Journal of Contemporary Teacher Education
Vol: 8, 2024, 169-186

Relationship between Test Anxiety and Academic Achievement of Students in Science at Secondary Level, in Islamabad

Shahzad Ahmad[*]
Sadia Jamil[**]
Saba Fatima[***]

Abstract

The study aimed to examine secondary school students' test anxiety and its impact on their academic achievement, focusing on gender and locality differences. Understanding test anxiety is crucial for effective teaching and learning. A descriptive and correlational design was employed, with a sample of 440 students (215 male and 225 female) from 6 urban and 7 rural secondary schools in Islamabad. Academic achievement was assessed using marks from recent board exams. A modified and culturally adapted 29-item Likert-type scale, based on Spielberger's 1980 instrument, was validated to measure test anxiety. Data were analyzed using mean, standard deviation, Pearson correlation, t-tests, and two-way ANOVA. The findings indicated most students showed a neutral attitude toward test anxiety in science, with minimal negative or positive responses. A negative correlation was observed between test anxiety and academic achievement, suggesting higher anxiety lowers performance. Additionally, gender and locality significantly influenced students' test anxiety and academic outcomes.

***Keywords*:** Science; Anxiety; Academic achievement; Secondary education; gender; locale; Islamabad.

[*] Assistant Professor, Federal College of Education, H-9, Islamabad.
E-mail: mianshahzadali17@gmail.com
[**] Research Associate, Federal College of Education, H-9, Islamabad.
E-mail: sadiajamilfce@gmail.com
[***] Research Assistant, Federal College of Education, H-9, Islamabad.
E-mail: saba.fati09@gmail.com

Introduction

The National Education Policies (NEPs) of Pakistan, particularly the 2009 policy (Government of Pakistan, 2009), have emphasized providing quality education, especially in science, as essential for social development. Despite recognizing the need for a scientifically skilled workforce, the education system still struggles to deliver quality science education to the youth.

The lack of success stems from issues like an ineffective science curriculum, unsupportive school environments, and teaching methods that fail to engage students or foster a positive attitude toward science. This is evident in poor performance in physics, chemistry, biology, and mathematics, particularly at the secondary level when students decide their future career paths after grade 10.

Test anxiety often leads to a decline in performance and is accompanied by discomfort before, during, or after a test (Hanoski, 2002). Testing issues can cause problems such as concentration loss, fear, and physical symptoms like nausea, headaches, and fatigue (Zeidner & Mathews, 2005; Bourne, 2005). Exams and assessments are significant sources of stress for students worldwide (Hodge et al., 1997; Kouzma & Kennedy, 2004). In Pakistan, the Secondary School Certificate (SSC) examination is no exception.

Anxiety, described by Asadullapoor et al. (2010) as a distressing emotion in challenging situations, affects personal, social, and professional life (Zahrakar, 2008). It is a leading cause of poor academic performance among adolescents globally (Al-Atram, 2015; Dawood et al., 2016). While moderate anxiety can motivate effort and responsibility (Kahan, 2008; Donnelly, 2009), excessive anxiety impairs performance (Dawood et al., 2016). Symptoms often occur when individuals perceive situational demands as exceeding their capabilities (Akca, 2011).

Test anxiety is a major psychological concern faced by students either prior to or while taking exams and assessments (Akca, 2011; Zeidner & Mathews, 2005). Research identifies various causes, including parenting styles, gender-based anxiety differences, parental education, environmental and cultural factors, societal and peer pressures, instructor traits, test difficulty, family expectations, and challenges in learning or addressing learning difficulties (De Civita et al., 2004; Rana & Mehmood, 2010; Subramani & Venkatachalam, 2019).

Test anxiety has been a widely researched topic in recent years (Dawood et al., 2016). It is considered a two-factor construct comprising cognitive (worry) and affective (emotionality) components, along with

an inner conflict (Legesse, 2014). According to Cassady and Johnson (2002), the cognitive dimension of test anxiety has a direct effect on exam performance, whereas the affective dimension is interconnected but does not exert a direct influence. The cognitive component involves self-doubt and fear of failure, often tied to negative thoughts during tests (Dawood et al., 2016; Sarason & Sarason, 1990).

