



Original Research

Prevalence of Self-Reported Psychotic Experiences and Associated Factors Among High School Students in Dire Dawa Ethiopia, 2025

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Abstract

Background: Psychotic experiences (PEs) among high school students often represent early indicators of serious mental health risks. In low-resource settings such as Ethiopia, these experiences remain insufficiently studied despite their potential long-term effects on educational performance and social functioning. This study assessed the prevalence of psychotic experiences and associated factors among high school students in Dire Dawa, Ethiopia, in 2025.

Methods: A school-based cross-sectional study was conducted among 953 high school students selected using stratified random sampling from public and private schools. Data were collected using a structured questionnaire, including the Community Assessment of Psychic Experiences. Social and environmental factors were assessed using the Oslo-3 Social Support Scale and the Adverse Childhood Experience scale. Information on demographic characteristics, substance use, and family-related factors was also obtained. Data analysis was performed using multivariable logistic regression to identify predictors of psychotic experiences.

Results: The mean age of participants was 17.76 ± 1.74 years. The overall prevalence of psychotic experiences was 33.8%, with persecutory ideation being the most commonly reported symptom (40.4%). Significant predictors of psychotic experiences included khat chewing (AOR = 3.27; 95% CI: 2.01–5.33), cigarette smoking (AOR = 2.02; 95% CI: 1.07–3.83), physical neglect (AOR = 1.74; 95% CI: 1.16–2.60), emotional abuse (AOR = 5.05; 95% CI: 2.83–9.02), and parental absence (“left behind”) (AOR = 4.71; 95% CI: 3.20–6.92). Females reported more perceptual abnormalities, whereas males reported more bizarre thoughts.

Conclusion: The high prevalence of psychotic experiences underscores the urgent need for school-based mental health interventions focusing on substance use prevention, trauma-informed care, and strengthened social support to reduce future mental health burden among Ethiopian adolescents.

Keywords: Childhood Trauma, Drug Use, Ethiopia, Psychotic Experiences, Social Support

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1. Introduction

Psychotic experience (PE) is defined as subclinical manifestations of hallucinations, delusional beliefs, and disorganized or unusual thought processes are increasingly recognized as important indicators of underlying mental health vulnerability, particularly during adolescence ^[1,2]. Although these experiences do not necessarily meet diagnostic criteria for psychotic disorders, they are clinically significant because of their strong association with later mental illnesses, including schizophrenia spectrum disorders, mood disorders, anxiety, and suicidal behaviors ^[3]. Adolescence represents a critical developmental period marked by rapid neurobiological maturation, psychological restructuring, and expanding social roles. These transitions, combined with heightened exposure to academic pressure, peer influence, and environmental stressors, increase susceptibility to PEs and other mental health problems ^[4,5].

Globally, an estimated 5–20% of adolescents report at least one psychotic experience, and approximately 10–20% suffer from diagnosable mental health conditions ^[1,6]. Evidence from high-income countries indicates relatively lower prevalence rates of PEs, ranging from 5% to 7.4%, likely reflecting better access to early mental health services and preventive interventions ^[7]. In contrast, studies from low- and middle-income countries (LMICs) consistently report higher prevalence, such as 45.5% in Kenya and 51.4% in Tunisia ^[8,9]. These elevated rates are often attributed to socioeconomic adversity, exposure to trauma, limited mental health infrastructure, and cultural interpretations of unusual perceptual experiences that may normalize or underreport distress ^[10].

In LMICs such as Ethiopia, adolescent mental health risks are further intensified by rapid urbanization, widespread poverty, unemployment, and limited availability of specialized mental health services ^[11,12]. Dire Dawa City Administration, one of Ethiopia's major urban centers, illustrates these challenges. A substantial proportion of adolescents are exposed to psychoactive substances, particularly khat, which is widely available and socially accepted ^[13]. Additionally, labor migration has resulted in a significant number of adolescents being "left behind" by one or both parents, increasing vulnerability to emotional neglect, poor supervision, and psychosocial stress ^[14]. Urban stressors, including overcrowding, academic competition, and community violence, further compound these risks.

