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Is the mental health of young students and their family members affected during the quarantine period? Evidence from the COVID-19 pandemic in Albania

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Accessible summary

What is known on the subject?

- Mental health is deteriorated during the quarantine period.
- Mental health status is affected by the quarantine even after the end of it and for an extended period.

What the paper adds to existing knowledge?

- Depression levels among nursing/midwifery students during the quarantine period are high.
- Depression levels among students' family members during the quarantine period are high.
- Those who are not satisfied with COVID-19 prevention measures and those who believe that COVID-19 and quarantine can cause problems on health, have elevated levels of depression.

What are the implications for practice?

- Provision of mental health services during the quarantine period should be a priority for the healthcare system.
- Offering mental health first aid training and support can improve the mental health status of students and their family members.

Abstract

Introduction: The use of quarantine method has a significant impact on mental health status.

Aim: This study aimed to assess the levels of depression among bachelor and master university students (nurses/midwives) and their family members' during the quarantine period of COVID-19 pandemic.

Method: A cross-sectional study was conducted in Vlora University, Albania. Patient Health Questionnaire (PHQ-9) was used. Institutional e-mails of all active students were used for their recruitment.

Results: In total, 863 students and 249 family members participated in the study. The mean PHQ-9 score was 6.220 (SD = 5.803) and 6.280 (SD = 5.857) for students and family members, respectively. Being unsatisfied with COVID-19 prevention measures, beliefs that COVID-19 infection and quarantine process can cause problems on

their health status were the key factors for students to be screened positive for mental problems in multiple regression analysis. For parents, the last two factors were found to contribute significantly.

Discussion: Our findings indicate that quarantine measures have a significant impact on the levels of depression among both university students and their family members. Broader population studies are necessary to safeguard these results.

Implications for Practice: Provision of mental health services during the quarantine period is of paramount significance. Mental health first aid training and support could benefit both students and their parents significantly. Additionally, follow-up services after the end of quarantine are recommended.

KEYWORDS

COVID-19, depression, family members, PHQ-9, quarantine, university students

1 | INTRODUCTION

The SARS-CoV2 or COVID-19 first cases were initially detected in Wuhan, Hubei province in China (ECDC, 2020). By 16 April 2020, more than 2.078.000 cases have been diagnosed while the burden of death is up to 138.100 worldwide. In Albania, until June 5, the number of reported cases was 1.197 and 33 fatalities (Johns Hopkins CSSE, 2020). According to the available data (April 14, 2020), the countries with the highest numbers on positive cases and deaths are the USA, Italy and Spain (Johns Hopkins CSSE, 2020). In terms of strict measures implemented to prevent the transmission of the virus, China, and in particular Hubei province, was the first to be quarantined. Soon after, the European countries were put in a similar situation to China. The Albanian government was also among the first, which implemented stringent measures to prevent the spread of COVID-19. First, on March 10 2020, schools and Universities were closed and a total lockdown was put into force two days after. Only supermarkets, bakeries and pharmacies remained open. At the same time, people were allowed to leave their houses only for one hour per day, and only one member per family, from 05:00 am till 13:00 (with 40 hours lockdown during weekends) by keeping physical distance and respecting all the prevention measures.

Evidence from previous outbreaks data showed that quarantine measures have been effective (Dénes and Gumel, 2019; Gupta et al., 2005; Tsang and Lam, 2003) while preliminary data after COVID-19 outbreak showed that it is recommended as an effective way to stop disease transmission (Ng et al., 2020; Choi and Ki, 2020; Tang et al., 2020). World Health Organization (WHO) has stressed the potential psychological impact of COVID-19 outbreak on the population and published key messages for different target groups (WHO, 2020a).

A recent study in China evaluated the levels of depression and other mental health problems during the COVID-19 pandemic. Authors concluded that the prevalence of moderate to severe depressive symptoms, anxiety and stress in the general population is at 16.5%, 28.8% and 8.1% respectively (Wang et al., 2020a). Another study conducted in China showed no statistical differences in depressive, anxiety and stress scale during the initial outbreak and four weeks later (Wang et al., 2020b). According to Hao et al. (2020), the Depression, Anxiety and Stress Scale-21 during the COVID-19 outbreak was significantly higher (8.3 vs. 2.2; $p < 0.001$) on psychiatric patients in comparison to the healthy population. The prevalence of stress, insomnia, depression and anxiety was found at the levels of 1.5%, 2.3%, 3.7% and 3.8% respectively in the study of Tan et al. (2020). However, the authors concluded that returning to work after the quarantine period was not very stressful. A study among healthcare personnel in Singapore and India found that the prevalence of moderate to severe depression symptoms is at 5.3% (Chew et al., 2020).