Feeling helpless, doubting intellectual abilities, and having negative thoughts about performance contribute to cognitive test anxiety (Legesse, 2014). Cassady and Johnson (2002) identified symptoms such as comparing performance with peers, fear of failure, low confidence, parental pressure, and dissatisfaction with self-esteem. Other symptoms include difficulty making decisions, forgetfulness, short attention span, inability to focus, self-absorption, and negative self-beliefs (Legesse, 2014). Researchers also noted behaviors like avoiding tests, dropping out, substance use to escape anxiety, forgetting answers, and negative self-talk as cognitive symptoms of test anxiety (Subramani & Venkatachalam, 2019; Duraku, 2017).

Test anxiety, a significant issue for students (Dinga et al., 2018), causes severe distress during exams. While mild anxiety can motivate, excessive anxiety harms academic performance (Oluoch et al., 2018). Symptoms include restlessness, poor concentration, insomnia, fatigue, and physical discomfort (Habibullah & Ashraf, 2013).

Oludipe (2009) noted that low-anxiety students outperformed high-anxiety peers in physics tasks. Most studies support a negative relationship between test anxiety and performance (Dodeen et al., 2014; Shishigu, 2018), though some, like Ndirangu et al. (2008) and Kavakci et al. (2014), found no significant link.

Cultural and contextual factors, such as societal expectations, family support, and academic pressures, influence the relationship between test anxiety and biology achievement at the secondary level (Yildirim, 2010; von der Embse et al., 2018; Bedewy & Gabriel, 2015).
Anxiety is a widespread issue that impacts students' performance, particularly test anxiety, which significantly affects academic achievement. This is a common challenge for high school students and may play a key role in influencing their success in science at the secondary level. Examining the link between test anxiety and academic performance in science is, therefore, highly relevant.

Objectives of the Study

Objectives of the present study were to:

i. Examine the relationship between test anxiety and academic

achievement in science among secondary-level students.

ii. To explore the relationship between test anxiety and academic achievement in science, considering gender and locality at the secondary level.

iii. To assess the interaction effect of gender and locality on test anxiety and academic achievement in science at the secondary level.

Research Questions

The objectives of the study were further supported by the following research questions:

i. Is there a significant difference in science test anxiety based on gender/ locality?

ii. Does a significant difference exist in science academic achievement based on gender/ locality?

iii. Is there a significant relationship between test anxiety and academic achievement in science at the secondary level?

iv. Does a significant relationship exist between test anxiety and academic achievement in science, considering gender/ locality, at the secondary level?

v. What is the interaction effect of gender and locality on test anxiety and academic achievement in science at secondary level?

Research Hypotheses

The research questions of the study were further supported by the following research hypotheses:

H01: No statistically significant difference in science related test anxiety between students with respect to gender.

H02: No statistically significant difference in science related test anxiety between students with respect to locale.

H03: No statistically significant difference in science related academic achievement between students with respect to gender.

H04: No statistically significant difference in science related academic achievement between students with respect to locale.

H05: No statistically significant relationship between test anxiety and academic achievement in science of students.

H06: No statistically significant relationship between test anxiety and academic achievement in science of male students.

H07: No statistically significant relationship between test anxiety and

academic achievement in science of female students.

H08: No statistically significant relationship between test anxiety and academic achievement in science of urban students.

H09: No statistically significant relationship between test anxiety and academic achievement in science of rural students.

H10: No interaction effect of gender and locale on test anxiety in science.

H11: No interaction effect of gender and locale on academic achievement in science.

Methodology

The study employed a correlational and descriptive survey design to collect data. Cognitive-behavioral approaches suggest that addressing negative thoughts and enhancing focus can help students with test anxiety improve academically. The present research was conducted in both urban and rural secondary schools in Islamabad, Pakistan.

Population and Sample

The study population comprised 10th-grade biology students from six educational zones in Islamabad: Urban-I, Urban-II, Nilore, Humak, Tarnol, and Bahara Kao. Due to time constraints and convenience, a sample of 440 students was selected. This sample included both male and female students from fourteen public schools in Islamabad (refer to Table 2).

