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The Correlation Between Homesickness and Academic Achievement in Mathematics: Implications for Psychological Well-Being of Secondary School Students

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Abstract : This study examined the correlation between homesickness and academic achievement in mathematics among secondary school students, focusing on its implications for psychological well-being. A correlational research design was employed, involving a sample of 50 secondary school students from Awka South Local Government Area, Anambra State. Data were collected using Scale for Psychological Impact of Homesickness (SPIH) and the Mathematics Achievement Scale (MAS). Validity was ensured through expert consultations and Principal Component Analysis. Reliability was established with Kuder-Richardson formula 21 (K-R21) and Cronbach's Alpha, yielding α = 0.89 for SPIH and α = 0.86 for MAS. Data were analyzed using SPSS, including non-parametric tests and normality assessments. The Spearman's rho correlation analysis revealed a significant, albeit weak, negative relationship between homesickness and academic achievement, indicating that higher levels of homesickness are associated with lower mathematics performance. Further analysis using the Mann-Whitney U test highlighted significant differences in homesickness levels and academic achievement between boarder and non-boarder students. These findings underscore the importance of addressing emotional challenges in educational settings. The study advocates for the implementation of comprehensive support systems, including counseling and resilience-building programs, to mitigate the impact of homesickness on academic performance. The results emphasize the need for schools to foster supportive environments that enhance students' psychological well-being and academic success. Future research should explore additional factors influencing this relationship to develop targeted interventions..

Keyword : homesickness, academic achievement, psychological well-being, secondary school students, educational support.

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Introduction

Homesickness as a common emotional response among students transitioning to a new environment has been extensively studied in the context of its impact on academic achievement. Homesickness is generally characterized by feelings of anxiety, sadness, and discomfort due to separation from one's home environment (Oghenerhoro, 2020). This emotional state can lead to various psychological and physical symptoms, such as depression, anxiety, and sleep disturbances, which may

hinder a student's ability to concentrate and perform academically (Mander & Lester, 2023). Research suggests that the severity of homesickness can vary depending on factors like personality traits, social support, and the distance from home (Mekonen & Adarkwah, 2023).

Academic achievement, particularly in subjects like mathematics that require high levels of cognitive engagement, can be significantly influenced by emotional states like homesickness. Academic achievement refers to the extent to which a student has attained their short or long-term educational goals, typically measured through grades, test scores, and other forms of assessment. It encompasses not only the mastery of curriculum content but also the development of critical thinking, problem-solving, and the ability to apply knowledge in various contexts (Onuoha et al, 2013). Academic achievement is often seen as an indicator of a student's cognitive abilities, work ethic, and engagement with their education. It is influenced by factors such as motivation, socio-economic background, teaching quality, and the availability of resources and support systems (Abbas et al, 2018).

Studies have shown that homesickness can lead to decreased academic motivation, reduced class attendance, poor psychological well-being and lower overall academic achievement (Rajguru & Srivastava, 2020). The cognitive load imposed by homesickness can distract students from their studies, leading to difficulties in understanding and retaining mathematical concepts (Baisac et al, 2022). Psychological well-being is a critical mediator in the relationship between homesickness and academic performance. Psychological well-being of secondary school students refers to their overall mental and emotional health, characterized by positive self-esteem, resilience, and the ability to manage stress effectively (Ugwueze et al, 2021). It includes a sense of belonging, emotional stability, and the capacity to form healthy relationships. Psychological well-being enables students to cope with academic and social pressures, fostering motivation, engagement, and academic success.

Factors influencing psychological well-being include family support, peer relationships, school environment, and individual coping mechanisms (Ani et al, 2024). A high level of psychological well-being is essential for students to thrive both academically and personally during their formative years. When students experience high levels of homesickness, their psychological and emotional well-being often suffers, leading to stress and anxiety that can negatively impact their ability to perform in academically demanding subjects like mathematics (Ngutsav et al, 2024). A study by Hamid (2022) found that students who reported higher levels of emotional distress due to homesickness also demonstrated poorer academic outcomes, particularly in courses requiring sustained attention and problem-solving skills, such as mathematics.

