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TEST ANXIETY AMONG SECONDARY SCHOOL STUDENTS AND UNIVERSITY STUDENTS

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Abstract

The present study aims at comparing test anxiety among secondary school students and university students to reveal if the interventions for reducing test anxiety should be focused more on secondary school students who do not have enough skills for emotional management. The Bulgarian version of the Westside Test Anxiety Scale was used among 60 junior high school/middle school students, 30 high school students and 90 university students. It was found that test anxiety diminished with age advance. Higher test anxiety was manifested during the school/academic year than at the beginning of the school year. The interventions for reducing test anxiety should be focused mainly on overcoming negative thoughts, and negative self-talk during exams, and worry about own performance after the exam.
Keywords: *test anxiety, secondary school students, university students*

Introduction

Exam situations are an immanent part of the educational process at school and university, and students usually experience some symptoms of test anxiety. Test anxiety is a form of performance anxiety (Moses, 2023) or state anxiety under the specific conditions (Mary et al., 2014) before, during, and after exams (Baghaei & Cassady, 2014) characterized with fear of failure, fear of not performing well, fear of negative evaluation (Moses, 2023; Tzoannopoulou, 2016), worry (Moses, 2023), persistent negative thoughts (Moses, 2023; Pitta, 2021), negative self-talk, problems with attention focus and lack of concentration (Moses, 2023), nervousness (Moses, 2023; Tzoannopoulou, 2016), feeling of tension (Tzoannopoulou, 2016), feeling uneasy about a situation of exam/testing (Moses, 2023), feeling confusion (Pitta, 2021), and some physical symptoms as headache, nausea, accelerated heartbeat, sweating, etc. (Moses, 2023; Pitta, 2021).

It has been established that high test anxiety has a negative effect on students' academic performance (Pitta, 2021) manifested in lower grades/marks achievement (Amalu, 2017; Barik & Barman, 2019; Cassady & Johnson, 2002; Larson et al., 2010; Orakwue & Okigbo, 2023; Papantoniou et al., 2017; Thomas et al., 2018; Tzoannopoulou, 2016) for both secondary and postsecondary students (Cassady & Johnson, 2002). Fear of exams can lead to avoidance of exam situation (Pagaria, 2020), so the student does not attend the exam. It is important to study test anxiety in relation to the factors that may provoke it to find some possibilities for its reduction and diminishment of negative consequences from test anxiety.

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Test anxiety may be provoked from the lack of enough preparation (Cassady & Johnson, 2002; Moses, 2023; Pitta, 2021), social pressure and fear of not meeting some expectations (Moses, 2023), parental overprotection (Yang, 2023) or lack of parental support (Pitta, 2021), striving for perfectionism (Baghaei & Cassady, 2014; Moses, 2023; Pitta, 2021), inadequate learning strategies, ineffective coping strategies, especially procrastination (Cassady & Johnson, 2002; Desai et al., 2021; Moses, 2023; Pitta, 2021), time pressure (Moses, 2023) and poor time management (Pitta, 2021), negative past experiences related to exam situations, the importance of exam consequences, negative social comparison (Moses, 2023), low self-esteem (Moses, 2023; Pitta, 2021), feeling of inferiority (Pitta, 2021), low self-confidence (Moses, 2023) for a specific task (Cassady & Johnson, 2002), unfamiliar test formats (Moses, 2023), high trait anxiety (Burhan et al., 2020; Cassady & Johnson, 2002; Moses, 2023), high generalized anxiety (Moses, 2023), high state anxiety in situations of communication with teachers (Topova, 2023), high state anxiety in situation of answering questionnaires (Mur et al., 2022), pessimism and feeling of hopelessness (Moses, 2023; Pitta, 2021), lack of control over the exam process (Pitta, 2021), etc.

The scientific studies usually report that test anxiety is higher in female students compared to male students (Baghaei & Cassady, 2014; Baig et al., 2018; Balogun & Olanrewaju, 2016; Barik & Barman, 2019; Cassady & Johnson, 2002; Pagaria, 2020; Pitta, 2021; Yatkin et al., 2023) in different educational degrees.