Table 1
Population in Detail

Type of School	Co-Education		Female		Male		Total
	Urban	Rural	Urban	Rural	Urban	Rural	
Higher Secondary	01	13	04	20	------	19	57
Secondary	02	------	22	24	13	34	95
Total	03	13	26	44	13	53	152

Table 2

Sample in Detail

Number of Institutions	Number of Students	Gender	Locality
IMSG-(VI-X), G-8/2.	58	Females	Urban
IMSG-(VI-X), I-10/4.	41	Females	-do-
IMSB-(VI-X), G-6/4.	53	Males	-do-
IMSB-(VI-X), G-7/3.-1	50	Males	-do-
IMSG-(I-X), G-9/1.	35	Co-Education	-do-
IMCG-(I-XII), University Colony (U.C).	33	Co-Education	-do-
IMCG-(VI-XII), Korang Town.	30	Co-Education	Rural
IMSB-(VI-X), Jhang Syden.	25	Males	-do-
IMCB-(VI-XII), Tarnol.	20	Males	-do-
IMSG- (I-X), Kurri.	40	Females	-do-
IMSG-(I-X), Gokina.	15	Females	-do-
IMCG-(VI-XII), NHC, Chak Shahzad.	18	Females	-do-
IMCG, Pehount.	22	Co-Education	-do-
Total	440	------	------

Research Instrument

The study examines two variables: "Test Anxiety" and "Academic Achievement." Academic achievement data was collected from students' marks in the recent board examination. To assess test anxiety, a 29-item questionnaire, developed and validated by the researcher, was used. Originally created by Spielberger in 1980 and later adapted by Stefan Peter and Philip Zabek, the instrument had 40 items. To ensure validity, four experts in the field reviewed the instrument. Following their feedback, redundant items were removed, and some were rephrased, leaving 29 items in the final version.

The 29-item questionnaire was pre-tested on 120 grade 10 students not included in the sample. Its reliability was confirmed with a Cronbach's alpha coefficient of 0.85. The items were then rated on a 5-point Likert scale: “Strongly Disagree,” “Disagree,” “Neutral,” “Agree,” and “Strongly Agree.”

Data Collection and Analysis

The researcher distributed the questionnaire directly to participants. The Test Anxiety Inventory (TAI) contained both positive and negative statements. Positive items were scored 1 to 5 ("Strongly Disagree" to "Strongly Agree"), while negative items were reverse scored.

Responses were organized in MS Excel and analyzed using descriptive (mean, standard deviation) and inferential statistics (independent t-test, Pearson correlation, two- way ANOVA). The t-test compared group means, Pearson correlation assessed relationships between variables, and two-way ANOVA evaluated the interaction effects of gender and locale on test anxiety and academic achievement in science.

Results

Table 3

Scores of Students' Test Anxiety in Science of Males and Females Students

Gender	N	Mean	S.D.	df	t	Sig. (2-tailed)
Male	215	77.29	14.47	438	−0.099	0.921
Female	225	77.13	18.95			

Level of significance $= \boldsymbol{\alpha} = 0.05$.

Table 3 results, t (438) = −0.099, ρ = 0.921, show no statistically significant difference in mean test anxiety scores between male (M = 77.29, SD = 14.47) and female students (M = 77.13, SD = 18.95). Thus, the null hypothesis (H_{01}) was accepted, indicating both genders exhibit similar mean test anxiety scores toward science.

Table 4

Scores of Students' Test Anxiety in Science of Urban and Rural students

Locale	N	Mean	S.D.	df	t	Sig. (2-tailed)
Urban	260	76.97	17.18	438	−0.356	0.722
Rural	180	77.56	16.51			

Level of significance $= \boldsymbol{\alpha} = 0.05$.

Table 4, t (438) = −0.356, ρ = 0.722, indicates no significant difference in test anxiety scores between urban (M = 76.97, SD = 17.18) and rural students (M = 77.56, SD = 16.51). The null hypothesis (H_{02}) was accepted, showing similar test anxiety levels for both groups in science.

Table 5

Scores of Students' Academic Achievement in Science of Males and

Females Students

Gender	N	Mean	S.D.	df	t	Sig. (2-tailed)
Male	215	394.84	75.32	438	−3.718	0.000
Female	225	367.65	77.94			

Level of significance $= \boldsymbol{\alpha} = 0.05$.

Table 5, t (438) = −3.718, ρ = 0.000, reveals a significant difference in achievement scores between males (M = 394.84, SD = 75.32) and females (M = 367.65, SD = 77.94). The null hypothesis (H03) was rejected, indicating male students outperform females in science achievement.

