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Psychosocial Complaints and Life Satisfaction Among Greek University Students: A Pre- and Pandemic-Era Comparison

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Abstract: This study aims to identify and compare the prevalence and risk factors associated with psychosocial and psychological complaints, as well as life and study satisfaction, among Greek undergraduate students before and during the COVID-19 pandemic. Data were collected in two phases: initially, from 2018 to 2019 (pre-COVID), through face-to-face surveys, and later, from October 2020 to June 2021 (COVID period), through online surveys. The study, conducted at Democritus University of Thrace (DUTH) in Greece, utilized a repeated descriptive and comparative cross-sectional design. The sample comprised 540 and 641 undergraduate students during the pre-COVID and COVID period, respectively. The following questionnaires were used: I. A socio-demographic characteristics form, II. Psychosocial Complaints List (PCL), and III. Satisfaction with Life and Studies Scale (SLSS). During the COVID period, there was an increase of 63% in psychosocial complaints ($p < 0.001$), as indicated by the PCL total, and a 25% decrease in satisfaction with life and studies ($p = 0.001$), according to the SLSS, compared to the pre-COVID period. Incidences of "suicidal thoughts", "sexual problems", and "extreme psychological distress" nearly doubled (61%, 67%, and 104%, respectively) during the pandemic. Females exhibited a 33% increase in the PCL total during the COVID period compared to males ($p < 0.001$). These findings highlight the profound impact of pandemic-induced changes on students' mental health and quality of life. Female gender and the pandemic period itself emerged as significant factors influencing these outcomes. Universities should prioritize the development of comprehensive support services to mitigate these adverse effects.

Keywords: university students; COVID-19; pandemic; quality of life; mental health

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1. Introduction

The COVID-19 pandemic has resulted in significant changes in many aspects of daily life. Since the beginning of the pandemic and the implementation of measures to control the spread of SARS-CoV-2, there have been reports of a significant impact on the mental health and quality of life of the general population [1]. According to the literature published during the pandemic, global anxiety and depression increased by 25%, with women and young people being more likely to experience symptoms of mental disorders. Multiple factors, such as social isolation and loneliness, fear of infection for oneself and loved ones, and financial worries, have been reported to have a negative impact on mental health, thereby reducing overall satisfaction with life [2].

Mental health among university students has been a major public health issue and had become an area of increasing concern even before the pandemic outbreak. Although one would expect students to be a healthy population group due to their youth, a frequent occurrence of physical discomfort and psychosomatic symptoms has been observed. It is evidently clear that university students are at high risk of developing mental health problems [3,4]. The onset of higher education marks a crucial transition in a young person's life [5]. Upon entering the field of academic pursuit, students face new pressures and stresses related to academic rigor, social integration, and personal growth [6,7].

For students in higher education, the pandemic presented several specific challenges as education moved online, making it difficult, particularly initially, for universities to integrate it into their operations and for students to adapt to it. Students reported great difficulties in the beginning of implementing e-learning through online lectures [8], which led, in many cases, to increased study-related stress, concerns about their academic performance, and, subsequently, to decreased satisfaction with their studies. Study satisfaction is important for students' academic success and is a cognitive component of overall well-being [9,10]. On the other hand, poor psychosocial well-being has been linked to academic underperformance [11].

This growing trend of mental health issues among students was further evidenced during the 2020–2021 period when over 60% of students met the criteria for one or more mental health issues, representing an increase of nearly 50% since 2013 [12]. The COVID-19 pandemic has inflicted unprecedented psychological and psychosocial distress on students, resulting in various issues and symptoms including posttraumatic stress disorder, suicidal thoughts, fear, panic, somatic symptoms, fatigue, insomnia, and sleep disturbances [13–15]. Alongside the pandemic-related concerns and containment measures, students faced additional challenges, affecting their well-being and life satisfaction, including the necessity for more effective time management skills, the loss of employment, crucial for their survival, and the loss of interpersonal relationships, all of which further impacted their well-being and life satisfaction [16].

Although many studies have addressed the impact of the pandemic on the mental health and well-being of university students, studies comparing these issues before and during the pandemic are scarce. Conducted at Democritus University of Thrace in Northeastern Greece, this study aimed to identify and compare the prevalence and risk factors of psychosocial and psychological complaints, as well as life and study satisfaction, among undergraduate students before and during the COVID-19 pandemic.

2. Material and Methods

2.1. Setting

This study was carried out by the Counseling and Accessibility Unit of Democritus University of Thrace (DUTH). DUTH, with a student population of about 30,990 students (26,000 undergraduate, 3400 postgraduate, and 1700 PhD–doctoral students), has campuses in four cities in Northeastern Greece (Xanthi, Komotini, Alexandroupolis, and Orestiada) and includes eight schools: School of Health Sciences, School of Engineering, School of Humanities, School of Law, School of Agricultural Sciences, School of Education, School of Economics and Social Sciences, and School of Physical Education and Sports Sciences.

2.2. Sample and Procedure

The present study employed a repeated descriptive and comparative cross-sectional design, focusing on undergraduate students enrolled at DUTH. The individuals selected for this study were undergraduate students from all schools of DUTH and were recruited in two phases.

