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RESEARCH ARTICLE

PREVALENCE OF TEST-ANXIETY AND ITS RELATIONSHIP WITH ACADEMIC ACHIEVEMENT: FINDINGS FROM NURSING, PHYSICAL THERAPY, LABORATORY AND RADIOLOGY STUDENTS IN TAIF CITY, SAUDI ARABIA

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Abstract

Background: Test anxiety is most commonly associated with students taking informational tests at all levels of education and pupils with learning disabilities.Students often experience extreme tension and anxiety during tests, possibly as a result of pressure to perform well, among other variables; as a result, test anxiety has become a prevalent problem throughout time.Test anxiety can develop as a result of a student's fear of failing or performing poorly on the examination. Test anxiety is also caused by sporadic test preparation, high-stakes exams, and discomfort with the testing scenario.

Methodology: This cross-sectional study was conducted among 449 students from both branches, male and female, from all departments of the college of applied medical science (nursing, laboratory, radiology and physiotherapy) in Taif citythrough the academic year of 2017-2018. It was aimed to evaluate the prevalence of test-anxiety among students from the four departments, to see is there a relationship between test anxiety and academic achievement of the students and are there differences between genders. Test Anxiety Inventory (TAI) scale have been used for measuring test anxiety.

Results: The total prevalence of anxiety among students was (86.41%), it was (85.56%) for male students and (87.79%) for female students. The total anxiety prevalence of laboratory department was (88.50%), it was (88.90%) for male students, and (88.00%) for female students. The total anxiety prevalence of physical therapy department was (88.89%), it was (91.04%) for male students, and (86.00%) for female students. The total anxiety prevalence of nursing department was (83.19%), it was (80.95%) for male students, and (89.66%) for female students. The total anxiety prevalence of radiology department was (84.91%), it was (82.54%) for male students, and (88.37%) for female students.

Conclusion: This study shows a high prevalence of test anxiety among our students comparing with other studies that showed less prevalence of such anxiety. According to that, more researches need to becarried out to elaborate the reasons beyond this high prevalence.

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Introduction:-

Test anxiety is most commonly associated with students taking informational tests at all levels of education and pupils with learning disabilities. Additionally, test anxiety might occur while a patient is anticipating a medical procedure or waiting for the results of investigations. Referrals to other evaluation situations, such as activities, conversations, and presenting events, are also made using the notion.

Excessive anxiety about a number of events or activities, happening more days than not for at least 6 months, is described as anxiety (Diagnostic and Statistical Manual of Mental Disorders - DSM-IV, 2000.).

There is no specific coding for test anxiety in the DSM-IV or the International Classification of Diseases (ICD) [5]. Two recent reviews classified it as both a specific phobia (LeBeau et al., 2010) and a social phobia (Bögels et al., 2010), [1] which is defined as a fear of one or more social or performance situations in which the person is exposed to unfamiliar people or may be scrutinized by others and fears acting in an embarrassing manner (DSM-IV, 2000). Test anxiety, on the other hand, differs from general anxiety in that it occurs in specific settings.

Students often experience extreme tension and anxiety during tests, possibly as a result of pressure to perform well, among other variables; as a result, test anxiety has become a prevalent problem throughout time (Spielberger & Vagg, 1995)[2].

Test anxiety can develop as a result of a student's fear of failing or performing poorly on the examination.[3] Test anxiety is also caused by sporadic test preparation, high-stakes exams, and discomfort with the testing scenario.

Another significant distinction within the test anxiety structure is the distinction between common tendency to experience anxiety associated to examination taking and short-term anxiety events experienced in a specific examination taking circumstance. The distinction between trait and state emotions of test anxiety, first described by Cattell (1950), is used to define the former type as trait test anxiety. An individual's tendency to develop anxiety connected to exams is known as trait test anxiety.When a trait test-anxious individual is confronted with a test or examination, this tendency can manifest as a quick state anxiety trial. [4]

Test anxiety appears to be a composite of various factors that are influenced by examination-related stress and manifest as anxiety. Sarason proposed one of the most theoretical conceptual frameworks (1984). He claims that worrying about failing exhausts cognition, which then impacts attention and working memory, limiting a student's ability to concentrate fully. All of these outcomes of failure-related thinking will result in lower performance on difficult activities, while easy tasks would be unaffected. In addition, he claims that test anxiety is a multi-faceted construct with cognitive, emotional, behavioral, and physiological components. [5]

As a result of fatigued cognition, students with test anxiety may experience worse concentration and easy distractibility, as well as trouble retaining knowledge.

