Impact of the COVID-19 pandemic on mental health among Greek adults: a cross-sectional survey.
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Abstract

The COVID-19 virus characterised as a pandemic in 2020 at its outbreak around the world has been recorded to have severe effects on the global health and mental health. The current research is accomplished during the first period of the restrictive measures in Greece March – April 2020 and is aiming to evaluate the COVID-19 effect on mental health of the population. The STAI and DASS-21 questionnaires have been used in order to accomplish the aims of the study. The results (n = 527) show a moderate level on mental health status of the sample STAI-S: 45.8, STAI-T: 40.7, Depression: 4.6, Anxiety: 3.1 and Stress: 6.1. The research shows that women, younger respondents, lower income households and those living on smaller houses suffer from increased depression, anxiety and stress. Additionally, factors of the daily habits within the period of COVID-19 such as mask, gloves and use of antiseptic can drastically decrease illnesses of mental health. Such findings can be used from the Greek State in order to reduce the effects of COVID-19 in mental health of the population and protect the socially vulnerable groups.

NOTE: This preprint reports new research that has not been certified by peer review and should not be used to guide clinical practice.
Introduction

The coronavirus disease (COVID-19) was first reported and confirmed in Wuhan (Hubei Province, China) in late December 2019 and from then it began to spread first in China, and soon throughout all over the world. The World Health Organization (WHO) declared the COVID-19 outbreak as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020 and characterized it as a pandemic on March 11, 2020. The coronavirus pandemic detected in Greece on February 26, 2020. The Government took instant measures of decongestion of the public such as the cancelation of the upcoming carnival events that compose a period of extreme crowding in many cities. In the following days, the Greek authorities imposed restrictive measures regionally and on March 23, 2020 a national lockdown was imposed as soon as the number of positive COVID-19 cases and the number of deaths started to increase. Due to the high transmissibility, Lockdown was an option for the most European countries in an effort to contain the COVID-19 outbreak. The restrictive measures disrupted social and occupational life, education, transportation and traveling, and other aspects of daily life. Moreover, restrictive measures and isolation have negative psychological effects such as confusion, anger and posttraumatic distress [1,2].

Infectious diseases, such as severe acute respiratory syndrome (SARS) [3–5], the new influenza A (HIN1) epidemic [6–8], the Middle East Respiratory Syndrome (MERS) [9,10] and Ebola virus disease (EVD) [11] have become one of the major threats to global public health recent years with impact in both physical and mental health. Epidemic diseases that are globally spread rapidly are characterized as pandemic. Pandemics usually compose a public health emergency situation that affects the community’s normal functioning. Anxiety, stress, depression and post-traumatic stress are some of the psychological problems that humans can experiences through these outbreaks [3,7,10,11].

The reported symptoms of COVID-19 are primarily respiratory. Although most patients present with mild symptoms, in some cases the disease progresses to viral pneumonia,
which in severe cases can lead to acute respiratory failure and to death. The limited knowledge of the COVID-19, the overwhelming news, the increasing number of patients, suspected cases and deaths lead to anxiety and fear in the public [12,13]. In confirmed or suspected cases of COVID-19 except from the physical suffering, the patient may experience anxiety and fear due to the high contagiousness and the serious consequences of the disease [14,15]. Moreover, under restrictive measures they may also experience boredom, disappointment, irritability loneliness, denial, and depression. [1,15]. Researches in China and Turkey showed that lockdown during the COVID-19 epidemic affects the general population with the present of anxiety and depression [16–18].

Health professionals and affiliated healthcare workers in Greece and worldwide are in the frontline on the fight against COVID-19 pandemic and they are under both physical and psychological pressure [19,20]. An impact on the mental health status of university students in Greece has already been documented and shows increased anxiety and depression [21,22]. Moreover, COVID-19 pandemic and the lockdown measures had also adverse mental health impact on children and adolescents in Greece [2]. During nationwide lockdown, anxiety and depression had increased for the already stressed last year senior high school students preparing for the upcoming Panhellenic university entrance exams [23]. Patients with chronic disease have increased distress and somatization during quarantine in Greece [24].

COVID-19 outbreak and the restrictive measures raising concerns of the adverse effects, although literature that focus on the impact of the COVID-19 outbreak on mental health has not been systematically studied. The aim of the study was to investigate the effect of COVID-19 outbreak to the public mental health in Greece, during the period of the lockdown.

