

# THE IMPACT OF EXAMS ON ANXIETY LEVELS AMONG UNIVERSITY STUDENTS

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## ABSTRACT

**Objective:** To explore the anxiety levels in exam situations among female college students at a female nursing college.

**Methods:** The participants were 50 first year, 46-second year, 44 third year and 47 fourth year students. The Arabic version of the Test Anxiety Inventory was used as a measure of the students' anxiety proneness to evaluative situations such as tests or exams. One-Way ANOVA and the Scheffe post hoc test were used to analyze the results of the study.

**Results:** Significant differences were found between the scores of the 1<sup>st</sup> year and 4<sup>th</sup> year students with the latter displaying higher test anxiety as measured by the Test Anxiety Inventory.

**Conclusion:** Frequent college exams over the years do not have an effective role in reducing test anxiety levels among students. Psychological intervention and strategies are required in order to lessen the high level of test anxiety for these students.

**Key words:** Test anxiety, Test anxiety inventory, Academic performance, Trait anxiety, State anxiety.

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## Introduction

Test anxiety is a universal phenomenon, as old as the concept of personal evaluation, but the concentration of research activity in this field is of rather recent origin<sup>(1)</sup>. *Test anxiety* seems like a benign problem to some people, but it can be potentially serious when it leads to high levels of distress<sup>(2)</sup>. The fear of test is prevalent at all educational levels. This is not surprising, since a paper and pencil tests is generally used many times each year to determine educational placement, eventually occupational acceptance and ultimately life-style<sup>(3)</sup>. Acceptable level of anxiety stimulates and improves the educational achievement, while increasing anxiety level may inversely affect attention, concentration and performance<sup>(4)</sup>.

Spielberger points out to the presence of two types of anxiety: State and trait<sup>(5)</sup>. *State anxiety* is

conceptualized as a transitory emotional state or condition of the human organism that varies in intensity and fluctuates over time, whereas *trait anxiety* refers to a relatively stable personality characteristic that predisposes an individual to react to threatening situations with sometimes debilitating psychological, physiological and behavioral responses<sup>(6)</sup>. *Test anxiety* is considered to be a form of *state anxiety* and its level can be predicted by the extent of *trait anxiety* in certain threatening situations, particularly those that endanger the individual's self esteem, such as test taking<sup>(5,6)</sup>. Examinations usually arouse higher levels of state anxiety among individuals with high levels of trait anxiety<sup>(5)</sup>.

In the past four decades research has identified two main sources of test anxiety. Firstly, evidence indicates that some highly test-anxious students have deficits in the organisational stage of test preparation

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due to a deficiency in learning or study skills<sup>(7-9)</sup>. Such students develop high levels of anxiety going into a testing situation because they are unable to process or organize information effectively for recall. Therefore, the principal problem for this type of student is not the test but the preparation for the test. The second source of test anxiety arises from habitual, negative, irrelevant thoughts that some students have during a testing situation<sup>(10)</sup> which distract students from the task of taking the test and causes them to focus on their fears, inadequacies and past failures, thus establishing a conditioned fear. These students may have adequate study skills but they become anxious and distracted during the test, causing poor performance.

In effect, studies have shown students with test anxiety stemming from either one of the two identified sources, *i.e.* inadequate preparation skills or distraction during the test procedure, develop learned helplessness<sup>(11-13)</sup>. Learned helplessness was originally proposed as an animal model of human depression, which reflects the learned expectation of inescapable punishment. A social application of this concept involves students who have learned that they fail no matter what they do, therefore 'learned helplessness' in relation to test anxiety is due to their focusing on their previous fears, inadequacies and past failures<sup>(12)</sup>.

Additionally students have a tendency to feel higher *test anxiety* in proportion to the difficulty of the subjects<sup>(14,15)</sup>. Additional support to this is provided in a study conducted on 130 Libyan secondary school students attending the first and second years of the scientific stream. The findings of this study indicated the presence of significantly higher levels of test anxiety in the second year students<sup>(16)</sup>. A South African study on university students revealed that there is no significant correlation between test anxiety and academic performance when the test concerned was reported to be relatively easy by the majority of students<sup>(17)</sup>.

There is an extensive amount of empirical evidence of the negative effects of test anxiety on academic performance. Hembree in a meta-analysis of 562 studies found that test anxiety causes poor academic achievement<sup>(18)</sup>. He concluded that test anxiety is a learned condition, which is small to non-existent in the early grades but firmly in place and negatively related to performance by grade 5<sup>(18)</sup>. In a cross-cultural study, El-Zahhar and Hocer found evidence for test anxiety in the USA and Brazil, and particularly in the Arab world where typically extreme consequences to performance on examinations in high school are attached<sup>(19)</sup>. It therefore seems evident that social and cultural evaluative factors have an important bearing on test anxiety.