Initially, a face-to-face cross-sectional questionnaire survey was administered to undergraduate students during the 2018–2019 period (pre-COVID period). A second survey was conducted online from October 2020 to June 2021, covering the entirety of the academic

year 2020–2021, during the COVID-19 pandemic (COVID period). At that time, Greece was in the 2nd wave of lockdown.

In the first phase, data collection comprised the administration of group questionnaires within the classrooms, during regular course hours, and this occurred after coordinating with faculty members. To ensure a representative sample, data collection was conducted during the days and times when mandatory courses for each department and each academic year were held, as these sessions were expected to have the highest student attendance. Efforts were made to gather data from all schools at DUTH, across different academic disciplines. Students were informed of the purpose of the study and assured of their anonymity, so that they could understand the research aims and give informed consent. Each participant was asked to put the completed questionnaire in a closed envelope and to write a code on it in case he/she wished to withdraw from the survey. To prevent response bias, no additional information was given. Research personnel, not faculty, addressed participants' inquiries. Out of (557) questionnaires that were returned, 540 were valid for the survey (completion rate 97%).

During the COVID-19 pandemic, the study was carried out using the online platform Lime Survey (Lime Survey GmbH, Survey Services & Consulting, Hamburg, Germany), in partnership with DUTH's Erasmus Student Network. The Erasmus Student Network (ESN) is a global, nonprofit organization dedicated to supporting international students. Its core mission is to advocate on their behalf, offering numerous opportunities for cultural exchange and personal growth. To maximize participation, we applied several approaches. The Counseling and Accessibility Unit in collaboration with the just abovementioned students' association (DUTH's Erasmus Student Network), had launched a campaign targeting different student associations within the university and faculty members, encouraging them to inform students about the survey through the teaching platform and departmental secretariats of DUTH. The anonymous questionnaires, which were also used before the pandemic, were adapted to meet the requirements of the online survey, following the guidelines in the Lime Survey platform manual, without any changes to their content or structure, and DUTH students voluntarily and anonymously participated, confirming their consent after understanding the research aims and personal data handling method. Out of (814) questionnaires that were returned, 694 were valid for the survey (completion rate 85%).

The inclusion criteria for participation encompassed enrollment in undergraduate programs within any school or department at DUTH. During the pandemic, the survey was conducted online, and no particular exclusion criteria were applied.

2.3. Ethical Approval–Permission

The study protocol was in accordance with the Helsinki declaration. Ethical approval was obtained by the Ethics and Research Integrity Committee (ERIC) of DUTH, for both phases of the survey (Α. Π.: ΔΠΘ/ΕΗΔΕ/15198/22 Date: 10 November 2017 & Α. Π.: ΔΠΘ/ΕΗΔΕ/32253/217 Date: 1 February 2021).

2.4. Instruments

2.4.1. Socio-Demographic Characteristics

Characteristics such as age, gender, school, occupation of parents, and education of parents were present in the specific questionnaire.

2.4.2. Psychosocial Complaints List (PCL)

The Psychosocial Complaints List [17] is an adapted version of the complaints list employed in the 11th social survey by the German National Association for Student Affairs [18]. The PCL includes 22 references to various issues that are evaluated by the respondent on a six-level graded scale (ranging from 0 = not at all to 5 = extremely) and represent the level of discomfort of the respondents in each of them. The total burden on the respondent arises from the sum of the individual scores for each question. The

questions can have values of 0 = None, 1 = Very little, 2 = Little, 3 = Moderate, 4 = A lot, and 5 = Extremely with a minimum score of 0 and a maximum score of 110. A value greater than 3 is considered clinically significant for each question, and for the total score, a value greater than 27.34 is considered significant [18]. The questions are divided into two categories: firstly, psychosocial problems (questions 1–7) with a minimum 0 and maximum score of 35, and secondly, psychological problems (questions 8–22) with a minimum score of 0 and a maximum of 75 for each category, respectively. The two categories are as follows:

i. The psychosocial problems are relationship difficulties, parental conflicts, loss of loved ones, personal health issues, housing challenges, financial constraints, and stress related to childcare.
ii. The psychological problems are difficulties with work and concentration, fear of exams or authorities, communication challenges, low self-esteem, unexplained fear and unease, issues managing aggression, obsessive-compulsive disorder (OCD), depression, thoughts of suicide, sexual problems, psychosomatic complaints, substance use problems, substance dependence, severe mental distress (indicative of serious mental illness), and other issues categorized as residual.

The internal consistency (Cronbach's alpha) of the PCL was $\alpha = 0.79$. Test–retest reliability of the PCL was r = 0.72 [17].

2.4.3. Satisfaction with Life and Studies Scale (SLSS)

The Satisfaction with Life and Studies Scale (SLSS) includes seven questions regarding the general satisfaction of students with their life and studies [19,20]. It is an assessment scale with closed-type questions on a five-point graded scale (with values ranging from 1 = Not at all to 5 = Very much). The respondent is asked to choose one of the available levels from the option 'not at all satisfied' to 'very satisfied', which represent the two extremes of the scale. The total score can range from 7 to 35. The questions are divided into two categories; the 1st relates to satisfaction with life (questions 1 to 4) and has a scoring range from 4 to 20, and the 2nd refers to satisfaction with studies (questions 5 to 7) with a scoring range from 3 to 15.

