

Original Research

COVID-19 Mental Health Impact and Readiness to Be Vaccinated Among Medical Academic Staff in Non-EU and EU Countries

Ilirjana Zekja ^{1, †, *}, Fatjona Kamberi ^{2, †, *}, Ria Bruijn ^{3, †}, Tedi Kokuri ^{4, †}, Evanthia Asimakopoulou ^{5, †}

1. Faculty of Technical Medical Sciences, University of Medicine Tirana, Albania; E-Mail: ilirjana.zekja@umed.edu.al
2. Scientific Research Centre for Public Health, University of Vlore "Ismail Qemali", Vlore, Albania; E-Mail: fatjona.kamberi@univlora.edu.al
3. Thomas More, Health care Campus Turnhout, Campus Blairon 800, 2300 Turnhout, Belgium; E-Mail: ria.bruijn@thomasmore.be
4. Tedi Kokuri, Charité – Universitätsmedizin Berlin, Charitéplatz 1, 10117, Berlin, Germany; E-Mail: tedi.kokuri@charite.de
5. Frederick University, Cyprus; E-Mail: hsc.ae@frederick.ac.cy

† These authors contributed equally to this work.

* **Correspondences:** Ilirjana Zekja and Fatjona Kamberi; E-Mails: ilirjana.zekja@umed.edu.al; fatjona.kamberi@univlora.edu.al**Academic Editor:** Roy G. Beran*OBM Neurobiology*

2023, volume 7, issue 2

doi:10.21926/obm.neurobiol.2302166

Received: January 18, 2022**Accepted:** March 27, 2023**Published:** April 10, 2023

Abstract

The COVID-19 pandemic has resulted in the worst public health catastrophe in recent history, impacting people's mental health and increasing concern over vaccinations. Between early May and late June 2021, a web-based survey that included higher education institutions from three countries (Albania, Belgium, and Cyprus) was conducted. The purpose was to assess the impact of the COVID-19 pandemic on the mental health of academic staff, what affects their readiness to get the COVID-19 vaccine, and whether there is a link between the country of residence and readiness to be vaccinated. The short version of the Depression, Anxiety, and Stress Score (DASS) questionnaire and a section of questions on vaccination readiness



© 2023 by the author. This is an open access article distributed under the conditions of the [Creative Commons by Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium or format, provided the original work is correctly cited.

supported by the Health Belief Model were used for data collection. The final study sample was composed of 87 academics, both in Albania ($n = 57$) and in European Union (EU) countries ($n = 30$). Females comprised 91.2% of the Albanian participants and 63.3% of the EU countries participants. 89.7% of Albanian participants reported significantly higher proportions of prior COVID-19 ($p = 0.001$), compared to only 10.3% of EU country participants. Participants from Albania were less likely to vaccinate family members against COVID-19, and there was a significant association between this finding and whether an institution was affiliated with the EU ($p = 0.007$). In the two study groups, the DASS indicators showed a significant association between stress ($p = 0.012$) and depression ($p = 0.011$). The findings indicated that the pandemic affected the academic staff's mental health. When compared to academic staff members working in the EU, Albanian participants exhibited a larger prevalence of moderate-to-extremely severe depression and stress, which had an impact on their intentions to vaccinate against COVID-19. The results are essential to developing mental health coping strategies and approaches for increasing vaccination uptake, especially in developing countries.

Keywords

COVID-19 outbreak; EU country; Albania; mental health; vaccination; readiness

1. Introduction

The COVID-19 outbreak has triggered the largest global public health crisis since the SARS (severe acute respiratory syndrome) epidemic of 2003 [1]. Due to the situation, the World Health Organization (WHO) declared a pandemic on January 30, 2020. According to the WHO, there have been 474,659,674 confirmed cases of COVID-19 worldwide as of March 24, 2022, with 6,103,355 deaths and a total of 10,925,055,390 vaccine doses delivered [2]. The first COVID-19 vaccine, created by BioNTech and Pfizer, was recommended for use in the European Union (EU) on December 21 to prevent coronavirus disease 2019 (COVID-19) in individuals aged 16 and up, and the European Commission subsequently granted market authorization for use across the entire EU [3]. COVID-19 vaccinations have been shown to inhibit transmission and extend protection to those in close proximity to those vaccinated [4]. However, even bigger benefits exist if the population immunity threshold is reached and vaccine uptake increases [5]. Many people can be vaccinated but refuse to do so [6]. Fortunately, when COVID-19 vaccinations became available, there were some signs that vaccine hesitancy had decreased [7, 8]. Before the vaccine, the most often reported reason for being unwilling to get vaccinated was a fear of adverse reactions to the COVID-19 vaccine [9]. In particular, adults from lower socioeconomic backgrounds are more likely to be hesitant or unable to accept a booster vaccine and, in turn, more likely to be seriously affected by the virus. Studies on the public perception of booster doses also showed this unwillingness to vaccinate, highlighting several relevant factors [10]. The scale of vaccination reluctance ranges from full acceptance to complete refusal of all vaccines. Some variables associated with a greater impact on vaccination uptake were confidence, belief in the need for or value of a vaccine, belief in the vaccine's supplier, and convenience [11]. Vaccine hesitancy was associated with a lack of trust in

