

CHILDHOOD MALTREATMENT, PERCEIVED SOCIAL SUPPORT, AND NEUROCOGNITIVE IMPAIRMENT AMONG COLLEGE STUDENTS

Ramla Sehar¹, Memona Amjad^{*2}, Dr. Syed Muhammad Imran Haider Zaidi³

^{1,*2,3}Govt. Municipal Graduate College, Faisalabad

¹ramlasehar32@gmail.com, ²memona_amjad_7@yahoo.com, ³imran_zaidi_1@yahoo.com

Corresponding Author: *

Memona Amjad

DOI: <https://doi.org/10.5281/zenodo.18812832>

Received 28 December 2025	Accepted 13 February 2026	Published 28 February 2026
------------------------------	------------------------------	-------------------------------

ABSTRACT

This correlational study investigated the interrelations between childhood maltreatment, perceived social support, and neurocognitive impairment in young adults in Pakistan. Childhood maltreatment is an important public health issue associated with persistent cognitive impairment. Yet, some empirical evidence for the moderating effect of social support has been discovered in non-Western societies, but in collectivist societies, it is limited. A total of 800 college students (400 males and 400 females), aged 18-25, from Faisalabad, were included in the study, and the Adverse Childhood Experiences Scale (ACE-10), the Multidimensional Scale of Perceived Social Support (MPSS), and the Cognitive Failure Questionnaire (CFQ-25) were employed.

Childhood maltreatment showed significant positive correlation with cognitive failure ($r = .285$, $p < .01$), and significant negative correlation with perceived social support ($r = -.130$, $p < .01$). Likewise, a significant negative correlation also seen between perceived social support and cognitive failure ($r = -.140$, $p < .01$). Regression analysis revealed that childhood maltreatment was a significant predictor of cognitive failures ($\beta = .29$, $p < .001$), explaining 8% of the variance. Moderation analysis indicated that perceived social support moderated the relationship between childhood maltreatment and cognitive impairment ($\beta = -.04$, $p = .027$). The t-test findings indicated that there were no significant differences in cognitive failure between genders and family structure. The ANOVA findings showed that cognitive failures were highest in the lower SES group, whereas the individuals from middle and upper socioeconomic classes reported lower levels of cognitive failures. Similarly, urban residents experienced less cognitive failure than rural residents. This study demonstrated the long-term effects of childhood maltreatment on cognitive function and highlighted the protective role of perceived social support in the Pakistani cultural context. These results illustrate the importance of integrating trauma-informed screening and interventions that strengthen social support in educational and community settings to foster cognitive resilience among at-risk youth.

Keywords: Childhood Maltreatment, Neurocognitive Impairment, Perceived Social Support

INTRODUCTION

The study aims to investigate the effects of childhood trauma on the neurocognitive capabilities of college students who are aged between 18 and 25 years, owing to the fact that

childhood and adolescence are critical developmental stages, and this determines the adulthood of an individual (Mahmood and Fatmi, 2025). Conversely, it also tries to find out whether

there exists a functional protection mechanism as far as social support is concerned in relation to trauma in alleviating its adverse effects on neurocognitive processing (Yang et al., 2024).

A majority of the latest research findings indicated that childhood maltreatment is a category of maltreatment that includes physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect that happens in childhood and adolescence. Exposure to abuse and/or neglect in an individual who has progressed to adolescence has emerged as a risk factor regarding high outcomes and worse functioning and quality of life in adulthood, primarily due to augmented psychopathology, reduced functioning and quality of life, alcohol and drug use and dependence, and high-risk behaviors and victimizations (Tan et al., 2025).

Child maltreatment is defined as abuse and neglect of children, and it has proven to be a major health problem in the population. These negative experiences have always been strongly correlated with a very diverse negative impact on the physical and psychological health conditions of human beings (Li et al., 2024). The effects of various types of negative events in early life, when studied in relation to cognitive functioning, have been explored widely throughout the entire span of development (Lynch and Wisdom, 2022). WHO proposes that epidemiological research indicates the predominance of the maximum maltreatment form of neglect at 78%, and physical abuse at 17%, whilst sexual abuse at 9%, and psychological abuse at 8% Kaplan, Kurtoğlu et al., 2024).

Neurocognitive impairment refers to the disabilities in the areas of fundamental cognition, i.e., attention, memory, executive processing, or processing speed. A greater focus would, however, be on executive processing that entails numerous major processes, such as sustained attention, planning, cognitive flexibility, inhibitory control or response inhibition, information organization, or abstract thinking/concept formation (Maxfield et al., 2023).

Such negative influences are stressful psychosocial elements, which may include abuse, as well as the instability of a dysfunctional family system (Danielsdóttir et al., 2024). Chronic stress has a negative effect on the pathways in the

neuroendocrine system, especially on hypothalamic-pituitary-adrenal functioning, leading to excessive inflammation, decreased cognitive flexibility, and disruptions in the regulation of emotions, accumulation of allostatic load (Jurruena et al., 2021). These brain changes in functioning and physiology can affect the performance of a person in coping with stress and managing emotions (Craig et al., 2023).

Social support refers to physical and psychological support that is accorded to us by family members, friends, workmates, and others. More so, we also belong to a social network of people who love and care about us and think highly of us (Maqbool et al., 2021). The environment is an important factor, and in most cases, social support is brought about by family and friends and teachers. Social support essentially assumes various forms, which are emotional support, joint problem-solving, professional help, and feedback (Wu et al., 2025). Social support influences the mental health of adolescents both in the long-term and short-term effects. The positive social support factor can help minimize the substantial impact of stress on the psychological condition of individuals and, in certain instances, has the direction of enhancing emotional control and self-esteem/self-image. The major transition factor and the threat of an unfavorable mental health state are greatly influenced by the teenage years (Maravilla et al., 2025).

LITERATURE REVIEW

Kim et al. (2024) examined the negative effect of child maltreatment on cognitive functioning, especially executive functions, working memory, and processing speed. Lantrip et al. (2023) tested the relationships between trauma exposure and subjective cognitive issues, specifically, executive functioning complaints, in adults who referred to a neuropsychology clinic with no known neurocognitive disorders. Moreover, the cumulative quality of many of them increases their harmful effect, and it is shown that the consequences are especially dramatic when they are made at critical periods of neurodevelopment when neural plasticity is high (Bhutta et al., 2023). Child maltreatment not only physically harms but also poses a major threat to cognitive functioning

throughout the lifespan. The studies have demonstrated that the traumatic disturbances in the prefrontal cortex influence executive functioning, leading to working memory deficits, attention, and episodic memory deficits. Studies also indicate that maltreated children exhibit slower language and cognitive developmental levels and low levels of intelligence (Ainamani et al., 2021). Numerous studies have shown that an increased degree of social support is correlated with greater life satisfaction, greater intensity of positive affect expression, and lesser psychological distress. In the case of maltreated individuals, supportive social networks are associated with decreased vulnerability to psychiatric problems, increased emotional well-being, and adequate development (Calhoun et al., 2022). In particular, childhood abuse may have potentially devastating impacts throughout the life span on the physical, psychological, and psychosocial development and functioning (Dominguez et al., 2025).

