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Article

Stress Perceptions, Somatization, and Coping Strategies among Dentistry and Nursing Students: A Comparative Study

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Abstract: This study investigates stress perceptions, somatization, and coping strategies among 271 nursing and dentistry (n=126 and n=145, respectively), undergraduate and postgraduate students. For the study, an e-questionnaire was designed in a two-step process, uploaded in Google Forms and staying open for submissions during February 2024 in the School of Health Sciences, National and Kapodistrian University of Athens. In our sample, predominantly female (68.60%), the majority were undergraduates (80.10%). Females reported higher stress somatization (M=10.22, SD=5.23) compared to males (M=7.94, SD=6.14), with a moderate effect size (Cohen's d=0.412, p<.05) with dentistry students reporting more often on the subject than nursing students but not in statistically important level. Stress interpretations varied, with "Inability to manage unexpected situations, Insecurity, Panic" (38.38%) and "Restlessness and psychological pressure" (34.32%) being the most common. Notably, nursing students associating stress with insecurity were more likely to experience somatization ($\chi^2=0.276$, p<.05). Physical symptoms included chest discomfort (41.8%), digestive issues (41.4%) and headaches and nausea (36.3%). Also, dental students reported that they experienced clenching or grinding teeth during the day or night (42.7%), compared to a smaller ratio of 29.5% for nursing students (p = .010). Coping strategies emphasized emotional balance (34.44%) and managing stressors (25.93%). Short-term strategies favored situation analysis (38.70%) and breathing techniques (32.95%), while long-term strategies included distraction and entertainment (31.9%) physical exercise and sports (16.7%), or patience and doing nothing (15.1%). Suggested administrative improvements included curriculum revisions (45%) and better communication and treatment from teachers and supervisors (27.3%). Willingness to seek coaching support was high (53.8%), linked to higher stress somatization in dental students ($\chi^2=0.243$, p<.05). There was a significant difference between dental and nursing students' acceptance of "Introduction of Psychological Support Programs," with nursing students having a higher acceptance rate (24.3%) compared to dental students (11.8%). Dental students more strongly supported "Revision of the Educational Program, Better Organization, Staff Evaluation" (51.2% vs 37.4%, p < .05) and "Improvement of Physical Spaces, Infrastructure, and Working Conditions" (10.2% vs 1.7%, p < .05). Additionally, "Reduction of Curriculum Requirements and Hours, Flexibility in Studies" was more prevalent among female dental students compared to male dental students (26.2% vs 9.3%, p < .05). The responses identified three primary stressors: academic demands, inadequate infrastructure, and the professional devaluation of both dentistry and nursing. They advocated for enhanced support systems and increased program flexibility to help alleviate these stressors.

Keywords: stress somatization; nursing students; dentistry students; coping strategies; gender differences; academic stress; stress management; psychological support; mentoring; coaching in healthcare

1. Introduction

Stress among dental and nursing students is a well-documented phenomenon that encompasses various psychosocial and physiological dimensions (Li and Hansson 2020; Smolana et al 2022)[1,2]. Research has consistently highlighted the pervasive nature of stress in these academic disciplines, with studies indicating its detrimental impact on student's well-being and academic performance (Mocny-Pachońska et al 2020; Kadhila, & Sheelongo, 2023) [3,4]. While much attention has been devoted to understanding the psychological aspects of stress (Basudan et al 2017; Wu et al 2021) [5,6], less emphasis has been placed on its somatic manifestations, particularly among dental and nursing students (Arrieta-Vergara, et al 2019; Córdova Olivera, et al 2023)[7,8].

Somatization of stress refers to the phenomenon where psychological distress manifests as physical symptoms without discernible organic pathology (Feussner et al., 2022) [9]. This is particularly concerning in healthcare education due to the demanding nature of these disciplines and the potential implications for students' future clinical practice (Sperling et al., 2023) [10]. Among dental students, who face significant stressors during their education, somatization symptoms such as tension-type headaches with a positive association with painful TMD or bruxism are prevalent, linking these symptoms to stress and psychological functioning (Câmara-Souza et al., 2020) [11]. Research highlights the association between emotional stress and awake bruxism, with sleep disturbances also playing a role (Levartovsky et al., 2022) [12]. Awake bruxism, characterized by clenching and grinding of teeth during waking hours, is linked to psychological factors and perceived stress levels [11,13,14]. On the other hand, sleep bruxism has been correlated with stress and depression [15,16]. Factors such as academic workload, clinical requirements, and the competitive nature of the field contribute to high levels of psychological distress [17-19]. Also, demographic factors such as gender and age may additionally influence the experience of stress and somatization symptoms among dental students [20,21]. Studies show sex differences too in stress reactivity, suggesting gender socialization plays a role in stress responses [22]. Additionally, age-related differences in proprioceptive function and fine motor behavior may affect the manifestation of somatic symptoms (Liutsko et al., 2020) [23]. This stress can lead dentistry students to somatization in different parts of the body, where psychological distress is expressed through physical symptoms (Bal et al., 2022) [24].

Similarly, nursing students are not immune to the somatic effects of stress, with studies highlighting associations between stress and physical health outcomes (Zou et al 2023) [25]. Nursing students also encounter substantial stressors throughout their education, which can lead to somatization of stress and various physical health issues (Hamaideh, 2022,24) [26,27]. Recent studies have shed light on the prevalence and risk factors associated with stress among nursing students, highlighting the need for targeted interventions to support their well-being (Zulu 2021; Mishra, et al 2023; Mumba, et al 2023) [28-30]. Factors such as heavy workloads, academic pressure, and exposure to emotionally challenging situations during clinical placements contribute to the psychological distress experienced by nursing students (Hwang, &, Kim, 2022) [31]. This distress is expressed through physical health problems (Sonmez et al 2023) [32]. Additionally, the demanding nature of nursing education and clinical practice can exacerbate existing physical health conditions, further highlighting the importance of holistic support for nursing students (Labrague 2024) [33]. It is reported that sleep disturbances, musculoskeletal problems, and gastrointestinal issues are among the common somatic manifestations of stress reported by nursing students (Membrive-Jiménez et al 2022) [34]. Moreover, the experience of stress-induced somatic symptoms may vary based on demographic factors such as gender, age, and academic year [35-37]. Understanding these variations is essential for developing tailored programs to address the unique needs of nursing students and promote their overall well-being (Mikkonen, et al 2016; Lim et al 2022; Mínguez Moreno, et al 2023) [38-40].

However, comparative analyses between dental and nursing students regarding somatization of stress symptoms do not exist, diminishing our understanding of discipline-specific stressors and coping mechanisms. For this reason, this study aims to address this gap by examining the somatization of stress in dental and nursing undergraduate and postgraduate students at the

Dentistry and Nursing department of a public university. More specifically, we seek to investigate the prevalence of somatization symptoms among dental and nursing students, along with perceived stress levels and their differences between the two disciplines. Additionally, the study seeks to identify the most common somatic manifestations of stress reported by students and determine if there are discipline-specific differences in the severity and frequency of these symptoms. The research also aims to explore resilience factors associated with lower levels of somatization symptoms and examine how coping strategies vary between dental and nursing students in response to stress-induced somatic symptoms. Furthermore, it investigates the impact of somatization symptoms on academic performance and well-being, considering demographic factors such as gender, age, family income, and academic year. The study also aims to gather perceptions of dental and nursing students regarding the effectiveness of existing support mechanisms in addressing stress in the academic environment. Ultimately, the findings may provide evidence for the development of targeted interventions and support mechanisms aimed at promoting the well-being of dental and nursing students.

2. Materials and Methods

The sample of the present study consisted of undergraduate (N1A=780) and postgraduate students of the Department of Dentistry (N1A=85) and accordingly of Nursing (N1B=808 and N2B=330) of the School of Health Sciences of the National and Kapodistrian University of Athens, Greece.