the COVID-19 vaccine's safety and scientific foundations and doubts about its effectiveness [12]. On the other hand, it is found that the COVID-19 pandemic was linked to extremely high levels of psychological discomfort, which frequently exceeded the requirements for clinical significance worldwide. Being female, being part of the younger age group (<40 years), the presence of chronic or psychiatric disorders, being unemployed, being a student, and having regular exposure to social media or news on COVID-19 were some of the risk factors identified as related to distress measures [13, 14]. In addition, these impacts were present in all countries independently, whether they were EU members or not. For example, studies in Cyprus identified a mental health burden for younger adults [15], with nurses reporting increased depressive and post-traumatic stress disorder symptoms compared to other healthcare professionals [16]. However, results from a cross-sectional study that included nurses and physicians from five hospitals in Belgium revealed a high prevalence of burnout, insomnia, depression, and anxiety among participants from the COVID-19 pandemic [17]. While another study identified the key factors that affected how many people in Belgium received the first dose of the COVID-19 vaccination. The COVID-19 vaccine was less likely to be received by immigrants, persons living alone, single parents, or people from socioeconomically disadvantaged groups [18]. According to a study of COVID-19 vaccinations in six European countries, vaccination hesitancy was more common in younger people, lived alone in smaller areas, and didn't have children. The hesitant profile, however, was linked to decreased institutional trust, a lack of COVID-19 preventive activities, and increased pandemic fatigue [19]. However, a survey conducted in the Western Balkans, including Albania, showed regional differences in the factors that influence social trust in the COVID-19 vaccination, showing the necessity for different strategies in communication efforts [20]. Despite this, vaccination significantly reduced the psychological distress linked to COVID-19, according to a new study [21]. Although the literature is rich in studies on the mental impact of the COVID-19 pandemic and vaccination readiness in various target populations, the academic medical staff lacks representation as a study population. To our knowledge, this is the first study comparing the benefits of getting vaccinated against COVID-19 by academic staff with a medical background in a non-EU country to those in EU countries.

2. Materials and Methods

2.1 Study Setting

We used data from a web-based survey that included academic staff members from four higher education institutions across three countries: Albania, Belgium, and Cyprus, the latter two of which are members of the European Union (EU), while Albania is a candidate. Participants in the study included full-time academic and research staff from Frederick University in Cyprus, Thomas More Health Care Campus Turnhout, Belgium, the University of Medicine Tirana (Faculty of Technical Medical Sciences), and the University of Vlore "Ismail Qemali," Faculty of Health in Albania. These educational institutions offer degree programs in health-related fields. The research partnership was established based on existing cooperation among the institutions involved in international programs, as well as active agreements and individual collaborations in national and international scientific research projects.

2.2 Study Design and Sample

Due to the breakthrough in the higher education system caused by the pandemic, all the countries involved were pursuing efforts to continue teaching and researching through alternative channels, mostly online; therefore, this study was conducted as a cross-sectional, web-based survey. The primary outcome of the survey was to assess the impact of the COVID-19 pandemic on the mental health of academic staff by better-understanding health beliefs and factors that affect their readiness to get the COVID-19 vaccine and whether to identify if there is a link between the country of residence, vaccine type, and readiness to be vaccinated in different European countries (EU and non-EU). The Cochran formula: $n = (Z_{\alpha})^2 (p \times q)/d^2$ was used to determine the sample size. Based on this formula, p = depression prevalence (according to Albanian, Belgian, and Cypriot studies, we took an average of about 11%) [14, 15, 17] q = prevalence complement, error margin = d , α = 95 percent significance level, and $n = 2.85 \times 2.85 (0.11 \times 0.95)/0.1 \times 0.1 = 92$. According to the formula, 85 participants made the optimal sample size. Finally, 87 academic staff members were willing to participate in the survey. The response rate was 76% for the Faculty of Health, 85% for the Faculty of Technical Medical Sciences, Albania, 53% for Frederick University, Cyprus, and 46% for Thomas More, Belgium.