Maltreatment of children is associated with long-term psychological and interpersonal expenses and is a risk factor of various chronic diseases, including inflammatory diseases, neurological diseases, musculoskeletal diseases, metabolic diseases, and cardiovascular diseases (Chicoine et al., 2024). Moreover, the adverse effects of maltreatment can be carried into adulthood. Those who survived child maltreatment face challenges when it comes to relationships, employment, and life overall (Zhang et al., 2025). According to Attachment Theory (Bowlby, 1969), early caregiver relationships have an impact on both emotional and cognitive development; maltreatment harms the normal development of healthy attachment that leads to long-term issues of emotional and neurocognitive dysfunctions (Riggs and Kaminski, 2010). The argument of the Trauma Theory (Herman, 1992) is that chronic childhood trauma and abuse impair the parts of the brain, such as the hippocampus or prefrontal cortex, which influence memory, learning, and executive processing (Teicher and Samson, 2016). According to the Ecological Systems Theory (Bronfenbrenner, 1979), failure in the family, community, and society systems is the cause of maltreatment that cumulatively impairs cognitive

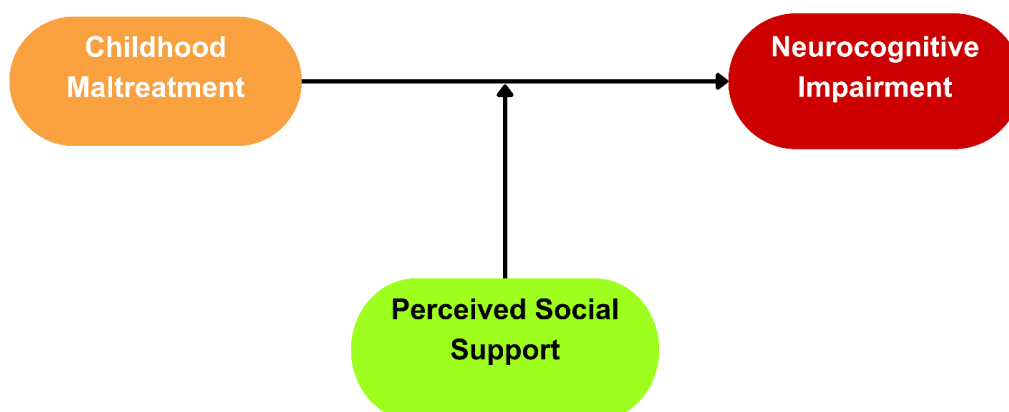
and emotional development in children (Cicchetti and Toth, 2016).

It is the Buffering Hypothesis (Cohen and Wills, 1985), which is based on the notion that social support helps mitigate the adverse influence of stress and provides emotional and physical help, thereby safeguarding maltreated individuals against psychological and cognitive malfunction (Thoits, 2011). According to the Social Capital Theory (Putnam, 2000), resilience is developed through social structures, trust, and reciprocity to enable the maltreated individuals to establish and sustain access to resources and improved cognitive-emotional functioning. According to the Neurodevelopmental Theory (Anderson, 2010), childhood neglect and abuse interfere with the normal development of the brain, particularly the area responsible in the brain that regulates attention, memory, and executive functions, leading to long-term cognitive impairments.

According to the Allostatic Load Model (McEwen & Stellar, 1993), chronic stress causes physiological load on the brain, where cognitive flexibility is derailed, and individuals are susceptible to learning and decision-making challenges. Through the Cognitive Reserve Theory (Stern, 2002), intellectual stimulation and social support are relevant towards enhancing the compensatory capacity of the brain, which is able to develop resilience to the cognitive weaknesses that are linked to early maltreatment (Opdebeeck et al., 2016).

The research study addresses valuable research gaps in the role of childhood maltreatment in neurocognitive functioning in non-clinical South Asian young adults despite the adverse experience and neglect on the brain networks relating to memory and executive functioning (Teicher and Samson, 2016), there is a paucity of research that modulates the role of perceived social support in the association between adverse experiences and neglect and neurocognitive functioning. Through the analysis of these links through the prism of a culturally different setting, the research will advance theoretical knowledge and provide the framework of interventions that would support cognitive resilience and academic achievement.

Conceptual Framework



Note: Model examining the moderator effect of perceived social support on the relationship between childhood maltreatment and neurocognitive Impairment

Objectives of the Study

The current study is designed to evaluate the relationship among childhood maltreatment, social support, and neurocognitive impairment in young adults. The following objectives of this current study are:

1. To find out the effect of childhood maltreatment on neurocognitive impairment
2. To examine the moderating role of social support in the association between childhood maltreatment and neurocognitive impairment
3. To explore demographic differences (e.g., gender, age, socioeconomic status, family structure, residential area, etc.) in the study variables.

Hypotheses:

1. H1: There would be a significant association between childhood maltreatment, social support, and neurocognitive impairment
2. H2: Childhood maltreatment (Emotional, sexual, and physical abuse as well as child neglect) will significantly predict neurocognitive impairment.
3. H3: Social support will significantly moderate the association between childhood maltreatment and neurocognitive impairment
4. H4: There will be significantly mean difference between study variables in terms of demographic variable

MATERIAL AND METHODS

Participants

A convenience sampling technique was used to recruit the participants (800 young adults: 400 males and 400 females) aged between 18 and 25 years, and students of the government colleges in Faisalabad.

Inclusive and Exclusive criteria

The participants had to be aged between 18 and 25 years old, permanent residents of Faisalabad, and had to give informed consent. Because this study was aimed at investigating the outcome of early adverse events, the respondents who self-reported being exposed to childhood maltreatment or other negative aspects in their lives were eligible. The study's elimination criteria included those who were out of the given age bracket, those who had a history of neurodevelopmental or neurological disabilities, and individuals whose psychiatric conditions prevented them from doing the tests. In addition, people who were significantly cognitively or physically impaired and could not have participated in the inclusion were not included.

