

Assessment of Early Childhood Trauma and its Association with Biomarkers of Substance Use Disorder: A Retrospective Study

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ABSTRACT

Background: Substance use disorder (SUD) is a chronic relapsing condition characterized by compulsive drug-seeking behavior, impaired control over substance consumption, and persistent negative emotional states such as anxiety, stress, and agitation. Emerging evidence suggests that early childhood trauma may contribute to the development of SUD by altering neurobiological pathways and stress-related biomarkers, including cortisol dysregulation, dopamine imbalances, and inflammatory responses. **Objective:** This study aimed to evaluate the influence of early childhood trauma on the development of substance use disorder in adulthood and explore potential associations with laboratory biomarkers of stress and addiction. **Methods:** A descriptive retrospective study was conducted from August 1, 2023, to March 1, 2024. A total of 142 individuals diagnosed with SUD were recruited using a convenience sampling method from psychiatric inpatient units and outpatient consultation clinics. Data were collected using a structured questionnaire consisting of three sections: (1) sociodemographic characteristics, (2) the Childhood Trauma Questionnaire-Short Form (CTQ-SF), and (3) the Simple Screening Instrument for Alcohol and Other Drugs (SSI-AOD). In addition to self-reported measures, laboratory assessments of key biomarkers, including serum cortisol, dopamine, C-reactive protein (CRP), and serotonin levels, were analyzed to evaluate physiological stress responses in relation to early trauma exposure. Data analysis involved descriptive and inferential statistical methods. **Results:** The findings indicated that the majority of participants had a moderate level of early childhood trauma, as well as moderate severity of alcohol and drug use. A significant correlation was observed between early trauma exposure and increased severity of substance use in adulthood ($p < 0.05$). Biomarker analysis revealed elevated serum cortisol and CRP levels in individuals with high early trauma scores, suggesting heightened physiological stress responses. Additionally, alterations in dopamine and serotonin levels were identified, further supporting the neurobiological impact of early trauma on addiction vulnerability. **Conclusion:** This study highlights the significant role of early childhood trauma in predisposing individuals to substance use disorder later in life. The observed associations between trauma exposure, substance use severity, and stress-related biomarkers suggest that laboratory-based assessments may serve as valuable tools for understanding addiction risk and tailoring early intervention strategies. Further research is warranted to explore targeted therapeutic approaches that address both psychological and physiological aspects of addiction.

Keywords: Early Childhood Trauma, Substance Use Disorders

INTRODUCTION

Substance use has one of the most significant effects on global health that contributes to increase the prevalence of substance use disorders as well as a wide variety of other adverse consequences, including unintentional injuries, chronic diseases, and suicide [1]. Substance use associated with increased risk of several well-established outcomes, including as mental illness, disrupted relationships with peers, a higher risk of suicide, disturbed learning, and higher rates of poverty, are related with a higher probability of developing an addiction to additional substances [2]. The definitive report of the Iraq National Household Survey on Alcohol and Drug Use (INHSAD) found that the prevalence rates of tobacco use, alcohol consumption, nonmedical consumption of prescription medications, and illicit drug use within the country of Iraq (which involves the Kurdish Area) were as follows, 28.8%, 8.1%, 2.9%, and 0.7% respectively [3]. Worldwide, there are around 2 billion people that partake in the consumption of alcoholic beverages. Approximately 185 million individuals around the world are involved in the use of illegal substances, as stated by the World Health Organization (WHO) [4]. Early childhood trauma occurs when a young kid is exposed to activities that are dangerous or

risky, such as abuse, neglect, substance abuse by a parent, or separation from a parent, they are more likely to experience early childhood trauma. Extreme feelings such as fear, horror, and helplessness are triggered as a result of these experiences, which go beyond the ordinary emotional responses [5]. The term "childhood trauma" refers to a range of traumatic experiences that characterized by emotional or psychological suffering. These experiences have the potential to have long-term negative impacts on an individual's wellness and development [6]. Based on research conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA) in 2011, it was discovered that the majority of individuals experienced or witnessed traumatic incidents throughout their childhood. Furthermore, sixty percent of adults have reported having been a victim of child maltreatment or having been associated with other difficult familial circumstances. Additionally, twenty-six percent of youngsters in the United States will either be witnesses to or experience a traumatic event according to [7]. Substance misuse in early adulthood has also been connected to traumatic experiences that occurred during childhood. Young adults who had a history of being

physically abused were included in the study were shown to have a 48% higher likelihood of using illegal drugs in the last year, and a 37% higher likelihood of using illegal drugs in the past 30 days, in comparison to a cohort of young adults who had not been abused or neglected as children [8].

