



## RESEARCH ARTICLE

## Health professional students' self-reported test anxiety and nutrition

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### Abstract

**Background:** Higher education students are frequently exposed to stressful life conditions in pursuit of their degrees within a highly competitive environment. Especially, health professional students experience high levels of stress throughout their academic life, which may affect also their nutritional choices.

**Aim:** To explore whether and to what extent the exams anxiety of final year health visiting students influences their dietary habits.

**Method and material:** A questionnaire containing demographic information, anthropometric measurements, nutrition and stress eating habits and state part of the Spielberger State-Trait Anxiety Inventory was completed by a random

sample of final year students (N=166). Statistics included descriptive measures, correlations using Spearman rho coefficient and logistic regression analysis.

**Findings:** The majority of the sample consisted of females (78,9%), while most students were non-smokers, with normal BMI and they tend to follow healthy dietary habits. Although, diet score was positively correlated with anxiety, correlation was significant only for women. Male students with high anxiety appear to consume more often doughnut and sweets at breakfast (explaining 27,6% of anxiety variance), while women with high stress tend to use less supplemental salt in meals (explaining 5,6% of anxiety variance).

**Conclusions:** In general, health visiting students follow a healthy lifestyle pattern which is negatively affected during exams period and is manifested through consumption of saturated and high in calories meals, especially by females.

**Keywords:** Academic exams, stress, dietary habits, anxiety, students

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### Introduction

Students are frequently exposed to stressful life conditions in pursuit of higher education within a highly competitive academic environment. In particular, cumulative evidence has shown that academic exams can be experienced as an extremely stressful event for students.<sup>1-3</sup> Test or exam anxiety may be defined as an individual's somatic, cognitive and behavioral response, which stimulates negative feelings about an evaluation. As negative feelings are meant an inability to think, to think or recall information, tension, and difficulty in understanding simple test questions or direction on an examination.<sup>2</sup> In the United States, the



wider spectrum of anxiety disorders, part of which is the particular one, is considered an indicator of mental health state of college students and alarming evidence is accumulated to suggest that it affects at least 1 in 10 college students.<sup>4</sup>

It appears that the phenomenon of exams anxiety has been examined through several different perspectives in the literature. These might be summarized broadly into three categories. Firstly what causes exams anxiety on a personal<sup>5-6</sup> and/or a social level. Interactional models of stress and anxiety assume that situational anxiety in evaluative context is determined by the reciprocal interaction of personal traits (i.e., trait anxiety) and the characteristics of situations (i.e., social-evaluative).<sup>7</sup> Secondly, there is ample evidence on what kind of emotional and/or physical symptoms might emerge from anxiety disorders, such as irritability, restlessness, tension, sweating, headache, fatigue, tremors etc.<sup>8</sup> Test anxiety interferes with young people's lives. For instance, it has been found that the proximity of the university entrance exams can be a determining factor for a poor sleep quality.<sup>9</sup> Thirdly, there is a plethora of studies focusing on potential ways of tackling test anxiety.<sup>10-12</sup>

The particular variation of the wider phenomenon of performance anxiety, has been investigated through several perspectives. For example, employing a sample population with similar characteristics to the one employed in our research but in a different country, that is nursing students in Israel, the factors influencing responsiveness to treatment for exam anxiety has been investigated assessing the degree of influence of health beliefs on the extent of asking for treatment for exam anxiety.<sup>13</sup> Also the relationship between high school students' self esteem, optimism and test anxiety has also been examined coming up with the conclusion that students' perceptions of their educational environment and their personality characteristics are connected with test anxiety.<sup>14</sup>

Also, Latas and colleagues<sup>1</sup> have found that a considerable number of medical students experience intense symptoms of test anxiety and require help and support. The objective of this study was to ascertain the presence of test anxiety in medical students and to analyze some aspects of test anxiety in medical students of different gender, different year of studying and possibility of falling the year of studying. Medical students generally present moderate level of test anxiety whereas female students have statistically significant more intense symptoms of test anxiety than male students, while most intense symptoms are in the final years of studies.

