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Anxiety among Higher Secondary Students: A Factorial Study of Gender and Locality Differences

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ABSTRACT

Adolescent anxiety is increasingly recognized as a significant psychological concern affecting academic functioning and emotional well-being. The present study examined anxiety levels among higher secondary students and investigated whether gender and locality differences exist using a 2×2 factorial design. The sample consisted of 40 students (10 boys and 10 girls from urban schools; 10 boys and 10 girls from rural schools) selected through random sampling from Jammu district. Anxiety was assessed using a standardized self-report inventory. Data were analyzed using two-way Analysis of Variance (ANOVA). Results revealed no statistically significant main effects of gender ($F = 0.021$, $p > .05$) or locality ($F = 0.91$, $p > .05$), and no significant interaction effect between gender and locality ($F = 1.92$, $p > .05$). Findings suggest that adolescent anxiety in this sample appears to be a generalized developmental phenomenon rather than one determined by demographic factors. Implications for universal school-based mental health interventions are discussed.

Keywords: adolescent anxiety, gender differences, rural–urban students, factorial design, school psychology

INTRODUCTION

Adolescence represents a critical developmental stage characterized by rapid physical, cognitive, and socio-emotional changes. During this transitional phase, individuals encounter increasing academic expectations, identity formation challenges, peer influences, and examination pressures. These developmental demands make adolescents particularly vulnerable to psychological difficulties, among which anxiety is especially prevalent.

Anxiety refers to a state of heightened apprehension & tension, or worry arising from perceived threats or anticipated difficulties. While moderate anxiety may enhance alertness and performance, excessive anxiety can impair concentration, academic achievement, and emotional stability. In contemporary educational contexts, competitive examinations, parental expectations, and career uncertainties often intensify stress levels among students.

Previous research examining demographic influences on anxiety has produced inconsistent findings. Some studies report higher anxiety levels among females, while others suggest minimal or negligible gender differences. Similarly, rural urban comparisons have yielded mixed results. These inconsistencies underscore the need for localized empirical investigations using factorial designs to examine both independent and interaction effects simultaneously.

The present study therefore investigates anxiety among higher secondary students in Jammu district, examining whether gender and locality significantly influence anxiety levels.

REVIEW OF LITERATURE

Research consistently demonstrates a relationship between anxiety and academic functioning. Putwain (2007) reported that examination stress significantly predicts test anxiety and reduced academic performance. Deb, Strodl, and Sun (2015) found high levels of academic stress among Indian adolescents, linking anxiety to parental expectations and academic competition.

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Gender differences in anxiety have been widely debated. McLean and Anderson (2009) reported that females often exhibit higher anxiety levels than males. However, the Gender Similarity Hypothesis proposed by Janet Shibley Hyde argues that males and females are more alike than different on most psychological variables.

Environmental influences also shape adolescent adjustment. Evans (2006) highlighted the role of environmental stressors in child development, while Roeser, Eccles, and Sameroff (2000) emphasized the importance of school climate and teacher support in emotional adjustment.

Research Gap

Existing research reveals:

- inconsistent gender findings
- mixed locality results
- limited localized factorial studies

Therefore, examining these variables simultaneously within a single design is necessary.

Despite these findings, factorial studies simultaneously examining gender and locality differences within localized Indian contexts remain limited. This study attempts to address that gap.

Objectives

1. To compare anxiety levels of boys and girls.
2. To compare anxiety levels of urban and rural students.
3. To examine the interaction effect of gender and locality on anxiety.

Hypotheses

H_1: There is no significant difference in anxiety between boys and girls.

H_2: There is no significant difference in anxiety between urban and rural students.

H_3: There is no significant interaction effect between gender and locality on anxiety.

METHOD

Research Design

A descriptive survey method employing a 2×2 factorial design was used.

Participants

The sample comprised 40 higher secondary students from Jammu district. The distribution was as follows:

i. Urban Boys (N= 10)
ii. Urban Girls (N= 10)
iii. Rural Boys (N= 10)
iv. Rural Girls (N= 10)

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Participants were selected through random sampling from selected schools.

Instrument

Anxiety was measured using a standardized self-report inventory consisting of 100 dichotomous items. Higher scores indicated higher levels of anxiety. The instrument has been widely used in adolescent populations.

