

Gender Differences in Test Anxiety and Academic Performance of Medical Students

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Abstract The current research investigates gender differences in test anxiety level and academic performance of medical students. A sample of 150 medical students (75 males and 75 females) was drawn from the Services Institute of Medical Sciences (SIMS) within the age range of 17-24 years. Purposive sampling technique was used. *Test Anxiety Inventory (TAI) by Professor Emeritus Dr. Charles D. Spielberger (1980) was individually administered to the participants. The author granted written permission for the use of TAI in this research. The results suggested that the female medical students reported significantly higher test anxiety level as compared to the male medical students ($t = -5.02$, $df = 148$, $**p < .01$). Moreover, the results suggested that the male medical students achieved statistically significant higher GPAS as compared to the female medical students ($t = 3.66$, $df = 148$, $**p < .01$). Furthermore, significant negative relationship was found between test anxiety and academic performance of medical students ($r = -.21$, $**p < .01$). The findings of this research have implications for helping professionals and academia in addressing the test anxiety of the students in higher education so that timely and effective counseling and therapeutic interventions could be introduced in medical colleges and universities.

Keywords test anxiety, academic performance, medical students

1. Introduction

Test anxiety is an overwhelming feeling of disturbance and distress among the students around the world. It is a type of performance problem just like when some people get nervous speaking to large crowds or trying something new. Test anxiety can be a devastating problem for many college and university students; because it may impair their performance and well being in the long run (Culler & Holahan, 1980; Rafiq, Ghazal & Farooqi, 2007). Cassady and Johnson (2002) found that cognitive test anxiety exerts a significant stable and negative impact on students' academic performance.

Ian and Owens (1996) state that test anxiety or performance anxiety often includes such cognitive, affective and behavioral responses that will result in poor performance and probably failure in an evaluative situation. Cohen (2004) argues that performance anxiety (especially, test anxiety) may adversely affect people in every field of life, whenever people of all ages have to be evaluated, assessed and graded with regard to their abilities, achievements or interests. Birenbaum and Nasser (1994) propose that test anxiety has

become one of the most disruptive factors in school and other settings where testing is performed.

Dusek (1980) describes test anxiety as "An unpleasant feeling or emotional state that has both physiological and behavioral components and that is experienced in formal testing or other evaluative situations" (p.88). Hagtvet and Johnsen (1992 as cited in Anastasi and Urbina, 1997) pointed out that chronically high level of anxiety exerts a negative effect on school learning and intellectual development. They further argue that overwhelming test anxiety interferes with both the acquisition and the retrieval of information by students of all grades across the globe.

Carver and Scheier (1984 as cited in Zeidner, 1998) argues that "Test anxious persons are likely to have strong chronic doubts about either producing adequate performance on exams, being evaluated favorably by significant others or being able to control their feelings so that they do not feel overwhelmed by them" (p.78).

Test anxiety is a serious problem for many students it has been described as the most powerful obstacle to learning in an educational setting (Matthew, Tracy & Scott, 2000). Hambree (1988 as cited in Everson and Millsap 1991) stated that it has been linked to fear of negative evaluation, dislike of testing and less effective study skills and has been identified as one of the factors that impair academic performance.

The effect of test anxiety on academic performance has been thoroughly investigated by many researchers (Cassady

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& Johnson, 2002; Rezazadeh & Tavakoli, 2009; Wine, 1971). Generally, the study of the relationship between test anxiety and academic achievement began in the early 1900's (McDonald, 2001). The comprehensive reviews by Hambree (1988) studies showed that test anxiety caused poor performance. It implied that test anxiety had a negative relation with student's performance. Therefore, the high-test anxious students tended to score lower than low-test anxious students. This result was supported by the findings of various studies (Eman & Farooqi, 2005; McDonald, 2001).