It may be expected that with the advance of age and accumulated experience of coping with exam situations test anxiety would be reduced, so the interventions and techniques for reducing test anxiety should be focused mainly on secondary school students than on university students. However, there is a shortage of studies focused on exam anxiety both among secondary school students and university students. Conducting a literature review, only one study was found to compare the levels of test anxiety among secondary school students and university students. In a study in China of 200 students from 11 to 22 years old, the highest level of test anxiety was among the secondary school students at high school, followed by the degree of expression of test anxiety in the university students and the lowest test anxiety was among the secondary school students at junior high school/middle school (Yang, 2023).

Test Anxiety among Secondary School Students

Some other studies also report high test anxiety among secondary school students in different parts of the world. In a study among 46 secondary school students between the ages of 14–18 in Nigeria, 71.7% of them had high test anxiety (Dami et al., 2019). Among 600 higher secondary school students studying in their final year of secondary education in India, 46.3% had high test anxiety and 36.7% had low test anxiety (Goswami & Roy, 2017). A group of 100 students from 10th to 12th grades aged 15-18 years old in India had an increased level of anxiety three months prior to exams, particularly higher in the 12th school year (Mary et al., 2014) that may be due to the important consequences from the exams for further educational development. The secondary school students in their final year of study experience higher test anxiety due to the high stakes and the only chance to pass the maturity exam (Kolev, 2020).

Another part of the studies reported the prevalence of medium/moderate test anxiety among the secondary school students. In a study of 698 secondary school students in Turkey from 9 to 12 grades, most of them had mid-level test anxiety (Gürses et al., 2010). Test anxiety of 74.10% of 332 secondary school students in India is moderate (Barik & Barman, 2019). Some cultural specificities, different state policies regarding the educational systems and conducting studies in different time periods of the school year may explain some discrepancies in the research findings concerning the most frequent levels of test anxiety among secondary school students. However, no studies were found to report the most frequent low levels of test anxiety among the secondary school students.

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Test Anxiety among University Students

Regarding test anxiety of university students, it seems that it depends on their specialty. For example, the university students in the nursing specialty have high test anxiety (Moore, 2013). The university students who studied medical sciences had higher levels of test anxiety than students who studied psychology in the Republic of Northern Macedonia (Stankovska et al., 2018). A study among 220 undergraduate and postgraduate physiotherapy students from colleges in India established a prevalence of moderately high test anxiety among the students in different years of education (Desai et al., 2021).

A study in Iraq among 70 university students of diverse specialties established the opposite trend –half of them had mild levels of test anxiety, while 27.1% had a high level of test anxiety (Khalaf & Halboos, 2020). It may be expected that university students from a variety of specialties would have mainly medium levels of test anxiety as most social phenomena are widespread in their medium degree in norm-based testing (Anastasi & Urbina, 1997).

Hypotheses

It was expected that test anxiety would diminish with age advance because of the accumulation of more experience with testing and examinations, i.e., the secondary school students should have higher test anxiety than university students, and junior high school/middle school students should have higher test anxiety than high school students who should have higher test anxiety than university students.

It was supposed that higher test anxiety would be manifested during the school/academic year than at the beginning of the school year. At the beginning of the school year, the exams have not started yet, while the course of the school year is a period of regular exams.

Research Methodology

Procedure

A cross-sectional study was conducted both paper-and-pencil and online at the beginning of the school/academic year (before exams) and during the school/academic year 2022/2023.

Sample

Participation was voluntary and anonymous. Purposeful sampling was applied and the criterion for selection was being a secondary school or university student.

In Bulgaria, 180 students from 11 to 29 years old (mean age = 18.68 years old, *SD* = 6.3, median = 17 years) were studied by means of WTAS. They were distributed into three age groups: 11-13 years old, studying in junior high school/middle school (*N* = 60, 33.3%), 14-18 years old, studying in high school (*N* = 30, 16.7%), and 19-29 years old, studying in university (*N* = 90, 50%).

The secondary school and university students were equal – 90 students in each group. The studied university students were mainly in their third year of studies (*N* = 42; 23.3%), followed by the students in their second year of studies (*N* = 30; 16.7%) and the studied students in their first year of studies (*N* = 18; 10%). They studied in diverse specialties.