Research Design

A correlational research design was employed in this study as it was necessary to investigate the nature of associations between childhood

maltreatment, perceived social support, and neurocognitive impairment in young adults. Actually, one can hardly ever speak about the fact that correlational designs would be considered as suitable, in the case of attempting to experimentally investigate naturally occurring relations between variables in which no manipulation or experimental control is necessary (Creswell and Creswell, 2018). The approach taken with this design allowed the current research to elicit the relationships of patterns between constructs of interest, and therefore, specific details of the extent to which negative childhood events and levels of social support can contribute to neurocognitive functioning in young adults in a school environment.

Sampling Technique

A convenience sampling technique was used to collect the sample. The respondents were 800 enrolled college students. The primary consideration as to why this approach was employed is that it is possible to approach the participants in an easy manner. In not every research, convenience sampling helps in the research since it is not random. It is, however, an effective measure of collecting information among the targeted group.

Measurement Scales:

The various tools utilized and tested in this study. The demographic data of the participants, such as age, sex, and family setup, number of siblings, socioeconomic status, living pattern, and geographical location, were taken through a structured demographic questionnaire. The measurement of childhood maltreatment was done through the use of the Adverse Childhood Experiences Scale (ACE-10; Felitti et al., 1998) which is a 10-item scale designed to measure experiences of childhood abuse, both emotional and physical, sexual abuse, neglect and household dysfunction, the higher the scale scores, the more the exposure one has had to maltreatment and the scale entails high reliability and validity in assessing maltreatment in a diverse population, including South Asian populations. The Multidimensional Scale of Perceived Social Support (MPSS-12; Zimet et al., 1988) was used to

measure perceived social support, assessing its magnitude with 7-polar Likert scale; support of family, friends, and significant others has high internal consistency ($=.85, .91$) and has been cross-culturally validated, including in Pakistan. Neurocognitive functioning was evaluated through the Cognitive Failure Questionnaire (CFQ-25; Broadbent et al., 1982), which is a 25-item self-report tool that rates everyday lapses in memory, attention, perception, and action on a 5-item Likert scale and has shown high reliability ($=.80, .90$) and proven validity in non-Western groups of people.

Procedure

To identify the effects of childhood abuse, social support, and neurocognitive impairment among graduate students, the comparative and correlational research design was adopted in the present study. Convenience sampling was done on 800 participants (400 males and 400 females) aged between 18 and 25 years in the city of Faisalabad in various government colleges. Before data collection, the administration of the shortlisted colleges was consulted regarding the collection. The participants were contacted both in person, in the classroom, and through the Web, with the use of Google Forms. The two-fold character of the data collection assisted in making the survey more reachable through the participation of students, who could not afford the offline chance. In the physical context, the researcher would go personally to institutions issuing questionnaires and provide personal explanations on how the research would be carried out. The purpose, importance, and confidentiality of the research were explained to the students by the researcher, and informed consent was written down. An introductory section of Google Forms, in the online setting, presented research goals and contents, research issues of personal and institutional nature, a consent sheet, and then proceeded to a questionnaire.

Measurement of data was done using standardized, reliable, and valid measurement tools, which comprised the Adverse Childhood Experiences Questionnaire (Felitti et al., 1998), the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), and the Cognitive

Failures Questionnaire (Broadbent et al., 1982). Also, through the demographic questionnaire, there was acquisition of the basic data on the participants was acquired, which consisted of age, sex, family structure, socioeconomic status, the number of siblings, and residential area.

Anonymity and confidentiality of responses provided were ensured to the respondents. The information obtained would be purely research oriented. None of the personal identifying data has been collected to guarantee the data was applicable to formal research ethics. The information that would have been captured in the physical and cyber forms would be summarized to undergo further analysis.

Ethical Considerations

All potential participants were informed of the purpose and the significance of carrying out the research process and written consent was obtained from those willing to take part in the research exercise. This research would only include those students who would be voluntary participants and they would only participate in this research on voluntary terms and would be informed of their free will to pull out of this research at any point in time without any repercussions whatsoever.

In order to maintain the privacy of the participants, anonymity and secrecy were used. No data was gathered using personal identifiers, and the information was stored in a password-secured database and could only be accessed by the researcher.

The consent procedures consisted of physical and electronic procedures depending on the mode that the participants were to use to access the study materials. A lot of attention was given to the fact that the study subject matter dealt with sensitive information that should be handled carefully. Moreover, as the question about childhood exposures might have brought about the feeling of discomfort on the side of the respondent, the assurance was made that any felt distress would be provided the corresponding help or that he/she would be directed to professionals in case of necessity.

The highest ethical standards were to be followed during the research to ensure that the dignity, safety, and well-being of the participants were not

endangered during the study. Concisely, such ethical processes have made the study be conducted in a responsible manner since they not only safeguard the rights of the subjects but also enhance the validity and authenticity of the research results.

Statistical Analysis

In all the statistical tests, the IBM SPSS Statistics version 27 software was applied. The demographic variables (age, gender, socioeconomic status, family structure, geographical location within the residential area and living arrangement) and the three main study variables (childhood maltreatment, perceived social support, neurocognitive impairment) both assessed using the descriptive statistics of central tendency and variance of the continuous variables, or the frequency distribution of the categorical ones, respectively, in the study.

The correlation coefficients of Pearson product-moment were used to identify the strength and the nature of association between the variables as a check to test the initial hypothesis on the association between childhood maltreatment, social support, and neurocognitive impairment.

To test the existence of predictive associations, childhood maltreatment and children's social support perception were used as independent variables to predict neurocognitive impairment. Concerning the moderation hypothesis testing, it was conducted with the assistance of Hayes (2017) PROCESS macro of SPSS. In particular, Model 1 has been used. In all the hypothesis tests, the alpha was taken as $p < .05$.

To find out the mean differences between the variables in relation to the demographic categories, independent sample t-tests were employed with two categories (e.g., male/female, family system, and residential area), and one-way ANOVA was used in the variables that contain more than two categories (e.g., socioeconomic status, the number of brothers and sisters, the level of education, and the state of living).

Results

In this study, 800 (400 male and 400 female) undergraduate students participated. With a mean age of 21.49 years and a standard deviation of

1.80, participants' ages ranged from 18 to 25, suggesting that most respondents were in their early adult years. The measures showed good to excellent reliability: Adverse Childhood Experiences ACEs - 10 ($\alpha = .64$), Cognitive

Failure Questionnaire CFQ - 25 ($\alpha = .92$), and the Multidimensional Perceived Social Support MPSS - 12 ($\alpha = .95$).