Our research focuses on the effects of exams anxiety on students' diet and nutritional choices. There is limited and mostly outdated evidence on stress stress-induced eating may occur during academic examinations period<sup>15-16</sup> when under the state of acute emotional stress, food choices are often modified.<sup>17</sup> Apart from the above, little is known regarding to health professionals students' exposure to exams anxiety, given their education-related high awareness for a healthy lifestyle. It would be worth exploring whether and how exams anxiety affects their lifestyle and dietary habits. In this cross-sectional study, it is attempted to assess dietary habits in relation to levels of anxiety, during final-exam period, among final year health visiting students. Dietary habits are screened both through scoring of a small scale questionnaire and by extracting individual information for each type of habit. The hypothesis of the present study is that higher levels of anxiety will be associated with higher scores of unhealthy diet and higher frequency of unhealthy dietary habits.

## Methods

A small-scale cross-sectional survey was conducted in the School of Health and Social Care Professions of the Technological Educational Institute of Athens during the spring semester's examination period in 2009. A random sample of



166 final year undergraduate students was used. Participation was voluntarily, whereas anonymity and confidentiality was guaranteed. The questionnaires have been completed individually by the respondents and the operators have provided supplementary explanations where the case. Consents of the students were acquired.

A self-reported semi-quantitative questionnaire included four components: A) The demographic profile section, including questions on gender and age, B) The anthropometric measurements section containing body mass index (BMI) and waist measurements. C) The nutritional choices section, comprising of 10 questions which measure the frequency (3-point rating scale) of adopting an equal number of nutritional habits during the current academic exams period (e.g. coffee, sweets, sugar, chocolate, fizzy drinks, savoury snacks, fast food, alcohol and tobacco consumption). D) The Emotional Stress section which measured state anxiety by the 20-item Spielberger State-Trait Anxiety Inventory (STAI), containing items measure on a four-point scale (i.e. responses range from "not at all" to "very much") scoring from 20 at lowest level anxiety to 80 at highest level anxiety. Due to the relative small sample, each diet variable was made binary as seen in Table I of results. Due to the lack of official universal scoring cut-offs, scores of STAI were equally grouped as following: very low anxiety ( $\leq 33$ ), low (34-41), high (42-54), very high ( $+55$ ). For the sake of univariate analysis categories were further grouped as low (very low+low) and high (high+very high). Reliability of STAI in this study was found high (Cronbach alpha 0,931).

### Data Analysis

Statistical analysis was made using SPSS 17v. SPSS software. For descriptive statistics it was used absolute values, means, standard deviation (SD) and % ratios. Correlations were made using Spearman rho coefficient with level of significance at  $P < 0,05$ . The rest of the analysis was stratified

according to gender. Logistic regression analysis was used for univariate analysis with dependent factor the binary levels of anxiety and independent the rest of the variables inserted separately. Only independent variables significant at the level of 0,05 finally remained for each gender category.

### Results

Summary of all the measurements are presented in Table 1. Missing values ranged from 4,8-21,1%, with maximum for the diet scoring (21,1%). The majority of the sample consisted of females (78,9%) and mean age (21,12 years old, range: 18-38). Most students were non-smokers, with normal BMI (53% and 62% respectively). Most students tend to follow healthy dietary habits, as depicted by percentages in Table 1, except for supplemental salt in meals (55,4% vs 27,7%) and fast food consumption (69,9 vs 13,3%) (table 1). Although, diet score was positively correlated with anxiety, correlation was significant only for women (men: Spearman  $r=0,319$ ,  $p=0,159$ , women: Spearman  $r=0,241$ ,  $p=0,023$ ). In the univariate analysis women had more often high anxiety than men (OR 3,46, 95% CI 1,29 to 9,34,  $p=0,014$ ). Table 2 presents univariate analysis stratified by gender. Doughnut or sweet consumption at breakfast (OR 10,5, 95%CI 1,03 to 107,17) and supplemental salt in meals (OR 0,42, 95%CI 0,18 to 0,99) were the only variables associated with high anxiety in men and women respectively (table 2). In general, men with high anxiety tend to consume more often doughnut and sweets at breakfast (explaining 27,6% of anxiety variance), while women with high stress tend to use less supplemental salt in meals (explaining 5,6% of anxiety variance). The rest of demographic and dietary variables were excluded by the univariate analysis.