The questionnaire addresses various aspects, which are categorized into two subscales:

i. Satisfaction with life (healthiness/productivity, being content with oneself, getting along with others, satisfaction with life) and;
ii. Satisfaction with their studies (satisfaction with academic performance, current study situation, general study conditions). Responses are measured using a five-point Likert scale, ranging from 'not satisfied at all' to 'very satisfied (Berger et al., 2015).

Internal consistency (Cronbach's alpha) of the SLS was $\alpha = 0.84$ [17].

The aforementioned internal consistency values of the PCL and SLSS support the conclusion that both scales are reliable for assessing mental dysfunction.

The PCL and SLSS were employed after receiving permission from their creators. The questionnaires were initially translated into Greek by a Greek individual fluent in German, and then back-translated into German by a German philologist–translator. Any required adjustments were discussed until the Greek adaptation aligned with the questionnaire's specifications.

2.5. Internal Consistency of Questionnaires in Our Research

The internal consistency of the Greek versions of the questionnaires was confirmed by calculating Cronbach's alpha. A value between 0.70 and 0.94 was considered acceptable for internal consistency [21,22]. The Cronbach's alpha reliability coefficient had an acceptable value in all cases. Specifically, for PCL_total, it was 0.89, for SLSS_total, 0.85, for SLSS_life, 0.82, and for SLSS_studies, 0.79.

2.6. Statistical Analysis

Descriptive statistics were computed for the demographic characteristics of the sample (age, gender, department/school, father's occupation status, mother's occupation status, father's education status, mother's education status), the percentages of students who scored > 0 on each item of the PCL scale (both pre-COVID and during it), and the percentages of individuals at each level of all items on the SLSS scale. Additionally, the means (and standard deviations) were calculated both for the total score of the PCL and the SLSS, as well as for each item of the two scales separately (for both the pre-COVID and the COVID periods).

The Kolmogorov–Smirnov test was applied to test whether the variables PCL_total, SLSS_total, SLSS_life, SLSS_studies follow the normal distribution or Poisson distribution [23–25], but in all cases, there was a statistically significant difference ($p < 0.05$). Testing the data against the Poisson distribution showed over-dispersion and therefore we applied negative binomial regression analysis four times for each of the four dependent variables (PCL_total, SLSS_total, SLSS_life, SLSS_studies), respectively [26,27]. The variables gender (0 = female/1 = male), period (0 = COVID/1 = pre-COVID), age (in years), Parents_occupation, and Parents_education were used as independent variables. The variables Parents_occupation and Parents_education were obtained as scores with both parents contributing. Specifically, every parent who did not have income from work was given 1 point, while every parent who had income due to work (even if they were retired) was given 2 points. Thus, the Parents_occupation variable received values from 2 to 4. On the other hand, for the variable Parents_education, each parent gave 1 to 4 points depending on his/her education (1 = no formal, 2 = primary, 3 = secondary, 4 = tertiary). Therefore, the variable Parents_education could take values from 2 to 8.

In addition, simple non-parametric tests were also performed. Spearman correlations were performed to determine if there were correlations between the four dependent variables (PCL_total, SLSS_total, SLSS_life, SLSS_studies). The Spearman coefficient result was interpreted based on the suggestion of Schober, et al. [28] (0.00–0.10 Negligible correlation, 0.10–0.39 Weak correlation, 0.40–0.69 Moderate correlation, 0.70–0.89 Strong correlation, 0.90–1.00 Very strong correlation). Chi-square tests were conducted to compare students who scored 0 or >0 during both the pre-COVID and COVID periods for each item on the PCL scale. Finally, Mann–Whitney's U test was applied in cases where it was necessary to compare the differences between two independent samples [29].

All statistical analyses were performed with the SPSS statistical package (version 25.00) and the significance level was set at $p < 0.05$. The Cohen's d coefficient was computed manually using the means, standard deviations, and sample sizes to assess the practical significance of the variances between two independent samples [30]. The effect sizes (Cohen's d) were defined as follows: trivial (d < 0.20), small (d = 0.2–0.49), medium (d = 0.50–0.80), and large (d > 0.80) [31,32].

3. Results

3.1. Sample Demographics

During the pre-COVID period of the study, a total of 540 students completed the questionnaires. During the COVID period of the study, a total of 694 students successfully participated in the survey. In Table 1, descriptive statistics regarding the age, gender, and school of the participants are presented, along with their parents' occupational status and education level.

Table 1. Demographic characteristics of the sample population before and during the COVID-19 pandemic.

