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INVESTIGATING THE MEDIATING AND DIRECT EFFECTS OF ADVERSE CHILDHOOD EXPERIENCES ON SELF-ESTEEM AMONG HIGH SCHOOL STUDENTS IN SOUTHERN NIGERIA

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ABSTRACT
Adverse Childhood Experiences (ACEs) significantly affect self-esteem in academic, social, and familial contexts. This study examined the direct and indirect effects of ACEs on self-esteem among high school students (N = 2138), using a generalised linear model (GLM) mediation analysis. Results showed ACEs had substantial direct effects on self-esteem, with age emerging as a crucial mediator. Older students demonstrated improved capacity to cope with ACEs and maintain self-esteem. To mitigate ACEs' immediate consequences, we recommend implementing school-based trauma-informed interventions, such as mindfulness programmes and counselling services, tailored to students' age and individual needs. Implications for practice and future research are discussed, emphasising the importance of comprehensive support systems for enhancing psychological well-being among ACEs-affected individuals.

Keywords: *Adverse Childhood Experiences (ACEs), mindfulness, psychological wellbeing, resilience, self-esteem.*

INTRODUCTION
Adverse Childhood Experiences (ACEs) refer to a variety of distressing or traumatic incidents that take place during a person's childhood. These experiences encompass a range of abusive behaviours (physical, emotional, sexual), instances of neglect (physical and emotional), and dysfunctional family situations such as observing marital violence, parental substance addiction, mental illness, or incarceration (Lee, Kim & Terry, 2020, Goddard, 2021). The notion of Adverse Childhood Experiences (ACEs) was first established through a ground-breaking investigation carried out by the Centres for Disease Control and Prevention (CDC) and Kaiser Permanente in the 1990s. This study uncovered a robust and incremental correlation between the quantity of adverse childhood experiences (ACEs) and various detrimental health consequences in adulthood, such as chronic illnesses, psychiatric disorders, and substance misuse (Hamai & Felitti, 2022).

The cumulative weight of these unfavourable encounters disrupts normal developmental processes, resulting in a series of physiological, psychological, and behavioural adjustments that can have enduring impacts throughout an individual's lifespan. Neurobiological studies have demonstrated that adverse childhood experiences (ACEs) can modify the structure and functioning of the brain, impacting regions that are involved for regulating emotions, processing thoughts, and responding to stress (Herzog & Schmahl, 2018, Alpuğan, 2024). As a result, children who have high Adverse Childhood Experience (ACE) scores are more prone to encountering difficulties in their academic achievements, social interactions, and overall state of being.

Self-esteem is an essential aspect of mental health and well-being, referring to a person's general perception of their own value and self-worth. It is crucial in determining a person's identity, impacting their social interactions, activities, and methods of dealing with challenges. Self-esteem is not uniform; instead, it appears in many areas of a child's life, specifically in school, peer, and family settings, each making a distinct contribution to overall self-esteem. In

the school setting, self-esteem is directly connected to academic success, motivation, and resilience. Children who possess a strong sense of self-worth are more inclined to actively participate in the learning process, establish and accomplish objectives, and demonstrate persistence when confronted with difficulties (Auttama, Seangpraw, Ong-Artborirak & Tonchoy, 2021, Makelele, 2024).
On the other hand, having low self-esteem might result in a lack of interest in academics, reduced drive, and an increased likelihood of quitting. The school environment, encompassing interactions with educators and classmates, exerts a substantial impact on a child's intellectual self-perception and self-worth. Additionally, peer relationships hold a pivotal position in the cultivation of self-esteem. Throughout childhood and adolescence, the significance of peer approval, friendships, and social status grows progressively. Positive interactions with peers and a feeling of belonging can enhance a child's self-esteem, but instances of bullying, exclusion, or rejection by peers can significantly harm a child's sense of self-value. Peer feedback functions as a reflective mirror, revealing an individual's social worth and level of acceptance.

The interplay within a family unit is fundamental to the formation of one's self-worth. Secure attachment connections, which are defined by the presence of warmth, support, and responsiveness, promote a feeling of safety and self-esteem in children. The self-esteem of a child is substantially influenced by the attitudes, behaviours, and communication methods of their parents. An example of this is authoritative parenting, which involves a combination of being highly sensitive to children's needs while also setting appropriate expectations. This parenting style has been linked to increased levels of self-esteem in children. Also, family environments that are neglectful or abusive can weaken a child's self-perception, resulting in emotions of insignificance and insufficiency. It is crucial to comprehend how adverse childhood experiences (ACEs) and self-esteem interact in different developmental settings in order to identify the mechanisms by which negative experiences impact individuals (Maneiro, Llerena, & López-Romero, 2023, Adebanjo, 2024, Owusu, 2024).

The objective of this study is to examine the immediate and indirect impacts of adverse childhood experiences (ACEs) on an individual's self-esteem within the school, peer, and family environments. The study intends to gain a deeper understanding of the mechanisms that drive these connections and to develop solutions to assist those who are affected. The correlation between Adverse Childhood Experiences (ACEs) and self-esteem is a crucial field of study because of the significant impact these experiences have on a child's psychological growth and general welfare. Although numerous researches have emphasised the negative impact of adverse childhood experiences (ACEs) on other aspects of mental health and behaviour, there are still major gaps in our comprehension of how ACEs specifically affect self-esteem. Prior studies (of Park, Lee & Han, 2021, Tzouvara *et al.,* 2023) have confirmed that Adverse Childhood Experiences (ACEs) are linked to a wide range of detrimental consequences, such as impaired psychological well-being, diminished educational achievements, and heightened vulnerability to substance misuse. Nevertheless, there is a scarcity of studies that establish a direct correlation between ACEs and self-esteem, and these studies are frequently constrained in their scope.

A significant number of these researches tend to concentrate on general mental health results or categories of adverse childhood experiences (ACEs) without doing a thorough analysis of the combined effect of various bad experiences on self-esteem. Moreover, most study has historically focused on individual. To fill these gaps, it is essential to investigate not only the direct impacts of ACEs on self-esteem but also the indirect mechanisms through which these impacts may be mediated. Direct impacts are to the immediate consequences of ACEs on self-esteem, such as a child's self-perception being directly decreased by instances of abuse or neglect. Indirect effects refer to the influence of intermediary elements that can either worsen or alleviate the consequences of adverse childhood experiences (ACEs) on an

individual's self-esteem. Mediating factors encompass several elements such as social support systems, coping methods, mental health condition, and educational contexts. Through examining both the immediate and indirect consequences, we may develop a more intricate comprehension of how Adverse Childhood Experiences (ACEs) impact an individual's self-esteem. This method enables us to identify elements that could act as protective barriers or increase the risk, thereby providing valuable information for focused interventions.

