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# Assessing test anxiety and resilience among Greek adolescents during COVID-19 pandemic

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## ABSTRACT



The aim of the present study was to explore the impact of school year's extension due to the coronavirus pandemic (COVID-19) by addressing test anxiety and by studying the coping strategies adolescents used to overcome it. For the majority of the adolescents the final exams can be a powerful source of stress, since the entrance examinations are required for admission into higher education and further reflect the transition to adulthood. The sample consisted of 67 High School students and the data collection was conducted online due to the imposed measures by the Greek government. Results showed normal or average levels of test anxiety with low self-esteem and fear of a family member contracting the virus identified as significant predictors. Students who participated in the research pointed teachers as the main source of pressure in school exams. Gender differences regarding social media engagement and online video gaming were also detected. Resilience was equally as high among genders [ $t(63) = 858, p = .324$ ] and the correlation between test anxiety and resilience did not produce a statistically significant result ( $r = -.178, p = .155$ ).

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## Introduction

The outbreak of the coronavirus (COVID-19) brought about many changes in all aspects of daily life. Part of these was the suspension of the operation of schools and educational institutions in Greece, resulting in efforts to continue lessons using digital devices, educational software, and interactive platforms. However, beyond the new learning resources and technological tools, students in Greece have to manage the upcoming Pan-Hellenic Examinations (i.e. university entrance exams externally assessed by a national standardized test given at the end of the school year). For the majority of adolescents, the final exams can be a powerful source of stress, since the entrance examinations are required for admission into higher education and further reflect the transition to adulthood [1, 2].

Exam anxiety is a combination of psychological symptoms and concomitant reactions that derive from

possible adverse effects or exam failure [3]. The cognitive aspects of test anxiety usually include negative intrusive thoughts before or during the test, difficulty in recalling memory, and deficient attention. The emotional reactions related to exams are anxiety, fear, and panic, while physical reactions include muscle tension, sweating, and increased heartbeat. The behavioral aspects can be manifested by seemingly unrelated events, such as low motivation to study, absences from school, or procrastination [4, 5]. Stress levels vary among adolescents and can be influenced by factors such as age, gender, parental occupation, level of education, family socioeconomic status, and previous school achievement and performance [6]. Several worldwide findings suggest that exam anxiety increases with age, with the highest rates found in High School students [7]. In Greece, the entrance to university is a milestone in the school life of every student and is interwoven with various challenges. Adolescents, in addition to being burdened with all the physical and mental

changes, need to make critical career decisions, while confronting their parents' high expectations for academic success and recognition [8, 9].

Along the same lines, studies in the field of school psychology support the development of social and emotional skills that contribute to the positive adjustment and mental well-being of adolescents, such as mental resilience, which appears to reduce the negative effects of stress [10, 11]. The term "mental resilience" refers to a dynamic process in which a person exhibits positive adaptation or ability to maintain and regain his mental health and balance during challenging and adverse conditions, using one's own abilities and available support systems [12]. Especially in stressful situations, such as before or during exams, endurance characteristics seem to be particularly helpful in combating stress. Individual characteristics such as self-efficacy, maintaining a sense of identity, future orientation, as well as external sources, such as social support, national identity and pre-social behavior are considered important [13]. But beyond the exams, adjusting to the changes effectuated from the pandemic is challenging for adolescents as it is for adults [14]. Recent research [15] has shown that during the spread of coronavirus, high levels of resilience in adults were associated with lower levels of stress.

Mandatory stay at home, lack of peer contact, and strict adherence to hygiene and self-protection measures have brought significant challenges in everyday routine, which require adaptation and flexibility [16]. Additional stressors within this new context of the pandemic include the adaptation to new educational requirements, the experience of online schooling, and the postponement of the upcoming examinations [17]. Limited information regarding coping skills and functioning is reported. The aim of this study was to investigate if resilience could mitigate the level of test anxiety in students who are going to participate in the final High School exams having to overcome the challenges of a new teaching-learning reality created by the aftermath of Coronavirus (COVID-19). A secondary aim was to investigate the attitudes and behaviors of Greek students during the imposed quarantine.