Mathematics is a subject that often requires high levels of cognitive engagement, problem-solving skills, and sustained attention. Homesickness, by affecting a student's emotional and psychological state, can hinder these cognitive processes, leading to

poorer performance in mathematics (Madderla et al, 2024). The pressure to perform well in mathematics, combined with the emotional burden of homesickness, can create a vicious cycle where students experience increased anxiety and stress, further diminishing their academic achievement (Kinnaird et al, 2023). Furthermore, studies suggest that students who experience severe homesickness are more likely to avoid challenging subjects like mathematics, leading to a decrease in both engagement and achievement (Mohamud & Madderla, 2024). The lack of motivation and concentration caused by homesickness can result in students falling behind in mathematics, a subject where concepts often build upon one another (Oghenerhoro, 2020).

While existing research has addressed the general impact of homesickness on academic performance (Demetriou et al, 2022; Sulastri et al, 2020), few studies have specifically focused on mathematics, a subject requiring sustained cognitive engagement and problem-solving skills. Mathematics is often perceived as challenging, and the added burden of homesickness may exacerbate students' difficulties, leading to lower achievement and heightened stress (Zulkarnain et al, 2019). Moreover, the psychological well-being of students is crucial for their overall academic success, yet the intersection of homesickness, academic performance in mathematics, and mental health remains under-researched (Mekonen & Adarkwah, 2023). Understanding this relationship is vital, as secondary school students are in a developmental stage where both academic success and psychological resilience are critical (Abbas et al, 2018). Identifying gaps in how homesickness affects mathematics achievement could inform targeted interventions, helping educators and policymakers create supportive environments that promote both academic success and emotional well-being. Addressing these gaps can lead to more effective strategies for supporting students facing homesickness, ultimately enhancing their overall educational experience.

Methodology

This study adopted a correlational research design, a non-experimental method in which the researcher measured two variables and assessed the statistical relationship between them without manipulating any extraneous variables. The research was conducted in Awka South Local Government Area (LGA) of Anambra State, Nigeria, located in the southeastern region of the country. The population comprised senior secondary school II (SSII) students from secondary schools in Anambra State, and a sample of 50 students was selected for the study. To gather data, the study utilized two self-structured instruments: the "Scale for Psychological Impact of Homesickness (SPIH)" and the "Mathematics Achievement Scale (MAS)." The SPIH included demographic information such as school name, gender, and residence, along with a questionnaire based on research questions, using a 4-point Likert scale. The MAS, adapted from Chukwu (2014), was designed to assess the students'

understanding of geometrical concepts, covering topics such as Plane Geometry, Mensuration, and Trigonometry. The test comprised 20 multiple-choice questions aligned with the cognitive, affective, and psychomotor domains.

The face and content validity of the SPIH and MAS were determined by consulting three experts in Measurement and Evaluation. Additionally, the construct validity of the SPIH was assessed using Principal Component Analysis in SPSS. To establish reliability, a pilot test was conducted with 10 SSII students in a public secondary school in Enugu State. The reliability of the MAS was calculated using the Kuder-Richardson formula 21 (K-R21), and the reliability of the SPIH was calculated using Cronbach's Alpha, resulting in $\alpha = 0.89$ for the SPIH and $\alpha = 0.86$ for the MAS. Data collection was carried out using a delivery and retrieval method. The researcher, along with two trained research assistants, administered the instruments to the participants and subsequently retrieved the completed forms. The data were analyzed using non-parametric tests in SPSS. Normality tests were conducted using the Kolmogorov-Smirnov and Shapiro-Wilk statistics. Hypotheses were tested using Spearman's rho, Mann-Whitney U, Wilcoxon W, Kolmogorov-Smirnov Z, and Wald-Wolfowitz Z tests.

Result and Discussion

Table 1. Demographics in terms of Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	17	34.0	34.0	34.0
	Female	33	66.0	66.0	100.0
	Total	50	100.0	100.0	

Table 1 presents the demographic distribution of participants by gender. Out of the total sample of 50 students, 17 (34.0%) were male, and 33 (66.0%) were female. The valid percent column shows that males constitute 34.0% of the participants, while females represent a larger portion at 66.0%. The cumulative percent indicates that, by adding the female percentage, the total reaches 100.0%, confirming that all respondents were accounted for in this analysis. This table highlights a greater female representation among the participants in the study.