Mental health problems are frequent to students' population, with nursing students being also at risk (Cilar et al., 2019; Holm-Hadulla & Koutsoukou-Argyraki 2015; Chernomas and Shapiro, 2013). The 27% of nursing students reported mild to extremely severe depression levels (Chernomas and Shapiro, 2013). Another study showed that depression prevalence among baccalaureate nursing students was at 35.8% (Cheung et al., 2016).

Since Universities curfew in Albania, students and their families were obligated to stay at home and respect the government rules for stopping the pandemic spread. Although the mental health status in the general population has been evaluated during the COVID-19 quarantine period (Wang et al., 2020a; Wang et al., 2020b), there is a lack of data about nursing and midwives students. In addition, Albania lacks of data on the mental status both of the general population and the students. Therefore, given, the psychological burden caused by similar emergencies in the past, this study aimed to evaluate the levels of depression of students (nursing and midwifery) and their family members' during the quarantine period.

2 | METHODS

2.1 | Study population

This is a cross-sectional study conducted in Vlora, Albania, with the participation of University of Vlora (UV) students from Faculty of Public Health and their parents/family members from March 30 till April 9. After the first ten days of quarantine, UV initiated the use of the GoogleClasroom platform for online classes. To join the e-classrooms, students needed to use their institutional e-mail to log in the platform and participate. All active students of the Faculty (both Bachelor and Master), attending the online classes, were asked to participate in the study.

To approach all students, the institutional e-mails of all Faculty students were provided to the research team from the Information Technology (IT) sector of the University. Twenty days after the quarantine, the link of the online questionnaire was sent to the institutional e-mails of the students to be completed both from them and their family members. General information regarding the purpose of the study, the questionnaires and the process to be followed were also included in the communication. The first reminder for those who had not responded yet was sent three days after and the second, seven days after the initial e-mail was sent. Additionally, University professors encouraged the students to participate in the study and reinforced the importance through the GoogleClasroom platform.

2.2 | Questionnaire

Google forms were used to distribute the questionnaire online. We used the Patient Health Questionnaire (PHQ-9) to measure depression levels and monitor severity (Kroenke & Spitzer, 2002). It is a tool translated in the Albanian language, validated and systematically used in primary healthcare settings for the annual population check-up (those aged 35-70 years old). The PHQ-9 questionnaire has been used before for screening depression among university students and the general population (Du et al., 2017; Ngasa et al., 2017; Zhang et al., 2013; Yu et al., 2012; Karekla et al., 2012; Al-Busaidi et al., 2011). Additionally, the online use of PHQ-9 has been suggested for screening depression among Chinese university students (Du et al., 2017).

The participants completing the PHQ-9 questionnaire were asked to rate the frequency (Not at all; Several days; More than half the days; Nearly every day) at which they had been bothered by any of the following problems the past two weeks: little interest or pleasure in doing things; feeling down, depressed or hopeless; trouble falling or staying asleep, or sleeping too much; feeling tired or having little energy; poor appetite or overeating; feeling bad about yourself or that you are a failure or have let yourself or your family down; trouble concentrating on things, such as reading the newspaper or watching television; moving or speaking so slowly that other people could have noticed or the opposite being so fidgety or restless that you have been moving around a lot more than usual; thoughts that you would be better off dead, or of hurting yourself.

Each statement was rated from zero to three and then the total score was calculated. Higher scores indicated higher depression levels (0-4 indicates minimal depression levels, 5-9 mild depression levels, 10-14 moderate depression levels, 15-19 moderate–severe depression levels and 20-27 severe depression levels). The cut-off score of 10 (PHQ-9 ≥ 10) which was previously found to have high sensitivity and specificity for major depression (Du et al., 2017; Kroenke et al., 2001) was set in the study.