## Materials and Methods

### *Participants-procedure*

The study group consisted of 67 High School students. Inclusion criteria contained the requirement of attending the senior year in High School and participating at the Pan-Hellenic Examinations. The project was completed online and was carried out in mid-April 2020. Participants were members of a private educational institution of secondary

education in Thessaloniki. They were invited to participate in this online questionnaire via emails after informing them about the project. Parental informed consent was required and provided online at the beginning of the completion for individuals under the age of 18. The questionnaire was anonymous and all personal information processed was considered confidential and kept with the utmost confidentiality, in accordance with the European Data Regulation 2016/679[(General Data Protection Regulation (GDPR)] for the protection of personal data. The survey took approximately twelve minutes to complete.

### *Tools/Measures*

- **Westside Test Anxiety Scale.** The Westside Test Anxiety Scale (WTAS) is a brief, ten-item instrument designed to identify students with anxiety impairments. The scale items cover self-assessed anxiety impairment and cognitions which can impair performance. It contains 10 items, rated on a five-point scale ranging from 1- [not at all true] to 5 – [extremely true]. Some of the items include: “The closer I am to a major exam, the harder it is for me to concentrate on the material”, “When I study, I worry that I will not remember the material on the exam” [18]. Total score is generated from summing the items and dividing by 10. Scores between 1.0 – 1.9 indicate “comfortably low test anxiety”; Scores between 2.0-2.5 equal “normal or average test anxiety”, between 2.5 – 2.9 “high normal test anxiety”; between 3.0 – 3.5 “moderate test anxiety”, and between 3.5 – 3.9 “high test anxiety”. Higher scores indicate more severe anxiety symptoms with scores on the upper end (4.0-5.0) indicating extremely high anxiety. In this study Cronbach's Alpha coefficient value of the WTAS was found to be 0.85.

- **Child and Youth Resilience Measure (CYRM-12).** The Child and Youth Resilience Measure is a 12-item scale [19] that can be used as a screener for resilience processes in adolescents' lives. CYRM-12 is a short version of the original scale that contains 28 items (20). Psychometric Properties of the measure have been proved robust ( $\alpha = 0.84$ ; AGFI = .96; CFI = .96; RMSEA = .050) [20]. Items (e.g. item 1, “My family/relatives really watch out for me”) are scored on a five-point scale; 1 = not at all; 2 = a little; 3 = somewhat; 4 = quite a bit; 5 = a lot. Scores ranging between 12 and 45 points indicate low levels of resilience, and scores ranging between 45 and 60 points indicate moderate to high levels of resilience [21]. In this study Cronbach's Alpha coefficient value was found to be 0.69.

- **Questionnaire related to the lockdown and the final exams:** Several questions were selected by the authors to explore the challenges adolescents are facing during the imposed lockdown and the impact of school suspension.

Question topics included “Coronavirus challenges”, “Online school”, “Exams”, “Recreation -Communication”, and “Attributions for the lockdown”.

The responses were recorded using a ten-point scale when applied to frequency questions (participants were asked to choose a number from 0 to 10), and a five-point scale when applied to attribution questions (1, strongly disagree to 5, strongly agree). Lastly, a single question was selected rated on a ten- scale to identify participants who have low self-esteem: “I feel that whatever I do, I am not going to be competent enough”.

## Results

Sixty-seven adolescents born in 2002 [(51 females (76%) and 16 males (24%)] completed over the 95% of the survey items, and were included in the statistical analysis.

### *Anxiety and resilience*

WTAS scores reported by participants reveal average anxiety ( $M = 2.45$ ,  $SD = 1.14$ ). No statistically significant differences were found among males and females regarding WTAS [( $M_{\text{males}} = 2.63$ ,  $SD = .84$ ;  $M_{\text{females}} = 2.40$ ,  $SD = 1.23$ );  $p = .481$ ]. Although overall mean scores between males and females did not clarify a statistical difference, when exploring the levels of anxiety there was a 9.8% of females that report extremely high anxiety and another 9.8% that report high test anxiety. Overall levels of anxiety were low with 31.34% of the total sample reporting “low test anxiety”, 13.4% “normal or average test anxiety”, 19.4% “high-normal test anxiety”, 17.9% “moderate test anxiety”, 10.4% “high test anxiety” and 7.46% “extremely high test anxiety”. WTAS scores had the highest correlation with low self-esteem” ( $r = .664$ ,  $p = .001$ ). The correlation between anxiety and resilience did not produce a statistically significant result ( $r = -.178$ ,  $p = .155$ ). Resilience scores ( $M_{\text{males}} = 49.75$ ,  $SD = 5.13$ ;  $M_{\text{females}} = 48.59$ ,  $SD = 4.91$ ) did not yield a statistically significant difference [ $t(63) = 858$ ,  $p = .324$ ] between genders. Scores were on the upper side of the scale, equaling moderate to high resilience.

