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Prevalence of Substance use in Adolescent Suicide Attempters

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ABSTRACT

Background: Adolescent suicide is a critical public health issue, with substance use being a significant contributing factor. This study examines the prevalence and demographic associations of substance use among adolescent suicide attempters. **Methods:** A cross-sectional study was conducted on adolescents aged 15–19 years admitted following suicide attempts. Data on sociodemographic variables and substance use were collected using structured questionnaires and analyzed using descriptive and inferential statistics. **Results:** Substance use was reported by 35% of participants, with a significantly higher prevalence among females ($p = 0.027$). No significant associations were observed with age, residence, economic status, or occupation. Adolescents currently attending school exhibited the highest prevalence of substance use, suggesting education-related stress as a potential factor. **Conclusion:** Substance use is prevalent among adolescent suicide attempters, with notable gender differences and links to educational engagement. These findings underscore the need for gender-sensitive and school-based interventions to address substance use and associated suicidal behaviors.

INTRODUCTION

Suicidal behavior encompasses a spectrum ranging from suicidal ideation to attempts and completed suicide, and it is deeply influenced by psychological, social, and environmental factors. Adolescence, characterized by heightened emotional and cognitive transitions, is a particularly vulnerable period for such behaviors. Research underscores that suicidal behaviors in youth often involve impulsive actions stemming from stressors such as family conflicts, academic failures, and social alienation [1-4]. Understanding these behaviors demands a multidimensional approach that integrates psychosocial and biological perspectives to devise effective prevention strategies.

Adolescents account for a significant proportion of global suicide-related statistics, making this demographic a focal point for suicide prevention efforts. Studies highlight the disparity in methods and motives among adolescent suicide attempts, with females often using drug ingestion and males more likely to employ lethal methods. Socioeconomic hardships, exposure to trauma, and mental health conditions, including depression and anxiety, compound the risk of suicidal behaviors. The interplay of these factors necessitates targeted interventions and policy impleme - ntations to address the unique needs of this group [5-8].

Substance abuse is a critical contributor to suicidal tendencies among adolescents, acting as both a coping mechanism and a risk amplifier. The disinhibitory effects of substances like alcohol and drugs can heighten impulsivity and diminish problem-solving capabilities, increasing the likelihood of suicide attempts. Adolescents with co-occurring substance use disorders and psychiatric conditions exhibit a markedly higher risk of engaging in suicidal behavior. Hence, integrating substance abuse prevention within mental health frameworks is essential to mitigate these risks [9-13].

In India, adolescent suicide is a pressing public health issue, with high rates attributed to academic stress, familial pressure, and social stigma surrounding mental health. A recent analysis highlights that adolescents from rural areas and disadvantaged backgrounds are particularly susceptible due to limited access to mental health resources and educational opportunities [5,14-16]. The prevalence of suicidal ideation and attempts among Indian adolescents underscores the urgent need for culturally tailored interventions.

The psychological underpinnings of suicidal behavior in adolescents are multifaceted, often involving depression, anxiety, and personality disorders. Latent class analyses of suicidal behaviors reveal distinct subgroups, including those with suicidal ideation, gestures, and high-risk attempts, each presenting unique psychosocial profiles [17-19]. Inter- ventions targeting these psychological correlates can signifi cantly reduce suicide rates in adolescents by addressing root causes.

Adolescents' suicidal behaviors are often precipitated by adverse environmental and social factors such as family dysfunction, peer rejection, and societal expectations. Studies demonstrate a strong correlation between house hold conflicts and the emergence of suicidal tend encies in adolescents [19,21]. Schools and communities can play pivotal roles in suicide prevention by fostering supportive environments and offering accessible mental health services.

Gender differences significantly influence the presentation and outcomes of suicidal behaviors. Adolescent girls are more likely to exhibit suicidal gestures and ideation, whereas boys have higher rates of completed suicide due to the lethality of methods employed. This divergence necessitates gender-sensitive approaches to both prev ention and treatment [22,24]. Recognizing these patterns can enhance the effectiveness of tailored inter ventions.