Furthermore, questions related to gender, age and study programme were added to the students' questionnaire. To control the impact and satisfaction with the measures undertaken, three more questions were added: (1) Do you think that COVID-19 can cause problems to your health status; (2) Do you think that quarantine causes problems to your health status; and (3) Are you satisfied with the prevention measures undertaken to stop COVID-19 spread; As about the family members' questionnaire except the aforementioned, questions related to their working status were added.

2.3 | Statistical analysis

To analyse the data, the statistical programme IBM SPSS-23 was used. The significance levels were defined at the 0.05 level. PHQ-9 showed high-reliability rate to both populations. Cronbach's alpha indicator was 0.885 for students' population and 0.898 for family members' population. With absolute and relative, frequencies are presented the categorical variables and as mean and standard deviation the quantitative variables. In both populations, the cut-off point of 10 was used and in this way, we transformed the PHQ-9 in a dichotomous variable with participants having scored above nine considered depressed and those below ten not. We conduct simple logistic regression with the PHQ-9 used as the dependent variable and the rest as the independents.

In all cases, the Enter method was used. Dummy coding was done for qualitative variables. Multiple regression analysis was done by using the Backward Conditional method to explore the risk factors for PHQ-9 positive screening (PHQ-9 ≥10). The entry point of independent variables was set at 0.05 level and removal point at 0.10. Even though some variables did not show statistical significance during simple logistic regression analysis, we considered of higher importance to include all them in multiple regression analysis. We did not run Chi-squared test but conducted a multiple logistic regression analysis because this method gave us the possibility to neutralize different confounding factors at the same time. Additionally, based on the fact that the number of participants was high and the number of independent variables was low, our model is very much reliable. In both populations, after applying Hosmer–Lemeshow control, the *p*-value was found higher than 0.05, something that confirms the suitability of the logistic regression analysis. To some extent, the standard errors found were low, something that means a very low probability of linearity existence. After multiple regression analysis, the Nagelkerke R^2 was 0.232 for students' sample and 0.134 for family members' sample.

3 | RESULTS

Invitations were sent to 921 students in total. From them, 892 completed the questionnaire (response rate 96.8%). Twenty-nine questionnaires were withdrawn as incomplete. Finally, data from 863 students were used for the analysis. As about their family members, initially, 253 responded. Four questionnaires were withdrawn as incomplete. The final sample of the family members was 249. In both populations, the majority of the participants were female (88.6% among students and 70.8% among family members). The 79.5% of the students are conducting their bachelor studies and 90.3% of them reported being satisfied with the measures undertaken to prevent the spread of COVID-19. The 67.4% of the students and 75.2% of family members stated that COVID-19 can be harmful to their health. Additionally, 27.4% and 28.4% respectively indicated that quarantine can cause health problems for them (Table 1).

The mean PHQ-9 score for the students was 6.220 (SD = 5.803) and for the family members was 6.280 (SD = 5.857) with a range of 0-27 in both populations. The 25.2% (n = 217) of the students and 25.6% (n = 64) of the family members were above the threshold of PHQ-9 ≥ 10, indicating moderate to severe symptoms of depression.

In simple logistic regression analysis for students' population (Table 2), variables regarding the level of satisfaction with COVID-19 prevention measures ($p < 0.001$), if COVID-19 can cause problems to their health ($p < 0.001$) and if quarantine cause problems to their health status ($p < 0.001$), were statistically significant. With regards to the family members population (Table 2), if COVID-19 can cause problems to their health ($p < 0.001$) and if quarantine cause problems to their health status ($p < 0.001$) were statistically significant.

In multiple logistic regression analysis for students' population (Table 3), three factors were found to contribute significantly to being screened with an elevated risk for depression. Students who were not satisfied with COVID-19 prevention measures were more likely to have elevated levels of depression in comparison to those being satisfied (OR = 1.802; 95% CI: 1.070–3.036 $p = 0.027$). Students who believed that COVID-19 can cause problems on their health and students who believed that quarantine can cause problems on their health were more likely to be screened positive for depression (OR = 1.888; 95% CI: 1.275–2.797 $p = 0.002$ and OR = 6.312; 95% CI: 4.450–8.952 $p < 0.001$).

