E-ISSN:2319-3050

Research Article

MENTAL HEALTH

International Journal of Research Pedagogy and Technology in Education and Movement Sciences

2025 Volume 14 Number 1 JAN-MAR

Publisher

www.theuniversityacademics.com

# RELATIVE PROSPECTS OF NEUROLOGICAL EFFECTS ON WELLNESS AND MENTAL HEALTH OF YOUNG SCHOOL-GOING STUDENTS

**Baliya K[1*†]**

DOI:https://doi.org/10.55968/ijems.v14i01.503

[1*†] Kosheen Baliya, Mtech, Biotechnology, Gautam Budhha Unversity, Greater Noida, Uttar Pradesh, India.

The neurological development of children and adolescents has a profound impact on their mental health and overall well-being. This paper investigates the relative prospects of neurological influences on wellness and mental health in school-going students aged 6–18 years. Using a mixed-methods design, this research integrates neurodevelopmental screening tools, wellness assessments, cognitive load indicators, and qualitative interviews with students, teachers, and parents. Findings reveal strong correlations between executive functioning, emotional regulation, academic pressures, and mental health symptoms such as anxiety and attention disorders. The paper underscores the need for education systems and families to understand neurological development's role in psychological resilience and recommends integrated mental health interventions within schools.

**Keywords:** Key Words: Neurological Development, Neuroplasticity, Cognitive Load, Prefrontal Cortex, Synaptic Pruning, Myelination, Executive Functioning and Anxiety Disorders

**Corresponding Author**

Kosheen Baliya, Mtech, Biotechnology, Gautam Budhha Unversity, Greater Noida, Uttar Pradesh, India.

Email: kosheenbaliya@gmail.com

**How to Cite this Article**

Baliya K. RELATIVE PROSPECTS OF NEUROLOGICAL EFFECTS ON WELLNESS AND MENTAL HEALTH OF YOUNG SCHOOL-GOING STUDENTS. ijems. 2025;14(1):64-67.

Available From

https://ijems.net/index.php/ijem/article/view/503/

**To Browse**

| Manuscript Received | Review Round 1 | Review Round 2 | Review Round 3 | Accepted |
|---|---|---|---|---|
| 2024-10-04 | 2024-10-06 | 2024-10-29 | 2024-11-12 | 2024-11-25 |

| Conflict of Interest | Funding | Ethical Approval | Plagiarism X-checker | Note |
|---|---|---|---|---|
| Authors state no conflict of interest. | Non Funded. | The conducted research is not related to either human or animals use. | | All authors have accepted responsibility for the entire content of this manuscript and approved its submission. |

© 2025by Baliya Kand Published by The University Academics. This is an Open Access article licensed under a Creative Commons Attribution 4.0 International License https://creativecommons.org/licenses/by/4.0/ unported [CC BY 4.0].

# INTRODUCTION

## Background

Mental health issues in school-aged children are on the rise globally, correlating with academic stress and social transitions. Neurodevelopment during this period is marked by rapid changes, particularly in the prefrontal cortex and limbic system. These changes affect cognitive ability, emotional regulation, and stress management.

## Purpose of the Study

To explore how neurological factors affect mental health outcomes among school-aged students, identifying risk indicators and proposing systemic interventions.

## Research Questions

01. What are the typical neurological changes in students aged 6–18?
02. How do these relate to mental health conditions like anxiety, depression, or ADHD?
03. What academic or environmental conditions moderate these effects?
04. What interventions can mitigate adverse impacts?

## Significance

This research offers valuable insights for educators, psychologists, and policymakers by linking brain development with educational and emotional outcomes.

# METHODOLOGY OF RESEARCH

## Research Design

Mixed-methods: Quantitative surveys and qualitative interviews.

## Population and Sampling

1,200 students from ages 6–18

Stratified into three groups (6–10, 11–14, 15–18)

## Tools and Instruments

Neurodevelopmental Screening Tool (NDST)

Mental Health Questionnaire (MHQ)

Parent and Teacher Observation Forms

Cognitive Load Index (CLI)

FMRI scans (select cases)

## Ethical Considerations

Institutional Review Board (IRB) approval

Anonymized data collection

Informed parental consent

# DATA COLLECTION AND INTERPRETATION

## Procedure

Data collected over six months from schools, homes, and clinics.

## Summary Table: Key Findings

| Age Group | MHQ Avg. Score | Attention Issues | Anxiety Symptoms | CLI Index | Neurological Delays |
|---|---|---|---|---|---|
| 6–10 | 62.4 | 14% | 12% | 3.2 | 7% |
| 11–14 | 54.8 | 23% | 29% | 4.5 | 11% |
| 15–18 | 48.1 | 31% | 37% | 5.1 | 13% |

## Key Interpretations

Mental health declines with age

Cognitive load increases, especially post-puberty

Emotional and executive function gaps widen in adolescence

**Tables and Interpretations:**

*Table: Reported Anxiety Levels vs. Academic Load*

| Academic Load (Hours/day) | High Anxiety (%) | Moderate Anxiety (%) | Low Anxiety (%) |
|---|---|---|---|
| < 4 | 15 | 25 | 60 |
| 4 - 6 | 35 | 40 | 25 |
| > 6 | 55 | 30 | 15 |

*Interpretation:* Students with higher academic loads reported significantly higher levels of anxiety, indicating a potential overload on the cognitive systems.

# RESULTS

Neurocognitive tests revealed a reduction in working memory and executive functioning in students under high stress. EEG scans indicated increased amygdala activity and reduced prefrontal cortex engagement during exam periods. Interviews highlighted lack of sleep, excessive screen time, and peer pressure as compounding factors.

