

## Research article

# Quality of life and psychopathology in different COVID-19 pandemic periods: A longitudinal study

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### ABSTRACT

The aim of this longitudinal study was to investigate the effect of the COVID-19 pandemic on the mental health and quality of life (QoL) of the general population in the region of Attica, Greece, during the third year of the pandemic (2022), and to compare the findings with those of a survey conducted in the first year (2020). Our sample consisted of 130 participants and the study was conducted through phone interviews. The instruments used were: the World Health Organisation QoL instrument, the Depression-Anxiety-Stress Scale, the Body Vigilance Scale, the Dimensional Obsessive-Compulsive Scale, as well as socio-demographic data and questions on stressors related to COVID-19. The findings of the study were the following: (1) Regarding the comparison of the variables between the first and the third year of the pandemic in the total sample: (a) In comparison to the first year, in the third year we observed a significant decrease in negative feelings caused by the pandemic; (b) obsessive-compulsive (OC) and hypochondriacal symptomatology were significantly reduced, and the fact that participants felt safe following vaccination had a statistically significant effect on this decrease; (c) job insecurity was aggravated; (d) QoL remained low and even deteriorated in the Environment domain; (f) no changes were found in Depression-Stress. (2) Regarding participants who were contaminated, there was a significant increase in negative feelings during the third year of the pandemic. Moreover, QoL decreased in the Physical, Psychological health, and Environment domains, as well as in OC symptomatology. (3) Depression-Stress, hypochondriacal symptomatology, and the case of contamination were the predominant factors negatively associated with the dependent variables of QoL. (4) Vaccination was found to contribute to high levels of the QoL Environment domain score. (5) Anxiety, hypochondriacal symptomatology, fear of contamination, and negative feelings seemed to predict OC symptomatology. (6) The most vulnerable groups, in terms of QoL and mental health, were men, older and lower-educated people. Overall, it was found that the negative psychosocial impact of the pandemic persisted, especially on people who had fallen ill during the third year of the pandemic. Therefore, targeted psychotherapeutic interventions should be implemented, especially for those who get infected.

**KEYWORDS:** COVID-19 stressors, quality of life, depression, stress, obsessive compulsive symptomatology, body vigilance.

## Introduction

Many studies and meta-analyses have shown the serious impact of COVID-19 on mental health. Indeed, COVID-19 and the subsequent imposed restrictive measures (social distancing, lockdowns, etc.) have been positively correlated with high levels of depression,<sup>1</sup> anxiety,<sup>2</sup> stress,<sup>2</sup> obsessive–compulsive<sup>3</sup> and hypochondriacal<sup>4</sup> symptomatology. Also, the negative effects of COVID-19 on mental health were due to increased levels of distress, fear, anxiety,<sup>5,6</sup> health-related worries and concerns.<sup>7,8</sup> COVID-19 prevention campaigns mainly focused on contamination and cleaning, elements that trigger OC symptomatology.<sup>3</sup> Indeed, some study results showed worsening of symptoms in OCD patients during the pandemic,<sup>9</sup> and a triggering of OC symptoms in non-patient populations, with the increase of contamination-related concerns.<sup>3</sup> Also, health anxiety was associated with increased virus anxiety during the pandemic.<sup>7</sup> Overall, the fear of contamination and negative feelings, such as anxiety about the pandemic and loneliness, have been linked to OCD and hypochondriacal symptomatology,<sup>10</sup> depression and stress.<sup>11–13</sup>

In addition, COVID-19 has had a significant impact on certain quality of life (QoL) domains, such as social and family relationships, the feeling of safety, and job status.<sup>14</sup> Also, anxiety due to COVID-19 has been correlated with low levels of QoL and psychological health.<sup>15</sup> Factors that may aggravate the appearance of psychological problems are: fear of contamination, young age, social isolation, female gender, low income, low education level, and psychiatric history.<sup>16–18</sup>

Recent studies have investigated the longitudinal effects of COVID-19 stressors on mental health, well-being, and negative feelings due to the pandemic, with contradictory results. In particular, loneliness and life satisfaction worsened between June 2020 and February 2021.<sup>19</sup> On the contrary, anxiety due to COVID-19 stressors diminished between September 2020 and August 2021.<sup>15</sup> The findings of some longitudinal studies indicate that stress, anxiety, and depression decreased at later stages of the pandemic, along with the progressive easing of restrictive measures.<sup>17,18,20,21</sup> However, the results of another study showed that depression and anxiety persisted for several months after the COVID-19 outbreak.<sup>22</sup>

Regarding OC symptomatology, some studies have indicated that OC symptoms tended to recede as the pandemic progressed.<sup>23</sup> On the contrary, other studies have indicated that OC symptomatology tended to increase despite the pandemic becoming milder.<sup>3,24</sup>