Methods

The study designed on April 2020 and accomplished in May 2020. The study uses quantitative methods of primary research. The procedure of the study was the online survey since from March to May 2020 the Greek State has issued laws, provisions and
Ministerial decisions that set traffic and circulation restrictions of the population. Furthermore, during this period, the university institutions’ operation has been suspended and personal contacts were limited. Therefore, in the need of conducting the research at the period of the lock-down, the online distribution of the questionnaire has been used. The research conducted from May 2 to May 5, while the restrictive measures were still in charge. The final sample is consisted of 527 respondents who answered the questionnaire in more than six (00:06) and less than forty (00:40) minutes.

The questionnaire is divided into six sections of issues that the respondents are up to answer. The first section is about the demographics of the sample where the respondents are answering fourteen (14) questions: gender, age group, type of place of living, education level, citizenship, work status, if they are health professionals, if they own a type A of movement document, income level, family status, dependent members in family and m^2 of house/flat. These questions will be used as control variables in our research.

The second section of the questionnaire is about the medical history and habits of the sample. Thirteen (13) different illnesses – health status are listed where the respondents mark if they suffer from them (General medical record, Diabetes, Hypertension, Increased Cholesterol levels, Stroke, Lung diseases, Asthma, Cancer, Autoimmune illnesses, Transplant history, Immunosuppression, no problem – being healthy). Moreover, the sample is reporting the use of cigarettes, alcohol, caffeine and exercise, habits that are connected with stress, anxiety and depression among the relevant literature.

The third section contains three questions concerning the knowledge about the transmission and their personal protection measures against the covid19, in order to assess the level of medical and epidemiological knowledge of the respondents (report the most vulnerable subgroups, the ways of transmission and ways of protection). The fourth section of the questionnaire is dedicated to the symptoms, the reactions and the health status of the sample during the period of the wide spread of covid19 and the lock down period, from February to May 2020. The sample answers if from February 2020 has presented one or more symptoms that are related to covid19, among relevant literature.
and medical sources (fever 37o C and above, Cough, Headache, Runny nose, Sore throat, Shortness of breath, Pain in joints and muscles, felt tired, Immune, Tasteleness, Gastrointestinal disorders and if they were full healthy), what they did with the above-mentioned symptoms and state their future decisions in case they will present suspicious symptoms related with the covid19.

The fifth section of the questionnaire is concerning the Greek authorities, their decisions and the respondents’ agreement to the policies that implied in Greece from February 2020. The section contains three questions where the sample is called to report its agreement to the restrictive measures, its satisfaction from authorities and its main sources of information. The final section is scheduled to measure mental health status of the respondents. Stress on work environment measured using STAI questionnaire (State-Trait Anxiety Inventory), introduced by Spielberger [25]. This part of the questionnaire consists of 40 statements to which the respondent is asked to answer. Through them, we examine transient and permanent stress, measuring the employee's emotional state at the time of completing the questionnaire and how they generally feel. The evaluation is reported in a 4 items scale, at the first 20 questions (transient stress) the answers range from "Not at all" to "Too much" while for the next 20 questions (permanent stress) the answers range from "Almost never" to "Almost always.". Furthermore, the research also uses the Depression Anxiety and Stress scale (DASS-21) [26] in order to measure these illnesses on the respondents. The questions are answered in a 4 items Likert scale where range varies from 0 – “does not apply for me” to 3- “does apply for me very much, most of the times”. The STAI and DAS-21 research tools have previously used in research related to the COVID-19 pandemic [27–32].
Results

General beliefs about COVID-19
As seen on table 1, the most perceived vulnerable groups are the people with health problems and elderly people, while the least vulnerable are children and teenagers. The sample mostly believes that the virus is spread easier from “the drops from the mouth and nose when someone coughs or sneezes” and least from mosquitos or other insect bites.

| Vulnerability                  | Question          | Statement                  | N   | Mean | Std. Deviation |
|-------------------------------|-------------------|----------------------------|-----|------|---------------|
| Children                      | Children          | 511                        | 3.62| 0.900|
| Teenagers                     | Teenagers         | 506                        | 3.50| 0.776|
| Elderly people                | Elderly people    | 520                        | 1.38| 0.637|
| People with health problems   | People with health problems | 525 | 1.28 | 0.556 |
| Pregnant women                | Pregnant women    | 516                        | 2.68| 0.961|
| Mosquitos or other insect bites| Mosquitos or other insect bites | 511 | 4.72 | 0.726 |
| Sexual contacts               | Sexual contacts   | 513                        | 3.25| 1.560|
| Infected animals              | Infected animals  | 506                        | 4.01| 1.245|
| Contaminated objects          | Contaminated objects | 521 | 2.10 | 1.016 |
| Drops from the mouth and nose when | Drops from the mouth and nose when | 526 | 1.15 | 0.481 |
| Unhealthy cooking or poor cooking | Unhealthy cooking or poor cooking | 509 | 3.74 | 1.333 |
| Raw vegetables - fruits       | Raw vegetables - fruits | 514 | 3.78 | 1.212 |