The high prevalence of suicidal behavior among adolescents highlights an urgent need for comprehensive prevention strategies that integrate mental health care, substance abuse interventions, and social support systems. Collaborative efforts among schools, families, and healthcare providers are essential to address this multi faceted issue. By understanding the complex interplay of factors driving suicidal behavior, it is possible to develop more effective and culturally appropriate preventive measures(25,29).

METHODS

Study Design

This crosssectional study was conducted to examine the prevalence and associated factors of substance use among adolescent suicide attempters. The study utilized a quanti-tative design, with data collected through structured interviews and validated questionnaires administered to participants.

Study Setting and Participants

The study was conducted in a tertiary care hospital catering to both urban and rural populations. The participants included adolescents aged 15–19 years who were admitted following suicide attempts during the study period. Inclusion criteria were: (1) adolescents within the specified age range; (2) a confirmed history of a suicide attempt; and (3) ability to provide informed consent (or

Data Collection

Data collection was performed using a structured questionnaire divided into three sections: (1) sociode mographic information (age, gender, education, residence, economic status, and occup ation); (2) substance use history (type, frequency, and duration of substance use); and (3) psychiatric history and clinical variables. Standardized tools, including the CRAFFT screening test for sub stance use, were used to ensure reliability and validity. Interviews were conducted by trained clinical psychologists in a confidential setting to minimize reporting bias.

Variables and Measurements

The primary outcome variable was substance use status (present or absent). Independent variables included demographic factors (age, gender, residence, economic status, and education level) and clinical variables (history of psychiatric disorders and frequency of suicide attempts). Substance use was defined as the regular or occasional use of alcohol, tobacco, or other psychoactive substances within the past six months.

Statistical Analysis

Descriptive statistics (mean, standard devi-ation, frequencies, and percentages) were calcu-lated to summarize participant characteristics and substance use prevalence. Chi-square tests were employed to examine associations between substance use and demographic variables. Logistic regression analysis was performed to identify independent predictors of substance use. A p-value <0.05 was considered statistically significant. Statistical analyses were conducted using SPSS software (version 25.0).

Ethical Considerations

Ethical approval for the study was obtained from the institutional ethics committee. Informed consent was secured from all participants or their guardians, ensuring confidentiality and voluntary participation. Participants identified as at risk during the study were referred to mental health services for further evaluation and support.

RESULT

The analysis of the study participants revealed that gender was the only variable significantly associated with substance use among adolescent suicide attempters ($p = 0.027$), with a higher prevalence of substance use observed in females compared to males. Other demographic variables, including residence (rural vs. urban, $p = 0.961$), economic status (APL vs. BPL, $p = 1.000$), education level (never attended, dropout, currently attending, $p = 0.493$), age category (15–17, 18–19, $p = 1.000$), and occupation (employed vs. unemployed, $p = 1.000$), did not show significant associations with substance use. This indicates that while gender may play a role in substance use behaviors in this population, other factors like socioeconomic and educational variables may have less influence in this specific context.

Table 1: Sociodemographic profile of suicide attempters

Demographic Variable	Category	Frequency (n)	Percentage (%)	P-Value
Age Category	15-17	14	70	1
	18-19	6	30	
Gender	Male	11	55	0.02
	Female	9	45	
Residence	Rural	13	65	0.96
	Urban	7	35	
Economic Status	APL (Above Poverty Line)	14	70	1
	BPL (Below Poverty Line)	6	30	
Education Level	Never Attended	1	5	0.49
	Dropout	5	25	
	Currently Attending	14	70	
Occupation	Employed	17	85	1
	Unemployed	3	15	

The prevalence of substance use among adolescent suicide attempters in the dataset was found to be 35%, with 7 individuals reporting a history of substance use. Conversely, the majority of participants (65%, 13 individuals) reported no history of substance use. This highlights that while substance use is not universal in this population, it remains a significant factor, occurring in over one-third of the cases studied.

Table 2: Prevalence of Substance Use

Substance Use Status		Frequency (n)	Percentage (%)
Absent		13	65
Present		7	35

Among males, 90.9% had no history of substance use, and only 9.1% reported substance use. In contrast, among females, a majority (66.7%) reported substance use, while only 33.3% had no history of substance use. These findings suggest a notably higher prevalence of substance use among females compared to males in this population of adolescent suicide attempters.