Substance use, adverse childhood experiences, and family instability are well-established predictors of PEs worldwide ^[15,16]. However, the combined influence of these factors has not been adequately explored among Ethiopian adolescents, particularly in urban settings. Existing studies in Northwest

Ethiopia have primarily focused on substance-using populations and reported a PEs prevalence of 24.2%, leaving a critical evidence gap regarding the general adolescent population [17].

Despite evidence that 14–24.5% of adolescents in Dire Dawa experience depressive symptoms, and that PEs strongly predict suicidality and functional impairment, localized data on psychotic experiences remain scarce [14,18]. Moreover, mental health service utilization among adolescents is extremely limited, with fewer than one in five affected individuals receiving appropriate care [19]. This lack of evidence hinders the development of targeted, school-based mental health interventions.

Therefore, this study aims to assess the prevalence of psychotic experiences and identify key socio-demographic, substance use-related, and trauma-related predictors among high school students in Dire Dawa. The findings are expected to provide context-specific evidence to inform early identification, prevention, and intervention strategies for adolescent mental health in resource-limited urban settings.

2. Methods

2.1. Study Area, Period and Design

The study was conducted in Dire Dawa City Administration, the second federal city administration of Ethiopia, located approximately 515 km east of Addis Ababa. Dire Dawa shares administrative boundaries with the Eastern Oromia and Somali Regional States and lies within about 300 km of Djibouti, giving it strategic socioeconomic and cultural significance. Administratively, the city comprises nine urban and thirty-eight rural kebeles. According to the 2024 United Nations population projection, the estimated metropolitan population of Dire Dawa is 486,000 [20].

In the 2023/2024 academic year, a total of 24,377 students were enrolled in secondary (high school) education in Dire Dawa, with males and females accounting for 54% and 46% of the student population, respectively. The city has approximately nine government high schools providing secondary education services [21]. This study was conducted in selected governmental high schools in Dire Dawa from February to April 2025.

2.2. The Study Variables

2.2.1. Dependent Variables

- **Psychotic Experiences (PEs):** The characteristic feature of experiencing distorted perceptions of reality, most commonly manifested as hallucinations (seeing or hearing things that aren't there) or delusions (strongly held false beliefs that are not based in reality).

2.2.2. Independent Variables

- **Demographic Factors:** Age, Sex, Socioeconomic status Urban/rural residence
- **Psychosocial Factors:** Trauma history, Family functioning, Peer relationships, Substance use
- **Childhood Traumas:** students experience before the age of 16 and measures childhood maltreatment.

2.3. Operational Definitions and Measurements

Psychotic Experiences (PEs):

- Weighted scores range from 1 to 4. A weighted score cut-off point of 1.7 was used to define the presence of psychotic experiences in the general population. Individuals scoring above this threshold were considered to have psychotic experiences [23,24]. In addition, higher scores at or above the 75th percentile were used to indicate individuals at an elevated risk for psychotic disorders.

Social Support:

- Social support was measured using the Oslo Social Support Scale (OSSS-3). The total OSSS-3 score was categorized into three levels: poor social support (scores 3–8), moderate social support (scores 9–11), and strong social support (scores 12–14) [25].

Adverse Childhood Experiences (ACEs):

- Exposure to adverse childhood experiences was assessed using established cut-off values for each trauma subtype. High exposure was defined as emotional abuse (EA) ≥ 13 , physical abuse (PA) ≥ 10 , sexual abuse (SA) ≥ 8 , emotional neglect (EN) ≥ 15 , or physical neglect (PN) ≥ 10 [26].

2.4. Data Collection Tools and Procedures

Data were collected using a structured, interviewer-guided questionnaire consisting of five components.