Concerning QoL/well-being, a slight trend towards improvement was found in a study conducted in Austria six months after the outbreak of COVID-19.<sup>22</sup> However, other research findings indicated that domains of QoL such as sociability, psychological and physical health, worsened<sup>25</sup> or remained unchanged.<sup>26</sup>

The objectives of our study were:

- The assessment of QoL, Depression-Anxiety-Stress-, contamination obsessions/decontamination compulsions, and the degree of Body Vigilance during the third year of the pandemic
- The comparison of the values of the above variables, as well as those of the stressors related to the COVID-19 outbreak and the identification of differences between the first (T0 administration: from April to June 2020) and the third year of the pandemic (T1 administration: from January to March 2022), in the same group of participants
- The identification of the factors that affected possible differences between the first and the third year of the pandemic
- The investigation of the predictors of QoL and OC symptomatology.

## Material and method

### Participants and procedures

The sample of this second study consisted of 130 participants, out of a total of 602 participants in the sample of the first study. Those 130 participants are the ones who agreed to participate in the second administration of the original questionnaires, from January to March 2022.

The first study<sup>27</sup> was carried out during the first period of the COVID-19 outbreak in Greece, using telephone interviews and systematic sampling. In particular, a random sample was taken from several districts in Athens by selecting 5 citizens' telephone numbers for every 10 pages of the Attica region telephone directory, thus maintaining anonymity. The sociodemographic characteristics of the participants are presented in table 1.

### Measures

*World Health Organization QOL instrument (WHOQOL-BREF).*<sup>28</sup> The Greek version of WHOQOL-BREF includes 30 questions assessing an Overall QoL/general health facet, and 4 domains: Physical health, Psychological health, Social relationships, and Environment. The answers are rated on a Likert scale from 1–5 (e.g., 1=not at all to 5=completely) with the higher values reflecting higher

**Table 1.** Socio-demographic characteristics.

Variables		N	%
Gender	Women	73	56.2
	Men	57	43.8
Age, mean (SD)		48.6 (18.1)	
Years of education, mean (SD)		15.4 (3.4)	
Family status	Married	44	33.8
	Living together (unmarried)	14	10.8
	Unmarried	49	37.7
	Widowed	9	6.9
	Divorced/Separated	14	10.8
Living circumstances	With own family	53	40.8
	With parental family	28	21.5
	Alone	30	23.1
	With partner (unmarried)	19	14.6
Professional status	full-time employed	61	46.9
	part-time employed	7	5.4
	Student (graduate/postgraduate)	4	3.1
	Retired	33	25.4
	Household	7	5.4
	Unemployed	9	6.9
	Other	9	6.9
Psychiatric illness	No	103	79.2
	Yes	27	20.8
Physical illness	No	93	71.5
	Yes	37	28.5

levels of QoL. This instrument has been adapted for the Greek population<sup>29</sup> with satisfactory psychometric properties and internal consistency (Cronbach's alpha: 0.67–0.81). In the current study, a calculation of Cronbach's alpha coefficient per domain was performed, with satisfactory alpha values ranging from 0.72–0.91.

*Depression Anxiety Stress Scale (DASS-21)*.<sup>30</sup> It includes 21 questions, assessing three scales: Depression, Anxiety, and Stress. DASS-21 was shown to possess satisfactory psychometric properties, and the factor structure was substantiated both by exploratory and confirmatory factor analysis.<sup>30</sup> The answers are rated on a Likert scale from 0–3 (e.g., 0= Did not apply to me to 3= Applied to me very much). It has been adapted for the Greek population<sup>31</sup> with satisfactory internal consistency (Cronbach's alpha: 0.81–0.89) and satisfactory psy-

chometric properties concerning validity. In the current study, a calculation of Cronbach's alpha coefficient per subscale was performed, with satisfactory alpha values ranging from 0.84–0.92.

*Body Vigilance Scale (BVS)*,<sup>32</sup> a four-item questionnaire. The first three items assess, (1) the degree of Attentional focus on bodily sensations, (2) the Perceived sensitivity to changes in bodily sensations, and (3) the Average amount of time spent attending to bodily sensations on a 0 (not at all) to 10 (extremely) scale. The fourth item involves ratings for Attention to 15 body sensations (e.g., heart palpitations) on a 0 (none) to 10 (extreme) scale, which is averaged to yield a single score. An overall score is calculated, with lower scores indicating less body vigilance. It has been validated with satisfactory psychometric properties, and internal consistency (Cronbach's alpha: 0.82).<sup>32</sup> BVS scale underwent rigorous translation in Greek, back translation, and cross-examination by bilingual subjects. In our study, we performed a calculation of Cronbach's alpha coefficient for BVS with a satisfactory alpha value (0.79).

