



STRESS, ANXIETY AND DEPRESSION AMONG RADIOGRAPHY STUDENTS DURING THE COVID-19 PANDEMIC

Radiology

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ABSTRACT

INTRODUCTION: This study aims to evaluate the psychological impact of COVID-19 emergency period on a sample of Radiography students.

METHODS: Levels of anxiety, stress, and depression were measured in a sample of 206 Greek Radiography students, using the DASS scale.

RESULTS: Radiography students reported moderate levels of stress anxiety and depression. The 27,7% for depression scale, 20,4% for anxiety and 15% stress found to have extremely severe levels. 48% of the sample declared dissatisfied and 16,1% very dissatisfied from the teaching method and 83% from our sample declared that prefer traditional classroom lesson. These perceptions of the students about the effectiveness of the distant educational method have significant differences in all subscales.

CONCLUSION: The impact of the Covid-19 pandemic on Radiography students' education and mental health are undeniable. Academics should discuss future strategies to address problems that arise.

KEYWORDS

covid-19, radiography students, DASS21

INTRODUCTION

On January 13, 2020, the World Health Organization (WHO) announced the first COVID-19 case outside China and recommended that health authorities should raise awareness to limit the spread of this novel disease [1,2]. From there for, the virus started spreading all over the world. On January 30, WHO declared COVID-19 a "Public Health Emergency of International Concern" [3]. The first confirmed case in Greece announced on February 26. In a very short period, and after the cases raising to 89, the Greek Government declared closure of all educational institutions on March 10 [4]. One year later, Greece is experiencing the biggest wave of the pandemic so far [5].

Besides the problems and challenges in the era of health, the COVID-19 pandemic has caused turmoil in society, economy and education [6]. In the field of education, Covid-19 is the greatest challenge that educational systems have ever faced. Governments have ordered institutions to switch almost overnight from face to face to online and virtual learning [7]. This rapid transformation is linked to various challenges for the institutions and the students [8].

Regardless the pandemic, mental health of university students is an area of increasing concern worldwide, as many studies have shown that this population has increased depression, anxiety and stress level [9], in light of challenges commonly associated with transitions to adulthood, economic difficulties and leaving family home [10]. The COVID-19 crisis has increased levels of anxiety, stress, depression, frustration and insomnia of the population in general [11-16] and of students in particular. A study from United States reported an increase of anxiety and stress levels to over 70% of the college students [17]. The first published study in Greece concerning the impact of lockdown and quarantine on University students' mental health, reported that there was an overall 'horizontal' increase for anxiety, depression and suicidal thoughts [18].

Studying from home, especially the earlier period when students are getting used to a new system might increase the feeling of advanced study obligations. Moreover, it requires greater self-discipline and motivation to follow through online lessons [6]. In Healthcare professions, in particular of Radiographers, there is growing concern. Radiography training institutions internationally had to cancel or postpone student clinical schedules. As Radiography is a hand-on profession, the removal of practical lessons and cancelling or shortening of clinical placements deliver huge blow to the learning procedure [19]. A study from universities of 12 countries showed that just under the half of the 1277 radiography students who respond, had been in clinical placement [20].

Although several studies have been conducted to medical or nursing students, to our knowledge, there are no published studies evaluating depression, anxiety and stress among Greek Radiography students during the coronavirus pandemic. This study aims to evaluate the psychological impact of COVID-19 emergency period on a sample of Radiography students and their perceptions about the distance learning.

MATERIALS AND METHOD

Participants

A cross-sectional study was adopted to evaluate levels of depression, anxiety and stress of radiography students during the COVID-19 pandemic. Participants completed an anonymous and voluntary questionnaire which was distributed and collected in the form of Google Form. The questionnaire was accessed from 1/4/2021 to 15/5/2021 and 206 Radiographer students of University of West Attica participated with a mean age 23,77 $\pm$ 5,092 (range 19 to 55 years). Each link included a brief text, detailing the nature of the study, for people to read before participation. Confidentiality and anonymity were ensured. All participants informed consent.

The questionnaire

The survey was in a multiple-choice format and the average completion time for the questionnaire was 5 minutes. The first section covered basic demographic data. The second section included questions for the perceptions of their health status and of the covid-19 (ex. are you afraid of covid? how is your health condition?). In the third part the responder had to answer two major questions about students' perception and experience of the e-learning educational program.