## Discussion

The association between dietary stress and acute emotional stress, expressed on the occasion of academic examinations, is explored in this study. More specifically, this study draws on a sample of tertiary education students, which is characterized though by an overrepresentation female respondents (approximately 79%). Since the particular sample consists of students in a Health Visiting Department, the overrepresentation of female participants is explained on the grounds of an almost universal pattern of gender segregation in respect to health professionals (i.e. nursing, social work etc).<sup>18</sup> In general, the respondents of this study appear to follow a marginally healthy lifestyle pattern, considering BMI and smoking habits. This may be attributed to some awareness in health promoting behaviors raised through their education in health care studies.

In accordance with previous evidence,<sup>19-20</sup> female students report higher degree of anxiety than their male peers. Self-regulatory efforts may fail, particularly in male young individuals, since this ability is depleted and exacerbated by stress.<sup>21</sup> On the other, female's capacity to control eating stress may be attributed to the adolescent females concern about not being overweight.<sup>22</sup> One interpretation for this finding may have to do with the value attached to academic performance and success. Conversely, it is suggested that male students are less interested in achieving high marks in their exams. Or, by contrast, it may show that male students are more self-confident than female peers, which is a mechanism protective against exams anxiety.<sup>23</sup> However, the particular finding cannot be generalized to larger populations since female overrepresentation characterizes this study's population sample.

In respect to eating stress during an acute emotional stress period, this study suggests that the students who report healthier food choices appear to report also a lower degree of exams anxiety. However the contrary is the case with the

students who report less healthy food choices. Therefore, it may be indicated, in agreement with previous evidence in the literature,<sup>23, 26-27</sup> that the students' perceived stress during academic examinations affects to a significant extent their nutritional behaviors, consuming comfort foods.

However, as these findings suggest, there is scope of promoting and utilizing stress management techniques<sup>12</sup> preventing thus the stress and anxiety caused in critical time periods of young people, such as academic period of examinations. Currently, the higher education institutions in Greece do not provide sufficient student support services. Also, in general, few relevant health promotion interventions are implemented for undergraduate students.<sup>24</sup> However young students, and especially nursing students who are confronted with an extremely stressful college life,<sup>25</sup> deserve greater and more organized provision of stress management and counseling services in order to achieve optimum academic results and to enjoy an even and calm academic life. Helping students learn to effectively manage exams anxiety is a demanding commission that requires a collaborative approach through students, family and the higher education institution in order to find ways in tackling the situation.<sup>11</sup>

## Limitation of the study

The main limitation of this study is considered the limited sample population which does not allow generalizations to the total population. Also the inevitable overrepresentation of female respondents in this sample may be viewed as an additional limitation to generalizations. In addition, unlike previous empirical work, this research study did not employ triangulation of methods to validate its findings. For instance, a combination of data derived from questionnaires with clinical tests on various biomedical markers could meet better the purpose of this study.<sup>28</sup> Further research is recommended therefore to illuminate further the phenomenon of



examinations anxiety in relation to nutritional choices. Also, a greater sample size is needed to provide generalizations.

### Conclusions

Health professional students, as represented by this sample of health visiting students, in general appear to maintain healthy behaviors, since the majority retains a normal weight and do not smoke cigarettes. However, this pattern is negatively affected during the exams period, as for nutritional habits, in particular. More specifically, it was shown that female students are more susceptible to experience the negative effects of exams anxiety since they report higher consumption of saturated and high in calories meals.

Overall, this research sought to investigate, understand and interpret a significant yet stressful period of the academic process, that of college exams. In particular, it was found that exams anxiety is present in young people studying health visiting, which in turn influences their nutritional habits in a negative manner. It is assumed that non-healthy eating choices are employed as an unorthodox coping technique against the exacerbated stressful conditions of academic exams. It is suggested therefore that this pattern needs to be explored on a larger scale, for generalizations to be drawn, and to pay greater attention to the coping mechanisms that prospective health professionals employ when in stressful life periods.

The value of these findings is emphasized since final-year health professional students are concerned, for the reasons explained below. As future health professionals, it is most likely that they will confront a stressful professional routine as the literature suggests.<sup>27</sup> However, at the same time, health professionals and educators, especially those involved in health education and health promotion (e.g. health visitors, community nurses, teachers etc) are often expected to

activate role modeling through their daily professional practice.<sup>29-30</sup> With this frame of mind, the utility of this study is manifested in the following three prospects.