Based on similar studies in the field [41,42], this questionnaire study was conducted in two stages. Initially, a literature review was performed to formulate the initial questionnaire, which was then piloted with 10 students from each Department (5 undergraduate and 5 postgraduate) who voluntarily agreed to participate. Feedback from the pilot phase was used to refine the questionnaire, excluding factors not addressed adequately. The finalized questionnaire underwent review by a team of four professors specialized in this field (two from each Department) and was part of a bigger research project on the theme for the two departments. Subsequently, the questionnaire was uploaded to Google Forms and distributed to students to submit their answers in February 2024.

The lead researchers of each department obtained approval from their respective Ethics committees to ensure uniform participation. More specifically, the study was conducted following the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of the Department of Dentistry (609/03.10.2023) and Nursing (467/26-10-2023) of the School of Health Sciences of the National and Kapodistrian University of Athens, Greece. The questionnaire, anonymous and devoid of personal data, was voluntary, and no compensation was provided. Each student completed the questionnaire only once. The questionnaire remained open for one month, with participation information and the link disseminated four times (every week) by each department's Secretariat.

The study questionnaire consisted of three distinct sections: 1) Part One (Q1-Q7: questions related to demographic characteristics), 2) Part Two (Q8-Q14: questions related to oral symptoms due to stress), and 3) Part Three (Q15-Q22: open-ended questions related to estimated stress factors, somatization of stress in the body, personal strategies followed to control stress and need for educational interventions). The questionnaire of the study and guidelines for fulfillment are presented in Appendix A and B.

Data analysis was performed with the statistical package IBM SPSS v. 28. Data for demographics and the stress somatization scale were analyzed by producing descriptive statistics. Stress somatization distribution was examined in terms of normality via skewness and kurtosis and was considered normally distributed (George & Mallery, 2019) [43]. Therefore, independent samples t-tests were used to assess differences in stress somatization between genders and departments. Qualitative data collected from open-ended questions were analyzed thematically and absolute and relative frequencies (n, %) were reported per theme/category and question. Potential differences in the theme/categories extracted between students' genders and the department of study were assessed with chi-square tests of independence performed with Fisher exact test correction when needed.

(Field, 2017) [44]. Moreover, correlations of theme/category prevalence and stress somatization levels were examined with the non-parametric Spearman correlation coefficient.

3. Results

Analysis revealed that for stress somatization Cronbach's alpha is 0.750. The sample consisted of 271 students, pursuing their undergraduate or postgraduate degree in the nursing department (n=126, 46.5%) or the dentistry department (n=145, 53.5%). The female gender was more prevalent (68.60% female students), while the majority, 80.10%, were undergraduate students, with 52.20% reporting a family income below 25,000€. (Table 1).

Table 1. Sample descriptives per students' department of studies.

		Total (N=271)		Dental department (n=145, 53.5%)		Nursing department (n=126, 46.5%)		χ^2 test results
		N	%	N	%	N	%	
Gender	Male	85	31.40%	54	37.30%	31	24.60%	$\chi^2(1)=5$, p = .025
	Female	186	68.60%	91	62.80%	95	75.40%	
Educational level	Postgraduate studies/PhD	54	19.90%	3	2.10%	51	40.50%	$\chi^2(1)=62.33$, p < .001
	Undergraduate studies	217	80.10%	142	97.90%	75	59.50%	
Year of studies	1 st year	12	4.3%	5	3.4%	7	5.3%	$\chi^2(1)=62.17$, p < .001
	2 nd year	18	6.5%	7	4.8%	11	8.3%	
	3 rd year	64	23.1%	43	29.7%	21	15.9%	
	4 th year	52	18.8%	18	12.4%	34	25.8%	
	5 th year	71	25.6%	69	47.6%	2	1.5%	
	Postgraduate students	60	21.7%	3	2.1%	57	41.7%	
Family income	< €15,000	32	16.20%	14	14.60%	18	17.80%	$\chi^2(1)=24.71$, p < .001
	€15,001-25,000	71	36.00%	24	25.00%	47	46.50%	
	€25,001-35,000	37	18.80%	15	15.60%	22	21.80%	
	€35,001-50,000	34	17.30%	24	25.00%	10	9.90%	
	> €50,000	23	11.70%	19	19.80%	4	4.00%	

As presented in Table 2, there was a statistically significant, moderate difference, between male and female participants in stress somatization (p < .05, Cohen's d = .412), with female students presenting increased levels of stress somatization (M=10.22, SD=5.23) compared to male students (M=7.94, SD=6.14) with dentistry students reporting more often on the subject than nursing students but in a non-statistically significant level. There were no statistically significant effects of educational level, year of studies, or family income on stress somatization.

Table 2. Stress Somatization for students of different departments and genders.

		Department					
		Total (N=271)		Dental (n=145, 53.5%)		Nursing (n=126, 46.5%)	
Stress somatization*		M	SD	M	SD	M	SD
Gender	Male (n=85, 31.4%)	7.94 _A	6.14	8.23 _a	6.37	7.48 _a	5.80
	Female (n=186, 68.6%)	10.22 _B	5.23	10.90 _a	5.46	9.59 _a	4.95
	Total (N=271)	9.51	5.62	9.92	5.93	9.06	5.23

Note: Values in the same row or the same column not sharing the same subscript are significantly different at p < .05 in the two-sided independent samples t-tests. * Minimum = 0, Maximum = 28.

The boxplots of students’ stress somatization by gender and department are reported schematically in Figure 1.

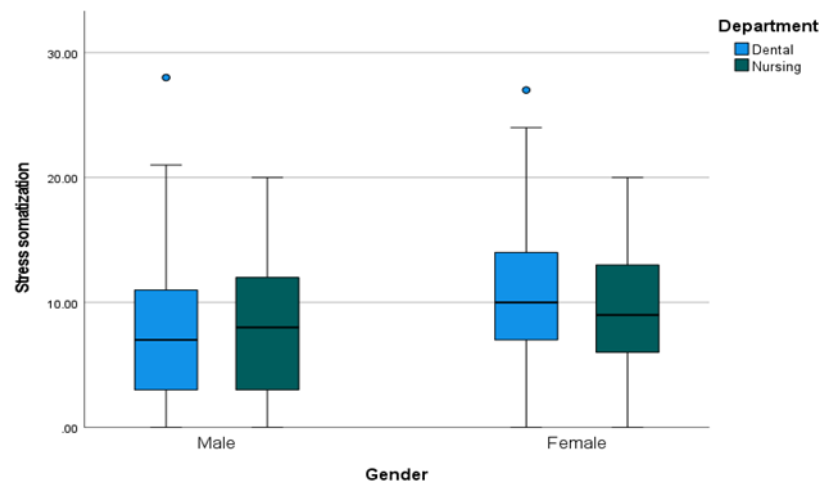


Figure 1. Boxplots of students’ stress somatization by gender and department.

Breaking down the stress somatization to its seven items (Table 3, Figure 2), female participants reported hearing a sound from the temporomandibular joint during movements of the mandible (very true or always applicable) at a higher rate of 24.8% in contrast to 15.1% of male participants ($p = .039$). Also, female participants reported at a percentage of 43.1% that they experienced headaches, compared to a smaller ratio of 18.6% for male participants ($p < .001$). Finally, female participants reported 35.8% that they feel nervous or annoyed at their relationships in the student/work environment, compared to a smaller ratio of 26.7% for male participants ($p < .001$).

Moreover, dental students reported that they experienced clenching or grinding teeth during the day or night (42.7%), compared to a smaller ratio of 29.5% for nursing students ($p = .010$). There were no statistically significant effects of educational level, year of studies, or family income, neither on the composite stress somatization scale nor its respective items.

Table 3. Differences in Stress Somatization items by gender.

