

Research Article

Magnitude of Substance Induced Psychosis among Adolescents in Amanuel Mental Specialized Hospital Addis Ababa Ethiopia

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Abstract

Background: Substance use among adolescents has sparked widespread concerns that millions of adolescents are at increased risk of mental health. A link between adolescent substance use and the development of psychosis in early adulthood within clinical practice, the issue is further complicated by high rates of co-occurring substance use disorders (SUD) amongst individuals suffering from a psychotic illness. There were about 190 million substance abusers. Out of these substance abusers, around 40 million develop serious mental illness, of these majority of them, were adolescents because of the Adolescence is often a time of experimentation with drugs, alcohol, and other substance use as well as practicing.

Objective: The objective of the study was to assess the magnitude of substance induced psychosis among adolescents in Amanuel Mental Specialized hospital Addis Ababa Ethiopia 2017.

Methods: A cross sectional institutional based study was conducted from February 1 March 31, 2017 in Amanuel mental specialized hospital on a total sample size of 235 using a systematic random sampling method. A structured questionnaire was used to collect data.

Results: With a 235 (100%) response rate, the overall prevalence of substance induced psychosis was 28.6%. The findings of this study revealed that the commonly abused drugs were alcohol 200 (85%), khat 196 (83.40%), cigarette 156 (66.4%), and other illicit substances 98 (41.7%). There is a statistically significant association between the uses of substance/Drugs with induced psychosis. Based on this any substance/drug abuse (AOR 95%CI 2.15 (1.23, 3.70), $p=0.02$) was found. There is strong association between substances abuse and psychosis development. Illicit drugs AOR 95%CI 4.36 (1.12, 7.33), $p<0.01$, Alcohol consumption AOR 95%CI 2.22 (1.63, 4.42), $p=0.01$, Khat chewing AOR 95%CI 2.10 (1.61, 5.49) $p=0.07$ and weak association with cigarette smoking (AOR 95%CI 1.5 (0.32, 2.38), $p=0.04$).

Keywords: Prevalence; Substance induced psychosis; Adolescents

Abbreviation: AHRQ: Agency for Healthcare Research and Quality; AMSH: Amanuel Mental Specialized Hospital; BSS: Behavioral Surveillance Survey; CIDI: Composite International Diagnostic Interview; NIDA: National Institute of Drug Abuse; NSDUH: National Survey of Drug Use and Health; ODD-OH: Organic Delusional Disorder or Organic Hallucination; PSUD: Psychoactive Substance Use Disorders; PRISM: Psychiatric Research Interview for Substance and

Mental Disorders; SCI: Structured Clinical Interview; SCAN: Schedules for Clinical Assessment in Neuropsychiatry; SIPS: Substance Induced Psychosis; SIPSD: Substance Induced Psychotic Disorder; SUD: Substance Use Disorder

Introduction

Psychiatric disorders constitute four of the top ten causes of worldwide disease burden [1], yet remain lowest on the agenda of policy makers, particularly in developing countries. Integrating psychiatric care into primary care, the principal strategy to address mental health unmet need has remained inadequate and psychiatric services have been centralized in the large cities in sub-Saharan Africa [2]. Substance related disorders are disorders of intoxication, dependence, substance withdrawal and abuse by various substances include alcohol; amphetamines or similarly acting agents; caffeine; cannabis; cocaine; hallucinogens; inhalants; nicotine; opioids; phencyclidine (PCP) or similar agents; and a group that includes sedatives, hypnotics, and anxiolytics. A residual 12th category includes a variety of agents not in the 11 designated classes, such as anabolic steroids and nitrous oxide. Substance related disorders can be subcategorized into substance use disorder (SUD) and substance induced disorder (SID) [3].

Globally, Substance abuse is becoming a serious ongoing public health problem; it affects almost every community and family in some way. There were about 190 million substance abusers. Out of these substance abusers, around 40 million serious mental illnesses or were identified each year substance use among adolescents [4]. The fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) was the major revision of the DSM

and resulted in significant, well documented changes from the (DSM-III) Substance induce disorder (SID) include a medical condition that can be directly attributed to the use of a substance these conditions include substance induced delirium, substance induced psychosis, substance induced mood disorders, intoxication and withdrawal [1].