- **Part one** assessed socio-demographic characteristics, including age, sex, grade level, and related variables, using a standardized questionnaire.
- **Part two** addressed lifestyle factors and academic-related pressures, measured using dichotomous (yes/no) questions.
- **Part three** evaluated childhood trauma using the Childhood Trauma Questionnaire (CTQ), which comprises 28 items assessing experiences before the age of 16 years. Of these, 25 items measure overall childhood maltreatment across five subscales, each

containing five items: Emotional Abuse (EA), Physical Abuse (PA), Sexual Abuse (SA), Emotional Neglect (EN), and Physical Neglect (PN) [77].

- **Part four** assessed perceived social support using the Oslo Social Support Scale (OSSS-3) [78].
- **Part five** measured psychotic experiences using the Community Assessment of Psychic Experiences (CAPE). The CAPE has three versions: the full-length CAPE-42, the short positive subscale (CAPE-P15), and the ultra-brief CAPE-9. In this study, the CAPE-P15 was utilized due to its established psychometric properties and suitability for community-based adolescent populations [74].

2.5. Data Quality Control

To ensure data quality, the questionnaire was initially prepared in English and then translated into Amharic, Afan Oromo, and Somali. It was subsequently back-translated into English to verify the accuracy and consistency of the translations. A two-day training was provided for data collectors and supervisors, focusing on the study objectives, data collection procedures, measurement techniques, and ethical considerations. Completed questionnaires were reviewed daily by the supervisors and the principal investigator for completeness, accuracy, and clarity. In addition, data were carefully checked during entry and compilation prior to analysis to minimize errors. A pretest of the data collection tool was conducted among 5% of the sample at a high school in Harar city, and necessary modifications were made based on the pretest findings.

2.6. Data Analysis and Presentation

All model assumptions were assessed and satisfied, and no evidence of multicollinearity was observed (variance inflation factor [VIF] range: 1.270–2.210). Descriptive statistics were used to summarize participants' sociodemographic characteristics, potential predictor variables (risk factors), and the prevalence of psychotic experiences (PEs). Bivariable regression analysis was initially conducted to examine the association between each independent variable and PEs. Variables with a p-value < 0.25 in the bivariable analysis were considered candidates for the multivariable regression model. Multivariable regression analysis was then performed to identify factors independently associated with PEs. All statistical analyses were conducted using SPSS version 27.0, and statistical significance was determined at a p-value of < 0.05.

3. Results

3.1. Socio-demographic Characteristics

Of the initial sample of 953 students, 27 declined participations, yielding a response rate of 97.2%. An additional 10 participants were excluded from the final analysis because they were currently receiving follow-up care for pre-existing mental health conditions. Consequently, data from 916 students were included in the analysis.

Among the participants, 459 (50.1%) were female and 457 (49.9%) were male. The age of respondents ranged from 15 to 25 years, with a mean ($\pm$ SD) age of 17.76 ± 1.74 years. The majority of participants were of Oromo ethnicity (312; 34.1%) and Muslim by religion (414; 45.2%). Nearly one-quarter of the students (245; 26.7%) reported being left behind by one or both parents due to migration, while 44 participants (4.8%) indicated a family history of mental illness (Table 1).

Table 1: Socio-demographic characteristics of the participants among high school students Dire Dawa Ethiopia

Variables		n (N = 916)	%
Age	Age $\leq$ 18	658	71.8
	Age >18	258	28.2
Gender	Male	457	49.9
	Female	459	50.1
Grade	9	244	26.6
	10	235	25.7
	11	260	28.4
	12	177	19.3
Religion	Muslim	414	43.1
	Orthodox	394	41
	Protestant	82	8.5
	Catholic	18	1.9
	Other	8	0.8
Ethnicity	Oromo	312	34.1
	Somali	162	17.7
	Amhara	290	31.7
	Gurage	79	8.6
	Other	73	8
Parent marital status	Married	673	73.7
	Not Currently Married*	241	26.3
Family left behind	Yes	243	26.5
	No	673	73.5
Family history of mental illness	Yes	44	4.8
	No	872	95.2