Literature Review

Adverse Childhood situations (ACEs) are stressful events that happen during childhood and can include many damaging situations (Lee, Kim & Terry, 2020, Goddard, 2021). These experiences can have lasting repercussions on a person's mental, emotional, and physical health. Adverse Childhood Experiences (ACEs) commonly encompass physical, emotional, and sexual abuse, neglect, and many types of household dysfunction such domestic violence, substance misuse, mental illness in the household, parental separation or divorce, and the imprisonment of a family member (Mosley-Johnson, Campbell, Garacci, Walker & Egede, 2021). The groundbreaking study conducted by Felitti *et al.,* (1998) emphasised the significant influence that early adversities can have on future life outcomes. This study laid the groundwork for comprehensive research on the complex and diverse consequences of Adverse Childhood Experiences (ACEs).

The occurrence of ACEs differs among various populations and demographic groups. Research has indicated that Adverse Childhood Experiences (ACEs) are prevalent, with a substantial proportion of the population reporting the occurrence of at least one negative experience during their early years. Nevertheless, specific demographic variables such as socio-economic position, race, and ethnicity might exert an influence on the frequency and nature of adverse childhood experiences (ACEs) encountered. Children from low-income households or marginalised groups are more prone to experiencing several Adverse Childhood Experiences (ACEs), which increases their likelihood of facing poor developmental consequences. Gaining insight into the demographic distribution of ACEs is essential for creating focused therapies that cater to the distinct requirements of affected communities (Kazeem, 2020, Trinidad, 2021, Auttama *et al.,* 2021).

Self-esteem is an essential aspect of mental well-being, which refers to a person's total subjective assessment of their own value and talents. Self-concept includes one's views about oneself (e.g., *"I am capable," "I am deserving"*) and emotional experiences like success, hopelessness, satisfaction, and humiliation. Self-esteem is a complex concept that may be divided into three main components that are important during childhood and adolescence: *school self-esteem, peer self-esteem, and family self-esteem* (Brown, 2014, Abdel-Khalek, 2016, Ellis, Hoskin & Ratnasingam, 2018). School self-esteem relates to a child's cognitive assessment of their academic capabilities and their feeling of inclusion and proficiency within the school setting. Positive self-esteem in the school context is linked to improved academic achievement, increased motivation, and enhanced participation in school-related activities. Peer self-esteem refers to a child's perception of their acceptance, popularity, and value among their peers. During adolescence, peer relationships play a crucial role in social development. Elevated levels of self-esteem among peers are associated with enhanced social aptitude, more robust interpersonal relationships, and reduced levels of social unease. Family self-esteem refers to a child's perception of being appreciated and encouraged within their family. Positive family self-esteem is associated with a strong bond, emotional resilience, and reduced behavioural issues (Abdel-Khalek, 2016, Zhao, Zheng, Pan & Zhou, 2021).

The significance of self-esteem during childhood and adolescence cannot be exaggerated. Having a strong sense of self-worth plays a significant role in building resilience, which allows youngsters to handle difficulties and disappointments more effectively. In contrast, having low self-esteem is linked to various adverse consequences, such as sadness, anxiety, and impaired performance in academics and social interactions. To promote the well-being of

young individuals, it is crucial to comprehend the elements that impact self-esteem, since it plays a fundamental part in their development.

The correlation between Adverse Childhood Experiences (ACEs) and self-esteem can be comprehended from multiple theoretical perspectives. Two major ideas in the field are attachment theory and the stress model. Attachment theory, introduced by John Bowlby, posits that early ties with main carers serve as the foundation for subsequent emotional and social development. Consistent and responsive caring, which is known as secure attachment, promotes the development of a good self-concept and high self-esteem. On the other hand, an insecure attachment, which is frequently caused by neglect or abuse, can result in unfavourable self-perceptions and a lack of confidence (Bretherton, 2013, Holmes, 2014). Adverse Childhood Experiences (ACEs), by interrupting the formation of a strong emotional bond, can greatly diminish a child's sense of self-worth.
The stress model suggests that prolonged exposure to stress, such as that induced by ACEs, might overpower a child's ability to cope and result in adverse developmental consequences. Extended periods of stress have a negative impact on the development of the brain and can hinder the ability to regulate emotions, resulting in challenges in maintaining a good self-image. This paradigm emphasises the collective influence of stressors and the significance of reducing their consequences to maintain self-esteem (Nurius, Green, Logan-Greene & Borja, 2015).

Empirical research has thoroughly shown the influence of Adverse Childhood Experiences (ACEs) on an individual's self-esteem. Research repeatedly demonstrates that children who encounter multiple Adverse Childhood Experiences (ACEs) are more susceptible to acquiring diminished self-esteem. Anda *et al.*, (2006) discovered that adverse childhood experiences (ACEs) are linked to many detrimental psychological consequences, such as reduced self-esteem. These studies emphasise the direct influence of ACEs on self-esteem, emphasising the importance of early intervention to prevent long-term psychological damage. Also, research has examined several mediating elements that could affect the connection between ACEs and self-esteem. Social support and coping mechanisms are commonly examined factors that mediate the relationship between variables. Having a supportive adult or friend can mitigate the adverse impacts of ACEs, hence promoting elevated levels of self-esteem. Coping techniques, such as the ability to solve problems and regulate emotions, are essential in how youngsters handle the effects of negative experiences. In their study, Jaffee *et al.,* (2007) discovered that maternal nurturance had a crucial role in reducing the impact of adverse childhood experiences (ACEs) on academic achievements, which are strongly associated with self-esteem.

The purpose of this investigation is to examine the direct effects of Adverse Childhood Experiences (ACEs) on self-esteem in three specific areas: school, peer relationships, and family dynamics. The objective is to ascertain the degree to which Adverse Childhood Experiences (ACEs) have a direct impact on a child's self-concept in each of these domains.
This study raised three research questions:

1. What are the variations in mediation connections among different demographic sub-groups?
2. What mechanisms account for the intricate connections between adverse childhood experiences (ACEs) and different aspects of self-esteem?
3. How do these findings influence the development of intervention techniques aimed at promoting psychological well-being in students and families?

