).

Another study in South Africa examined the causes of relapse among young African adults after inpatient drug abuse treatment. The study utilized a cross-sectional quantitative study design and purposive sampling technique among 44 patients from the Gutenberg Province Treatment Centre. The study found that negative emotions, a lack of coping skills, peer pressure, easy drug availability, a lack of support, and stigmatization by the community were the primary factors contributing to relapse. The study recommends individualized coping skill training, social support, and aftercare follow-up to help individuals maintain abstinence(11).

To ascertain the causes and prevalence of substance use relapse, a study was carried out at the Icyizere Psychotherapeutic Centre (IPC) in Rwanda. 391 patients with substance use disorder (SUD) participated in a retrospective cross-sectional survey during the five years from 2014 to 2018. The prevalence was found to be 59.9%, and patients who lived only with their mother, stayed fewer than three months in the hospital, and abused two or more substances had a higher risk of relapse. Other factors that are associated with relapse include peer pressure, drug accessibility, and family disputes. The study concludes that relapse rates are high, and as a result, longer follow-up periods are necessary to prevent relapse(27).

A cross-sectional study was done in Lagos, Nigeria, on the prevalence and sociodemographic factors of relapse among 228 patients with substance use disorders. A self-administered questionnaire and medical records were used for data collection. The study found a prevalence of relapse at 51.3%, and among the factors, patients of young age, higher levels of education, and family history of substance use were significantly related to higher relapse rates. The study concludes that substance abuse relapse after treatment is high, and prevention programs need to target younger individuals who have a high risk of relapse(28).

2.3: National studies

An Ethiopian study was conducted to assess the causes of relapse among six patients with substance use disorders who were on treatment at SPHMMC and AMSH. The study was qualitative in design, and patients were selected for in-depth interviews. The study found that negative emotional states, a lack of support, and peer pressures were the contributing factors for relapse; accessibility of drugs and economic problems were also significantly associated with relapse. The study concludes that psychosocial factors contribute to addiction relapse and recommends addressing the root cause of relapse(29).

In another Ethiopian cross-sectional study at Jimma University Hospital Medical Centre in 2019, the lifetime prevalence of relapse among 178 mentally ill patients was found to be 70.2%, and medication non-adherence, current level of functional status, and having a single admission history were the factors significantly associated with relapse. The study concluded that psychoeducation about medication adherence as well as enhancing the functional status of mentally ill patients could reduce relapse(30).

The prevalence of substance use relapse and its contributing factors were examined in a cross-sectional study at AMSH. About 100 patients with substance use disorders who were receiving treatment at the rehab facility participated in the study. The finding indicated that the causes of relapse were difficulty managing anger and frustrations, easy access to drugs, and peer and friend pressure(14).

Another qualitative study was conducted at AMSH Rehabilitation Centre to identify the psychosocial factors that trigger relapse among eight patients with SUD. The study revealed that negative emotional states, insufficient support, and peer pressures were the psychosocial factors that led to relapse. Apart from these factors, the availability and accessibility of substances and the working environment were also found to contribute to relapse. The study highlighted the consequences of relapse that affect various aspects of the patients' lives, including their health, economy, employment status, and personal relationships(31).