*Not currently married include (divorced, separated and widowed)

3.2. Prevalence of Psychotic Experiences

Overall, 310 students (33.8%) scored above the CAPE cut-off value of 1.7, indicating the presence of psychotic-like experiences (PEs). Among the different symptom domains, persecutory ideation was the most prevalent (40.4%), followed by bizarre experiences (36.1%) and perceptual abnormalities (27.2%). Furthermore, 230 students (25.1%) scored at or above the 75th percentile (≥ 28), suggesting an elevated risk for developing psychotic disorders.

3.3. Factors Associated with Psychotic Experiences

In bivariable logistic regression analysis, grade level, ethnicity, religion, being left behind by parents, parental marital status, cigarette smoking, academic pressure, poor social support, and adverse childhood experiences (physical neglect, emotional abuse, and physical abuse) were associated with PEs at $p < 0.25$.

In the multivariable logistic regression model, gender, age, parental marital status, adverse childhood experiences, poor social support, grade level, being left behind by parents, substance use (alcohol, khat, and cigarette smoking), and academic pressure remained significantly associated with psychotic experiences ($p < 0.05$).

Table 2: Multivariate Analysis to identify factors associated with psychotic experiences among high school students, Dire Dawa Ethiopia, 2025 (n = 916).

Variables		Psychotic Experiences		COR (CI 95%)	AOR	95% C.I. for AOR	
		Yes (n)	No (n)			Lower	Upper
Religion	Muslim	122	292			1	
	Orthodox	147	247	1.424 (1.062-1.911)	2.011	1.06	3.814
	Protestant	34	48	1.695 (1.041-2.760)	1.703	0.815	3.56
	Catholic	6	12	1.197 (0.439-3.261)	0.481	0.125	1.845
	others	1	7	0.342 (0.042-2.809)	0.061	0.002	1.879
Ethnicity	Oromo	70	242			1	
	Somali	65	97	2.317 (1.535-3.497)	2.377	1.386	4.076
	Amhara	102	188	1.876 (1.310-2.686)	1.704	0.912	3.18
	Gurage	32	47	2.354 (1.397-3.967)	3.809	1.797	8.077
	others	41	32	4.429 (2.598-7.551)	2.518	1.165	5.444
Parental Marital Status	married	190	485			1	
	Not married	120	121	2.532 (1.870-3.428)	1.509	1.009	2.257
Left Behind	yes	154	89	5.735 (4.19-7.869)	4.708	3.203	6.92
	No	156	517		1		
Cigarettes Smoking	Yes	56	37	2.166 (1.388-3.379)	2.02	1.066	3.829
	No	254	569			1	
Khat Chewing	yes	71	78	2.011 (1.409-2.871)	3.274	2.013	5.325
	No	239	528			1	
	yes	215	283	2.583 (1.934-3.450)	1.735	1.159	2.599

Physically Neglected	No	95	323		1		
Physically Abused	Yes	165	484	3.486 (2.586-4.700)	1.97	1.253	3.097
	No	145	122		1		
Emotionally Abused	Yes	94	29	8.659 (5.55-13.508)	5.053	2.831	9.017
	No	216	577		1		

4. Discussion

In this study, the prevalence of psychotic experiences (PEs) among high school students in Dire Dawa was found to be 33.8%, with persecutory ideation (40.4%) being the most frequently reported subtype. This prevalence is higher than previous estimates from Northwest Ethiopia (24.2%), which may be attributable to the protective effects of rural settings, including stronger community ties and social cohesion [27]. However, the finding aligns with even higher prevalence rates reported in other African countries, such as Kenya (45.5%) [28] and Tunisia (51.4%) [29]. These disparities likely reflect regional variations in exposure to psychosocial stressors. For instance, Kenya's higher prevalence may be linked to widespread cannabis use, while Tunisia's extreme rate may reflect the psychological impact of post-revolution political instability. Dire Dawa's intermediate prevalence suggests a unique interaction between culturally entrenched khat use and urban-related stressors.