METHODS

This study utilised a cross-sectional research design to investigate the relationships between Adverse Childhood Experiences (ACEs) and self-esteem dimensions (school, peer, and family) among Senior Secondary School students in Delta State. A cross-sectional design

allows for the collection of data at a single point in time, providing a snapshot of the relationships between variables without considering changes over time. This design was suitable for capturing the prevalence of ACEs, self-esteem perceptions, and demographic characteristics of the study population. The study sample comprised **2,138** Senior Secondary School students from various schools across Delta State.

Data for this study were collected using a structured questionnaire administered to the students. The questionnaire was designed to gather comprehensive information on the students' personal demographics, adverse childhood experiences (ACEs), and self-esteem across different dimensions (school, peer, and family). The ACEs section included questions on various types of abuse, neglect, and household dysfunction, while the self-esteem section utilized validated scales to measure students' perceptions in school, peer, and family contexts. Data was collected through standardized surveys administered in schools, with appropriate consent obtained from parents and guardians. Approval from the institutional review board, informed consent, confidentiality, and data protection measures. Frequency count, percentage, mean, and standard deviation for students' personal data and key variables. The study uses GLM mediation analysis to explore the complex interactions between ACEs, mediating factors (age, gender, and living situation), and self-esteem dimensions (school, peer, family).

Multiple models were used to assess the mediating effects of age, gender, and living situation on the relationship between ACEs and self-esteem characteristics both individually and collectively. Analysis will provide insights into overall effects (direct and indirect paths), indirect impacts (mediated relationships), and direct effects of ACEs on self-esteem.

The ACEs questionnaire assessed various traumatic events experienced by students before the age of **18**. This included items on physical, emotional, and sexual abuse; neglect; and household dysfunction (e.g., domestic violence, substance abuse, mental illness in the household, parental separation or divorce, and incarceration of a family member). Each item was scored dichotomously (yes/no), and a cumulative ACE score was calculated by summing the number of affirmative responses. Self-esteem was measured using validated scales that assessed students' perceptions in three specific domains:

i. **School self-esteem**: This dimension was measured using items that evaluated students' feelings of competence and acceptance in the academic environment.
ii. **Peer self-esteem:** Items in this dimension assessed students' sense of acceptance, popularity, and worth within their peer group.
iii. **Family self-esteem**: This dimension measured students' perceptions of being valued and supported within the family unit.

Additional measures included demographic variables such as age, gender, class level, school type, and living arrangements. These variables were collected to examine their potential mediating effects on the relationship between ACEs and self-esteem.

The data were analysed using a combination of descriptive statistics and Generalised linear model (GLM) mediation analysis. Descriptive statistics, including frequency counts, percentages, means, and standard deviations, were calculated to summarize the students' demographic characteristics and prevalence of ACEs For examining the complex interactions between ACEs, mediating factors (age, gender, and living arrangements), and different aspects of self-esteem, GLM mediation analysis was employed. This analytical approach allows for the simultaneous examination of multiple mediators and the evaluation of both direct and indirect effects of ACEs on self-esteem. Multiple models were constructed to assess the mediating effects of age, gender, and living arrangements individually and collectively.

Reliability

The adverse childhood experiences (ACEs) scale exhibits a high level of internal consistency. The scale's computed *Cronbach's alpha coefficient*, which is *0.695*, indicates that the items are fairly associated with one another. *McDonald's coefficient*, at *0.702*, supports this conclusion even more. The school self-esteem scale, which was created to measure self-esteem in the setting of the school, has strong internal consistency. This scale's items seem

to be accurately assessing the construct, as evidenced by a *Cronbach's alpha* of *0.742* and a *McDonald's alpha* of *0.786*. The credibility of the scale is increased by these higher coefficients, which show that the items are tightly connected. Comparable to the ACEs scale in terms of internal consistency, the peer self-esteem scale measures self-esteem in peer-related contexts. High consistency among the scale's components is indicated by *Cronbach's alpha value* of *0.694* and *McDonald's alpha value* of *0.714*, respectively. A high level of internal consistency may be seen in the family self-esteem scale, which measures self-esteem in the context of the family. The scale's items are reasonably linked, with a *Cronbach's alpha* of *0.722* and a *McDonald's alpha* of *0.775*. This implies that the four scales measure the target construct accurately.

RESULTS

Table 1: *Students Information*

Variable	Count	%	Mean	SD
Gender				
Female	1271	59.4		
Male	867	40.6		
Class				
SS1	321	15.0		
SS2	885	41.4		
SS3	932	43.6		
School type				
Faith based	56	2.6		
Private	945	44.2		
Government	1137	53.2		
Living arrangement				
Both parents	1606	75.1		
Mother alone	219	10.2		
Father alone	29	1.4		
One parent with stepfather/mother	66	3.1		
Relations	66	3.1		
Grandparents	108	5.1		
Alone	44	2.1		
Senatorial District				
Delta South	648	30.3		
Delta Central	750	35.1		
Delta North	740	34.6		
Age			15.4	1.41
Total	2138	100		

From *Table 1*, *40.6% of men* and *59.4% of women* make up the sample. The representation of both genders in the study is highlighted by this distribution. Most pupils, *41.4 percent* and *43.6 percent* respectively, are in Senior Secondary 2 (SS2**)** and SS3, while *15.0 percent* are in Senior Secondary 1 (SS1). This suggests that there are more pupils enrolled in the upper grades. Most pupils *(53.2%)* attend public schools, followed by private *(44.2%)* and faith-based institutions *(2.6%)*. The most common living situation is with both parents *(75.1%),* followed by living alone *(10.2%),* mother alone *(5.1%),* father alone *(1.4%),* one parent living with a stepfather **or** stepmother *(3.1%),* and with grandparents *(3.1%).* a tiny fraction cohabitates with family members *(2.1%).* This indicates that a sizable portion of pupils likely reside with both parents. The distribution is evenly distributed throughout the senatorial districts, with Delta Central holding the largest proportion *(35.1%),* closely followed by Delta North *(34.6%),* and Delta South *(30.3%).* The pupils' average age is *15.4 years*, and their standard deviation is a respectably small *1.41*. This implies that the age distribution is centred around the mean, showing that the individuals' ages are constant (Table 1).