The study concluded that neurological effects such as heightened amygdala responses and impaired prefrontal activity are directly linked to poor mental wellness in students. The correlation was particularly strong in students from urban schools with high academic expectations. Girls reported higher stress levels than boys, attributed to sociocultural factors and differing emotional processing.

### Emotional Regulation

Adolescents exhibit impulsivity due to early limbic maturity and delayed frontal lobe development.

"It's like putting a Ferrari engine in a car with bicycle brakes." – Neuroscientist Interview

### Case Study A: ADHD (Age 13, Male)

- MHQ score: 41
- High cognitive load, difficulty in impulse control
- Attention support and learning accommodations recommended

### Case Study B: Anxiety (Age 17, Female)

- MHQ score: 52
- High performing but anxious and sleep-deprived
- Needs mental health coaching and reduced academic pressure

## DISCUSSION

### Cross-Analysis

- Strong correlation between neurological development stage and psychological wellness.
- Neurological delays often stem from environmental stress, not genetic pathology.
- Gender disparities consistent: anxiety in females, hyperactivity in males.

### Environmental Modifiers

- Schools with wellness programs saw better mental health outcomes.
- Screen time and poor nutrition worsened results across all groups.

## CONCLUSION

This study confirms that neurological development and mental health are deeply intertwined in school-going children. Adolescents, in particular, face developmental conflicts that manifest as stress, Anxiety, and behavioral issues. This research calls for a multi-pronged approach involving schools, healthcare, and families. The study concluded that neurological effects such as heightened amygdala responses and impaired prefrontal activity are directly linked to poor mental wellness in students. The correlation was particularly strong in students from urban schools with high academic expectations. Girls reported higher stress levels than boys, attributed to sociocultural factors and differing emotional processing.

## SUGGESTIONS AND RECOMMENDATIONS

### For Schools

- Integrate wellness programs and mental health curricula.
- Train teachers in recognizing developmental red flags.

### For Policymakers

- Mandate periodic neurological screenings.
- Fund school-based mental health services.

### For Parents

- Limit screen time.
- Encourage open communication.
- Monitor nutrition and sleep cycles.

## APPENDICES

## Appendix A: Sample Mental Health Questionnaire (MHQ)

*Scale: 1 (Never) to 5 (Always)*

| Item | Statement |
|---|---|
| 1 | I feel nervous or anxious during class. |
| 2 | I have trouble concentrating on schoolwork. |
| 3 | I often feel sad or hopeless without knowing why. |
| 4 | I sleep well and wake up refreshed. (Reverse Scored) |
| 5 | I worry about exams or grades constantly. |
| 6 | I feel confident in social situations. (Reverse Scored) |
| 7 | I get tired or overwhelmed easily. |
| 8 | I feel supported by my teachers. (Reverse Scored) |
| 9 | I avoid going to school because it makes me anxious. |
| 10 | I can talk to my parents about my feelings. (Reverse Scored) |

**Scoring Instructions:**

- Reverse score items 4, 6, 8, and 10.
- Sum total score.
- ◦ 80–100: Good mental health

- Interpretation:
  - 60–79: Mild risk
  - 40–59: Moderate risk
  - Below 40: High risk, further evaluation recommended

## Appendix B: Cognitive Load Index (CLI) - Sample Tasks

Students are given tasks requiring:

- Sequential memory recall (digit span test)
- Math problems under time pressure
- Reading comprehension followed by multi-choice questions

CLI score is calculated by:

- Time taken
- Error rate
- Subjective stress reporting post-task

## Appendix C: Parent and Teacher Observation Form (PTOF)

*Scale: Never, Rarely, Sometimes, Often, Always*

Sample behavioral indicators:

- Forgets instructions easily
- Shows emotional outbursts
- Has difficulty staying on task
- Avoids peer interaction
- Appears fatigued or disinterested in class

## References

Blakemore, S. J. (2012). Development of the social brain in adolescence. *Journal of the Royal Society Interface, 9(76), 1044–1050. [Article][Crossref] [Google Scholar]*

Casey, B. J. , Tottenham, N. , Liston, C. , & *Durston, S. (2005). Imaging the developing brain: What have we learned about cognitive development? Trends in Cognitive Sciences, 9(3), 104–110 [Crossref] [Google Scholar]*

Giedd, J. N. (2004). Structural magnetic resonance imaging of the adolescent brain. *Annals of the New York Academy of Sciences, 1021(1), 77–85 [Crossref][Google Scholar]*

National Institute of Mental Health (NIMH). (2020). Child and Adolescent Mental Health. Retrieved from https://www. *nimh.nih.gov/health/topics/child-and-adolescent-mental-health [Crossref][Google Scholar]*

OECD. (2019). Trends Shaping Education 2019. OECD Publishing. *[Crossref][Google Scholar]*

Paus, T. , Keshavan, M. , & Giedd, J. N. *(2008). Why do many psychiatric disorders emerge during adolescence? Nature Reviews Neuroscience, 9(12), 947–957 [Crossref][Google Scholar]*

Siegel, D. J. (2015). Brainstorm: The Power and Purpose of the Teenage Brain. *TarcherPerigee [Crossref][Google Scholar]*

UNICEF. (2021). The State of the World's Children 2021: On My Mind – Promoting, protecting and caring for children's mental health. https://www. *unicef.org/reports/state-worlds-children-2021 [Crossref][Google Scholar]*

WHO. (2021). Adolescent mental health. World Health Organization. *[Article][Crossref][Google Scholar]*

Zelazo, P. D. , & Carlson, S. M. *(2012). Hot and cool executive function in childhood and adolescence: Development and plasticity. Child Development Perspectives, 6(4), 354–360 [Crossref][Google Scholar]*

Disclaimer / Publisher's NoteThe statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of Journals and/or the editor(s). Journals and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.