The increased prevalence of PEs in this study likely reflects the unique stressors faced by adolescents in Dire Dawa, including rapid urban growth, economic hardship, and widespread substance use [30,31]. Rapid urbanization and poverty are consistent with global evidence linking urban environments to increased mental health risks. Urban residents have a 2.4-fold higher risk of psychosis due to factors such as overcrowding, social fragmentation, and limited access to healthcare services [31], which may have increased participants' vulnerability [18,32]. Furthermore, the high occurrence of persecutory ideation is consistent with studies linking social challenges such as family separation and bullying to paranoid symptoms [17,33].

Regarding sex differences, females reported a slightly higher prevalence of non-clinical psychotic experiences compared with males (35.5% vs. 32.2%). This finding supports international evidence suggesting that females may be more susceptible to non-clinical psychotic symptoms due to social stressors or biological mechanisms [34]. Women's increased vulnerability may be explained by greater exposure to social stressors, including gender-based violence and caregiving burdens, as well as biological factors such as estrogen-related modulation of dopamine pathways [12]. Conversely, males exhibited a higher prevalence of

bizarre occurrences (36.1% vs. 27.2%), which may be related to higher substance use rates ^[35], consistent with findings from Nigeria indicating that males have a 2.3-fold higher risk of substance-induced psychosis ^[36].

Substance use showed a strong association with psychotic experiences. Khat chewing (AOR = 3.274, CI = 2.013–5.325) and cigarette smoking (AOR = 2.020) were identified as significant predictors. These findings are consistent with Ethiopian studies reporting high prevalence of khat and alcohol use and their adverse effects on perception and cognition ^[27,37,38]. In Dire Dawa, the cultural normalization of khat chewing may increase exposure, and the psychoactive alkaloid cathinone has been shown to disrupt dopaminergic regulation, increasing paranoia and psychotic symptoms ^[39]. Cigarette smoking was also significantly associated with PEs, aligning with global meta-analyses demonstrating that substance use doubles the risk of psychosis. In Dire Dawa, adolescents may face additional risks due to easy access to substances and self-medication for stress ^[27].

Childhood trauma was another significant predictor of psychotic experiences. This finding supports global evidence showing that adverse childhood experiences increase the risk of psychosis by three- to five-fold ^[40,41] and aligns with Ethiopian studies linking childhood adversity to increased substance use ^[37]. Trauma may contribute to a persistent state of heightened anxiety and psychological vulnerability ^[42]. Emotional abuse (AOR = 5.053, 95% CI: 2.831, 9.017) was strongly associated with PEs and, in the Ethiopian context, often coexists with economic deprivation, compounding psychological stress. Physical neglect (AOR = 1.735) showed a similar pattern, consistent with South African studies linking neglect to dissociation and psychotic symptoms ^[43]. Dire Dawa's high poverty rates likely contribute to neglect, reinforcing cycles of trauma and substance use. These findings suggest that childhood trauma acts as a distal risk factor that adversely affects adolescents' physical and mental development. Notably, physical neglect had the highest prevalence among trauma types, indicating the need for targeted interventions during vulnerable developmental periods.

Students who reported being left behind by their parents had 4.7 times higher odds of experiencing perceptual disturbances, highlighting the psychological impact of familial instability ^[25,44,45]. Academic stress also emerged as a significant predictor (AOR = 2.362), consistent with evidence that urban Ethiopian high school students face intense educational competition and economic pressure to succeed academically as a pathway out of poverty ^[16,46].