2.4: Conceptual Framework

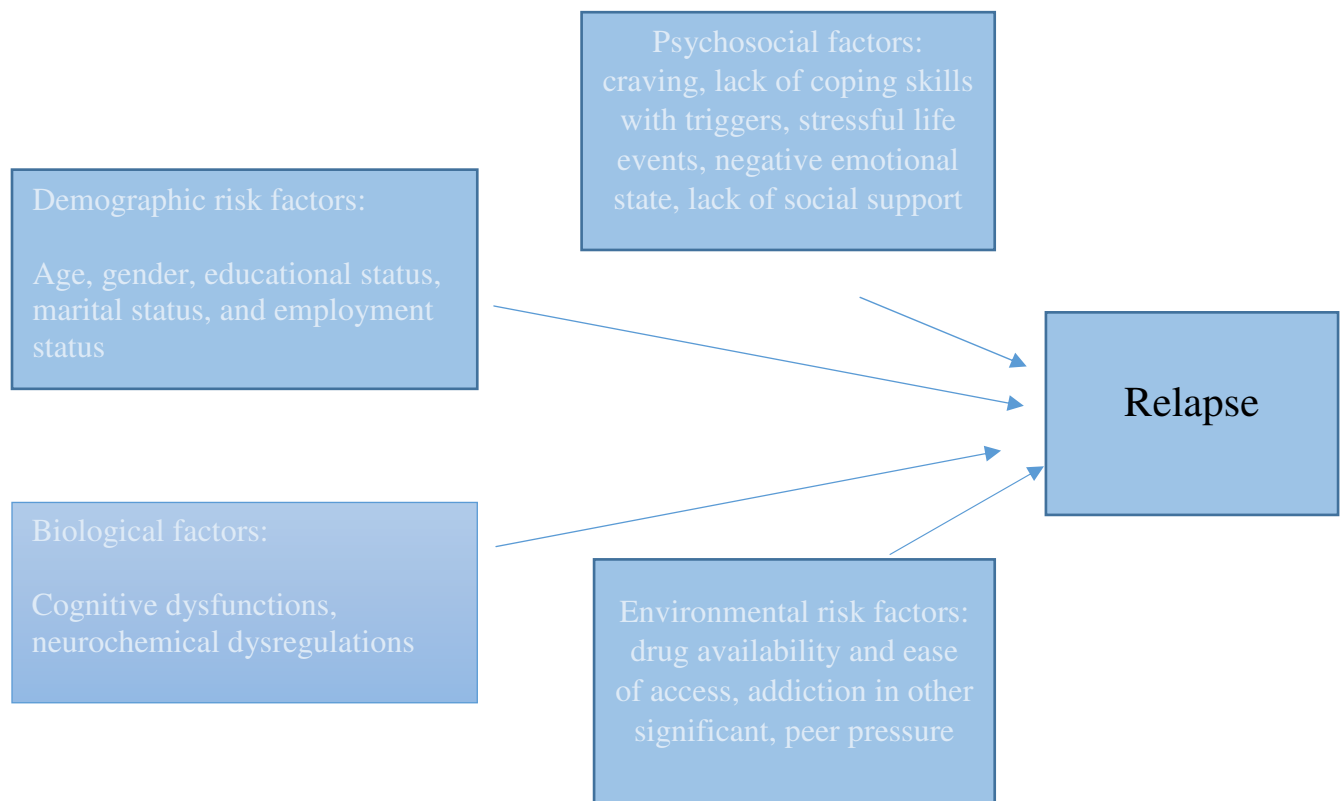


Figure 1: Conceptual framework for substance use relapse and the associated risk factors

3. Objectives of the study

3.1 General objectives

- ✓ To assess the lifetime prevalence of relapse and associated factors among patients with substance use d/o at Saint Paul's hospital millennium medical college

3.2. Specific objectives

- ✓ To assess the lifetime prevalence of relapse among patients with substance use disorder at Saint Paul's hospital millennium medical college
- ✓ To assess factors associated with relapse among patients with substance use disorder at Saint Paul's hospital millennium medical college

3.3.Hypothesis

- 1) There will be a high prevalence of relapse among participants in this study.
- 2) Demographic variables, psychosocial factors, and environmental factors will have a significant influence on relapse among individuals with SUD.

4. Methods and Materials

4.1 Study area and period

The study area was Saint Paul's Hospital Millennium Medical College (SPHMMC), which is found in Addis Ababa, Ethiopia. The hospital was established in 1968 and has been a medical college since 2007. It provides training for undergraduate and postgraduate students and patient service in more than 15 specialty departments. One of the specialties is the psychiatry department, which provides psychiatry residency training and clinical services, including general psychiatric care, addiction treatment, and other subspecialty care. Its addiction unit is one of the few units in the country providing inpatient as well as outpatient care and receiving patients from all over the country.

The study was conducted at general psychiatric OPDs, substance clinics, and inpatient settings, including the addiction rehabilitation center. The study was conducted from September 1 to October 30, 2023.

4.2 Study design

An institutional-based cross-sectional study was conducted.

4.3 Population

4.3.1. Source population

All patients with substance use disorders at SPHMMC who have been on treatment and follow-up at the psychiatric outpatient clinic and inpatient setting.

4.3.2. Study population

Patients with substance use disorders who have been on treatment at Saint Paul's Hospital Millennium Medical College and who fulfil inclusion criteria for the study

4.4. Inclusion and exclusion criteria

4.4.1 Inclusion criteria

- ✓ All patients who fulfil the DSM-5 diagnostic criteria for substance use disorders

4.4.2 Exclusion criteria

- ✓ Patients with acute exacerbations of a comorbid mental illness who are unable to give information
- ✓ Patients in severe withdrawal states

4.5. Sample size and Sampling procedures

The single population proportion formula was initially calculated by using the 48% prevalence of relapse from the previous study, yielding a sample size of 384(14).

But there were only an estimated total of 180 patients with substance use disorders visiting the psychiatric unit in the three-month period; as a result, all patients that were available during the study period were included for the sake of convenience.

4.6. Sampling procedures

Participants were selected from psychiatric OPD, patients attending follow-up at the substance clinic, and from the substance ward and rehab center. The study uses convenience sampling, in which all patients with SUD who were available during the study period and met the inclusion criteria were included. In addition, due to the limited number of patients, proportional selection among the service areas was not utilized.

4.7. Variables of the study

4.7.1 Dependent variable

Lifetime prevalence of relapse in patients with SUD

4.7.2 Independent variables

Sociodemographic variables: age, gender, educational status, marital Status

Psychosocial factors: craving, lack of coping skills, emotional state, lack of social support

Environmental risk factors: ease of access, employment status, drug use in significant others

4.8 Operational definition

Substances/drugs: refer to alcohol, khat, cigarettes, cannabis, and opioids, which could affect the mental, physical, and social functioning of a person.

Substance use: refers to using different substances to alter one's mood state, or performance.

Substance use disorder: maladaptive use of a substance that fulfills DSM-5 TR criteria

Relapse: is a return to previous levels of substance use after a period of abstinence(10) .

Treatment center: any places or settings that were used to help the patient solve his or her substance use problem

4.9. Data collection tools and procedures

The data collection tool used in this study was an interviewer-administered questionnaire adapted from previous studies to best meet the objective of the study, as there were no standardized tools to assess relapse. Questions were designed based on the previous studies done on relapse(11,28). The questionnaire had three components, which include demographic variables, patterns of substance use and treatment, and risk factor variables. The questionnaire was prepared in English, and its validity was checked by psychiatrists working in the field and with pre-testing. Medical records were also used to collect information about diagnosis and treatment history. The data were collected by the principal investigator and research assistants, who were given training. We did not proceed with any actions until informed consent was obtained and confidentiality was unequivocally guaranteed.

4.10 Data quality control

Pre-testing of the study tools was conducted at the SPHMMC psychiatric OPD. During pretesting, the questionnaire was assessed for its clarity and understandability. A total of 10% of sample size patients was selected for pre-testing and those patients were not included in the actual study.

4.11 Data processing and analysis

The data was coded and entered into a computer using Epi Data version 3.1, after which it was analysed using SPSS software version 20. To calculate the frequency and percentage of patient

characteristics, descriptive statistical analysis was employed. Bivariate logistic regression analysis was used to look at how independent factors are related to dependent variables. The variables were included in the multiple logistic regression analysis if the bivariate analysis revealed a relationship between the outcome variables with a p-value less than 0.25. In the multiple regression analysis, a p-value of 0.05 was regarded as statistically significant. The adjusted odds ratio (AOR) with the 95% confidence interval would measure the strength of the association between relapse and independent factors.