The last section consisted of the Depression, Anxiety and Stress Scale (DASS21), a 21-item shortened version of DASS42. The DASS is a self-administrated questionnaire and is in the public domain. It measures three related negative emotional states: depression, anxiety, and stress [22]. Total scores for the three domains were calculated by aggregating their corresponding points. It should be noted that DASS-21 is a short version derived from the basic DASS questionnaire and it is needed the scores to be multiplied by two in order to be compared with the cutoff values of conventional severity ratings [23] (Table 1). For this study, the scale reliability coefficients of depression, anxiety, and stress were 0.913, 0.893 and 0.914, respectively, indicating good validity of the DASS measurement.

Table 1. Severity levels of depression, anxiety and stress

Degree of Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14

Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Statistical analysis

The statistical analysis was conducted with SPSS STISTICS, version 26.0. DASS scores were recoded into three scales and doubled as mentioned above. The three scales were also recoded into the five levels of each scale, so that it can be possible to compare the results with the cutoff values. Normal distribution of measures was tested by using Kolmogorov-Smirnov test. Differences between the DASS scales and the sociodemographic characteristics were performed using Kruskal-Wallis and Mann-Whitney non parametric tests. The level of significance was set at 0.05.

Descriptive statistics

Table 2 describes the characteristics of the population. Among a total of 206 study participants, 138 were females (67%). Participants' ages ranged between 19 to 55 years with a mean age 23,77, SD=5,092. Only 23 students declared that they belonged to vulnerable group and 108 had a person in family belonged to vulnerable group. 7,3% and 40,3% of the participants were infected by Covid or had a family member infected respectively. As for students' beliefs about the educational process, the vast majority do not prefer distance education (95,6%) and state dissatisfied with the process (64,6%).

Table 2. Descriptive statistics

Variable	N (%)
Sex	
Male	138 (66,9)
Female	68 (33,1)
Vulnerable	
Yes	23(11,2)
No	183(88,8)
Vulnerable in family	
Yes	108(52,4)
No	98(47,6)
Covid infected	
Yes	15(7,3)
No	191(92,7)
Family member covid infected	
Yes	83(40,3)
No	123(59,7)
Health status	
Bad	11(5,4)
Moderate	45(21,8)
Good	121(58,7)
Very good	29(14,1)
Fear of Covid-19	
Minimal-Non	16(7,7)
Mild	109(52,9)
Moderately Severe	71(34,5)
Severe	10(4,9)
Preferable educational method	
Face to face	83(40,3)
E-learning	9(4,4)
Hybrid	114(55,3)
Satisfaction from the educational procedure	
Very Dissatisfied	33(16,1)
Dissatisfied	100(48,5)
Satisfied	60(29,1)
Very satisfied	13(6,3)

Overall Severity of Depression, Anxiety, and Stress

Only the 31,1%, 45,5% and 36,4% found to have normal levels of depression, anxiety and stress respectively. All scores are represented on Table 3. It is of interest that from the participants, the 27,7% for depression scale, 20,4% for anxiety and 15% stress found to have extremely severe levels.

Table 4 lists the mean scores and standard deviations of the three scales in the DASS-21 questionnaire. On average, students' severity scores of depression. After comparing with the cutoff values in Table 2, it was evident that radiography students, in general, had moderate levels regard to depression, anxiety and stress.

Table 3. Distribution of DASS scores (%) among Radiographer students

Subscale	Normal	Mild	Moderate	Severe	Extremely Severe
Depression	31,1	9,2	16,5	15,5	27,7
Anxiety	45,5	9,7	16,0	8,3	20,4
Stress	36,4	13,1	16,5	13,1	15,0

Table 4. Mean scores and SD of Depression, Anxiety and Stress scales.

Dass-21 Scales	N	Mean	Std. Deviation
Depression	206	18,00	12,262
Anxiety	206	10,96	10,725
Stress	206	19,99	12,183
Valid N (listwise)	206		

Significant statistical differences found between female and male. Females were more likely to be severely anxiety (p 0.017). Having been infected from covid or having a person of the family infected, have a significant effect on depression (p 0.031 and 0.036). Students belonging on the vulnerable group were likely to have higher anxiety levels (p 0.004). Moreover, students not being afraid of covid have significant lower levels of depression and anxiety (p 0.22 and 0,21). Significant statistical differences also found between students with bad, moderate, good and very good health status (p<0.05) at all three scales. At last, it is of interest that the perceptions of the students about the effectiveness of the educational method have significant differences in all scales (depression p 0.01, anxiety 0.04, stress 0.08).