2.3 Questionnaire Development

The questionnaire was developed based upon consulting the pertinent literature review using the following elements: 1) socio-demographic data, 2) evaluation questions on the effect of COVID-19 on staff mental health using the short version of the Depression, Anxiety, and Stress Score (DASS) [22]; and 3) a section on vaccination readiness supported by Health Belief Model questions [23]. Selected data collection questionnaires are available in English, and since the questionnaire was administered in English, translation, reconciliation, and posterior validation in the local language weren't needed. Socio-demographic questions included age, gender, years of teaching, institution, conjugal status, advanced education degree completed, and other data suggested by the study research group that was considered applicable after approval by the external experts, who assessed each item separately. The selection of the DASS instrument was made due to the trustworthiness and proven validity of its use both for scientific research and clinical practice [24] in countries with different socio-economic and cultural backgrounds [25] as well as during pandemics [26]. The DASS is a quantitative measure of distress focused on three axes of depression, anxiety, and stress, with the rating scale as follows: 0 = Never; 1 = occasionally; 2 = frequently; 3 = almost always. Based on the score, each variable outcome (depression, anxiety, and stress) was classified as normal, mild, moderate, severe, and extremely severe. The Health Belief Model (HBM) [27] assessed readiness to get the COVID-19 vaccine. HBM is the theory that is most often applied to explain people's behaviors related to health. The model is based on six predictors of health behaviors, such as risk susceptibility, risk severity, benefits and barriers, self-efficacy, and cues to action. This theory is valuable for explaining behaviors and designing interventions [8, 28]. This model was selected because the literature suggests that it has been widely used to explain people's behavior about receiving the COVID-19 vaccine [28, 29], flu vaccine [30], and human papillomavirus vaccine [31, 32]. The literature-based questionnaire contained 19 statements, including three general vaccine statements. The statements addressed participants' perceived susceptibility and severity of the COVID-19 virus and their perceived benefits and barriers to the COVID-19 vaccination. Yes-or-no

questions assessing past flu vaccination history (2 items) were also used to identify other cues to identify other cues to action. A four-point Likert scale (1 = very unlikely to 4 = very likely) was used for the two questions that directly asked participants about their intention to recommend or vaccinate their family members. All authors offered their expertise in designing and adopting the questionnaire, as well as its transition into Google Forms' electronic format for administration.

2.4 Data Collection

Data was collected between early May and late June 2021. The anonymous questionnaire was distributed in English to our colleagues' official e-mail addresses. Participants were recruited using the Google Forms platform and snowball sampling. The authors from each institution were the contact point and the reference for the data collection. The email was sent at different times to increase participation. Participants were asked to agree to the informed content by clicking a button at the beginning of the survey, failing which they were directed outside. The informed message explained that they would be asked to answer a series of questions and specified that all data would be treated anonymously. All the participants were able to complete the questionnaire once, and the survey was voluntary. The submission of incomplete questionnaires was avoided by making all the questions mandatory. Participants could not proceed with the next question or submit the questionnaire if all sections were incomplete.

2.5 Statistical Methods

Comparisons of characteristics between the study groups were made using chi-square (χ^2) or Fisher's exact test for categorical variables and the Mann-Whitney or Kolmogorov-Smirnov-Z test for continuous variables, as appropriate. Data were presented as medians accompanied by interquartile ranges (IQRs), where possible, or as numbers accompanied by their percentages. All normality assumptions were checked. Some variable categories were regrouped. For the selected variables, country and associated factors were presented. A p-value of 0.05 or less was considered statistically significant. An analysis of dichotomous outcomes was used to estimate the association between the different covariates and the following outcomes of interest: positive attitude about the effectiveness of the COVID-19 vaccine and the three-axis of the DASS, respectively, depression, anxiety, and stress. The Checklist reported results for Reporting Results of Internet E-Surveys (CHERRIES) [33]. The survey has been approved by the Research Ethics Committee (REC) of the Faculty of Health, the University of Vlore "Ismail Qemali," Vlorë, Albania, Decision No. 1, dated March 15, 2021. Every stage of the survey's design and implementation was guided by the Declaration of Helsinki's Ethical Principles for Medical Research Involving Human Subjects and the European Union's Ethics for Researchers. Before starting the survey, participants could read a paragraph in which the study goal and objectives were explained, including the risks and benefits of the participants as well as intended data use and management by the Declaration of Helsinki and the European Code of Conduct for Research Integrity.

3. Results

3.1 Sociodemographic Characteristics of Study Participants

Of the 150 invited subjects, only 87 completed the survey. The final study sample included in this analysis was composed of 87 academic healthcare professionals both in Albania (n = 57) and in European Union (EU) countries (n = 30) (14 from Belgium and 16 from Cyprus). Female participants comprised 91.2% of the Albanian participants and 63.3% of the EU countries participants. The majority of participants, both from Albania and EU countries, were married (77.2% vs. 76.7%). The educational background of Albanian participants was predominantly medicine (47.3%) and nursing (43.9%), while the majority of EU participants had a nursing background (56.7%). Most Albanian participants had a Ph.D. degree (43.9%), compared to 56.7% of EU participants with a postgraduate degree. The mean age of Albanian participants was 41.9, compared to 47.7 for EU participants. Table 1 shows the sociodemographic characteristics of the study participants.

Table 1 Sociodemographic characteristics of study participants.