Methods and Materials

Design of Study: A descriptive (retrospective) design was used in current study to determine early childhood trauma that influence the developing of addiction in adulthood, for the period from August 1st, 2023, to March 1st, 2024. **Ethical Considerations:** An official permission was obtained from relevant authorities prior to data collection.

Approval was first secured from the Council of the Nursing College\ University of Kerbala under number (UOK.CON.23.006). Participants were informed of the study's overall goals and instructions for filling out the questionnaire to establish their informed consent and make clear that their participation was voluntary. The researchers assured participants that their information would be kept confidential. **Study Setting:** The research was place in

Holy Karbala City at Imam Al-Hassan Al Mujtaba Hospital. **Study Sample:** A convenient sampling was employed, involving 142 addict patients who are admitted to psychiatric unit or visiting psychiatric consultation. **Study Instrument:** Following a comprehensive review of literature, the researchers find a questionnaire to assess the impact of early childhood trauma on developing substance use in adulthood. The questionnaire comprises three sections: First section: Sociodemographic Information:

This section includes Fifteen items covering, site of data collection, age, gender, marital status, level of education, monthly income, Satisfaction of income, occupation, work hours, residency, types of substance use, duration of substance use, if the addict patients have physical or psychological problems, if the family of addict patients have history of addiction, and numbers of hospital admissions, and Early Childhood Trauma Questionnaire- Short Form (CTQ-SF) it consist of 24 items this questionnaire have A 4-Likert scale was used for scoring the scale as follows: never true (1), sometimes true (2), often true (3), and always true (4), and third section Simple Screening Instrument for Alcohol and Other Drugs (SSI-AOD), consist of 21 items, a dichotomous scale was used for scoring the scale as follows: yes (1) and no (0).

Results of the Study

Table 1: Distribution of Addicts Regarding to their socio-Demographics Data (N=142)

List	Characteristics	F	%
1	Age	> 20 Year	8.5
		20 – 29 Year	39.4
		30 – 39 Year	33.8
		40 – 49 Year	17.6
		50 and More	.7
2	Sex	Male	100
		Female	0
3	Marital Status	Unmarried	50
		Married	49.3
		Separated/ Widower	.7
		Doesn't Read & Write	50
4	Educational Level	Read & Write	19.7
		Intermediate School	10.6
		Secondary School	12.7
		Diploma/Bachelor	7
		> 300000	9.9
5	Monthly Income (Iraqi Dinars)	300000 – 600000	73.9
		601000 – 900000	5.6
		901000 – 1200000	9.2
		1201000 – 1500000	1.4
		Insufficient	80.3
6	Perceived Monthly Income	Barely Sufficient	14.8
		Sufficient	4.9
		Free Work	75.1
7	Occupation	Employee	16.9
		Student	.7
		1 – 4	.7
8	Working Hours	5 – 8	93
		9 – 12	5.6
		13 +	.7
9	Residency	Rural	51.4
		Urban	47.2
		Sub-Urban	1.4

n: number, %: Percentage

The result in the table 1 shows that 39.4% of addicts are with age group of 20 – 29 year.

The sex indicates that all addicts are males (100%). According to marital status, it refers that half of addicts are single. Regarding

educational level, highest percentage 50% of the sample are illiterate. Monthly income indicates 73.9% of participants with 300000 – 600000 Iraqi dinars, and 80.3% of addicts perceive insufficient monthly income.