Table 1
Descriptive Statistics and Correlations for Study Variables (N = 800)

Variables	N	M	SD	1	2	3
1. ACE	222	1.06	1.45	1	.285**	-.130**
2. CFQ	222	27.94	14.64		1	-.140**
3. MPSS	222	48.51	19.14			1

Note. ACE = Adverse Childhood Experiences; CFQ = Cognitive Failure Questionnaire; MPSS = The Multidimensional Scale of Perceived Social Support. $p < .01$.

Table 1 shows the descriptive statistics and Pearson product-moment correlation coefficients between adverse childhood experiences (ACE), cognitive failures (CFQ), and perceived social support (MPSS). The mean score for ACE was 1.06 (SD = 1.45), which is a low to moderate level of exposure to childhood adversity. The mean score for CFQ was 27.94 (SD = 14.64), which reflects a moderate level of everyday cognitive failures. The mean score for MPSS was 48.51 (SD = 19.14), which reflects a moderate level of perceived social support.

Correlation analyses showed a statistically significant positive correlation between ACE and CFQ ($r = .285$, $p < .01$), suggesting that higher levels of exposure to adverse childhood

experiences were associated with higher levels of cognitive failures in adulthood. Conversely, ACE was found to have a significant negative correlation with perceived social support ($r = -.130$, $p < .01$), suggesting that those who had higher levels of childhood adversity reported lower levels of perceived social support. In addition, perceived social support was found to have a significant inverse correlation with cognitive failure ($r = -.140$, $p < .01$), suggesting that higher levels of perceived social support were associated with lower levels of cognitive failures. Taken together, these results suggest the presence of significant associations among the variables in this study and thus provide empirical support for the conduct of regression and moderation analyses.

Figure No 1:

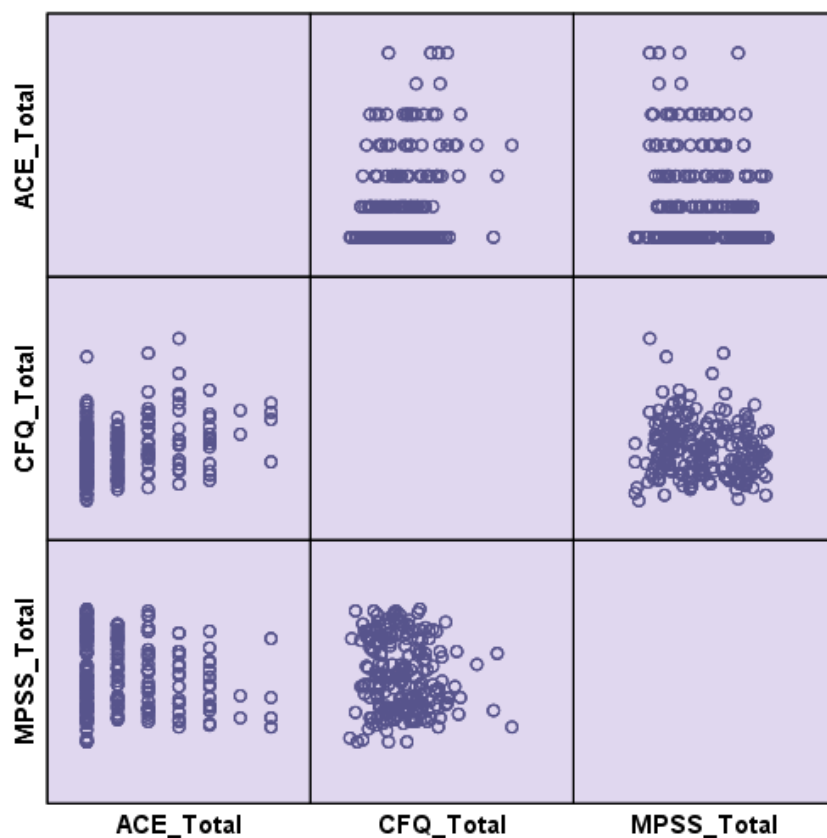


Table 2
Simple Linear Regression of ACE Predicting CFQ (N = 800)

Predictor	B	SE B	B	T	P	R	R ²	Adj. R ²	F(df)
Constant	24.89	0.61		40.56	< .001				
ACE Total	2.87	0.34	.29	8.40	< .001	.29	.08	.08	70.53 (1,798)***

Note. ACE = Adverse Childhood Experiences; CFQ = Cognitive Failures Questionnaire. Results are based on simple linear regression (N=800). $p < .001$

A simple linear regression analysis was performed to determine whether adverse childhood experiences (ACEs) were significant predictors of

cognitive failures (CFQ). The overall regression equation was statistically significant, $F(1, 798) =$

70.53, $p < .001$, suggesting that ACE was a significant predictor of CFQ scores.

Adverse childhood experiences accounted for approximately 8% of the variance in cognitive failures ($R = .29$, $R^2 = .08$, adjusted $R^2 = .08$). The unstandardized regression coefficient also showed that for every unit increase in ACE, CFQ scores were higher by 2.87 units ($B = 2.87$, $SE = 0.34$). The standardized regression coefficient further

confirmed the moderate positive association between ACE and cognitive failures ($\beta = .29$), which was statistically significant ($t = 8.40$, $p < .001$). These results provide evidence that increased levels of adverse childhood experiences are related to increased levels of cognitive failures in later life, confirming the hypothesized association between adverse childhood experiences and cognitive functioning.

Graph No 1:

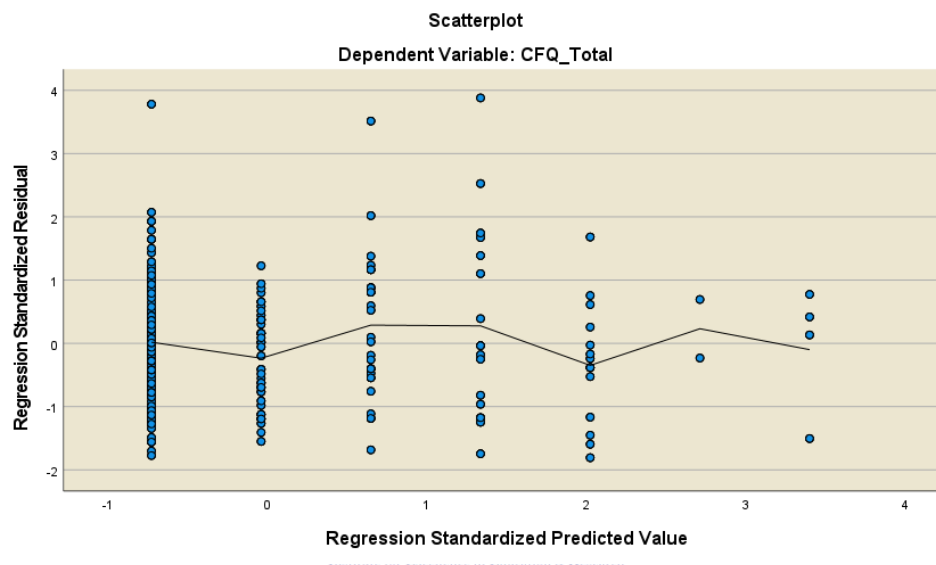


Table 3
Moderation Analysis Predicting CFQ_Total from ACE_Total and MPSS_Total (N = 800)