Perspiration, headache, tachycardia, and, in severe situations, significant gastrointestinal disturbances are some of the physiological signs of test anxiety caused by autonomic system activation.Students may also endure debilitating changes in feelings and mood as a result of test-related stress and anxiety, such as dread and panic, and "sometimes to the point of paralyzing the student with terror (Prato, 2009)" [6].

Another new conceptual framework is the cognitive-motivational model, which was addressed by Perkin (2006). Test anxiety, according to this model, impacts intrinsic drive to learn, information management, study tactics, and self-regulation of studying in addition to cognition. Anxiety, on the other hand, might elicit great inspiration to make an attempt to prevent failing. As a result, anxiety can have a wide range of consequences.Anxiety can encourage more firm study plans and procedures, as well as the application of metacognitive tools like effective time management, depending on the type of assignment. Furthermore, according to the developmental paradigm (Meece et al., 1990; Pekrun, 1992b), anxiety and academic achievement are mutually causative, with anxiety having negative impacts on student performance and bad academic performance causing anxiety before and during tests.As previously stated, the findings of a few longitudinal studies demonstrate that anxiety and performance are related over time via mutual causation (Meece et al., 1990; Pekrun, 1992b; Schnabel, 1998). [4]

Furthermore, high test anxiety is linked to high expectations for high achievement tasks due to the dread of poor performance (Burger, 2006; Carver & Scheier, 1994). Perfectionism is inextricably linked to self-imposed execution constraints. Sumi and Kanda (2002) discovered a link between perfectionism and test anxiety, which Tasdemir (2003), Kirdok (2004), and Hanimoglu (2010) apud Kandemir corroborated (2013).As a result, the higher the self-imposed execution measures, the greater the anxiety of poor performance (von der Embse & Hasson, 2012). [7]

Inconclusion, test anxiety is a serious issue that has an impact on students' cognition, emotions, behavior, and physical health, as well as their academic performance.

Review of Relevant Literature

Many studies have been undertaken to determine the prevalence of test anxiety among undergraduate and graduate students, as well as the association between test anxiety and academic achievement.

Test anxiety was detected in 29.9 percent of German medical students, 40.3 percent of Iranian medical students, 52 percent of Malaysian medical students, 64 percent of Pakistani medical students, 7percent of Taiwanese medical students, and 6 percent of Indian medical students in these studies.[8] There are few research on exam anxiety among college students in our region, the Arab countries.

A total of 311 medical students were enrolled in a study conducted by Mostafa Amr et al. in 2010 to explore the anxiety and depression experienced by medical students in Mansoura medical school and to discover associated risk factors. Depression and anxiety were found to be prevalent in 28.3 percent and 21.2 percent of the population, respectively. Test pressure was one of these risk variables. [9]

Hamza M.Abdulghani et al. (2008) did another cross-sectional study to evaluate the prevalence of stress among medical students and to observe an association between stress levels and academic performance, as well as the sources of their stress. The study included all medical students from the College of Medicine at King Saud University, from year one to year five. He discovered that stress was prevalent in 63 percent of the population, with severe stress accounting for 25% of the population. Females (75.7%) had a higher prevalence of stress (p0.5) than males (57%). [10]According to him, the students' biggest sources of stress were dealing with their coursework (60.3 percent), followed by their family situation (2.8 percent). However, 36.9% of the students said they didn't have any sources of stress. [10]

Ora Peleg (2003) conducted research to investigate variations in test anxiety and self-esteem between teenagers with and without learning impairments (LD), as well as the association between test anxiety and academic accomplishment. He came to the conclusion that children with LD had higher exam anxiety and worse self-esteem than their non-disabled counterparts. Their severe discomfort is likely to affect their academic achievement. [11]

Rizwan Akram and Nasir Mahmood investigated the relationship between test anxiety and academic achievement by randomly selecting 414 students from seven different science departments at a public sector university in Lahore, Pakistan. They discovered a substantial negative association between students' accomplishment scores and their test anxiety levels. Test anxiety is caused more by a cognitive factor (concern) than by affective factors, according to the findings (emotional). As a result, it is determined that test anxiety is one of the causes contributing to students' underachievement and poor performance, but it may be addressed by effective student training in coping with test anxiety-causing circumstances. [12]

Ozan Yüksel Tektaş et al. looked at test anxiety among German medical students (2013). 272 (29.9%) of the 909 first to fifth-year medical students anticipated they would experience test anxiety. [13]