Table 2: *Descriptive statistics of student's Advance childhood experiences (ACEs), school self-esteem, peer self-esteem, and family self-esteem*

	ACEs	School Self-esteem	Peer Self-esteem	Family Self-esteem
N	2138	2138	2138	2138
Missing	0	0	0	0
Mean	11.8	27.9	27.8	26.8
Sum	25263	59546	59353	57350
Standard deviation	1.91	3.94	4.31	3.88

Students' average ACEs scores are *11.8*, with a *1.91* standard deviation. This suggests that the range of ACEs scores around the mean is rather small. A higher mean score may indicate that the kids had experienced a considerable number of adverse experiences (ACEs), which are defined as unfavourable experiences that occurred throughout infancy. With a standard deviation of *3.94*, the mean score for school self-esteem is *27.9*. According to this, students' perceptions of their self-esteem in the setting of their educational environment are generally relatively good. With a standard deviation of *4.31* and a mean peer self-esteem score of *27.8*, it shows that students see their interactions with peers as reflecting a modest level of self-esteem. The average family self-esteem score is *26.8*, while the standard deviation is *3.88*. This suggests that among their family's dynamics, pupils' perceptions of their own self-esteem are fairly good (Table 2).

School self-esteem

Model information for the dependent variable (School self-esteem)

Table 3: *Model Information for school self-esteem as dependent variable*

Mediators Models		
	m1	Age ~ ACEs
	m2	Gender ~ ACEs
	m3	Living Arrangement ~ ACEs
Full Model		
	m4	School Self-esteem ~ Age + Gender + Living Arrangement + ACEs
Indirect Effects		
	IE 1	ACEs ⇒ Age ⇒ School self-esteem
	IE 2	ACEs ⇒ Gender ⇒ School self-esteem
	IE 3	ACEs ⇒ Living Arrangement ⇒ School Self-esteem

Several models are shown in Table 3 that investigate the mediating effects of age, gender, and living situation on the association between adverse childhood experiences (ACEs) and school self-esteem. Direct linkages (m1, m2, and m3) and a full model (m4) that considers all potential mediators are included in the models. The table also includes indirect effects (IE 1, IE 2, IE 3) that demonstrate how ACEs affect school self-esteem via each mediator. The direct models investigate the direct connection between each possible mediator and ACEs (age, gender, living arrangement). The outcomes of these models shed some information on how much an ACE will affect each of these factors on its own. To explain their combined influence on the connection between ACEs and school self-esteem, the comprehensive model incorporates all potential mediators (age, gender, and housing arrangement). The results of this model painted a complete picture of how these variables work together to mediate the connection. The indirect effects pathways emphasise how age, gender, and living situation

have a mediation role in the relationship between ACEs and school self-esteem. It was possible to determine if these factors serve as meaningful mediators based on the coefficients connected to each indirect impact. The chart reveals that ACEs, age, gender, living situation, and school self-esteem interact in a complicated way. It suggests that these factors may influence school self-esteem indirectly as well as directly, mediating or moderating the association between ACEs and school self-esteem.

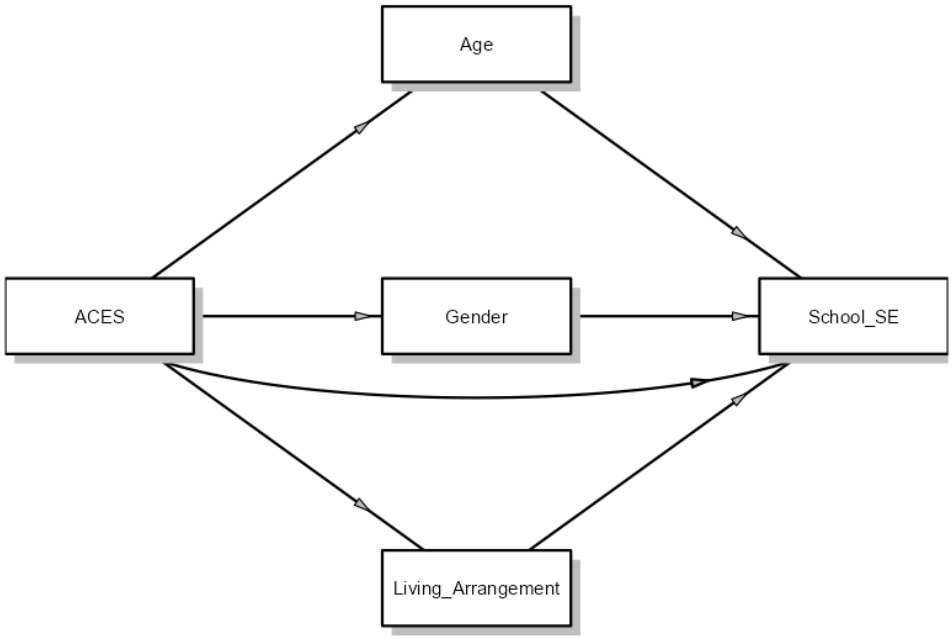

Figure 1: Path Model diagram for the dependent variable (School self-esteem)

Figure 1 *shows the dependent variable as school self-esteem. The independent variables ACEs has a direct effect on the dependent variable as indicated by the arrow linking them. The mediating variables are age, gender, and living arrangements, with the arrow showing how they stand as mediators between the independent variable and dependent variable.*

Table 4: The indirect, direct, and total effect model for Adverse Childhood Experiences (ACEs), Mediating Factors, and School Self-Esteem

				95% C.I. (a)				
Type	**Effect**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**Z**	**P**
Indirect	ACEs ⇒ Age ⇒ School Self-esteem	0.00601	0.00386	-0.00155	0.01357	0.00291	1.557	0.119
	ACEs ⇒ Gender ⇒ School Self-esteem	0.00185	0.00229	-0.00264	0.00635	8.96e-4	0.807	0.420
	ACEs ⇒ Living Arrangement ⇒ School Self-esteem	0.01211	0.00736	-0.00233	0.02654	0.00586	1.644	0.100
Component	ACEs ⇒ Age	0.02756	0.01601	-0.00381	0.05893	0.03722	1.722	0.085
	Age ⇒ School Self-esteem	0.21804	0.05975	0.10094	0.33514	0.07817	3.649	< .001
	ACEs ⇒ Gender	-0.01245	0.00557	-0.02337	-0.00154	-0.04832	-2.237	0.025
	Gender ⇒ School Self-esteem	-0.14859	0.17175	-0.48523	0.18804	-0.01854	-0.865	0.387
	ACEs ⇒ Living Arrangement	0.13077	0.01740	0.09667	0.16488	0.16043	7.515	< .001
	Living Arrangement ⇒ School Self-esteem	0.09257	0.05496	-0.01514	0.20028	0.03653	1.684	0.092
Direct	ACEs ⇒ School Self-esteem	0.21378	0.04488	0.12582	0.30173	0.10348	4.764	< .001
Total	ACEs ⇒ School Self-esteem	0.23374	0.04440	0.14671	0.32077	0.11314	5.264	< .001

Note. Confidence intervals computed with method: Standard (Delta method)

Note. Betas are completely standardized effect sizes

A thorough analysis of the complex associations between adverse childhood experiences (ACEs), mediating factors (age, gender, and housing situation), and school self-esteem is provided in Table 4. In addition to their estimates, standard errors, confidence intervals, standardized effect sizes, z-values, and p-values, it offers several types of effects, such as indirect, direct, and total effects.

