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ΑΛΕΞΑΝΔΡΑ & ΚΩΝΣΤΑΝΤΙΝΟ.

Ευχαριστίες

Θα ήθελα να ευχαριστήσω θερμά τους γονείς μου, Αλεξάνδρα και Κωνσταντίνο για τη στήριξη τους -συναισθηματική, ηθική αλλά φυσικά και οικονομική- όλα αυτά τα χρόνια των σπουδών μου στο μεταπτυχιακό πρόγραμμα της Επιστήμης του Στρες και Προαγωγής Υγείας. Η παρουσία, η βοήθεια και η ενίσχυσή τους σε κάθε βήμα αυτού του "ταξιδιού" ήταν πολύτιμη και αναντικατάστατη.

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ΠΕΡΙΕΧΟΜΕΝΑ

Abstract 5

Introduction 6

Methods 8

Flow chart 9

Results 10

Discussion 14

References 22

Exam stress: Who is affected more, and which are its consequences. A systematic review

Abstract

The purpose of this study is to accumulate, present and analyze the data of research studies regarding exam anxiety among college students. This kind of stress is considered an important problem which can negatively influence students' physical and mental health and can contribute to poor academic performance. This study presents research data regarding the predictors of anxiety, the gender differences, and its possible consequences, such as on students' academic achievement. On the scope of this purpose, a literature review was conducted and, finally, included 11 quantitative studies published from 2001. Overall, the results of this literature review suggested that exam stress can negatively affect students' academic performance, and it is higher among females. Certain factors, including social identity, parental support, high self-esteem, and selfactualization can act as protective factors against exam anxiety.

Key words: *exam stress, test anxiety, students*

Introduction

Exam anxiety describes a situation where the individual experiences moderate anxiety, agitation and depressive feelings stemming from the examination process, school or academic, and its potential outcomes. Thus, it has been conceptualized as an emotional response that some students may confront before the exams. The estimated percentage of students with exam stress is about 25-40%. Also, it seems that the ones with disabilities, as well as those in classrooms for gifted students usually present higher levels of exam stress (Nelson & Harwood, 2011).

Despite the fact that the student's fear regarding their performance and the possible consequences are rational, at least to a certain degree, and it seems that excessive fear can certainly influence in a negative way an individual's performance. Particularly, it has been suggested that a bit of worry is not harmful for students, given that it could keep them focused, motivated and task oriented. Nevertheless, too much worry can be exhausting and harmful for a student's performance, wellbeing and overall health (Frischenschlager, Haidinger & Mitterauer, 2005. Parkerson, Broadhead & Tse, 1990).

Exam anxiety is a mental condition, which is considered to be very common among students during examination periods. It has been suggested that there are four core determinants that can negatively influence a student's performance, such as the student's life and studying style, insufficient information, and various psychological factors. In particular, it has been argued that some of the main factors that can lead to exam anxiety include sedentary lifestyle, lack of a balanced diet and poor time management. Some of the factors that seem to play key role in developing exam stress include insufficient studying strategies, such as improper preparation, studying right before the day of the exam (especially during night hours), lack of sufficient review and revision of the syllabus, etc. Psychological factors can include negative and irrational thought patterns, such as negatively forecasting the results of the exams (e.g. I will fail at my exams), catastrophizing (I will never pass this course), feelings that the individual does not have control over the exam process as well as its results (Acharya, 2003. Hashmat, Amanullah & Aziz, 2008). In reality, anxiety and stress may have a protective impact on an individuals' self- preservation, since they can render a person vigilant for potential threat or imminent danger. Immense anxiety may lead an individual to experience increased heartbeat, difficulties in breathing, release of stress hormones, adrenaline rush, feelings of agitation and vigilance. Thus, the stress response is a result of individuals' perceived threat and available resources to cope with any potential danger. For instance, in the case of exams, the potential danger could be a low grade which could render the

student incapable of getting a scholarship for post- graduate studies. Furthermore, it is worth noting that students with low self-esteem and sense of competence may doubt about their ability to perform greatly and thus, they might negatively forecast their exam results. Hence, academic exams are viewed as a very threatening situation and consequently, students may become stressful for the whole examination process (Putwain, Woods & Symes, 2010). Last but not least, exam anxiety can vary from mild to severe; students experiencing severe exam anxiety are at a higher risk of undergoing panic attacks, whereas the ones with mild anxiety are not practically affected with regards to their performance (ADDA, 2012).