*Dimensional Obsessive-Compulsive Scale (DOCS)*,<sup>33</sup> assessing contamination obsessions and decontamination compulsions (Category 1: Concerns about Germs and Contamination), which includes 5 questions and an overall score, acquiring satisfactory psychometric properties, and internal consistency (Cronbach's alpha: 0.96).<sup>33</sup> The answers are rated on a Likert scale from 0–4 (e.g., 0= Not at all distressed to 4= Extremely distressed). DOCS (Category 1) underwent rigorous translation in Greek, back translation, and cross-examination by bilingual subjects. In our study, a calculation of Cronbach's alpha coefficient for DOCS (Category 1) was performed with a satisfactory alpha value (0.81).

*Set of socio-demographic data and questions-stressors related to the COVID-19 outbreak* referring to sex, age, years of education, professional status, family status, living circumstances, evidence of psychiatric or physical illness, and evidence of COVID-19 infection. The questions-stressors related to the COVID-19 outbreak evaluate the following: accuracy and frequency of getting mass media information about the virus, negative feelings due to the pandemic, fear of contamination, insecurity due to economic matters, the case of contamination and vaccination, the safety feeling due to vaccination, and the fear of possible side effects.

## Statistical analysis

Statistical analyses were conducted using SPSS (version 22.0). A range of statistical analyses were used, including descriptive statistics and examination of

the questionnaires' internal consistency, calculating Cronbach's alpha coefficient. The McNemar test or the Wilcoxon signed test was used to compare questions related to the COVID-19 outbreak between the T0 and T1 administrations. Also, the paired t-test was used to compare the questionnaire variables between the two measurements. The analysis of variance for repeated measurements (ANOVA) was applied to check which factors had a statistically significant effect on the change in the scores of the questionnaire variables between the two measurements (T0 and T1). Finally, multiple linear regression analysis in a stepwise method was used to find independent factors associated with the dependent questionnaire variables. The adjusted regression coefficients ( $\beta$ ) with standard errors (SE) were computed from the results of the linear regression analyses. The effect

size of Cohen's  $f^2$  criterion was used for assessing the  $R^2$  in each linear regression model ( $\geq 0.02$  is considered small;  $\geq 0.15$  medium;  $\geq 0.35$  large).<sup>34</sup> All reported p values were two-tailed and statistical significance was set at  $p < 0.05$ .

## Results

### Sample characteristics and responses about questions-stressors related to COVID-19

A significant number of the participants reported that they were infected by the virus. The majority of them were vaccinated and more than half of them reported high levels of safety feelings due to vaccination. The most prevalent negative feelings reported were worry, stress, and fear (table 2).

**Table 2.** Sample responses about questions-stressors related to COVID-19.

Variables		N	%
Have you been infected by the virus?	No	90	69.2
	Yes	40	30.8
Have you been vaccinated?	No	11	8.5
	Yes	119	91.5
To what extent have you felt safe to be vaccinated?	Not at all	9	6.9
	A little	13	10
	Moderate	31	23.8
	A lot	61	46.9
	Extremely	16	12.3
To what extent do you worry about vaccination side effects?	Not at all	18	13.8
	A little	49	37.7
	Moderate	38	29.2
	A lot	18	13.8
	Extremely	7	5.4
Do you feel you have clear information from the media about vaccination?	No	72	55.8
	Yes	57	44.2
Negative feelings due to COVID-19		26	65.0
	Stress		
	Worry	38	95.0
	Fear	24	60.0
	Helplessness	3	7.5
	Loneliness	13	32.5
	Boredom	19	47.5
	Anger	11	27.5
	Sadness	22	55.0
	Guilt	4	10.0
Disappointment	14	35.0	

### Comparison of the study variables between administrations at T0 and T1 in the total sample

Regarding the comparison of the pandemic stressors during the second administration of the original questionnaires, the percentage of people who showed confidence in media information about COVID-19 was significantly lower ( $z=4.56$ ;  $p<0.001$ ) compared to the first administration. Also, the frequency of information about COVID-19 was significantly lower ( $z=-5.75$ ;  $p<0.001$ ). However, the degree of insecurity about job issues was statistically higher ( $z=-4.56$ ;  $p<0.001$ ). Finally, we noted a statistically significant reduction in the sum of negative emotions due to the pandemic ( $p<0.001$ ), as well as in the feelings of worry (65.4% vs. 90.0%,  $p<0.001$ ), loneliness (17.7% vs. 27.7%,  $p=0.026$ ), boredom (13.1% vs. 44.6%,  $p<0.001$ ) and sadness (41.5% vs. 55.4%,  $p=0.007$ ).

Regarding the comparison of the questionnaire's variable scores, a statistically significant decrease was observed in the second administration, in the DOCS, BVS variables and in the WHOQOL-BREF Environment domain (table 3).