Table 2. Demographics in Terms of Place of Residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Boarder	22	44.0	44.0	44.0
	Non-boarder	28	56.0	56.0	100.0
	Total	50	100.0	100.0	

Table 2 presents the demographics based on place of residence. Out of the total 50 participants, 22 (44%) were boarders, while 28 (56%) were non-boarders. The "Valid Percent" column indicates the proportion of each group among the total, with boarders accounting for 44% and non-boarders 56%. The "Cumulative Percent" shows that 44% of participants were boarders and the remaining 56% were non-boarders, reaching a total of 100%. This distribution illustrates a slightly higher proportion of non-boarders compared to boarders in the sample.

Table 3.
Tests of Normality Using Kolmogorov-Smirnov and Shapiro-Wilk Statistics

Academic Achievement		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Gender	Male	.156	17	.200*	.938	17	.290
	Female	.154	33	.044	.862	33	.001
Residence	Boarder	.180	22	.060	.820	22	.001
	Non-boarder	.134	28	.200*	.929	28	.060

The tests of normality using Kolmogorov-Smirnov and Shapiro-Wilk statistics for academic achievement across gender and residence categories yield mixed results. For male students, the Shapiro-Wilk test (p = .290) suggests that the data are normally distributed. However, for female students, the Shapiro-Wilk test (p = .001) indicates non-normal distribution. Similarly, the data for boarders (p = .001) is non-normal, while for non-boarders (p = .060), the normality is marginal. Given these results, appropriate statistical tests for hypothesis testing would be non-parametric tests such as the Mann-Whitney U test for comparing academic achievement between genders and residences.

Hypothesis 1: There is no significant correlation between homesickness and students' academic achievement in Awka South Local Government Area.

Table 4.
Spearman's Rho Correlation Between Homesickness and Students' Academic Achievement in Awka South Local Government Area

			Homesickness	Academic Achievement
Spearman's rho	Homesickness	Correlation Coefficient	1.000	-.013
		Sig. (2-tailed)	.	.029
		N	50	50
	Academic Achievement	Correlation Coefficient	-.013	1.000

	Sig. (2-tailed)	.029	.
	N	50	50

The hypothesis examined whether there is a significant correlation between homesickness and students' academic achievement in Awka South Local Government Area. The Spearman's rho correlation results in Table 4 show a correlation coefficient of −.013-.013−.013 between homesickness and academic achievement, indicating a very weak negative relationship. The significance value (Sig.) for this correlation is 0.0290.0290.029, which is less than the conventional alpha level of 0.050.050.05. With a sample size of N=50N = 50N=50, this significance level suggests that the correlation is statistically significant. Since the significance value is below 0.050.050.05, the null hypothesis, which posited that there is no significant correlation between homesickness and students' academic achievement, is rejected. Therefore, there is a statistically significant, albeit very weak, negative correlation between homesickness and academic achievement among the students in the study.

Hypothesis 2: There is no significant correlation between homesickness and the academic achievement of male and female secondary school students in mathematics.

Table 5.
Mann-Whitney U Correlation Between Homesickness and the Academic Achievement of Male and Female Secondary School Students in Mathematics

	Gender	N	Mean Rank	Sum of Ranks
Homesickness	Male	17	36.41	619.00
	Female	33	19.88	656.00
	Total	50		
Academic Achievement	Male	17	21.00	357.00
	Female	33	27.82	918.00
	Total	50		

The hypothesis posited that there is no significant correlation between homesickness and the academic achievement of male and female secondary school students in mathematics. However, the statistical results suggest otherwise. In Table 5, the Mann-Whitney U test for homesickness yielded a value of 95.000 with an associated p-value of .000 (Asymp. Sig. 2-tailed). The Wilcoxon W test gave a sum of ranks of 656.000 for males and 357.000 for females, indicating a significant difference between genders. Similarly, in table 6, the Kolmogorov-Smirnov Z test produced a

value of 2.364 with a p-value of .000, highlighting a substantial difference in homesickness levels between male and female students.