Many studies have discussed reports of drug abuse among youths in various parts of the world [5]. A recent study based on prevailing concerns of the likely unnoticed prevalence of substance use among Saudi adolescents, to assess dependence on substances including amphetamines, cannabis, cocaine, and opioids. Psychotic symptoms increased with the severity of the disorders associated with the use of substances. These findings underscore the importance of developing services to target this population; a population at risk of developing psychotic disorder [6]. Studies of alcohol use among adolescents in the United States have shown that by 13 years of age, one third of boys and almost one fourth of girls have tried alcohol, by 18 years of age, 92 percent of males and 73 percent of females reported trying alcohol, and 4 percent reported using alcohol daily [7]. Approximately one in five adolescents have used marijuana or hashish and one third of adolescents have used cigarettes by age 17 years. Of high school seniors, 41 percent reported using marijuana; 2 percent reported using the drug daily [8]. Recent studies have demonstrated a link between adolescent substance use and the onset of psychosis in young adulthood, research is needed to study the neurobiology of substance induced psychosis. Such studies would thus promote primary prevention for substance abusers at risk of psychosis the findings also confirm the importance of developing services to target out of treatment [9,10].

The history of psychoactive substance use in Africa is relatively short except for the reports on the use of traditional substances such as alcohol, cannabis, and chat. The introduction of prescription drugs to Africa drastically increased the availability and use of psychoactive substances [11]. Two Ghanaian studies conducted among secondary school students and nationally representative samples of in and out of school youth found that the prevalence of lifetime alcohol use was approximately 25%. They also reported that Chat, alcohol, hashish, tobacco, and solvents were the most abused substances [12]. In the study conduct on Tanzania, most of the users are Adolescence is often a time of experimentation with drugs alcohols, and other substance use as well as practicing [13]. The percentage of cannabis associated psychosis has been reported to be between 12 and 40% of all psychosis in African psychiatric hospitals [14]. Existing literature on alcohol consumption among adolescents in sub Saharan Africa suggests that a substantial proportion of adolescents have consumed or currently consume alcohol [15].

Many risk and protective factors influence the age of onset and severity of substance use among adolescents. Psychosocial risk factors mediating the development of substance use disorders include parent modeling of substance use, family conflict, lack of parental supervision, peer relation-

ships, individual stressful life events, parental belief in the harmlessness of substances, lack of anger control in families of substance abusers, lack of closeness and involvement of parents with children's activities, maternal passivity, academic difficulties, comorbid psychiatric disorders such as to conduct disorder and depression, parental and peer substance use, impulsivity, and early onset of cigarette smoking [2].

The relationship between substance use and psychosis remains a contentious issue and regularly debated within academic, clinical, and political circles [16]. This level of comorbidity highlights the difficult diagnostic challenge faced by clinicians and researchers in accurately differentiating substance induced psychotic episodes from primary psychotic disorders in the context of co-occurring substance misuse [17]. Globally all groups of the population are abusing substances today than at other times in history. However, studies and statistics show that more vulnerability, incidence, and negative effects of substance abuse are observed among pre-teen and young people [3]. On the National Behavioral Surveillance Survey (BSS) done in Ethiopia, among every Chat users, 29.1% of out of school and 9% of in school students had consumed drinks containing alcohol in the four weeks preceding the Interview. Regular consumption of alcohol (at least once a week) was reported by 19.5% of the youngest out of school youth (OSY) and 8.9% of in school youth (ISY) [18].

Despite this fact of substances influence few studies address the increased risk of mental health link between adolescent substance use and the development of psychosis in early adulthood, within clinical practice, the issue is further complicated by high rates of co-occurring substance use disorders (SUD) amongst individuals suffering from a psychotic illness. Therefore, it is sound able to do this research based on the magnitude of substance induced psychosis and associated factors among adolescent.

Materials and Methods

Study design, period, and setting

The institution based cross sectional study design was conducted in Amanuel mental specialized hospital from February 1 to March 31, 2017. Amanuel Mental Specialized Hospital (AMSH) is the only psychiatric hospital in Ethiopia and is located in Addis Ababa. AMSH was established in 1980. The hospital provides 110, 000-120,000 extensive outpatient and a limited inpatient treatment service with 361 beds mostly dedicated to acute care one based on a one year admission record. The leading consultant psychiatrist for each ward has primary responsibility for making a clinical diagnosis were prefer to admission diagnosis as more valid and final categorization clinical profile of the admitted patient.