More female students (*N* = 170; 59.4%) were studied than male students (*N* = 73; 40.6%). More students were tested during the school/academic year (*N* = 133; 73.9% out of which 59 male students and 74 female students) than at the beginning of the school/academic year (*N* = 47; 26.1% out of which 14 male students and 33 female students).

Instruments

The Westside Test Anxiety Scale - WTAS (Driscoll, 2007) was used for this study. It is a self-report 10-item scale that measures students' test anxiety because of events before, during, and after

an exam on a five-point Likert scale (Dami et al., 2019; Maswood et al., 2019; Pagaria, 2020; Talwar et al., 2019). There is not any reverse-coded item on WTAS (Yatkin et al., 2023). After summing up the scores on each item, the total score is divided by the number of all items in WTAS and then distributed into six categories with different degrees of test anxiety from low to extremely high test anxiety (Baig et al., 2018; Desai et al., 2021; Driscoll, 2007; Larson et al., 2010; Talwar et al., 2019). A higher score on WTAS means a higher test anxiety level (Yatkin et al., 2023).

Its items measure emotional agony (Talwar et al., 2019), worry, catastrophizing, some difficulties in cognitive processing, incapacity, cognitive dysfunction like problems with concentration and memory loss which can impair performance (Baig et al., 2018; Crawford, 2021; Kubala, 2021; Larson et al., 2010; Pagaria, 2020; Talwar et al., 2019; Ward & Smith, 2019).

Cronbach's alpha ranged between 0.80–0.90 in different studies (Dami et al., 2019; Maswood et al., 2019; Talwar et al., 2019), even 0.91 (Yatkin et al., 2023). In Bulgaria, its Cronbach's alpha is .834, and its Guttman split-half reliability coefficient is 0.880 (Relojo-Howell & Stoyanova, 2019).

Socio-demographic information was also collected.

Data Analysis

Data were processed statistically by means of the software SPSS 23. Descriptive statistics were applied, as well as Shapiro-Wilk test of normality of distribution, chi-square analysis, Kruskal – Wallis test and Mann-Whitney *U* test for group comparisons, and Spearman's rho correlation coefficient for establishing some connections between different variables.

Research Results

The participants' mean score on test anxiety was 3.318 and the standard deviation was 0.612, i.e., slightly more than half of the scores varied between high normal test anxiety through moderately high anxiety to high test anxiety (see Table 1).

Table 1

Frequency Distribution of Levels of Test Anxiety

Levels of test anxiety	Frequency	Percent
Comfortably low test anxiety	26	14.4
Normal or average test anxiety	44	24.4
High normal test anxiety	38	21.1
Moderately high (some items rated 4=high)	30	16.7
High test anxiety (half or more of the items rated 4=high)	24	13.3
Extremely high anxiety (items rated 4=high and 5=extreme)	18	10.0

Age was not normally distributed (Shapiro-Wilk coefficient = 0.829, df = 180, $p < .001$). The scores on WTAS were not normally distributed (Shapiro-Wilk coefficient = 0.981, $df = 180$, $p = .015$).

Age advance was related to diminishment in test anxiety (Spearman's rho = -0.643, $p < .001$, $N = 180$) for the whole sample and this trend was more strongly expressed for the female students (Spearman's rho = -0.652, $p < .001$, $N = 107$) than for the male students (Spearman's rho = -0.586, $p < .001$, $N = 73$).

The studied secondary school students had higher test anxiety than the studied university students (see Table 2), and the effect size was large, according to Lenhard & Lenhard (2022). The studied secondary school male students ($N = 44$, mean rank = 47.27, $M = 3.166$, $SD = 0.541$) had higher test anxiety (Mann-Whitney $U = 186$, $p < .001$, Effect size Eta squared $\eta 2 = 0.356$) than the studied university male students ($N = 29$, mean rank = 21.41, $M = 2.256$, $SD = 0.513$), and the effect size was large, according to Lenhard & Lenhard (2022). The studied secondary school female students ($N = 46$, mean rank = 79.46, $M = 3.463$, $SD = 0.645$) had higher test anxiety (Mann-Whitney

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$U = 232$, $p < .001$, Effect size Eta squared $\eta 2 = 0.507$) than the studied university female students ($N = 61$, mean rank = 34.80, $M = 2.355$, $SD = 0.638$), and the effect size was large, according to Lenhard & Lenhard (2022).