Exam stress consists a mental condition oriented by physiological changes, maladaptive thoughts, poor concentration and emotional distress. Physical symptoms are very common and, in many cases, may include sweating, headaches, difficulties in breathing, mouth dryness, inclination to vomit, etc. Maladaptive thoughts may include fear for failure, denial, sense of inadequacy, selfblame, negative affirmations against themselves, frustration and feelings of inferiority. Moreover, poor concentration can lead to difficulties in becoming organized, feelings of confusion, distracted behavior, etc. As a consequence, students with exam anxiety may perform poorly, regardless of their efforts and exam preparation.Emotional difficulties may include sense of hopelessness, low self-esteem and feelings of anger and depression (Zunhammer, Eberle, Eichhammer & Busch, 2013).

Parental pressure is also considered to be one of the causes of exam anxiety. Other risk factors usually include procrastination, low test performance in the past and fear for failure. Additionally, other possible factors may include the nature of the task in terms of difficulty level, time limitations, perfectionism, low self-esteem, as well as how demanding the examiner may be, which can influence the degree of stress that students experience during the exams (ADDA, 2012). The risk factors that connect students with exam stress are depression, sleep deprivation, lack of social life, lack of spare time and certain number of breaks, throughout their academic years. Furthermore, there are evidence that African exchange students cope better than others, due to their social skills, thus indicating that race plays a significant role in dealing with stressful situations (Papadopoulos & Ali, 2013).

Taking into consideration all the aforementioned factors, it can be said that it is crucial to conduct a literature review about the mental condition called exam stress. In particular, the main aim of this literature review is to provide answers to the following two research questions:

What are the consequences of exam anxiety?

Who is more vulnerable to exam anxiety?

Methods

The main purpose of this project is to present and delineate previous research studies regarding the subject of exam anxiety. In this systematic review is being included a research study in order to define the factors which make students more vulnerable exam stress, as well as the possible factors and the consequences when undergoing exam anxiety. The current literature review was performed in January of 2019. To this project it was equally necessary to review published articles regarding the subject of exam stress among undergraduate and postgraduate students regardless of their field of studies. The databases which were used in order to entry those articles were in no particular order: Google Scholar, PubMed and EBSC. Those provide a variety of scientific journals with reference to exam stress, anxiety, and exam performance.

Certain keywords were used, such as "*exam stress", "exam anxiety", "academic examination stress", "test stress and examination anxiety"*. The custom range of articles' published day varies from year 2000 to 2020. It is worth mentioning that the literature review focuses only on articles examining exam stress among undergraduate and post graduate students excluding those who graduated high school. During the literature search 90 articles were found and assessed in order to identify whether the subject is related to the main research question and whether sound methodological methods were used so as to produce reliable and validate results. After excluding the less relevant and less reliable articles, 75 in total, 15 articles were selected, scrutinized and finally included to the study. *Figure 1* clearly depicts the flow chart of the literature search.

The other 75 articles were rejected since they could not meet the inclusion criteria. Those were the following: articles reviewing exam stress among undergraduate and post graduate students, published from year 2.000 to present, following sound methodological design and producing valid results, including a representative sample of target group mentioned above and quantitative studies. On the other hand, the excluded criteria were a target group of high school students or other kind of exams, including academic exams, literature reviews, and qualitative studies, as well. All the participants come from different ethnic background, so the target group consists of Asians, Caucasians and other nationalities. The research studies not presented in this review were literature reviews and qualitative studies that included undergraduate and post graduate students from various fields such as medical students, veterinary students, physiotherapists etc. Other studies were excluded due to being outdated or did not necessarily meet the criteria regarding the present study's literature background or failed to illustrate specific representative sample and proper target group.

