The Academic
International Journal of Multidisciplinary Research

An Online Peer Reviewed / Refereed Journal
Volume 3 | Issue 7 | July 2025
ISSN: 2583-973X (Online)
Website: www.theacademic.in

Comparison of Mental Health and Academic Anxiety Amongst Students of High Altitude and Low Altitude School going Children

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DOI : https://doi.org/10.5281/zenodo.16875482

ARTICLE DETAILS

Research Paper

Accepted: 28-07-2025

Published: 10-08-2025

Keywords:

mental health, academic anxiety, atltitutude

ABSTRACT

The purpose of the study was to assess and compare the mental health and academic anxiety amongst students of high altitude and low altitude school going children. A total of 150 boys students were selected as subjects of classes 9 to 12 (14-18 years age) from different Kendriya Vidyalaya schools of Uttarakhand. The data was collected using questionnaires - the Academic Anxiety Scale developed by Singh and Sen Gupta &Mental Health Scale developed by Dr. Sushma Talesara and Dr. Akthar Bano. Apart from descriptive statistics i.e. mean and standard deviation, independent t-test was used to compare the students of different altitude schools. The results showed that there was significant difference in the mental health of students of different altitude schools, while no differences were observed for academic anxiety. It was concluded that altitude has significant impact on mental health but not on academic anxiety.

Introduction

Mental health and academic anxiety represent critical factors influencing the educational trajectory and overall well-being of school children. The interconnected relationship between psychological wellness and academic performance has garnered significant attention from researchers, educators, and policymakers, revealing profound implications for student success and long-term outcomes.

Mental health challenges among school children have reached concerning levels. Studies indicate that 1 in 5 students experience a mental health problem in a given year (All Kinds of Therapy, 2024), with anxiety disorders and depression being the most prevalent conditions. According to a 2022 YouthTruth student survey, over 50% of students at every high school grade level cited depression, stress, and anxiety as obstacles to learning (Independent School Management, 2024), highlighting the ubiquitous nature of these challenges in contemporary educational settings.

The age-related progression of anxiety symptoms is particularly noteworthy. Research shows that anxiety rates increase dramatically with age, with 2.3% of elementary students, 7.9% of middle school students, and 15.9% of high school students falling within the anxious range (Grover et al., 2007). This escalation coincides with increased academic demands and social pressures, suggesting that the school environment itself may contribute to heightened anxiety levels.

The relationship between mental health and academic achievement is complex and multifaceted. Correlation analysis has revealed significant negative associations between stress, depression, and anxiety levels with academic performance, with stress showing the strongest correlation ($r = -0.25$, $p < 0.001$) (Khanam et al., 2024). These findings underscore the detrimental effects of psychological distress on learning outcomes.

Academic anxiety specifically manifests in various forms that directly impair student performance. Research indicates that 38.5% of undergraduates experience test anxiety at some point in their academic careers (Van Ameringen et al., 2003), affecting not only high-stakes examinations but also routine assessments. The anxiety-performance relationship creates a cyclical pattern where poor academic outcomes exacerbate anxiety symptoms, leading to further deterioration in performance.

The pathways through which mental health issues affect academic performance are multifaceted. When students have anxiety and depression that goes unnoticed, their mental health deteriorates, leading to social and behavioral problems, poor performance and learning, neglected hygiene, poor self-care practices, and low self-esteem (International Board of Credentialing and Continuing Education Standards, 2020). These interconnected challenges create a comprehensive barrier to effective learning.

Academic-related stress can reduce academic achievement, decrease motivation, and increase the risk of school dropout (Pascoe et al., 2020), with long-term consequences extending beyond the educational sphere. The cognitive resources typically allocated to learning become redirected toward managing

anxiety symptoms, resulting in decreased attention, impaired memory consolidation, and reduced problem-solving capabilities.

Altitude significantly affects mental health and academic anxiety in school children through multiple physiological and psychological mechanisms. High altitude hypoxia has been shown to have significant impact on cognitive performance (Singh et al., 2014), with recent work demonstrating that high altitude impairs the neuropsychological function of children of school age when compared with similar control groups at low altitude, implying that the learning process is compromised at high altitude (Vargas & Spielvogel, 2006).

High-altitude exposure induces adverse effects on cognitive performance and mood, potentially due to poor sleep quality, with high-altitude travelers experiencing frequent arousals and low slow-wave sleep duration, which can impair attention, memory (Zhang et al., 2023). People exposed to high altitudes often experience somatic symptoms triggered by hypoxia, such as breathlessness, palpitations, dizziness, headache, and insomnia, with most symptoms being identical to those reported in panic attacks or severe anxiety (Roth et al., 2002).

Several studies show that exposure of mentally healthy individuals to high and extreme altitude can adversely affect mood, behaviour and cognition, and that anxiety scores can increase with altitude (Küchenhoff& Weiss, 2024). High altitude (3,600 m) affects cognitive flexibility and anxiety state (Zhang et al., 2014), demonstrating direct impacts on academic-relevant cognitive functions.

Based on the above literature and significance of mental health and academic anxiety, the researcher conducted this study with the motive to assess and compare the mental health and academic anxiety of school children of low altitude and high-altitude schools.

