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CLINICAL PROFILE OF FEMALE ADOLESCENTS WITH SUBSTANCE USE DISORDERS: A RETROSPECTIVE CHART REVIEW FROM A TERTIARY CARE CENTRE IN INDIA

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ABSTRACT

Background: Female adolescents with substance use disorders (SUD) are underrepresented in Indian research, and their clinical profile is poorly described.

Materials and Methods: We reviewed the charts of 60 girls aged 10–18 years with DSM-5 SUD treated at the Child and Adolescent Psychiatry and Addiction Medicine services, NIMHANS, Bengaluru, between January 2014 and September 2023. Sociodemographic features, vulnerability factors, illness characteristics, comorbidities, treatment and severity indicators were extracted and analyzed descriptively.

Results: The mean age was 16.3 ± 1.2 years; 81.7% were urban, 63.3% from middle socioeconomic strata, and 76.7% were brought by parents. Difficult temperament (68.3%), academic difficulties (60.0%), deviant peers (58.3%), family history of substance use (51.7%) and of psychiatric illness (43.3%) were common. Mean age at onset of use was 14.5 ± 1.6 years and of dependence 15.6 ± 1.3 years; median duration of use before treatment was 24 months. Tobacco was most common, followed by alcohol and cannabis. Experimentation (78.3%), relief of negative emotions (78.3%) and peer influence (73.3%) were the main reasons for initiation. Depression, attention-deficit/hyperactivity disorder and conduct symptoms were the commonest comorbidities. Onset of use before 14 years occurred in 41.7%, onset of dependence before 15 years in 71.7%, use of three or more substances in 48.3% and legal consequences in 20.0%. Motivational Enhancement Therapy was given to 81.7%.

Conclusion: Treatment-seeking girls began substance use in mid-adolescence and presented a median of 24 months later, often with difficult temperament, family history of substance use and psychiatric comorbidity. Comorbidity screening, family-inclusive care and gender-sensitive services are warranted.

Keywords: Adolescent, Female, Substance-Related Disorders, Comorbidity, Retrospective Studies, India.

INTRODUCTION

Adolescent substance use is a growing global public health concern. Use during adolescence is often transient, and only a small proportion of exposed young people progress to a substance use disorder (SUD); early initiation, however, sharply raises that risk.[1] In the National Comorbidity Survey Replication-Adolescent Supplement, 11.4% of 10,123 US adolescents aged 13-18 years met

lifetime criteria for an SUD, at a median age at onset of 15 years.[2] Initiation itself begins considerably earlier. In the Adolescent Brain Cognitive Development (ABCD) study, 22.5% of 11,875 children aged 9-10 years had already sipped alcohol, although full use of any drug was rare (0.2% a full alcoholic drink, 0.7% nicotine),[3] by ages 12-13, 39.7% reported lifetime experimentation, but only 7.4% reported full use.[4] Substance use disorders thus remain among the later-onset psychiatric conditions, yet are commonly preceded by earlier, untreated disorders.[5]

Indian data echo these patterns. The National Mental Health Survey,[6] and the national Magnitude of Substance Use in India report,[7] documented substance use among adolescents, and a national survey of children reported early initiation, particularly of inhalants.[8] Gender-specific profiling, however, remains sparse. In a school survey of 7350 students in Kerala, lifetime tobacco use was 12.5% among boys but 1.2% among girls, with a mean age at onset of 14.0 ± 2.2 years.[9] Clinic samples are more skewed still: among 50 treatment-seeking inhalant users at a north Indian centre, only three (6%) were girls.[10]

Several features distinguish substance use in girls. Impulsivity-related traits, particularly sensation seeking, are consistently associated with adolescent alcohol use and may drive early experimentation,[11] and first use in the 11-14 year window carries a far higher risk of progression: 9.0-15.9% developed abuse or dependence within a decade, against 1.0-2.0% among those beginning at 19 years or later.[12] Male-to-female prevalence ratios have narrowed internationally, with earlier initiation among women.[13,14] Women are also described as showing "telescoping", meeting diagnostic criteria or seeking treatment after fewer years of use than men, although the evidence is mixed and general-population surveys offer little support for it.[15,16] More consistently, the medical, psychiatric and functional consequences of SUD are more severe in women, and co-occurring mood, anxiety, eating and post-traumatic stress disorders are frequent.[13,17]

Research has nonetheless focused largely on adolescent boys. Women are less likely than men to enter treatment over the lifetime,[13] and for Indian adolescent girls specifically, the one comparable series we found identified 28 girls across fourteen years at a specialty addiction clinic.[18] Female adolescent substance users therefore remain a largely hidden clinical population whose illness trajectories are poorly characterised, and gender-specific treatment strategies cannot be formulated without such data. The present study addresses this gap by describing the sociodemographic characteristics, vulnerability factors, illness characteristics, patterns of substance use, comorbidities and treatment of female adolescents seeking care at a tertiary centre in southern India.