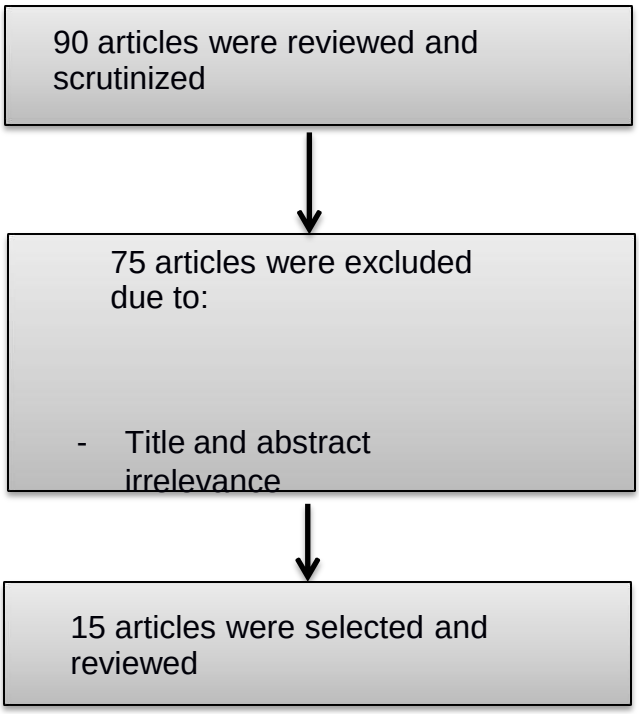

Figure 1: Flow chart of the literature search.

Results

Table 1, which represents the taxonomy table of the present review, describes the included articles and more specifically, it includes useful information regarding article's citation, research question (RQ) and research hypothesis (RH), participants' description, including their size, research's present, measures, namely the instruments used to measure the variables and the paper's conclusion. Studies' participants were all from differenent ethnic backgrounds, including Asians, Caucasians and other mixed ethnic backgrounds. Also, it is worth mentioning that the majority of the selected studies used the term test anxiety instead of exam stress.

Regarding test anxiety and students' exam performance there has been a plethora of research studies, focusing on examining their relationship. For instance, Trifoni & Shahini (2011) tried to investigate how university students' performance is influenced by their level of exam anxiety. Furthermore, they examined the perceived causes and effects of exam anxiety. More specifically, the paper examined the levels of test anxiety among 109 students by using Test Anxiety Scale developed by Sarason (1980). They also used a survey with open questions regarding student's attributions of the causal factors and impacts of test anxiety. The results of this review suggested that many students experienced exam anxiety and are negatively affected by this, especially females. Moreover, the main causal factors of exam anxiety, as reported by the students asked, were the inadequate exam preparation, fear of low scores, negative previous experiences on testing, pressure and time limitation, the length of the test and the difficulty of course's context. In reference to the possible consequences of exam anxiety, students reported that it can negatively

affect their motivation and academic achievement, their ability to concentrate and recall the learned material and their exam scores.

Mohamadi, Alishahi & Soleimani (2014) examined the relationship between test anxiety, self-perception and exam score, as well as the role of gender, among 55 college students in Iran. Participants had to complete two self-reported questionnaires to measure test anxiety and selfactualization and they also, had to answer a question regarding their feelings about their anxiety during this specific exam. Results suggested that anxiety for the exam was negatively correlated with self-actualization and perception. The study shows that test anxiety

occurred regardless of students' gender; this is in contrast with the Trifoni & Shahini (2011) study, which showed that female experience higher exam anxiety compared to men. Furthermore, students with high test anxiety scored presented a lower test score, suggesting that test anxiety can negatively affect their performance in exams. Therefore, it seems that both self-actualization and exam score have a negative relationship with test anxiety.

Similarly, Chapell et al. (2005) examined the relationship between test anxietyand academic performance among 4,000 undergraduate students and 1,414 graduates. In order to measure test anxiety, they used the Test Anxiety Inventory developed by Spielberger (1980). The results of this study showed that both undergraduate students and graduates with high exam anxiety had lower exam performance. However, female undergraduate students had more test anxiety and better exam performance compared to males. Likewise, female graduate students have also significantly more test anxiety and better exam performance compared to male graduates.

Moreover, Sucuoğlu (2018) examined how overseas students' demographic characteristics, such as nationality and grade, gender,could predict levels of stress anxiety. In total, 115 undergraduate students took part in this study from the Near East University. The participants had to complete two questionnaires, one with their demographic characteristics and the Cognitive Anxiety Scale. In total, almost 31% of students presented test anxiety and as the results suggested, females reported higher levels of test anxiety compared to males.

Hancock (2001) examined how students' academic achievement and motivation is affected by test anxiety. In particular, they examined 61 postsecondary students and their characteristic, test anxiety, the variable of classroom, and fear of evaluation and how they could influence their academic achievement and motivation. The participants were allocated randomly into two different conditions: the high evaluative threat condition and the low evaluative threat condition. The results of this study suggested that students with high exam anxiety scored lower grades compared to the ones with low exam anxiety. This is something

to be expected, because they presented lower motivation apart from poor academic performance, when they were into classrooms which were highly evaluated.

