Section: Psychiatry

Original Research Article

ADVERSE CHILDHOOD EXPERIENCES (ACE) AMONG PATIENTS WITH SUBSTANCE USE DISORDER IN A TERTIARY CARE CENTRE: A CROSS-SECTIONAL STUDY

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Abstract

Background: Adverse Childhood Experiences (ACEs) are strongly associated with Substance Use Disorders (SUDs). Despite high rates of child abuse in India, data on ACE prevalence among individuals with SUDs is limited. The objective is to assess ACE prevalence and its association with substance use severity among SUD patients in a tertiary care center in Kerala, India. **Materials and Methods:** This cross-sectional study included 148 adults with SUDs diagnosed using DSM-V criteria. ACEs were assessed with the ACE-IQ and substance use severity with the WHO ASSIST tool. Statistical analyses explored ACE prevalence and associations with substance use. **Result:** Most participants (60.54%) reported four or more ACEs, with parental separation (59.18%) and family incarceration (46.26%) being most common. Cumulative ACEs were significantly associated with higher substance use severity ($p < 0.05$). Gender differences were minimal, except for emotional neglect and physical abuse. **Conclusion:** ACEs are highly prevalent among individuals with SUDs in Kerala, underlining the need for trauma-informed care and early interventions to mitigate their impact on substance use.

INTRODUCTION

Adverse Childhood Experiences (ACEs) encompass various forms of maltreatment and household dysfunction experienced during childhood, including physical and sexual abuse. Extensive research has established a strong correlation between ACEs and the development of substance use disorders (SUDs) in adulthood. In India, the prevalence of child abuse is alarmingly high, necessitating a comprehensive examination of its impact on subsequent substance misuse.

Adverse Childhood Experiences: Definition and Scope

The seminal study by Felitti et al. (1998) introduced the concept of ACEs, identifying a range of childhood adversities such as physical, emotional, and sexual abuse; neglect; and household dysfunction, including domestic violence and parental substance abuse. The study revealed a dose-response relationship between the number of ACEs and the risk of negative health outcomes, including substance misuse.[1-4]

Both forms are critical components of ACEs and have been linked to a range of detrimental outcomes. Research indicates that individuals who have experienced physical or sexual abuse in childhood are at a heightened risk for developing SUDs. The mechanisms underlying this association may involve the use of substances as a coping strategy to manage trauma-related stress and emotional pain.[5-7]

India faces significant challenges in addressing child maltreatment. A comprehensive study by the Ministry of Women and Child Development (2007) revealed alarming rates of child abuse, with 69% of children reporting physical abuse and 53% reporting sexual abuse. These figures underscore the urgent need for targeted interventions and policies to protect children from such adversities.[8-11]

The relationship between ACEs and substance misuse is well-documented. Individuals with a history of ACEs are more likely to initiate substance use at an earlier age, develop dependence, and encounter greater challenges in treatment and recovery. In the Indian context, studies have demonstrated a significant association between childhood trauma and substance misuse among adolescents and adults. For instance, a study conducted in Kerala found that 91% of young people reported at least one ACE, with over half reporting three or more, highlighting the pervasive nature of these experiences and their potential impact on substance use behaviors.[12-15]

Several mechanisms have been proposed to explain the link between ACEs and SUDs. Neurobiological

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research suggests that early-life stress can alter brain development, particularly in areas related to stress response and reward processing, thereby increasing vulnerability to substance use. Psychologically, individuals with ACEs may use substances as a maladaptive coping strategy to alleviate emotional distress. Socially, ACEs can lead to impaired relationships and social functioning, further contributing to substance misuse. Understanding these mechanisms is crucial for developing effective prevention and intervention strategies.[16-19]

Recent studies in India have begun to explore the association between ACEs and substance misuse. A cross-sectional study conducted in a tertiary care center found that individuals with SUDs reported higher rates of ACEs compared to the general population. Another study highlighted that adolescents with a history of physical or sexual abuse were more likely to engage in substance use. These findings underscore the need for routine screening for ACEs in clinical settings and the integration of trauma-informed care approaches in the treatment of SUDs.[13,20-22]

Addressing the impact of ACEs on substance misuse in India involves several challenges. Cultural stigmas associated with discussing abuse and mental health issues often lead to underreporting and lack of support for affected individuals. Limited resources and infrastructure for mental health services further exacerbate the problem. Additionally, there is a need for greater awareness and training among healthcare professionals to recognize and address the effects of ACEs on substance use behaviors.