Sample size calculation and sampling procedure

The assumption made for sample size calculation were standard normal distribution with a 95% confidence interval, absolute precision or tolerable margin of error ($d=0.05$),

and 50% expected prevalence substance induced psychosis to get the maximum sample size and Considering 10% of the non-respondents rate, Then by population correction formula because of the target population is less than 10,000 final sample size was (n=235). Systematic random sampling technique was employed to select study units among Psychotic patients who come for follow up visit at AMSH during the study period.

Data collection instrument and technique

The questionnaire was prepared in English and translated into Amharic (the commonly spoken language in the study area), and finally back to English to test the accuracy of the translation. The Amharic version questionnaire was pre-tested on 12 (5%) at Amanuel street (Kebele 06/07) on the voluntary respondents to check its understandability, clarity, and completeness of the question.

Operational definitions

Substance: For this study, it was defined as alcohol, chat, cigarettes, and illicit drugs to alter their mood or behavior.

Substance abuse: For this study, it was defined as the abuse of alcohol, chat, cigarettes, and illicit substances by adolescents and fulfills the criterion.

Substance induced psychosis: one of substance related disorder mainly characterized by a loss of connectedness with reality.

Illicit drugs: A psychoactive substance, the production, sale, or use of which is prohibited

Data analysis and interpretation

Collected data was checked for completeness and code was given before data entry. Then Data were entered into Epi Data version 4.4.2.1 and exported to Statistical package of social sciences (SPSS) version 19 software package for data analysis. Descriptive statistics were done to explore the distribution of socio demographic characteristics; substance induced psychotic disorder of study participants. Different frequency tables, graphs, and descriptive summaries were used to describe the study variables. Bivariate and multivariate logistic regression with an odds ratio (OD) of 95% confidence interval was used to identify the substance types which more likely induce psychosis. Types of substance with a P value of less than 0.25 in the bivariable analysis were transformed into the multivariable analysis. In multivariable analysis, variables with a p value of less than or equal to 0.05 were considered statistically significant. The adjusted odds ratio (AOR) with the corresponding 95% confidence interval (CI) was used to show the strength of association.

Results

Socio demographic characteristics of the study participants

All 235 (100%) selected subjects responded to the prepared questionnaire. Among the study subjects, 155 (65.9%) were males and 80 (34.1%) were females. Of the selected sub-

jects 92 (39.14%) were in the age group 12-15 years, 143 (60.85%) were in the age group of 16-20 years with a mean age of 17.069 ± 1.54 years for males and 16.71 ± 1.24 for females respectively. Of respondents 68 (28.9%) were Amhara. Out of the total respondents, 115 (50.9%) were Muslim followers. Of the total participants, 74 (31.4%) were at a higher educational level. Regarding the parental characteristics, father's educational level 42 (17.87%) were illiterate, 82 (18.3%) were can read and write. Mother's educational level 66 (28.1%) illiterates, 95 (40.4%) were can read and write, and family exposure to substances/drug 155 (66%) uses substances/drugs and 80 (34%) non-users (Table 1).

Table 1: Socio-demographic characteristic of study participants at Amanuel mental specialized hospital adolescents (n=235) Addis Ababa, Ethiopia 2017.

Variables	Frequency	Percentage
Age		
Dec-20	235	100%
Sex		
Male	155	66%
Female	80	34%
Educational status		
1.Illiterate	-	-
2.1-8 Grade	20	8.50%
3.9-12 Grade	141	60%
4.Higher education	74	31.50%
Religion		
Orthodox	43	18.30%
Protestant	26	11.06%
Catholic	27	11.50%
Muslim	119	50.60%
Others	20	8.50%
Ethnicity		
Amhara	68	28.90%
Oromo	52	22.10%
Tigray	30	12.80%
Gurage	34	14.50%
Others	51	21.70%
Father's education		
Illiterate	42	17.90%
Read and write	82	34.90%
7-12 grades	72	30.60%
Above grade 12	29	12.30%
He is not alive don't know	10	4%
Mother's education		
Illiterate	66	28.10%
Read and write	95	40.40%

7-12 grades	44	18.70%
Above grade 12	20	8.50%
She is not alive don't know	10	4.30%
Family use of substance / drug		
Yes	155	66%
No	80	34%

Prevalence of substance use and substances inducing psychotic disorder among study participants

The finding reveals that the Prevalence of substance induced psychosis was among 67 (28.51%) adolescents.