Variables		Academic health care professionals in Albania (N = 57)	Academic health care professionals in EU countries (N = 30)	P-value
Gender	Males	5 (8.8)	11 (36.7)	0.001
	Females	52 (91.2)	19 (63.3)	
Age [mean(95%CI)]		41.9 (39.3-44.5)	47.7 (43.6-51.9)	0.014
Marital status	Single	10 (17.5)	5 (16.7)	0.962
	Married/in a relationship	44 (77.2)	23 (76.7)	
	Divorced/widowed	3 (5.3)	2 (6.7)	
Educational background	Medical	27 (47.4)	3 (10)	<0.001
	Nursing	25 (43.9)	17 (56.7)	
	Other healthcare profession	5 (8.8)	10 (33.3)	
Academic degree	Postgraduate degree	24 (42.1)	17 (56.7)	0.196
	PhD degree	25 (43.9)	5 (16.7)	
	Higher	8 (14)	8 (26.7)	

Note: Values are given in number and (percentage), unless otherwise indicated. Mann-Whitney test was used to test differences and chi-square for associations, as applicable. Significant p-values are highlighted in grey.

3.2 COVID-19-Related Characteristics of Study Participants

Table 2 shows the COVID-19-related characteristics of study participants. 89.7% of Albanian participants reported significantly higher proportions of prior COVID-19 (p < 0.001), compared to only 10.3% of EU country participants who reported COVID-19. Among those vaccinated, the most

common types of vaccines used among Albanian subjects were vector-based vaccines (72.5%), while mRNA-based vaccines comprised most of the vaccines received by EU-based participants (40%). There was a significant association between the two groups and how the type of vaccine affected their decision to vaccinate ($p = 0.071$).

Table 2 COVID-19-related characteristics of study participants.

Variables		Academic health care professionals in Albania (N = 57)	Academic health care professionals in EU countries (N = 30)	P-value
Prior COVID-19	Yes	35 (89.7)	4 (10.3)	<0.001
Vaccination	Vector-based vaccine	29 (72.5)	11 (27.5)	0.447
	mRNA-based vaccine	21 (60)	14 (40)	
	Not vaccinated	7 (58.3)	5 (41.7)	
Willingness to vaccinate family members for COVID-19	Unwilling	12 (100)	0 (0)	0.007
	Willing	45 (60)	30 (40)	
Does type of vaccine affect the decision to vaccinate?	SD	7 (41.2)	10 (58.8)	0.071
	D	7 (53.8)	6 (46.2)	
	U	12 (85.7)	2 (14.3)	
	A	24 (72.7)	9 (27.3)	
	SA	7 (70)	3 (30)	

Note: Values are given in number and (percentage).SD: Strongly Disagree; D: Disagree; U: Undecided; A: Agree; SA: Strongly Agree. Willingness to vaccinate family members is based on 'willing', defined as rather being likely or very likely to vaccinate and 'unwilling', defined as unlikely or very unlikely to vaccinate. Fisher exact or Chi-square test was used to test associations, as applicable. Significant p-values are highlighted in grey.

3.3 Depression, Anxiety and Stress among Participants

Table 3 shows the level of depression, anxiety, and stress among participants about COVID-19. Depression ($p = 0.006$), anxiety ($p = 0.011$), and stress ($p = 0.008$) scores were significantly higher among Albanian academic healthcare professionals. The DASS indicators show significant associations between EU and non-EU participants in the study.

Table 3 Depression, anxiety and stress among participants.

DASS indicators	Academic health care professionals in Albania (N = 57)	Academic health care professionals in EU (N = 30)	P-value
-----------------	--	---	---------

Depression score [median (IQR)]	10 (8-13)	6 (6-8)	0.006
Anxiety score [median (IQR)]	10 (8-13)	6 (5-8)	0.011
Stress score [median (IQR)]	8 (6-11)	4 (2-8)	0.008
Depression categories	Normal to mild	18 (50)	0.011
	Moderate to extremely severe	39 (76.5)	
Anxiety categories	Normal to mild	16 (55.2)	0.151
	Moderate to extremely severe	41 (70.7)	
Stress categories	Normal to mild	30 (55.6)	0.012
	Moderate to extremely severe	27 (81.8)	

Mann-Whitney test was used to test differences and chi-square for associations, as applicable. Significant p-values are highlighted in grey.

3.4 Depression, Anxiety and Stress by Willingness to Vaccinate Family Members against COVID-19 among Participants

Table 4 shows depression, anxiety, and stress as measured by willingness to vaccinate family members against COVID-19 among participants. Among Albanian participants, some participants had expressed an unwillingness to vaccinate family members against COVID-19, while there were none among EU-country participants. Among Albanian participants, there was a statistically significant difference between the depression ($p = 0.040$) and anxiety ($p = 0.039$) scores of those willing and those unwilling to vaccinate their family members, with those unwilling having lower scores compared to those willing. This difference in scores was not observed for stress.

Table 4 Depression, anxiety and stress by willingness to vaccinate family members against COVID-19 among participants.

	Academic health care professionals in Albania (N = 57)		P-value	Academic health care professionals in EU countries (N = 30)		P-value
	Unwilling	Willing		Unwilling	Willing	
Depression score [median (IQR)]	6.5 (1-9)	11 (9-13)	0.040	-	6 (6-8)	-
Anxiety score [median (IQR)]	6 (1-10)	12 (10-14)	0.039	-	6 (5-8)	-
Stress score [median (IQR)]	5 (1-10)	10 (6-11)	0.101	-	4 (2-8)	-

Mann-Whitney test was used to test differences. Significant p-values are highlighted in grey.