The need to investigate Adverse Childhood Experiences (ACEs) among individuals with substance use disorders (SUDs) is underscored by the profound and enduring impact childhood trauma has on mental health and behavioral outcomes. Studies have consistently demonstrated a strong association between exposure to ACEs, such as physical abuse, sexual abuse, and household dysfunction, and the development of SUDs in adulthood. These experiences disrupt normal psychological and emotional development, often predisposing individuals to maladaptive coping mechanisms such as substance misuse. In India, where child abuse is alarmingly prevalent—reports indicate that nearly 69% of children experience physical abuse and 53% experience sexual abuse—the burden of ACEs is immense, yet understudied. Substance use disorders, which are increasingly recognized as a significant public health challenge in India, particularly in states like Kerala, often have roots in unresolved trauma. Despite this, research into the prevalence and nature of ACEs among individuals with SUDs in the Indian context remains scarce, limiting the ability to develop culturally appropriate prevention and intervention strategies. By identifying the prevalence of ACEs in this population, the research aims to inform the integration of trauma-informed care into substance use treatment programs. Furthermore, it emphasizes the importance of addressing childhood adversity as a critical step in breaking the cycle of trauma and addiction, ultimately contributing to the formulation of evidence-based public health policies and therapeutic approaches. The findings from this study will help contextualize the relationship between ACEs and SUDs in India, highlighting the urgent need for systemic interventions that address the root causes of addiction.

MATERIALS AND METHODS

Study Design

This was a cross-sectional study designed to assess the prevalence and impact of Adverse Childhood Experiences (ACEs) among patients diagnosed with Substance Use Disorders (SUDs). The study was conducted at the Psychiatry Outpatient Department (OPD) of Travancore Medical College, Kollam, Kerala.

Study Population: The study included patients attending the Psychiatry OPD who met the inclusion criteria. Participants aged 18 years and above with a clinical diagnosis of substance use disorders based on DSM-V criteria were eligible for inclusion. Patients with active psychiatric illnesses or those who were morbidly ill were excluded from the study.

Sample Size: A sample size of 148 participants was determined based on expected prevalence rates of ACEs among individuals with SUDs, accounting for a confidence interval of 95% and a permissible error margin. Participants were recruited using convenience sampling.

Data Collection Tools

1. Adverse Childhood Experiences International Questionnaire (ACE-IQ): This WHO tool measured participants' exposure to various ACEs, including abuse (physical, sexual, emotional), neglect, and household dysfunction (e.g., parental substance abuse, incarceration, or violence).
2. Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST): This WHO-developed questionnaire assessed the extent and severity of substance misuse.

The tools were translated into Malayalam, with back-translation to ensure accuracy as per WHO guidelines.

Procedure: Participants were interviewed by trained clinicians after obtaining ethical approval and informed consent. Confidentiality was ensured by anonymizing identifiers. A semi-structured proforma captured demographic details, while the ACE-IQ and ASSIST tools gathered data on ACEs and substance misuse patterns.

Ethical Considerations: Approval was obtained from the Institutional Ethics Committee of Travancore Medical College. Participation was voluntary, and participants had the right to withdraw

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at any stage. Privacy and confidentiality were strictly maintained.

Statistical Analysis: Data were analyzed using SPSS version 27. Descriptive statistics summarized demographic details, ACE prevalence, and substance use patterns. Inferential statistics, including chi-square tests and logistic regression, assessed the relationship between ACE exposure and SUD severity. Cumulative ACE scores were categorized (0, 1–3, ≥4) to assess dose-response relationships, with significance set at $p<0.05$.

RESULTS

The study included 148 participants, predominantly male (n=135, 91.2%) with a smaller representation of females (n=13, 8.8%). The mean age of the participants was 35.3 ± 12.1 years, with males having a higher mean age (35.8 ± 12.3 years) compared to females (29.5 ± 8.1 years). These results highlight a predominantly male cohort with a wide age range, reflecting a typical demographic pattern observed in substance use disorder studies. The age distribution suggests that substance use issues span across younger to middle-aged adults, with males being the majority in such clinical settings.