Even though almost all Adolescents were using at least one type of substance during the study period, 28.51% of them developed psychosis because of their substance use. Addressed list of substances induced psychosis were; alcohol 200 (85%), khat 196 (83.40%), cigarettes 156 (66.4%), and illegal drugs 98 (41.7%) Based on this, overall substance/drugs abuse (AOR 95%CI 2.15 (1.23, 3.70), $p=0.02$) was found. There is strong association between substances abuse and psychosis development Illegal drugs AOR 95%CI 4.36 (1.12, 7.33), $p<0.01$, Alcohol consumption AOR 95%CI 2.22 (1.63, 4.42), $p=0.01$, Khat chewing AOR95%CI 2.10 (1.61, 5.49) $p=0.07$ and weak association with cigarette smoking (AOR 95%CI 1.5 (0.32, 2.38), $p=0.04$) (Table 2).

Table 2: Factors Associated with induced psychotic disorder among study participants in Amanuel mental specialized hospital, Addis Ababa, Ethiopia 2017

Substances inducing psychosis		N	%	p-value	Crude OR 95%CI	Adjusted OR 95% CI
Use of any substance	Yes	235	100	0.02	4.34(2.64, 6.41)	2.15(1.23,3.70)
	No	0		1		
Alcohol consumption	Yes	200	85%	0.01	2.91(1.32,4.25)	2.22(1.63,4.42)**
	No	35	14.80%	1		
Khat chewing	Yes	196	83.40%	0.07	3.11(1.81,4.24)	2.10(1.61, 5.49)**
	No	39	16.60%	1		
Cigarettes smoking	Yes	156	66.40%	0.04	2.16(1.77,4.36)	1.5(0.32,2.38)
	No	79	33.62%	1		
Illegal drugs	Yes	98	41.70%	0.01	1.23(0.12,2.33)	4.36(1.12,7.33)**
	No	137	58.30%		1	

Factors influencing adolescents to use substances among study participants

Peer pressure and family influence to use substance 92 (39.14%), availability of the drugs 40 (17.02%), personal pleasure (relaxation) and to stay awake 57 (24.26%) and to get relief from academic tension 46 (19.57%); were found to be factors influencing adolescents to use substances among Adolescents at Amanuel Hospital (Figure 1).

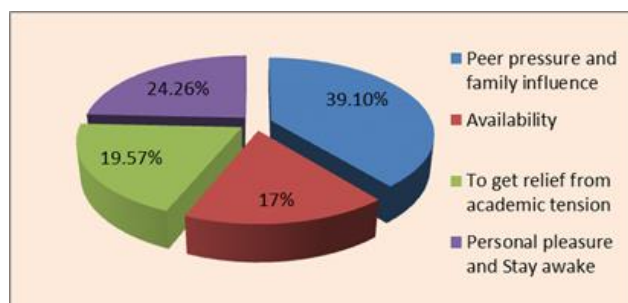


Figure 1: Represent Distribution of Factors influencing Adolescents to use substances among study participants in Amanuel mental specialized hospital, Addis Ababa, Ethiopia 2017.

Discussion

The cross sectional study design was undertaken among 235 and the prevalence of substance induced psychosis

was 28.51% among adolescents (12-20 years). The findings were consistent with a descriptive analysis of the admission report in Amanuel psychiatric hospital; admission with 322 (26.4%) was substance induced psychosis and Most patients were predominantly aged 20 years and under [19]. The study showed that there was a substantial burden of psychoactive substance use among adolescents in Amanuel mental specialized hospital.

The high prevalence of khat use among adolescents 196 (83.40%), in the current study, was almost consistent with the result of a similar study done at Somalia, Addis Ababa, and southwestern Ethiopia that revealed the prevalence of khat chewing 81.6%, 84.7%, and 84.9% among adolescents respectively [14,18,19,20].

The prevalence of alcohol drinking among the study participants were 200 (85%), the finding is similar with the study on Western Kenya with an alcohol consumption rate of 323 (87.60%), Netherlands 266 (85.20%), Brazil 311 (84.90%) however study done among Saudi Arabia adolescents at Al-Amal Hospital in Jeddah alcohol use was 10.7% [5] the difference may be partly due to community norms and traditional difference. The finding shows that adolescents who have high alcohol use, as compared to other drugs, maybe due to social, cultural, and legal acceptability [20-22].