3.5 Depression, Anxiety and Stress among Those Who Were Unvaccinated but Willing to Vaccinate Family Members by EU/Non-EU

Table 5 shows depression, anxiety, and stress among those who were unvaccinated but willing to vaccinate family members, EU or non-EU. Even when the three indicators showed a severe to extremely severe score, no statistical association was found between depression, anxiety, and stress scores among study participants. Yet, EU-based professionals had lower but more variable depression, anxiety, and stress scores.

Table 5 Depression, anxiety and stress among those who were unvaccinated but willing to vaccinate family members by EU/non-EU.

	Academic health care professionals in Albania (N = 7)	Academic health care professionals in EU countries (N = 5)	P-value
Depression score [median (IQR)]	13 (10-15)	6 (3-21)	0.161
Anxiety score [median (IQR)]	14 (11-15)	6 (3-22)	0.161
Stress score [median (IQR)]	11 (8-15)	6 (5-16)	0.816

Kolmogorov-Smirnov Z test was used to test differences. Significant p-values are highlighted in grey.

4. Discussion

We analyzed the data to evaluate the readiness of the academic staff included in the study to be vaccinated against COVID-19 and the effects of COVID-19 on their mental health. Most of the academic staff in the study were married. The academic staff from EU countries had a more extensive educational background in nursing, while the staff from Albania was a mix of doctors and nurses. As suggested by Table 1, there were significant associations between gender ($p = 0.001$), educational background ($p < 0.001$), and academic institutions in Albania and the EU, with a larger proportion of females in Albanian institutions and a larger proportion of other healthcare professions among the EU academic institutions. In this regard, the results of our study were in line with a similar study conducted in the Eastern Mediterranean Region, where female healthcare workers and those working in teaching hospitals had higher depression and stress scores due to the pandemic [34]. As shown in the results of Table 1 participants from Albania were significantly younger compared to their EU-based counterparts ($p = 0.014$). A study conducted in Belgium provided evidence that young people experienced high levels of mental distress during the COVID-19 pandemic [18]. While in Cyprus, as reported by a study, nurses were more likely than physicians to suffer from depression [16].

A characteristic of this study is that the academic staff from Albania had passed COVID-19 before the vaccine was available. The most common types of vaccines used among Albanian subjects (72.5%) were vector-based vaccines, while mRNA-based vaccines made up the majority of vaccines received by EU-based participants (40%). No statistical association was found between vaccine type

and the need to be vaccinated. Differences were discovered for those who were willing to vaccinate family members. The unwillingness to vaccinate family members for COVID-19 was higher among Albanian participants ($n = 12$). There was a significant association between the willingness to vaccinate family members and whether institutions were EU- or non-EU-based ($p = 0.007$). No EU-based participant was unwilling to vaccinate family members, Table 2. A study that evaluated the willingness of academic nursing staff to be vaccinated evidenced their higher willingness than that of students, but with reservations mainly related to the uncertainty of the vaccine and the side effects associated with it [35]. There was a significant association between the two groups and how the type of vaccine affected their decision to vaccinate ($p = 0.071$). In this regard, the findings are consistent with previous research. Low acceptance and uptake were associated with low perceived benefits of vaccination and health concerns [36]. In contrast to studies conducted in Belgium among nursing healthcare workers, it was discovered that fear of unknown future effects and fear of side effects influenced vaccination uptake [37]. According to other studies, the national vaccination plan and the properties of new vaccines (such as their safety, side effects, effectiveness, etc.) play a major role in how well the COVID-19 vaccine is accepted [38]. The results of the assessment of depression, anxiety, and stress among participants about COVID-19 revealed moderate-to-extremely severe depression ($p = 0.006$), anxiety ($p = 0.011$), and stress ($p = 0.008$) scored significantly higher among Albanian academic health care professionals. When categorized according to the scoring criteria and further dichotomized, there was a significant association between depression ($p = 0.011$) and stress ($p = 0.012$) and the two study groups, with Albanian participants having a higher representation of moderate to extremely severe depression and stress (Table 3).