First, due to the nature of this population's future career, young people studying health professionals need to learn and effectively apply stress coping techniques so that they will benefit themselves considering the stressful professional events they may encounter. Second, further effort is needed to make sure that the theoretical knowledge on healthy nutrition is translated into practice for young individuals studying health-related subjects. Finally, especially those involved in the health promotion services will act as healthy role models, both in stress and diet matters, for the health service users and at the same lead a smooth and enjoyable life career.

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## ANNEX

Table1. Main demographic, diet and anxiety measurements (N=166)<sup>1</sup>

Gender	N (%)	Soda drink consumption	N (%)
Male (%)	27 (16,3)	≤2 drinks/day (%)	129 (77,7)
Female (%)	131 (78,9)	>2 drinks/day (%)	4 (4,2)
<b>Mean Age (SD) in years old</b>	21,12 (2,87)	<b>Coffee or tea consumption</b>	
<b>Mean BMI (SD)</b>	22,15 (3,72)	≤2 cups/day (%)	117 (70,5)
<b>BMI categories (Kg/m<sup>2</sup>)</b>		>2 cups/day (%)	19 (11,4)
<18,5 (%)	17 (10,2)	<b>Sugar consumption</b>	
18,5-24,9 (%)	103 (62)	≤3 small spoons/day (%)	119 (71,7)
25-29,9 (%)	23 (13,9)	>3 small spoons/day (%)	17 (10,2)
≥30 (%)	5 (3)	<b>Supplemental salt in meals</b>	
<b>Smoking</b>		Never (%)	46 (27,7)
No (%)	88 (53)	Sometimes-always (%)	92 (55,4)
Yes (%)	50 (30,1)	<b>Chocolate consumption</b>	
<b>Mean STAI score (SD)</b>	43,57 (12,91)	Never (%)	106 (63,9)
<b>STAI categories (levels of anxiety)</b>		≥1 bar/week (%)	32 (19,3)
<b>Very low (≤33)</b>	38 (22,9)	<b>Doughnut or other sweet consumption at breakfast</b>	
<b>Low (34-41)</b>	37 (22,3)	≤1/week (%)	110 (66,3)
<b>High (42-54)</b>	35 (22,1)	>1/week (%)	26 (15,7)
<b>Very high (+55)</b>	35 (22,1)	<b>Fast food consumption</b>	
<b>Mean Diet score (SD)<sup>2</sup></b>	3,69 (2,15)	Never (%)	22 (13,3)



Gender	N (%)	Soda drink consumption	N (%)
<b>Diet Categories</b>		≥1/week (%)	116 (69,9)
<b>Sweet consumption</b>		<b>Alcohol consumption</b>	
≤1 serve/week (%)	67 (40,4)	≤1 drink/week (%)	91 (54,8)
>1 serve/week (%)	71 (42,8)	>2 drinks/week (%)	45 (27,1)
<sup>1</sup> Missing values range 4,8-21,1%			
<sup>2</sup> Calculated from initial not dichotomized diet variables			

**Table 2. Univariate logistic regression analysis of dietary habits with levels of anxiety as the depended variable (reference category: low anxiety)<sup>1</sup>**

Males			Females		
	OR (95%CI)	p <sup>2</sup>		OR (95%CI)	p <sup>2</sup>
<b>Doughnut or other sweet consumption at breakfast</b>			<b>Supplemental salt in meals</b>		
≤1/week	1 <sup>3</sup>		Never	1	
>1/week	10,5 (1,03 to 107,17)	0,047	Sometimes-always	0,42 (0,18 to 0,99)	0,048
Nagelkerke R square	0,276			0,056	
Exclude variables: age, BMI, smoking, sweet consumption, soda drink consumption, coffee or tea consumption, sugar consumption, chocolate consumption, fast food consumption, alcohol consumption					
<sup>1</sup> Pearson r (sig): males=0,319 (0,159), females=0,241 (0,023)					
<sup>2</sup> p level of significance 0,05					
<sup>3</sup> 1=reference category					