		Gender					
		Total		Male		Female	
		N	%	N	%	N	%
1.Do you experience pain in the facial area during the day and/or night?	Never, not applicable	139	50.4%	51 _a	59.3%	88 _a	46.3%
	Usually not applicable	64	23.2%	17 _a	19.8%	47 _a	24.7%
	Not sure	35	12.7%	8 _a	9.3%	27 _a	14.2%
	Very true	31	11.2%	7 _a	8.1%	24 _a	12.6%
	Always applies	7	2.5%	3 _a	3.5%	4 _a	2.1%
2.Do you hear a sound from the temporomandibular joint during movements of the mandible?	Never, not applicable	131	47.5%	49 _a	57.0%	82 _b	43.2%
	Usually not applicable	41	14.9%	7 _a	8.1%	34 _b	17.9%
	Not sure	44	15.9%	17 _a	19.8%	27 _a	14.2%
	Very true	32	11.6%	6 _a	7.0%	26 _a	13.7%
	Always applies	28	10.1%	7 _a	8.1%	21 _a	11.1%
3.Do you clench or grind teeth during the night and/or day?	Never, not applicable	91	33.0%	33 _a	38.4%	58 _a	30.5%
	Usually not applicable	35	12.7%	11 _a	12.8%	24 _a	12.6%
	Not sure	51	18.5%	14 _a	16.3%	37 _a	19.5%
	Very true	54	19.6%	15 _a	17.4%	39 _a	20.5%
	Always applies	45	16.3%	13 _a	15.1%	32 _a	16.8%
4.Do you experience headaches?	Never, not applicable	52	18.8%	30 _a	34.9%	22 _b	11.6%
	Usually not applicable	64	23.2%	25 _a	29.1%	39 _a	20.5%

	Not sure	62	22.5%	15 _a	17.4%	47 _a	24.7%
	Very true	57	20.7%	7 _a	8.1%	50 _b	26.3%
	Always applies	41	14.9%	9 _a	10.5%	32 _a	16.8%
	Never, not applicable	63	22.8%	26 _a	30.2%	37 _b	19.5%
	Usually not applicable	74	26.8%	20 _a	23.3%	54 _a	28.4%
5. Is your sleep disturbed?	Not sure	61	22.1%	15 _a	17.4%	46 _a	24.2%
	Very true	51	18.5%	17 _a	19.8%	34 _a	17.9%
	Always applies	27	9.8%	8 _a	9.3%	19 _a	10.0%
6. Do you feel nervous or/annoyed-at your relationships in the student/work environment?	Never, not applicable	58	21.0%	33 _a	38.4%	25 _b	13.2%
	Usually not applicable	60	21.7%	17 _a	19.8%	43 _a	22.6%
	Not sure	67	24.3%	13 _a	15.1%	54 _b	28.4%
	Very true	65	23.6%	18 _a	20.9%	47 _a	24.7%
	Always applies	26	9.4%	5 _a	5.8%	21 _a	11.1%
7. Are you taking medication to calm down from the responsibilities of everyday life?	Never, not applicable	236	85.5%	73 _a	84.9%	163 _a	85.8%
	Usually not applicable	18	6.5%	3 _a	3.5%	15 _a	7.9%
	Not sure	10	3.6%	3 _a	3.5%	7 _a	3.7%
	Very true	6	2.2%	5 _a	5.8%	1 _a	0.5%
	Always applies	6	2.2%	2 _a	2.3%	4 _a	2.1%

Note: Values in the same row and subtable not sharing the same subscript are significantly different at $p < .05$ in the two-sided chi-square test.

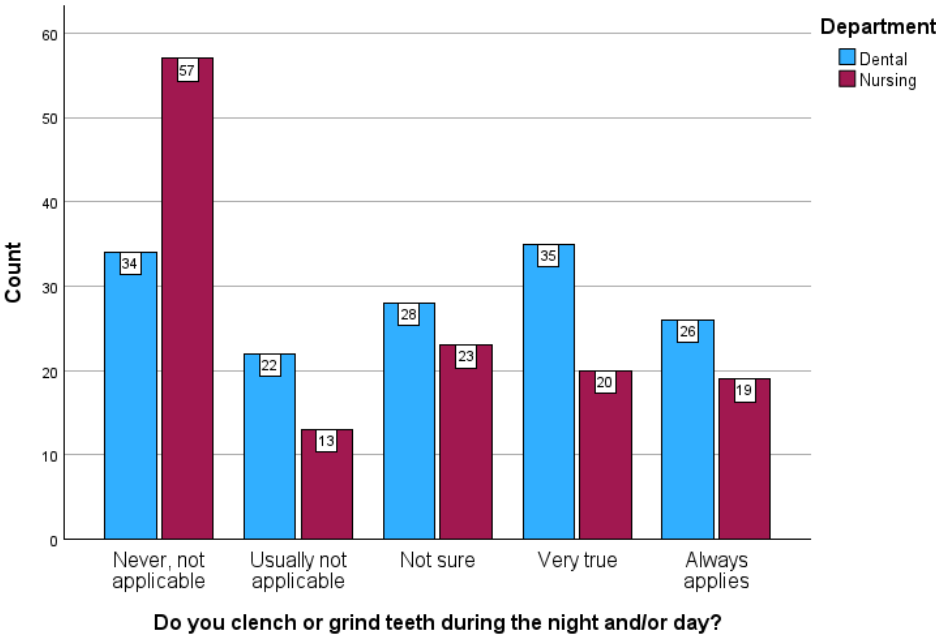


Figure 2. Clustered bar chart of clenching or grinding teeth during day or night by department.

Students' responses to the open-ended questions were categorized based on their content relative to perceptions of stress, stress management strategies, and requirements. Table 4 presents the categories/themes extracted from the qualitative analysis, by students' department (nursing/dental) and gender (male/female).

Table 4. Categories/themes extracted from open-ended questions relative to perceptions of stress, stress management strategies and requirements, by students’ department and gender.

	Total sample		Dental/Total		Nursing/Total		Dental/Male		Dental/Female		Nursing/Male		Nursing/Female	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<i>What does “stress” mean to you?</i>														
Physical symptoms	54	19.9%	26	18.7%	26	21.0%	7	13.7%	19	21.6%	6	18.8%	20	21.7%
Restlessness And Psychological Pressure	93	34.3%	57 ^a	41.0%	35 ^b	28.2%	23	45.1%	34	38.6%	9	28.1%	26	28.3%
Difficulty Concentrating, Disorganization of thoughts and feelings, Numbness	48	17.7%	26	18.7%	20	16.1%	9	17.6%	17	19.3%	8	25.0%	12	13.0%
Obsessive thoughts	26	9.6%	17	12.2%	8	6.5%	6	11.8%	11	12.5%	2	6.3%	6	6.5%
Insecurity, Inability to handle unexpected or difficult situations, Panic	104	38.4%	48	34.5%	52	41.9%	17	33.3%	31	35.2%	15	46.9%	37	40.2%
Fear of failure, lack of confidence	18	6.6%	10	7.2%	8	6.5%	4	7.8%	6	6.8%	2	6.3%	6	6.5%
Pressure to meet daily obligations/long-term goals	26	9.6%	11	7.9%	15	12.1%	5	9.8%	6	6.8%	2	6.3%	13	14.1%
<i>How and where in the body do you experience stress?</i>														
Heart or chest discomfort	107	41.8%	54	41.2%	50	42.7%	22	46.8%	32	38.1%	10	34.5%	40	45.5%
Digestive Disorders, Anorexia	106	41.4%	48	36.6%	53	45.3%	17	36.2%	31	36.9%	14	48.3%	39	44.3%
Breathing Difficulties, Cough	30	11.7%	14	10.7%	15	12.8%	4	8.5%	10	11.9%	3	10.3%	12	13.6%
Headaches, Nausea	93	36.3%	44	33.6%	48	41.0%	18	38.3%	26	31.0%	11	37.9%	37	42.0%
General Muscle Tension and Discomfort	28	10.9%	13	9.9%	13	11.1%	7	14.9%	6	7.1%	4	13.8%	9	10.2%
Dental Symptoms	19	7.4%	12	9.2%	7	6.0%	3	6.4%	9	10.7%	3	10.3%	4	4.5%
Sweating, itching and skin diseases	27	10.5%	14	10.7%	11	9.4%	5	10.6%	9	10.7%	5	17.2%	6	6.8%
<i>How do you feel you can improve your resilience?</i>														
Dedication to work or study	11	4.1%	4	2.9%	7	5.7%	1	2.0%	3	3.4%	0	0.0%	7	7.5%
Psychotherapy and Psychological Support	47	17.4%	23	16.5%	20	16.3%	7	14.0%	16	18.0%	4	13.3%	16	17.2%
Managing Stressors	70	25.9%	31	22.3%	39	31.7%	14	28.0%	17	19.1%	14	46.7%	25	26.9%
Planning - Time Management	25	9.3%	9	6.5%	16	13.0%	2	4.0%	7	7.9%	3	10.0%	13	14.0%
Improving Physical Condition, Nutrition and Sleep	29	10.7%	21 ^a	15.1%	8 ^b	6.5%	7	14.0%	14	15.7%	2	6.7%	6	6.5%
Emotional Balance and Self-Awareness	93	34.4%	47	33.8%	43	35.0%	15	30.0%	32	36.0%	12	40.0%	31	33.3%
Social Support and Socialization	20	7.4%	10	7.2%	8	6.5%	2	4.0%	8	9.0%	1	3.3%	7	7.5%
I don’t know	22	8.1%	14	10.1%	8	6.5%	7	14.0%	7	7.9%	1	3.3%	7	7.5%
<i>What strategy do you follow to immediately (at the same time) deal with stressful situations?</i>														
Breathing and Relaxation Techniques	86	33.0%	45	33.3%	40	33.6%	15	30.0%	30	35.3%	8	28.6%	32	35.2%
Distraction and thought management	42	16.1%	19	14.1%	21	17.6%	6	12.0%	13	15.3%	3	10.7%	18	19.8%
Analysis of the situation, staying cool, self-regulation	101	38.7%	53	39.3%	47	39.5%	21	42.0%	32	37.6%	11	39.3%	36	39.6%
Organization and methodicality	6	2.3%	5	3.7%	1	0.8%	1	2.0%	4	4.7%	0	0.0%	1	1.1%
Physical activity	21	8.0%	9	6.7%	11	9.2%	2	4.0%	7	8.2%	4	14.3%	7	7.7%