Although overall sex differences in perceptual disturbances were modest, females reported a higher prevalence of perceptual abnormalities (27.2% vs. 23.6%), potentially due to gender-specific trauma exposure or societal stigma [34]. In contrast, males experienced more bizarre occurrences (36.1% vs. 27.2%), possibly linked to higher engagement in risk-taking behaviors such as substance use [65]. Ethnicity also influenced psychotic experiences, with Somali (AOR = 2.377) and Gurage (AOR = 3.809) students exhibiting higher risks. These disparities may reflect cultural marginalization, displacement, and economic inequality [18]. Similar patterns have been documented globally, where marginalized groups such as African-Caribbean migrants in the United Kingdom experience three- to five-fold higher rates of psychosis due to discrimination and social exclusion [47]. In Dire Dawa, the Somali population, often affected by conflict-related displacement, may experience comparable “social defeat,” a well-established trigger for psychotic symptoms.

Strengths and Limitations of the Study

This study has several important strengths. It achieved a high response rate (97.2%) with a large sample size ($n = 953$), which enhances the representativeness and reliability of the findings. The use of standardized and validated instruments, translated into Amharic, Afaan Oromo, and Somali, improved inclusiveness and reduced language-related measurement bias. In addition, this is the first local study to examine the combined association of khat use and adverse childhood experiences with psychotic experiences among high school students in Dire Dawa, providing novel evidence relevant to the Ethiopian context.

However, the study also has limitations. The cross-sectional design precludes causal inference between identified risk factors and psychotic experiences. Self-reported data, particularly on sensitive issues such as adverse childhood experiences and substance use, may be affected by recall and social desirability biases. Furthermore, as the study was conducted exclusively in urban public high schools, the findings may not be fully generalizable to adolescents in rural settings or those not attending school.

5. Conclusion

This study reveals a high prevalence of psychotic experiences (PEs) among high school students in Dire Dawa, with approximately one in three students affected, indicating a significant public health concern. The occurrence of PEs is strongly associated with modifiable risk factors, including khat chewing, adverse childhood experiences, poor social support, and

social inequalities. These findings highlight the cumulative impact of substance use, early-life trauma, and social fragmentation on adolescent mental health in urban Ethiopian settings.

Urgent, comprehensive, and culturally appropriate interventions are needed to address these determinants. School-based mental health programs focusing on substance-use prevention, trauma-informed care, early screening, and the strengthening of social support systems are essential to mitigate the long-term mental health consequences of PEs. Prioritizing adolescent mental health within education and public health policies will contribute to improved resilience among at-risk youth and support progress toward health equity and relevant Sustainable Development Goals.

Abbreviations

ACE: Adverse Childhood Experience; AOR: Adjusted Odds Ratio; BE: Bizarre Experiences; CAPE: Community Assessment of Psychic Experiences; OSS-3: Oslo-3 Social Support Scale; LMICs: Low and Middle-Income Countries; PA: Perceptual Anomalies; PEs: Psychotic Experiences; PI: Paranoid Ideation; SPSS: Statistical Package for the Social Sciences.

Acknowledgments

First and foremost, we would like to express our sincere gratitude to Dire Dawa University and the Research Ethics and Review Board for granting us the opportunity to conduct this research proposal. We also extend our appreciation to the College of Medicine and Health Sciences, as well as to all participating health facilities, for their cooperation and support throughout the study.

Author's Contribution

All authors contributed equally to the conceptualization and design of the study. They participated in the development of the methodology, data collection, data analysis, and interpretation of the findings. All authors were involved in drafting, reviewing, and revising the manuscript and approved the final version for submission.

Ethical Approval

Ethical approval was obtained from the Institutional Review Board (IRB) of Dire Dawa University, and an official permission letter was secured from the Regional Education Bureau. Prior to data collection, participants were clearly informed about the study's purpose, procedures, potential risks, and anticipated benefits. Written informed consent was obtained

from all study participants as well as from their parents or legal caregivers. Throughout the study, participants' privacy was respected, and the confidentiality of all collected information was strictly maintained.

Conflicting Interests

The author(s) declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

Funding

Not applicable

Availability of Data and Materials

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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