Predictor	B	SE B	T	P	95% CI LL	95% CI UL
Constant	27.28	1.62	16.84	< .001	24.10	30.46
ACE_Total (X)	4.53	0.88	5.15	< .001	2.80	6.26
MPSS_Total (W)	-0.04	0.03	-1.46	.145	-0.10	0.02

ACE × MPSS -0.04 0.02 -2.22 .027 -0.08 -0.004

Note. ACE = Adverse Childhood Experiences; CFQ = Cognitive Failures Questionnaire; MPSS = Multidimensional Scale of Perceived Social Support. Results are based on moderation analysis. N = 800.

Moderation analysis was used to investigate whether perceived social support (MPSS) moderated the relationship between adverse childhood experiences (ACE) and cognitive failures (CFQ). The overall model showed significant predictive effects, suggesting that the variables together were useful in explaining the variance in CFQ scores.

Adverse childhood experiences were found to be a significant positive predictor of cognitive failures ($B = 4.53$, $SE = 0.88$, $t = 5.15$, $p < .001$, 95% CI [2.80, 6.26]), suggesting that higher levels of adverse childhood experiences were positively related to cognitive failures. The main effect of perceived social support on CFQ was not statistically significant ($B = -0.04$, $SE = 0.03$, $t = -1.46$, $p = .145$, 95% CI [-0.10, 0.02]).

Importantly, the interaction term between ACE and MPSS was statistically significant ($B = -0.04$, $SE = 0.02$, $t = -2.22$, $p = .027$, 95% CI [-0.08,

-0.004]). This suggests that perceived social support was a significant moderator of the relationship between adverse childhood experiences and cognitive failures. The negative interaction coefficient suggests that the positive relationship between ACE and CFQ became weaker as the levels of perceived social support increased.

Overall, these results indicate that while adverse childhood experiences are associated with greater cognitive failures, higher perceived social support buffers this relationship by reducing the strength of the association between childhood adversity and cognitive dysfunction.

Graph No 2:

Note: This graph depicts the moderating effect of perceived social support on the relationship between childhood maltreatment and neurocognitive impairment.

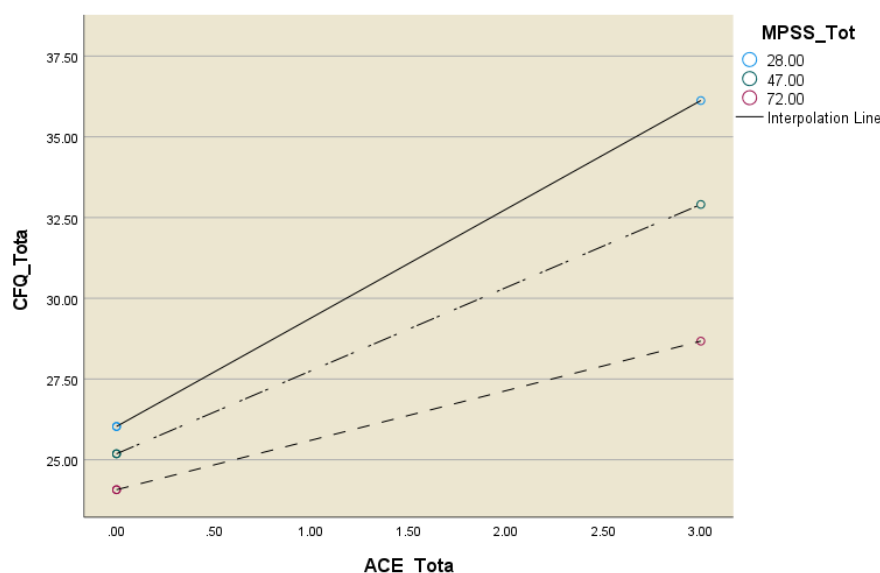


Table 4
Independent Samples t-Test for Gender Differences on CFQ (N = 800)

V	(M=400)		(F=400)		t	Df	p	Mean Difference	95% CI of Difference
	M	SD	M	SD					
CFQ_TOTAL	27.97	14.15	27.87	15.13	-0.09	798	.927	-0.10	[-2.13, 1.94]

Note. CFQ = Cognitive Failures Questionnaire, reported values represent means (M), standard deviations (SD), t-values, degrees of freedom (df), significance levels (p), mean differences, and 95% confidence intervals (CI) for gender comparisons.

An independent samples t-test was conducted to examine gender differences in cognitive failures as measured by the Cognitive Failures Questionnaire (CFQ). The results indicated no statistically significant difference in CFQ scores between male participants (M = 27.97, SD = 14.15) and female participants (M = 27.87, SD = 15.13), $t(798) = -0.09$, $p = .927$.

The mean difference for males and females was negligible (Mean Difference = -0.10), and the 95% confidence interval for the difference was between -2.13 and 1.94 , which further supports the fact that there was substantial overlap between the two groups. These results suggest that cognitive failures did not differ significantly by gender in the current sample.

Table 5
Independent Samples t-test for Family Structure Differences on CFQ (N = 800)

V	Nuclear (n = 582)		Joint (n = 218)		t	df	p	Mean Difference	95% CI of Difference
	M	SD	M	SD					
CFQ_TOTAL	28.52	14.17	26.30	15.76	1.91	798	.056	2.22	[-0.06, 4.50]

Note. CFQ = Cognitive Failures Questionnaire. Reported values represent means (M), standard deviations (SD), t-values, degrees of freedom (df), significance levels (p), mean differences, and 95% confidence intervals (CI) for family structure comparisons.

Independent samples t-test was also used to compare the differences in neurocognitive impairment between people from nuclear and joint family systems. The results revealed that the difference in CFQ scores between people from nuclear family systems (M = 28.52, SD = 14.17) and people from joint family systems (M = 26.30,

SD = 15.76) was not statistically significant, $t(798) = 1.91$, $p = .056$.

Although people from nuclear family systems reported a slightly higher level of cognitive failures than people from joint family systems, the mean difference of 2.22 was small, and the 95% confidence interval (-0.06 to 4.50) included zero,

suggesting a substantial overlap between the two groups. These results suggest that family structure was not a statistically significant predictor of cognitive failures in the current sample, although

the trend approached conventional levels of significance.