### *Quarantine challenges*

The highest positive correlation was found between WTAS and the fear that a family member is going to be infected ( $r = .427$ ,  $p = .001$ ) and the lowest correlation was found between WTAS and self-evaluated affected concentration due to the lockdown ( $r = .267$ ,  $p = .033$ ). No statistically significant differences were found among female and male participants but in social media engagement ( $M_{\text{males}} = 3.04$ ,  $SD = 1.66$  vs  $M_{\text{females}} = 3.85$ ,  $SD = 3.61$ ;  $t(65) = 3.016$ ,  $p = .004$ ) and online video

gaming ( $M_{\text{males}} = 3.66$ ,  $SD = 1.84$  vs  $M_{\text{females}} = 1.06$ ,  $SD = .86$ ;  $t(62) = 8.465$ ,  $p = .001$ ).

### *Attributions for the lockdown*

Forty-nine participants (64.5%) reported that the lockdown is the proper strategy for protection from coronavirus, 9 (11.8%) think that the lockdown was imposed to satisfy hidden interests, 5 (6.6%) believe that it is an ineffective measure and 4 (5.3%) rate it as extravagant precaution. When asked about how long would they tolerate to be quarantined, 30 participants (39.5%) answered that they will tolerate it as long as they have to, 18 (23.7%) for a maximum of two months, 11 (14.5%) for some days only and 8 (10.5%) reported that they cannot be quarantined any longer. Regarding pressure to excel in the exams, 30.3% reported that their professors press them the most, even more than their family, the society or the state. Test anxiety for those adolescents was significantly higher [ $t(65) = -2.491$ ,  $p = 0.15$ ] than for participants who attribute pressure to other factors ( $M = 2.92$  vs  $M = 2.21$ ).

### *Predictors of Test Anxiety*

Hierarchical linear regression analysis was performed to identify significant predictors of test anxiety. Variables significantly correlated with test anxiety entered the equation. All needed transformation was completed before the analysis and relevant statistical assumptions were met. A five-stage hierarchical multiple regression was conducted with test anxiety as the dependent variable (Table 1). Low self-esteem was entered at stage one of the regression. Self-evaluated impact on performance and concentration were entered at stage two, coronavirus-related talking with friends, and fear of a family member contracting the virus at stage three, social media and gaming frequency at stage four and finally pressure from professors at stage five.

Results revealed that at stage one, low self-esteem contributed significantly to the regression model ( $F(1, 37) = 20.21$ ,  $p = .001$ ) and accounted for 35.3% of the variation in test anxiety. Introducing the variables related with coronavirus challenges explained an additional 14.4% of variation in test anxiety and this change in  $R^2$  was significant,  $F(2, 35) = 5.03$ ,  $p = .038$ . Adding affected performance and affected concentration to the regression model explained an additional 9.7% of the variation in test anxiety and this change in  $R^2$  was significant,  $F(1, 33) = 3.94$ ,  $p = .029$ . The addition of social media and gaming resulted in a non-significant change in  $R^2$ ,  $F(2, 31) = 1$ ,  $p = .324$ . Finally, when pressure from professors was added to the model explained a 9.6% of the variation in test anxiety and the result was significant,  $F(1, 30) = 10.28$ ,  $p = .003$ . All independent variables together accounted for 71.8% of the variation in text anxiety.

**Table 1.** Summary of Hierarchical Regression Analysis for Variables Predicting Test Anxiety

Variable	<i>b</i>	<i>t</i>	<i>sr</i> <sup>2</sup>	<i>R</i>	<i>R</i> <sup>2</sup>	$\Delta R^2$
<b>Step 1</b>				.594	.353	.353
Low self esteem	.267	2.21*	.215			
<b>Step 2</b>				.706	.498	.144
Coronavirus talk	.173	1.62	.157			
Fear of a family member contracting the virus	.308	2.46*	.238			
<b>Step 3</b>				.771	.595	.097
Affected performance	.223	1.77	.172			
Affected concentration	.153	1.10	.106			
<b>Step 4</b>				.789	.623	.028
Social media (hours)	-.049	-.38	-.037			
Gaming (hours)	.208	1.75				
<b>Step 5</b>				.848	.719	.096
Pressure from professors	.330	3.20**	.310			