General habits of the population
Table 2 results show that the daily practices of sample were mostly the covering of the mouth in case of cough / sneeze, washing hands with soap and water, and washing hands after contacting contaminated objects. An interesting finding is the habits that the respondents do less are wearing gloves and masks.

| Way of transmission                  | Statement                                           | N   | Mean | Std. Deviation |
|--------------------------------------|-----------------------------------------------------|-----|------|---------------|
| Cover my mouth when you cough or sneeze | Cover my mouth when you cough or sneeze | 525 | 1.11 | 0.382 |
| Avoid sharing utensils               | Avoid sharing utensils                               | 518 | 1.93 | 1.115 |
| Wash your hands with soap and water | Wash your hands with soap and water                  | 522 | 1.20 | 0.467 |
| Wash hands immediately after coughing, sneezing, or wiping nose. | Wash hands immediately after coughing, sneezing, or wiping nose. | 524 | 2.00 | 1.059 |
| Wash hands after contact with contaminated objects | Wash hands after contact with contaminated objects | 525 | 1.31 | 0.674 |
| Wash the products you buy            | Wash the products you buy                            | 522 | 2.36 | 1.329 |
| You used a hand antiseptic           | You used a hand antiseptic                           | 522 | 1.88 | 1.009 |
Wear a face mask when you go out regardless of the presence or absence of symptoms

Wear gloves when going out regardless symptoms

The 47.4% declared having no symptoms related to COVID-19 from period of February to May 2020. The most common indication of illness among the sample was the headaches that 26.8% of the respondents declare having (Table 3). The 37.2% of the sample declared that had done nothing from the above, taking no action against these symptoms and 9.3% reported that addressed to a doctor by phone. The 75.3% declared being health and the group that had some symptoms of the COVID-19 was the 22% of the sample.

| Table 3 – COVID-19 symptoms |
|-----------------------------|
| Statement                  | N   | Mean |
| ___________________________ | _____| _____|
| Fever 37°C and above        | 67   | 12.7% |
| Cough                      | 85   | 16.1% |
| Headache                   | 150  | 28.5% |
| Runny noise                | 116  | 22%   |
| Sore throat                | 102  | 19.4% |
| Shortness of breath        | 29   | 5.5%  |
| Pain in joints and muscles | 51   | 9.7%  |
| Feeling tired              | 95   | 18%   |
| Immune                     | 12   | 2.3%  |
| Tastelness                 | 13   | 2.5%  |
| Gastrointestinal disorders | 50   | 9.5%  |
| None of the above           | 246  | 46.7% |

| Table 4 – Reaction on COVID-19 symptoms |
|----------------------------------------|
| Statement                            | N   | Percent |
| To a private doctor (family or other) by phone | 49   | 16.8% |
| To a private doctor (family or other) with a visit | 23   | 7.9% |
| In a private hospital                 | 1    | 0.4%   |
| In a public hospital                  | 8    | 2.7%   |
| By phone at NPHO (1135)               | 7    | 2.4%   |
| I made a SARS-COV-2 test              | 8    | 2.7%   |
| Nothing from the above                | 196  | 67.1%  |

| Table 5 – Health status |
|-------------------------|
| Statement               | N   | Percent |
| Full healthy            | 397 | 75.3% |
According to the mean scores of the following table, the sample is recording more positive opinions for calling doctors by phone and calling the National Public Health Organization than other options. The least positive opinion is recorded about going to a private hospital.

**Table 6 – Reaction on potential COVID-19 symptoms**

| Statement                                      | N   | Mean | Std. Deviation |
|------------------------------------------------|-----|------|----------------|
| To a private doctor (family or other) by phone | 509 | 1.96 | 1.27           |
| To a private doctor (family or other) with a visit | 499 | 3.19 | 1.32           |
| In a private hospital                          | 492 | 4.21 | 1.02           |
| In a public hospital                           | 499 | 3.02 | 1.40           |
| To a pharmacist                                | 490 | 3.91 | 1.22           |
| By phone at NPHO (1135)                        | 507 | 2.63 | 1.44           |
| In a family and friendly environment           | 499 | 3.25 | 1.59           |
| To anyone / I will deal with it alone          | 494 | 4.14 | 1.17           |

As table 7 shows, the most popular mean of information was the doctors’ advice and the daily briefing at 18.00 that was accomplished by the Civil Protection, the National Public Health Organization and information through the Internet websites.

