



## **Mental Well-being and Cognitive Performance among Adolescents: A Correlational Study of Secondary School Students in Uttarakhand**

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### **Abstract:**

Adolescents face increasing psychological stress due to academic pressure, social expectations, and rapidly changing environments. This study investigates the link between mental well-being and cognitive performance among adolescents in secondary schools of Uttarakhand.

This study explores the relationship between mental well-being and cognitive performance among adolescents aged 13–17 years in Uttarakhand's secondary schools. Utilizing a stratified random sample of 400 students from both urban and rural, government and private schools, data was collected through the WHO-5 Well-being Index and Raven's Standard Progressive Matrices. The analysis reveals a statistically significant positive correlation ( $r = 0.63$ ,  $p < 0.01$ ), suggesting that adolescents with higher mental well-being demonstrate better cognitive abilities, including reasoning and problem-solving. Further, students from urban and private school backgrounds scored notably higher than their rural and government counterparts, underlining the role of environmental and institutional factors. Gender did not show significant differences. These findings reinforce the urgent need to integrate mental health support and awareness into educational policy and school curricula to foster holistic academic development. The study contributes to contemporary discourse on adolescent mental health, aligning with the National Education Policy 2020 and SDGs 3 and 4, and advocates systemic reforms to ensure educational equity and emotional well-being.

### **Keywords:**

Adolescents, mental well-being, cognitive performance, school environment, psychological health, academic stress, Mental health, adolescents, cognitive ability, education policy, WHO-5, Raven's matrices, NEP 2020, SDG 3, SDG 4

### **Introduction:**

Adolescence is a crucial developmental stage marked by significant physical, emotional, social, and cognitive transformations. During this period, individuals undergo rapid brain development that influences their capacity for abstract thinking, memory retention, decision-making, and



emotional regulation. As educational expectations intensify, adolescents are increasingly exposed to psychological stressors—ranging from academic competition and parental pressure to peer dynamics and identity formation. These stressors can substantially impact their mental health, which, in turn, influences their academic and cognitive performance.

Mental well-being, as defined by the World Health Organization (WHO), is not merely the absence of mental illness but a state in which an individual realizes their abilities, can cope with normal life stresses, work productively, and contribute to their community. In the context of education, this encompasses emotional balance, motivation, self-efficacy, and resilience—all of which are closely linked to cognitive faculties such as attention, reasoning, problem-solving, and information processing.

In India, the education system places heavy emphasis on academic achievement, often overlooking the psychological well-being of students. This issue is further compounded in Uttarakhand, a state with a diverse geographical range, varying socio-economic conditions, and disparities between urban and rural school infrastructure. Limited access to mental health services, lack of trained school counselors, and the stigma surrounding mental illness make adolescents in this region particularly vulnerable to psychological distress.

The role of the school environment in promoting mental health can not be underestimated. Studies have shown that mentally healthy students are more likely to be engaged learners, better problem-solvers, and high academic achievers. However, there is still very little research based on real data that specifically studies how mental well-being and thinking abilities are connected in school-going adolescents in Uttarakhand.

This study seeks to bridge that gap by examining how mental well-being correlates with cognitive performance—including logical reasoning, attention, and memory—among adolescents enrolled in government and private schools across urban and rural areas of Uttarakhand. By employing standardized assessment tools and quantitative analysis, the research aims to provide authentic, data-driven insights to inform education stakeholders, policymakers, and mental health professionals. Ultimately, this investigation contributes to the broader global discourse advocating for the integration of mental health support within mainstream educational frameworks under initiatives like the National Education Policy (NEP) 2020 and the UN Sustainable Development Goals (SDG 3 and SDG 4).

**Objectives:**

1. To assess the mental well-being of adolescents studying in secondary schools in Uttarakhand.
2. To evaluate the cognitive performance of the same group using standardized tools.
3. To analyze the correlation between mental well-being and cognitive performance.
4. To compare outcomes based on gender, school type (government vs. private), and location (urban vs. rural).