As for the family members, participants who consider that COVID-19 can cause problems on their health (OR = 2.471; 95% CI: 1.081–5.648 $p = 0.032$) and that quarantine can cause problems on their health were more likely to have elevated levels of depression (OR = 3.492; 95% CI: 1.895–6.437 $p < 0.001$), (Table 3).

4 | DISCUSSION

To our best knowledge, this is the first study in Albania and among the first worldwide to evaluate depression levels among nursing/midwifery students and their family members during the quarantine. Our research found that more than a quarter of both populations were screened with moderate to severe depression levels. Key factors contributing to high levels of depression were as follows: the perception that COVID-19 and quarantine can cause problems on their health (both population) and the satisfaction with prevention measures on students' population.

According to Albania Demographic and Health Survey (Institute of Statistics and Institute of Public Health and ICF, 2018), thirteen and eighteen per cent of Albanian females and males aged 15-59 reported feeling depressed a lot of the time or all of the time during the two previous weeks, at the time when the study was conducted. These results differ with the current study but we should take into account the different periods of receiving the data, the differences in representativeness and differences in data collection. In the Albanian study of Institute of Statistics and Institute of Public Health and ICF (2018), data were collected through interviews while in the current study via online questionnaires. Usually, participants are more reluctant to report their mental health situation in a face to face interview but easier while completing an anonymous online survey.

Our results are similar to a recent Chinese study in which authors concluded that the prevalence of moderate to severe depressive symptoms is at the levels of 16.5% (Wang et al., 2020a) but with no significant differences four weeks after the outbreak (Wang et al., 2020b). Our study has not re-evaluated the mental health of these populations. Findings of a study in University students at Thessaloniki, Greece, reported an increase of depression by 60.9% during the lockdown (Kaparounaki et al., 2020). Both studies received information via online tools, but in the current study, nursing and midwifery students were included while in the study of Thessaloniki University, students from all fields were recruited. However, the study of Wang et al. (2011) found no differences among quarantined and non-quarantined students during the H1N1 epidemic. To some extent, the students in the study of Wang et al. (2011) were quarantined only for seven days while now they were quarantined for more than four weeks. Prevalence of moderate to severe depressive symptoms differs between the current study and the healthy population in the study of Hao et al. (2020). Differences in the sample size, measuring instruments and data collection are the main reasons for these differences.

Differences in the prevalence of depression exist between the current study, the study of Chew et al. (2020) and the study of Tan et al. (2020). These differences can be attributed mainly to the different periods of data collection and the approach used, the differences in culture and on the instrument used, the intensity of the epidemic, the response from governments and healthcare systems as well as the possibility in selection bias in the current study.

In comparison to other studies in student populations which used the PHQ-9 questionnaire, our study reported much higher depression levels (Kim and Lee, 2019; Du et al., 2017; Karekla et al., 2012). However, we should take into account that these studies were conducted under normal conditions without the impact of isolation and quarantine, which most probably is the reason for these high levels. Similar results with our study with regards to the general population

TABLE 1 Demographic characteristics, depression levels and perceptions of Vlora University students and their families during the COVID-19 epidemic

Students				Family members			
Variable		**N**	**%**	**Variable**		**N**	**%**
Age	18-19	247	28.7	Age	Mean = 36.67 (SD = 14.65) Min.-Max. 18-85		
	20-21	405	47.0	Gender	Male	73	29.2
	22-23	155	18.0		Female	177	70.8
	24-25	21	2.4	Working status	Public sector	48	19.2
	>25	33	3.8		Private sector	51	20.4
Gender	Male	98	11.4		Self-employed	36	14.4
	Female	764	88.6		Unemployed	79	31.6
Study programme	Bachelor	686	79.5		Pensioner	7	2.8
	Master	177	20.5		Other	29	11.6
Satisfied with COVID-19 prevention measures	Yes	779	90.3	Can COVID-19 cause problems on your health	Yes	188	75.2
	No	84	9.7		No	62	24.8
Can COVID-19 cause problems on your health	Yes	580	67.4	Can quarantine cause problems on your health	Yes	71	28.4
	No	280	32.6		No	179	71.6
Can quarantine cause problems on your health	Yes	236	27.4				
	No	625	72.6				
Depression severity (total score)	Minimal depression (0-4)	432	50.0	Depression severity (total score)	Minimal depression (0-4)	129	51.6
	Mild depression (5-9)	214	24.8		Mild depression (5-9)	57	22.8
	Moderate depression (10-14)	125	14.5		Moderate depression (10-14)	39	15.6
	Moderate–severe depression (15-19)	60	7.0		Moderate–severe depression (15-19)	17	6.8
	Severe depression (20-27)	32	3.7		Severe depression (20-27)	8	3.2