Talking with Others and Social/Psychological Support	38	14.6%	20	14.8%	16	13.4%	3a	6.0%	17b	20.0%	4	14.3%	12	13.2%
Hobbies, Entertainment and Leisure	32	12.3%	13	9.6%	18	15.1%	7	14.0%	6	7.1%	6	21.4%	12	13.2%
What do you usually do when you are stressed for a long period (e.g. during an exam)														
Patience / Nothing	38	15.1%	18	13.8%	20	17.7%	4	8.7%	14	16.7%	4	14.3%	16	18.8%
Distraction and Entertainment	80	31.9%	39	30.0%	38	33.6%	13	28.3%	26	31.0%	9	32.1%	29	34.1%
Analysis of the situation, Staying cool, Positive thoughts	31	12.4%	17	13.1%	12	10.6%	9	19.6%	8	9.5%	3	10.7%	9	10.6%
Physical Exercise and Sports	42	16.7%	25	19.2%	16	14.2%	6	13.0%	19	22.6%	7	25.0%	9	10.6%
Communication, Psychological/Social Support	27	10.8%	14	10.8%	13	11.5%	5	10.9%	9	10.7%	3	10.7%	10	11.8%
Personal time and Personal Care	33	13.1%	16	12.3%	15	13.3%	6	13.0%	10	11.9%	8a	28.6%	7b	8.2%
Strategic Thinking and Organization	28	11.2%	18	13.8%	9	8.0%	7	15.2%	11	13.1%	1	3.6%	8	9.4%
Dedication to study	17	6.8%	6	4.6%	11	9.7%	3	6.5%	3	3.6%	2	7.1%	9	10.6%
Spirituality	5	2.0%	4	3.1%	1	0.9%	2	4.3%	2	2.4%	0	0.0%	1	1.2%
What would you suggest to your school administration to reduce the level of stress you and your fellow students experience?														
Reduction of Curriculum Requirements and Hours, Flexibility in studies	47	18.9%	26	20.5%	21	18.3%	4a	9.3%	22b	26.2%	4	12.9%	17	20.2%
Introduction of Psychological Support Programs	46	18.5%	15a	11.8%	28b	24.3%	4	9.3%	11	13.1%	4	12.9%	24	28.6%
Revision of the educational Program, Better Organization, Staff evaluation	112	45.0%	65a	51.2%	43b	37.4%	21	48.8%	44	52.4%	13	41.9%	30	35.7%
Better and more timely information about the curriculum/labs/exams and the resulting changes	8	3.2%	4	3.1%	3	2.6%	1	2.3%	3	3.6%	1	3.2%	2	2.4%
More practice, better preparation	14	5.6%	11a	8.7%	3b	2.6%	3	7.0%	8	9.5%	0	0.0%	3	3.6%
Improvement of physical spaces, infrastructure and working conditions	15	6.0%	13a	10.2%	2b	1.7%	6	14.0%	7	8.3%	0	0.0%	2	2.4%
Improved communication and support, Better treatment by teachers and supervisors	68	27.3%	40	31.5%	26	22.6%	16	37.2%	24	28.6%	6	19.4%	20	23.8%
Would you use the help of a coach to help you manage your anxiety?														
Positive about support from a coach	141	53.8%	70	52.2%	68	56.7%	22	45.8%	48	55.8%	15	48.4%	53	59.6%
Negative about support from a coach	106	40.5%	57	42.5%	44	36.7%	24	50.0%	33	38.4%	15	48.4%	29	32.6%
Preference for support from mental health counselors	18	6.9%	9	6.7%	9	7.5%	3	6.3%	6	7.0%	1	3.2%	8	9.0%

What does "stress" mean to you?

In the question about their interpretation of stress, the category *"Inability to manage unexpected or difficult situations, Insecurity, Panic"* gathered the largest percentage of responses (38.38%) which includes the insecurity, fear or panic caused by unexpected or difficult situations that are either happening or may happen in the future. Following, the second most frequent category was the one of *"Restlessness and psychological pressure"* (34.32%) and the category of *"Physical Symptoms"* manifested due to anxiety (19.93%) such as tachycardia, head and chest pains, stomach disorders, fatigue, etc.

A significant number of students explained stress as the difficulty in concentration and the disorganization of the person's thoughts and feelings (17.71%) which indicates the person's sudden reduced ability to concentrate, think productively and express their feelings. The remaining manifestations of anxiety include obsessive thoughts and overanalyzing (9.59%), the daily pressure of the individual to meet his obligations combined with the pressure of long-term goals (9.59%) and finally the fear of failure (6.64%).

The interpretation of stress as *"Restlessness and psychological pressure"* was more prevalent in dental students compared to nursing students ($p < .05$, 41.0% vs 28.2%, respectively, see Table 4). Moreover, nursing students who perceived stress as the *"Inability to manage unexpected or difficult situations, Insecurity, Panic"* were more likely to experience stress somatization symptoms ($q = .276$, $p < .05$), while for dental students, stress somatization was related to *"Pressure to meet daily obligations/long-term goals"* ($q = .186$, $p < .05$).

How and where in the body do you experience stress?

Regarding the physical symptoms with which anxiety manifests itself in students, the most common of them are heart and chest discomfort (41.8%), such as tachycardia and a feeling of heaviness in the chest, as well as digestive/nutritional disorders (41.41%) such as stomach pains, ulcers, constipation, anorexia, etc. Followed by headaches (36.33%), breathing difficulties (11.72%), general muscle tension (10.94%), such as tremors in the hands and the legs and sweating, or various skin diseases (10.55%). There were no significant differences between male and female participants or between dental and nursing departments, in the categories extracted for body manifestation of stress (see Tables 3 and 5).

Table 5. Spearman correlations between the categories of meaning and manifestation of stress and stress somatization, by students' department.