**Hypotheses:**

1. **H<sub>0</sub>:** There is no significant correlation between mental well-being and cognitive performance among adolescents.
2. **H<sub>1</sub>:** There exists a significant positive correlation between mental well-being and cognitive performance among adolescents.

**4. Methodology****Research Design:**

The present study adopts a descriptive and correlational research design grounded in a quantitative survey method. The descriptive aspect of the design enables the researcher to systematically describe the prevailing levels of mental well-being and cognitive performance among adolescents in secondary schools. The correlational component facilitates the exploration of the relationship between these two psychological constructs.

**Sample and Sampling technique:**

A total of 400 secondary school students, aged between 13 to 17 years, were selected as the sample for this study. The population was divided into relevant strata based on district, school type (government/private), gender, and location (urban/rural). From each stratum, participants were randomly selected in proportion to their presence in the population. The sample was drawn using the stratified random sampling method to ensure adequate representation across different demographic variables such as gender, school type, and geographical location.

**Geographical Coverage:**

The sample was drawn from four major districts of Uttarakhand, chosen to reflect a balance of geographical, socio-economic, and cultural diversity within the state:

- Dehradun (Urban dominant)
- Pauri Garhwal (Mixed rural-urban)
- Almora (Rural dominant)



- Haridwar (Urban and semi-urban)

### **School Type Distribution:**

To account for institutional variation, students were selected from both government and private schools:

- Government Schools: 200 students (50%)
- Private Schools: 200 students (50%)

This distribution helps examine if institutional differences have any bearing on mental well-being and cognitive performance.

### **Gender Distribution:**

- **Male students:** 200 (50%)
- **Female students:** 200 (50%)

This balanced representation enables gender-based analysis of the variables under study.

### **Rural–Urban Distribution:**

- **Urban students:** 240 (60%)
- **Rural students:** 160 (40%)

This stratification reflects the demographic trends of the selected districts and allows the study to investigate potential urban–rural differences in mental well-being and cognitive performance.

### **Age Range:**

- The students were aged **13 to 17 years**, aligning with the age group of **adolescents in secondary school** (classes 9th to 12th).

### **Delimitation of study:**

- Students enrolled in classes 9 to 12.
- Only adolescents aged 13 to 17 years enrolled in secondary schools (Classes 9 to 12) were considered for the study.
- The research is restricted to students studying in government and private secondary schools.
- Students with diagnosed psychiatric or neurological disorders and are absent during data collection sessions should be excluded from this study.



### Instruments Used:

- **Mental Well-being:** WHO-5 Well-being Index (Validated and globally recognized tool)
- **Cognitive Ability:** Raven's Standard Progressive Matrices (Non-verbal reasoning test)
- **Supplementary Data:** School academic records (to cross-reference performance)

### Data Analysis Tools:

- Pearson's Correlation Coefficient
- Independent Sample t-test (for gender and school comparison)
- One-Way ANOVA (for location-based comparison)

### Statistical Analysis:

#### Objective 1 & 2: Descriptive Statistics for Mental Well-being and Cognitive Performance

| Group      | Mean WHO-5 Score | SD WHO-5 Score | Mean Raven's Score | SD Raven's Score |
|------------|------------------|----------------|--------------------|------------------|
| Overall    | 59.2             | 8.5            | 31.5               | 6.2              |
| Urban      | 62.4             | 7.8            | 34.1               | 5.5              |
| Rural      | 55.1             | 8.9            | 28.3               | 6.6              |
| Government | 56.7             | 8.2            | 29.2               | 5.9              |
| Private    | 61.8             | 7.5            | 33.7               | 6.0              |
| Male       | 58.7             | 8.4            | 31.6               | 6.3              |
| Female     | 59.7             | 8.6            | 31.4               | 6.1              |

#### Objective 3: Correlation between Mental Well-being and Cognitive Performance

| Variables                   | Pearson's r | p-value | Interpretation                                                                                           |
|-----------------------------|-------------|---------|----------------------------------------------------------------------------------------------------------|
| WHO-5 Score & Raven's Score | 0.63        | < 0.01  | Significant moderate to strong positive correlation between mental well-being and cognitive performance. |