**Table 7 – Frequency of using sources of information about COVID-19.**

| Source of Information          | N   | Mean | Std. Deviation |
|--------------------------------|-----|------|----------------|
| Newspapers and magazines      | 519 | 3.43 | 1.123          |
| The news on TV                | 517 | 3.56 | 1.213          |
| Online information (websites) | 519 | 2.66 | 1.021          |
| Social media (e.g. Facebook)  | 520 | 3.62 | 1.070          |
| Daily government briefing at 6 p.m. | 523 | 2.65 | 1.320          |
| Advice from Doctors           | 522 | 2.01 | 0.895          |
| Tips from family / friends    | 516 | 3.89 | 0.964          |

Public satisfaction
The sample reports highest level of agreement to the cancellation of the carnival events and the restrictive measure in churches. The higher satisfaction levels are reported for the response of the National Health System and the responsibility in the peoples’ behavior. The lowest satisfaction levels are reported for the University reactivity in applying the restrictive measures within their daily life.

**Table 8 – Agreement in specific decisions**

| Statement                                        | N  | Mean | Std. Deviation |
|--------------------------------------------------|----|------|----------------|
| General circulation ban                          | 522| 2.55 | 1.336          |
| Enhanced bans on circulation on the Easter period| 523| 2.11 | 1.303          |
| Closing of public spaces                         | 523| 2.24 | 1.318          |
| Cancellation of carnival events                  | 524| 1.75 | 1.116          |
| Restrictive measures in churches                 | 524| 1.75 | 1.158          |

**Table 9 – Satisfaction**

| Statement                                                      | N  | Mean | Std. Deviation |
|----------------------------------------------------------------|----|------|----------------|
| Response of the National Health System                       | 521| 2.31 | 1.128          |
| Daily briefing at 18.00 from Government                       | 520| 2.58 | 1.324          |
| University reactivity (distance learning platforms)           | 515| 2.75 | 1.158          |
| Remote working and work from home system                     | 513| 2.67 | 1.172          |
| Government readiness regarding the scope of measures taken    | 520| 2.70 | 1.268          |
| Responsibility of peoples’ behavior                          | 520| 2.42 | 0.938          |

**Anxiety, Stress and Depression**

Measuring the Depression, Anxiety and Stress levels, Table 10 shows moderate level of mental health status. Normality tests performed and showed that all the six scales do now follow the normal distribution. Reliability analysis performed and the Cronbach’s alpha scores were higher than 0.8 for the DAS-21 scales and higher than 0.9 for the STAI scales. The table 11 presents high and significant (α = 99%) correlation levels between variables.

**Table 10 – Anxiety, Stress and Depression**

| STATE   | N    | Min | Max  | Mean     | Std. Deviation |
|---------|------|-----|------|----------|----------------|
| STATE   | 511  | 2.00| 77.00| 45.8552  | 12.53679       |
| TRAIT   | 510  | 1.00| 75.00| 40.7471  | 10.41651       |
| TOTAL   | 510  | 5.00| 151.00| 86.6333  | 20.46668       |
| Depression | 496 | 0.00| 21.00| 4.6472   | 4.42793        |
| Anxiety | 495  | 0.00| 21.00| 3.1192   | 3.71831        |
| Stress  | 495  | 0.00| 21.00| 6.0848   | 4.66150        |
Table 11 – Correlation between scales

|       | State | Trait   | Total   | Depression | Anxiety | Stress |
|-------|-------|---------|---------|------------|---------|--------|
| State | 1     | 0.567** | 0.909** | 0.517**    | 0.487** | 0.604**|
| Trait |       | 1       | 0.849** | 0.623**    | 0.592** | 0.591**|
| Total |       |         | 1       | 0.638**    | 0.602** | 0.672**|
| Depression |       |         |         | 1          | 0.686** | 0.791**|
| Anxiety |       |         |         |            | 1       | 0.723**|
| Stress  |       |         |         |            |         | 1      |

Depression, Anxiety and Stress non-related with COVID-19.