	Stress Somatization	
	Dental	Nursing
<i>What does "stress" mean to you?</i>		
Physical symptoms	-0.099	-0.093
Restlessness And Psychological Pressure	-0.055	0.03
Difficulty Concentrating, Disorganization of thoughts and feelings, Numbness	-0.029	0.066
Obsessive thoughts	0.037	0.01
Insecurity, Inability to handle unexpected or difficult situations, Panic	0.032	.276*
Fear of failure, lack of confidence	-0.114	-0.074
Pressure to meet daily obligations/long-term goals	.187*	-0.152
<i>How and where in the body do you experience stress?</i>		
Heart or chest discomfort	-0.089	0.036
Digestive Disorders, Anorexia	-0.011	0.002
Breathing Difficulties, Cough	-0.035	0.054

Headaches, Nausea	-0.005	-0.103
General Muscle Tension and Discomfort	-0.06	-0.016
Dental Symptoms	0.106	0.059
Sweating, itching and skin diseases	-0.073	0.027

*Statistical significance between the two departments.

How do you feel you can improve your resilience?

In terms of the ways that students believe can help them improve their resilience to stress, the highest percentage of common acceptance is gathered by *“Emotional balance and Self-awareness”* (34.44%) a category that generally includes any effort to develop and improve one's identity. This is followed by *“Managing Stressors”* with an acceptance rate of 25.93%, which mainly includes voluntary exposure to uncertainty to gain experience in dealing with problems as well as other stress reduction strategies. Lower down, we see the category of *“Psychotherapy and Psychological support”* (17.41%) and immediately after the category of *“Improving Physical Condition, Nutrition and Sleep”* (10.74%). In addition, other methods of reducing stress include *“better time management”* (9.26%), *“seeking social support”* (7.41%) and *“devoting oneself to study or work”* (4.07%). It should be noted that the strategy of *“Improving Physical Condition, Nutrition and Sleep”* was more prevalent in dental students compared to nursing students ($p<.05$, 15.1% vs 6.5%, see Table 3).

What strategy do you follow to immediately (at the same time) deal with stressful situations?

The next two questions focus on two categories of coping strategies for stressful situations, the more immediate and short-term and the more systematic and long-term. Regarding the first category of strategies, the highest percentage of acceptance is gathered from the *“Analysis of The Situation, Staying Cool, Self-Regulation”* (38.70%) which sometimes includes self-animation techniques. This is followed by *“Breathing Techniques”* (32.95%) and other exercises that help to decompress and immediately relax, and the various methods of *“Distraction from The Stressful Situation”* (16.09%) which may include a dedication to work or other activities. Communicating and seeking *“Social/Psychological Support”* gathers acceptance from 14.56% and seeking free time to engage in *“Hobbies and Recreational Activities”* gathers acceptance from 12.26% of the sample. This is followed by *“Physical Activity”* (8.05%) and *“Organization and Methodicality”* (2.3%) which mainly concern the studies.

There was a statistically significant difference between male and female dental students' acceptance of the strategy of *“Social/Psychological Support”*, with female dental students presenting a higher acceptance rate (20.0%), compared to male dental students (6.0%). No other significant differences were detected between dental and nursing departments, in the categories of short-term stress management (see Tables 3 and 6).

What do you usually do when you are stressed for an extended period?

Now, studying the category of strategies for longer periods of stress, we again see that first in order of acceptance ranking comes the *“Analysis of The Situation, Staying Cool”* (31.87%) usually combined with positive thoughts, followed by the search for *“Communication and Social/Psychological Support”* (16.73%) mainly to friends and family or mental health professionals. *“Distraction Combined with Entertainment”* gathers 15.14% and *“Strategic Thinking and Better Organization of Time”*, 13.15%. This is followed by *“Physical Activity”* (12.35%), *“Dedication to Study”* (11.16%) and focus on *“Personal Time and Personal Care”* (10.76%) which includes, among other things, rest and good nutrition. Another strategy we see at the end is the appeal to one's *“Spirituality”* (6.77%) which includes techniques such as prayer, and meditation.

There was a statistically significant difference between male and female nursing students' acceptance of the strategy of *“Personal time and Personal Care”*, with female nursing students presenting a lower acceptance rate (8.2%), compared to male nursing students (28.6%). No other significant differences were detected between dental and nursing departments, relative to long-term stress management (Table 3), yet, the *“Patience, Doing Nothing”* strategy was associated with higher levels of stress somatization ($q = .204$, $p < .05$). Moreover, *“Analysis of the situation, staying cool, Positive*

thoughts” strategy was associated with decreased stress somatization levels ($\rho = -.199$, $p < .05$) for dental students, and “*Physical Activity and Sports*” strategy with decreased stress somatization levels ($\rho = -.186$, $p < .05$) for nursing students.

Table 6. Spearman correlations between the categories stress management strategies and stress somatization, by students’ department.

	Stress Somatization	
	Dental	Nursing
<i>How do you feel you can improve your resilience?</i>		
Dedication to work or study	0.109	-0.038
Psychotherapy and Psychological Support	0.127	0.059
Managing Stressors	0.006	-0.065
Planning - Time Management	0.090	-0.038
Improving Physical Condition, Nutrition and Sleep	-0.112	-0.060
Emotional Balance and Self-Awareness	-0.059	0.061
Social Support and Socialization	-0.111	-0.080
I don’t know	-0.091	-0.013
<i>What strategy do you follow to immediately (at the same time) deal with stressful situations?</i>		
Breathing and Relaxation Techniques	0.037	-0.051
Distraction and thought management	-0.001	0.008
Analysis of the situation, staying cool, self-regulation	-0.154	-0.075
Organization and methodicality	0.120	-0.083
Physical activity	0.018	-0.054
Social/Psychological Support	0.134	-0.074
Hobbies and Recreational Activities	-0.046	0.046
<i>What do you usually do when you are stressed for a long period?</i>		
Patience / Nothing	.204*	0.058
Distraction and Entertainment	0.138	-0.08
Analysis of the situation, staying cool, Positive thoughts	-.199*	0.153
Physical Activity and Sports	0.06	-.186*
Communication, Psychological/Social Support	-0.023	0.000
Personal time and Personal Care	-0.112	-0.015
Strategic Thinking and Organization	-0.166	-0.025
Dedication to study	-0.028	-0.029
Spirituality	-0.005	-0.087

*Statistical significance between the two departments.

What would you suggest to your school administration to reduce the level of stress you and your fellow students experience?

The following are the suggestions of the students to the administration of the school for smoothing its malfunctions and alleviating the problems they face in their educational experience, which are perceived as the source of their daily stress. The most accepted and perhaps the most general category of solutions proposed by the students is “*Revision of the educational Program, Better Organization, Staff evaluation*” with proposals to expand it to 5 or 6 years of study, the revision of some courses to focus on more essential and practical knowledge and the better evaluation of the

educational staff (45.16%). Another popular suggestion of the students was the “Improved communication and support”, mainly referring to the professors and supervisors (27.42%), asking for better treatment, greater understanding, and support, especially in their first steps of practical training.

Another important category was “Reduction of Curriculum Requirements and Hours, Flexibility in Studies” which includes proposals for easing the studies’ requirements and reducing teaching hours with greater flexibility and breaks (18.95%). Moreover, “Introduction of Psychological Support Programs” alongside the educational experience (18.55%) was also accepted by a significant number of students.

Finally, other proposals include the improvement of infrastructure and working conditions, especially in laboratories (5.65%), and better and more timely information from the faculty regarding study programs, laboratories, and exams and the changes that arise from time to time (3.23%).

There was a statistically significant difference between dental and nursing students’ acceptance of “Introduction of Psychological Support Programs”, with nursing students presenting a higher acceptance rate (24.3%), compared to dental students (11.8%). Also, dental students supported more strongly, compared to nursing students, the changes of “Revision of the educational Program, Better Organization, Staff evaluation” (51.2% vs 37.4%, $p < .05$) and “Improvement of physical spaces, infrastructure, and working conditions” (10.2% vs 1.7%, $p < .05$). It should be noted that “Reduction of Curriculum Requirements and Hours, Flexibility in studies” was a more prevalent requirement for female dental students compared to male dental students (26.2% vs 9.3%, $p < .05$)(Table 7).

Table 7. Spearman correlations between suggestions to school administration for better stress management support and stress somatization, by students’ department.