Research Period	**Pre-COVID-19**		**COVID-19**	
Total	540		694	
Age (mean ± SD)	20.5 ± 2.71		23.49 ± 5.37	
Frequencies	**N**	**%**	**N**	**%**
Gender				
Female	330	61.1	457	65.9
Male	210	38.9	237	34.1
Department/school				
Faculty of Health Sciences	142	26.3	96	13.7
Faculty of Agricultural Sciences	124	23.0	73	10.4
Faculty of Law	26	4.8	83	11.9
Faculty of Social, Political and Economics Sciences	31	5.7	68	9.7
School of Engineering	61	11.3	196	28.0
School of Education	144	26.7	94	13.4
School of Humanities	12	2.2	53	7.6
School of Physical Education and Sport Science	0	0.0	37	5.3
Father's occupation status				
Public employee	162	30.1	168	25.2
Private employee	84	15.6	139	20.8
Self-employed	150	27.9	181	27.1
Worker	15	2.8	24	3.6
Farmer	42	7.8	50	7.5
Retiree/pensioner	72	13.4	86	12.9
Unemployed	13	2.4	19	2.8
Housemaker	0	0.0	0	0.0
Mother's occupation status				
Public employee	173	32.1	210	30.7
Private employee	109	20.2	148	21.6
Self-employed	56	10.4	72	10.5
Worker	12	2.2	17	2.5
Farmer	26	4.8	34	5.0
Retiree/pensioner	25	4.6	54	7.9
Unemployed	37	6.9	39	5.7
Housemaker	101	18.7	110	16.1
Father's education status				
No formal education	2	0.4	11	1.7
Primary education	55	10.2	68	10.4
Secondary education	197	36.5	270	41.3
Tertiary education	286	53.0	304	46.6
Mother's education status				
No formal education	2	0.4	12	1.8
Primary education	30	5.6	49	7.4
Secondary education	197	36.5	209	31.5
Tertiary education	311	57.6	393	59.3

3.2. Descriptive Statistics for PCL-SLSS

Table 2 displays the frequency (in percentages) of students exhibiting scores greater than 0 on each item of the PCL scale, both during the pre-COVID and COVID periods. Additionally, it shows the means (and standard deviations) for each item of the PCL scale, for both periods.

Table 2. Descriptive statistics for the PCL scale before and during the COVID-19 pandemic.

Items of the PCL Scale	Pre-COVID		COVID	
	>0 (%)	MEAN (±SD)	>0 (%)	MEAN (±SD)
Partnership problems	46.1	1.2 ± 1.6	60.9	1.7 ± 1.8
Conflicts with parents	67.1	1.3 ± 1.3	84.7	2.3 ± 1.5
Disease or death of close friends/relatives	41.1	1.2 ± 1.8	48.3	1.4 ± 1.8
Physical diseases	42.0	0.9 ± 1.3	45.7	1.0 ± 1.4
Housing problems	40.0	0.8 ± 1.2	50.2	1.2 ± 1.5
Financial problems	67.8	1.5 ± 1.5	74.2	2.0 ± 1.6
Considerable strain due to own child	5.6	0.1 ± 0.5	6.8	0.2 ± 0.8
Difficulties to work and concentrate	65.6	1.4 ± 1.4	87.1	2.8 ± 1.6
Test anxiety/feelings of insecurity towards authorities	81.6	2.3 ± 1.6	92.3	3.2 ± 1.6
Contact problems	59.3	1.2 ± 1.3	78.1	2.3 ± 1.7
Low self-esteem	66.9	1.7 ± 1.7	83.6	2.7 ± 1.7
Feelings of anxiety that I cannot explain	58.7	1.3 ± 1.5	84.2	2.7 ± 1.8
Feelings of aggression that are hard to control	39.2	0.7 ± 1.1	58.9	1.5 ± 1.6
Compulsive thoughts, compulsive acts	50.7	1.0 ± 1.3	77.0	2.2 ± 1.7
Depressiveness	58.0	1.3 ± 1.5	82.3	2.4 ± 1.6
Suicidal thoughts	10.4	0.2 ± 0.7	16.8	0.4 ± 1.0
Sexual problems	25.8	0.5 ± 1.1	43.1	1.1 ± 1.6
Psychosomatic complaints	48.1	1.0 ± 1.3	66.9	1.7 ± 1.6
Problems with alcohol or drugs	13.4	0.3 ± 0.8	16.7	0.4 ± 1.0
Medicine-dependency	6.9	0.1 ± 0.6	5.8	0.1 ± 0.6
Extreme psychological distress	11.9	0.2 ± 0.7	24.3	0.5 ± 1.0
Other problems/complaints	33.5	0.7 ± 1.1	52.5	1.2 ± 1.4
TOTAL SCORE		20.8 ± 14.8		33.3 ± 17.6

Table 3 presents the responses to the SLSS questionnaire for both the pre-COVID and COVID periods.

3.3. Results for the PCL

When PCL_total was used as the dependent variable in the negative binomial regression, it appeared that period and gender significantly contribute to the model, unlike the variables age, Parents_occupation, and Parents_education, for which $p > 0.05$ (Table 4). According to the model, females cause a 33% increase in PCL_total compared to males, while the COVID period causes a 63% increase in the PCL total compared to the pre-COVID period. The Omnibus test indicates that the model is statistically significant ($p < 0.001$) and the data fit well (deviance/df = 0.46).

Table 3. Descriptive statistics for the SLSS scale before and during the COVID-19 pandemic.