In addition to this, Kahan (2008) examined the relationship between anxiety for exams and main anxiety elements regarding academic performance among college students. Test anxiety measured by the Debilitating Anxiety Scale of the Alpert-Haber Anxiety Achievement Test (Alpert & Haber, 1960) and anxiety levels measured by the State/Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). In total, 68 students took part in this study and completed all the questionnaires, including the one with the demographics. They completed the measurements regarding anxiety and depression before taking their final college exams. The results of this study demonstrated that test anxiety was not correlated with exam performance.

An earlier study examined test anxiety among college students carried out by Capa Loadman (2001) and tried to identify the role of past testing experiences and self-efficacy in predicting test anxiety. In total, 29 undergraduate students took part in this study and answered the following self-reported questionnaires: College Academic Self-Efficacy Scale to measure general and academic self-efficacy, the Test Anxiety Scale and the Previous Testing Experience Scale. The results of this study showed that the independent variables of previous testing experience and self-efficacy could significantly predict students' test anxiety. Besides, low academic self-efficacy was related to higher test anxiety, whereas previous testing experience has a positive correlation with test anxiety.

A more recent study carried out by Obosi, Odusanya, Tomoloju & Olagoke (2018) examined how gender, self-efficacy and locus of control can affect exam anxiety. In total, 596 students in Ibadan Oyo State of Nigeria took part in this study. Test anxiety was measured by Westside & Driscoll's (2004) scale which consists of 10 items. Locus of control was measured by Craig, Franklin and Andrews's (1984) questionnaire which consists of 17 items. Moreover, the variable of self-efficacy was measured by Schwarzer, & Jerusalem's (1995) 10 item questionnaire. Through this study the researchers tried to examine the following hypothesis: Self-efficacy and locus of control will be predictors of test anxiety; exam anxiety will be affected by certain demographic factors, including age, gender, religion and educational level. Females will experience higher exam anxiety compared to males. The results of this study suggested that selfefficacy, locus of control and the aforementioned sociodemographic factors could significantly affect test anxiety.

Putwain, Woods & Symes (2010) tried to find out how test anxiety and beliefs about personal knowledge, including students' achievement goals and their perceptions regarding

academic competence, level of parental support and pressure, and teachers' achievement goals are related to each other. In total, 175 students of pre-degree courses in the fields of sociology and psychology. The participants completed six self-reported questionnaires so that to measure test anxiety, academic self-concept, perceived test competence, teachers' and personal achievement goals and perceived level of parental support and pressure. The results suggested that among students the higher the perceived academic competence was, the more stress for exams they experienced. Besides, exam stress was higher among students whose parents were less supportive. Lastly, teachers' performance-avoidance goals were associated with student's higher test anxiety.

A more recent study carried out by Zwettler et al. (2018) examined how social identity is related to test anxiety among university students. In general, it has been suggested that social identification can be a protective factor against emotional distress. Therefore, the researchers of this study tried to investigate how emotional (e.g. feeling anxious) and cognitive symptoms (e.g. difficulty in concentrating) of stress for exams are related to social identification. In total, 108 college students took part in this survey, who have received the diagnosis of test anxiety. The participants had to complete the following questionnaires: a four-item scale developed by Doosje et al. (1995) to measure social identification, a scale from a German test anxiety survey (PAF; Hodapp et al., 2011) to assess worry regarding exam performance, the Brief Symptom Checklist (BSCL-53; Franke, 2017) to estimate the psychopathologic stress and the achievement motivation inventory (LMI-K; Schuler & Prochaska, 2001) to measure student's motivation. The results of this study showed that students with poor social identity experienced higher levels of test anxiety.