Table 1: Demographic characteristics of participants.

Gender	Count	Mean Age (years)	SD (years)
Male	135	35.8	12.3
Female	13	29.5	8.1
Total	148	35.3	12.1

The overall prevalence of physical abuse and emotional abuse is 43.92%, with slightly higher rates among females (53.85%) compared to males (42.96%). Contact sexual abuse shows a lower overall prevalence of 14.19%, with nearly equal rates among females (15.38%) and males (14.07%). Alcohol or drug use in the household has an overall prevalence of 45.95%, slightly higher among males (46.67%) than females (38.46%). Incarcerated household members are the most prevalent ACE, affecting 52.03% overall, with higher prevalence among males (53.33%) than females (38.46%).

Table 2: ACE Prevalence by Gender

ACE Category	Overall Prevalence (%)	Female (%)	Male (%)
Physical abuse	43.9	53.8	43.0
Emotional abuse	43.9	53.8	43.0
Contact sexual abuse	14.2	15.4	14.1
Alcohol/drug use in household	45.9	38.5	46.7
Incarcerated household member	52.0	38.5	53.3
Someone with mental illness in household	29.1	23.1	29.6
Household member treated violently	38.5	30.8	39.3
One or no parent	26.4	23.1	26.7
Emotional neglect	59.5	69.2	58.5
Physical neglect	48.0	61.5	46.7
Bullying	43.2	46.2	43.0
Community violence	46.6	38.5	47.4
Collective violence	14.2	15.4	14.1

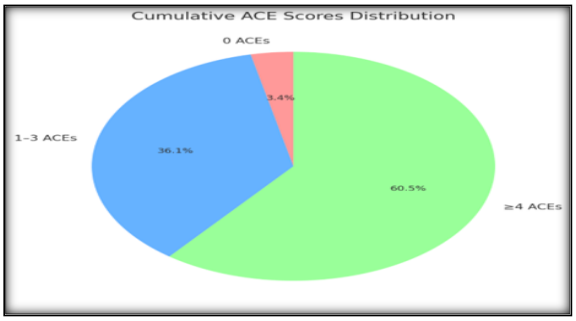

Figure 1: Cumulative ACE Scores Distribution

The cumulative analysis of adverse childhood experiences (ACEs) revealed that the majority of participants (60.54%) experienced four or more ACEs, indicating a high prevalence of cumulative adversities within the population. A smaller proportion (36.05%) reported experiencing between one and three ACEs, while only 3.40% of participants had no reported ACEs. This distribution underscores the significant burden of multiple childhood adversities among the study group, emphasizing the need for targeted interventions to address the compounded effects of ACEs on long-term health and behavior.

The bar graph illustrates the frequency distribution of various Adverse Childhood Experience (ACE) indicators within the dataset. Incarcerated household members and alcohol or drug use in the household are among the most frequently reported ACEs, with over 50 reported cases. Physical and emotional abuse are also prevalent, each with around 43 cases. Contact sexual abuse and collective violence show the lowest frequencies, with approximately 21 cases each. This distribution highlights the varying degrees of childhood adversities experienced by the

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participants, suggesting potential areas of focus for targeted interventions.

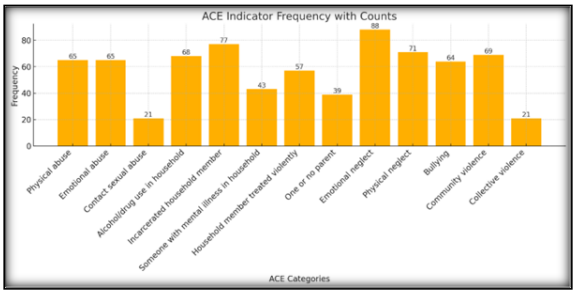

Figure 2: ACE Indicator Frequency

The analysis of cumulative ACE scores revealed that the majority of participants (60.54%) experienced four or more adverse childhood events, indicating a high prevalence of severe cumulative adversities within the study population. About 31.29% of participants reported experiencing two or three ACEs, while smaller proportions experienced only one adverse event (4.76%) or none (3.4%). These findings highlight the significant burden of cumulative ACEs among participants, with most individuals experiencing multiple adversities, emphasizing the need for targeted interventions to mitigate the long-term impacts of such experiences.