In a study conducted by Onder Kavakci et al. among students who will take the University Entrance Examination in Sivas city center in Turkey, test anxiety was discovered in 48percent of students (n=208) out of 436 students (girls=220, boys=216). Exam anxiety was reported in 40.3 percent of males (n=87) and 55.8% of females (n=121), with a statistically significant difference between them (p0.001). [14]

In a study conducted by Milan LATAS et al., 198 students from Belgrade University School of Medicine from various years were enrolled, with the following results: **1**. Medical students have a moderate level of test anxiety; **2**. Female students have statistically significant more test anxiety than male students; **3**. the most severe symptoms

were in the third year and the least severe symptoms were in the fourth year of studies; **4**. There is no statistically significant difference in the presence of test anxiety symptoms among students who have repeated one of the years of study and ordinary students. [15]

Test anxiety affects between 25–40% of the population in the United States (Cassady, 2010; Cizek & Burg, 2006; Huberty, 2009)[3]. Appropriate ways of quantifying the construct of test anxiety, as well as its impact on academic achievement and standardized examination performance, were the specific topics on which research concentrated to evaluate test anxiety.[16] Furthermore, many studies have linked test anxiety to dread of unfavorable evaluations, insufficient study skills, poor test performance, and perfectionism.

However, college/university students continue to be the focus of the most renowned study on exam anxiety (Conneely & Hughes, 2010). In fact, past research reveals that 10-35 percent of college students have realistically inhibiting levels of test anxiety (Naveh-Benjamin, Lavi, McKeachie, & Lin, 1997; Strumpf & Fodor, 1993), which is negatively correlated to academic achievement (Cassady, 2004; Kennedy & Doepke, 1999). [17]

Anxiety about exams is a concern for many college students in general (Peleg 2009). A student's capacity to proceed through difficult situations may be harmed by a lack of effective study skills and exam anxiety, resulting in poorer test scores and GPAs (Bembenutty, 2009; Chappell et al., 2005). [18]

Methodology:-

This cross-sectional study was conducted among 449 students from both branches, male and female, from all departments of the college of applied medical science (nursing, laboratory, radiology and physiotherapy) in Taif citythrough the academic year of 2017-2018. It was aimed to evaluate the prevalence of test-anxiety among students from the four departments, to see if there is a relationship between test anxiety and academic achievement of the students and any differences between genders.

Test Anxiety Inventory (TAI) scale have been used for measuring test anxiety.

The Test Anxiety Inventory (TAI) is an individually administered normative measure of test anxiety (Spielberger et al., 1980). Consisting of 20 items, participants rated their responses on a Likert-type scale of 1-4, with responses ranging from Almost Never to Almost Always. The scores possible range from a minimum of 20 to a maximum of 80. The TAI produces an overall anxiety score as well as scores for both Emotionality and Worry subscales.

Demographic Variables were developed by the researcher. They were comprised of information regarding a student's gender, department, semester and achievement scores (Achievement scores were verified by the officials of concerned departments).

Statistical analysis

All statistical measures were performed using the statistical package for social studies (SPSS) version 16. One-sample t test was used to calculate the difference between the assumed and actual mean in the Test anxiety inventory scales. As the participants rated their response on a Lickert-type scale of 1-4, and the minimum value equal 8 and the maximum value equal 32 so that the assumed mean equal 20 for the TAI emotionality and worry subscales. While the assumed mean of the TAI total score equal 50, that is because it's minimum value equal 20 and the maximum value equal 80.

One way ANOVA was used to examine the difference between the students inthe TAI total score, TAI emotionality subscale, and TAI worry subscale according to their department (laboratory, physical therapy, nursing and radiology),and GPA level (A+, A, B+, B, C+, C, D+ and D). Independent t-test was used to examine the effect of gender on the TAI total score, TAI emotion subscale, and TAI worry subscale. The level of significance was set at $p < 0.05$ for all statistical tests.

Results:-

Effect of tests on the test anxiety inventory scales

The descriptive statistics of TAI emotionality and worry subscales and TAI total score are illustrated in table 1.There was no significant difference between the actual mean of the TAI emotionality subscale (E) and assumed mean ($p > 0.05$).The actual mean of TAI worry subscale was significantly lower than the assumed mean ($p < 0.05$).

However, there was no significant difference between the actual mean of TAI total score and the assumed mean (p> 0.05).

Table 1:- The values of TAI emotion, worry subscales and TAI total score.