Indirect Effects

Although favourable, the indirect impact of ACEs on academic self-esteem across age groups is not statistically significant *(p = 0.119).* This shows that although there appears to be a slight beneficial effect, age may not significantly buffer the association between ACEs and school self-esteem. Similarly, while not statistically significant *(p = 0.420),* the indirect effect of ACEs on school self-esteem through gender is favourable. This suggests that the association between ACEs and school self-esteem may not be greatly moderated by gender. Living arrangements had a favourable and negligibly significant indirect influence of ACEs on school self-esteem *(p = 0.100).* This suggests that further research into the role of home arrangements as a mediator in the association between ACEs and school self-esteem may be worthwhile.

Component Effects

The component effects shed light on specific interactions between the mediators and ACEs. Age and ACEs exhibit a mildly inverse connection *(p = 0.085),* indicating that the link is not statistically significant. Age is an important predictor of school self-esteem since it has a strong and favourable component influence on it *(p = 0.001).* ACEs had a substantial and unfavourable component influence on gender *(p = 0.025),* suggesting that bad experiences may be related to how people perceive gender. However, the gender component impact on school self-esteem is not statistically significant *(p = 0.387),* suggesting that gender may not be a reliable predictor of school self-esteem. Living arrangements are strongly and significantly influenced by ACEs *(p = 0.001),* highlighting the influence of negative events on living arrangements. Living arrangement may have only a little effect on school self-esteem, as indicated by the non-significant component effect on school self-esteem *(p = 0.092).*

Direct and Total Effects

Underscoring the large direct influence of ACEs on school self-esteem, the direct effect of ACEs is very significant *(p = 0.001).* The combined influence of both direct and indirect routes is significant, as shown by the overall effect of ACEs on school self-esteem *(p = 0.001).*

Peer self-esteem

Model information for the dependent variable (Peer self-esteem)

Table 5: Model Information for peer self-esteem as dependent variable

Mediators Models		
	m1	Age ~ ACEs
	m2	Gender ~ ACEs
	m3	Living Arrangement ~ ACEs
Full Model		
	m4	Peer Self-esteem ~ Age + Gender + Living Arrangement + ACEs
Indirect Effects		
	IE 1	ACEs ⇒ Age ⇒ Peer Self-esteem
	IE 2	ACEs ⇒ Gender ⇒ Peer Self-esteem
	IE 3	ACEs ⇒ Living Arrangement ⇒ Peer Self-esteem

The table presents the results of a Generalised Linear Model (GLM) mediation study that looked at the mediating effects of age, gender, and living situation on the association between adverse childhood experiences (ACEs) and peer self-esteem. The models include comprehensive models (m4) that incorporate all possible mediators in addition to direct interactions (m1, m2, and m3). The indirect effects (IE 1, IE 2, IE 3) show how each mediator contributes to the impact of ACEs on peer self-esteem. The mediating models look at specific

interactions between each mediator and each ACE (age, gender, living arrangement). These connections make it easier to comprehend how each variable is affected by ACEs separately. The entire model provides a thorough understanding of how these elements collectively mediate the link between ACEs and peer self-esteem by considering all mediators (age, gender, and living situation). These collateral effects highlight how age, gender, and living situation play a moderating role in the relationship between ACEs and peer self-esteem. The coefficients indicate how effective each mediation approach is Table 5

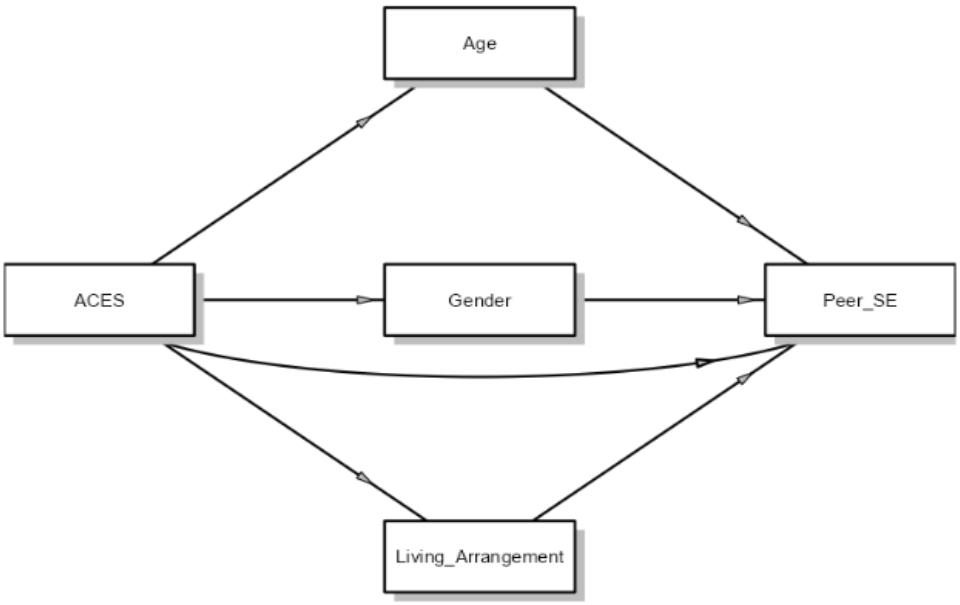

Figure 2: Path Model diagram for the dependent variable (Peer self-esteem)

Figure 2 *shows the dependent variable as peer self-esteem. The independent variables ACEs has a direct effect on the dependent variable as indicated by the arrow linking them. The mediating variables are age, gender, and living arrangements, with the arrow showing how they stand as mediators between the independent variable and dependent variable.*

Table 6: The indirect, direct, and total effect model for Adverse Childhood Experiences (ACEs), Mediating Factors, and Peer Self-Esteem