Spielberger and Vagg (1995) viewed that test anxiety as a situation-specific rather than a trait anxiety. Trait anxiety is a constant personality characteristic; whereas state anxiety is a temporary emotional state (Spielberger et al., 1978). According to Spielberger and Vagg (1995) test-anxious individual is more prone to react with excessive anxiety (such as, worry, negative thoughts, nervousness and physiological arousal) across evaluative situations. It may be argued that the test-anxious individual experience more intense levels of state anxiety in each evaluative situation. State anxiety is viewed as the emotionality component (such as, the physiological symptoms) of test anxiety. The high level of state anxiety among the test-anxious individual in an evaluative situation activates worry conditions stored in one's memory. Consequently, these worry conditions interfere with the test-anxious individual's performance on a test (Zeidner, 1998).

Hebb (1966) proposed a theory on arousal "which states that there are ideal levels of arousal for various activities. It further assumes that people try to keep arousal near these ideal levels" (as cited in Coon, 2001, p.415). Arousal refers to activation of the body and the nervous system. Arousal is low during sleep; it is moderate during normal daily activities, it is high at times of excitement, emotion or panic. Arousal is zero at death. This theory assumes that we become uncomfortable when arousal is too low or when it is too high. Performance is usually best when arousal is moderate. It may be argued that when students are least anxious for an essay exam; their arousal level is too low and then their performance will suffer. However, if their state of anxiety or panic about the test (arousal level) is too high; then their performance will be poor (Coon, 2001).

A review of current literature shows that test anxiety is a dynamic, progressive and sometimes controversial area for students. Hambree's (1988) research findings suggest that test anxiety is a key factor in undermining student's academic performance. Chapell, Benjamin, Michael, Masami, Brian, Aaron et al (2005) investigated relationship between test anxiety and academic performance of the undergraduate and graduate students and found a significant but small inverse relationship between test anxiety and grade point average (GPA) in both groups.

Culler and Holahan (1980) investigated the relationship of test anxiety and academic performance in college students. They found a significant decrement in GPA associated with test anxiety. High test-anxious students were also found to have poorer study skills. For high test-anxious group, quality

of study habits and amount of study time were positively related to academic performance; whereas missing classes and postponement of exams were inversely related to performance.

Kassim, Hanafi and Hancock (2008) conducted a research to explore test anxiety and its consequences on academic performance among university students. The results of this research suggested that test anxiety was negatively related to academic performance.

Farooqi, Rafiq and Ghazal (2007) compared the level of test anxiety in students studying in semester system with those of annual system. Their findings indicate no significant difference in test anxiety among students studying under the two educational systems.

Sharma and Sud (1990) found that female students experience higher levels of test anxiety than do males irrespective of their cultural background. The study involved students from four Asian cultures. They further argue that the major fundamental factor involved in the gender-related differences in test anxiety among students may be a greater role expectation conflict among females than among male students.

Sarason (1972) found the interfering effect of test anxiety and the facilitating effect of general anxiety on academic work. Sarason's findings confirmed the facilitating influence of general anxiety on course grade. Richard (2008) found the differential effects of anxiety in terms of the interaction between anxiety and grade level, over learning, nature of the tasks and intellectual ability.

Vogel and Collins (2002) investigated the effect of test anxiety on academic performance. The students with high-test anxiety as well as those students with low-test anxiety showed lower academic performance. Moreover, those students with moderate levels of test anxiety will performed the best.

The current research explored the following research questions:

- i. Is there any gender difference in test anxiety level of medical students?
- ii. Is there any gender difference in academic performance of medical students?
- iii. Is there any relationship between test anxiety and academic performance of medical students?

2. Method

Research Design

The survey research design was used in this research.

Sample and Sampling Strategy

Non-probability purposive sampling technique was used. The following inclusion criteria were used:

1. Enrollment in a Services Institute of Medical Sciences (SIMS) as full-time medical student was a prerequisite for inclusion in the sample.
2. Availability and willingness of the participants.