Test anxiety researchers have identified several personality variables which are believed to be systematically related to test anxiety<sup>(20)</sup> and which are also empirically related to academic performance: self-efficacy<sup>(21)</sup> and locus of control<sup>(18)</sup>. Students with low self-efficacy tend to be higher in test anxiety and vice-versa, and those who have an internal locus of control are more likely to have lower level of test anxiety<sup>(22)</sup>. These personality traits are potentially important in establishing appropriate remedial interventions. Controlled studies have previously concluded that test anxiety levels tend to fall, and examination performance improves when self-efficacy levels are made to increase<sup>(20)</sup>. More recent studies focus on the effectiveness of psychological strategies that help students to reduce the features of test anxiety, through behavioural (systematic desensitisation based on the principles of reciprocal inhibition and utilizing relaxation), cognitive-behavioural, and hypnotic techniques<sup>(2,3)</sup>.

The literature reviewed for this study suggests that test anxiety levels rise with increased difficulty of the subjects being studied. The following study aims to provide empirical evidence to support or refute these assumptions by exploring the rates of anxiety levels as measured by the Test Anxiety Inventory (TAI) in a group of female university students in Jordan and by comparing anxiety levels between the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year students.

## Methods

The study was carried out in a female nursing college. The participants were 50 first year, 46-second year, 44 third year and 47 fourth year students. The mean age for first year students was 18.35, for second year students 19.22, for third year students 20.23 and for the fourth year students 21.3.

The Test Anxiety Inventory (TAI) developed by Spielberger<sup>(5)</sup> and translated to Arabic language in Egypt by Abdul-Hameed<sup>(4)</sup> was used as a measure of the students' anxiety proneness to evaluative situations such as tests or exams. The TAI was administered to all nursing college students during the week of final examinations.

The TAI is a self-report inventory designed to measure *test anxiety* as a situation-specific personality trait. The TAI consists of 20 statements, and the respondents indicate on a four point Likert-type scale how often they experience the feeling described in each statement, producing total scores of 20-80<sup>(4)</sup>. For the purposes of this study scores of 60 to 80 were considered to reflect 'high' test anxiety, scores of 46 to 59 were considered to reflect 'moderate' test anxiety, scores of 31 to 45 were considered to reflect 'mild' test anxiety and scores of 20 to 30 were considered to reflect 'low' test anxiety. This arbitrary division was

made by calculating the mean and the standard deviation of the data which were 44.9 and 13.61 respectively. The cut-off point of the data was set at 44.9 and the 'moderate' and 'mild' levels of test anxiety were considered to be those who were included between plus or minus one standard deviation. Anything above one standard deviation from the mean was considered to be 'high' test anxiety and similarly scores below one standard deviation from the mean were considered to be 'low' test anxiety. The decimal numbers obtained following these calculations were rounded to whole numbers.

The TAI provides a measure of total *test anxiety* as well as measures of two test anxiety components: *worry* and *emotionality*. Eight of the items measure the *emotionality* component and eight items measure the *worry* component. The remaining four items contribute to the total test anxiety score but are not scored on either the worry or emotionality subscales. The raw scores obtained from TAI are prepared for analysis by calculating their percentile ranks.

The TAI has consistently displayed sound psychometric properties in use with college student populations. *Test-retest reliability* coefficients range from 0.80 at 2 weeks to .62 at 6 months<sup>(5)</sup>. Similar test-retest reliability coefficients are reported for the Arabic version of the TAI. A study conducted on a sample of Egyptian university students report a reliability coefficient of 0.89 at two weeks<sup>(4)</sup> for and another study conducted in Libya on high school students report a reliability coefficient of 0.74 at three weeks<sup>(16)</sup>.

High *internal-consistency reliability* has also been reported with the Cronbach alpha reliability coefficient being 0.93<sup>(23)</sup> and 0.67 for the worry component and 0.87 for the emotionality component<sup>(4)</sup>. Evidence of *concurrent validity* has also been provided with correlation coefficients of 0.82 and 0.83 for males and females, respectively, by comparisons made between the TAI and Sarason's<sup>(6)</sup> Test Anxiety Scale. The Arabic version of the TAI when compare with scores obtained from the Arabic version of Sarason's indicate lower but good concurrent validity with a correlation coefficient of 0.67<sup>(16)</sup>. *Construct validity* of the arabic version has been provided by data collection in normal conditions and test conditions. Evidence indicated that both male and female scores were significantly higher in the emotionality and worry scales when the test was performed in a test situation<sup>(4)</sup>.