Category		Satisfaction with Life			Satisfaction with Studies				
Question		Healthiness/Productivity	Being Content with Oneself	Getting along with Others	Satisfaction with Life	Satisfaction with Academic Performance	Satisfaction with Current Study Situation	Satisfaction with General Study Conditions	SLSS_Total
Pre-COVID	Not at all	3.7	3.0	0.6	2.0	7.6	6.9	7.1	
	Very little	15.3	16.0	7.4	11.5	19.6	21.4	23.1	
	Little	32.4	31.1	30.5	28.9	28.5	31.5	34.3	
	Much	33.5	28.5	41.9	37.6	26.8	25.9	24.2	
	Very much	15.1	21.4	19.6	19.9	17.5	14.3	11.4	
	MEAN (±SD)	3.4 ± 1.0	3.5 ± 1.1	3.7 ± 0.9	3.6 ± 1.0	3.3 ± 1.2	3.2 ± 1.1	3.1 ± 1.1	23.8 ± 5.4
COVID	Not at all	14.4	14.6	5.3	13.9	15.4	18.3	22.0	
	Very little	26.7	23.4	15.2	21.8	15.6	19.8	22.0	
	Little	34.1	30.6	35.6	33.2	31.0	33.1	29.5	
	Much	18.7	22.9	36.7	23.1	28.2	21.6	20.6	
	Very much	6.1	8.4	7.2	8.0	9.8	7.2	6.0	
	MEAN (±SD)	2.8 ± 1.1	2.9 ± 1.2	3.3 ± 1.0	2.9 ± 1.1	3.0 ± 1.2	2.8 ± 1.2	2.7 ± 1.2	18.3 ± 7.2

Table 4. Results of negative binomial regression analysis predicting PCL_total scores.

Parameter	B	Std. Error	Wald Chi-Square	df	Sig.	Exp(B)
(Intercept)	3.53	0.33	111.14	1.00	0.00	34.08
[Gender = 0] (female)	0.28	0.06	20.27	1.00	0.00	1.33
[Gender = 1] (male)	0.00					1.00
[Period = 0] (COVID)	0.49	0.06	57.00	1.00	0.00	1.63
[Period = 1] (pre-COVID)	0.00					1.00
Age	−0.01	0.01	2.03	1.00	0.15	0.99
Parents_education	−0.05	0.03	3.18	1.00	0.07	0.95
Parents_occupation	−0.04	0.07	0.28	1.00	0.60	0.97

For further investigation of the effect of gender and period on PCL_total, separate Mann–Whitney U tests were conducted. From Table 5 and Figure 1, it can be observed that for PCL_total, the difference between the two genders is small both in the pre-COVID and COVID periods, while the difference between the two periods is moderate for both males and females.

Table 5. Results of Mann–Whitney U tests comparing PCL_total scores across gender and periods.

Dependent Variable	Grouping Variable	Select Cases	Mann–Whitney U	*p*	Cohen's d
PCL_total	Gender	Pre-COVID	24,125.00	<0.001	0.49
PCL_total	Gender	COVID	40,803.00	<0.001	0.43
PCL_total	Period	Male	14,122.00	<0.001	0.77
PCL_total	Period	Female	43,759.50	<0.001	0.76