Table 6

Scores of Students' Academic Achievement in Science of Urban and Rural Students

Locale	N	Mean	S.D.	df	t	Sig. (2-tailed)
Urban	260	375.22	83.45	438	−1.926	0.054
Rural	180	389.19	68.16			

Level of significance $= \boldsymbol{\alpha} = 0.05$.

Table 6, t (438) = −1.926, ρ = 0.054, shows a significant difference in achievement scores between urban (M = 375.22, SD = 83.45) and rural students (M = 389.19, SD = 68.16). The null hypothesis (H04) was rejected, indicating rural students have higher science achievement scores than urban students.

Table 7

Relationship between Students' Test Anxiety in Science and their Academic Achievement in Science

Variable	N	Mean	S.D.	df	r-Cal	r-tab	Remark
Students' Test Anxiety in Science	440	77.21	16.89	438	0.023	0.1129	*
Students' Academic Achievement in Science	440	380.94	77.79				

Level of significance $= \boldsymbol{\alpha} = 0.05$.

Table 7 shows that the calculated r-value (0.023) is less than the critical r-value (0.1129) at a 0.05 significance level, suggesting no significant

relationship between test anxiety and academic achievement in science. Consequently, the null hypothesis (H05) was accepted, confirming no meaningful connection between these variables.

Table 8

Relationship between Students' Test Anxiety in Science and their Academic achievement in Science of Males

Variable	N	Mean	S.D.	df	r-Cal	r-tab	Remark
Students' Test Anxiety in Science	215	77.29	14.47				
Students' Academic Achievement in Science	215	394.84	75.32	213	0.127	0.1593	*

$P<$ 0.05, ($*$ = Result is significant at 0.05 level)

Table 8 shows that the calculated r-value (0.127) is less than the critical r-value (0.1593) at the 0.05 significance level, indicating no significant relationship between test anxiety and academic achievement among male students. Thus, the null hypothesis (H06) was accepted, confirming no significant link between the two variables for males.

Table 9

Relationship between Students' Test Anxiety in Science and their Academic Achievement in Science of Females

Variable	N	Mean	S.D.	df	r-Cal	r-tab	Remark
Students' Test Anxiety in Science	225	77.13	18.95				
Students' Academic Achievement in Science	225	367.65	77.94	223	0.000	0.1593	*

$P<$ 0.05, ($*$ = Result is significant at 0.05 level)

Table 9 shows that the calculated r-value (0.000) is less than the critical r-value (0.1593) at the 0.05 significance level, showing no significant relationship between test anxiety and academic achievement among

female students. The null hypothesis (H07) was accepted, confirming no significant link between the two variables for females.

Table 10

Relationship between Students' Test Anxiety in Science and their Academic Achievement in Science at Urban Schools

Variable	N	Mean	S.D.	df	r-Cal	r-tab	Remark
Students' Test Anxiety in Science	260	76.97	17.18				
Students' Academic Achievement in Science	260	375.22	83.45	258	0.015	0.11	*

$P< 0.05$, ($*$ = Result is significant at 0.05 level)

Table 10 shows that the calculated r-value (0.015) is less than the critical r-value (0.11) at the 0.05 significance level, indicating no significant relationship between test anxiety and academic achievement among urban students. The null hypothesis (H08) was accepted, confirming no significant link between the two variables for urban students.

Table 11

Relationship between Students' Test Anxiety in Science and their Academic achievement in Science at Rural Schools

Variable	N	Mean	S.D.	df	r-Cal	r-tab	Remark
Students' Test Anxiety in Science	180	77.56	16.51				
Students' Academic Achievement in Science	180	389.19	68.16	178	0.702	0.13	*

$P< 0.05$, ($*$ = Result is significant at 0.05 level)

Table 11 shows that the calculated r-value (0.702) exceeds the critical r-value (0.13) at the 0.05 significance level, revealing a significant relationship between test anxiety and academic achievement among rural students. The null hypothesis (H09) was rejected, confirming a

significant link between the two variables for rural students.

Table 12

Descriptive Analysis of Test Anxiety Scores of Males and Females in Urban and Rural Schools

	Male			Female		
Locale	N	Mean	S.D.	N	Mean	S.D.
Urban	105	78.90	14.49	155	76.20	19.82
Rural	110	75.76	14.85	100	78.80	18.30

Table 12 shows that Urban male students had higher mean test anxiety scores (78.90) than urban females (76.20), while rural females scored higher (78.80) than rural males (75.76). Urban males performed better than females, whereas rural females outperformed males. Gender differences were also influenced by school type (See Figure 1).