are also reported elsewhere (Villarreal-Zegarra et al., 2019; Ahn, et al., 2014). However, since the family members' sample of our study is small, it cannot be considered as representative of the general population and interpretation of the results should be done with caution.

Most of the participants, in both populations, did not consider that quarantine can cause problems in their health status. Probably, this shows the low level of awareness on the potential impact of isolation on mental health. In contrast, a relatively small percentage of respondents (lower on family members) considered that COVID-19 could not cause problems on their health. Most probably, this comes as a result of the high numbers of confirmed cases and deaths in many countries as well as the everyday discussion in the media. The higher rates on family members could also reflect on the fact that COVID-19 affects older ages (WHO, 2020b). According to Chew et al. (2020), experiencing physical symptoms during the COVID-19 pandemic is significantly associated with depression at healthcare workers. However, our study did not evaluate physical symptoms and comparisons are not feasible.

Both students and family members who considered that quarantine itself and COVID-19 can cause problems on their health were more likely to have high levels of depression. According to a study among medical students, the presence of a recent major life event or being a student at the clinical level is significantly connected with depression (Ngasa et al., 2017). We cannot distinguish if they are facing endogenous depression or reactive depression as a result of the situation and further research is needed to confirm these findings.

The level of satisfaction with COVID-19 prevention measures in our study was correlated with mental health problems. Improvement of the prevention measures is a key issue that can decrease these health issues significantly. Giving more information about the impact of SARS-CoV-2 is not effective, although updating or developing training programmes and communication activities could be more helpful (Tran et al., 2020). Additionally, performing hand hygiene, wearing face masks, improvement of ventilation and school hygiene are some simple actions for the low prevalence of psychiatric symptoms (Tan et al., 2020).

Prevalence of depression in the current study is high on both populations, but differences were not found between gender and working status. However, during the period of this study, neither the students nor their family members returned to the University and/or their job positions. A recent study in China confirms that returning to work during the COVID-19 outbreak does not increase the prevalence of depression and other mental health symptoms (Tan et al., 2020). Probably, our results may possibly change after

TABLE 2 Simple Logistic Regression for students' population and family members population

Student population								
							95% C.I. for EXP (B)	
Variable		B	SE	*p*-value	Wald	Odds ratio	Min.	Max.
Gender	Male	Ref.						
	Female	0.162	0.256	.527	400	1.176	0.712	1.942
Study programme	Bachelor	Ref.						
	Master	0.130	0.191	.497	460	10.138	0.738	10.655
Satisfied with COVID-19 prevention measures	Yes	Ref.						
	No	1.074		<.001	2030.331	20.926	10.847	40.637
Can COVID-19 cause problems on your health	Yes	0.721	0.184	<.001	150.319	20.056	10.433	20.949
	No	Ref.						
Can quarantine cause problems on your health	Yes	1.965	0.174	<.001	128.020	7.138	5.078	10.033
	No	Ref.						

TABLE 3 Multiple logistic regression for students' population and family members population

Student population								
							95% C.I. for EXP (B)	
Variable*		B	S.E	*p*-value	Wald	Odds ratio	Min.	Max.
Can COVID-19 cause problems on your health	Yes	.635	0.200	.002	10.052	1.888	1.275	2.797
	No	Ref.						
Can quarantine cause problems on your health	Yes	1.842	0.178	<.001	106.758	6.312	4.450	8.952
	No	Ref.						
Satisfied with COVID-19 prevention measures	Yes	Ref.						
	No	0.589	0.266	.027	4.898	1.802	1.070	3.036

*All qualitative variables were included at covariates.

they go back to the daily routine, and further studies are needed to confirm this.