Furthermore, the study also revealed that cigarette smok-

ing was 156 (66.4%) The reported rate of cigarette smoking in this study was almost consistent with the study conducted among college students in Northwest Ethiopia 187 (63.21%) [5]. The finding was also in agreement with the community based study conducted in Butajera town, among adolescents in Ethiopia and undergraduate medical students of Addis Ababa University 422 (65.3%), 235 (57.2%), respectively [19].

This finding was also consistent with a study conducted among undergraduate students at the University of Ilorin, Nigeria in which the prevalence of smoking was 538 (57%) [22]. However, the results of this study were lower than studies conducted among adolescents in rural Zambia, among High school students in Harare, Zimbabwe, and among college students in Eldoret, Western Kenya with the prevalence of cigarette smoking 77%, 78.8% and 82.8% respectively [9,21-23]. The possible explanation for the observed differences in substance use could be due to the differences in the knowledge on the health risks of substances used, the consumption of cigarettes is increasing because cigarettes are readily available from shops and street peddlers without any age restrictions, students can buy with low cost and consume.

In this findings prevalence of illegal substance use was (41, 7%) similarly on the study done on Illegal substance use prevalence was 718 (35.2%), 639 (37.1%) for private school and higher education respectively and is lesser finding on governmental high school 993 (3.2%) for Addis Ababa and 876 (2.7%) for butajera governmental school [20]. The inability to reduce prevalence might result from those substances are obtained from illicit drug traffickers in the form of illegal ways. And also, the geographical location of Addis Ababa probably might favor those substances/drugs to abuse.

The finding on reason to use substance was peer pressure and family influence 92 (39.10%), availability of the drugs 40 (17.02%), personal pleasure (relaxation) 32 (13.6%) and academic dissatisfaction 33 (14%) to get relief from academic tension 46 (19.57%), personal pleasure and to stay awake 57 (24.26%). The illegal drug use more likely increases the risk of psychosis by 4 times than non-users AOR 95%CI 4.36 (1.12, 7.33). Alcohol and Khat chewing were more likely 2 times increase the risk of developing psychosis than non-users AOR 95%CI 2.22 (1.63, 4.42) and AOR 95%CI 2.10 (1.61, 5.49) respectively. More substances were introduced to students by peer pressure and family influence which play a great role in introducing substances/drugs.

Conclusion

The prevalence of substance induced psychosis was 28.51% among adolescents (12-20 years). Substance use mainly illegal drugs, alcohol, and khat significantly insisted on school adolescents. Peer pressure and family substance abuse have influences on the drug use of adolescents. There is an association between adolescent substance use and the onset of psychosis in young adulthood. We iden-

tified the top 250 differentially expressed genes based on significant P values. DENV2 and 4 had the highest significantly expressed genes in GEO2R comparison analysis. The significant DEGs (n=34) are clustered into four big gene functional groups using the DAVID bioinformatics tool and three groups contain 27 genes selected for further analysis based on the highest enrichment scored (>1). PPI network analysis shows 10 protein interactions among the nodes and selected one protein which is highly interacting with the other 3 protein in the network. CASR a G-protein coupled receptor protein found the highest interacting and enrichment analysis results also supportive of the findings. This could be a potent biomarker for the therapeutic and diagnosis of dengue viral disease.

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Availability of Data and Material

The datasets used and/or analyzed during the study were available from the corresponding author on reasonable request through email bokaabdisa@yahoo.com

Authors' Contributions

AB originated the idea and wrote the proposal, participated in data collection, analyzed the data, drafted the paper interpretation, and writing of the manuscript.

Ethics Approval and Consent to Participate

Ethical issues were approved by the Addis Ababa research review committee (RRC). After approval for ethical clearance, then a formal letter of cooperation was written to Amanuel Mental Specialized Hospital from Addis Ababa University before data collection. Before administering the questionnaire, the objectives of the study were clearly explained to the participants and written consent was obtained. Participants were informed that their participation was voluntary that they could withdraw from the study at any time if they wished to do so and this would not affect any service or benefit that they will get from the institution. All the information given by the respondents has been used for research purposes only and confidentiality was maintained by omitting the names of the respondents.

Consent for Publication

This manuscript contains original material. Neither the article nor any part of its essential substance, tables, figures, has been or will be published elsewhere. The author submitted for publication without conflict of interest.

Competing Interests

The authors declare that they have no significant competing financial, professional, or personal interest that might have

influenced the performance or presentation of the work described in this manuscript

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