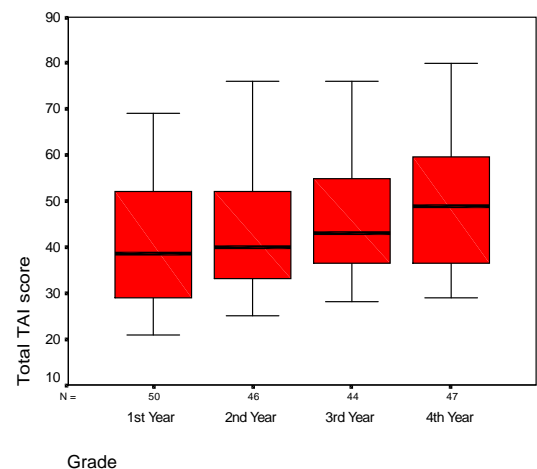
Data analysis was carried out using SPSS software. Descriptive statistics, one-way ANOVA and the Scheffe post hoc procedure were utilised to analyze the data.

## Results

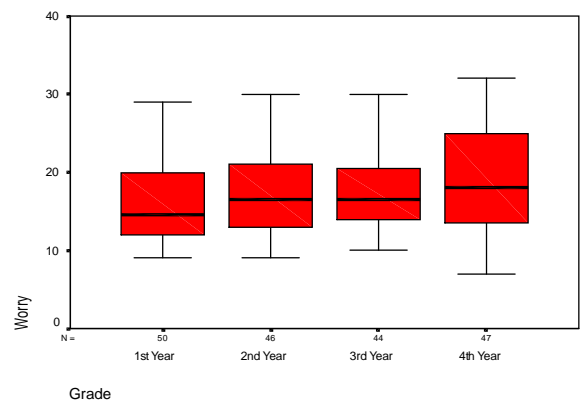
Overall, the majority of the student nurses (41.7%,

$n=78$ ) had 'mild' test anxiety and the number of students who had 'low' anxiety (15%,  $n=28$ ) and those who had 'high' anxiety (19.9%,  $n=26$ ) were similar. Within each year group there was a greater percentage of first year students who experienced either 'low' (32%,  $n=16$ ) or 'mild' (32%,  $n=16$ ) test anxiety and a greater percentage of second (47.8%,  $n=22$ ), third (50%,  $n=22$ ), and fourth (38.3%,  $n=18$ ) year students who experienced 'mild' test anxiety. There were considerably more fourth year students who experienced high test anxiety (25.5%,  $n=12$ ) compared to the other year groups (See Table I).

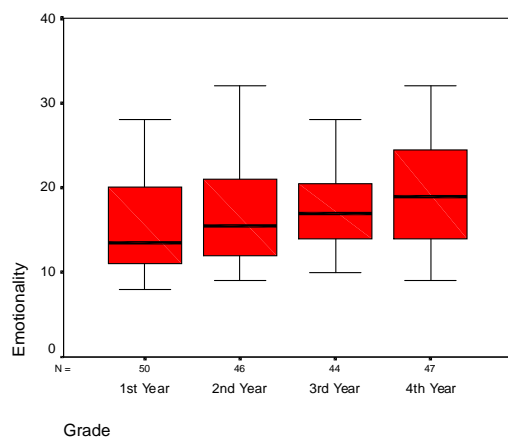
The percentile ranks of the raw data for the total score on the TAI and for the emotionality and worry dimensions was calculated and one-way ANOVA applied. This test indicated the presence of significant differences between the different grade students on the levels of test anxiety experienced ( $F = 3.505$ , 3 and 183  $df$ ,  $p = 0.017$ ). Similarly, analysis with one-way ANOVA for the *worry* ( $F = 2.726$ , 3 and 183  $df$ ,  $p = 0.046$ ) and *emotionality* component ( $F = 3.177$ , 3 and 183  $df$ ,  $p = 0.025$ ) revealed significant differences between the different grade students. These differences have been depicted in the following box-plots using the raw scores (See Figures 1,2 and 3).



**Fig. 1.** Box-plot depicting the differences between the four student groups' scores on the TAI.



**Fig. 2.** Box-plot depicting the differences between the four student groups' scores on the worry component of the TAI.



**Fig. 3.** Box-plot depicting the differences between the four student groups' scores on the emotionality component of the TAI.

There were clear differences in the test anxiety score and in the emotionality and worry components of the test anxiety inventory. First year students collectively scored the lowest and the fourth year students collectively scored highest in all dimension of the TAI (See Figures 1, 2 and 3).

One-way ANOVA carried out on the first, second, third and fourth year students' mean scores on the TAI effectively established the presence of significant difference in the scoring patterns of the students (see Table II) but did not determine exactly which groups differed from each other. Since many patterns of difference were possible secondary analysis was required to pinpoint the source of significant difference. In order to determine where the significant differences lied, further analysis was undertaken by applying the Scheffe post hoc test.