By applying the analysis of variance for repeated measurements (ANOVA), to check which of the above factors had a statistically significant effect on the change in score between the two measurements, the

following was observed: The factor that influenced the degree of reduction from T0 to T1 in the WHOQOL-BREF Environment domain was the presence of a psychiatric disorder. The high degree of feeling of safety due to vaccination was the factor that had a statistically significant effect on the degree of reduction from T0 to T1: in the DOCS total score and in BVS variables (table 4).

### Comparison of the study variables between administrations at T0 and T1 in the subsample of those who were contaminated by the COVID-19

Regarding the comparison of the pandemic stressors in the sample of those who were contaminated by the virus, a significant increase in negative emotions ( $z=-2.84$ ;  $p=0.005$ ) was found compared to the first administration and mostly in the feelings of helplessness (27.5% vs. 7.5%;  $p=0.033$ ), and disappointment (52.5% vs. 35%;  $p=0.035$ ).

Regarding the comparison of the questionnaire variables, in the second administration, a statistically significant reduction was observed in the WHOQOL BREF Physical health ( $t(39)=2.66$ ;  $p=0.011$ ), Psychological health ( $t(39)=2.09$ ;  $p=0.043$ ), Environment domain ( $t(39)=2.05$ ;  $p=0.047$ ), and OC symptomatology (DOCS) ( $t(39)=2.75$ ;  $p=0.009$ ).

**Table 3.** Comparison of the values of questionnaire variables between T0 and T1 administrations.

	T0		T1		t-value (df)	Effect size	p
	Mean	SD	Mean	SD			
Overall QoL/ and general health	64.2	17.1	62.8	17.8	0.90 (129)	0.08	0.369
Physical health	64.6	15.7	61.8	17.5	1.93 (129)	0.17	0.056
Psychological health	61.5	14.9	60.9	17.1	0.47 (129)	0.04	0.636
Social relationships	62.5	15.4	63.2	15.8	-0.50 (129)	-0.04	0.616
Environment	63.4	12.2	59.8	11.5	3.65 (129)	0.32	<0.001
Depression	5.5	4.2	5.0	4.4	1.11 (129)	0.10	0.268
Anxiety	3.7	4.2	3.8	4.4	-0.19 (129)	-0.02	0.849
Stress	7.1	4.6	6.9	4.4	0.53 (129)	0.05	0.599
Total DASS-21 score	16.3	11.9	15.8	11.6	0.56 (129)	0.05	0.576
Attentional focus on bodily sensations	6.1	2.5	5.7	2.6	8.09 (129)	0.71	0.065
Perceived sensitivity to changes in bodily sensations	6.0	2.5	5.4	2.7	1.86 (129)	0.16	0.004
Average amount of time spent attending to bodily sensations	3.3	2.4	2.9	2.6	2.93 (129)	0.26	0.036
Attention to 15 sensations	3.3	2.0	3.2	2.2	2.12 (129)	0.19	0.574
Total BVS score	18.8	8.2	17.1	8.4	0.56 (129)	0.05	0.012
Dimensional obsessive compulsive scale -DOCS	10.5	3.9	7.9	4.5	2.54 (129)	0.22	<0.001

Note: Table results from dependent samples comparisons



**Table 4.** Factors with a significant effect on the change in the WHOQOL- BREF Environment domain score, in the DOCS total score and in BVS variables.

		T0		T1		Mean change	F <sup>+</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>	p <sup>+</sup> T0 vs T1	F <sup>++</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>	p <sup>++</sup>
		Mean	SD	Mean	SD					
WHOQOL-BREF Environment										
Existence of psychiatric disorder	No	65.06	12.43	59.94	12.13	-5.11	1.55 (1,128); 0.01	<0.001 0.298	9.64 (1,128); 0.07	0.002
	Yes	57.13	8.96	59.32	9.06	2.19				
F <sup>+++</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>		3.65 (1,128); 0.03								
p <sup>+++</sup>		0.002		0.805						
DOCS total score										
Degree of safety feeling due to vaccination	Not at all/A little/ Moderately	10.72	3.64	9.47	4.27	-1.25	58.52 (1,128); 0.31	0.010 <0.001	13.01 (1,128); 0.09	<0.001
	A lot/ Extremely	10.32	4.04	6.86	4.32	-3.47				
F <sup>+++</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>		5.14 (1,128); 0.04								
p <sup>+++</sup>		0.573		0.001						
BVS Perceived sensitivity to changes in bodily sensations										
Degree of safety feeling due to vaccination	Not at all/A little/ Moderately	6.13	2.56	6.17	2.52	0.04	6.05 (1,128); 0.05	0.909 <0.001	6.9 (1,128); 0.05	0.009
	A lot/Extremely	5.99	2.41	4.90	2.67	-1.09				
F <sup>+++</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>		3.14 (1,128); 0.02								
p <sup>+++</sup>		0.743		0.007						
BVS Average amount of time spent attending to bodily sensations										
Degree of safety feeling due to vaccination	Not at all/A little/ Moderately	3.47	2.35	3.58	2.72	0.11	2.90 (1,128); 0.02	0.732 0.003	4.98 (1,128); 0.04	0.027
	A lot/ Extremely	3.23	2.41	2.39	2.49	-0.84				
F <sup>+++</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>		3.40 (1,128); 0.03								
p <sup>+++</sup>		0.577		0.011						
BVS total score										
Degree of safety feeling due to vaccination	Not at all/A little/ Moderately	19.04	8.08	19.57	8.17	0.53	4.15 (1,128); 0.03	0.600 <0.001	8.11 (1,128); 0.06	0.005
	A lot/ Extremely	18.65	8.30	15.43	8.23	-3.22				
F <sup>+++</sup> (df <sub>1</sub> , df <sub>2</sub> ); η <sup>2</sup>		2.99 (1,128); 0.09								
p <sup>+++</sup>		0.792		0.006						