Figure 1:

Graphical presentation of the Interaction Effect of Gender and Locale on mean Test Anxiety scores

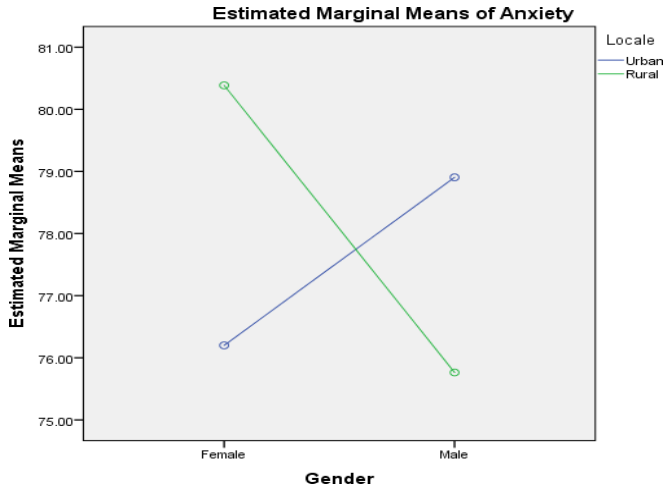

Table 13

Summary of Two-Way ANOVA for Interaction Effect on Test Anxiety Scores

Source	df	SS	MS	F	Sig.
Group*Gender	1	1364.162	1364.162	4.565	0.033
Residual	436	130278.288	298.803		

Table 13 shows that the interaction effect of gender and locale on test anxiety was significant ($F = 4.565$, $\rho = 0.033$). Thus, the null hypothesis (H_{10}) was rejected, confirming the influence of both factors on test anxiety.

Table 14

Descriptive Analysis of Academic Achievement Scores of Males and Females in Urban and Rural Schools

	Male			Female		
Locale	N	Mean	S.D.	N	Mean	S.D.
Urban	105	396.62	80.68	155	343.47	86.87
Rural	110	390.91	72.00	100	392.51	65.35

Table 14 shows that Urban males had higher mean achievement scores (396.62) than urban females (343.47), while rural females scored higher (392.51) than rural males (390.91). Urban males outperformed females, and rural females outperformed males, with locale affecting both genders differently (See Figure 2).

Figure 2:

Graphical presentation of the Interaction Effect of Gender and Locale on mean Achievement scores

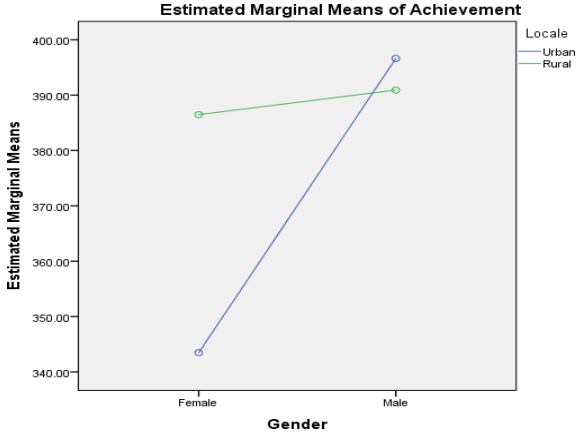

Table 15

Summary of Two-Way ANOVA for Interaction Effect on Test Anxiety Scores

Source	df	SS	MS	F	Sig.
Group*Gender	1	60314.786	60314.786	9.848	0.002
Residual	436	2670318.935	6124.585		

Table 15 shows that the interaction effect of gender and locale on academic achievement was significant ($F = 9.848$, $\rho = 0.002$). Therefore, the null hypothesis (H_{11}) was rejected, confirming the combined influence of gender and locale on academic performance.

Conclusions and Discussion

This study explored the relationship between science test anxiety and academic achievement among 440 secondary students from 13 public and private schools in Islamabad. Test anxiety was measured using a 5-point Likert scale, and academic achievement was based on board exam scores.

Findings revealed that no significant gender or locale-based differences in test anxiety were found, contradicting Fareo (2019). Male students outperformed females in science, aligning with Singh (2011), and urban students scored higher than rural students.

No significant relationship was found between test anxiety and academic achievement overall or by gender, contradicting Kaya (2004) and Chapel et al. (2005). However, rural students showed a significant link between anxiety and achievement. Gender and locale significantly influenced both test anxiety and academic achievement.