What would you suggest to your school administration to reduce the level of stress you and your fellow students experience?	Stress Somatization	
	Dental	Nursing
Reduction of Curriculum Requirements and Hours, Flexibility in studies	0.130	0.005
Introduction of Psychological Support Programs	0.101	-0.183
Revision of the educational Program, Better Organization, Staff evaluation	0.086	0.012
Better and more timely information about the curriculum/labs/exams and the resulting changes	-0.038	0.097
More practice, better preparation	0.030	0.049
Improvement of physical spaces, infrastructure, and working conditions	-0.081	-0.008
Improved communication and support, better treatment by teachers and supervisors	0.050	0.073

Would you use the help of a coach to help you manage your anxiety?

From the responses of the students in the sample, we conclude that the majority is or would be positive about seeking coaching support within the faculty. The main motivation seems to be seeking advice on everyday issues and obviously in managing stress, while a less important motivation seems to be guidance in managing their time, improving their skills, and achieving their goals. Some of the characteristics they look for or would look for in a coach are to show understanding, to have empathy and confidentiality, to be encouraging but at the same time to be objective and realistic. Regarding the desired frequency with which the students would like to interact with a coach, one session per week gathers the largest percentage (56.45%), with one session per month following (25.81%).

There were no significant differences between male and female participants or between dental and nursing departments, in the coach acceptance categories (see Table 3). Yet, dental students who were willing to accept support from a coach were also experiencing more stress somatization symptoms ($q = .243$, $p < .05$), while negative attitudes towards coach support were linked with dental students’ reporting lower somatization symptoms ($q = -.238$, $p < .05$). No significant correlations were

detected between nursing students’ acceptance of coach support and level of stress somatization (Table 8).

Table 8. Spearman correlations between the categories of coach acceptance and stress somatization, by students’ department.

	Stress somatization	
	Dental	Nursing
Positive about support from a coach	.243**	-0.077
Negative about support from a coach	-.238**	0.067
Preference for support from mental health counselors	0.059	0.026

** : significant correlation between stress somatization symptoms and need of a coach.

In the last open-ended question, students are asked to mention anything they find interesting about the stress they experience. In their answers, we can distinguish two main patterns.

The first concerns the problems and stressful situations that arise in their education/workplace. They find that the very high academic demands for laboratory and clinical performance, the large volume of work, and the speed with which they are required to prepare create a highly stressful situation for them.

“I am worried about my superiors who, however, do not have the appropriate knowledge to deal with a problem that arises and while they should admit it, they give instructions to their subordinates, who are not sure that it is the right action that they are indicating to be performed”.

“As someone who generally struggles in labs, I would like more internships before going into the clinics (e.g. if the dental school had one more year of internships before going into the clinics, I think it would be much better)”

The situation is aggravated by inadequate infrastructure, non-functional equipment, and insufficient support in critical educational processes. Other factors that increase psychological pressure are the increased responsibility they have in clinical practices and having to deal with real patients and difficult situations very quickly:

“The anxiety that next year we will enter the clinics and in some laboratories, half of the units may not work, as a result of which there is no proper simulation of a real clinical case. I’m getting anxious at the thought that next year I’ll be dealing with a real patient that a mistake of mine could cost him dearly. It also worries me that if, for example, you are sick, it is very difficult to replace a laboratory. Also, if you miss a workshop, it means you are left behind in the next one. And obviously, the amount of reading is huge.”

“After my clinical practice, when I leave the hospital, without the clinic staff seeing me, I leave in tears. The conditions are very bad, I get tired both physically and psychologically, I can’t study and I’m worried that I won’t be able to get the material in the lessons.”

Of particular interest is the highlighting of a nursing participant, regarding the professional devaluation of nurses in Greece and the role of this devaluation in the psychological burden of nurses.

“Nurses experience extra stress in Greece because most people don’t appreciate them. I know this is very hard to change. However, I saw that almost all the excellent nursing students continued their studies in another subject. None remained in the infirmary. There are these stereotypes in Greece that anyone who is a nurse is just someone who isn’t good enough to be a doctor. If this doesn’t stop most nurses will never feel fulfilled by their profession.”

The second pattern of responses focuses on proposed solutions to existing problems and changes they would like to see made in the existing system to reduce stress and improve the academic

experience. These focus on improving contact with teaching staff with the main request being more understanding and support from teachers and teaching staff. More flexibility in academic procedures is also proposed, such as better management of examination times and more opportunities for replacements, but also restructuring of some programs and courses to better prepare for clinical applications, for more practical training, and focus on more essential knowledge. Finally, some student requests focus on strengthening available psychological services and psychological support programs in educational institutions: *“Group therapy, a course that will focus on managing stress in the hospital and during the clinics I wish we had psychological support. Some students experienced traumatic events, if I hadn’t been able to do psychotherapy on my own, I believe I would still be struggling for a long time with my emotions and anxiety.”* or, *“If there were psychologists at workplaces we could talk about what is troubling us”* or *“Due to everyone’s many obligations, it would be good to communicate to resolve questions, but it is also important to be informed in time of material...courses to read as well as dates for exams”*

4. Discussion

This study aims to investigate stress perceptions, somatization, and coping strategies among 271 nursing and dental undergraduate and postgraduate students from the Department of Dentistry and Nursing at the National and Kapodistrian University of Athens. The study seeks to provide a comprehensive understanding of how stress manifests physically and mentally in these students, how they cope with these challenges, and the need for educational interventions.

4.1. Prevalence of Somatization Symptoms among Dental and Nursing Students

The present study, regarding the prevalence of somatization symptoms among dental and nursing students, indicated that there were no statistically significant effects although they were relatively higher in dentistry rather than in nursing students. It also revealed that there are discipline-specific differences in the severity and frequency of somatization symptoms. Dental students had higher rates (41%) compared to nursing students (28.20%) in terms of somatization symptoms. Additionally, nursing students had more elevated levels of somatization of stress related to the inability to manage unexpected and difficult situations, insecurity, and panic, while dental students had more elevated levels of stress somatization related to the stress of meeting daily demands, compared to the stress of long-term goals. Generally, somatization symptoms among nursing and dental students are severely understudied. We can refer indicatively to the study of Feussner et al. (2022) [9], which indicated more severe somatization symptoms of dental students compared to medical students. On the other hand, nursing students may experience more somatization symptoms compared to medical students too due to factors such as rigorous clinical responsibilities and the emotional demands of patient care [45,46].

4.2. Difference of Perceived Stress Levels between Dental and Nursing Students

The perceived levels of stress, according to this study, in terms of the somatization of stress in nursing and dental students were presented at a higher level as *“Inability to manage unexpected or difficult situations, insecurity, panic”*, basically reported by nursing students and *“Restlessness and psychological pressure”*, from dentistry students. This difference corresponds to the nature of each discipline and the daily routines faced by students in each departments. Our data are in accordance with a study conducted in Australia among nursing, dental and pharmacy students on perceived stress levels and emotional intelligence [47]. The study demonstrated a significant negative correlation between emotional intelligence and perceived stress levels in nursing and pharmacy students. Perceived stress levels were significantly higher than the normative average for pharmacy and dental students and overall higher than nursing students [47]. Similar studies conducted on dental students showed moderate levels [48] and high levels of perceived stress respectively [49,50], while other studies concerned nursing students demonstrated moderate levels of perceived stress [27,51].

4.3. Somatic Manifestations of Stress

In our study, dental and nursing students commonly reported somatic manifestations of stress such as heart dysphoria, digestive disorders, and headaches, similar to findings elsewhere [9,52]. There were no significant differences between dental and nursing students regarding these symptoms, except for temporomandibular joint (TMJ) symptoms, where more females reported issues (24.8%) compared to males (15.1%). Additionally, female participants reported higher rates of tension-type headaches (43.1%) compared to males (18.6%), consistent with findings in nursing and dental student populations [53-55]. The study also found that headaches significantly impact academic performance and quality of life among health profession undergraduates, aligning with previous research (Bashatah et al., 2023) [56]. However, our study showed a lower use of medications (2.2%) compared to other self-management strategies reported in the literature, such as over-the-counter medications and relaxation techniques [56]. The prevalence of migraine-like headaches, exacerbated by perceived stress from events like the COVID-19 pandemic, highlights the need for interventions to manage stress and enhance students' well-being (Tamulevicius et al., 2023) [57].