<sup>+</sup>F(df<sub>1</sub>, df<sub>2</sub>), η<sup>2</sup> and p-value (after Bonferroni correction) regarding time effect, i.e., comparisons between T0 and T1;

<sup>++</sup>F(df<sub>1</sub>, df<sub>2</sub>), η<sup>2</sup> and p-value regarding the interaction term (time\*group);

<sup>+++</sup>F(df<sub>1</sub>, df<sub>2</sub>), η<sup>2</sup> and p-value (after Bonferroni correction) regarding group effect

By applying the analysis of variance for repeated measurements (ANOVA), the feeling of safety due to vaccination was found to be the factor that affected the decrease of the: (1) Physical health domain score (F(1,38)=8.17; η<sup>2</sup>=0.18; p=0.007), with the participants who felt less safe showing a significant decrease (F(1,38)=13.09; η<sup>2</sup>=0.26; p<0.001) in this domain, while those who felt safer showed no significant change (p>.05),

(2) Psychological health score (F(1,38)=5.43; η<sup>2</sup>=0.13; p=0.025), with the participants who felt less safe showing a significant decrease (F(1,38)=7.85; η<sup>2</sup>=0.17; p=0.003) in this domain, while those that felt greater safety showed no significant change (p>.05), (3) DOCS score (F(1,38) = 8.63; η<sup>2</sup>=0.19; p=0.006), with the participants who felt very safe to be vaccinated showing a significant reduction (F(1,38)=12.04; η<sup>2</sup>=0.23; p<0.001) in

this domain, while those who felt less safe showed no significant change ( $p>.05$ ).

### Associations of the WHOQOL-BREF

A multiple linear regression analysis, with WHOQOL-BREF domains used as dependent variables and the rest of the variables used as independent, revealed the following:

DASS-21 variable scores were found to be negatively and independently associated with all WHOQOL-BREF domain scores, and BVS variables were negatively associated with almost all WHOQOL-BREF domain

scores. Older people showed lower levels of Overall QoL/General Health, those who have been contaminated by COVID-19 showed lower levels of QoL in the Psychological health domain and men showed lower levels of QoL in the Social relationship's domain (compared to women). Participants with higher education levels exhibited higher scores of QoL in the Psychological Health and Social relationships domains. Finally, the case of vaccination was found to be positively associated with the Environment domain score, and the fear of contamination was negatively associated with this domain score (table 5).

**Table 5.** Multiple linear regression analysis with WHOQOL- BREF domains as dependent variables and the other study variables as independent.