To improve the mental health status of the population, the coordination and collaboration of community settings and hospitals are important. The online provision of mental health services by using cognitive behavioural therapy and mindfulness-based cognitive therapy could meliorate the outcome (Ho et al., 2020).

5 | STRENGTHS AND LIMITATIONS

This is the first study to measure the depression levels of nursing/midwifery students and their family members in Albania during the COVID-19 outbreak and quarantine period. Students' response rate was very high, which means that generalizability can be done for this population. However, the results are self-reported and verification by using other screening instruments or by a clinician is recommended. Additionally, the sample of family members is low and the use of convenience sampling means difficulties in representativeness in the general population. Besides, although students were instructed not to influence the responses of their family members, a bias may have occurred. Lack of previous data makes difficult comparisons and determining whether the high percentage found is due to the quarantine situation or is indicative of the permanent mental health parameters of this population. However, these results can be used as a baseline.

6 | CONCLUSIONS

The psychological impact of quarantine due to COVID-19 outbreak is high among nursing and midwives students' of Vlora University as well

Family members population								
							95% C.I. for EXP (B)	
Variable		B	SE	*p*-value	Wald	Odds ratio	Min.	Max.
Gender	Male	Ref.						
	Female	0.282	0.330	.392	731	1.326	0.695	2.529
Working status	Public sector	Ref.						
	Private sector	0.241	.465	.604	269	1.273	0.511	3.167
	Self-employed	−0.396	0.564	.482	494	0.673	0.223	20.031
	Unemployed	0.384	0.422	.363	828	1.468	0.642	3.354
	Pensioner	−0.579	1.133	.610	261	.561	0.061	5.169
	Other	0.248	0.539	.646	212	10.281	0.446	30.686
Still work after the pandemic	Yes	Ref.						
	No	0.515	0.385	.181	1.787	1.673	0.787	3.559
Can COVID-19 cause problems on your health	Yes	1.052	0.411	<.001	6.552	2.864	1.280	6.409
	No	Ref.						
Can quarantine cause problems on your health	Yes	Yes	1.327	.308	<0.001	18.543	3.769	2.060
	No	Ref.						

Family members population								
							95% C.I. for EXP (B)	
Variable*		B	S.E	*p*-value	Wald	Odds ratio	Min.	Max.
Can COVID-19 cause problems on your health	Yes	0.905	0.422	.032	4.603	2.471	1.081	5.648
	No	Ref.						
Can quarantine cause problems on your health	Yes	1.251	0.312	<.001	16.062	3.492	1.895	6.437
	No	Ref.						

as among their family members. At a cut-off point of ten (PHQ-9 ≥ 10), 25.2% of the students and 25.6% of the family members were screened positive. Key factors for this were found perceptions that COVID-19 and quarantine can cause problems on health. Nursing and midwifery students, as well as their family members, could benefit from mental health support during the quarantine period. Offering mental health first aid training and support could be a useful approach to provide help and to ease the symptoms they are experiencing.

7 | RELEVANCE STATEMENT

This is the first study that assesses depression levels of nursing and midwifery students as well as their family members during the quarantine period in Albania. This study can be used as a baseline for further assessment of depression levels during and after the end of quarantine. Looking after and providing mental health services to nursing and midwives students as well as their family members are recommended. Having healthy future healthcare personnel should be a priority for health policymakers.

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CONFLICT OF INTEREST

All authors declare no conflicts of interest.

AUTHORSHIP

EAM and EP2 designed the study. AS, FK, EP1 and JB contributed in data collection. EAM and CG did the statistical analysis. EAM, AS and AP prepared the first draft. All authors reviewed the article

and provided comments. All authors accepted the final version after revisions.

ETHICAL STATEMENTS

The ethical committee of the Faculty of Public Health was informed and approved the study. Due to the University lockdown, the request and approval were handed to us by e-mail (issue date 26/03/2020). No personal data were recorded, and all questionnaires were completed anonymously. Due to technical difficulties of using printed material, participants were informed through e-mail that by participating, they provide their convent (students and family members) to the researchers. This information was also shared with them during the online classes when they were first invited to participate in the study. Additionally, they were informed that participation in the study was voluntary and participants could withdraw at any moment. Furthermore, they were informed that all the data collected will be used only for the current study. All ethical guidelines for medical research were strictly respected.

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