Anxiety was measured using Sinha's Comprehensive Anxiety Test (SCAT) developed by A.K.P. Sinha. The test consists of 100 dichotomous (Yes/No) items designed to assess general anxiety levels among adolescents and adults. Higher scores indicate higher levels of anxiety. The test manual reports high reliability, with a split-half reliability coefficient of 0.92 and test–retest reliability of 0.85. Evidence of content, construct, and criterion-related validity supports the suitability of the instrument for assessing anxiety among higher secondary students

Procedure

Permission was obtained from school authorities prior to data collection. The inventory was administered collectively in classroom settings under standardized instructions. Participants were assured confidentiality and voluntary participation.

Statistical Analysis

Data were analyzed using two-way Analysis of Variance (ANOVA). Significance was tested at .05 level.The following table showing anxiety scores in different cells for two-way ANOVA (2 x 2 Factorial experiments)

Anxiety					
	(Boys) A_1	(Girls)A_2		A_1^2	A_2^2
UrbanB_1	64	68	B_1	4096	4624
	59	58		3481	3364
	45	70		2025	4900
	51	68		3721	4624
	44	44		1936	1936
	72	77		5184	5929
	64	74		4046	5476
	46	48		2116	2304
	65	71		4225	5041
	62	61		3844	3721
Anxiety					
	(Boys) A_1	(Girls)A_2		A_1^2	A_2^2
Rural B_2	55	46	B_2	3025	2116
	85	44		7225	1936
	55	70		3025	4900
	46	61		2116	3721
	86	62		7396	3844
	50	38		2500	1444
	55	66		3025	4356
	55	68		3025	4624
	61	43		3721	1849
	50	54		2500	2916
	$\sum A_1B_2 = 598$	$\sum A_2B_2 = 552$		$\sum A_1^2 B_2 = 37558$	$\sum A_2^2 B_2 = 31706$
	$\sum A_1B_1 = 582$	$\sum A_2B_1 = 639$		$\sum A_1^2 B_1 = 34724$	$\sum A_2^2 B_1 = 41919$

$$\sum NT = N_1 + N_2 + N_3 + N_4$$

$$= 10 + 10 + 10 + 10 = 40$$

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$\sum XT = \sum A_1B_1 + \sum A_2B_1 + \sum A_1B_2 + \sum A_2B_2$

$= 582 + 639 + 598 + 552 = 2371$

$\sum X^2T = \sum A_1^2B_1 + \sum A_2^2B_1 + \sum A_1^2B_2 + \sum A_2^2B_2$

$= 34724 + 41919 + 37558 + 31706 = 145907$

Step A $=$ Correction (C) $= \frac{(\sum X_T)^2}{N_T}$

$= \frac{(2371)^2}{40} = \frac{5621641}{40} = 140541.025$

Step B

$SS_t = \sum X^2_T - C$

$= 145907 - 140541.025 = 5365.975$

Step C

$SS_A = \frac{(\sum XA_1)^2}{N_1} + \frac{(\sum XA_2)^2}{N_2} - C$

$= \frac{(582+598)^2}{20} + \frac{(639+552)^2}{20} - 140541.025$

$= \frac{(1180)^2}{20} + \frac{(1191)^2}{20} - 140541.025$

$= \frac{1392400}{20} + \frac{1418481}{20} - 140541.025$

$= \frac{2810881}{20} - 140541.025$

$= 140544.05 - 140541.025 = 3.025$

Step D

$SS_B = \frac{(\sum XB_1)^2}{N_1} + \frac{(\sum XB_2)^2}{N_2} - C$

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$$= \frac{(582+639)^2}{20} + \frac{(598+552)^2}{20} - 140541.025$$

$$= \frac{(1221)^2}{20} + \frac{(1150)^2}{20} - 140541.025$$

$$= \frac{1490841}{20} + \frac{1322500}{20} - 140541.025$$

$$= \frac{2813341}{20} - 140541.025$$

$$= 140667.05 - 140541.025 = 126.025$$

Step E

$$SS_{BET} = \frac{(\sum A_1B_1)^2}{N_1} + \frac{(\sum A_1B_2)^2}{N_2} + \frac{(\sum A_2B_1)^2}{N_3} + \frac{(\sum A_2B_2)^2}{N_4} - C$$