Demographics and medical history were tested in order to report their relations with mental health. The results (table 12) indicate that women present significantly higher mean scores on stress, depression and anxiety, the 18-24 years old group (the younger sample group) presents significantly higher mean scores on anxiety and stress and the group that works at the private sector present higher stress levels. Moreover, people with two dependent members in their family have significantly higher trait stress and depression than the other groups of the sample. Furthermore, the sub-groups with income up to 500 euros and living at an apartment up to 50m² present significantly higher anxiety symptoms. As for the medical history, results indicate that the mental health issue are presented significantly higher in only four cases: people with asthma had higher state anxiety, people with cancer had higher trait anxiety, people with immunosuppression had higher anxiety and people with hypertension had lower stress.
| Table 12 - Association between demographics and the mental health status | State anxiety | Trait Anxiety | Total Anxiety | Depression | Anxiety | Stress |
|-----------------------------|---------------|---------------|---------------|------------|---------|--------|
| Gender                      |               |               |               |            |         |        |
| Male                        | -2.16         | -1.73         | -1.06         | -1.03      | -3.07   | -1.53  |
| Female                      |               |               |               |            |         |        |
| Age group                    |               |               |               |            |         |        |
| 18-24                       | 7.02          | 2.03*         | 6.16          | 2.16*      | 11.33   | 2.03*  |
| 25-34                       | 4.67          | 1.76          | 6.05          | 2.78*      | 9.04    | 2.12*  |
| 35-44                       | 1.74          | 0.73          | 4.55          | 2.34*      | 4.51    | 1.19   |
| 45-54                       | 0.34          | 0.15          | 1.29          | 0.67       | 0.72    | 0.19   |
| 55+                         |               |               |               |            |         |        |
| Living at                   |               |               |               |            |         |        |
| City                        | -2.21         | -0.86         | -1.68         | -0.81      | -3.05   | -0.75  |
| Town                        | -2.28         | -0.79         | -2.38         | -1.01      | -4.86   | -1.05  |
| Village                     |               |               |               |            |         |        |
| Education                   |               |               |               |            |         |        |
| High-School                 | -2.66         | -1.37         | 0.68          | 0.43       | -1.89   | -0.60  |
| Institute                   | -2.46         | -1.02         | -0.2          | -0.11      | -2.00   | -0.53  |
| BSc                         | -1.90         | -1.25         | -0.496        | -0.40      | -1.98   | -0.82  |
| MSc / PhD                   |               |               |               |            |         |        |
| Citizenship                 |               |               |               |            |         |        |
| Greek                       | -2.20         | -0.46         | 3.32          | 0.84       | 1.69    | 0.22   |
| Non-Greek                   |               |               |               |            |         |        |
| Working at                  |               |               |               |            |         |        |
| Public Sector               | 3.28          | 1.08          | 0.21          | 0.08       | 3.88    | 0.79   |
| Private Sector              | 0.81          | 0.30          | 0.40          | 0.18       | 2.88    | 0.67   |
| Freelancer                  | 0.022         | 0.08          | -0.24         | -0.10      | 3.18    | 0.71   |
| Retired                     | -1.26         | -0.33         | -2.144        | -0.69      | -4.17   | -0.68  |
| Unemployed                  | -0.66         | -0.23         | 1.12          | 0.48       | 1.78    | 0.38   |
| Student                     |               |               |               |            |         |        |
| Health professional         |               |               |               |            |         |        |
| Health worker               | 0.53          | 0.30          | 0.56          | 0.39       | 0.95    | 0.34   |
| Non-health                  |               |               |               |            |         |        |
| Moving with document        |               |               |               |            |         |        |
| Type A                      | -1.18         | -0.83         | -0.83         | -0.71      | -2.88   | -1.26  |
| Non-Type A                  |               |               |               |            |         |        |
| Income                      |               |               |               |            |         |        |
| No income                   | 3.37          | 1.50          | 1.23          | 0.67       | 6.39    | 1.79   |
| Up to 500                   | 5.64          | 2.41*         | 4.33          | 2.26*      | 11.20   | 3 **  |
| Up to 800                   | 4.51          | 2.26*         | 1.62          | 0.99       | 7.44    | 2.32*  |
| Up to 1000                  | 0.39          | 0.23          | 0.32          | 0.23       | 1.15    | 0.41   |
| Over 1000                   |               |               |               |            |         |        |
| Living status               |               |               |               |            |         |        |
| Married                     | 1.34          | 0.29          | -3.81         | -1.01      | -2.62   | -0.35  |
| Unmarried                   | -1.95         | -0.40         | -5.39         | -1.34      | -7.00   | -0.89  |
| Divorced                    | 1.8           | 0.36          | -2.75         | -0.66      | -0.63   | -0.08  |
| Widowed                     |               |               |               |            |         |        |
| Dependent members           |               |               |               |            |         |        |
| 0 members                   | -1.83         | -0.65         | 0.48          | 0.21       | -2.18   | -0.48  |
| 1 member                    | -1.58         | -0.57         | -0.10         | 0.04       | -1.85   | -0.41  |
| 2 members                   | -1.11         | -0.41         | -1.77         | -0.79      | -2.96   | -0.67  |
| 3+ members                  |               |               |               |            |         |        |
| m² of house                 |               |               |               |            |         |        |
| Up to 50                     | -0.90         | -0.49         | 1.55          | 1.04*      | 1.58    | 0.54*  |
| 50 - 100                    | -0.59         | -0.43         | -0.33         | -0.30      | -0.20   | -0.09  |
| Over 100                    |               |               |               |            |         |        |

The sample was completed of 527 respondents. *p < 0.05, **p < 0.01.
Depression, Anxiety and Stress related with COVID-19.