Table 2

Comparison between the Secondary School Students and the University Students on their Scores on WTAS

Students	*N*	Mean Rank	*M*	*SD*	Mann-Whitney *U*	*p*	Effect size Eta squared (η^2)
Secondary school students	90	125.96	3.318	0.612	858.500	< .001	0.463
University students	90	55.04	2.288	0.555			

Significantly more secondary school students than expected ($\chi^2_{(N = 180,\ df = 5)} = 88.791$, $p < .001$, Cramer's $V = 0.702$, i.e., large/strong effect size, according to IBM, 2023) had extremely high test anxiety, high test anxiety and moderately high test anxiety (see Table 3). Significantly more university students than expected had comfortably low test anxiety, normal or average test anxiety, and high normal test anxiety (see Table 3).

Table 3

Comparison between the Secondary School Students and the University Students on Their Levels of Test Anxiety

Students	Frequencies	Levels of test anxiety					
		Comfortably low test anxiety	Normal or average test anxiety	High normal test anxiety	Moderately high test anxiety	High test anxiety	Extremely high test anxiety
Secondary school students	Count	2	9	13	26	24	16
	Expected Count	13.0	22.0	19.0	15.0	12.0	9.0
	% within secondary school students	2.2	10.0	14.4	28.9	26.7	17.8
University students	Count	24	35	25	4	0	2
	Expected Count	13.0	22.0	19.0	15.0	12.0	9.0
	% within university students	26.7	38.9	27.8	4.4	0.0	2.2

Test anxiety was higher among the studied junior high school/middle school students (11-13 years old), followed by test anxiety in high school students (14-18 years old) and the lowest test anxiety was among the university students (19-29 years old), and the effect size was large, according to Lenhard & Lenhard (2022) – see Table 4. The studied junior high school/middle school students (11-13 years old) did not differ statistically significantly in their test anxiety compared to the studied high school students (14-18 years old) (Mann-Whitney $U = 697$, $p = .082$). The studied junior high school/middle school students (11-13 years old) had significantly higher test anxiety than the studied university students (Mann-Whitney $U = 449.500$, $p < .001$, effect size Eta squared $\eta^2 = 0.497$, i.e., large effect size, according to Lenhard & Lenhard, 2022). The studied high school students (14-18 years old) had significantly higher test anxiety than the studied university students (Mann-Whitney $U = 409.000$, $p < .001$, effect size Eta squared $\eta^2 = 0.271$, i.e., large effect size, according to Lenhard & Lenhard, 2022).

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Table 4

Comparison between the Junior High School Students, High School Students and the University Students on Their Scores on WTAS

Students	*N*	Mean Rank	*M*	*SD*	Kruskal-Wallis coefficient (*df* = 2)	*p*	Effect size Eta squared (η^2)
Junior high school/middle school students (11-13 years old)	60	131.39	3.403	0.564	85.513	< .001	0.472
High school students (14-18 years old)	30	115.10	3.147	0.675			
University students (19-29 years old)	90	55.04	2.288	0.555			

Significantly more junior high school/middle school students (11-13 years old) than expected ($\chi^2_{(N = 180,\ df = 10)} = 91.113$, $p < .001$, Cramer's $V = 0.503$, i.e., large/strong effect size, according to IBM, 2023) had extremely high test anxiety, high test anxiety and moderately high test anxiety (see Table *5*). Significantly more high school students (14-18 years old) than expected had high test anxiety and moderately high test anxiety (see Table *5*). Significantly more university students (19-29 years old) than expected had comfortably low test anxiety, normal or average test anxiety, and high normal test anxiety (see Table *5*).