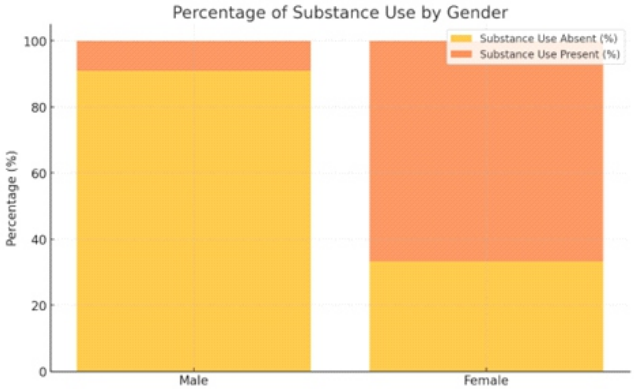

Figure 1: Percentage of Substance Use by Gender

The prevalence of substance use varied across different education levels. Among those who had never attended school, none (0.0%) reported substance use. Among dropouts, 20.0% reported substance use, while 80.0% did not. Among those who were currently attending school ,substance use prevalence was highest, with 42.9% reporting substance use and 57.1% having no history of substance use. These findings suggest that adolescents currently engaged in education exhibit a higher prevalence of substance use compared to other groups, possibly indicating unique stressors or environmental factors in this subgroup.

Table 3: Prevalence of Substance Use by Education

Education Level	Substance Use Absent (n, %)	Substance Use Present (n, %)
Never Attended	1 (100.0%)	0 (0.0%)
Dropout	4 (80.0%)	1 (20.0%)
Currently Attending	8 (57.1%)	6 (42.9%)

The analysis of substance use by residence and economic status revealed no substantial differences across categories. Among those from rural areas, 30.8% reported substance use, while 69.2% did not. In urban areas, substance use prevalence was slightly higher at 42.9%, with 57.1% having no history of substance use. For individuals classified as APL(Above Poverty Line), 35.7 % reported substance use,while .64.3% did not. Similarly, among those categorized as BPL (Below Poverty Line), substance use prevalence was 33.3%, with 66.7% reporting no history of substance use. These findings suggest that neither residence nor economic status showed a marked association with substance use in this population

Table 4: Association of Substance Use with Residence and Economic

Variable	Substance Use Absent (n, %)	Substance Use Present (n, %)
Residence: Rural	9 (69.2%)	4 (30.8%)
Residence: Urban	4 (57.1%)	3 (42.9%)
Economic Status: APL	9 (64.3%)	5 (35.7%)
Economic Status: BPL	4 (66.7%)	2 (33.3%)

The age distribution among individuals with and without a history of substance use was similar. The mean age of those without substance use was 16.77 years (SD = 1.24), while for those with substance use, the mean age was slightly higher at 16.86 years (SD = 1.68). Both groups had a median age of 17 years, with ages ranging from 15 to 19 years. The interquartile ranges (IQR) were also comparable, indicating no significant differences in age distribution between the two groups. This suggests that age may not be a distinguishing factor for substance use in this population.

Table 5: Association of Substance Use with Residence and Economic

Substance Use Status	Mean Age	Standard Deviation	Minimum Age	25th Percentile	Median Age	75th Percentile	Maximum Age
Present	16.76923	1.235168	15	16	17	18	19
Absent	16.85714	1.676163	15	15.5	17	18	19

Statistical analysis using chi-square tests revealed significant and non-significant associations between substance use and various demographic variables. Gender showed a statistically significant association with substance use ($\chi^2 = 4.90$, $p = 0.027$), indicating that substance use prevalence differs between males and females. However, other variables, including residence ($\chi^2 = 0.002$, $p = 0.961$), economic status ($\chi^2 = 0.000$, $p = 1.000$), education level ($\chi^2 = 1.41$, $p = 0.493$), and age category ($\chi^2 = 0.000$, $p = 1.000$), were not significantly associated with substance use. These results highlight gender as the most relevant demographic factor influencing substance use in this population.