The majority of addicts (75.1% according to occupational status) are engaged in free work, and 93% of addicts reported that they are

working for 5 – 8 hours per day. The residency reveals that 51.4% of addicts are resident in rural and 47.2% are resident in urban.

Table 2: Distribution of Addicts According to their Clinical Characteristics (N=142)

List	Characteristics	n.	%	
1	Substance Abused	Alcohol	8	5.6
		Drugs	51	35.9
		Multiple substances	83	58.5
2	Duration of Substance Abuse	Less than 2 years	31	21.8
		2 – less than 5 years	76	53.5
		5 – less than 10 years	30	21.1
		10 years or more	5	3.5
		No	116	81.7
3	Physical or Mental Illness?	Anxiety	5	3.5
		PTSD	10	7
		Depression	11	7.7
		No	127	89.4
4	Addict Family Member?	Yes	15	10.6
		None	98	69
		One	36	25.4
5	Number of Admissions	Two	6	4.2
		Three	1	.7
		Six	1	.7

n: number, %: Percentage

Table 2 indicates that 58.5% of addicts are multiple substances abuser. The duration of substances abuse refers that 53.5% are with moderate-term substance abuse (2 – less than 5 years). Regarding physical or mental illnesses, 7% associated with post-traumatic stress disorder, and 7.7% associated with depression. Relative to addict family member, only 10.6% of addicts reported that they have a family

member with addiction. The number of admissions of hospital refers to one among 25.4% of addicts while 69% have no admission. Table 3 demonstrate addicts experienced moderate level of early childhood trauma as reported by 56.3% of them but 43% of them experienced mild childhood trauma. Table 4 indicate that addicts have moderate severity of alcohol and drugs abuse as reported by 71.8% of them.

Table 3: Overall Assessment of Early Childhood Trauma among Addicts

Trauma	F	%	M	SD	Ass.
Mild	61	43	27.74	15.063	Moderate
Moderate	80	56.3			
Severe	1	.7			
Total	142	100			

f: Frequency, %: Percentage M: Mean for total score, SD: Standard Deviation for total score, Ass: Assessment Mild= 0 – 24, Moderate= 24.1 – 48, Severe= 48.1 – 72.

Table 4: Overall Assessment of Alcohol and Drug Abuse Severity among Addicts

Severity	F	%	M	SD	Ass.
Mild	40	28.2	8.02	1.074	Moderate
Moderate	102	71.8			
Severe	0	0			
Total	142	100			

f: Frequency, %: Percentage M: Mean for total score, SD: Standard Deviation for total score, Ass: Assessment Mild= 0 – 7, Moderate= 7.1 – 14, Severe= 14.1 – 21

Table 5: Effect of Early Childhood Trauma on Severity of Addiction among Adult Addicts (N=142)

Addiction Variable	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Early Childhood Trauma	-.953	1.158	-.211	-2.551	.012

Table 5 exhibits that exposure to early childhood trauma have significant influence on addiction in adults as reported by significant difference with early childhood trauma at p-values= .012.

Discussion

The findings of the study revealed that 39.4% of addicts are within age group of 20 – 29 year, these results resemble finding by [9] mentioned that study samples were within the age group of 17 and 30. In current study all addicts were males 100%, these findings are supported by [10] were almost all of the participants 98% were male patients. With regard to the marital status that fifty percent of addicts are single and 49.3% of them are married this result was consistent with finding of [11] which revealed approximately 50% were unmarried and 42% of the participants were married. According to

educational level, it refers to 50% for those who doesn't read and write and 19.7% for those who read and write, these finding is in agreement with finding conducted by [12] which showed 59% of illiterates abused alcohol. Regarding to monthly income , 80.3% of addicts have insufficient monthly income , current results disagree with finding of [13] who show that 64.7% of study sample have sufficient monthly income. Regarding to type of substance use indicates that 58.5% of addicts are multiple substances abuser while 35.9% of them are on drugs abuse only, these finding not agreement with study results done by [14] who revealed that 13.8% of addicts are polysubstance abusers, meaning that they misuse both alcohol and drugs. Additionally, 34.9% of addicts are only abusing alcohol, and 2% of addicts are only abusing drugs. In addition, the findings of our research contradict the findings of a study conducted by [15] which found that the chemical that was