4.4. Demographic Factors Influencing the Experience of Stress-Induced Somatic Symptoms

The present study indicated that stress-induced somatic symptoms are significantly related to gender, with females demonstrating higher levels of stress somatization compared to males. In contrast, factors such as academic year, educational level, and family income did not show statistically significant effects on stress somatization. From a relevant descriptive cross-sectional study, it was reported that female nursing students who slept six hours or less, did not eat a balanced diet or exercise, attended public universities, had lower grade point averages, intended to leave nursing, and were dissatisfied with the nursing profession reported higher levels of perceived stress. Conversely, nursing students who were satisfied with their field and did not intend to leave it reported lower levels of perceived stress (Hamaideh et al., 2024) [27]. Also, female nursing students exhibited higher anxiety levels due to multiple factors, including lack of competence and having to deliver bad news (Valero-Chillerón et al., 2019) [58]. Overall, our findings align with previous research, highlighting gender differences in stress response due to developmental and biological factors [51,59], as well as differences in emotional stress responses related to gender [60].

Furthermore, age differences in emotional responses to daily stress have been documented, with older individuals showing different stress responses compared to younger individuals [61]. This age-related variation in stress response was also evident during the COVID-19 pandemic, where older adults experienced distinct stress levels and life changes impacting their psychological well-being (Birditt et al., 2021) [62]. On the other hand, an observational study involving dental students compared first-year and fifth-year students, indicating that older students experienced lower levels of perceived stress and anxiety (Owczarek et al., 2020) [63], which was not the case in our study. Additionally, an observational study involving nursing students in a Spanish university revealed that no student experienced high levels of depersonalization or low personal fulfillment, but depersonalization increased as the academic year progressed [58]. Research specific to dental students has also shown that the stress response to the dental school environment varies by year of study. Older and more advanced students tend to report lower stress levels, suggesting an adaptation or increased coping mechanisms over time [64,65] but was not proven on a statistical basis in our study.

4.5. Resilience Factors for Dentistry and Nursing Students

In the present study, resilience factors associated with lower levels of somatization symptoms among dental and nursing students included emotional balance and self-awareness (34.44%). This aligns with findings from Sperling et al. (2023) [66], who highlighted the importance of emotional regulation and self-awareness in reducing somatic symptoms among medical students. Similarly, another research indicated that self-reflection and emotional self-disclosure contribute significantly to post-traumatic growth in nursing students, reporting on the role of self-awareness in mental health

resilience [67]. Furthermore, studies have shown that high levels of empathy, self-awareness, and effective stress management predict reduced perceived stress among nursing students [27] and promote well-being [68]. To prove this, Rasheed et al. (2021) [69], developed a measure of self-awareness among nurses, demonstrating its positive impact on stress reduction and mental health. Finally, others investigated the relationship between spiritual health, resilience, and happiness among dental students, finding that these factors were associated with lower somatization levels and higher happiness [70], as was the case in our study too.

4.6. Variation of Coping Strategies in Response to Stress-Induced Somatic Symptoms

In this study, we investigated coping strategies among dental and nursing students in response to stress-induced somatic symptoms. Short-term stress management strategies included situational analysis, maintaining composure, self-coercion techniques, self-regulation, breathing exercises, distraction, and social and psychological support. Female dental students showed a higher preference (20%) for social and psychological support compared to male dental students (6%), with no other significant differences observed between dental and nursing students [71]. Long-term stress management strategies involve situation analysis, maintaining composure, communication, social and psychological support, distraction combined with entertainment, strategic thinking, time management, sleep, physical activity, dedication to study, personal time, self-care (including rest and nutrition), and spirituality such as prayer and meditation, at a lower but significant rate [72]. Dental students in our study particularly emphasized the benefits of improved physical well-being, nutrition, and sleep (15.1%) compared to nursing students (6.50%). So, our findings support previous research indicating that regular physical activity and social support contribute to lower rates of somatic symptoms [27].

As reported in other studies, alternative ways of stress control such as prayer, meditation, and yoga are preferred among healthcare professionals [73,74]. Recent research has highlighted the positive impact of prayer on well-being, emphasizing its dynamic role in daily life. Newman et al. (2023) [75] found that engaging in prayer regularly can significantly enhance an individual's overall well-being by providing a sense of comfort and purpose. Additionally, it was reported that internal dialogue is a crucial mediator in this relationship, suggesting that prayer facilitates a constructive internal conversation that contributes to improved mental health and emotional stability [76]. Overall, there are insufficient studies in the literature to be associated with our study. Nevertheless, it is generally reported elsewhere that spirituality is associated with lower levels of depression and stress somatic symptoms in female healthcare students [31,77]. Despite this fact, the present study reported low percentages of spirituality in students' coping strategies. Possibly such initiatives could be used as vital components in promoting the psychological well-being of both dentistry and nursing students.

Significantly elevated levels of stress somatization were observed among participants who adopted a passive approach, characterized by "being patient and doing nothing else." This passive response to stress contradicts other findings that report that self-guided stress management interventions can effectively reduce stress in college students, highlighting the need for active coping strategies (Amanvermez et al., 2022) [78]. Furthermore, Bonnesen et al. (2020) [79] emphasized the importance of implementing proactive initiatives to prevent student stress, suggesting that merely waiting for stress to pass without acting can exacerbate somatic symptoms. Some additional studies reported that active coping was supportive of healthcare students' mental health [77] and was particularly protective of male healthcare students [77,80].

Dental students in our study effectively managed stress by employing cognitive strategies such as situational analysis and maintaining a calm demeanor, which correlated with lower levels of stress somatization. This approach aligns with research highlighting the importance of academic resilience and motivational intensity in managing stress (Yang & Wang, 2022) [81]. Resilient individuals are known to utilize positive emotions effectively, demonstrating the critical role of emotional regulation in reducing stress [82]. These findings prove the effectiveness of cognitive and emotional strategies in helping dental students reduce stress and its somatic effects. Conversely, nursing students

achieved similar outcomes by engaging in physical activity and sports to control academic stress. The Mayo Clinic (2024) [83] supports these findings, noting that regular exercise enhances overall health and releases endorphins, which elevate mood and reduce stress as also mentioned elsewhere [84]. This distinction aligns with broader research on stress coping strategies among students where effective coping mechanisms in reducing academic stress and fatigue while strengthening self-control are discussed (Nweke et al. 2024) [85].

Furthermore, female nursing students in our study exhibited lower acceptance rates of personal time and personal care (8.20%) compared to male counterparts (28.60%), revealing a gender disparity influenced by societal expectations. It was reported accordingly that male nursing students often feel less constrained by traditional gender roles, leading to greater acceptance of personal care practices [86]. Gender-defined roles significantly affect nursing students' attitudes towards self-care, with females prioritizing patient care over personal well-being [87], as was the case in our study too. But self-care is crucial for maintaining overall well-being and professional effectiveness in nursing (Riegel et al., 2021) [88], underscored by the COVID-19 pandemic's impact on healthcare professionals' attitudes towards self-care [89]. Psychological interventions promoting resilience can enhance self-care practices among nursing students (Kunzler et al., 2020) [90], highlighting the need to address gender-specific barriers and cultivate a culture of self-care for their well-being and professional development.

4.7. Perceptions of Dental and Nursing Students Regarding the Effectiveness of Existing Support Mechanisms in Addressing Somatization Symptoms

This study highlighted dental and nursing students' perceptions of support mechanisms in addressing somatization symptoms, emphasizing areas for improvement such as curriculum revision, faculty organization, and psychological support programs. Dental students prioritized curriculum changes and better facilities, while nursing students favored psychological support and enhanced educational experiences. Female dental students expressed more interest in reducing study requirements and increasing flexibility compared to males. Concerns about supervisor support in demanding conditions were also noted [March-Amengual et al., 2022] [91]. Although direct studies on these mechanisms are lacking, the literature suggests that positive school environments and coping strategies contribute significantly to student health outcomes [92-94]. Tailored mental health interventions in dental education are also mentioned elsewhere to emphasize the importance of holistic approaches that integrate spiritual and emotional support most needed in these disciplines [95,96].