$$= \frac{(582)^2}{10} + \frac{(598)^2}{10} + \frac{(639)^2}{10} + \frac{(552)^2}{10} - 140541.025$$

$$= \frac{338724 + 357604 + 408321 + 304704}{10} - 140541.025$$

$$= \frac{1409353}{10} - 140541.025$$

$$= 140935.3 - 140541.025 = 394.273$$

Step F

$$SS_{A\times B} = SS_{BET} - (SS_A + SS_B)$$

$$= 394.273 - (3.025 + 126.025)$$

$$= 394.273 - 129.05 = 265.223$$

Step G

$$SS_w = SS_T - SS_{BET} = 5365.975 - 394.273 = 4971.702$$

The following table showing summary of ANOVA for 2x2 Factorial Design

Source of Variance	SS	Df	MS = SS/df	F. Ratio	Level of Significance
A Sex (boys and girls)	3.025	1	3.025	0.021	Insignificant
B Locality (Rural & urban)	126.025	1	126.025	0.91	Insignificant
A×B (Sex × Locality)	265.223	1	265.223	1.92	Insignificant
Within	4971.702	36	138.10		

Table value against 1 and 36 (df), at 0.05 level = 4.1709 & at 0.01 level = 7.5625

It is clear from the above table that the F-Ratio for A (i.e, sex – boys and girls) have been obtained to be 4.1709 and 7.5625 at 0.05 and 0.1 level of significance. It indicates that the calculated value is far less than the table

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value. Thus, it is insignificant. Hence, we conclude that higher secondary boys and girls do not show any significant difference in anxiety.

The F-Ratio for "B" (i.e, is locality- Urban & rural) has been found to be 0.91 and the table value against 1 and 36 df have been obtained to be 4.1709 and 7.5625 at 0.05 and 0.1 level of significance . It indicates that our calculated value is less than the table value. Thus, it is insignificant. Hence we conclude that adolescent of urban and rural region do not show any difference in anxiety.

The F-Ratio for "AxB" (i.e, sex and locality) has been found to be 1.92 which is also far less than the table value of 4.1709 and 7.5625 against df 1 and 36 respectively at 0.05 and 0.01 level of significance. Thus, it is insignificant. It indicates that the nature of difference under joint influence of different level of AxB is the same in the anxiety. In other words the anxiety among boys and girls belonging to urban and rural region remain to be same.

All obtained F-values were below the critical value, indicating no statistically significant differences.

Interpretation of Results

The obtained F-value for gender (0.021) is far below the critical value (4.17), indicating no significant difference between boys and girls in anxiety levels.

Similarly, the F-value for locality (0.91) is less than the critical value, indicating no significant difference between urban and rural students.

The interaction effect (F = 1.92) is also non-significant, suggesting that gender and locality do not jointly influence anxiety levels in this sample.

DISCUSSION

The absence of gender differences supports the view that adolescent anxiety may be influenced more by universal developmental pressures than by biological sex differences. This aligns with the Gender Similarity Hypothesis.

The lack of rural–urban differences suggests that modernization, standardized curricula, and shared academic pressures may be reducing contextual disparities. Exposure to similar educational systems and examination structures may contribute to comparable stress experiences.

The non-significant interaction effect further indicates that demographic variables do not combine to influence anxiety in a meaningful way within this sample. Anxiety appears to be a generalized adolescent phenomenon shaped by academic and developmental demands common to both groups.

Educational Implications

The findings support the implementation of universal mental health interventions rather than demographic-specific programs. Schools should:

i. Introduce stress-management workshops

ii. Strengthen counseling services

iii. Foster supportive classroom environments

iv. Promote emotional resilience programs

Limitations

i. Small sample size (N = 40)

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ii. Limited geographic coverage (Jammu district only)

iii. Cross-sectional design

iv. Self-report measurement

Suggestions for Future Research

Future studies should:

i. Include larger and more diverse samples

ii. Employ longitudinal designs

iii. Examine additional variables such as academic stress, parental expectations, and school climate

iv. Report effect sizes and reliability indices

CONCLUSION

The present study concludes that anxiety among higher secondary students in Jammu district does not significantly differ across gender or locality. These findings suggest that adolescent anxiety may be a widespread developmental concern rather than a demographic-specific issue. Comprehensive and universal school-based mental health strategies are therefore recommended.

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