DISCUSSION

This study is addressing psychological well-being of radiography students during a critical global situation. We found that university students are suffering moderate level of depression, anxiety and stress levels. Similar results are reported in the literature about COVID-19 for the general population during the pandemic [4, 24-26] and others highlighting the psychological effects of the pandemic university students [27,28]. University students are experience high levels off anxiety in general. Adding the covid pandemic's stressor factors can further heighten depression, stress and anxiety levels [29]. Our study in line with other studies reported a moderate to severe impact on more than a half of participants. Similar results were also reported in European and Global studies [6]. Comparing with general population during the pandemic 37.7% of the Austrian study population reported a severe psychological impact and 10% considered to suffer from severe depression, anxiety or stress which percentages are lower than for radiographer students of our study [30]. Although many studies have shown high levels of stress, anxiety and depression in students in general, regardless of the pandemic, we believe that during the pandemic period these levels increased, as students are concerning about the academic and profession careers, and express feelings of boredom, anxiety and frustration [6]. A study in Switzerland compared students' mental health before and during the covid-19 crisis and they found that they got worse [31].

Regarding the factors that seem to affect the mental health of the participants of our study, as expected, the results show that having been infected from covid or having a person of the family infected, have a significant effect on depression. Elmer's et al. study had similar results. Students who worry more about their family and friends are more likely to become more depressed [31]. However, we could say that it is not a factor that is limited to the student community as many studies have highlighted increased anxiety levels in the general population with at least one family member, relative, or a friend with the COVID-19 disease [32]. Students belonging on the vulnerable group were likely to have higher anxiety levels. Individuals reporting chronic diseases had higher mean levels not only of stress, but also of anxiety and depression compared to participants not reporting such diseases on a study for the general Greek population [33]. Poor or very poor self-rated health status was significantly associated with a greater psychological impact of the outbreak, pointing higher DASS stress subscale, DASS anxiety subscale and DASS depression subscale scores as compared to those with very good or good self-rated health status. Several studies and we argue that the pandemic can involve particularly strong stressors for people with vulnerabilities or/and pre-existing mental health problems [34]. It is necessary to have further research to identify all these factors and their variations.

An issue that arose from our study and which should concern the academic community, is the dissatisfaction of students with the

teaching method, when it is limited to distance learning. 48% of the sample declared dissatisfied and 16,1% very dissatisfied from the teaching method. This might be a result from the sudden transition from a fixed, timetable-based lessons to flexible, home-based learning. At home there are many factors that cause difficulties in the educational process such as distractions, lack of space, fast internet and devices, comparing with school facilities [20]. When asked about their preference for the educational method, 40.3% stated that they prefer traditional classroom lessons, while only 4.4% would choose distance education. 55.3% of the students' sample believe that a hybrid educational method, combining e-learning with lecture-based curriculums, is preferable. Students' satisfaction with these different educational approaches (traditional, online and hybrid) but also their effectiveness has often been the subject of reflection and research and seems to be influenced by many factors [35].

Our study has some limitations. Our sample consisted of a specific department of the University, and this makes the direct comparison of the results difficult as there is no other study to our knowledge with radiography students only. Another limitation is that there is no previous study in this pre-pandemic population so that we can determine to what extent these results are a consequence of the effects of the pandemic only or there is a pre-existing high stress, anxiety and depression in students. Finally, we used a web-based survey that makes possible selection bias.

CONCLUSION

In conclusion, COVID-19 has left its mark worldwide, but its implications for health-care professions students are on a totally different level. The impact of the Covid-19 pandemic on radiography students' education and mental health are important issues to address. Despite the high variability between countries in the burden of the pandemic and the countermeasures, the research so far seems to underscore similarities in vulnerability factors for mental health problems. However, further research is required regarding the university's students and especially the radiographers who deal with a hands-on profession. As the recession of the pandemic is unknown when it will occur, there is a need for academics and researchers to focus on creating programs and discuss future strategies on how to combine on-site teaching with online courses, aiming to maximize student satisfaction with the educational process. This would be a good legacy for future crises.

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