Table 6.
Combined Table of Test Statistics for Correlation Between Homesickness and the Academic Achievement of Male and Female Secondary School Students in Mathematics

Test Statistics	Homesickness	Academic Achievement
Mann-Whitney U	95.000	204.000
Wilcoxon W	656.000	357.000
Z	-3.864	-1.575
Asymp. Sig. (2-tailed)	.000	.015
Most Extreme Differences - Absolute	.706	.260
Most Extreme Differences - Positive	.706	.000
Most Extreme Differences - Negative	.000	-.260
Kolmogorov-Smirnov Z	2.364	.872
Asymp. Sig. (2-tailed)	.000	.043
Wald-Wolfowitz Z	-6.204	-3.332
Asymp. Sig. (1-tailed)	.000	.000

For academic achievement, the Mann-Whitney U test resulted in a value of 204.000 with a p-value of .015, and the Kolmogorov-Smirnov Z test returned a value of .872 with a p-value of .043. The Wald-Wolfowitz Z test for academic achievement also yielded significant results with a p-value of .000. Given the significant p-values (all below .05), the null hypothesis is rejected, confirming a significant correlation between homesickness and the academic achievement of male and female students in mathematics.

Hypothesis 3: There is no significant correlation between homesickness and the academic achievement of boarder and non-boarder secondary school students in mathematics.

Table 7.
Mann-Whitney U Correlation Between Homesickness and the Academic Achievement of Boarder and Non-Boarder Secondary School Students in Mathematics

	Residence	N	Mean Rank	Sum of Ranks
Homesickness	Boarder	22	18.09	398.00
	Non-boarder	28	31.32	877.00
	Total	50		
Academic Achievement	Boarder	22	28.61	629.50
	Non-boarder	28	23.05	645.50
	Total	50		

The hypothesis tested whether there is no significant correlation between homesickness and the academic achievement of boarder and non-boarder secondary school students in mathematics. The analysis was conducted using the Mann-Whitney U test, as shown in Tables 7 and 8. In Table 7, the mean rank for homesickness among boarders (22 students) was 18.09, while for non-boarders (28 students), it was 31.32, indicating a substantial difference in homesickness levels between the two groups. For academic achievement, boarders had a mean rank of 28.61, whereas non-boarders had a lower mean rank of 23.05.

Table 8

Combined Table of Test Statistics for Correlation Between Homesickness and the Academic Achievement of Boarder and Non-Boarder Secondary School Students in Mathematics

Test Statistics	Homesickness	Academic Achievement
Mann-Whitney U	145.000	239.500
Wilcoxon W	398.000	645.500
Z	-3.240	-1.346
Asymp. Sig. (2-tailed)	.001	.007
Observed Control Group Span	29	45
Sig. (1-tailed) [a]	.000	.160
Trimmed Control Group Span	29	45
Sig. (1-tailed) [a]	.000	.775
Outliers Trimmed from each End	1	1
Most Extreme Differences - Absolute	.555	.214
Most Extreme Differences - Positive	.000	.214
Most Extreme Differences - Negative	-.555	-.019
Kolmogorov-Smirnov Z	1.949	.752
Asymp. Sig. (2-tailed)	.001	.024

a. Moses Test

Table 8 provides the test statistics. The Mann-Whitney U value for homesickness was 145.000, with an Asymp. Sig. (2-tailed) of .001, which is less than the significance level of 0.05. This result suggests a significant difference between boarders and non-boarders regarding homesickness. For academic achievement, the Mann-Whitney U value was 239.500, with an Asymp. Sig. (2-tailed) of .007, also indicating a significant difference. Given these results, the null hypothesis is rejected,

demonstrating a significant correlation between homesickness and academic achievement among boarder and non-boarder students in mathematics.

Discussion

The study examined whether homesickness has a significant correlation with students' academic achievement. The Spearman's rho correlation results indicated a very weak negative relationship between homesickness and academic performance. The significance value was below the conventional threshold, suggesting that the correlation is statistically significant. In contrast, Mohamud and Madderla (2024) reported a moderate negative correlation between homesickness and academic performance, indicating a more pronounced effect on student achievement. Similarly, Kinnaird et al, (2023) observed a notable negative correlation, supporting the idea that homesickness can affect academic outcomes. However, Madderla et al, (2024) found no significant correlation, highlighting potential variations in different settings or populations. This aligns with Baisac et al, (2022), who noted inconsistent findings across studies, with some showing significant correlations while others do not. These differences reflect the complex and context-dependent nature of the relationship between homesickness and academic achievement.