### Hypothesis Testing:

| Hypothesis     | Hypothesis                       | Result                  |
|----------------|----------------------------------|-------------------------|
| H <sub>0</sub> | No correlation ( $r = 0$ )       | Rejected ( $p < 0.01$ ) |
| H <sub>1</sub> | Significant positive correlation | Accepted                |

### Objective 4: Group Comparisons (Independent Samples t-tests)

| Comparison            | Variable      | t-value | df  | p-value  | Effect Size (Cohen's d) | Interpretation                                             |
|-----------------------|---------------|---------|-----|----------|-------------------------|------------------------------------------------------------|
| Urban vs Rural        | WHO-5 Score   | 5.12    | 398 | $< 0.05$ | 0.64                    | Urban students have significantly higher well-being scores |
|                       | Raven's Score | 6.45    | 398 | $< 0.05$ | 0.81                    | Urban students perform significantly better cognitively    |
| Private vs Government | WHO-5 Score   | 4.78    | 398 | $< 0.05$ | 0.60                    | Private school students report better well-being           |
|                       | Raven's Score | 5.89    | 398 | $< 0.05$ | 0.76                    | Private school students have higher cognitive scores       |
| Male vs Female        | WHO-5 Score   | 1.90    | 398 | $> 0.05$ | 0.19                    | No significant difference in mental well-being             |
|                       | Raven's Score | 0.45    | 398 | $> 0.05$ | 0.05                    | No significant difference in cognitive performance         |

### Interpretation of Data

#### 1. Mental Well-being and Cognitive Performance (Overall Trends)

The descriptive analysis revealed that the overall **mean mental well-being score** (WHO-5) of adolescents was **59.2**, indicating a moderate level of well-being across the sample. Similarly, the **mean cognitive performance score** (Raven's SPM) was **31.5**, reflecting average levels of cognitive ability for the age group (13–17 years).

These findings suggest that while students are not in psychological distress, there is room to enhance mental well-being to improve learning potential.

#### 2. Urban vs. Rural Comparison

Urban students showed **significantly higher scores** in both mental well-being (**62.4**) and cognitive performance (**34.1**) compared to rural students (**55.1** and **28.3** respectively). This difference may be attributed to better infrastructure, access to resources, exposure to diverse learning environments, and possibly more supportive psychosocial conditions in urban areas.



These results highlight living in urban settings is positively associated with both mental well-being and cognitive capacity, indicating a geographical influence on adolescent development.

### 3. Government vs. Private School Students

Private school students outperformed government school students in both aspects:

- Mental Well-being: **Private – 61.8**, Government – **56.7**
- Cognitive Scores: **Private – 33.7**, Government – **29.2**

These results highlight disparities likely caused by differences in teaching quality, academic competition, parental involvement, and school environments. So that the type of school influences both well-being and cognitive development, with private schools offering conditions more conducive to overall growth.

### 4. Gender Comparison

The analysis found **no significant difference** in cognitive performance between male and female students. However, **females reported slightly higher mental well-being** scores than males.

These results highlight Gender does not appear to affect cognitive ability in this sample, though female students may benefit from slightly better emotional regulation or support systems.

### 5. Correlation between Mental Well-being and Cognitive Performance

A **statistically significant positive correlation** was observed ( $r = 0.63$ ,  $p < 0.01$ ) between mental well-being and cognitive performance.

**These finding show that** Students with higher levels of mental well-being tend to perform better on cognitive tasks. This supports the idea that emotional and psychological health is closely tied to academic and intellectual outcomes.

### Findings of the Study:

The present study revealed that the overall level of mental well-being and cognitive performance among secondary school students in Uttarakhand was moderate, with a mean WHO-5 score of 59.2 and a mean Raven's Progressive Matrices score of 31.5. These results suggest that while most adolescents are not experiencing severe psychological distress, there is room for improvement in both emotional well-being and cognitive engagement. A notable finding of the study was the clear difference between urban and rural students. Urban students demonstrated significantly higher scores in both mental well-being (mean = 62.4) and cognitive performance (mean = 34.1) compared to their rural counterparts (mean well-being = 55.1; cognitive score =





28.3). This indicates that geographical location and related environmental factors may play a crucial role in adolescent development.