4.12 Ethical considerations

The SPHMMC Ethics Committee has provided permission after reviewing the application. Following the granting of permission requests with a letter of permission, the study has been undertaken by informing each participant of their rights and the study's aim. Additionally, participants were given the assurance that leaving the study at any point during the research period would not have any detrimental effects. Throughout the course of the study, informed consent was obtained from each participant. After receiving sufficient information about the study, participants voluntarily provided written informed consent. Confidentiality and privacy concerns were also being maintained. Participants in the study were thanked after the data was gathered, and they were continuing to receive their regular clinical care.

4.13 Dissemination plan

The study's findings will be presented as a partial fulfillment of the residency program in psychiatry and submitted to the department of psychiatry. Efforts will be made to publish the results in regional and international publications.

5. Results

5.1: Sociodemographic characteristics

As shown in Table 1, the majority (42.2%) of participants were 21–30 years old, and the mean age at their first use was 20 (SD =5.28). The majority (96.1%) of participants were males, and 75.6 percent were single in marital status. Almost all respondents had formal education, and 87 (48.3%) of them have completed college or university. Only about 78 (43.3%) of the participants were full-time employed. The finding also indicated that the majority of participants, 137 (76.1%), live in Addis Ababa.

Table 1: Sociodemographic characteristics of study participants

Variables	Frequency (N=180)	Percent
Age at first use		
<18	58	32.2
18-25	97	53.9
>25	25	13.9
Age at current treatment		
20 and below	15	8.3
21-30	76	42.2

31-40	56	31.1
41 and above	33	18.3
Gender		
Male	173	96.1
Female	7	3.9
Educational status		
No formal education	1	0.6
Primary education	25	13.9
Secondary education	67	37.2
Higher education	87	48.3
Employment status		
Employed	78	43.3
Part time employed	11	6.1
Unemployed	72	40.0
Suspended	5	2.8
Student	14	7.8
Marital status		
Single	136	75.6
Married	30	16.7
Divorced	11	6.1
Separated	2	1.1
Living with partner	1	0.6
Place of residence		
Addis Ababa	137	76.1
Non-Addis Ababa	43	23.9

5.2: Prevalence and substance use treatment characteristics

5.2.1 Types of substances used

As shown in figure 2 below, the majority of participants use two or more substance types (66.7%), followed by tobacco use (10%). Additionally, very few of them use only cannabis (1.1%).

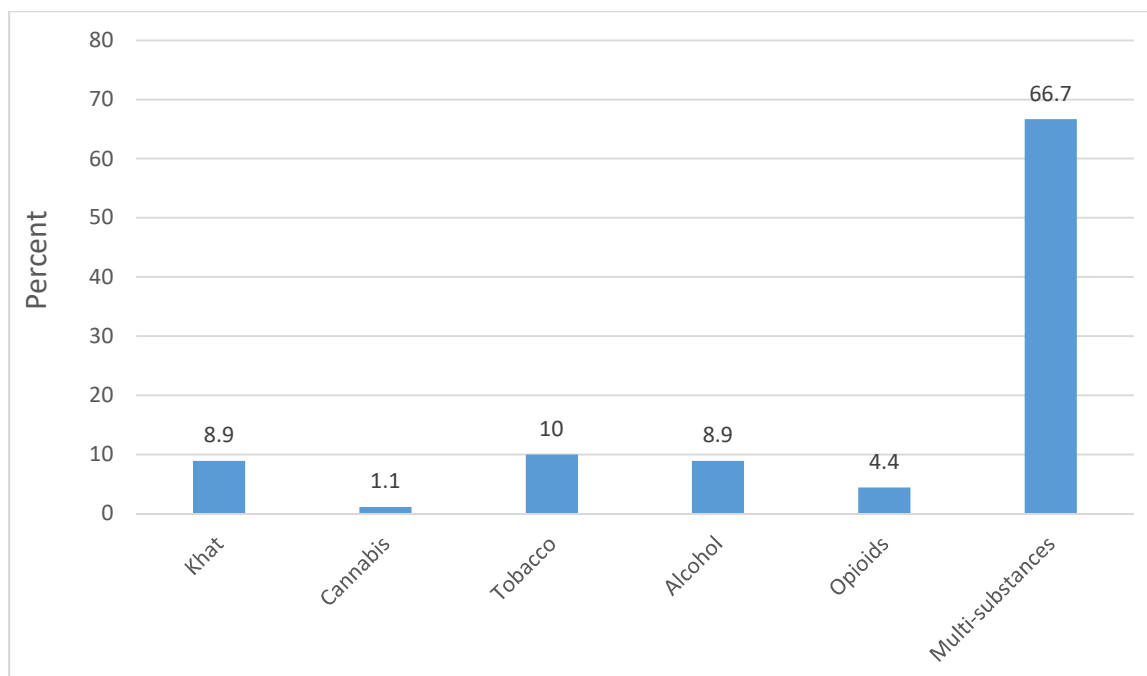


Figure 2: Types of substances used

5.2.2: Comorbidity status of participants

Of 180 respondents with SUD, 26.1 percent of them had a history of co-occurring mental illnesses, which included schizophrenia (11.7%), major depressive disorder (6.7%), and bipolar disorder (2.2%), among others.