Indirect and Total Effects

				95% C.I. (a)				
Type	**Effect**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**z**	**P**
Indirect	ACEs ⇒ Age ⇒ Peer Self-esteem	0.00713	0.00452	-0.00172	0.01598	0.00316	1.579	0.114
	ACEs ⇒ Gender ⇒ Peer Self-esteem	-0.00111	0.00240	-0.00581	0.00358	-4.93e−4	-0.465	0.642
	ACEs ⇒ Living Arrangement ⇒ Peer Self-esteem	0.00709	0.00793	-0.00845	0.02263	0.00314	0.894	0.371
Component	ACEs ⇒ Age	0.02756	0.01601	-0.00381	0.05893	0.03722	1.722	0.085
	Age ⇒ Peer Self-esteem	0.25872	0.06546	0.13042	0.38702	0.08480	3.952	< .001
	ACEs ⇒ Gender	-0.01245	0.00557	-0.02337	-0.00154	-0.04832	-2.237	0.025
	Gender ⇒ Peer Self-esteem	0.08936	0.18818	-0.27947	0.45818	0.01019	0.475	0.635
	ACEs ⇒ Living Arrangement	0.13077	0.01740	0.09667	0.16488	0.16043	7.515	< .001
	Living Arrangement ⇒ Peer Self-esteem	0.05422	0.06021	-0.06379	0.17223	0.01956	0.901	0.368
Direct	ACEs ⇒ Peer Self-esteem	0.20807	0.04917	0.11170	0.30444	0.09208	4.232	< .001
Total	ACEs ⇒ Peer Self-esteem	0.22118	0.04866	0.12582	0.31654	0.09786	4.546	< .001

Note. Confidence intervals computed with method: Standard (Delta method)

Note. Betas are completely standardized effect sizes

The findings of an investigation on the direct and full effect of adverse childhood experiences (ACEs) on peer self-esteem are shown in Table 6. It describes many impact types, including direct effects, total effects, and indirect effects via mediators (age, gender, and living situation). Estimates, standard errors, confidence intervals, standardized effect sizes, z-values, and p-values are all included in the table.

Indirect Effects

Positive but not statistically significant *(p = 0.114),* the indirect impact of ACEs on peer self-esteem varies with age. This shows that the association between ACEs and peer self-esteem may not be considerably moderated by age. The gender-based indirect impact of ACEs on peer self-esteem is detrimental and insignificant *(p = 0.642).* In this situation, gender might not have a substantial moderating function. Positive but insignificant *(p = 0.371),* ACEs' indirect influence on peer self-esteem through living arrangements. The place you live might not be a great mediator.

Component Effects

Age and ACEs may be related, as shown by the positive but insignificant component impact of ACEs on age *(p = 0.085).* Age is a major predictor of peer self-esteem and has a large and positive component influence on it *(p = 0.001).* It is possible that ACEs affect how people perceive gender since they have a negative and substantial component effect on gender *(p = 0.025).* However, the component effect of gender on peer self-esteem is non-significant *(p = 0.635),* suggesting that gender may not have a substantial effect on peer self-esteem. Living arrangements are significantly influenced by ACEs *(p = 0.001),* suggesting a connection between ACEs and living arrangements. Living arrangements have a little effect on peers' self-esteem, as indicated by their non-significant component effect *(p = 0.368).*

Direct and Total Effects

The direct effect of ACEs on peer self-esteem is highly significant *(p < 0.001)*, suggesting a direct influence of ACEs on peer self-esteem. The total effect of ACEs on peer self-esteem is also highly significant *(p < 0.001),* indicating that the combined direct and indirect effects of ACEs on peer self-esteem are substantial. A direct impact of ACEs on peer self-esteem is shown by the direct effect, which is very significant *(p = 0.001).* The combined direct and indirect impacts of ACEs on peer self-esteem are strong, and the overall effect of ACEs on peer self-esteem is likewise highly significant *(p = 0.001).*

Family self-esteem

Table 7: Model information for the dependent variable (School self-esteem)

Mediators Models		
	m1	Age ~ ACEs
	m2	Gender ~ ACEs
	m3	Living Arrangement ~ ACEs
Full Model		
	m4	Family Self-esteem ~ Age + Gender + Living Arrangement + ACEs
Indirect Effects		
	IE 1	ACEs ⇒ Age ⇒ Family Self-esteem
	IE 2	ACEs ⇒ Gender ⇒ Family Self-esteem
	IE 3	ACEs ⇒ Living Arrangement ⇒ Family Self-esteem

Results from a Generalised Linear Model (GLM) mediation study are shown in Table 7. This analysis looked at the role that age, gender, and living situation had in mediating the link between adverse childhood experiences (ACEs) and family self-esteem. The models contain separate mediators (m1, m2, and m3) as well as an all-encompassing model (m4) that incorporates all conceivable mediators. Indirect effects are also shown (IE 1, IE 2, IE 3), demonstrating how ACEs affect family self-esteem via each mediator. Understanding each mediator's unique associations with ACEs is made easier by the mediating models, which provide insights into the many roles that ACEs play on each mediator (age, gender, and living situation). The whole model provides a thorough view on how these characteristics collectively moderate the association between ACEs and family self-esteem by merging all mediators (age, gender, and living situation). These unintended consequences show how age, gender, and living situation play a moderating role in the relationship between ACEs and family self-esteem. The coefficients represent each mediation pathway's strength.

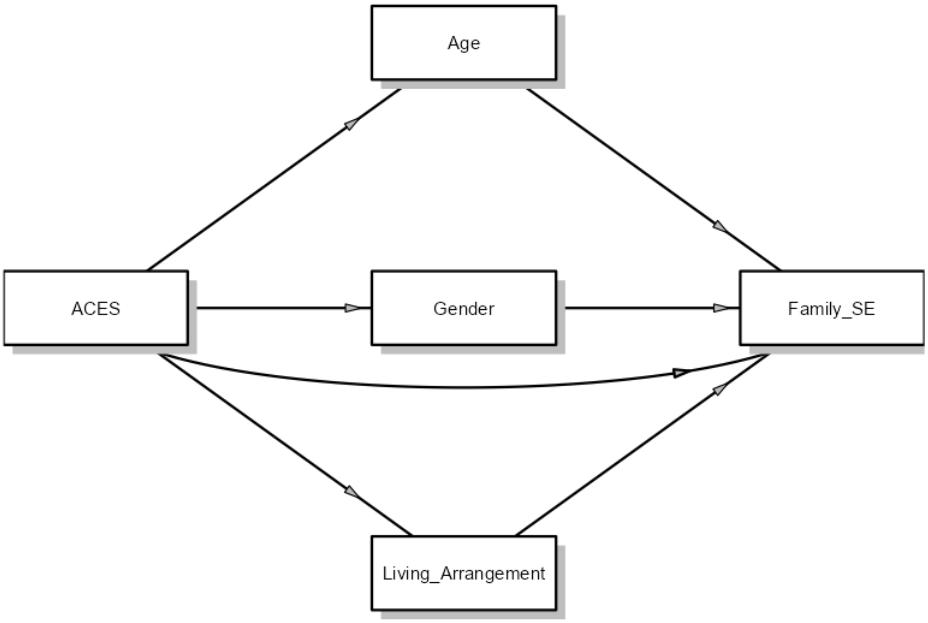

Figure 3: Path Model diagram for the dependent variable (Family self-esteem)