Table 6: Statistical Analysis of Associations between Substance use and Various

Variable	Chi-Square Value	Degrees of Freedom	P-Value
GENDER	4.903985	1	0.026795
RESIDENCE	0.002415	1	0.960804
ECONOMIC STATUS	0	1	1
EDUCATION	1.412873	2	0.493399
AGE CATEGORY	0	1	1
OCCUPATION	0	1	1

DISCUSSION

This study highlights the prevalence of substance use among adolescent suicide attempters, with 35% reporting a history of substance use. Gender emerged as the only significant demographic factor, with females exhibiting a higher prevalence compared to males. These findings align with earlier studies, such as those by Wu et al. (2004), who reported the bidirectional relationship between substance use and suicidal behaviors in adolescents, particularly among females who use substances as a maladaptive coping mechanism [11].

The observed gender disparity, where females demonstrated higher substance use, contrasts with traditional findings that associate males with higher rates of substance use. However, studies like Pompili et al. (2012) emphasize that females may turn to substances in response to emotional distress and interpersonal conflicts, which are more prevalent in suicide attempters. This aligns with our findings, suggesting a need for gendersensitive interventions that address the unique psychosocial stressors faced by adolescent females [12].

Adolescents currently attending school showed the highest prevalence of substance use (42.9%), highlighting the significant stressors associated with academic environments. This aligns with Zhang et al. (2014), who found that school-related pressures contribute to substance use as a form of stress relief. The findings emphasize the need for mental health support within educational settings to mitigate the dual risks of substance use and suicidal behavior [10].

Contrary to expectations, neither economic status nor residential background showed significant associations with substance use in this study. Similar findings were reported by Radhakrishnan and Andrade (2012), who suggested that familial and social factors often outweigh economic disparities in influencing adolescent behaviors in Indian contexts. This underscores the importance of focusing on familial and community support systems rather than solely addressing economic inequalities [10].

Age did not significantly correlate with substance use among adolescent suicide attempters, consistent with studies by Liu et al. (2019), which found that emotional and psychological vulnerability, rather than age, is a stronger determinant of suicidal behavior. This reinforces the need for universal adolescent-focused mental health interventions, irrespective of age distinctions [2].

Globally, studies like Dawes et al. (2008) have highlig hted the intricate interplay between substance use and suicidal behaviors. While our study focuses on the Indian context, it aligns with international trends that underscore substance use as both a risk factor and a coping mechanism for adolescents in distress. However, the significantly higher prevalence among females in our study contrasts with global data, necessitating further research into cultural and societal influences specific to India [9].

The findings emphasize the urgent need for integrated prevention strategies that address both substance use and suicidal tendencies. Evidence from Wu et al. (2004) and Senapati et al. (2024) supports the implementation of school-based mental health programs and family-focused interventions. Such programs should target early detection of substance use, provide stress management techniques, and improve access to mental health care [11].

Limitations and Future Directions

While this study provides valuable insights, its cross-sectional design limits the ability to infer causation. Additionally, the reliance on self-reported data may introduce recall bias. Future research should explore longitudinal designs to establish causal relationships and include a more diverse sample to examine regional and cultural variations. Expanding the focus to explore the psychological pathways linking substance use and suicidal behavior could provide actionable insights for more targeted interventions.

CONCLUSION

The study underscores the significant prevalence of substance use among adolescent suicide attempters, with notable gender differences, highlighting a higher prevalence among females. These findings emphasize the intricate interplay between psychosocial factors, such as academic stress and emotional distress, and substance use in this vulnerable population. While socioeconomic and residential

factors were not significantly associated with substance use, the role of education and schoolrelated stress emerged as critical areas for intervention. Comp-arisons with global and national studies reveal both consistencies and cultural distinctions, particularly regarding gender dynamics in substance use and suicide attempts. These insights stress the importance of imp-lementing integrated prevention strategies, including school-based mental health programs, family counseling, and early identification of substance use. A multidimensional approach that addresses both substance use and underlying psychosocial stressors is crucial for reducing the burden of suicidal behavior among adolescents. Future research should focus on longitudinal analyses and culturally tailored interventions to enhance our under standing and management of this pressing issue.

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