The effect of different protection ways during the spread of COVID-19 on the three stress, depression and anxiety levels are reported on Table 11. The correlations indicate that there is a significant decrease on anxiety levels with the use of mask (trait anxiety, total anxiety and anxiety), with the use of antiseptic (state anxiety and anxiety) and with the use of gloves (anxiety). People who use more antiseptic, wearing masks and gloves more often, tend having lower levels of anxiety. Moreover, a significant higher depression levels are evaluated as the people share more often their utensils. The following table summarizes the correlations that come up in a statistically significant level.

|             | Cover mouth on Sneeze | Sharing utensils | Hand washing | Washing after cough | Washing after contaminated products washing | Antiseptic | Mask | Gloves |
|-------------|-----------------------|-----------------|--------------|---------------------|---------------------------------------------|------------|------|--------|
| State.anx   |                       | -0,09           |              |                     |                                             |            |      |        |
| Trait.anx   |                       | -0,08           |              |                     |                                             |            |      |        |
| Total.anx   |                       | -0,08           |              |                     |                                             |            |      |        |
| Depression  | 0,09                  |                 |              |                     |                                             |            |      |        |
| Anxiety     |                       |                 |              |                     |                                             | -0,11      | -0,15| -0,12  |
| Stress      |                       |                 |              |                     |                                             |            |      |        |

Furthermore, in order to evaluate the effect of COVID-19 potential symptoms on mental health levels, twelve symptoms – conditions were tested. The results (table 14) indicate those who presented each symptom had significantly higher levels of stress, depression and anxiety than those who did not. Specifically, people who had fever 37°C and above, cough, headache, runny nose, sore throat, pain in joints and muscles and felt tired had significantly higher mean scores of depression, stress and anxiety. Moreover, the sample who had gastrointestinal disorders and immune presented only higher levels of anxiety. Furthermore, the sample who had shortness of breath and tasteleness presented significantly higher mean scores of depression. The same time, the sample that declared to be healthy presented significantly lower mean scores for depression, stress, and anxiety.
|                     | State anxiety | Trait Anxiety | Total Anxiety | Depression | Anxiety | Stress |
|---------------------|---------------|---------------|---------------|------------|---------|--------|
|                     | B  | t  | B  | t  | B  | t  | B  | t  | B  | t  |
| Fever 37°C plus     |    |    |    |    |    |    |    |    |    |    |
| No                  | -4.76 | -2.9** | -3.75 | -2.75** | -8.48 | -3.17** | -1.5 | -2.54* | -9.94 | -2* | -1.54 | -2.47* |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Cough               |    |    |    |    |    |    |    |    |    |    |
| No                  | -0.86 | -0.57 | -1.86 | -1.49 | -2.68 | -1.09 | -1.05 | -1.97* | -1.1 | -2.6** | -1.26 | -2.24* |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Headache            |    |    |    |    |    |    |    |    |    |    |
| No                  | -4.96 | -4.1** | -4.1 | -4.07** | -9.03 | -4.58** | -2.3 | -5.35* | -1.45 | -3.97** | -2.19 | -4.83** |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Runny nose          |    |    |    |    |    |    |    |    |    |    |
| No                  | -3.02 | -2.2* | -2.87 | -2.6** | -5.86 | -2.69** | -1.8 | -3.74** | -1.22 | -3* | -1.97 | -3.91** |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Sore throat         |    |    |    |    |    |    |    |    |    |    |
| No                  | -4.85 | -3.5** | -3.62 | -3.12** | -8.43 | -3.71** | -1.63 | 3.27** | -1.41 | -3.37** | -1.84 | -3.49** |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Shortness of breath |    |    |    |    |    |    |    |    |    |    |
| No                  | -6.7 | -2.76** | -3.78 | -1.87 | -10.4 | -2.64** | -1.55 | -1.77 | -2.61 | -3.6** | -2.2 | -2.4* |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Pain in joints and muscles |    |    |    |    |    |    |    |    |    |    |
| No                  | -0.83 | -0.45 | -3.55 | -2.32* | -4.35 | -1.44 | -1.43 | -2.13* | -1.55 | -2.76** | -1.6 | -2.2* |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Feeling tired       |    |    |    |    |    |    |    |    |    |    |
| No                  | -3.72 | -2.61** | -4.86 | -4.15** | -8.55 | -3.7** | -2.38 | -4.76** | -2.2 | -5.23** | -2.64 | -5** |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Immune              |    |    |    |    |    |    |    |    |    |    |
| No                  | -1.85 | -0.5 | -2.82 | -0.93 | -4.64 | -0.77 | -1.05 | -0.81 | -3.38 | -3.13** | -1.87 | -1.38 |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Tasteleness         |    |    |    |    |    |    |    |    |    |    |
| No                  | -6.55 | -1.79 | -7.17 | -2.36* | -13.7 | -2.3* | -1.94 | 1.44 | -5.28 | -4.75** | -3.17 | -2.24* |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Gastrointestinal disorders |    |    |    |    |    |    |    |    |    |    |
| No                  | -4.57 | -2.46* | -3.43 | -2.22* | -7.97 | -2.63** | -2.11 | -3.2** | -2.68 | -4.89** | -1.97 | -2.82 |
| Yes                 |    |    |    |    |    |    |    |    |    |    |
| Full healthy        |    |    |    |    |    |    |    |    |    |    |
| No                  | 4.28 | 3.91** | 4.51 | 5** | 8.86 | 5** | 2.5 | 6.5** | 1.94 | 5.98** | 2.76 | 6.88** |
| Yes                 |    |    |    |    |    |    |    |    |    |    |