Figure 3 *shows the dependent variable as family self-esteem. The independent variables ACEs has a direct effect on the dependent variable as indicated by the arrow linking them. The mediating variables are age, gender, and living arrangements, with the arrow showing how they stand as mediators between the independent variable and dependent variable.*

Table 8: The indirect, direct, and total effect model for Adverse Childhood Experiences (ACEs), Mediating Factors, and Family Self-Esteem

Indirect and Total Effects

				95% C.I. (a)				
Type	**Effect**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**z**	**P**
Indirect	ACES ⇒ Age ⇒ Family Self-esteem	0.00779	0.00480	-0.00162	0.01720	0.00383	1.623	0.105
	ACEs ⇒ Gender ⇒ Family Self-esteem	6.90e-4	0.00211	-0.00344	0.00482	3.39e-4	0.327	0.744
	ACEs ⇒ Living Arrangement ⇒ Family Self-esteem	0.00710	0.00707	-0.00677	0.02096	0.00349	1.003	0.316
Component	ACEs ⇒ Age	0.02756	0.01601	-0.00381	0.05893	0.03722	1.722	0.085
	Age ⇒ Family Self-esteem	0.28260	0.05829	0.16836	0.39685	0.10287	4.848	< .001
	ACEs ⇒ Gender	-0.01245	0.00557	-0.02337	-0.00154	-0.04832	-2.237	0.025
	Gender ⇒ Family Self-esteem	-0.05539	0.16756	-0.38380	0.27302	-0.00702	-0.331	0.741
	ACEs ⇒ Living Arrangement	0.13077	0.01740	0.09667	0.16488	0.16043	7.515	< .001
	Living Arrangement ⇒ Family Self-esteem	0.05427	0.05361	-0.05081	0.15935	0.02175	1.012	0.311
Direct	ACEs ⇒ Family Self-esteem	0.32312	0.04378	0.23731	0.40893	0.15883	7.380	< .001
Total	ACEs ⇒ Family Self-esteem	0.33870	0.04340	0.25364	0.42376	0.16647	7.804	< .001

Note. Confidence intervals computed with method: Standard (Delta method)

Note. Betas are completely standardized effect sizes

Table 8 displays findings from a review of indirect and overall impacts, with a particular emphasis on the connection between adverse childhood experiences (ACEs) and family self-esteem. It offers estimates, standard errors, confidence intervals, standardized effect sizes, z-values, and p-values for a variety of impact types, such as direct effects, total effects, and indirect effects via mediating factors (age, gender, living arrangement).

Indirect Effects

ACEs have a positive but not statistically significant indirect influence on family self-esteem over time *(p = 0.105).* The association between ACEs and family self-esteem may not be significantly mediated by age. Due to gender, the indirect impact of ACEs on family self-esteem is very small and insignificant *(p = 0.744).* Gender might not be a significant mediating factor in this situation. Living arrangements had a favourable, but not statistically significant, indirect influence of ACEs on family self-esteem *(p = 0.316)*. The living situation may not be a significant mediator in the relationship.

Component Effects

Age and ACEs may be related, as shown by the positive but insignificant component impact of ACEs on age *(p = 0.085).* The relevance of age in predicting family self-esteem is highlighted by the fact that age has a large and positive component effect on family self-esteem *(p = 0.001).* ACEs had a negative and substantial component effect on gender *(p = 0.025),* suggesting that bad experiences may have an impact on how people perceive gender. Gender may not be a very good predictor of family self-esteem, as seen by the gender component impact on family self-esteem being non-significant *(p = 0.741).* A connection between ACEs and living arrangement decisions is shown by the fact that ACEs have a strong component effect on living arrangement *(p = 0.001).* The living situation has a non-significant component effect on family self-esteem *(p = 0.311),* indicating that it has little bearing on this factor.

Direct and Total Effects

The direct effect of ACEs on family self-esteem is highly significant *(p < 0.001),* suggesting that ACEs have a direct impact on family self-esteem. The total effect of ACEs on family self-esteem is also highly significant *(p < 0.001),* indicating that the combined influence of direct and indirect pathways is substantial.

DISCUSSION OF FINDINGS

The study revealed that age had a notable impact on the connection between ACEs (Adverse Childhood Experiences) and self-esteem. However, the indirect effects of age were favourable but not statistically significant. This implies that although age is an important aspect in comprehending the effects of adverse childhood experiences (ACEs) on self-esteem, the specific ways in which age influences these effects may not directly explain the variations in self-esteem. The notable mediating influence of age suggests that as children mature, their ability to comprehend and manage challenging situations develops, thereby impacting their self-esteem. Nevertheless, the insignificant indirect effect suggests that age itself does not significantly mitigate the influence of ACEs, unless other factors such as maturity, resilience, and external support networks are considered.

The study also found that the impact of ACEs on self-esteem through gender was negligible or modest. This discovery suggests that gender does not play a significant role in influencing the link between ACEs (Adverse Childhood Experiences) and self-esteem. Put simply, the impact of ACEs on self-esteem outcomes is not significantly influenced by an individual's gender. This implies that therapies targeting the influence of adverse childhood experiences (ACEs) on self-esteem may not require a strong focus on gender, as gender does not seem to have a significant mediating effect in this context.

The analysis revealed a positive correlation between adverse childhood experiences (ACEs) and self-esteem, although this relationship was frequently not statistically significant. This correlation was mediated by the individual's living situations. This suggests that the association between adverse childhood experiences (ACEs) and self-esteem can be influenced by the kind of living arrangement, such as living with both parents, one parent, or other family members. However, the impact of living arrangement on this relationship is not significant. The living arrangement does exert some influence, albeit not substantial enough, to dramatically modify the effects of ACEs on self-esteem. This implies that although the family environment is significant, there may be other elements that have a greater influence on how adverse childhood experiences (ACEs) affect one's self-esteem.