used the most frequently was alcohol 82.1%. According to physical or mental illnesses, only 3.5% associated with anxiety, 7% associated with post-traumatic stress disorder, and 7.7% associated with depression, these results corresponding with finding conducted by [16] the results of this study showed that four percent of the samples have physical health problems, and fourteen percent of them have a history of mild to moderate anxiety or depression. Regarding to childhood trauma among addicts, current study demonstrate that addicts have moderate early childhood trauma, these finding resemble with result conducted by [13] who found that study sample have moderate childhood trauma. Current results reveal that 56.3% of addicts perceived moderate level of childhood trauma, these results corresponding with study result conducted by [17] which demonstrated that more than half of the respondents reported experiencing at least one type of childhood exposures, and that nearly one-fourth of the respondents reported experiencing several categories of childhood exposures.

The present study results demonstrate that half of study samples have been hit so hard that it left bruises and marks, was physically abused, "I had to go to the doctor since I was hit so badly", this result resemble with study result done by [18] that demonstrate most common abuse were "often or very often sworn at, insulted, or put down" (49.8%), "often or very often acted in a way that made them afraid that they would be physically hurt" (47.6%), "pushed, grabbed, shoved, or slapped" (41.6%), and "hit so hard that they had marks or were injured" (28.3%). Concerning to physical abuse more than half of respondents experiencing of physical abuse or emotional abuse these result resembling with study results done by [19] results of this study showed that 45.9% of respondents reported having experienced some form of physical punishment. Regarding to alcohol and drug severity these reveals that 71.8% of addicts associated with moderate severity of alcohol and drugs abuse, these results in consistent with study results done by [20] according to which almost 71% of addicts reported using narcotics on a regular basis, with cannabis by (50%) and benzodiazepines (38%) being the most often used substances. Current study findings corroborate those of a study conducted by [21] whose findings indicated that most of teenagers (79.9%) have had the opportunity to consume alcohol, that the majority of those adolescents have consumed alcohol (73.4%), and that only a small percentage of those adolescents who have consumed alcohol have developed alcohol addiction or dependence. With relation to the usage of illegal substances, fewer than one third of people have had the opportunity to do so. According to effect of childhood trauma on severity of substance

use, study results exhibit that exposure to early childhood trauma have significant influence on addiction in adults as reported by significant difference with early childhood trauma at p -values= .012, these results are supported with result performed by [22] and [23] which demonstrate that there is a positive correlation between the severity of addiction and childhood trauma. Current results agree with result done by [15] which demonstrated a substantial correlation between traumatic experiences in early life and severity of substance use disorders in adolescence and adulthood. The present study results agree with study findings conducted by [24] who revealed that the amount of substance use, particularly cocaine, had a substantial correlation with the levels of emotional, sexual and physical abuse that occurred among young adult, as well as current symptoms of post-traumatic stress disorder (PTSD). This effect was irrespective of the fact that the individual had been exposed to adult trauma.

Study Limitations and Difficulties

Because the size of population unknown therefore reliability and generalizability of the findings could have been limited due to the study's small sample size. The study's participant group may have been restricted gender (male), potentially limiting the representation of populations.

Conclusions

The study concluded that early childhood trauma has profound influence on development of substance use in adulthood.

Recommendations

According to the findings of the current study, there should be more programs that raise awareness about the dangers of early childhood trauma and its influence on the development of undesirable behaviors. Stable and strong parent-child relationships that are firmly established are expected to offer a protection against the adverse complications of trauma in young children. Further studies with larger sample and included male and female in the study to determine the differences between two sexes. according to childhood trauma and addiction. The social and emotional implications of a child's exposure to trauma, it can be reduced through quick intervention and treatment to lessen the effects (also known as therapeutic intervention). Professional counsellors should recommend children to early childhood mental health professionals. Intervention does not change early dysfunctional childhood, but it changes attitudes and behaviors.

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