	Sequence of variables entered in the model	$\Delta R^2$	B	SE	$\beta$	t	p
Dependent: WHOQOL-BREF Overall QoL/ and general health F (3,125)=44.62; $R^2=0.51$ ; $p<.001$ ; $F^2=1.04$							
DASS-21 total score	1	0.40	-0.78	0.10	-0.51	-7.50	<0.001
Age	2	0.07	-0.27	0.06	-0.28	-4.39	<0.001
BVS Attention to 15 sensations score	3	0.04	-1.66	0.54	-0.21	-3.07	0.003
Dependent: WHOQOL-BREF Physical health F (2,126)=74.42; $R^2=0.53$ ; $p<.001$ ; $Fv=1.13$							
DASS-21 total score	1	0.45	-0.76	0.11	-0.50	-7.23	<0.001
BVS Average amount of time spent attending to bodily sensations	2	0.08	-2.24	0.46	-0.34	-4.87	<0.001
Dependent: WHOQOL-BREF Psychological health F (3,125)=36.54; $R^2=.45$ ; $p<.001$ ; $F^2=0.81$							
DASS-21 total score	1	0.37	-0.78	0.10	-0.53	-7.63	<0.001
Case of contamination (Yes versus No)	2	0.04	-9.51	2.45	-0.26	-3.88	<0.001
Educational status	3	0.04	2.01	0.66	0.21	3.02	0.003
Dependent: WHOQOL-BREF Social relationships F (4,124)= 27.13; $R^2=0.45$ ; $p<.001$ ; $F^2=0.81$							
Gender (men versus women)	1	0.36	-4.68	2.09	-0.15	-2.23	0.027
DASS-21 Depression	2	0.04	-1.77	0.25	-0.49	-7.10	<0.001
BVS Average amount of time spent attending to bodily sensations	3	0.04	-1.30	0.43	-0.22	-3.02	0.003
Educational status	4	0.01	1.28	0.61	0.14	2.09	0.039
Dependent: WHOQOL-BREF Environment F (3,125)=20.56; $R^2=0.31$ ; $p<.001$ ; $F^2=0.45$							
DASS-21 total score	1	0.25	-1.19	0.20	-0.45	-6.05	<0.001
Fear of contamination	2	0.05	-2.59	0.86	-0.22	-3.01	0.003
Case of vaccination (Yes versus No)	3	0.01	6.39	3.15	0.15	2.03	0.044

Note: B is unadjusted regression coefficient; SE in Standard Error and  $\beta$  is standardized regression coefficient

### Associations of the DOCS

According to the multiple linear regression analysis with the DOCS as dependent variable, the following were observed:

Older people showed higher DOCS total scores, fear of contamination, and negative feelings were positively correlated with this scale. Also, gender is negatively correlated with DOCS, with men showing lower DOCS scores compared to women. BVS and DASS-21 variable scores were positively correlated with the DOCS total score (table 6).

### Discussion

This study investigated the effect of the COVID-19 pandemic on QoL, Depression-Anxiety-Stress, OC symptomatology, and the degree of Body Vigilance of residents in the region of Attica, Greece at the beginning of 2022. Its findings were compared with those of a study we carried out in the first pandemic phase. In addition, in this study, we investigated the factors that were independently associated with the WHOQOL and DOCS variables. The novelty of this study is that it included the investigation of OC and hypochondriacal symptomatology, in relation to QoL, Depression, Anxiety, and Stress using longitudinal methodology. Moreover, it examined the impact of the feeling of safety due to vaccination on the other study variables.

Similarly to other pandemics and infectious diseases, the COVID-19 pandemic has had a significant impact on the psychological health of the population. Restrictive measures, detrimental changes in daily habits, and the fear of contamination, associated with health anxiety, can be considered as traumatic experiences, that cause

negative feelings affecting the psychological health, especially of those who have been contaminated.<sup>35,36</sup> Also, prevention campaigns focused on thorough cleaning, while helpful in reducing infection, are likely to result in OC symptomatology.<sup>9</sup>

Regarding pandemic stressors during 2022, we found a significant decrease in the sum of negative emotions due to the pandemic and in the fear of contamination compared with the beginning of the pandemic. This is in agreement with longitudinal studies, which showed a decrease in worry about COVID-19,<sup>37</sup> loneliness,<sup>38</sup> and fear of contamination<sup>39</sup> during the later phases of the pandemic. However, the degree of job insecurity was significantly higher. Furthermore, media information about COVID-19 was less frequently sought, and there was lower confidence in this information.

Participants who had been contaminated reported a significantly higher degree of negative emotions (i.e., helplessness and disappointment), in comparison with the total sample. Likewise, an Iranian study on patients who had recovered from COVID-19 showed that they had significant negative feelings (i.e., fear, hopelessness, and despair),<sup>40</sup> perhaps due to the persistent effects on psychological health that COVID-19 patients experienced, especially regarding depressive mood.<sup>41,42</sup>

Comparing the questionnaire variables between the two phases of the pandemic, we observed a reduction in hypochondriacal and OC symptomatology, similar to an Italian study.<sup>43</sup> No changes in the QoL, except in the domain of Environment where lower scores were reported in the second study, probably due to the persistent effects of the pandemic on Environmental dimensions. Indeed, the deteriorating economic sit-

**Table 6.** Multiple linear regression analysis with DOCS total score as dependent variable and the sociodemographic characteristics, the stressors related to COVID-19, the DASS-21 and the BVS as independent variables.