The sample was consisted of 527 respondents, *p < 0.05, **p < 0.01
Discussion

The results show that the sample shows sufficient level of knowledge about the virus in terms of vulnerability and transmission ways. The people with health problems and the elderly people face increased threat in case of coronavirus contamination. Recent studies and clinical data have shown that the mortality levels are increased for people 55+ and people who suffer from an underlying disease. The sample seems to be well informed about the ways that the virus is transmitted (table 1) and their most common practices is covering mouth when cough or sneeze and wash their hands with soap and water and the use of a face mask in public places.

The symptom-related findings at table 3-5 are showing that the sample did not perceive symptoms as serious threats. The majority of the sample (54,3%) reported that from February to May have presented one or more symptoms related to COVID-19 virus. However, the majority of them (67%) did nothing about the specific symptoms in terms of visiting or calling a doctor, hospitals, calling the NPHO or making a COVID-19 test. As result, the 75,3% of the sample considered themselves as totally healthy for the specific period as not facing any serious symptoms related to COVID-19. Consequently, and given the low diagnostic test numbers that has been conducted in Greece during this period we still not know the real number of people who were positive on COVID-19.

Considering the work anxiety levels (STAI), the sample reports a STAI-S score of 45,85 and a STAI-T score of 40,74. Relevant research have evaluated either higher [30] or lower [33] STAI-S and STAI-T scores. Our study reveals medium anxiety levels (STAI-S: 32,7% low, 54,2% moderate, 12,3% severe – STAI-T: 47,2% low, 47,9% moderate, 4,1% severe) in similar levels with the relevant literature. Moderate to severe levels are reported to the 66,5% (STAI-S) and 52% (STAI-T) of the respondents which is a respectively high percentage within the relevant literature [34].

Considering the rest of mental health illnesses (DASS-21) the levels of Depression was 4,65, Anxiety 3,12 and Stress 6,08. These results represent a lower level of mental health illnesses compared to various researches within the relevant literature in different places in the same research period: According to Odriozola-Gonzáleza et al. (2020) [35] the levels of Depression is 5,52, Anxiety 3,34 and Stress 6,81 in Spain. According to Wang et al., (2020) [29] there are significant differences between DASS-21 scores in Europe (Poland) and Asia (China) but these two cases are still higher than Greece (In China Depression:
According to Verma et al. (2020) [36] the level of Depression is 8,39, Anxiety 6,53 and Stress 8,83 in India. Although the above findings signify a higher level of mental health illnesses than our results, our sample has a relatively high score in severe and extremely severe das scales. The scores of the sample are classified in five categories: normal, mild, moderate, severe and extremely severe. The majority of our sample (60-65%) demonstrate normal DASS-21 levels, however these scores are relatively lower than the current literature. The mild and moderate levels are between 20-24% of the sample which is higher than the relevant literature. Finally, the severe and extremely severe levels are between 11,7-15% which is significantly higher than the relevant literature [27,28,32,37–39].