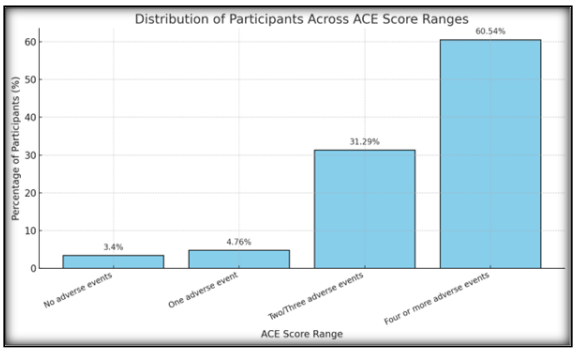

Figure 3: Distribution of Participants Across ACE Score Ranges

The bar graph illustrates the gender-specific prevalence of Adverse Childhood Experiences (ACEs) across various categories. Female participants reported higher prevalence rates for certain categories, such as physical and emotional abuse (53.85% each) compared to males (42.96% each). However, males reported slightly higher prevalence in categories such as alcohol or drug use in the household (46.67% vs. 38.46% for females) and having an incarcerated household member (53.33% vs. 38.46% for females). Contact sexual abuse showed similar prevalence between genders, with 15.38% for females and 14.07% for males. These patterns suggest notable gender differences in the experiences of specific ACE categories.

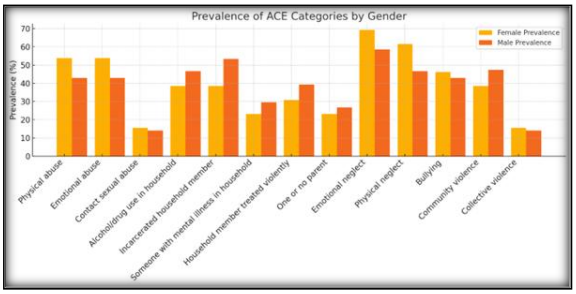

Figure 4: Significant Gender Differences in ACEs

DISCUSSION

The present study underscores the significant prevalence of Adverse Childhood Experiences (ACEs) among individuals with Substance Use Disorders (SUDs) in India, with 60.54% of participants reporting four or more ACEs. This finding aligns with the study by Fernandes et al. (2021), which reported that 1 in 2 participants experienced child maltreatment and family-level ACEs, highlighting the pervasive nature of childhood adversities in this population.[13]

Parental separation and exposure to family violence emerged as the most frequently reported ACEs in this study. Similarly, Maurya and Maurya (2023) found that adverse experiences at home, such as witnessing violence and parental separation, were significantly associated with risky health behaviors among adolescents and young adults in India.[23] These findings suggest that household dysfunction plays a central role in shaping maladaptive coping mechanisms, such as substance misuse, later in life.

Gender differences in ACE prevalence were observed, with males reporting higher rates of incarceration-related adversities and females reporting higher emotional neglect. This is consistent with the findings of Bebere and Vrubļevska (2023), who noted that males reported more instances of certain childhood adversities, while females were more likely to report emotional neglect.[24] These gender-specific patterns underscore the importance of tailored interventions that address the unique vulnerabilities of male and female patients.

Notably, 93% of participants in this study reported at least one ACE, mirroring findings from the ACE Study by Felitti et al. (1998), which demonstrated a strong dose-response relationship between the number of ACEs and various health outcomes, including substance use disorders.[1] The high prevalence of ACEs across studies suggests that childhood trauma is nearly ubiquitous among individuals with SUDs, underscoring the critical need for routine ACE screening in clinical settings.

The association between specific ACEs and substance use revealed that emotional and physical abuse were linked to tobacco and cannabis use, respectively. This corresponds with the findings of Dube et al. (2003), who reported that childhood abuse and household dysfunction were significantly

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associated with the risk of illicit drug use in adulthood.[25] These patterns suggest that interventions should be tailored to address specific trauma-related coping mechanisms.