Methodology

Subjects

A total of 150 school boys of classes 9 – 12 (14 to 18 years age) were selected as subjects from different schools of Kendriya Vidyalaya Sangathan. 75 of the students were from low altitude schools and remaining 75 from the high-altitude schools. All the school were of Uttarakhand state.

Data Collection

The data was collected using questionnaires: The Academic Anxiety Scale developed by Singh and Sen Gupta &Mental Health Scale developed by Dr. Sushma Talesara and Dr. Akthar Bano. For effective

psychological data collection from students in grades 9-12, the researcher gave proper instructions and followed essential procedures. A thoughtful approach ensured quality data while protecting the well-being of adolescent participants.

Statistical Analysis

The collected data was analyzed with the help of SPSS software. First of all, the descriptive statistics along with graphical representation was used to present the data. Then the normality of the data was tested followed by independent t-test to compare the selected dependent variables among low altitude and high-altitude students. The level of significance was set at 0.05.

Results

Table 1. Descriptive statistics of mental health and academic anxiety

	Mental Health		Academic Anxiety	
	Mean	SD	Mean	SD
Low-altitude	130.4	9.041	11.08	2.705
High-altitude	122.466	18.861	10.973	2.026

Table 2. Independent t-test analysis for comparing different altitude school students

	t	df	Sig.	Mean Difference	Std. Error Difference
Mental Health	-3.285	148	0.001	-7.933	2.415
Academic Anxiety	-0.273	148	0.785	-0.106	0.390

The table showed that there is significant difference in the mental health of students of different altitude schools (p-value = 0.001), while no differences were observed for academic anxiety (p-value = 0.785).

Discussion

The study was conducted with the motive to assess the mental health and academic anxiety of school going children and also to study the influence of altitude on both the variables. The findings showed that there was significant difference in the mental health of students of different altitude schools, while no differences were observed for academic anxiety.

Research demonstrates that altitude produces adverse alterations in human mood states, behavior, and cognitive functioning (Beall &Steegmann, 2000). The physiological impact of high altitude on mental

health is primarily attributed to hypoxic conditions that affect brain function. Studies on electrical workers in Peru showed that those stationed at about 10,000 feet had more symptoms of depression and anxiety than their sea-level colleagues (Kious et al., 2018). This finding aligns with the study's observation of significant differences in mental health across different altitude schools.

The hypoxic environment at higher altitudes triggers complex neurobiological responses that can influence mood regulation and mental health status. At high altitude, the lower atmospheric oxygen pressure inevitably challenges the brain, affecting voluntary spatial attention, cognitive processing, and attention speed (Zhang et al., 2023). These neurological changes can manifest as altered mental health states, explaining why students at different altitudes show varying mental health profiles.

Several epidemiological studies support the altitude-mental health relationship. Multiple studies suggest that the risks of depression and suicide increase with increasing altitude of residence (Huber et al., 2015; Brennan et al., 2011). Research has shown that altitude was positively associated with depressive symptom scores (Patten et al., 2010). These findings provide substantial evidence for the observed significant differences in mental health among students from schools at varying altitudes.

The absence of significant differences in academic anxiety across different altitudes can be explained by the nature of academic anxiety as a context-specific construct. Academic anxiety is primarily influenced by educational environment factors, performance expectations, and individual coping mechanisms rather than physiological altitude-related factors. Studies incorporating non-domain-specific anxiety measures have found no effect on academic achievement, suggesting that general anxiety differs from specific academic anxiety (Owens et al., 2012).

Academic anxiety is more closely tied to pedagogical factors, classroom dynamics, and individual academic experiences than to environmental altitude conditions. Unlike general mental health, which can be influenced by physiological changes due to oxygen availability, academic anxiety represents a domain-specific response to educational stressors that remain consistent regardless of geographical location. Research shows that students respond to classroom activities and achievement outcomes with various emotions including anxiety, which can negatively impact student performance (England et al., 2017).

The distinction between general mental health and academic anxiety reflects different underlying mechanisms. While altitude affects overall brain function and mood regulation through hypoxic conditions, academic anxiety is primarily a learned response to educational contexts. College science

classrooms have the potential to be especially anxiety-inducing because of the sometimes chilly and competitive environment (Cooper et al., 2018), suggesting that academic anxiety is more influenced by environmental context than altitude-related physiological factors.

Furthermore, long-term exposure to high altitudes causes hemispheric compensation during discrimination processes at early processing stages and reduces attentional resources at late processing stages (Yan et al., 2014). These cognitive adaptations may help explain why general mental health shows altitude-related variations while specific academic anxiety remains stable across different elevations.

Conclusion

The research findings show a clear difference in how altitude affects different aspects of student wellbeing. Students at different altitudes have significantly different mental health levels, which makes sense because higher elevations have less oxygen. This lack of oxygen affects how the brain works, influencing mood and thinking abilities. However, academic anxiety remains the same regardless of altitude because it is mainly caused by school-related stress rather than environmental factors. Academic anxiety depends on classroom situations, teacher expectations, and test pressures, which are similar in schools everywhere. This explains why general mental health changes with altitude while academic anxiety stays consistent across different elevations, showing that these two aspects of student wellbeing are influenced by completely different factors.

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