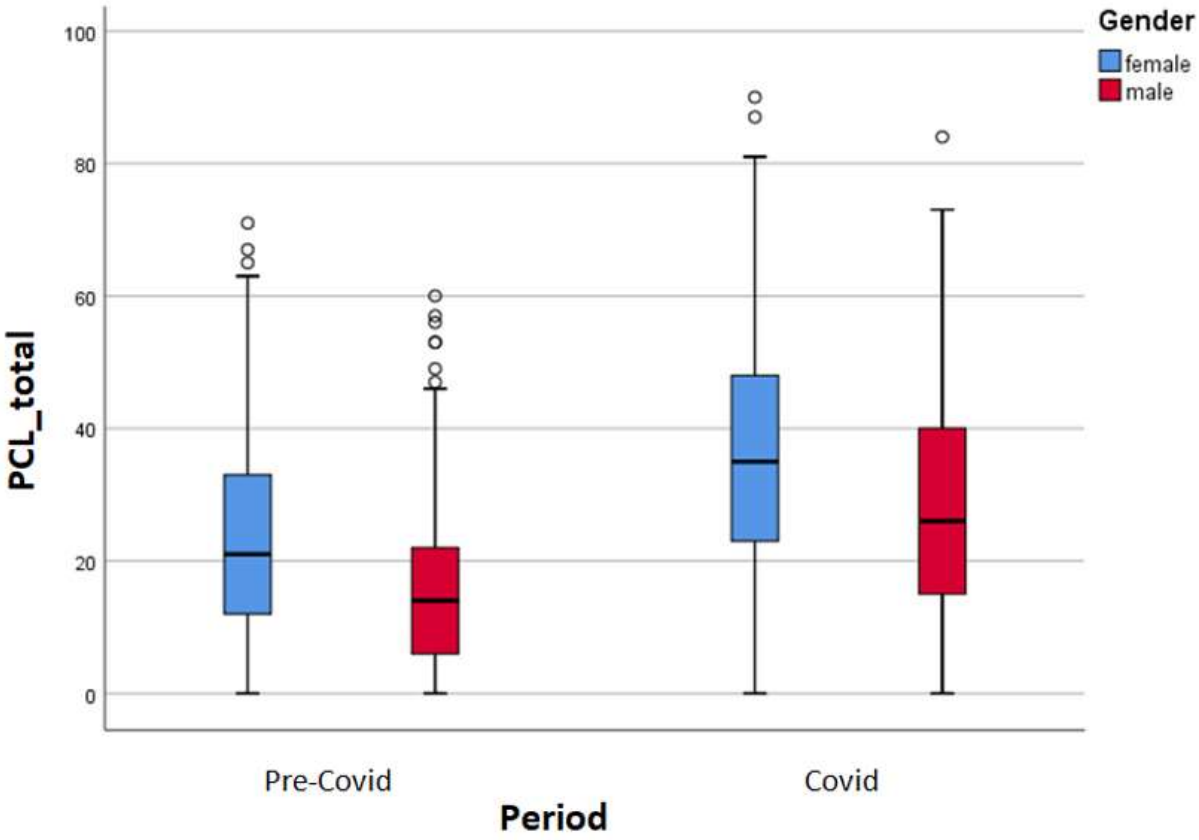

Figure 1. Box-plots comparing PCL_total scores by gender before and during the COVID-19 pandemic. Small circles represent outliers.

3.4. Results for the SLSS

Three additional consecutive negative binomial regressions were conducted for the dependent variables SLSS_total, SLSS_life, and SLSS_studies. Only the variable "period" statistically significantly explains the dependent variable in all three models (Table 6). In all three cases, the COVID period results in a decrease in the dependent variable compared to the pre-COVID period by 25%, 24%, and 27%, respectively. Additionally, in all three cases, the Omnibus test is statistically significant ($p = 0.001$, $p = 0.002$, $p < 0.001$, respectively). The deviance/df ratio is 0.13 in the first case, 0.12 in the second, and 0.26 in the third.

Table 6. Results of negative binomial regressions with SLSS_total, SLSS_life, and SLSS_studies as the dependent variables.

Parameter	B	Std. Error	Wald Chi-Square	df	Sig.	Exp(B)
Dependent Variable: SLSS_Total						
(Intercept)	2.73	0.34	66.27	1.00	0.00	15.32
[Gender = 0] (female)	−0.03	0.06	0.25	1.00	0.61	0.97
[Gender = 1] (male)	0.00					1.00
[Period = 0] (COVID)	−0.29	0.06	19.65	1.00	0.00	0.75
[Period = 1] (pre-COVID)	0.00					1.00
Age	0.01	0.01	2.53	1.00	0.11	1.01
Parents_education	0.01	0.03	0.12	1.00	0.73	1.01
Parents_occupation	0.04	0.07	0.41	1.00	0.52	1.04

Table 6. *Cont.*

Parameter	B	Std. Error	Wald Chi-Square	df	Sig.	Exp(B)
Dependent Variable: SLSS_Life						
(Intercept)	2.23	0.34	43.01	1.00	0.00	9.26
[Gender = 0] (female)	−0.06	0.06	0.73	1.00	0.39	0.95
[Gender = 1] (male)	0.00					1.00
[Period = 0] (COVID)	−0.27	0.07	17.05	1.00	0.00	0.76
[Period = 1] (pre-COVID)	0.00					1.00
Age	0.01	0.01	1.75	1.00	0.19	1.01
Parents_education	0.02	0.03	0.31	1.00	0.58	1.02
Parents_occupation	0.04	0.07	0.41	1.00	0.52	1.04
Dependent Variable: SLSS_Studies						
(Intercept)	1.80	0.35	26.59	1.00	0.00	6.02
[Gender = 0] (female)	0.00	0.07	0.00	1.00	0.95	1.00
[Gender = 1] (male)	0.00					1.00
[Period = 0] (COVID)	−0.31	0.07	21.67	1.00	0.00	0.73
[Period = 1] (pre-COVID)	0.00					1.00
Age	0.01	0.01	3.69	1.00	0.05	1.01
Parents_education	0.00	0.03	0.00	1.00	0.96	1.00
Parents_occupation	0.04	0.07	0.35	1.00	0.55	1.04

3.5. Correlations of Questionnaires Scores

The Spearman correlation coefficient showed that PCL_total has a moderate negative correlation with SLSS_total, SLSS_life, and SLSS_studies, SLSS_total has a strong positive correlation with SLSS_studies and a very strong positive correlation with SLSS_life, while SLSS_life and SLSS_studies have a moderate positive correlation (Table 7). In all cases, $p < 0.001$.

Table 7. Spearman correlation coefficients between PCL_total and SLSS_total, SLSS_life, and SLSS_studies.

	PCL_Total	SLSS_Total	SLSS_Life	SLSS_Studies
PCL_total		−0.61	−0.63	−0.47
SLSS_total	−0.61		0.91	0.89
SLSS_life	−0.63	0.91		0.64
SLSS_studies	−0.47	0.89	0.64	

4. Discussion

This study aimed to identify and compare the prevalence and associated risk factors of psychosocial and psychological complaints as well as life and study satisfaction, among undergraduate university students in Greece, both prior to and amidst the COVID-19 pandemic. The PCL and SLSS questionnaires were used to address psychosocial and psychological complaints and satisfaction with life and study, respectively.