\* $p < .05$ , \*\* $p < .01$

## Discussions

The present study explored test anxiety and resilience as well as quarantine-related attitudes and behaviors among Greek students taking part in the Pan-Hellenic entrance examinations in view of the COVID-19 outbreak. Student stress anxiety ranged from moderate to high levels, with girls reporting higher levels of stress, a finding that is consistent with data from the international literature as gender-linked response biases, or gender differences in self-confidence or self-efficacy may contribute to over-reporting anxiety [22, 23]. The most significant predictor in this study was low self-esteem, a result which appears to be in line with earlier studies [24, 25]. Regarding the novel coronavirus-related variables, fear of a family member contracting the virus was found to be a significant predictor of test anxiety demonstrating that a situational factor can contribute to text anxiety.

Another interesting finding was that the students who participated in the research pointed to teachers as the main source of pressure in school exams, a variable that was also found to be a significant predictor of test anxiety. The outbreak of the pandemic created a new educational reality and brought about many changes in the way the courses are conducted. Online lessons and the effort to adapt to distance learning further strengthened the role of the teacher as a coordinator of the learning process, adding additional stress especially if the educator was not familiar with technology. This extra pressure may be passed on to children, as success in exams also reflects upon the teacher's effort.

Resilience in this sample was found to be moderate-to-high for both male and female students. One should keep in mind that these children have undergone another major crisis impacting education, a financial crisis resulting in the country's bankruptcy that ended a mere two years ago. The

hypothesis that resilience functions as a partial moderator to stress has been observed elsewhere [26, 27]. In this study the result could not be replicated. This may be explained by the particular circumstances, (school suspension, online schooling, unknown exam date) resulting to novel type of stressors which possibly intervene between resilience with test anxiety. This hypothesis remains to be clarified.

Quarantine as a method of protecting the spread of the pandemic was considered an acceptable strategy by the majority of participants regardless of gender, while a smaller percentage claimed that it was a means of serving hidden interests, perhaps an ineffective measure and extreme condition. Most of the participants were not anxious about contracting themselves the virus; instead they were concerned about their family members, perhaps because older adults have an increased risk of experiencing more severe symptoms, if sick.

Regarding the additional challenges caused by the imposed lockdown, participants reported that their favorite activities were watching movies and engaging on social media, or video gaming. Findings are in line with the research by Orgilés et al. [28], regarding the direct psychological effects of quarantine on children and adolescents from Italy and Spain. The results showed that during quarantine, children spent more time daily on electronic devices, and less time doing physical activity.

Online schooling and the technical difficulties involved seemed to offer low levels of satisfaction for the participants, with the hours of online course attendance fluctuating at the same levels. Despite the limitation of course material being relieving, the majority of adolescents agreed that quarantine could negatively affect their performance on the forthcoming exams.

These results are highly useful to help understand the impact of the pandemic to adolescents already experiencing stress. Several limitations of this research

should be considered. Initially, the sample size was relatively small, making it difficult to detect statistically significant data. One of the challenges of this study was to verify parental consent for adolescents less than 18 years old and as the project was completed online, gaining parental consent before the completion of the survey by the participants was complicated. The choice of sampling members of the same private educational institution provided the consent needed, but created a negative effect to the sample size and the external validity of the study, therefore the generalizability of the results is questionable and requires a larger and more representative population. Furthermore, the study's design was cross-sectional, which does not allow for a true cause and effect relationship to be established. Future research in the field should address these issues with a longitudinal methodology.

## Highlights

- ✓ The outbreak of the coronavirus (COVID-19) brought about many changes in all aspects of daily life.
- ✓ Results showed that despite the fact that there are several gender differences regarding the way boys and girls manage everyday life, the test stress remains common.
- ✓ Enhancing adolescents' resilience in the family and school environment can be a useful tool to cope with test anxiety.

## Conclusions

The spread of COVID-19 brought changes in the daily lives of Greek adolescents, who had to deal with both quarantine and the upcoming exams. Results showed that despite the fact that there are some gender differences regarding the way boys and girls manage everyday life, the test stress remains common. Thus, enhancing adolescents' resilience in the family and school environment can be a useful tool to cope with test anxiety.

## Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article. The manuscript was read and approved by all authors.

## Compliance with ethical standards

Any aspect of the work covered in this manuscript has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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