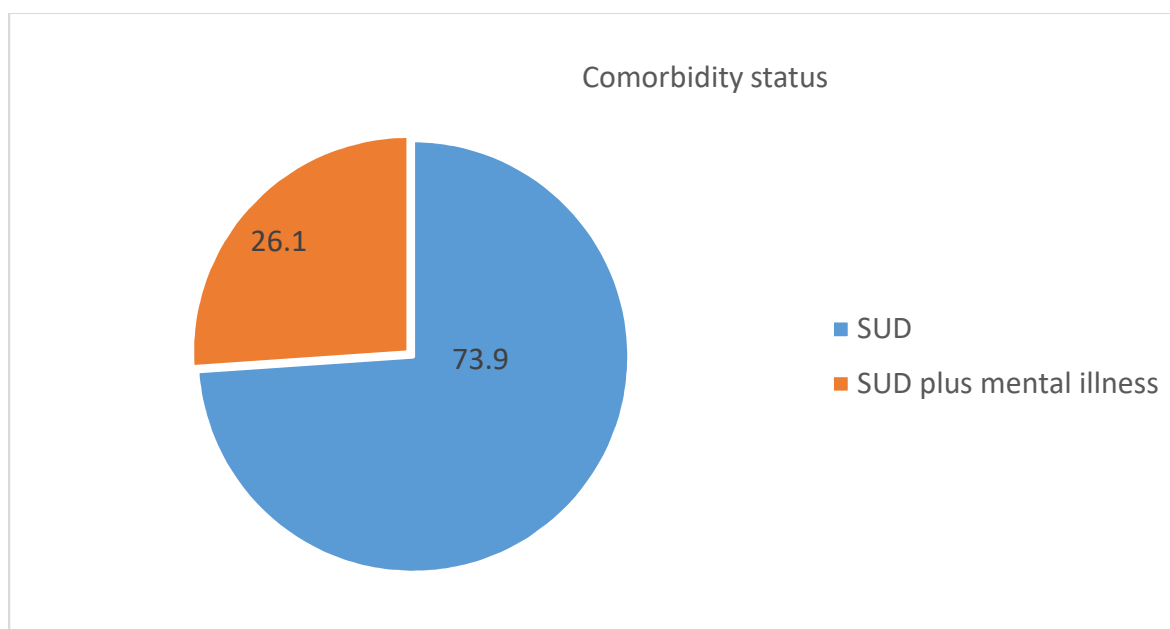
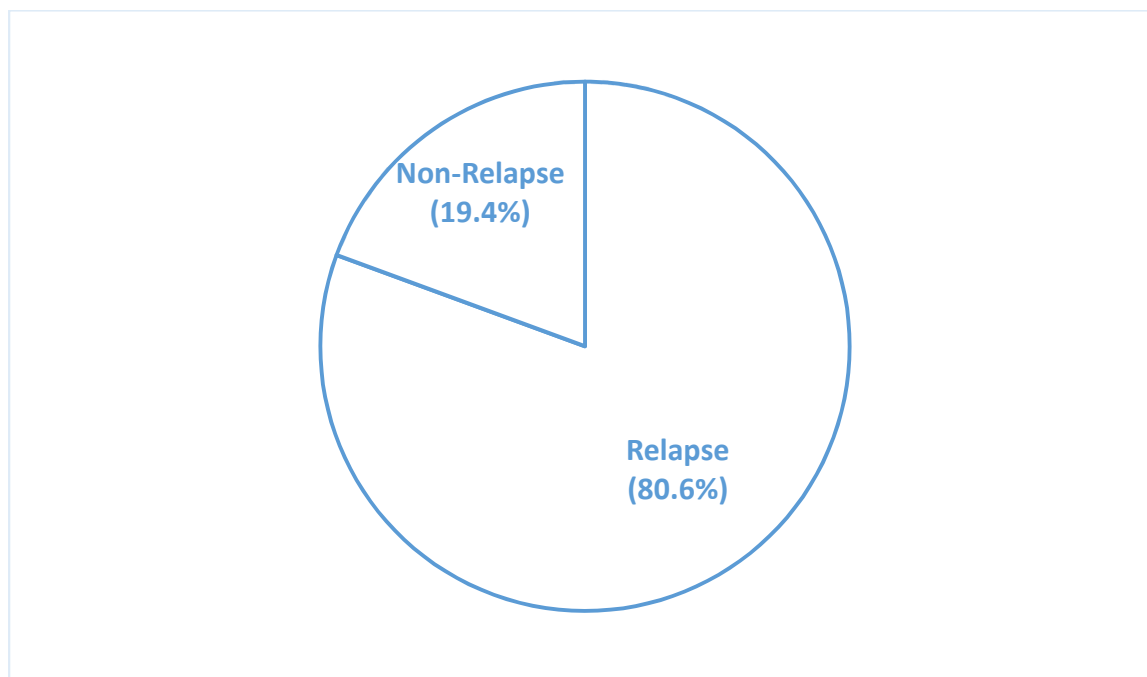


Figure 3: Comorbidity status of study participants, (N=180)

5.2.3: Lifetime relapse of patients with SUD

The life-time prevalence of relapse among patients with SUD in this study was 80.6%.



Figure

4:Lifetime relapse of patients with SUD at SPHMMC, (N=180)

5.2.4: Pattern of substance use and treatment

The patterns of substance use are shown in Table 2. About 92 (51.1%) of them had previous treatment, and 128 (71.1%) of them had a history of stopping substance use by themselves. The majority of study participants, 130 (72.2%), were referred to their first treatment by their family members. Regarding the number of times of previous treatment, the majority had a history of treatment 1-2 times (72, N = 92) and were treated at a church facility or holy water (34, N = 92); a majority (81.1%) did not have an admission history, and most of the participants tried 1-2 times to stop the substance use by themselves (72, N = 128).