Post hoc analysis of the ANOVA findings revealed significant differences only between the first year and fourth year student in all dimension of the scale.

## Discussion

The results of the present study revealed highly significant differences on test anxiety levels between 1<sup>st</sup> year and 4<sup>th</sup> year students only ( $p=0.02$ ) in which 1<sup>st</sup> year students demonstrated the least amount of test anxiety. Furthermore, a clear pattern of progressively higher test anxiety levels is evident for students at each consecutive higher class (see Figure 1.). This result is consistent with a Canadian study which found increasing levels of anxiety with increased exposure to tests among students who were registered in a

baccalaureate nursing programme<sup>(24)</sup>. Other studies on elementary students from grade 2 to grade 5 also indicate the presence of progressive increase in test anxiety<sup>(18)</sup>. Such results suggest test anxiety levels increase over the years, because of the stress of exam situation, heavy tasks and different responsibilities that increased year by year. High test anxiety is especially related to tasks that are difficult or complex and administered under achievement orienting conditions that emphasise the evaluation of performance<sup>(25)</sup>. This situation is very similar to the position of the 4<sup>th</sup> year students who are expected to succeed with high grades, given their future career and placement is highly correlated with their academic performance.

This evidence should drive researchers to ask if frequent exams experience during college levels have no positive effect on decreasing the test anxiety degrees which is expected in seniors' level. On the contrary it seems to be increasing the test anxiety, which was evident in current study. Various strategies of psychological intervention and counselling are helpful to settle down this phenomenon. There is a need to increase awareness about this problem among teachers and students to counteract any negative impacts. Frequent exposure to examination settings (mock exams) do not seem to be effective in reducing anxiety in students who score high on test anxiety. Evidence indicates that psychological methods that pay attention to the cognitive factors like self-efficacy<sup>(21)</sup> and internal locus of control<sup>(18)</sup> are probably more effective. These cognitive variables have been shown to be negatively related to test anxiety and positively related to academic performance<sup>(18)</sup> but the assessment of these variables was beyond the scope of this study. Nonetheless intervention strategies focusing on cognitive factors like self-efficacy and internal locus appear to be valuable methods for helping students to reduce their test anxiety and to improve their exam performance by developing a greater sense of control over their own examination outcome, including control over their own cognitions.

Finally there is a need for further studies to be conducted on test anxiety in the context of Arabic culture (Jordanian culture) with the specific aim of exploring the relationship between test anxiety, academic performance and personality traits such as self-efficacy and locus of control.

**Table I.** Number of student nurses for scoring within each anxiety level and each grade on the TAI.

| Anxiety Level | Grade                |                      |                      |                      | Total      |
|---------------|----------------------|----------------------|----------------------|----------------------|------------|
|               | 1 <sup>st</sup> year | 2 <sup>nd</sup> year | 3 <sup>rd</sup> year | 4 <sup>th</sup> year |            |
| Low           | 16 (32.0%)           | 5 (10.9%)            | 4 (9.1%)             | 3 (6.4%)             | 28 (15%)   |
| Mild          | 16 (32.0%)           | 22 (47.8%)           | 22 (50.0%)           | 18 (38.3%)           | 78 (41.7%) |
| Moderate      | 13 (26.0%)           | 13 (28.3%)           | 15 (34.1%)           | 14 (29.8%)           | 55 (29.4%) |
| High          | 5 (10.0%)            | 6 (13.0%)            | 3 (6.8%)             | 12 (25.5%)           | 26 (13.9%) |
| Total         | 50 (100%)            | 46 (100%)            | 44 (100%)            | 47 (100%)            | 187 (100%) |

**Table II.** Results of one way ANOVA for the ranked scores of the students on the TAI and on the worry and emotionality dimensions.

| Rank of Scores | df | F     | Sig. |
|----------------|----|-------|------|
| Total TAI      | 3  | 3.505 | .017 |
| Worry          | 3  | 2.726 | .046 |
| Emotionality   | 3  | 3.177 | .025 |

**Table III.** Presentation of the significant results of the Scheffe test.

| Dependent Variable | (I) Grade            | (J) Grade            | Mean Difference (I-J) | Std. Error | Sig. |
|--------------------|----------------------|----------------------|-----------------------|------------|------|
| Emotion            | 1 <sup>st</sup> year | 4 <sup>th</sup> year | -31.88745             | 10.792824  | .036 |
| Worry              | 1 <sup>st</sup> year | 4 <sup>th</sup> year | -30.96043             | 10.827543  | .046 |
| Total score        | 1 <sup>st</sup> year | 4 <sup>th</sup> year | -34.26809             | 10.776613  | .020 |

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