Dan & Raz (2015) examined how attention deficit hyperactivity disorder is related (ADHD) to self-esteem and test anxiety among young adults. In particular, the researchers of this study examined three main subscales of test anxiety in young adults, namely cognitive obstruction, tenseness and social derogation. In total, 25 females diagnosed with ADHD and 30 females without this disorder as a control group. All the participants completed four questionnaires: the Friedben Test Anxiety Scale (FTAS; Friedman & Bendas-Jacob, 1997), an ADHD questionnaire, the Rosenberg 10-item Self- Esteem Scale (Rosenberg, 1965) and the Continuous Performance Tests/Tasks (eAgnosis, Inc., Delaware; Raz et al., 2012; Sadeh, Dan, & Bar-Haim, 2011). The hypothesis that tested through this study was the following: ADHD will be negatively correlated with test anxiety and negatively with self-esteem compared with young adults without ADHD. The results of this study suggested that participants with ADHD had significantly lower selfesteem and much higher test anxiety compared to the control group.

Discussion

The main aim of this literature review was to investigate the consequences, the possible predictors and gender differences of exam stress among college students. Based on the data presented above, it seems that exam anxiety is generally quite frequent among students. However, some students are more vulnerable to experience this negative feeling. In particular, it seems that students with low self-esteem, low self-efficacy and self- actualization, the ones suffering from ADHD, the ones with poor social identity, the ones experiencing parental pressure, and the ones with previous test experience, and females, tend to experience higher levels of test anxiety. Therefore, it could be concluded that the aforementioned factors render students more vulnerable to experience stressful feelings during exams (Whitaker et al., 2007).

Furthermore, it seems that stress have negative repercussions mainly on students' academic performance and motivation. Just one study showed the opposite, namely that test anxiety does not negatively influence exam performance, but rather it can lead to better results compared to students with low test anxiety (Chapell et al., 2005). Similarly, Kahan (2008) suggested that test anxiety does not affect academic performance. This is in accordance with Sarason & Sarason's (1990) study which showed that facilitative anxiety and the accompanied physiological arousal cannot necessarily contribute to poor academic performance. Nevertheless, the vast majority of the presented studies suggested that high exam stress can lead to poor academic performance. The negative effect that anxiety can have on academic achievement has been widely demonstrated during the last 30 decades, since it has been widely suggested that psychological distress usually contribute to lower grades and in some cases to dropouts from college (Hamaideh & Hamdan-Mansour, 2014).

The present review proves that exam stress is a main factory among others which has a tremendous impact on the individual's psychology, mental stability, mental health and balance. It is also proven that exam anxiety can have negative effects on a student's overall performance, so it is crucial for them to prepare themselves accordingly in order to maintain their performance at maximum levels. Therefore it would be fair to say that a student's performance should be assessed as a whole and not only during the exam period.

All in all, the results of this study highlight the impact of test anxiety on students' academic achievement and some of the predictors related to test anxiety. Hence, they stress out the importance of designing relative interventions targeting on reducing students' test anxiety or preventing its onset. Such interventions could consider the mediating role of various factors that could act as protective resources against test anxiety, such as enhanced social identity, parental support, etc (Whitaker et al., 2007).

Table 1. Basic characteristics of included studies.

Citation	RQ and RH	Participants	Design	Measures	Conclusion	Country
Capa & Loadman (2001).	How undergraduate students' test anxiety is correlated with self-efficacy and past testing experiences?	N=29 college students at a Midwestern University	Quantitative study	-Test Anxiety Scale - College Academic Selfefficacy Scale - Generalized Self-Efficacy Scale - Previous Testing Experience Scale.	- Test anxiety was positively correlated with past testing experience. - High academic self-efficacy was correlated with low test anxiety.	USA
Chapell et al., (2005).	How test anxiety is related to academic performance ?	N= 4,000 undergraduates and 1,414 graduates.	Quantitative study	- Test Anxiety Inventory (Spielberger, 1980).	- Females experienced higher exam anxiety presented a better exam performance. - Undergraduate and graduate students with high exam anxiety had lower exam performance.	USA
Dan & Raz (2015).	ADHD will be negatively correlated with test anxiety and negatively with self-esteem compared with young adults without ADHD	N= 55 females with and without ADHD.	Quantitative study	- The Friedben Test Anxiety Scale - an ADHD questionnaire - the Rosenberg 10-item SelfEsteem Scale	- Participants with ADHD had significantly lower self - esteem and much higher test anxiety compared to the control group.	Israel

				- the Continuous Performance		
				Tests/Tasks.		
Hancock (2001).	How learner's characteristic, test anxiety, the variable of classroom, and fear of evaluation can influence academic achievement and motivation?	N= 61 post secondary students	Quantitative study	- NOT MENTIONED	- High test anxiety led to poor academic performance and low motivation in highly evaluated classrooms.	USA