Table 5

Comparison between the Junior High School Students, High School Students and the University Students on Their Levels of Test Anxiety

Age groups	Frequencies	Levels of test anxiety					
		Comfortably low test anxiety	Normal or average test anxiety	High normal test anxiety	Moderately high	High test anxiety	Extremely high anxiety
11-13 years old	Count	0	5	8	18	17	12
	Expected Count	8.7	14.7	12.7	10.0	8.0	6.0
	% within 11-13 years old	0.0	8.3	13.3	30.0	28.3	20.0
14-18 years old	Count	2	4	5	8	7	4
	Expected Count	4.3	7.3	6.3	5.0	4.0	3.0
	% within 14-18 years old	6.7	13.3	16.7	26.7	23.3	13.3
19-29 years old	Count	24	35	25	4	0	2
	Expected Count	13.0	22.0	19.0	15.0	12.0	9.0
	% within 19-29 years old	26.7	38.9	27.8	4.4	0.0	2.2

Test anxiety at the beginning of the school year was significantly lower than test anxiety during the school year (see Table 6) and the effect size was large, according to Lenhard & Lenhard (2022). The mean score on WTAS at the beginning of the school year corresponded to normal or average test anxiety, according to Driscoll (2007) and Relojo-Howell & Stoyanova (2019). The mean score on WTAS during the school year corresponded to high normal test anxiety, according to Driscoll (2007) and Relojo-Howell & Stoyanova (2019).

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Table 6

Comparison between the Students Tested at the Beginning of the School Year and the Students Tested during the School Year on Their Scores on WTAS

Students	*N*	Mean Rank	*M*	*SD*	Mann-Whitney *U*	*p*	Effect size Eta squared (η^2)
Tested at the beginning of school year	47	54.50	2.302	0.534	1433.500	< .001	0.169
Tested during the school year	133	103.22	2.98	0.776			

Significantly more students than expected ($\chi^2_{(N=180,\, df=5)} = 35.720$, $p < .001$, Cramer's $V = 0.445$, i.e., moderate effect size, according to IBM, 2023) tested at the beginning of the school year had comfortably low test anxiety and normal or average test anxiety (see Table 7). Significantly more students than expected tested during the school year had extremely high levels of test anxiety, high test anxiety or moderately high test anxiety (see Table 7).

Table 7

Comparison between the Students Tested at the Beginning of the School Year and during the School Year on Their Levels of Test Anxiety

Students	Frequencies	Levels of test anxiety					
		Comfortably low test anxiety	Normal or average test anxiety	High normal test anxiety	Moderately high test anxiety	High test anxiety	Extremely high test anxiety
tested at the beginning of school year	Count	11	23	9	3	0	1
	Expected Count	6.8	11.5	9.9	7.8	6.3	4.7
	% within tested at the beginning of school year	23.4	48.9	19.1	6.4	0.0	2.1
tested during the school year	Count	15	21	29	27	24	17
	Expected Count	19.2	32.5	28.1	22.2	17.7	13.3
	% within tested during the school year	11.3	15.8	21.8	20.3	18.0	12.8

The biggest differences (as *p* – values and effect size) between the studied secondary school students (including between middle high school and high school) and university students, as well as between the beginning and the course of the school year were related to the answers to the 3rd and 9th items of WTAS, i.e., negative thoughts, negative self-talk during exams and anxiety, worry about own performance after the exam.

Discussion

The results supported the hypothesis that test anxiety would diminish with age advance. The same trend was found both for the studied male and female students. This finding may be due to the improved skills for self-control, emotional control with age advance (Mihaylova, 2020) and the accumulation of more experience with testing and examinations. The same explanations are relevant to the result that the secondary school students had higher test anxiety than university students. The same trend was found both for the studied male and female students at secondary school and at university.

It was found that the studied Bulgarian junior high school/middle school students did not differ statistically significantly in their test anxiety compared to the high school students, but there was a trend for higher test anxiety among junior high school/middle school students than among high school students. Both junior high school/middle school students and high school students had higher test anxiety than university students. This result corresponds to the finding by Yang (2023) that Chinese secondary school students at high school had higher levels of test anxiety than Chinese university students, but it differs from the finding by Yang (2023) that Chinese junior high school/middle school students had lower levels of test anxiety than Chinese high school students. This difference may be due to different time periods of conducting both studies in the course of the school year, as well as to some specificity of the culture and educational system.