Interestingly, community and collective violence, though prevalent, showed weaker statistical associations with substance misuse. This contrasts with findings in the cVEDA cohort, where collective violence and community-level ACEs showed strong links to substance misuse in adolescents.[8] These discrepancies could be attributed to differences in demographic and cultural contexts, emphasizing the need for region-specific data to inform targeted interventions.

The cumulative impact of multiple ACEs was evident in this study, with participants exposed to four or more adversities exhibiting a significantly higher risk of severe substance misuse. This dose-response relationship aligns with the foundational ACE study by Felitti et al. (1998), which demonstrated that the likelihood of engaging in high-risk behaviors increases with the number of ACEs experienced.[6] This reinforces the importance of addressing cumulative

In conclusion, this study adds to the growing body of evidence linking ACEs to substance misuse, providing crucial insights into the Indian context. By highlighting the high prevalence of ACEs and their impact on substance use patterns, this research lays the groundwork for developing culturally tailored, trauma-informed interventions that address the root causes of addiction. Future studies should explore the longitudinal effects of ACEs and evaluate the efficacy of targeted intervention programs in reducing the burden of SUDs in India.

Limitations

This study has several limitations that should be acknowledged. First, the cross-sectional design precludes the establishment of causal relationships between Adverse Childhood Experiences (ACEs) and Substance Use Disorders (SUDs). Second, the reliance on self-reported data for ACEs and substance use may introduce recall bias or social desirability bias, potentially affecting the accuracy of the findings. Third, the study was conducted in a single tertiary care center in Kerala, which may limit the generalizability of the results to other regions or populations in India with differing sociocultural and economic contexts. Fourth, the exclusion of participants with active psychiatric illnesses or severe cognitive impairments might underestimate the true prevalence of ACEs and SUDs in the broader population. Lastly, the study did not account for other potential confounders, such as genetic predispositions or environmental factors, that could influence the relationship between ACEs and substance misuse. Future studies employing longitudinal designs and larger, more diverse samples are needed to validate and extend these findings.

CONCLUSION

This study underscores the pervasive impact of Adverse Childhood Experiences (ACEs) on individuals with Substance Use Disorders (SUDs). The findings reveal that a significant proportion of participants reported multiple childhood adversities, with a clear dose-response relationship between the number of ACEs and the severity of substance misuse. The high prevalence of ACEs highlights the urgent need to address childhood trauma as a critical determinant of mental health and behavioral outcomes. This research contributes to the growing body of evidence linking ACEs to SUDs, emphasizing the importance of early identification and intervention to mitigate long-term health risks. The results provide a strong rationale for integrating trauma-informed care into clinical practice and public health strategies.

The study also highlights the need to address the unique vulnerabilities associated with different types of ACEs, such as family dysfunction, physical and emotional abuse, and community violence. Gender-specific patterns observed in the data point to the necessity of tailored approaches that account for the distinct ways males and females experience and respond to childhood adversities. Moreover, the findings emphasize the importance of addressing not only individual adversities but also the cumulative burden of multiple ACEs, which significantly heightens the risk of severe substance misuse.

Recommendations

Based on these findings, the integration of trauma-informed care into SUD treatment protocols is strongly recommended. Trauma-sensitive approaches should become a standard part of clinical practice to address the underlying psychological consequences of ACEs. Routine screening for ACEs using validated tools, such as the ACE-IQ, is essential in identifying at-risk individuals early and enabling the development of personalized treatment plans.

Family-based interventions should be prioritized to tackle key contributors to ACEs, such as domestic violence and parental substance misuse. Programs that provide support and education to families can reduce the transmission of trauma across generations. Additionally, public health policies must focus on mental health education and early interventions for children and adolescents exposed to adversities. Advocacy for such policies is critical to addressing systemic barriers and promoting mental health equity.

Community awareness campaigns are also vital in reducing the stigma surrounding mental health and substance misuse. Increasing public understanding of the impact of childhood trauma on long-term health outcomes can encourage individuals to seek help and foster a supportive environment for recovery. Finally, future research should focus on longitudinal studies involving diverse populations to

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further explore the long-term effects of ACEs and assess the effectiveness of trauma-informed interventions in reducing the burden of SUDs.

By addressing the root causes of addiction and implementing these recommendations, the healthcare system can better support individuals with SUDs and prevent the perpetuation of trauma across generations.

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