Table 2: Past/current substance use and treatment history

Variables	Number	Frequency	Valid Percent
Ever treated for substance abuse			
Yes		92	51.1
No		88	48.9

Ever stopped substance by self		
Yes	128	71.1
No	52	28.9
Source of referral for first treatment		
Friends	25	13.9
Family	130	72.2
Him/her-self	20	11.1
Others*	5	2.8
No. of previous treatment	92	
1-2 times	72	78.3
3-4 times	14	15.2
5 or more times	6	6.5
No. of previous admission	180	
None	146	81.1
1-2 times	32	17.8
3-4 times	1	0.6
5 or more times	1	0.6
No. of times stopped by self	128	
1-2 times	72	56.2
3-4 times	30	23.4
5 or more times	26	20.3
Previous treatment center	92	
Private rehab. Center	11	12.0
Governmental Rx center	22	23.9
Governmental hospital	11	12.0
Private hospital	5	5.4
Church facility/Holy water	34	37.0
Two or more treatment center	9	9.8
Type of current treatment received		
Not received yet	50	27.7
Psychotherapy	36	20.0
Medication treatment	11	6.1
Inpatient/rehab. center	25	13.8
Group therapy	5	2.8
Combination treatment	53	29.4
Confidence level to stop substance		
Yes	129	71.7
No	12	6.7
Uncertain	29	21.7

*Others include courts, hospitals, and churches.

5.2.5: Duration of abstinence and treatment

The findings, as shown in Table 3, depict that the mean duration of the previous treatment was 8.52 weeks (SD=10.71) and of the current treatment was 9.89 weeks(SD = 21.3). In addition, the

average duration of abstinence after getting treatment was 5.77 months (SD=12.15), and after stopping by oneself, it was 6.33 months (SD=14). The mean duration of substance use was 12 years (SD=14).

Table 3: Duration of abstinence and previous/ current treatment

Variables	Valid number	Mean	Std.Deviation	Minimum	Maximum
Previous treatment in weeks	92	8.52	10.71	2	54
Current treatment in weeks	180	9.89	21.3	0.1	94
Abstinence after treatment in months	92	5.77	12.15	1	96
Abstinence after stopping by self in months	128	6.33	14.0	0.5	78
Duration of substance use in years	180	12.04	8.13	1	47

5.3: Description of factors influencing relapse in SUD

Table 4 shows the description of factors influencing relapse in substance use disorders. The results found that the majority (73.3%) of participants relapsed due to easy access to substances and their inability to control cravings (71.1%). The results also indicated a high reported rate for the influence of negative emotion states and peer friends at 65% and 62.7%, respectively. A low percentage was reported for the factors that included family members who abuse substances (23.9%), the presence of physical pain (23.3%), and being approached by drug dealers (10%).

Table 4: Description of factors influencing relapse in substance use disorders (N=180)

Variables	Frequency(n=180)	Percent
Easy access to substances		
Agree	132	73.3
Disagree	48	26.7
Peer pressure		
Agree	113	62.7
Disagree	67	37.3

Pressure from a friend		
Agree	84	46.7
Disagree	96	53.3
Lack of needed support		
Agree	43	23.9
Disagree	137	76.1
Difficult to find a job		
Agree	61	33.9
Disagree	119	66.1
Change in marital status		
Agree	24	13.3
Disagree	156	86.7
Family members abuse substances		
Agree	43	23.9
Disagree	137	76.1
Approached by drug dealers		
Agree	18	10.0
Disagree	162	90.0
Stressful life events		
Agree	68	37.8
Disagree	112	62.2
Inability to control triggers		
Agree	102	56.6
Disagree	78	43.4
Inability to control craving		
Agree	128	71.1
Disagree	52	28.9
Negative emotional states		
Agree	117	65.0
Disagree	63	35.0
Seeking euphoric states		
Agree	98	54.4
Disagree	82	45.6
Physical pain		
Agree	42	23.3
Disagree	138	76.7

5.4: Risk Factors of relapse among individuals with SUD

5.4.1: Chi Square test

The result in Table 5 showed that age ($X^2=13.66$, $p=.003$) was significantly associated with relapse. On the other hand, employment status ($X^2= 11.36$, $p =.09$), gender ($X^2 = 1.75$, $p =.18$), educational level ($X^2 =3.91$, $p =.27$), marital status ($X^2 =6.53$, $p =.16$), place of residence ($X^2=.36$, $p =.54$), and presence of comorbid mental illness ($X^2 =.84$, $p =.35$) had no significant relationship with relapse.

Table 5: Showing Association between Socio-demographic Variables and Relapse

Characteristics	Relapse			X^2	P value
	Yes	No	Total		
Age				13.66	.003*
20 and below	7	8	15		
21-30	61	15	76		
31-40	47	9	56		
41 and above	30	3	33		
Gender				1.75	.18
Male	138	35	173		
Female	7	0	7		
Education level				2.30	.31
Primary education	21	4	25		
Secondary education	49	18	67		
Higher education	74	13	87		
Employment status				11.36	.09
Employed	68	10	78		
Part-time employed	10	1	11		
Unemployed	56	16	72		
Suspended	4	1	5		
Student	7	7	14		
Marital status				5.72	.057
Single	104	32	136		
Married	27	3	30		
Divorced	11	0	11		
Place of residence				.36	.54
Addis Ababa	109	28	137		
Non-Addis Ababa	36	7	43		
Comorbidity status				.84	.35
SUD	105	28	133		
SUD plus mental illness	40	7	47		

*Statistically significant at 0.05

5.4.2: Bivariate logistic regression analysis

Table 6 reveals the bivariate logistic regression analyses corresponding to the factors associated with relapse among patients with SUD. Statistically, significant factors associated with relapse included age ($p = .01$), easy access to substances ($p = .000$), stressful life events ($p = .001$), peer pressure ($p = .000$), lack of support ($p = .01$), inability to control triggers ($p = .008$), craving, negative emotional states ($p = .000$), and seeking euphoric states ($p = .041$).