The findings supported the hypothesis that higher test anxiety would be manifested during the school/academic year than at the beginning of the school year. At the beginning of the school year, the exams have not started yet, while the course of the school year is a period of regular exams that strengthens apprehension related to exams.

Limitations

Some limitations of the study could be related to the sample size. A representative sample with repetitive measures during the school/academic year would give a more detailed picture of the levels of test anxiety in different sub-groups of students. The format of testing may influence the results because it was found in two studies that test anxiety was higher for students examined by pen and paper than for students examined by means of computers/online (Baig et al., 2018; Cassady & Gridley, 2005). The present study used both methods for data collection, and they could have strengthened the effect of individual differences between the students.

Social desirability could also have been manifested in the participants' answers, but the consistency of the findings from the current research with some previous research findings could be evidence for sincere answering. There is also a risk of negative emotional states during the moment of testing when the participants answered how they felt before, during and after an exam situation.

Directions for Further Research

This research was one of the few studies found in the scientific literature that compared test anxiety among students in different educational degrees and in two different periods of the school/academic year – its beginning and its course. Some further studies may focus on cross-cultural comparisons in test anxiety and longitudinal organisation of the study during different stages of the school/academic year. Some further studies may clarify such contradictory research findings as stating that urban secondary school students had higher test anxiety than rural secondary school students in India (Rajasekaran, 2016) and later stating that test anxiety is higher among rural students than among urban students in India (Barik & Barman, 2019).

The findings from this study suggest that the interventions for reducing test anxiety should be focused mainly on secondary school students. The interventions for reducing test anxiety should be focused mainly on overcoming their negative thoughts, and negative self-talk during

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exams, and worry about their own performance after the exam. Such techniques as expressive writing (Lang & Lang, 2011; Relojo-Howell & Stoyanova, 2019), relaxation interventions like elevator breathing and guided relaxation (Larson et al., 2010), mindfulness and meditation activities (Duraku et al., 2023), practising of sport and physical exercises, music therapy (Ward & Smith, 2019) have been proven their effectiveness for diminishing test anxiety among students with higher test anxiety and they are appropriate even for younger students. Such types of interventions are focused mainly on how students see themselves and another effective type of intervention should be related to the change of some social and physical characteristics of the school that also affect test anxiety, according to Sari & Anil (2022). Creating a positive psycho-climate at school by means of constructive encouragement and emphasizing the students' strengths in a cosy and beautiful surrounding, may contribute to experiencing positive emotions by students and reducing their test anxiety.

Conclusions

A comparison of test anxiety among students in different educational degrees and in the beginning and during the course of the school/academic year suggested that the interventions for reducing test anxiety should be focused mainly on secondary school students during the school year to overcome their negative thoughts, and negative self-talk during exams, and worry about own performance after the exam. The beginning of the school/academic year was characterized by lower test anxiety because the exams had not started yet. At the start of the school/academic year, the positive emotions from sharing memories about the summer holiday when meeting classmates again should prevail. The exams are an immanent part of the educational process throughout the school year, so test anxiety was more frequently experienced during the course of the school year.

It was found that the manifestations of test anxiety during and after the exam differed for the studied secondary school students and the studied university students. However, apprehension about an approaching exam was similar among both secondary school students and university students. Test anxiety of secondary school students was more expressed in the form of negative thoughts, negative self-talk during the exams and worry about their own performance after the exam than for the studied university students. The university students have successfully passed more exams than the secondary school students, and the confidence in their own ability to cope with the exams may have diminished the university students' negative self-talk during the exams. Besides, the possibility of attending two or three times the same exam may have also reduced worry about their own performance after the exam among the university students.

Accumulating experience, mastering self-control, building self-confidence, interacting in a positive psycho-climate, constructive encouragement emphasizing the students' strengths in a cosy and beautiful surrounding, may contribute to experiencing positive emotions by students, increasing their positive self-talk, and reducing their test anxiety.

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