These results contrast with those of a longitudinal study among seven European countries, which found that in all waves of COVID-19 the participants had probable depression and anxiety, even if at a low or moderate rate [39]. At the same time, a study of healthcare workers in Albania discovered that mild anxiety and moderate depression were expressed, similar to the results of our study [40]. Depression, anxiety, and stress as measured by willingness to vaccinate family members against COVID-19 among Albanian participants appeared statistically significant for the depression ($p = 0.040$) and anxiety ($p = 0.039$) scores of those willing and those unwilling to vaccinate their family members, with those unwilling having lower scores compared to those willing. In this regard, our results are inconsistent with the literature. A study revealed that having a postgraduate degree is associated with fewer concerns and a greater willingness to vaccinate [41]. But in our study, the Albanian participants in Table 1 had more postgraduate and PhD degrees than EU participants. Similar worries about vaccinating family members are more closely tied to the safety and effectiveness of the vaccination [42]. Also, a study has revealed different factors for being unvaccinated and for delaying the COVID-19 vaccination. Unvaccinated appears linked to a general mistrust of preventative efforts [43]. Depression, anxiety and stress among those who were unvaccinated but willing to vaccinate family members by EU or non-EU, Table 5 measured a severe to extremely severe score with no statistical association among study participants. EU-based academic professionals had lower but more variable depression, anxiety, and stress scores. Depression, anxiety, and stress were common among unvaccinated but willing to vaccinate family members, EU or non-EU. Table 5 revealed a severe to extremely severe score with no statistical association among study participants. EU-based academic professionals had lower but more variable depression, anxiety, and stress scores. According to a study, participants who had received the COVID-19 vaccine had a 25% higher likelihood of reporting both anxiety and depression than

those who had not received the vaccine [44]. However, the research points to social anxiety as a significant element connected to COVID-19's impacts and attitudes toward vaccine compliance [45]. The results of our study, particularly for the unvaccinated Albanian participants, can be explained by the fact that most of them got the COVID-19 infection prior to vaccination (Table 1). Evidence from a study supports this fact. It is suggested that psychological distress before to infection could be a risk factor for post-COVID-19 disorders involving mental health symptoms [46]. Finally, a multinational study stated that inadequate or inaccurate information that fails to adequately explain the advantages and disadvantages of the available vaccines might also contribute to vaccine hesitancy [47].

5. Limitations

Our study has several limitations. First, our study population was small and predominantly Albanian compared to participants from other EU countries. The nonrandom study population and the web-based survey type may introduce bias into the study. Also, the different educational backgrounds of the academic staff involved in the study might have contributed to biased results. In addition, since the sample's mental state before the pandemic was unknown when it was tested, this cross-sectional methodology doesn't reveal anything about how the results for mental health have changed over time. All of the factors above limit the external validity of the data and the extent to which our study's findings can be generalized. Nevertheless, our study has several strengths. Depression and anxiety were measured using validated scales. We assessed perceived stress and worried about COVID-19 and the need to be vaccinated in an unstudied target population group, such as academic staff with a medical background. Knowing how people perceive stress and depression about the pandemic in European countries with different socio-economic, cultural, and health systems adds value to developing preventive and support strategies for academics who disseminate knowledge to the general population.

6. Conclusions

To conclude, various determinants contributed to COVID-19 mental health impact and vaccination hesitancy in a sample of academic staff from three European countries (EU and non-EU). The three indicators of mental health impact analyzed, such as depression, anxiety, and stress, showed a severe to extremely severe score even if EU-based academic staff had lower but more variable depression, anxiety, and stress scores. The study found that the academic staff from Albania expressed more severe depression, anxiety, and stress scores. Considering the small sample size in the study (Belgium and Cyprus), it was found that the profile of the COVID-19 vaccine-hesitant in Albania is a person of a younger age, with Ph.D. degrees, and with greater reluctance to vaccinate their families against the COVID-19 vaccine. Furthermore, even if they had the COVID-19 infection prior to the vaccine's rollout, the Albanian academic staff were significantly more prone to psychological distress. The findings are essential for developing vaccination uptake and mental health coping strategies, especially in developing countries. Further research in the form of large-scale studies which also more closely consider the socio-demographic and economic profiles of each country could be beneficial in creating a complete picture of the impact of the pandemic on the mental health of healthcare professionals in particular.

Acknowledgments

We are thankful to all the participants in the study.

Author Contributions

Conceptualization, I.Z. and F.K.; formal analysis, F.K., T.K.; data collection I.Z., F.K., R.B., and E.A.; methodology, I.Z., F.K., R.B., E.A., and T.K.; project administration, I.Z. and F.K.; resources, I.Z., F.K., R.B., E.A., and T.K. Writing—original draft, I.Z., and F.K.; writing—review and editing, I.Z., F.K., R.B., and E.A. All authors have read and agreed to the published version of the manuscript.

Funding

There was no financial support for this research.

Competing Interests

The authors have declared that no competing interests exist.