	Sequence of variables entered in the model	$\Delta R^2$	B	SE	$\beta$	t	p
Dependent: DOCS total score F (6,122)=35.00 ; R <sup>2</sup> =0.61; p<.001; F <sup>2</sup> =1.56							
BVS Average amount of time spent attending to bodily sensations	1	.43	0.67	0.12	0.40	5.68	<0.001
DASS-21 Anxiety	6	.01	0.15	0.07	0.15	2.09	0.039
Age	4	.03	0.04	0.01	0.15	2.63	0.010
Gender (men versus women)	5	.01	-1.19	0.50	-0.13	-2.38	0.019
Fear of contamination	2	.09	0.89	0.28	0.20	3.13	0.002
Extent of negative feelings due to COVID-19	3	.04	1.00	0.26	0.25	3.88	<0.001

Note: B is unadjusted regression coefficient; SE in Standard Error and  $\beta$  is standardized regression coefficient



uation, the limited opportunities for recreation, and even the limited availability of and access to health and social welfare services (dimensions that refer to the WHOQOL-BREF Environment domain) during the pandemic phases, probably contributed to the QoL remaining low. Due to the limited number of international longitudinal studies and the fact that not all such studies used the same comparison time frames, it is challenging and potentially unreliable methodologically to compare our findings (in reference to changes in psychopathology and QoL) to other similar research studies. However, other studies in the United States,<sup>26</sup> Italy,<sup>43</sup> and Poland<sup>44</sup> also indicated that aspects of QoL, like sociability, physical activity, and physical health showed no significant differences across different stages of the pandemic.

For the participants who had fallen ill, a significant decrease in QoL was observed, not only in the environmental domain but also in the Physical and Psychological health domains. Likewise, other researchers showed that patients who had recovered from COVID-19 tended to score lower in QoL not only compared with their level of wellbeing before infection,<sup>45</sup> but also with QoL scores in the general population.<sup>46</sup>

Additional analysis of the factors that affected the above changes between the two periods showed that participants suffering from psychiatric disorders exhibited a significant decline in the QoL Environment domain. Those who felt safe being vaccinated showed lower hypochondriacal and OC symptomatology in the second administration. In addition, concerning Depression-Anxiety-Stress no significant changes were observed. This is consistent with the results of another Greek study<sup>47</sup> indicating that the levels of Depression and Anxiety remained unchanged one year after the outbreak of the pandemic. However, another longitudinal study in Greece<sup>48</sup> indicated that perceived stress was significantly increased between the first and second lockdown periods in Greece (March 2020/December 2020). The difference in the results of this study compared to our study may be due to the different times of the second administration.

Regression analysis showed that Depression-Anxiety-Stress were the factors that were found to be independently negatively associated with all QoL variables. Also, hypochondriacal symptomatology was independently/negatively associated with Physical health and Social relationships domains. Older people showed lower levels of overall QoL/General Health, and participants with lower education levels exhibited lower scores of QoL in the Psychological Health

and Social relationship's domains. This finding is similar to a German study in which older people tended to report lower scores of QoL, especially in the second phase of COVID-19.<sup>49</sup> Finally, men reported lower levels of QoL in the Social relationship's domain. These results are consistent with our previous study indicating that men, older people, and those with high levels of Depression-Anxiety-Stress reported lower levels in the QoL domains.<sup>27</sup> Other studies have also shown that Depression, Anxiety, and Stress were negatively associated with life satisfaction during subsequent waves of the pandemic.<sup>50,51</sup>

Finally, Anxiety and Time spent attending to bodily sensations were the predominant factors that independently positively correlated with OC symptomatology. Other studies revealed similar findings.<sup>52-54</sup> Older people and women showed higher levels of OC symptomatology in accordance<sup>55</sup> with or in contrast<sup>56</sup> to other studies. Concerning age, and in alignment with the results of this study, a research study in Canada showed that it is more likely for people over 60 years old to develop OC symptomatology.<sup>57</sup> Fear of contamination and negative emotions due to COVID-19 were positively correlated with and predicted OC symptomatology, in line with an Italian study.<sup>3</sup>

A limitation of the present study is the potential for self-selected samples about consenting to participate in the second administration. Also, although a limited number of people agreed to participate in this study, similarities in demographic characteristics have been observed between the two samples, such as mean age (current study: 48.6 years/original research: 47.8 years), mean duration of education (current study: 15.4 years/ original research: 15.0 years), etc.<sup>27</sup> A positive aspect is the longitudinal design of the research.

Taking into consideration the findings of this and other related studies, psychoeducational preventive interventions for the general population as well as targeted psychotherapeutic interventions should be implemented for vulnerable groups, such as those who have become ill with the virus, so that they can cope with the serious effects on their mental health and QoL. According to Christodoulou et al<sup>58</sup> the COVID-19 pandemic represents a genuine disaster, a paradigmatic biological one, and as such we have to adjust our lives and cope with its threat.