**Table 15 – Levels of mental health illnesses**

| Level / Mental health illness | Depression | Anxiety | Stress |
|------------------------------|------------|---------|--------|
| Normal                       | 60%        | 66,5%   | 64,8%  |
| Mild                         | 11,5%      | 13,1%   | 12,4%  |
| Moderate                     | 12,5%      | 6,7%    | 11,1%  |
| Severe                       | 10%        | 6,7%    | 9,3%   |
| Extremely Severe             | 5%         | 6,7%    | 2,4%   |

Stress, Anxiety and Depression are strongly connected. The results of the study suggest a high and significant correlation between variables at table 11: work stress, stress, anxiety and depression are highly linked. People who suffer from a mental health illness have increased potential to suffer from others too.

The research aimed to assess potential significant differences between sub-groups of the sample in order to evaluate the factors that have a significant role in mental health status. The results show that these factors are the gender, the age, the income level and the place of living size. The female subgroup has significantly higher Depression, Stress and Anxiety levels, younger respondents have significantly higher State and Trait Anxiety levels, low-income workers have significantly lower Anxiety, State and Trait Anxiety levels and sample that lives in a place less than 50m² has significantly higher Trait Anxiety scores. The findings are similar to the relevant literature within the period of the COVID-19 outbreak in Europe: the female subgroups are reported having a significantly higher anxiety, stress and depression level [18,38–46], Another group of increased Depression, Anxiety or Stress levels within the relevant literature is the younger sub-group [27,28,30,33,40,41,46] and our findings confirm this significant difference. A third factor that is
strongly linked with higher Depression, Anxiety or Stress levels is related with the income. Our findings support the relevant literature conclusions that low-income and unemployed people have higher levels of DASS during the current period [30,33,34,39,43,46]. Some researchers also point out the significantly decreased Depression, Anxiety or Stress levels on singles / unmarried groups [32,38,43] however our research does not evaluate significant differences within different family status sub-groups. Furthermore, our study did not reveal significant differences in Depression, Anxiety or Stress (normal, state or trait) levels between healthcare professionals and other community sample in contrast to relevant literature findings that state healthcare workers are suffering from higher Depression Anxiety and Stress levels [33,39,43].

The results of our research show that the link between some specific measures of protection and mental health illnesses is strong. The use of mask, antiseptic and gloves as way of protection found to be vital the mental health of the sample. The use of each of them decreases the levels of specific mental health illnesses. These results are supported from the current literature findings. Within the relevant literature, the mask and the gloves, as way of protection, are reported to generate significantly lower scores of mental health illnesses [27,28,38,46]. Moreover, people who wash their hands more often, specifically after coughing or sneezing, are reporting lower Depression, Anxiety or Stress levels [32,38,39,46].

Another significant finding is that the specific symptoms of COVID-19 can create serious mental health issues as people who suffered from the above-mentioned symptoms had a significantly higher level of Depression, Anxiety, Stress, State and Trait Anxiety (Table 14). The results of our research support the relevant literature findings that disclose a significant relation between mental health illnesses and symptoms of COVID-19: the people who had once or more symptoms related with COVID-19 had significant higher levels of Depression, Anxiety and Stress [27–29,32,38,39,46]. During the pandemic outbreak, the people who had any symptom of illness that can be related to COVID-19 symptoms suspected that were positive to the virus. The suspicion of being ill to a severe virus such as COVID-19 constitutes a Depression, Anxiety and Stress increase factor.

**Conclusions**

A prevalent finding is the intense effect of COVID-19 and the restrictive measures in the social environment in mental health of specific groups. Relevant literature findings and the current study results
show adverse mental health impact during the COVID-19 outbreak and the period of the lockdown. However, the impact on specific sub-groups is significantly higher: the females, the sample living in a limited house or flat (under 50m²), the low-income and the younger population experience increased levels of Depression, Anxiety and Stress.

Another conclusion is based on the results of DASS-21 and specifically on the mean scores and the percentages of severe and extremely severe mental health illnesses that are increased. That means that people who have these mental health issues experience them more intensively.

Lastly, the results suggest that there are factors with a moderating role at the relation between COVID-19 outbreak, restrictive measures and mental health status. Such factors are the use of a mask for protection in public places, use of gloves and antiseptic that are significantly decreasing the mental health illnesses such as Anxiety and Stress. The results of our study show that except from the commonly accepted medical significance (protecting from the spread), these factors have a mental health significance too.

Based on the above-mentioned results and the relevant findings of the current literature, the authorities have to focus on the most vulnerable groups and take specific measures for their medical and mental health status. The COVID-19 outbreak demands enactment of targeted care and reinforcing the public health of the population, focusing on every sub-group and specifically the most vulnerable, in contrast of taking just horizontal measures that affect commonly the whole population. The restrictive measures, specifically the strictest, the prolonged and the recurrent ones, might lead to serious mental health problems.

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