The purposive sample was composed of 150 medical

students (75 male students and 75 female students) who met the inclusion criteria and participated in this research. The sample was drawn from Services Institute of Medical Sciences (SIMS) Lahore with the endorsement of the Principal. The teachers cooperated in the collection of the data from the research participants according to the above-mentioned criteria. Further demographic characteristics of the sample are given in Table 1.

Table 1. Demographic Characteristics of the Sample (N = 150)

Characteristics	Sample (N = 150)		Male Students (n = 75)		Female Students (n = 75)	
	Freq	Percent	Freq	Percent	Freq	Percent
Age						
18-20	98	65%	60	80%	38	51%
21-24	52	35%	15	20%	37	49%
Birth order						
1	53	36%	19	25%	34	45%
2	35	23%	21	28%	14	19%
3	30	20%	20	26%	10	13%
4	8	5%	5	7%	3	4%
5	11	7%	3	4%	8	11%
6	9	6%	7	10%	2	3%
7	4	3%	0	0	4	5%

Instrument

Following instruments were used:

1. Demographic Information Form
2. *Test Anxiety Inventory (Spielberger, 1980)
3. Previous Academic Grades.

2.1. Demographic Information Form

Demographic Information Form was used to gather information about age, education, occupation, gender, marital status, number of siblings, birth order, father's education, father's profession, mother's education, mother's profession, family monthly income, number of dependents.

2.2. *Test Anxiety Inventory (TAI)

*The Test Anxiety Inventory (Spielberger, 1980) is a copyrighted instrument to measure test anxiety level of an individual. Professor Emeritus Dr. Charles D. Spielberger developed TAI based upon extensive and intensive research work (Spielberger, & Vagg, 1995; Bembenuddy, 2009). Spielberger (1980) argues that the level of test anxiety of an individual is determined by the total score on TAI. TAI consists of 20 items and each item has four options ranging from Almost Never to Almost Always. The respondent is asked to pick one of the four options which are scored, as follows:

Optional Responses	Scores
Almost Never	1
Sometime	2
Often	3
Almost Always	4

Spielberger et al (1978) argue that the internal consistency of the Test Anxiety Inventory is $\alpha .86$ and it is significantly correlated with other commonly used anxiety measures. Thus, TAI is a reliable and valid instrument for assessing test anxiety. The four-point scale of the TAI is used to determine the frequency of experiencing the specific symptoms of anxiety in test situations only rather than the trait anxiety. Written permission was sought from the author for use of this inventory in the current research project.

2.3. Academic Performance

In educational institutions, success is measured by academic performance or how well a student meets standards set out by the local government and the institution itself. In the current research project, the student's academic performance was determined by previously achieved grades and percentages of their Matric, F.Sc and Entry Test marks.

The following standard grading system was used:

Percentage of Marks	Grades
80% and above	A+
70% and above but below 80%	A
60% and above but below 70%	B
50% and above but below 60%	C
40% and above but below 50%	D
Below 40% to minimum pass marks	E

Procedure

Official permission was sought from the Principal of Services Institute of Medical Sciences (SIMS) Lahore for data collection. Before administration of Test Anxiety Inventory (TAI), the participants were briefed about the nature and purpose of the study. Rapport was established by assuring them of the confidentiality about their personal information which would be used for research purpose only and kept confidential. A consent form was individually administered to each participant. TAI was individually administered to all the research participants to determine their test anxiety level. Moreover, the participants reported their grades in the very last exam.

Statistics

The SPSS (version 14) was used to perform independent sample t-test to determine gender differences in test anxiety level and academic performance of the medical students. Furthermore, Pearson Product Moment Correlation coefficient was performed to determine the relationship between test anxiety and academic performance of the research participants.

3. Results

The results given in Table 2 indicate significant gender differences in the test anxiety level of medical students ($t = -$

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5.02, $df = 148$, $**p < .01$). The female students reported higher level of test anxiety as compared to the male students (Mean = 43.89 and Mean 36.14, respectively).