Table 6: Bivariate logistic regression analysis of risk factors of relapse among patients with substance use disorders (N = 180)

Variables	Odds ratio(OR)	95% CI	P value
Age			.01*
20 and below	Ref.		
21-30	4.72	1.48 - 15.08	.009*
31-40	5.96	1.72 - 20.62	.005*
41 and above	11.04	2.31 - 52.71	.003*
Age at first use			.35
<18	Ref.		
18-25	1.72	.77-3.85	.18
>25	1.83	.53-6.28	.33
Gender			.99
Male	-	-	
Female	Ref.		
Educational status			.32
Primary education	Ref.		
Secondary education	.56	.16-1.86	.34
Higher education	.99	.29-3.33	.99
Employment status	-	-	.09
Employed			
Part-time employed			
Unemployed			
Suspended			
Student	Ref.		
Marital status	-	-	.28
Single			
Married			
Divorced			
Place of residence			
Addis Ababa	1.32	.53 - 3.28	.54
Non-Addis Ababa	Ref.		
Substance types used	-	-	.94

Khat	Ref.		
Cannabis			
Tobacco			
Alcohol			
Opioids			
Multi-substances			
Easy access to substances			
Agree	10.05	1.87 - 26.81	.000
Disagree	Ref.		
Peer pressure			
Agree	12.34	.64 - 29.80	.000*
Disagree	Ref.		
Pressure from a friend			
Agree	2.23	1.03 – 4.82	.43
Disagree	Ref.		
Lack of needed support			
Agree	6.51	1.49 - 28.35	.01*
Disagree	Ref.		
Difficult to find a job			
Agree	1.35	.60 - 3.04	.46
Disagree	Ref.		
Change in marital status			
Agree	1.24	.39 - 3.89	.71
Disagree	Ref.		
Family members abuse substances			
Agree	0.61	.27 – 1.39	.28
Disagree	Ref.		
Approached by drug dealers			
Agree	.43	.15 - 1.25	.26
Disagree	Ref.		
Stressful life events			
Agree	6.12	2.05 - 18.24	.001*
Disagree	Ref.		
Inability to control triggers			
Agree	9.13	5.06 - 34.05	.008*
Disagree	Ref.		
Inability to control cravings			

Agree	16.20	6.59 - 39.80	.000*
Disagree	Ref.		
Negative emotional states			
Agree	15.77	6.04 – 41.18	.000*
Disagree	Ref.		
Seeking euphoric states			
Agree	4.28	2.18 – 18.77	.041*
Disagree	Ref.		
Physical pain			
Agree	0.70	.30 – 1.62	.416
Disagree	Ref.		

This table indicates a bivariate logistic regression analysis for determining the association between relapse and demographic and clinical risk factors among patients with SUD at SPHMMC. The 95% confidence interval and the significance levels at 0.05 were applied.

*Statistically significant at 0.05

5.4.3: Multiple logistic regression analysis

Table 7 presents multiple logistic regression models that show variables related to the likelihood of relapse among patients with substance-use disorders at SPHMMC. All the variables that showed statistical significance at < 25% in the bivariate logistic regression were included. As a result, age, employment status, easy access to substances, peer pressure, lack of support, stressful life events, inability to control triggers, cravings, negative emotional states, and experiencing euphoric states were analysed in the model. The results from the model showed that the significant factors of relapse were easy access to substances(P=.04), peer pressure(P =.031), inability to control cravings(P=.028), and negative emotional states(P=.010).

Table 7: Multiple logistic regression analysis of the risk factors for relapse(N=180)

Variables	P value	Odds ratio(adjusted)	95% CI
Age in years	.36		
20 and below		Ref.	
21-30	.08	6.21	.78-48.97
31-40	.29	3.45	.34-34.99
41 and above	.27	5.16	.26-99.13
Employment status	.49	-	-
Employed			
Part-time employed			
Unemployed			
Suspended			
Student		Ref.	
Easy access to substances			
Agree	.04*	3.47	.91- 10.56
Disagree		Ref.	

Peer pressure			
Agree	.031*	4.05	.59 - 14.71
Disagree		Ref.	
Lack of needed support			
Agree	.07	6.68	.84 – 52.65
Disagree		Ref.	
Stressful life events			
Agree	.33	2.17	.45 – 10.36
Disagree		Ref.	
Inability to control triggers			
Agree	.82	1.19	.24 – 5.85
Disagree		Ref.	
Inability to control cravings			
Agree	.028*	5.32	1.19- 23.68
Disagree		Ref.	
Negative emotional states			
Agree	.010*	5.51	1.49 – 20.41
Disagree		Ref.	
Seeking euphoric states			
Agree	.09	3.04	1.12 – 16.73
Disagree		Ref.	

*statistically significant at 0.05. The table displays multiple logistic regression model analyses to indicate the determinants of relapse among the patients with SUD at SPHMMC.

6. Discussion

6.1. Prevalence, Demographic and Clinical characteristics

We investigated the lifetime prevalence and the risk factors of relapse among patients with substance-use disorders in SPHMMC. The life-time prevalence of relapse was 80.6%. This finding is in line with the study(16), which reported a relapse rate of 76.6%. But this figure is higher than the findings of other studies (27,28), which reported 51.3% and 59.9%, respectively. The possible difference from these studies may be due to the study design, which examines the overall lifetime frequency of relapse either after getting treatment and/or stopping by oneself.

The study found that, compared to younger individuals, older patients had increased odds of relapse. This finding is in contrast to other studies that showed relapse occurs among younger individuals rather than older people(24,28). This could be due to the fact that most of the study participants started substance abuse at a younger age and had a long duration (12 years) of

substance use, which leads to an increased risk of relapse(32). The study found that most of the participants(96.1%) were males, which is consistent with the study(25)which reported that 96.8 percent of participants were males. The higher prevalence may imply that substance abuse for males is relatively accepted by the community, and males with SUD are encouraged or supported to seek treatment more than females.

We found that the majority (89.1%) of participants started using substances before 25 years of age. The result is consistent with the finding(19)which reported that the majority(80.6%) of participants started abusing drugs before age 18 or between 18 and 25 years of age. Abusing substances at an early age could cause impairments in the individual's psychological and social development.