Scale	Number	Mean ± SD	p value
TAI emotion	449	20.16 ± 4.05	0.394
TAI worry		19.27 ± 4.12	0.001
TAI total score		48.89 ± 8.54	0.782

SD: Standard deviation

Effect of specialty on TAI total score, TAI emotionality subscale, and TAI worry subscale departments

Table 2shows the descriptive statistics of the TAI total score, TAI emotionality, and worry subscales of the departments. Regarding TAI total score and the TAI emotionality subscale (E) there was no significant difference between departments (p= 0.439, 0.242, respectively). In relation to TAI worry subscale there was a significant difference between departments (p= 0.001).

There was no significant difference between TAI worry values of laboratory and physical therapy departments (p= 0.690), Furthermore, there was no significant difference between TAI worry values of nursing and radiology departments (p= 0.670). However, the TAI worry values of laboratorydepartment was significantly higher than those of nursing and radiology departments (p= 0.001, 0.004, respectively). Moreover, the TAI worry values of physical therapy department was significantly higher than those of nursing and radiology departments (p= 0.001).

Table 2:- The departments' values of TAI total score, TAI emotionality subscale and worry subscale.

Department	Number	Total score		Emotion subscale		Worry subscale	
		Mean ± SD	Max (min)	Mean ± SD	Max (min)	Mean ± SD	Max (min)
Laboratories	113	49.92±7.66	73(23)	19.52±4.05	31(10)	20.04±3.52	32(12)
Physical therapy	117	50.91±8.61	77(17)	20.48±3.78	32(12)	20.25±3.92	32(11)
Nursing	113	49.49±8.82	77(26)	20.46±4.26	32(11)	18.24±4.38	32(8)
Radiology	106	49.15±9.05	77(15)	20.25±4.08	32(13)	18.47±4.30	31(10)

SD: Standard deviation, Max: maximum, Min: minimum

Effect of GPA scores on the TAI total score, TAI emotionality subscale, and TAI worry subscale

The descriptive statistics of the TAI total score, TAI emotionality, and worry subscales of the students according to their GPA scores are shown in Table 3. Regarding the TAI total score, the TAI emotionality subscale and TAI worry subscale there was no significant difference between different levels of GPA scores in TAI total score, TAI emotionality subscale and worry subscale (p= 0.285, 0.792, 0.631, respectively).

Table 3:- The GPA scores of TAI total score, TAI emotionality subscale and worry subscale.

GPA scores	Number	Total score		Emotion subscale		Worry subscale	
		Mean±SD	Max(min)	Mean±SD	Max(min)	Mean±SD	Max(min)
B+	76	51.64±7.49	77(37)	19.47±4.20	32(12)	19.89±3.94	32(13)
B	175	49.51±8.63	77(15)	20.26±3.92	32(10)	19.26±4.16	32(8)
C+	69	50.03±9.41	70(31)	20.67±3.10	29(12)	19.19±4.46	30(11)
C	91	49.74±8.73	69(17)	20.20±4.20	30(11)	19.03±3.90	29(10)
D+	38	48.24±7.79	66(32)	20.32±4.13	32(12)	18.79±4.30	31(12)

SD: Standard deviation, Max: maximum, Min: minimum

Effect of gender on the TAI total score, TAI emotionality subscale, and TAI worry subscale

Descriptive statistics of gender of the participants was illustrated in table 4. The TAI total score and TAI worry subscale of female students were significantly higher than those of the male (p= 0.016, 0.001, respectively). However, there was no significant difference between male and female in TAI emotionality subscale (p= 0.098).

Table 4:- Effect of gender on the TAI total score, TAI emotionality subscale and worry subscale.

Gender	Number	Total score	Emotion subscale	Worry subscale
		Mean ± SD	Mean ± SD	Mean ± SD
Male	277	49.13 ± 8.66	19.93 ± 4.21	18.75 ± 4.17
Female	172	51.12 ± 8.21	20.58 ± 3.75	20.11 ± 3.91

SD: Standard deviation

Prevalence of anxiety symptoms

The total prevalence of anxiety among students was (86.41%), it was (85.56%) for male students and (87.79%) for female students. The total anxiety prevalence of laboratory department was (88.50%), it was (88.90%) for male students, and (88.00%) for female students.The total anxiety prevalence of physical therapy department was (88.89%), it was (91.04%) for male students, and (86.00%) for female students.The total anxiety prevalence of nursing department was (83.19%), it was (80.95%) for male students, and (89.66%) for female students.The total anxiety prevalence of radiology department was (84.91%), it was (82.54%) for male students, and (88.37%) for female students.