Table 6
Independent Samples t-Test for Residential Area Differences on CFQ (N = 800)

V	Urban (n = 588)		Rural (n = 212)		t	df	P	Mean Difference	95% CI of Difference
	M	SD	M	SD					
CFQ_TOTAL	26.71	14.59	31.27	14.27	-3.92	798	< .001	-4.56	[-6.84, -2.28]

Note. CFQ = Cognitive Failures Questionnaire. Reported values represent means (M), standard deviations (SD), t-values, degrees of freedom (df), significance levels (p), mean differences, and 95% confidence intervals (CI) for residential area comparisons. $p < .05$.

To investigate that whether residential areas (rural and urban) were associated with difference, an independent sample t test was performed. The results showed a statistically significant difference between the two groups, $t(798) = -3.92$, $p < .001$. It was found that participants living in rural areas reported a higher level of cognitive failures (M = 31.27, SD = 14.27) compared to those living in urban areas (M = 26.71, SD = 14.59). The mean

difference between the two groups was -4.56, with a 95% confidence interval of -6.84 to -2.28, which indicates that the difference is very unlikely to be due to sampling error. These results suggest that there is a possible relationship between residential area and cognitive differences, with participants in rural areas experiencing a higher level of cognitive failures than those in urban areas.

Table 7
One-Way Analysis of Variance for Cognitive Failures (CFQ) Across Socioeconomic Status (N = 800)

SES	N	CFQ	
		M	SD
Lower	27	34.52	11.19
Middle	732	27.88	14.63
Upper	41	24.19	15.60

Note. CFQ = Cognitive Failures Questionnaire. Values represent sample size (n), means (M), and standard deviations (SD) for each category of socioeconomic status.

One-way analysis of variance (ANOVA) was performed to analyze the differences in cognitive failures (CFQ) among the categories of

socioeconomic status (SES). The descriptive statistics show that the mean score of CFQ is highest for the lower SES group (M = 34.52, SD =

11.19), followed by the middle SES group ($M = 27.88$, $SD = 14.63$), and the lowest mean score is for the upper SES group ($M = 24.19$, $SD = 15.60$). The results show a trend where lower socioeconomic status is linked with higher cognitive failures, and higher socioeconomic status is linked with lower cognitive failures.

DISCUSSION

The study was intended to examine the complex correlation between childhood trauma, perceived social support, and neurocognitive impairment among 800 young adults hired from government colleges, Faisalabad, Pakistan. This study attempted to answer the following questions: 1) to examine the correlation between adverse childhood experiences, cognitive failure, and perceived social support, 2) to determine the predictive validity of early adversity on cognitive functioning, 3) to determine the moderating influence of perceived social support, and 4) to examine how demographic variables influenced the relationships among the study variables. This study contributes to the literature on trauma and cognition, which remains limited but is gradually emerging in South Asia. This region has a different family system, culture, and social support structures compared to Western societies.

Each of the hypotheses is described below, and the findings are related to theoretical frameworks, the existing body of empirical literature, and application.

Hypothesis 1: It was hypothesized that there would be a significant relationship among childhood maltreatment, social support, and neurocognitive impairment.

The findings of the correlation analysis fully supported this hypothesis. The correlations analysis indicated that there would be significant positive relationship between adverse childhood experiences (ACE) and cognitive failures ($r = .285$, $p < .01$) and significant negative relationship between perceived social support (MPSS) and cognitive failures ($r = -.140$, $p < .01$). Moreover, the perceived social support was also negatively correlated with ACE ($r = -.130$, $p < .01$). These findings confirm the hypothesis that childhood adversity correlates with inefficiencies in cognition

in later adulthood, and social support proved as protective factor.

Theoretically, these results can be explained with the help of the allostatic load model (McEwen and Stellar, 1993). It explained that childhood stress also may affect the hypothalamic-pituitary-adrenal (HPA) axis, which may lead to neurobiological changes resulting in changes in cognitive processes such as attention, memory, and executive processing (Jurueña et al., 2021). Conversely, the buffering hypothesis (Cohen & Wills, 1985) suggests that the negative effect of stress can be cushioned by social support through emotional and tangible resources. These findings agreed with both theories, which underline the importance of risk and protection in cognitive results.

Hypothesis 2: Neurocognitive impairment will be significantly predicted by childhood maltreatment.

Simple linear regression revealed that ACE was a strong predictor of the cognitive failures ($B = 2.87$, $8 = .29$, $p < .001$), accounting for approximately 8% of the CFQ scores variance. This demonstrates that early adversity is not merely related to, but it also predicts cognitive failures in young adulthood.

These findings are also in line with trauma theory (Herman, 1992) and neurodevelopmental models (Anderson, 2010) that state the effects of maltreatment on sensitive developmental stages can result in structural and functional alterations in the brain regions that execute functions, memory, and attention (Teicher and Samson, 2016). The changes can be monitored as simple cognitive failures even without the epidemiology of a neurocognitive disorder.

The findings of the current research indicated that cognitive issues that followed childhood traumas were still present in adulthood, even among individuals from a non-clinical and highly engaged population.

Hypothesis 3: Social support will have an important moderating effect on the relationship between childhood maltreatment and neurocognitive impairment.

The moderation analysis of this study showed that there is a significant interaction between ACE MPSS interaction ($B = -.04$, $p = .027$), which implies that perceived social support moderates

the relationship between childhood misery and cognitive failures. To be more exact, the positive relationship between ACE and CFQ was weakened in the presence of higher perceived social support. This result provides empirical evidence for the buffering hypothesis (Cohen and Wills, 1985) and highlights the possibility of support being a resilience factor. It would indicate that under conditions of great early trauma presence, its cognitive effects can be mitigated by strong social networks. This has significant consequences on intervention design, whereby it has been indicated that support systems among youth exposed to trauma need to be strengthened.

Hypothesis 4: Study variables will be significantly different in terms of the demographic variables. This hypothesis was partially confirmed. Cognitive failures showed no good gender difference ($p = 0.927$) but good difference by residential area, with trends in family structure and socioeconomic status.

Family structure: The family structure was not a critical determinant ($p = .056$), but individuals in nuclear families ($M = 28.52$, $SD = 14.17$) had statistically significantly higher CFQ scores than those in joint families ($M = 26.30$, $SD = 15.76$). This could be related to differences in caregiving patterns, social density, and stress exposure across large family systems. Joint families show greater adaptability, better communication, and stronger emotional support. In contrast, nuclear families are more prone to psychological stress and less social interaction, which may contribute to the higher rates of cognitive failures in nuclear family members (Pratima et al., 2025).