References

1. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *Int J Antimicrob Agents*. 2020; 55: 105924.
2. WHO Coronavirus (COVID-19) dashboard [Internet]. Geneva, Switzerland: WHO; 2022. Available from: <https://covid19.who.int/>.
3. EMA recommends first COVID-19 vaccine for authorisation in the EU [Internet]. Amsterdam, Netherlands: EMA; 2020. Available from: <https://www.ema.europa.eu/en/news/ema-recommends-first-covid-19-vaccine-authorisation-eu>.
4. Hall VJ, Foulkes S, Saei A, Andrews N, Oguti B, Charlett A, et al. COVID-19 vaccine coverage in health-care workers in England and effectiveness of BNT162b2 mRNA vaccine against infection (SIREN): A prospective, multicentre, cohort study. *Lancet*. 2021; 397: 1725-1735.
5. Randolph HE, Barreiro LB. Herd immunity: Understanding COVID-19. *Immunity*. 2020; 52: 737-741.
6. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med*. 2021; 27: 225-228.
7. Kluge H, McKee M. COVID-19 vaccines for the European region: An unprecedented challenge. *Lancet*. 2021; 397: 1689-1691.
8. Solís Arce JS, Warren SS, Meriggi NF, Scacco A, McMurry N, Voors M, et al. COVID-19 vaccine acceptance and hesitancy in low- and middle-income countries. *Nat Med*. 2021; 27: 1385-1394.
9. Del Riccio M, Bechini A, Buscemi P, Bonanni P, on behalf of the Working Group DHS, Boccalini S. Reasons for the intention to refuse COVID-19 vaccination and their association with preferred sources of information in a nationwide, population-based sample in Italy, before COVID-19 vaccines roll out. *Vaccines*. 2022; 10: 913.

10. Paul E, Fancourt D. Predictors of uncertainty and unwillingness to receive the COVID-19 booster vaccine: An observational study of 22,139 fully vaccinated adults in the UK. *Lancet Reg Health Eur.* 2022; 14: 100317.
11. Smith K, Lambe S, Freeman D, Cipriani A. COVID-19 vaccines, hesitancy and mental health. *BMJ Ment Health.* 2021; 24: 47-48.
12. Lazarus JV, Wyka K, White TM, Picchio CA, Rabin K, Ratzan SC, et al. Revisiting COVID-19 vaccine hesitancy around the world using data from 23 countries in 2021. *Nat Commun.* 2022; 13: 3801.
13. Xiong J, Lipsitz O, Nasri F, Lui LM, Gill H, Phan L, et al. Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *J Affect Disord.* 2020; 277: 55-64.
14. Ndreu V, Themeli Y, Zekja I, Kamberi F. Psychological distress due to COVID-19 in the Albanian adult population. *OBM Neurobiol.* 2022; 6: 126.
15. Stylianou N, Samouti G, Samoutis G. Mental health disorders during the COVID-19 outbreak in Cyprus. *J Med Life.* 2020; 13: 300-305.
16. Chatzittofis A, Karanikola M, Michailidou K, Constantinidou A. Impact of the COVID-19 pandemic on the mental health of healthcare workers. *Int J Environ Res Public Health.* 2021; 18: 1435.
17. Tiete J, Guatteri M, Lachaux A, Matossian A, Hougardy JM, Loas G, et al. Mental health outcomes in healthcare workers in COVID-19 and Non-COVID-19 care units: A cross-sectional survey in Belgium. *Front Psychol.* 2021; 11: 612241.
18. Cavillot L, Van Loenhout J, Catteau L, Van den Borre L, De Pauw R, Blot K, et al. COVID-19 vaccination uptake in Belgium: Socioeconomic and sociodemographic disparities. *Eur J Public Health.* 2022; 32: ckac129.046.
19. Rens E, Smith P, Nicaise P, Lorant V, Van den Broeck K. Mental distress and its contributing factors among young people during the first wave of COVID-19: A Belgian survey study. *Front Psychiatry.* 2021; 12: 575553.
20. Cvjetkovic S, Jeremic Stojkovic V, Mandic-Rajcevic S, Matovic-Miljanovic S, Jankovic J, Jovic Vranes A, et al. Societal trust related to COVID-19 vaccination: Evidence from Western Balkans. *Sustainability.* 2022; 14: 13547.
21. Chaudhuri K, Howley P. The impact of COVID-19 vaccination for mental well-being. *Eur Econ Rev.* 2022; 150: 104293.
22. Psychology foundation of Australia. Depression, Anxiety, Stress, Scales (DASS) [Internet]. 2022. Available from: <https://www2.psy.unsw.edu.au/dass/>.
23. Eichenberg C, Grossfurthner M, Andrich J, Hübner L, Kietaihl S, Holocher-Benetka S. The relationship between the implementation of statutory preventative measures, perceived susceptibility of COVID-19, and personality traits in the initial stage of corona-related lockdown: A German and Austrian population online survey. *Front Psychiatry.* 2021; 12: 596281.
24. Alfnsson S, Wallin E, Maathz P. Factor structure and validity of the depression, anxiety and stress scale-21 in Swedish translation. *J Psychiatr Ment Health Nurs.* 2017; 24: 154-162.
25. Bibi A, Lin M, Zhang XC, Margraf J. Psychometric properties and measurement invariance of depression, anxiety and stress scales (DASS-21) across cultures. *Int J Psychol.* 2020; 55: 916-925.
26. Vaughan RS, Edwards EJ, MacIntyre TE. Mental health measurement in a post COVID-19 world: Psychometric properties and invariance of the DASS-21 in athletes and non-athletes. *Front Psychol.* 2020; 11: 590559.