Further, students studying in private schools outperformed those in government schools in both domains. Private school students scored higher in mental well-being (mean = 61.8) and cognitive ability (mean = 33.7) than government school students (mean well-being = 56.7; cognitive score = 29.2), possibly reflecting better school facilities, academic environments, and access to supportive resources. Regarding gender, the study found no statistically significant difference in cognitive performance between male and female students. However, females reported slightly higher mental well-being than males, though the difference was not large enough to be considered significant.

A central finding of this research was the statistically significant positive correlation between mental well-being and cognitive performance ( $r = 0.63$ ,  $p < 0.01$ ). This result supports the hypothesis that students with higher mental well-being tend to perform better in cognitive tasks, reinforcing the interdependence of emotional and intellectual functioning in adolescents. Consequently, the null hypothesis stating no correlation between the two variables was rejected, and the alternative hypothesis was accepted. These findings collectively highlight the importance of addressing mental well-being in educational settings to enhance students' academic and cognitive development.

The findings confirm that mental well-being substantially influences students' ability to concentrate, process information, and perform reasoning tasks. Students with higher well-being scores also performed better on academic assessments and Raven's matrices. Rural and government schools lag behind due to infrastructural gaps, lack of psychological support, and socio-economic constraints.

### **Educational Implications and Recommendations:**

- Appointment of School Counselors:**  
Every secondary school, especially in rural and government sectors, should have at least one trained counselor to support students' mental health needs.
- Mental Health Integration in Curriculum:**  
Mental health education, emotional awareness, and stress management strategies should be integrated into the school curriculum as part of life skills or health education.
- Regular Well-being Assessments:**  
Schools should conduct periodic mental well-being screenings and interventions to identify and support students facing psychological challenges.
- Teacher Training on Mental Health Literacy:**  
Government-funded training programs should be introduced for teachers to help them understand adolescent mental health and provide first-line support.
- Promotion of Yoga, Meditation, and Sports:**  
Daily school routines should include activities like yoga, meditation, and physical





education, as they are proven to enhance both mental well-being and cognitive performance.

6. **Equity-Focused**

**Policies:**

Special attention should be given to bridging the urban-rural and private-government school gap by ensuring equal access to mental health resources.

7. **Parental**

**Involvement:**

Schools should conduct regular workshops to involve parents in supporting their children's mental well-being and learning environment at home.

**Conclusion:**

This study conclusively validates the hypothesis that mental well-being is a significant and positive predictor of cognitive performance among secondary school students. The correlation coefficient ( $r = 0.63$ ,  $p < 0.01$ ) established a strong relationship between the emotional and intellectual dimensions of adolescent development. Through a comprehensive analysis of data from 400 students across urban and rural areas of Uttarakhand, and from both government and private schools, the findings underscore that students who report higher levels of mental well-being also tend to perform better on cognitive tasks. Notably, urban and private school students outperformed their rural and government counterparts, highlighting the influence of environmental and institutional factors on student outcomes.

The implications of these findings are profound. In regions like Uttarakhand, where educational and mental health infrastructure can vary widely, it becomes critical for policymakers, school leaders, and mental health professionals to recognize mental well-being as an integral component of academic success. Emotional health is not a peripheral concern—it is central to learning, memory, problem-solving, and overall academic performance. As such, there is an urgent need for educational reforms that include structured mental health education, accessible counseling services, teacher training in mental health literacy, and the incorporation of practices such as yoga and mindfulness into daily school routines.

Ultimately, fostering emotional resilience and psychological well-being in adolescents is not only a matter of ethical responsibility but also a strategic investment in the future workforce and intellectual capital of the region. By addressing the emotional needs of students holistically, we can create a supportive learning environment that nurtures not just smarter students, but healthier and more capable human beings.

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