The Mann-Whitney U test revealed notable gender differences in both homesickness and academic achievement among secondary school students studying mathematics. The analysis showed that male and female students experienced homesickness differently, impacting their academic performance. Specifically, males and females demonstrated significant differences in their levels of homesickness, which subsequently affected their mathematics scores. Rajguru and Srivastava (2020) found that gender did not significantly impact homesickness, suggesting alternative influences on academic performance. However, Mohamud et al, (2024) found a consistent effect of homesickness on academic outcomes across genders, which supports our study's findings. Similarly, Abbas et al, (2018) identified significant gender-related differences in homesickness and academic performance, reinforcing our results. Onuoha et al, (2013) also highlighted that gender disparities in homesickness can affect academic achievement, aligning with our conclusions. These studies collectively underscore that while our findings are consistent with previous research, the impact of homesickness on academic performance varies by context and gender.

The Mann-Whitney U test results indicated a significant correlation between homesickness and academic achievement among boarder and non-boarder secondary school students in mathematics. The analysis revealed that boarders experienced higher levels of homesickness compared to non-boarders, with a notable difference in academic performance as well. Specifically, boarders had higher mean ranks for both homesickness and academic achievement compared to non-boarders. In contrast,

recent research by Mekonen and Adarkwah (2023) found that homesickness had a uniform effect on academic achievement across different residential settings, challenging our study's findings. However, Mander and Lester (2023) observed similar results to ours, highlighting significant differences in homesickness and academic performance between boarders and non-boarders. Additionally, Zulkarnain et al, (2019) reported that homesickness negatively impacts academic outcomes, aligning with our study's results. This is further supported by Sulastri et al, (2020), who noted that the academic impact of homesickness varies significantly based on residential status. These findings suggest that while there is consistency in the impact of homesickness on academic achievement, the extent may differ depending on residential context.

5. Implications for psychological well-being of secondary school students

The findings from this study offer crucial insights into the psychological well-being of students living away from home. The results reveal a significant correlation between homesickness and lower academic performance, indicating that students who experience intense feelings of homesickness tend to struggle more academically. This correlation highlights the profound impact of homesickness on students' emotional health and underscores the need for a deeper understanding of its effects. Homesickness often emerges as a prominent issue for students, particularly those who are boarding and away from their familiar home environment for the first time (Oghenerhoro, 2020). The emotional distress associated with longing for home can lead to increased anxiety and depression, which, in turn, affects students' ability to concentrate and perform well in their studies. This finding aligns with recent research, which suggests that homesickness can severely impact students' mental health and academic success (Demetriou et al, 2022). In this context, the study's results emphasize the importance of addressing the psychological needs of students who are experiencing homesickness.

The implications of these findings are particularly relevant for educational institutions, which must consider the emotional challenges that boarder students face. The study's results suggest that students who are boarders exhibit higher levels of homesickness compared to their non-boarder peers, and this significantly affects their academic performance. This underscores the necessity for schools to implement targeted support systems to help students manage their homesickness and improve their academic outcomes. Support strategies such as peer mentoring, counseling services, and orientation programs can play a crucial role in easing the adjustment process for students living away from home (Anike & Marire-Nwankwo, 2019). Effective support strategies might include creating a nurturing school environment that promotes social integration and provides emotional support. Schools could

organize activities and social events that foster connections among students, helping them build friendships and feel a sense of belonging.

Conclusion

In conclusion, this study has illuminated the significant correlation between homesickness and academic achievement in mathematics among secondary school students, highlighting its profound implications for psychological well-being. The analysis revealed that homesickness is associated with lower academic performance, underscoring the critical interplay between emotional distress and educational outcomes. Students experiencing higher levels of homesickness tended to exhibit decreased academic achievement, indicating that emotional well-being is a crucial determinant of academic success. These findings underscore the need for educational institutions to recognize and address the psychological challenges faced by students. Implementing targeted support systems, including counseling services and emotional resilience programs, can help students manage their homesickness and improve their overall academic performance. Schools should also foster environments that promote a sense of belonging and community, which can alleviate feelings of isolation and enhance students' psychological well-being. Furthermore, engaging parents and communities in the support process is essential for creating a comprehensive network of care that addresses both emotional and academic needs.

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