Consistent with the findings of study(25) that found 59.1% of individuals were poly-drug abusers, the majority of study participants (66.7%) used multiple substances. The studyalso found that 75.6% of the patients were single, which is in agreement with study(33), which reported 66.4%. This could be related to the fact that substance abuse itself makes it harder to establish and sustain relationships.

The study revealed that the majority (81.1%) of participants did not have any previous admissions to a treatment center. This may be due to either the lack of access to the treatment service or the absence of treatment-seeking behavior. The result depicts that the mean duration of abstinence before relapse was six months, which is lower than a study (32) that reported the mean survival time before relapse at 27 months. This finding may be because most patients were not seeking treatment (71.1%) or received an effective rehabilitation center (81.1%), which could help in gaining different coping skills to maintain abstinence.

The study revealed that the majority (78.3%, N=92) had gone through the treatment process one to two times, mainly due to family pressure (72.2%). This finding is consistent with the study done(20), which states that family pressure was the main reason to stop the drugs.

With regard to the treatment modality, the majority were treated at church or holy water (37%); this may reflect the religious belief that addiction can be treated and healed through spiritual mechanisms.

The study also revealed that 26 percent of participants had comorbid psychiatric illnesses, which include schizophrenia (11.7%), major depressive disorder (6.7%), and bipolar disorder(2.2%), among others. The result is in line with the study(33), which reported 20.4% of comorbidity among substance abuse patients.

6.2. Risk factors associated with Relapse

In this study, it was found that some demographic and substance-related factors predicted an increased risk of relapse in the bivariate regression analysis; however, after adjusting for the effect of other covariates in the multiple regression analysis, only easy access to substances, peer pressure, craving, and negative emotional states independently predicted the risk of relapse.

It was found that employment status had no significant influence on relapse. This is in contrast with the study(25), which found that employment status did have a significant association with relapse. This suggests that those with jobs and those without had relapses. This might be because those who are employed have easy access to money to purchase substances, while those who are unemployed might take drugs to cope with the stress of being unemployed. Similarly, educational status and marital status did not have a significant influence on relapse.

The study also revealed that place of residence did not have a significant influence on relapse status. This implies that both groups of individuals who live in Addis Ababa or in the regions experienced relapse. This may be due to the easy availability and access of the substance in different geographic regions of the country.

The study also depicts the non-significant association between the comorbidity status of the patient and relapse. This suggests that, as compared to people without a comorbid psychiatric condition, the likelihood of relapse is not significantly affected by having a comorbid mental illness. This finding is in contrast to the study (23), which reported that having psychiatric comorbidity is a significant factor in increased odds of relapse. The possibility that the co-occurring mental illness was properly treated with medication or the possibility that the co-occurring mental illness was substance-induced are potential explanations for the non-significant associations.

The results revealed a significant association between craving and relapse, where individuals with difficulty controlling craving have a significantly greater risk of relapse. This finding is in agreement with the studies(34,35), which reported a strong association between craving and substance relapse. This may be due to the fact that after abstinence, cravings or urges for substance use could be triggered by internal cues like stress, anxiety, or environmental cues such as places or individuals, which leads them to relapse.

The finding also revealed that patients who experience negative emotional states after stopping substance use have a significantly higher risk of relapse. The study result is consistent with other studies(8,15), which reported negative mood states as a stronger risk factor for relapse. This implies that most patients who had substance use problems would experience withdrawal symptoms including irritability, anger, low mood, and anxiety, which in turn reinforces using the substance in order to alleviate the painful emotions.

The study revealed that peer pressure was a significant determinant factor in relapse, which is in line with other studies(14,27,33) which reported peer pressure as the main contributing factor for relapse. This may result from a lack of assertiveness in saying no when their peers influence them to use the substance. In addition, after treatment, patients would continue relationships with their old friends, who can encourage substance use. Furthermore, individuals might live in a culture where the majority use substances for recreation, which can make it difficult to maintain abstinence.

The finding also depicts that easy access or availability of substances were significantly associated with relapse. It showed that individuals who reported having easy access to substances were more likely to relapse than those who didn't perceive easy access to substances as their

main cause of relapse. The finding is in agreement with several other studies(14,27,12), which reported the significant influence of easy access to drugs on relapse. This may be due to the fact that, after a period of abstinence, the easy availability of substances may act as an external trigger leading to previous problematic behavior.

6.3. Strength and Limitations of the Study

The strength of the study is its novelty. The study findings revealed the lifetime prevalence of relapse and identified relevant risk factors that predict relapse among patients with SUD.

One of the limitations of the study is that only a few of the participants are female, who may have different perspectives on the risks of relapse. Another limitation is the relatively small sample size and the non-probability sampling technique, which makes it difficult to generalize to populations with substance-use relapse in Ethiopia. Since the study design is cross-sectional, the risk factors associated with relapse may not inform the cause-and-effect relationship with outcome variables. Additionally, the questionnaires were interviewer administered, and as a result, the risk factors reported may be subject to recall and social desirability bias.

7. Conclusion and recommendations

This study showed a high lifetime prevalence of relapse among patients with SUD. Easy access to substances, cravings, negative emotional states, and peer pressure were the factors that independently predicted relapse among patients with SUD. Therefore, it's essential to assess these risk factors during treatment and at follow-up to help patients maintain their abstinence.

Clinicians and policymakers are suggested to note the most important risk factors for relapse while developing relapse prevention programs.

Future studies with a prospective multicenter study design could enrich the knowledge gap on relapse and determinant factors among patients with SUD in Ethiopia.

Raising public awareness about the substance abuse problem, its treatment, and working to increase the availability of rehabilitation centers in the country may decrease the prevalence of relapse.

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9. Annexes

Annex A: information sheet

Title of research project: Determinants and lifetime prevalence of relapse among patients with substance use disorder at SPHMMC.