Table 2. Gender Differences in Test Anxiety Level of Medical Students (N = 150)

Test Anxiety Scores	Mean	SD	t
Male Students (n=75)	36.14	8.83	- 5.02**
Female Students (n=75)	43.89	10.02	

$t = -5.02$, $df = 148$, $**p < .01$

The results given in Table 3 indicate significant gender differences in the academic performance of medical students ($t = 3.66$, $df = 148$, $**p < .01$). The male students showed higher grades as compared to the female students (Mean= 4.72 and Mean 3.97, respectively).

Table 3. Gender differences in Academic Performance of Medical Students (N = 150)

Academic Performance	Mean	SD	t
Male Students (n=75)	4.72	1.47	3.66**
Female Students (n=75)	3.97	.95	

$t = 3.66$, $df = 148$, $**p < .01$

The result given in Table 4 ($r = -.21$, $**p < .01$) suggest significant negative relationship between test anxiety and academic performance of medical students.

Table 4. Relationship between Test Anxiety and Academic Performance (N=150)

	Test Anxiety
Academic Performance	-.21**

$r = -.21$, $**p < .01$

The results given in Table 5 and 6 suggest insignificant relationship between test anxiety and academic performance in the sub-sample of male and female medical students ($r = -.09$, $p > .05$ and $r = -.14$, $p > .05$, respectively). It may be argued that these finding may be due to the reason that the size of the sub-groups of female students and male students is relatively smaller as compared to the total sample.

Table 5. Relationship between Test Anxiety and Academic Performance of Male Students (n=75)

	Test Anxiety
Academic Performance	-.09

$r = -.09$, $p > .05$

Table 6. Relationship between Test Anxiety and Academic Performance of Female Students (n = 75)

	Test Anxiety
Academic Performance	-.14

$r = -.14$, $p > .05$

4. Discussion

The findings of the current research suggest that test anxiety adversely affects the student's performance and there are significant gender difference in test anxiety level and academic performance of medical students. Furthermore, the

female students reported higher level of test anxiety and lower grades as compared to the male students. These findings are consistent with the previous research findings of Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi et al (2005); El-Zahhar and Hocevar (1991); Kassim, Hanafi and Hancock (2008); McDonald (2001); Pintrich and Garcia (1991); Schonwetter (1995); Sharma and Sud (1990); and Stricker, Rock and Burton (1993).

Furthermore, significant negative relationship was found between test anxiety and academic performance which might have contributed to lower grades among the female medical students. These findings are consistent with the earlier research findings of Culler and Charles (1980); and Kassim, Hanafi and Hancock (2008).

Sarason (1984) argues that test anxiety is a major devastating factor for all academic performance from the elementary level to the university level. This view is also supported by the findings of Spielberger and Vagg (1995) and Tobias (1980) which suggest that test anxiety is one of the variables that are most commonly related to poor performance among students.

The gender differences in test anxiety level may be attributed to different social roles assigned to men and women and increased emotional vulnerability of women to this difference in their roles. Another reason may be that the Pakistani medical students are more prone to test anxiety; probably due to the reason that the Pakistani patriarchal society discourages higher education (especially medicine) for women and considers them intellectually inferior to men as result of prevalent stereotypical gender role assignments. Consequently, the female medical students often tend to experience higher level of test anxiety than their male counterparts; probably because of feelings of insecurity and threat to their self-esteem posed by the examinations and evaluation for achievement of MBBS degree.

5. Conclusions and Implications

It is concluded that there are statistically significant gender differences in test anxiety level and academic performance of medical students. The female Pakistani medical students reported higher level of test anxiety; but lower grades as compared to their male counterparts; probably due to their traditional gender role identification and role assignments in the patriarchal Pakistani society. Thus, it may be concluded that there is a significant negative relationship between test anxiety level and academic performance of the medical students. The findings of this research have implications for helping professionals and academia in addressing the test anxiety of the students in higher education so that timely and effective gender-sensitive counseling and therapeutic interventions could be introduced in medical colleges and universities.

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