Socioeconomic status (SES): The socioeconomic status indicated significant differences in cognitive failures across groups, demonstrating a clear socioeconomic gradient. Individuals from the lower SES group reported the highest levels of cognitive failures ($M = 34.52$, $SD = 11.19$), followed by those in the middle SES group ($M = 27.88$, $SD = 14.63$), whereas the lowest CFQ scores were observed among individuals from the upper SES group ($M = 24.19$, $SD = 15.60$). This pattern suggests that lower socioeconomic status is

associated with greater everyday cognitive issues, while higher socioeconomic status appears to be linked with relatively better cognitive functioning. The literature indicated that as the SES declined, so did the cognitive failure, as reported in the literature that economic hardship is linked to cognitive load and reduced cognitive reserve (Stern, 2002).

Residential area: The rural participants gave much higher CFQ scores compared to the urban participants ($p < .001$). Specifically, individuals residing in rural areas demonstrated greater cognitive failures ($M = 31.27$, $SD = 14.27$) than those living in urban areas ($M = 26.71$, $SD = 14.59$). It can be explained by disparities in access to medical care, nutrition, educational institutions, and psychosocial assistance, which is also known to have an effect on cognitive development (Bhutta et al., 2023).

CONCLUSION

This study discusses the relationship between childhood maltreatment, perceived social support, and neurocognitive impairment in a sample of 800 college-going students in Faisalabad, Pakistan. The correlation analysis revealed that higher levels of adverse childhood experiences were significantly associated with cognitive failures. Furthermore, both traumatic childhood experiences and cognitive failures were significantly associated with lower perceived social support. Findings of the regression analysis showed that traumatic childhood experiences were strong predictors of more self-reported cognitive failures in young adults. It is indicated that early exposure to trauma may lead to cognitive problems in later adulthood. The moderation analysis demonstrated that perceived social support served as a significant protective factor that weakens the relationship between adverse childhood experiences and cognitive functioning.

Additional demographic data showed that there are cognitive abilities that vary based on some contextual features. Students from rural areas belonging to lower socioeconomic status showed more cognitive problems, thus emphasizing the effect of structural and resource-based differences on cognitive outcomes. On the other hand, no

significant differences were found depending on gender and family structure when it comes to cognitive abilities.

To conclude, the present paper highlights the multifactorial and intricate nature of neurocognitive abilities that are moderated by early life experiences, perceived social support, and a few demographic factors in context. The research at hand, therefore, reveals the necessity of interventions that are trauma-sensitive and socially supportive, particularly in young people from socioeconomically disadvantaged and rural background to offset the long-term cognitive consequences of childhood maltreatment in childhood.

LIMITATIONS

There are certain methodological shortcomings to be considered when interpreting the results. Firstly, self-report measures may result in recall bias in assessing childhood experience (particularly retrospectively) and social desirability bias in assessing social support and cognitive problems. The objectivity of the neurocognitive examination may also be influenced by the use of cognitive tests (CFQ) instead of the performance-based neuropsychological tests. Secondly, the researchers did not adjust for potential confounding factors, including genetic disposition, recent manifestations of mental illness, or substance abuse.

RECOMMENDATIONS

The above-mentioned limitations are the areas that future research should focus on to overcome them through the use of longitudinal designs that would track cognitive and psychosocial development of adolescents into adulthood. Moreover, to have a clearer picture of the protective factors of social support, researchers should conduct research on the qualitative nature of social support, such as support satisfaction, conflict in the social network, and emotional support. Increasing the demographics and cultural range of sampling would increase the external validity of results.

IMPLICATIONS

The findings have several theoretical, applied, and sociocultural implications. In theory, they validate the trauma-informed care models, including the allosteric load model and buffering hypothesis, and emphasize the need to develop theories of development by also adding the cultural definition of family and support. They show that at-risk youth could be identified at an early procedural stage of the educational and primary care environment with the help of screening for adverse childhood experiences. Trauma-informed care and cognitive skill-building workshops should be included in the college counseling and student services. Improvements in social support networks, particularly those encompassing family, peers, mentors, etc., can possibly alleviate the cognitive impact of early adversity. More broadly, community-based prevention of child maltreatment and enhancement of community-based support systems that involve rural and low-SES communities could be used to help alleviate the neurocognitive neurotoxicity of child maltreatment over the long term. Family systems-based interventions and encouragement of emotionally responsive parenting practices might prove to be especially effective in collectivist countries like Pakistan.

REFERENCES:

- Ainamani, H. E., Rukundo, G. Z., Nduhukire, T., Ndyareba, E., & Hecker, T. (2021). Child maltreatment, cognitive functions, and the mediating role of mental health problems among maltreated children and adolescents in Uganda. *Child and Adolescent Psychiatry and Mental Health*, 15, 22. <https://doi.org/10.1186/s13034-021-00373-7>
- Anderson, J. R. (2010). *Cognitive Psychology and Its Implications* (7th ed.). Worth Publishers.
- References—Scientific Research Publishing. (n.d.).