The results repeatedly showed that Adverse Childhood Experiences (ACEs) have a direct and significant impact on all aspects of self-esteem, including school, peers, and family relationships. This highlights the widespread influence of negative childhood events on a child's perception of themselves in different areas of their life. The comprehensive overall impact, encompassing both direct and indirect routes, emphasises the collective effects of ACEs on self-esteem. While there may be other elements involved, the direct influence of ACEs is strong and has a considerable contribution to the total impact on self-esteem.

While characteristics such as age, gender, and living arrangements have different impacts on the connection between ACEs (Adverse Childhood Experiences) and self-esteem, the direct effects of ACEs are significant and require targeted intervention measures. These findings enhance our comprehension of the impact of ACEs on self-esteem and provide insights for creating comprehensive support systems for children and adolescents affected by ACEs. The results indicate that ACEs have a direct and substantial impact on self-esteem aligning with prior studies. Multiple studies have extensively shown the harmful impacts of negative events on the self-worth of children, emphasising the widespread and enduring consequences of Adverse Childhood events (ACEs) in different aspects of life, including school, social relationships, and family environments (Anda *et al.*, 2006; Felitti *et al.,* 1998). The age factor plays a crucial role in moderating, or influencing, the relationship between stress and coping abilities. This finding supports developmental theories that propose that individuals become better equipped to handle stress and unfavourable experiences as they grow older.

Prior research has also observed that older children and adolescents may acquire more effective coping strategies and resilience, which can mitigate the impact of adverse childhood experiences (ACEs) on self-esteem (Masten *et al.,* 1999; Garmezy, 1991). The discovery that gender does not significantly influence the connection between ACEs and self-esteem contradicts prior research that has indicated gender disparities in how children and adolescents encounter and react to ACEs. Research indicates that there is a possibility that boys and girls may handle and absorb negative experiences in different ways, which could result in differing effects on their self-esteem (Leadbeater *et al.,* 1999; Cauffman *et al.,* 2000). Nevertheless, the limited indirect impact of gender seen in the present study implies that these disparities may not be as significant or could vary depending on the circumstances. Although previous research has highlighted the significance of stable living arrangements and family contexts in mitigating the impacts of ACEs, this study discovered that living arrangements play a limited role in modulating these effects. This discovery implies that elements other than the living arrangement itself, such as the quality of relationships and support within certain living arrangements, may have a greater impact (Jaffee *et al.,* 2007; Werner & Smith, 2001).

The notable direct impacts of ACEs on self-esteem provide evidence for attachment theory, which suggests that early unpleasant events hinder the development of secure attachment, resulting in a poor self-perception and diminished self-esteem. The results emphasise the significance of early childhood connections and their enduring influence on the development of self-esteem (Bowlby, 1982). The findings are consistent with the stress model, which posits

that prolonged exposure to stress (such as ACEs) might hinder emotional regulation and cognitive functions, resulting in diminished self-esteem. The notable direct impacts of ACEs suggest that chronic stress directly affects self-esteem, hence confirming the relevance of the stress model in comprehending these dynamics (McEwen, 2000).

Implications of Findings for Educators, Parents, and Practitioners

- Teachers should possess knowledge of the possible influence of Adverse Childhood Experiences (ACEs) on students' self-worth and educational achievements. Establishing a nurturing and all-encompassing school atmosphere can assist in alleviating certain adverse consequences. Incorporating Social-Emotional Learning (SEL) programmes can also improve students' ability to manage stress and boost their self-confidence.
- Parents should be informed about the potential enduring effects of Adverse Childhood Experiences (ACEs) and the significance of creating a secure, supportive, and nurturing family environment. Parental support and involvement play a crucial role in assisting children in developing resilience and maintaining a positive sense of self-worth.
- Practitioners such as school counsellors, psychologists, and social workers, should utilise holistic strategies that consider the child's complete context, encompassing family dynamics, school environment, and peer interactions. Interventions should prioritise enhancing support systems and cultivating adaptive coping mechanisms to mitigate the impact of adverse childhood experiences (ACEs).

The study's findings offer vital insights into the intricate connections between adverse childhood experiences (ACEs) and self-esteem. The study emphasises the significance of customised therapies and comprehensive support to improve the psychological well-being of children and adolescents who have experienced unfavourable childhood events. This is achieved by incorporating existing ideas and filling gaps in earlier studies

Conclusion

This study has examined the complex connections between Adverse Childhood Experiences (ACEs) and self-esteem in several aspects (school, peer, and family). It has also investigated how age, gender, and housing arrangements mediate these interactions. The results emphasise the substantial and immediate effect of ACEs on self-esteem, indicating the widespread influence of early negative experiences on a child's perception of themselves. The role of age became apparent as an important mediator, indicating the increasing ability of children to handle difficult situations as they mature. On the other hand, the influence of gender and living circumstances on self-esteem was found to be insignificant, suggesting that these characteristics do not significantly modify the effects of adverse childhood experiences (ACEs) on self-esteem. The study supports established ideas such as attachment theory and the stress model, emphasising the significance of early childhood interactions and the management of chronic stress in comprehending the impacts of ACEs. The practical implications of addressing ACEs include the requirement for interventions tailored to specific age groups, the implementation of trauma-informed care, and the provision of easily accessible mental health support to successfully mitigate the direct effects of ACEs. Moreover, the results indicate that support networks in educational and familial settings are essential for promoting resilience and improving self-esteem in children and adolescents who have experienced adverse childhood experiences (ACEs).

Recommendations

Based on the findings of this study, the following recommendations are suggested:

- Programmes should be customized for various age groups, acknowledging that children's coping skills and need evolve as they mature.

- Utilising services and support that are suitable for a person's stage of development is essential for effectively reducing the negative impact of adverse childhood experiences (ACEs) on one's self-esteem.
- Introducing trauma-informed care in educational institutions and community environments can assist in addressing the immediate consequences of ACEs. This strategy involves educating educators and professionals to identify and address trauma, establishing secure and nurturing environments for impacted children.
- Offering easily accessible mental health services, such as counselling and therapy, can assist children and teenagers in processing their negative experiences and building resilience, ultimately enhancing their self-confidence.

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