The findings presented herein indicate a significant escalation in the severity of psychosocial and psychological challenges, accompanied by a notable decline in students' satisfaction with life and studies between the pre-COVID and COVID periods. These results empirically confirm the adverse effects of the pandemic on students' holistic well-being.

Our results indicate that both gender and the period (COVID vs. pre-COVID) played a significant role in influencing the changes observed in psycho complaints, unlike factors such as age, parental occupation, and parental education. According to the regression model, females showed a 33% increase in the PCL total compared to males. It is widely known that women are at a heightened risk of developing depressive and anxiety disorders worldwide. Throughout the pandemic, it became apparent that women continued to face

a disproportionate burden of mental and emotional challenges compared to men, with a marked decline in overall mental well-being [33]. In particular, and in line with our results, it has been shown that women were more vulnerable to the negative effects of the pandemic than men within academic settings [34]. Specifically, women felt significantly more depressed, lonely, fearful, and insecure and female students reported significantly more depressive feelings compared to male students, even after controlling for socio-demographic, socio-economic, and academic factors [35]. Studies conducted in Greek universities further highlighted this gender disparity, showing that female students were significantly more affected by the COVID-19 pandemic than their male counterparts, with increased rates of insomnia, sleep disorders, anxiety, and depression [36].

Further analysis revealed that the pandemic period appeared to have a greater effect than gender on PCL scores; the COVID period showed a 63% increase in the PCL total, compared to the pre-COVID period. In the pre-COVID sample, predominant issues (>0) on the PCL psychosocial scale included the following: "Anxiety/Feelings of Insecurity Towards Authorities" (81.6%), "Conflicts with Parents" (67%), "Financial Problems" (68%), "Low Self-Esteem" (66.9%), and "Difficulties to Work and Concentrate" (65.6%). During the COVID period, there was an increase in almost all aspects of psychosocial and psychological problems. In particular, the issues with the highest increase rates were as follows: "Extreme psychological stress" (104%), "Sexual problems" (67%), "Suicidal thoughts" (61%), "Compulsive Thoughts/Acts" (52%), "Depressiveness" (42%), and "Feelings of Anxiety that I Cannot Explain" (43%). The incidence of "suicidal thoughts", "extreme psychological distress", and "sexual problems", although less frequent before the pandemic (10.4%, 11.9%, 25.8%, respectively), increased to a level that almost doubled. These findings are in line with the majority of research in this area, particularly with regard to stress and depressive and anxiety symptoms [37]. Most studies have focused on stress, anxiety, and depression during the COVID-19 pandemic. Notably, ad hoc or open-ended questionnaires were usually used and because of this, direct comparisons with our findings cannot be made on a one-to-one basis. Regarding suicide, in most studies, there seemed to be an increasing trend in the suicide rate [38], but also a multiple increase in suicidal thoughts [39,40], while in some studies, in which no increased suicidality was found, trends emerged suggesting the possibility of delayed effects [41].

These findings suggest that conditions during the pandemic, such as increased isolation and loneliness, restricted daily routine but also the disruption of these routines, and uncertainty, as well as disparities in access to healthcare and mental health support, may have hindered students' ability to cope with the psychosocial impacts of the pandemic, adversely affecting those already at risk and possibly introducing new individuals to these critical concerns.

Interestingly, in our sample, "financial problems" and "physical diseases" were not among the items that had a considerable increase. During the first months of the COVID-19 pandemic, there was no increase in financial stress among students. However, post-pandemic, there has been an increase in economic stress, likely due to global inflationary pressures from 2021 onwards [42]. Studies involving non-Western universities have shown that financial difficulties or economic concerns were a major issue for students as the pandemic progressed [43–45]. This finding suggests that the impact of financial problems on students' well-being may vary depending on cultural and regional contexts. Furthermore, according to the literature reviewed, it appeared that the mental burden of the student population was not related to issues such as the spread of the virus and the impact on physical health [46] and that finding also suggests that the mental burden on students may be influenced by factors beyond the direct health impacts of the pandemic.

The observed decreases in our survey regarding SLSS_total (25%), SLSS_life (24%), and SLSS_studies (27%) during the COVID period compared to the pre-COVID period are significant. These results quantitatively confirm the negative impact of the pandemic on individuals' overall life and academic satisfaction. The COVID-19 pandemic has created challenges in the management of teaching and education for the global academic commu-

nity. Many institutions adopted online learning modalities to comply with social distancing measures. While some students appreciated the flexibility, others faced challenges with technological access, engagement, and academic support [47,48]. Life satisfaction is extremely important for university students because it leads to better academic performance, but also because it is a key pillar of subjective well-being [49,50]. A popular definition of life satisfaction is as follows: "Life satisfaction is the degree to which a person positively evaluates the overall quality of his/her life as a whole. In other words, how much the person likes the life he/she leads" [51]. The disruption of campus life, restrictions on extracurricular activities, and, in many cases, the return home and enforced living with parents disrupted the social aspect of student life, affecting students' sense of belonging and overall satisfaction [47,52,53]. It is worth noting, however, that several studies have documented significant individual differences in life satisfaction between cultures [54].