MATERIALS AND METHODS

Study Design and Setting: This retrospective chart review was conducted at the Department of Child and Adolescent Psychiatry (CAP) and the Centre for Addiction Medicine (CAM), National Institute of Mental Health and Neuro Sciences (NIMHANS), Bengaluru, a tertiary care centre in southern India. It is reported in accordance with the RECORD extension of the STROBE guidelines for observational studies using routinely collected data. The study was approved by the NIMHANS Institutional Ethics Committee. Records of female patients aged 10–18 years who were diagnosed with substance use disorder (SUD) according to DSM-5 by the treating team, and who sought treatment at CAP or CAM between January 2014 and September 2023, were identified from the Medical Records Department and the CAMSOFT electronic records. Sixty records met these criteria and were included.

Data were extracted using a semi-structured proforma. It covered:

- Sociodemographic details: age, education, place of residence, socioeconomic status, religion, family type, referral source and previous help sought;
- Vulnerability factors: temperament, academic difficulties, bullying, deviant peers, substance use among peers, and family history of psychiatric illness and of substance use;
- Illness characteristics: age at onset of use, age at onset of dependence, age at first treatment, duration of use, number and type of substances, and reasons for initiation;
- Psychiatric and neurodevelopmental comorbidity;
- Treatment: setting, medications and psychotherapies.

Severity was assessed with five indicators: onset of use before 14 years, onset of dependence before 15 years, duration of use longer than 12 months, use of three or more substances, and legal consequences.

Data were analyzed using IBM SPSS Statistics version 24.0. Descriptive statistical analysis was done for this study. Continuous variables are presented as mean ± SD, or as median (IQR) when skewed (duration of use and number of substances). Categorical variables are presented as frequencies and percentages.

RESULTS

Socio-demographic profile

The mean age of adolescents in the study sample was 16.3 ± 1.2 years, with most participants aged between 16 and 17 years. The majority of adolescents belonged to urban backgrounds and middle socio-economic strata. Most adolescents (76.7%) were brought for treatment by their parents [Table 1].

Table 1: Sociodemographic profile

Variable	Category	n (%) / Mean ± SD
Age (years)	Mean age	16.3 ± 1.2
	Range	14 – 18
Age distribution	14 years	6 (10)
	15 years	10 (16.7)
	16 years	13 (21.7)
	17 years	22 (36.7)
	18 years	9 (15)
Education	Middle school	6 (10)
	High school	22 (36.7)
	Intermediate	32 (53.3)
Living environment	Urban	49 (81.7)
	Semi-urban	6 (10)
	Rural	5 (8.3)
Socio-economic status	High	13 (21.7)
	Middle	38 (63.3)
	Low	9 (15)
Religion	Hindu	47 (78.3)
	Muslim	7 (11.7)
	Christian	6 (10)
Type of family	Small family	53 (88.3)
	Large family	7 (11.7)
Referral source	Parents	46 (76.7)
	Self	10 (16.7)
	Police	3 (5)
	Doctor	1 (1.7)
Previous help sought	None	37 (61.7)
	General psychiatric services	18 (30)
	General medical services	3 (5)
	De-addiction services	2 (3.3)

Risk and vulnerability factors

Difficult temperament was reported in 68.3% of the adolescents. Academic difficulties were present in 60%, while 31.7% reported experiences of bullying at school. Peer influences were common, with more than half reporting deviant peers.