- Bhutta, Z. A., Bhavnani, S., Betancourt, T. S., Tomlinson, M., & Patel, V. (2023). Adverse childhood experiences and lifelong health. *Nature Medicine*, 29(7), 1639–1648. <https://doi.org/10.1038/s41591-023-02426-0>
- Calhoun, C. D., Stone, K. J., Cobb, A. R., Patterson, M. W., Danielson, C. K., & Bendežú, J. J. (2022). The Role of Social Support in Coping with Psychological Trauma: An Integrated Biopsychosocial Model for Posttraumatic Stress Recovery. *The Psychiatric Quarterly*, 93(4), 949–970. <https://doi.org/10.1007/s11126-022-10003-w>
- Chicoine, A. X., Chertkow, H., Tardif, J.-C., Busseuil, D., & D'Antono, B. (2024). Childhood maltreatment, cognitive performance, and cognitive decline in middle-aged and older adults with chronic disease: A prospective study. *Journal of Psychosomatic Research*, 187, 111965. <https://doi.org/10.1016/j.jpsychores.2024.111965>
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310–357.
- Creswell, J.W. and Creswell, J.D. (2018). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*. Sage, Los Angeles. - References—Scientific Research Publishing. (n.d.). Retrieved January 21, 2026
- Danielsdóttir, H. B., Aspelund, T., Shen, Q., Halldorsdóttir, T., Jakobsdóttir, J., Song, H., Lu, D., Kuja-Halkola, R., Larsson, H., Fall, K., Magnusson, P. K. E., Fang, F., Bergstedt, J., & Valdimarsdóttir, U. A. (2024). Adverse Childhood Experiences and Adult Mental Health Outcomes. *JAMA Psychiatry*, 81(6), 586–594. <https://doi.org/10.1001/jamapsychiatry.2024.0039>
- Dominguez, D., Pérez-Testor, C., Benedico-Peydró, P., Casarramona, A., & Aznar-Martínez, B. (2025). Assessing Child Maltreatment and Its Relationships With Personality, Resilience and Attachment in Adulthood. *Children & Society*, 39(4), 845–853. <https://doi.org/10.1111/chso.12954>
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258.
- Juruena, M. F., Bourne, M., Young, A. H., & Cleare, A. J. (2021). Hypothalamic-Pituitary-Adrenal axis dysfunction by early life stress. *Neuroscience Letters*, 759, 136037. <https://doi.org/10.1016/j.neulet.2021.136037>
- Herman, J. L. (1992). *Trauma and Recovery*. New York Basic Books. - References—Scientific Research Publishing. (n.d.). Retrieved January 21, 2026, from <https://www.scirp.org/reference/referencespapers?referenceid=2146543>
- Kurtoğlu, M., Yücel, D., Coşkun, E., & Katar, K. (2024). The relationship between adverse childhood experiences and social anxiety disorder symptoms: The mediating role of rumination. *Current Psychology*, 43, 1–8. <https://doi.org/10.1007/s12144-024-06021-5>
- Kim, M. S., Kim, K., Nam, J., Lee, S. J., & Lee, S. W. (2024). Impact of Childhood Maltreatment on Cognitive Function and Its Relationship With Emotion Regulation in Young Adults. *Journal of the Korean Academy of Child and Adolescent Psychiatry*, 35(3), 155–162. <https://doi.org/10.5765/jkacap.240001>

- McEwen, B. S., & Stellar, E. (1993). Stress and the individual. Mechanisms leading to disease. *Archives of Internal Medicine*, 153(18), 2093–2101.
- Li, M., Yuan, Y., Cheng, X., Wang, Y., & Xu, Z. (2024). Childhood maltreatment and insomnia in college students: The role of alexithymia and psychological distress. *Acta Psychologica*, 243, 104149. <https://doi.org/10.1016/j.actpsy.2024.104149>
- Lantrip, C., Szabo, Y. Z., Pazienza, S., & Bengel, J. (2023). Associations of childhood trauma and executive functioning in everyday life of those with subjective cognitive complaints. *Applied Neuropsychology: Adult*, 30(1), 101–109. <https://doi.org/10.1080/23279095.2021.1913738>
- Maqbool, H., Mahmood, K., Muhammad, S., Zaidi, S. M., Ajid, A., Javaid, Z., & Mazhar, R. (2021). *The Predictive Role of Social Support in Social Adjustment and Academic Achievement among University Students*.
- Maravilla, J. C., Fine, S. L., Ramaiya, A., Li, M., Wado, Y. D., Wahdi, A. E., Odunga, S. A., Nguyen, V. D., Whiteford, H. A., Lawrence, D., Scott, J. G., & Erskine, H. E. (2025). Social support and mental health among adolescents in Kenya, Indonesia, and Vietnam: A latent class analysis using the National Adolescent Mental Health Surveys. *Child and Adolescent Psychiatry and Mental Health*, 19(Suppl 1), 85. <https://doi.org/10.1186/s13034-025-00923-3>
- Maxfield, M., McVilly, K., Devine, A., & Jordan, H. (2023). Cognitive and Psychological Impacts of Congenital Corpus Callosum Disorders in Adults: A Scoping Review. *Advances in Neurodevelopmental Disorders*, 7(2), 165–188. <https://doi.org/10.1007/s41252-023-00323-8>
- Mahmood, S., & Fatmi, Z. (2025). Prevalence of Adverse Childhood Experiences (ACEs) and its association with current mental wellbeing among young adults in Pakistan. *Child Abuse & Neglect*, 163, 107318. <https://doi.org/10.1016/j.chiabu.2025.107318>
- Pratima, K. M., Audichya, S., & Tiwari, A. (2025). *Understanding the role of joint and nuclear families in shaping psycho-social health among urban middle-class after the pandemic*. *International Journal of Advanced Biochemistry Research*, 9(6), 828–832. <https://doi.org/10.33545/26174693.2025.v9.i6j.4620>
- Riggs, S. A., & Kaminski, P. (2010). Childhood Emotional Abuse, Adult Attachment, and Depression as Predictors of Relational Adjustment and Psychological Aggression. *Journal of Aggression, Maltreatment & Trauma*. <https://doi.org/10.1080/10926770903475976>
- Stern, Y. (2002). What is cognitive reserve? Theory and research application of the reserve concept. *Journal of the International Neuropsychological Society: JINS*, 8(3), 448–460.
- Toth, S. L., & Cicchetti, D. (2013). A Developmental Psychopathology Perspective on Child Maltreatment. *Child Maltreatment*, 18(3), 135–139. <https://doi.org/10.1177/1077559513500380>
- Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews. Neuroscience*, 17(10), 652–666. <https://doi.org/10.1038/nrn.2016.111>

- Tan, H., Zhao, D., Cao, J., Huang, T., Yi, J., Wan, Z., & Zhang, F. (2025). The effect of childhood maltreatment on non-suicidal self-injury in adolescents with bipolar disorder: The mediating role of dysfunctional attitudes and the moderating role of social support. *Frontiers in Psychiatry*, 16, 1698424. <https://doi.org/10.3389/fpsyt.2025.1698424>
- Wu, L., Chen, Y., Xue, M., Zhu, W., & Wang, W. (2025). The effect of social support on learning engagement among Chinese nursing interns: The mediating role of self-efficacy. *BMC Nursing*, 24(1), 955. <https://doi.org/10.1186/s12912-025-03615-7>
- Yang, J., Alshaikh, E., Asa, N., VonDeylen, O., Desai, N., Taylor, H. G., Pommering, T., MacDonald, J. P., Cohen, D. M., Yeates, K. O., & ReAct Clinical Study Group. (2024). Exploring the association between cognitive activity and symptom resolution following concussion in adolescents aged 11-17 years. *British Journal of Sports Medicine*, 58(6), 328-333. <https://doi.org/10.1136/bjsports-2023-107601>
- Zhang, H., Wang, Z., Tang, X., & Wang, W. (2025). The association between child maltreatment and academic achievement: A systematic review and meta-analysis. *Child Abuse & Neglect*, 159, 107159. <https://doi.org/10.1016/j.chiabu.2024.107159>
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 52(1), 30-41.