The study found that most students had a neutral attitude towards test anxiety in science, with very few showing negative responses and almost none displaying positive responses. Both male and female students had similar mean scores for test anxiety, regardless of locale. However, significant differences were observed in academic achievement: male students outperformed females, and urban students had higher scores than rural students. To address these disparities, targeted interventions by educators and policymakers are recommended.

The study concluded that there is no significant relationship between students' test anxiety and academic achievement in science, regardless of gender or locale. However, gender and locale were found to

have an effect on both test anxiety and academic achievement in science.

Recommendations

Based on the findings, the following recommendations are made:

- Science teachers should adopt teaching methods that foster positive attitudes towards test anxiety in students at the secondary level.
- Curriculum designers should carefully select and organize science concepts to meet the diverse needs and aspirations of students.
- Teachers should guide students on managing test anxiety during exams, emphasizing that a moderate level of anxiety can serve as a motivator.
- Future researcher may investigate strategies to reduce test anxiety and its relationship with achievement in subjects like physics, chemistry, and mathematics, aiming to create a more inclusive learning environment.
- Qualitative methods such as interviews and focus groups could be used in future research to gain deeper insights into students' test anxiety experiences in biology.

References

Akca, F. (2011). The relationship between test anxiety and learned helplessness. Social Behaviour and Personality: *An International Journal, 39* (1), 101-111.

Al-Atram, A. A. (2015). The relationship between parental approach and anxiety. *Arch Depress Anxiety, 1* (1), 6-9.

Asadullapoor, A. Fati, L., & Gharaee, B. (2010) Metacognitive anxiety and the immediate and delayed judgment of learning. *Journal Psychist clinic Psychol*, *16* (4), 412–419.

Bedewy, D., & Gabriel, A. (2015). Examining perceptions of academic stress and its sources among university students: The perception of academic stress scale. *Health Psychology Open*, *2*(2), 2055102915596714.

Bourne, E. J. (2005). *The anxiety & phobia workbook* (4th ed.). Oakland, CA: New Harbinger Publications.

Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary educational psychology*, *27*(2), 270-295.

Chapell, M. Blanding, Z. Silverstein, M. (2005) Test anxiety and academic performance in undergraduate and graduate students. *Journal Educ Psychol*, *97* (2), 268–274.

Dawood, E., Al Ghadeer, H., Mitsu, R., Almutary, N., & Alenezi, B. (2016). Relationship between test anxiety and academic achievement among undergraduate nursing students. *Journal of Education and Practice, 7* (2), 57-65.

De Civita, M., Pagani, L., Vitaro, F., & Tremblay, R. E. (2004). The role of maternal educational aspirations in mediating the risk of income source on academic failure in children from persistently poor families. *Children and Youth Services Review, 26*(8), 749-769.

Dinga J. N., Mwaura A. M., and Ng'ang'a M. W. (2018). Relationship between achievement goal orientation and academic achievement among form three students in Kiambu County, Kenya. *International Journal of Education and Research*, *6*(4), 53-68.

Dodeen H. M., Abdulfattah F., and Alshumrani S. (2014). Test-taking skills of secondary students: the relationship with motivation, attitudes, anxiety, and attitudes towards tests. *South African Journal of Education, 34* (2), 250-268.

Donnelly R. (2009). Embedding interaction within a bend of learner-centric pedagogy and technology. *World Journal on Educational Technology, 1* (1), 6-29.

Duraku, Z. H. (2017). Factors influencing test anxiety among university students. *The European Journal of Social & Behavioral Sciences, 18* (1), 23-25.

Fareo, D.O. (2019). Study attitude and academic achievement in biology at the secondary school level in Mubi Metropolis of Adamawa state. *International Journal Scientific and Research Publications, 9* (8), 333-340.

Government of Pakistan. (2009b). *National Education Policy 2009*. Islamabad, Pakistan: Ministry of Education.

Habibullah, S., & Ashraf, J. (2013). Factors affecting academic performance of primary school children. *Pakistan Journal of Medical Research*, *52*(2), 47- 52.

Hanoski, T. (2002). Test anxiety: What it is and how to cope with it. Retrieved from www.drhanoski.com.examanxiety.html.