Purpose of the study: The purpose of the study is to determine the lifetime prevalence and causes of relapse among patients with substance use disorder who have started treatment at SPHMMC. The information gathered will be used to formulate guidelines for relapse prevention programs.

Procedures: I understand that I will be asked to complete a single questionnaire. Should I have any questions while answering the questionnaire, I can request assistance and clarification from the researcher.

Risks: There are no known risks or discomforts associated with this study. Acceptance or refusal to participate will not affect the care provided.

Benefits: I understand that there are no direct benefits to me participating in this study. The results of the study will, however, assist the researcher in gaining a better understanding of the determinants and lifetime prevalence of relapse among substance use disorders to inform relapse prevention programs.

Participant's rights: I may withdraw from participating in the study at any time.

Confidentiality: I understand that all information that is collected from me will be kept anonymous. However, I give my permission that information collected from me may be used for research and publication

Principal investigator: Maru Muluneh, MD, Tel: +251939697711

Signature of participant Date.....

Signature of researcher..... Date.....

Annex B: Consent form

Dear participants

My name is Maru Muluneh, and I am a postgraduate resident in the Department of Psychiatry at SPHMMC.

I am conducting a study on the determinants and lifetime prevalence of relapse among patients with substance use disorders at SPHMMC, Addis Ababa, Ethiopia, 2023 GC, for partial fulfilment of my specialty in psychiatry.

You are requested to participate in my research by filling out the following questionnaire: The information gathered, we trust, will assist in investigating the determinants of relapse and the provision of care thereafter.

Thank you for your time and cooperation in filling out the questionnaire. Please be aware that the information you supply will be treated with the utmost confidentiality and will only be used for research purposes.

Thank you

Maru Muluneh, MD

Annex C: Questionnaire

Section A: Demographic variables

1. Age

2. Gender

Male	1
Female	2

3. Highest level of completed education

Illiterate	1
Read and write only	2
Primary education	3
Secondary education(grade 9-12)	4
Higher education(college, university)	5

4. Employment status

Employed(including self-employed)	1
Part-time employed	2
Unemployed	3
Suspended	4
Full-time Student	5
Part-time Student	6
Other(specify)	

5. Marital status

Single	1
Married	2
Divorced	3
Widow/Widower	4
Separated	5
Cohabiting/living with a partner	6

6. Place of residence

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Section B: substance use history and treatment

7. What are your drugs of choice and frequency of use

Drug of choice	Once per day	2 or more times per day	1-3 times per week	4 or more times per week
Khat	1	2	3	4
Marijuana	1	2	3	4
Tobacco	1	2	3	4
Alcohol	1	2	3	4
pethidine	1	2	3	4
Tramadol	1	2	3	4
Morphine	1	2	3	4
Heroin	1	2	3	4
Other (specify)				

8. At what age did you start experimenting with drugs

9. Have you ever treated for your substance abuse (health facility, including church/holy water)

yes	1
No	2

10. If you answer yes to question 9 where did you receive your treatment for drug abuse? (more than one answer possible)

A private rehabilitation center	1
A governmental treatment center	2
A governmental hospital	3
A private hospital	4
A church facility/Holy water	5
Other(please specify)	

11. If you answered yes to question 10, how many times?

12. Have you ever stopped substance use by yourself?

yes	1
No	2

13. If you answered yes to question 12, how many times?

14. How many previous admissions, to a treatment Centre, if you had any?

15. Who referred you to the treatment center for your FIRST TREATMENT for drug abuse?
(Please select a single answer)

friends	1
family	2
Court	3
Welfare organization/NGO	4
employer	5
School	6
Church	7
Other(please specify)	

16.What was the longest time of your previous treatment (in weeks/months)?

17.What was the longest time of your abstinence before relapse (in weeks/months)?

After treatment	
By stopping yourself	

18.What type of treatment are you currently receiving? (please select a single answer)

Not received yet	1
Psychotherapy	2
Medication treatment	3
Inpatient treatment	4
Group therapy	5

19.For how long have you been on the current treatment (in weeks/months)

20. Ever relapse after abstinence

No	1
Yes	2

Section C: Substance relapse risk factors

Please read the following statements carefully and rank each of them on a scale of "1" to "4", with "1" indicating "Strongly disagree", "2" indicating "Disagree", "3" indicating "Agree" and "4" indicating "Strongly agree". Please provide your honest rating for each statement.

21. Risk factors

	Strongly disagree	disagree	Agree	Strongly agree
Easy access to drugs	1	2	3	4
Peer pressure	1	2	3	4
pressure from a friend	1	2	3	4
Lack of support that I needed	1	2	3	4
Difficult to find a job	1	2	3	4
Change in my marital status (got divorced, got married, lost partner...)	1	2	3	4
Family members abuses substances	1	2	3	4
Approached by drug dealers	1	2	3	4
Stressful life events(losing a job, being diagnosed with a medical illness etc.)	1	2	3	4
Unable to cope with triggers	1	2	3	4
Unable to control cravings	1	2	3	4
Negative emotional states(low mood, anxiety...)	1	2	3	4
A need to experience euphoric states(feeling of happiness, excitement...)	1	2	3	4
Due to physical pain	1	2	3	4

22. Please indicate, in the space below, no more than three causes for your relapse. (Please do not mention more than three causes)

--

23. Do you feel confident that you will be able to maintain abstinence from drug usage after your current treatment for drug abuse?

yes	1
No	2
I am uncertain	3

24. Diagnosis including comorbidity if any? (from a medical record)

Thank you for your time and co-operation

Declaration

I, the undersigned, declare that this thesis is my original work, has never been presented for a degree in this or any other university and that all sources of material used for the thesis have been fully acknowledged.

Name: Maru Muluneh (Psychiatry Resident)

Signature: _____

Name of the institution: SPHMMC

Date of submission: January 12, 2024

This thesis has been submitted for examination with my approval as Faculty advisor

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