27. Becker MH. The health belief model and personal health behavior. *Health Educ Monogr.* 1974; 2: 324-473.
28. Champion VL, Skinner CS. The health belief model. 4th ed. In: *Health behavior and health education: Theory, research, and practice.* San Francisco: John Wiley & Sons, Inc.; 2008.
29. Wong LP, Alias H, Wong PF, Lee HY, AbuBakar S. The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay. *Hum Vaccin Immunother.* 2020; 16: 2204-2214.
30. Cheney MK, John R. Underutilization of influenza vaccine: A test of the health belief model. *SAGE Open.* 2013; 3: 2158244013484732.
31. Kamberi F, Muhaj E. Knowledge and health beliefs of nursing students toward Human Papilloma Virus and vaccine use. *Asian Pac J Cancer Care.* 2019; 4: 27-32.
32. Donadiki EM, Jiménez-García R, Hernández-Barrera V, Sourtzi P, Carrasco-Garrido P, De Andrés AL, et al. Health belief model applied to noncompliance with HPV vaccine among female university students. *Public Health.* 2014; 128: 268-273.
33. Eysenbach G. Improving the quality of Web surveys: The checklist for reporting results of internet e-surveys (CHERRIES). *J Med Internet Res.* 2004; 6: e34.
34. Ghaleb Y, Lami F, Al Nsour M, Rashak HA, Samy S, Khader YS, et al. Mental health impacts of COVID-19 on healthcare workers in the Eastern Mediterranean Region: A multi-country study. *J Public Health.* 2021; 43: iii34-iii42.
35. Manning ML, Gerolamo AM, Marino MA, Hanson-Zalot ME, Pogorzelska-Maziarz M. COVID-19 vaccination readiness among nurse faculty and student nurses. *Nurs Outlook.* 2021; 69: 565-573.
36. Fieselmann J, Annac K, Erdsiek F, Yilmaz-Aslan Y, Brzoska P. What are the reasons for refusing a COVID-19 vaccine? A qualitative analysis of social media in Germany. *BMC Public Health.* 2022; 22: 846.
37. Digregorio M, Van Ngoc P, Delogne S, Meyers E, Deschepper E, Duysburgh E, et al. Vaccine hesitancy towards the COVID-19 vaccine in a random national sample of Belgian nursing home staff members. *Vaccines.* 2022; 10: 598.
38. Baj-Rogowska A. Mapping of the COVID-19 vaccine uptake determinants from mining Twitter data. *IEEE Access.* 2021; 9: 134929-134944.
39. Hajek A, Sabat I, Neumann-Böhme S, Schreyögg J, Barros PP, Stargardt T, et al. Prevalence and determinants of probable depression and anxiety during the COVID-19 pandemic in seven countries: Longitudinal evidence from the European Covid Survey (ECOS). *J Affect Disord.* 2022; 299: 517-524.
40. Kamberi F, Sinaj E, Jaho J, Subashi B, Sinanaj G, Jaupaj K, et al. Impact of COVID-19 pandemic on mental health, risk perception and coping strategies among health care workers in Albania-evidence that needs attention. *Clin Epidemiol Glob Health.* 2021; 12: 100824.
41. Gasteiger N, Gasteiger C, Vedhara K, Broadbent E. Characteristics associated with the willingness to receive a COVID-19 vaccine and an exploration of the general public's perceptions: A mixed-methods approach. *Vaccine.* 2022; 40: 3461-3465.
42. Lastrucci V, Lorini C, Stacchini L, Stancanelli E, Guida A, Radi A, et al. Determinants of actual COVID-19 vaccine uptake in a cohort of essential workers: An area-based longitudinal study in the Province of Prato, Italy. *Int J Environ Res Public Health.* 2022; 19: 13216.

43. Chen S, Aruldass AR, Cardinal RN. Mental health outcomes after SARS-CoV-2 vaccination in the United States: A national cross-sectional study. *J Affect Disord.* 2022; 298: 396-399.
44. Kyprianidou M, Konstantinou P, Alvarez-Galvez J, Ceccarelli L, Gruszczyńska E, Mierzejewska-Floreani D, et al. Profiling hesitancy to COVID-19 vaccinations in six European Countries: Behavioral, attitudinal and demographic determinants. *Behav Med.* 2022; 1-12. doi: 10.1080/08964289.2022.2071198.
45. Carlton CN, Garcia KM, Andino MV, Ollendick TH, Richey JA. Social anxiety disorder is associated with vaccination attitude, stress, and coping responses during COVID-19. *Cognit Ther Res.* 2022; 46: 916-926.
46. Wang S, Quan L, Chavarro JE, Slopen N, Kubzansky LD, Koenen KC, et al. Associations of depression, anxiety, worry, perceived stress, and loneliness prior to infection with risk of post-COVID-19 conditions. *JAMA Psychiatry.* 2022; 79: 1081-1091.
47. Lazarus JV, Romero D, Kopka CJ, Karim SA, Abu-Raddad LJ, Almeida G, et al. A multinational Delphi consensus to end the COVID-19 public health threat. *Nature.* 2022; 611: 332-345.