The lack of statistical significance for age, parents' occupation, and parents' education suggests that these factors do not have a direct impact on students' psychosocial needs and their satisfaction with life and studies within the sample. Regarding age and its impact on the overall quality of students' lives, studies yield mixed results. While some support a positive relationship between increasing age and improvements in students' quality of life, others suggest that each additional year of age is associated with a decrease in quality of life [55].

In our sample, 53% of fathers and 57.6% of mothers have completed higher education, which may mask any particular differences as most students come from families with similar educational backgrounds. Therefore, future research should consider variables like income to further explore these differences. This is supported by the literature showing that socio-economic status affects students' academic performance and engagement in the educational process [56], as well as the effect of family support on academic goals.

High levels of mental health problems, anxiety, and depression are observed in undergraduate students with a negative impact on the academic experience during the pandemic [57]. Our research innovates by offering a comparative perspective, before and after the pandemic, shedding light on the significant escalation of mental health issues among students related to academic and student satisfaction and psychosocial factors in the wake of the pandemic. This comparative analysis enhances the limited existing literature and emphasizes the unique challenges and stressors introduced by the pandemic, including the abrupt shift to online learning and the associated isolation [58].

Despite the insights gained from this study, it is imperative to acknowledge certain limitations. Firstly, the cross-sectional design precludes causal inferences, making it challenging to determine the directionality of the observed associations. Secondly, the reliance on self-reported measures introduces the potential for response bias, as students might underreport or overreport their psychosocial complaints and levels of satisfaction due to social desirability or recall biases. Additionally, the primary concern was related to the different sampling before and after the COVID-19 pandemic. It was not possible to study the same sample during the two moments because, at the beginning of the first phase of data collection, the COVID-19 pandemic was still unknown. Due to the online data collection during the pandemic, we acknowledge that using online methods may have excluded participants with limited Internet access or technological difficulties—an issue discussed in the literature [59]. To mitigate the possibility of student exclusion, we implemented various strategies to ensure broader student awareness and access. The survey was conducted via the Lime Survey platform, and notifications were distributed through university department secretariats, posted on faculty websites, shared in student groups on social media, and communicated through the university's teaching platform. Additionally, we collaborated with the Erasmus Student Network and the Counseling and Accessibility Unit to ensure that students were informed about the survey through multiple contact points. Similar practices for online data collection are recommended in the literature [60].

During the exceptional circumstances of the pandemic, surveys in general posed significant challenges for sampling, highlighting the need to address these issues [61],

especially when the representation of specific social groups is critical for the accuracy and reliability of data, particularly in fields such as public health [62]. A difference in completion rates was also observed between the two phases of the study, with completion rates of 85% during the pandemic phase and 97% during the in-person phase. The overall decrease in response rates during the pandemic, also noted in the literature [59,62], reflects a significant drop in participation rates in international surveys for various reasons. Despite this difference, the strategies we implemented effectively encouraged student participation, and the high completion rate strengthens the reliability of our findings.

Moreover, although the sample is representative of various university faculties, no detailed analysis was conducted by faculty or department to explore potential differences in psychosocial complaints and life satisfaction across different fields of study. This remains a limitation of the current study. Additionally, the study did not account for important confounding factors such as pre-existing mental health conditions, social support outside the university, and family economic situation, which could have influenced psychosocial complaints and life satisfaction. Incorporating these factors in future research would provide a more nuanced understanding of the risk factors involved. Lastly, the transition to online surveys during the pandemic might have affected the representativeness of the sample, potentially excluding students with limited Internet access or those more severely impacted by the pandemic.

These limitations suggest the need for cautious interpretation of the findings and underline the importance of further longitudinal and qualitative studies to deepen our understanding of the pandemic's impact on university students' mental health and academic satisfaction. Future research should also consider analyzing potential differences between various faculties or departments, as well as incorporating important confounding factors such as pre-existing mental health conditions, social support outside the university, and family economic situation, to better identify the specific risk factors associated with psychosocial complaints and life satisfaction. Such research could provide a more nuanced and comprehensive understanding of the variables influencing students' well-being, particularly in crisis situations like the COVID-19 pandemic.

5. Conclusions

This study provides a comprehensive examination of the psychosocial and psychological well-being of undergraduate students in Greece, comparing data from periods before and during the COVID-19 pandemic. Utilizing the PCL and SLSS questionnaires, our research documents a significant increase in psychosocial and psychological complaints, alongside a notable decline in life and study satisfaction among students as the pandemic progressed. These findings underscore the profound impact of pandemic-induced changes on students' mental health and quality of life, with female gender and the pandemic period itself emerging as key factors influencing these outcomes. Universities and educational institutions should prioritize the development of comprehensive support services, including counseling and online resources, to mitigate the negative impact of such crises on student well-being. Furthermore, our study's focus on both life and study satisfaction provides valuable insights for educators and policymakers to adapt teaching methodologies and academic policies to foster a more supportive and flexible learning environment, especially in times of widespread disruption.

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