Family-related vulnerabilities were also prominent. A family history of psychiatric illness was present in 43.3% of adolescents, and more than half of the study sample had family members with substance use disorders. [Table 2]

Table 2: Risk and vulnerability factors

Variable	Category	n (%)
Temperament	Difficult temperament	41 (68.3)
	Easy / slow temperament	19 (31.7)
Academic difficulties	Present	36 (60)
Bullying at school	Present	19 (31.7)
Association with deviant peers	Present	35 (58.3)
Substance use among peers	Present	31 (51.7)
Family history of psychiatric illness	Present	26 (43.3)
	Absent	34 (56.7)
Family history of substance use	One parent	21 (35)
	Both parents	5 (8.3)
	First-degree relative (non-parent)	1 (1.7)
	Second/third-degree relatives	4 (6.7)
	None	29 (48.3)

Illness characteristics:

Mean age at onset of substance use was noted to be 14.53 and the mean age at seeking first treatment was noted to be 16.23 years. On average, the girls used substances for a duration of 2 years before seeking treatment. [Table 3]

Table 3: Illness characteristics

Variable	Mean ± SD / Median (IQR)
Age at onset of substance use	14.53 ± 1.6
Age at onset of dependence	15.62 ± 1.27
Age at first treatment	16.23 ± 1.18
Duration of use (months)	24 (12–33)
Number of substances used	2 (2–3)

Reasons for initiation and treatment characteristics

Experimentation (78.3%), peer influence (73.3%) and relief of negative emotions (78.3%) were found to be the most important reasons for initiation. A minority were influenced by adults in initiating substance use. Sixty three percent of the adolescents required inpatient treatment and the rest were treated on OPD basis. All of them were on medications plus psychotherapeutic interventions. Most commonly prescribed medicines were antidepressants. [Table 4]

Table 4: Reasons for initiation and treatment characteristics

Variable	Category	n (%)
Reasons for initiation	Experimentation	47 (78.3)
	Peer influence	44 (73.3)
	Negative emotion relief	47 (78.3)
	Positive emotion enhancement	17 (28.3)
	Adult influence	8 (13.3)
Locus of treatment	Outpatient	22 (36.7)
	Inpatient	38 (63.3)
Medications	Antidepressants	31 (51.7)
	Antipsychotics	26 (43.3)
	Anti-craving agents	26 (43.3)
	Mood stabilizers	23 (38.3)
	Anti-ADHD	15 (25)
Therapies	MET	49 (81.7)
	Other therapies	57 (95)

Patterns of substance use

Tobacco was the most commonly used substance followed by alcohol, then by cannabis, opioids, MDMA and prescription medicines.

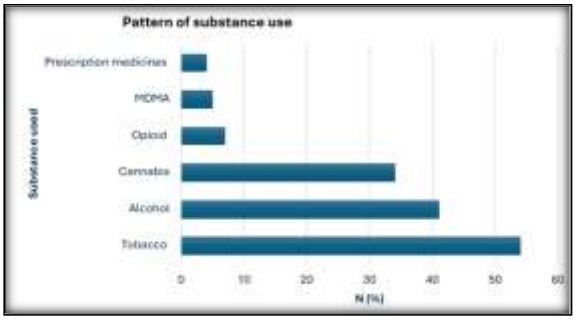


Figure 1: Pattern of substance use

Psychiatric and neurodevelopmental co-morbidity

Depression was the most common psychiatric co-morbidity followed by ADHD and Conduct symptoms. [Figure 2]

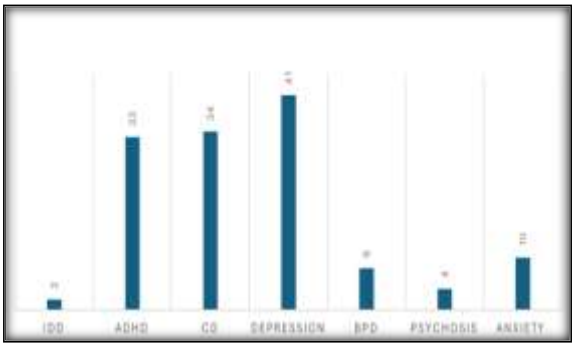


Figure 2: psychiatric co-morbidity

Indicators of severe illness

It was noted that some adolescents had a more severe illness. According to the operationalized severity indicators, 42% had early onset, 72% had established dependence pattern, 48% used ≥3 substances concurrently, 57% had a use duration beyond 12 months, and 20% of the adolescents also had to face legal consequences attributable to substance use.

Table 5: Severity indicators

Indicator	n (%)
Early onset (<14 years)	25 (41.7%)
Onset of dependence <15 years	43 (71.7%)
≥3 substances used	29 (48.3%)
Use duration >12 months	34 (56.7%)
Legal consequences	12 (20%)

DISCUSSION

This retrospective chart review is one of the few Indian studies of treatment-seeking female adolescents with substance use disorders. Only sixty cases were identified over nearly a decade. Mandal et al. found 28 girls over fourteen years at a north Indian addiction clinic.[18] In Jaisoorya et al.'s school survey of 7350 students, lifetime tobacco use was 12.5% among boys against 1.2% among girls.[9] The clinic gap exceeds the community gap, implicating help-seeking rather than use.