Hodge, G. M., McCormick, J., & Elliott, R. (1997). Examination-induced distress in a public examination at the completion of secondary schooling. *British Journal of Educational Psychology*, *67*(2), 185-197.

Kahan, L. M., (2008). The correlation of test anxiety and academic performance of community college students. Capella University. United State. Pro Quest LLC journal. https://www.proquest.com/openview/7a28865ed77fd3be2394f0c856594ec9/1

Kavakci, O., Semiz, M., Kartal, A., Dikici, A., and Kugu, N. (2014). Test anxiety prevalence and related variables in the students who are going to take the university entrance examination. *Dusunen Adem the Journal of Psychiatry and Neurological Sciences, 27*(4), 301-307.

Kaya, A. (2004). Test anxiety and psychopathology in fifth-grade students in Turkey. *International Journal of Educational Reform*, *13*(1), 19-26.

Khalid, R., and Hasan, S. S. (2009). Test anxiety in high and low achievers. *Pakistan Journal of Psychological Research*, *24*(3-4), 97-114.

Kouzma, N. M., & Kennedy, G. A. (2004). Self-reported sources of stress in senior high school students. *Psychological reports*, *94*(1), 314-316.

Legese, A. (2014). *The Relationship between Test Anxiety and Academic Performance at Addis Ababa University Institute of Technology*. Unpublished M.A Thesis Addis Ababa University, Addis Ababa.

Ndirangu, G. W., Muola, J. M., Kithuka, M. R., & Nassiuma, D. K. (2009). An investigation of the relationship between test anxiety and academic performance in secondary schools in Nyeri District, Kenya. *Global journal of educational research*, *8*(1-2), 1- 7.

Nicholson, A. M. (2009). Effects of test anxiety on student achievement (ACT) for college- bound students. Dissertation Abstract International. DAI-A-70/07, AAT 3366126.

Oludipe, B. (2009). Influence of test anxiety on performance levels on numerical tasks of secondary school physics students: *Academic Leadership: Online Journal*, *7*(4), 300- 319.

Oluoch, J. N., Aloka, J. O., and Odongo, B. C. (2018). Test anxiety beliefs as a predictor of students' achievement in chemistry in public secondary schools in Kenya. *International Journal of Psychology and Behavioural Sciences*, *8*(4), 70-76.

Putwain, D. (2008b). Do examination stakes moderate the test anxiety–examination performance relationship? *Educational Psychology*, *28*(2), 109-118.

Putwain, D. W. (2008a). Test anxiety and GCSE performance: The effect of gender and socio-economic background. *Educational Psychology in Practice*, *24*(4), 319-334.

Rana, R., & Mahmood, N. (2010). The relationship between test anxiety and academic achievement. *Bulletin of Education and Research*, *32* (2), 63-74.

Sarason IG, Sarason BR. Test anxiety. In: Leitenberg H, editor. Handbook of Social and Evaluative Anxiety. New York: Plenum Press; 1990. p. 475-96.

Shishigu, A. (2018). Mathematics anxiety and prevention strategy: an attempt to support students and strengthen mathematics education. *Mathematics Education Trends and Research*, *1*(1), 1-11.

Singh, Y.G. (2011). Academic achievement and study habits of higher secondary students. *International Referred Research Journal*, *3*(27), 2-18.

Spielberger, C. D. (1980). *The Test Anxiety Inventory*. Palo Alto, C.A; Consulting Psychology Press.

Subramani, C., & Venkatachalam, J. (2019). Parental expectations and its relation to academic Stress among school students. *International Journal of Research and Analytical Reviews (IJRAR)*, *6* (2), 95-99.

von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. *Journal of Affective Disorders*, *227*, 483-493.

Yildirim, A. (2010). Cultural factors affecting test anxiety in students. *International Journal of Educational Development*, *9*(2), 77-89.

Zahrakar, K., (2008). *Stress Consultant (1st ed.).* Tehran: Bal University Publication.

Zeidner, M., & Mathews, G. (2005). Evaluation anxiety. In ed. A.J. Elliot and C.S. Dweck (Eds.), *Handbook of competence and motivation*, 141–163. London: Guildford Press.

Citation of this Article: Ahmad, S., Jamil, S. & Fatima, S. (2024). Relationship between test anxiety and academic achievement of students in science at secondary level, in Islamabad. *Journal of Contemporary Teacher Education, 8*, 169-186.