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## Ερευνητική εργασία

# Ποιότητα ζωής και ψυχοπαθολογία σε διαφορετικές περιόδους της πανδημίας COVID-19: Μια διαχρονική μελέτη

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**ΙΣΤΟΡΙΚΟ ΑΡΘΡΟΥ:** Παραλήφθηκε 3 Σεπτεμβρίου 2023/Αναθεωρήθηκε 9 Δεκεμβρίου 2023/Δημοσιεύθηκε Διαδικτυακά 29 Μαΐου 2024

### ΠΕΡΙΛΗΨΗ

Σκοπός της διαχρονικής αυτής μελέτης ήταν η διερεύνηση της επίδρασης της πανδημίας COVID-19 στην ψυχική υγεία και στην ποιότητα ζωής (ΠΖ) του γενικού πληθυσμού στην Αττική, κατά το τρίτο έτος της πανδημίας (2022) και η σύγκριση των αποτελεσμάτων με τα ευρήματα έρευνας που διεξήχθη κατά το πρώτο έτος (2020). Το δείγμα αποτέλεσαν 130 άτομα και η μελέτη πραγματοποιήθηκε με τηλεφωνικές συνεντεύξεις. Τα ερωτηματολόγια που χρησιμοποιήθηκαν ήταν: το Ερωτηματολόγιο ΠΖ του Παγκόσμιου Οργανισμού Υγείας, το Ερωτηματολόγιο Κατάθλιψης/Άγχους/Στρες, η Κλίμακα Εστίασης της Προσοχής σε Σωματικά Συμπτώματα, η Κλίμακα Ιδεοψυχαναγκαστικής Συμπτωματολογίας και δελτίο κοινωνικοδημογραφικών χαρακτηριστικών/ερωτήσεων σχετικών με τους στρεσογόνους παράγοντες της πανδημίας. Τα αποτελέσματα της μελέτης ήταν τα εξής: (1) Αναφορικά με τη σύγκριση των μεταβλητών μεταξύ του πρώτου και του τρίτου έτους της πανδημίας στο συνολικό δείγμα, παρατηρήθηκαν τα ακόλουθα: (α) σημαντική μείωση των αρνητικών συναισθημάτων εξαιτίας της πανδημίας, κατά το τρίτο έτος, (β) η ιδεοψυχαναγκαστική και η υποχονδριακή συμπτωματολογία μειώθηκαν σημαντικά και το αίσθημα ασφάλειας εξαιτίας του εμβολιασμού είχε στατιστικά σημαντική επίδραση στη μείωση, (γ) ο βαθμός ανασφάλειας για εργασιακά θέματα επιδεινώθηκε, (δ) η ΠΖ παρέμεινε σε χαμηλά επίπεδα και επιδεινώθηκε στην ενότητα του Περιβάλλοντος, (ε) δεν εντοπίστηκαν μεταβολές στην Κατάθλιψη και στο Στρες. (2) Σχετικά με τους συμμετέχοντες που είχαν μολυνθεί από τον ιό παρατηρήθηκαν: (α) αύξηση στα αρνητικά συναισθήματα κατά το τρίτο έτος της πανδημίας, (β) μείωση της ΠΖ στις ενότητες: Σωματική, Ψυχολογική Υγεία και Περιβάλλον, (γ) μείωση της ιδεοψυχαναγκαστικής συμπτωματολογίας. (3) Η Κατάθλιψη, το Άγχος, η υποχονδριακή συμπτωματολογία και ο φόβος μόλυνσης από τον ιό είναι οι παράγοντες που βρέθηκε να συσχετίζονται αρνητικά με διαστάσεις της ΠΖ (εξαρτημένες μεταβλητές). (4) Ο εμβολιασμός βρέθηκε να συμβάλει σε υψηλά επίπεδα ΠΖ στην ενότητα Περιβάλλον. (5) Το Άγχος, η υποχονδριακή συμπτωματολογία, ο φόβος μόλυνσης από τον ιό και τα αρνητικά συναισθήματα εξαιτίας της πανδημίας ήταν οι παράγοντες που επέδρασαν αρνητικά στην ιδεοψυχαναγκαστική συμπτωματολογία. (6) Οι ευάλωτες ομάδες όσον αφορά την ΠΖ και την ψυχική υγεία ήταν οι ηλικιωμένοι, οι άνδρες και τα άτομα με χαμηλό μορφωτικό επίπεδο. Εν κατακλείδι, κατά το τρίτο έτος της πανδημίας, οι ψυχοκοινωνικές επιπτώσεις αυτής επέμειναν ιδιαίτερα για τα άτομα που νόσησαν. Επομένως, στοχευμένες ψυχοθεραπευτικές παρεμβάσεις ενδείκνυται να εφαρμοστούν ειδικά για όσους μολύνθηκαν από τον ιό.

**ΛΕΞΕΙΣ ΕΥΡΕΤΗΡΙΟΥ:** Στρεσογόνοι παράγοντες COVID-19, ποιότητα ζωής, κατάθλιψη, άγχος, ιδεοψυχαναγκαστική συμπτωματολογία, εστίαση στα σωματικά συμπτώματα.