Kahan (2008).	Test and state anxiety willbe correlated with academic performance.	N= 68 college students	Quantitative study	- State/Trait Anxiety Inventory - Debilitating Anxiety Scale of the AlpertHaber Anxiety Achievement Test .	- Academic performance was not affected by anxiety for exams and state anxiety.	USA
Mohamadi, Alishahi & Soleimani (2014).	• What are students' thoughts regarding the causal factors of their test anxiety? • Is test anxiety and selfactualizati on	N= 55 B.A. Students Median Age: 23 Ethnicity: Swedish	Quantitative prospective study	- Test anxiety: Carver and Scheier (1991) questionnaire - Self-Actualization: SelfActualization Index (SAI) by Jones and	- Test anxiety could be one of various factors which can negatively affect exam score. - The more self-actualization students had the less test anxiety they represent. - Neither males nor females experienced higher levels of exam anxiety.	Sweden

	significantly related to each other? • Is there any significant difference between males and females regarding test anxiety? • Is there any significant relationship between test score and test anxiety?			Crandall (1986)		
Obosi, Odusanya, Tomoloju & Olagoke (2018).	• Self-efficacy and locus of control will be predictors of test anxiety • Exam anxiety will be affected by certain demographic factors, including age, gender, religion and educational	N= 596 college students, post graduate and distance learning students in Ibadan Oyo State of Nigeria	Quantitative study.	- Test anxiety: Westside & Driscoll 's (2004) scale. - Locus of control: Craig, Franklin and Andrews's (1984) questionnaire - Self –efficacy: Schwarzer, & Jerusalem's	- Self-efficacy, locus of control and sociodemographic factors could significantly affect test anxiety.	Nigeria

	level Females will experience higher exam anxiety compared to males.			(1995) scale		
Putwain, Woods & Symes (2010).	How test anxiety and beliefs about personal knowledge, including students' achievement goals and their perceptions regarding academic competence, level of parental support and pressure, and teachers' achievement goals are related to each other.	N= 175 students of pre-degree courses in the fields of sociology and psychology	Quantitative study	- Self-reported questionnaires so that to measure test anxiety, academic selfconcept, perceived test competence, teachers' and personal achievement goals and perceived level of parental support and pressure	- High perceived academical performance, gh performanceavoidance goals and parent pressure were related to hi exam anxiety.	UK
Sucuoğlu (2018).	How overseas students' demographic	N = 115 undergraduat	Quantitative study	- Cognitive - Anxiety Scale	- Females reported higher levels of test anxiety	Cyprus

	characteristics, such as gender,	e students		Demographics	compared to males.	
	nationality and grade, could ·edict levels o ;tress anxiety f					
Trifoni & Shahini, (2011).	? How university students' performance is influenced by exam anxiety?	N= 109 students in "Aleksandër Moisiu" Universit	Quantitative study	- Sarason's (1980) Test Anxiety Scale - Demographics - 3 open-ended questions about their attributions regarding causes and impact of test anxiety.	- Test anxiety negatively affected performance.	Albania

Zwettler et al., 2018.	How social identity is related to test anxiety among university students?	N=108 University students.	Quantitative study	- A four-item scale developed by Doosje et al. (1995) to measure social identification - A scale from a German test anxiety survey (PAF; Hodapp et al., 2011) to assess worry regarding exam	- Students with poor social identity experienced higher levels of test anxiety.	Germany

				performance - The Brief Symptom Checklist (BSCL-53; Franke, 2017) to estimate the psychopathologic stress - Achievement motivation inventory (LMI-K; Schuler & Prochaska, 2001) to measure students motivation.		

INCORRECT STUDY PRACTICES	NEGATIVE THOUGHTS	SYMPTOMS

- Lack of concentration - Lack of balanced diet - Poor time management - Improper preparation - Studying right the day before the exam - Lack of sufficient review	- Catastrophizing - Lack of control over the exam process - Procrastination (due to perfectionism and low self-esteem) - Anxiety - Irrational thought patterns - Hopelessness	- Panic attacks - Difficulties in breathing Increased heartbeat - Adrenaline rush - Feelings of agitation - Sweating Headaches - Mouth dryness Inclination to vomit - Disorganization Distracted behavior - Psychological symptoms: self-blame, negative affirmation against themselves, feelings of inferiority, failure and denial, feelings of confusion

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