Discussion:-

This study focuses on relationship between test anxiety (measured by TAI) and student achievement with affective and cognitive factors of test anxiety. The statistics of TAI emotionally and worry subscales and total scores were done and showed that there was no significant difference between the actual and the assumed means of TAI emotionally subscale ($p > 0.05$). On the other hand, the actual mean of the TAI worry subscale was significantly different/lower than its assumed mean ($p < 0.05$). However, there was no significant difference between the actual mean of total TAI and its assumed mean ($p > 0.05$). This finding was interest as it is in a line with the findings of studies reported in Pakistan by Rizwan Akram Rana and Nasir Mahmood in December 2010 (Rizwan et al; 2010: Bulletin of education and Research. Vol. 32, No. 2 pp. 63-74).

Rather fore, no significant differences were found between 1980 and 2010 TAI scores for male undergraduates in the Houston USA (Derek D. Szafranski et al; 2012: Test anxiety inventory: 30 years later. Anxiety, Stress & Coping. Vol. 25, No. 6, November 2012, 667-677).

Also this study, when compared between departments (laboratory, physical therapy, nursing and radiology) in terms of TAI total score, TAI emotionally and worry subscales scores, it found no significant difference in TAI total scores as well as in TAI emotionally subscale scores ($p= 0.439, 0.242$ respectively) but there was a significant difference in TAI worry subscale ($p= 0.001$).

On further analysis, the TAI worry means of laboratory department was significantly different compared to those of nursing ($p= 0.001$) and radiology ($p= 0.004$) departments. Moreover, there was a significant difference between TAI worry subscale means of physical therapy department compared to those of nursing ($p= 0.001$) and radiology ($p= 0.001$) departments. On the other hand, there was no significant difference between TAI worry means of laboratory and physical therapy departments ($p= 0.690$) as well as between nursing and radiology departments ($p= 0.670$).

Analysis of data for TAI total scores, TAI emotionally subscale scores and TAI worry subscale scores of participants compared to their GPA scores shows that there was no significant difference between different levels of GPA scores ($p= 0.285, 0.792, 0.631$ respectively). This finding is similar to those found in a study done by Abdulghani HM et al in 2011 in Saudi Arabia who reported no significant association between academic grades and stress levels among their participants.

On the other hand, finding in this study is contradictory to the finding of a study done in Pakistan by Rizwan at al in 2010 which showed a strong negative relationship between students' achievement scores and scores of TAI total and both subscales. Similar finding was found in a study done by Derek and his colleagues in Houston in 2012.

They found a significant negative correlation of GPA of female students with both TAI total and TAI worry scores but not for TAI emotionally subscale scores. They also found no significant difference between GPA scores and TAI total and both TAI subscales scores of undergraduate male students. Cassady and his colleague conducted a study

entitled “Cognitive Test Anxiety and Academic Performance” in 2001. They found a correlation between cognitive test anxiety and academic performance. For the low anxiety students there was a positive skewness of the grades curve toward A and B grades while there was a negative skewness towards C and D grades for the high anxiety students.

This studyalso, compared between male and female students in terms of TAI total and TAI subscales. Means of TAI total scores and TAI worry subscale scores of female students were higher than those of male students (p=0.016, 0.001, respectively) while there was no significant difference between male and female students in TAI emotionality subscale (p=0.098). This finding is similar to the finding in a study by Abdulghani HM et al who found that being female is an independent significant factor for the outcome of variable of stress. Similarly, females reported higher levels of emotionality than males (p=0.04). Mostafa Amer et al study in 2010 found that the prevalence of depression was significantly higher among females. Logistic regression showed that being female is an independent predictor of depression.

The overall prevalence of anxiety among students in present study was (86.41%), it was (85.56%) for males and (87.79%) for females. It is higher than what have been found in several studies from different countries, locally and internationally. Prevalence of stress was found to be (63.7%) among medical students in a local study done by Abdulghani HM et al in 2011. Lower prevalence was found in Egypt (43.9% in one study and 21.2% in another study).

Despite there are no limitations in this study and the number of students that enrolled in the study is enough, the highest prevalence of anxiety among departments was found among students of physical therapy department (88.89%). However, this finding could not be appropriately studied in this paper and needs further investigation.

Conclusion:-

In conclusion, this study continues to show the prevalence and importance of test anxiety as a situation affecting students' academic performance. In addition, it shows a high prevalence of test anxiety among our students comparing with other studies that showed less prevalence of such anxiety. According to that, more researches need to becarried out to elaborate the reasons beyond this high prevalence. Regarding to the specialties, no considerable differences showed between the four disciplines in prevalence of test anxiety and this reflects another scope that interesting to evaluate such as the relationship between the medical specialty and test anxiety.

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