4.8. Importance of a Coach in Controlling the Phenomena

In our study, the importance of coaching in managing stress and somatization among dental and nursing students was highlighted. A majority of students viewed coaching positively, primarily for stress management, as well as for improving time management, skills, and achieving goals. Desired qualities in a coach include understanding, empathy, confidentiality, encouragement, goal orientation, and realism. Most students preferred weekly sessions (56.45%), while others opted for one to three sessions per month (25.81%). Dental students who accepted coaching tended to have higher somatization stress levels, whereas coaching acceptance did not correlate with stress levels among nursing students. Coaching has shown beneficial effects in managing stress and enhancing coping strategies among healthcare students, improving stress management compared to those without coaching [97,98]. Academic coaching, especially in online settings, has also been associated with improved student achievement and resilience [99]. Tailored coaching approaches support management skills and promote independence in research too [Martínez et al., 2021]. Implementing a coaching culture in academic settings not only addresses immediate stress-related issues but also equips students with long-term coping mechanisms crucial for professional growth [100-103]. This approach is particularly valuable in dentistry, where it enhances leadership and managerial skills to address unique challenges faced by students [104].

4.9. *Developing Targeted Interventions and Support Mechanisms to Promote the Well-Being of Dental and Nursing Students*

The findings of this study can guide the development of targeted interventions and support mechanisms to enhance the well-being of dental and nursing students. Key recommendations from the students include enhancing communication with teaching staff, extending internships, revising and replacing some courses, and strengthening available psychological services. There is an urgent need for improved support systems, flexible academic procedures, and better communication between students and teaching staff. Effective communication in healthcare education is critical, as improved interpersonal communication can enhance student support and reduce stress [105]. An interprofessional model promoting open communication behaviors among healthcare professionals can serve as a valuable framework for students in the two studied disciplines [106] to manage stress and improve job satisfaction [107]. Increased acceptance of coaching is also positively correlated with improved stress management outcomes. Conclusively, our findings identified specific training needs and interventions to enhance resilience, including stress management techniques and emotional regulation strategies, as mentioned elsewhere [108].

4.10. *Limitations of the Study*

This study has several acknowledged limitations. Firstly, while the sample size is adequate for statistical analysis, it is confined to nursing and dentistry students from a single institution, limiting its generalizability to students in other disciplines or institutions. Secondly, reliance on self-reported data introduces potential biases such as social desirability and recall bias [109,110]. The cross-sectional design precludes causal inference regarding the relationships between stress, somatization, and coping strategies. Additionally, the qualitative analysis of open-ended questions, while detailed, may be subject to researcher bias in categorizing responses. The study does not account for confounding factors like personality traits, pre-existing mental health conditions, or external stressors beyond the academic environment [111-112]. Lastly, the lack of longitudinal data limits understanding of how stress perceptions and coping strategies evolve over students' academic careers. Future research should address these limitations by utilizing larger, more diverse samples, employing longitudinal designs, and considering additional variables impacting student stress and coping mechanisms. Despite these limitations, the study reports on the importance of tailored interventions in educational settings to support nursing and dentistry students, enhancing their resilience and academic experience.

5. **Conclusions**

This study highlights gender and departmental differences in stress perception, somatization, and coping strategies among nursing and dentistry students. Female students reported higher stress somatization levels. Stress interpretations varied, with major themes including insecurity, psychological pressure, and physical symptoms. Nursing students associating stress with insecurity experienced higher somatization, while dental students linked stress to daily obligations and goals. Coping strategies focused on emotional balance, self-awareness, and stress management, with immediate techniques involving situational analysis and breathing, and long-term strategies including maintaining calm and seeking support. The study reveals academic pressures and inadequate infrastructure as key stress contributors, emphasizing the need for improved support systems, flexible academic procedures, and better communication. High acceptance for coaching support was linked to better stress management outcomes.

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Appendix A

Introductory message

ONLY FOR UNDERGRADUATE DENTAL and NURSING STUDENTS

The questionnaire of this study includes a general part (A) with demographic data, part (B) referring TMJ disorders due to stress and part C includes open-ended questions exploring participants' views on stress factors, somatization of stress in the body, strategies followed to control stress and need for educational interventions.

The survey is designed to be anonymous, ensuring that no personal information is collected during the process. Participation is voluntary and no reward of any kind is provided for your participation. You can fill in the questionnaire ONLY once. Completing the questionnaire implies acceptance of the personal data protection rules. The results of this study will be used for scientific publications and actions to improve working conditions in the departments involved. For observations, comments, and clarifications you can contact the research group.

Appendix B

Questionnaire

PART ONE

Q1. What is your gender?

Q2. What is your level of education (1- 5 years, degree/diploma) undergraduate, postgraduate, PhD, postdoctoral)

Q3. What is your place of origin?

Athens

Other urban center (capital of a prefecture)

Continental region (towns and villages)

Island region (towns and villages)

Other country outside Greece

Q4. Which dental specialty would you like to pursue in the future? (for dental students)

General dentistry

Pedodontics

Orthodontics

Oral surgery

Dentistry-sensitive dentistry

Endodontics

Periodontology

Stomatology/hospital dentistry

Prosthetics - implants

I will not practice dentistry

I am not a dental student

Q5. Which nursing specialization would you like to pursue? (for nursing students)

Community nursing

Psychiatric nursing

Surgical nursing

Pathological nursing

Emergency nursing

Oncology nursing

I will not practice nursing

I am not a nursing student

Q6.What is your family's annual income?

P1. less than 15.000 €

P2. 15.001-25.000 €

P3. 25.001-35.000 €

P4. 35.001-50.000 €

P5. more than € 50.000

P6. I do not know

P7. I have never worried about this issue

Q7.1.What are you thinking of doing after graduation? (for dental students)

P1. I will open my own clinic

P2. I will work as a clerk in a colleague's office for a few years until I see what I can do

P3. I will work as a dentist abroad

P4. I will do postgraduate studies and work in a colleague's office at the same time

P5. I will not practice clinical dentistry but will do something else in the field

P6. I will do something else professionally

P7. I will continue my studies in another discipline

P8. I am not a student of dentistry

Q7.2 What do you plan to do when you graduate? (for nursing students)

P1. I will work in a private clinic

P2. I will work in a public hospital

P3. I will do postgraduate studies

P4. I will do something else professionally

P5. I will continue my studies in another science

P6. I am not a nursing student

PART TWO

This part of the study collects data on the somatization of stress and its effect on students' SGD issues. It will be answered on a scale:

0. = Never, not applicable

1. = Usually not applicable

2. = Applies and does not apply

3. = Very true

4. = Always applies

Q8.Do you experience pain in the facial area during the day and/or night?

Q9.Do you hear a sound from the temporomandibular joint during movements of the mandible?

Q10.Do you clench or grind teeth during the night and/or day?

Q11.Do you experience headaches?

Q12.Is your sleep disturbed?

Q13. Do you feel nervous-or/annoyed-at your relationships in the student/work environment?

Q14. Are you taking medication to calm down from the responsibilities of everyday life?

PART THREE

The seventh part includes open-ended questions aimed at gathering desired actions and initiatives intended for the management and handling of stress, as well as the improvement of resilience.

Q15.What does stress mean to you?

- Q16.How and where in your body do you experience stress?
- Q17.What does resilience mean to you?
- Q18.How do you think you can improve your resilience?
- Q19.What strategy/strategies do you follow to deal with stressful situations?
- Q20.What do you usually do when you are stressed?
- Q21.What would you suggest to your school administration to reduce the level of stress you and your fellow students experience?
- Q22.Do you consider psychological resilience to be innate, or can it be cultivated?

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