Sociodemographic Profile

Our mean age of 16.3 ± 1.2 years is close to the 15.89 ± 2.72 years of Mandal et al.[18] Urban predominance (81.7%) matched their 89.3%. Most

of ours came from middle or high socioeconomic strata, whereas Quraishi et al. found 80% of inhalant users from lower strata and 82% school dropouts.[10] This reflects which service a patient reaches, not who uses.

Pathways to Care

More than three fourths were brought by parents. Only 3.3% had accessed de-addiction services, against prior treatment in 14.3% of Mandal et al.'s girls,[18] plausibly because theirs was a dedicated addiction clinic.

Vulnerability and Risk Factors

Two thirds had difficult temperament and over half academic difficulties; impulsivity-related traits are associated with adolescent alcohol use.[11] Ghosh et al., in 100 men with alcohol dependence, linked disruptive behaviour disorder and ADHD to early-onset but not late-onset dependence.[19] Deviant and substance-using peers in more than half echo Tsering and Pal, who found friends and family influenced initiation among 416 West Bengal students.[20] Family history of substance use was present in 51.7%, higher than the 30% positive family history of Quraishi et al,[10] Hoffmann and Cerbone showed parental substance use disorder predicts adolescent drug abuse but is attenuated by family cohesion.[21]

Illness Characteristics

Mean onset of use was 14.5 years and of dependence 15.6 years. Quraishi et al. reported first use at 14.13 ± 4.27 years,[10] and Jaisoorya et al. tobacco onset at 14.0 ± 2.2 years.[9] The median of 24 months between first use and presentation suggests accelerated progression. Among 5856 drinkers, DeWit et al. found first use at 11-14 years followed by abuse or dependence within a decade in 9.0-15.9%, against 1.0-2.0% starting at 19 or later.[12]

Reasons for Initiation

Experimentation (78.3%), peer influence (73.3%) and relief of negative emotions (78.3%) predominated. Gopiram et al. found peer influence and curiosity the main reasons for initiation among 40 users aged 15-24 years.[22]

Pattern of Substance Use

Tobacco was most common, followed by alcohol and cannabis. Mandal et al. found 60.7% of north Indian girls sought treatment for opioids,[18] while at our centre Narayanaswamy et al. described an all-male inhalant-dependent cohort with onset at 16.23 years.[23] Local availability and referral streams likely explain the difference.

Psychiatric and Neurodevelopmental Comorbidities

Depression, ADHD and conduct symptoms predominated; co-occurring mood and anxiety disorders are well described in women with substance use disorders.[13] Narayanaswamy et al. found ADHD in 50% of polysubstance against 14.3% of inhalant-only users,[23] Tamm et al., in 276 adolescents with ADHD and substance use disorder, found the combined subtype carried more severe use and more conduct disorder.[24] A dual diagnosis framework is warranted.

Treatment Characteristics and Severity

Motivational Enhancement Therapy was given to 81.7%; Jensen et al.'s meta-analysis of motivational interviewing in 21 trials (5471 adolescents) found a small but sustained effect (d = 0.17).[25]

Translational Relevance

Whether girls progress faster than boys remains contested, and we had no male comparison group. Keyes et al. found little evidence of telescoping across two national surveys,[16] and Towers et al. document both supportive and contradictory findings.[15] Priorities are early screening, routine assessment for depression and externalizing behaviour, family-inclusive therapy, and gender-sensitive de-addiction services linked to Rashtriya Kishor Swasthya Karyakram (RKSK).

Limitations

This single-centre retrospective study relied on clinical records, which may be incomplete and subject to recall bias. The small, treatment-seeking sample limits generalizability. Without a male comparison group, gender-specific conclusions and telescoping could not be tested. No outcome data were analyzed, and severity indicators were defined from chart entries rather than standardized instruments.

CONCLUSION

The study offers important clinical insights into female adolescent SUDs. Early initiation, rapid dependence, comorbidities, and stigma-driven delays underscore the need for longitudinal, gender-comparative research. Health systems must prioritize early identification, gender-sensitive care, equitable access, and community-based prevention to address gender-linked vulnerabilities and inequities.

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