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Prevalence and correlates of depression and anxiety among University of Rwanda community during COVID-19 pandemic in 2020

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ABSTRACT

INTRODUCTION: The COVID-19 pandemic disrupted many aspects of people's well-being worldwide, including the mental and physical health of university students and staff. The aim of this study was to assess the prevalence and correlates of depression and anxiety during COVID-19 pandemic in students and staff of the University of Rwanda (UR).
METHODS: Utilizing an online Google form, this rapid screening cross-sectional study collected and analyzed primary data from 693 participants (students: 73.9% and staff: 26.1%). Data was collected using a sociodemographic characteristic questionnaire and the Hopkins Symptom Checklist-25 (HSCL-25) for anxiety and depression. Multiple logistic regression model was used to test the association between social demographic characteristics, historical background and outcome variables.
RESULTS: This study found that about 40.6% of students had anxiety symptoms while 38.5% exhibited depression symptoms. Among staff, 34.8 % reported anxiety and 29.3% reported depression. Associated factors of anxiety included experiencing quarantine, pre-existing mental health conditions, exposure to violence, and belonging to a low-income household. Depression was linked to pre-existing mental health issues, COVID-19 related quarantine, and experiences of violence. Notably, students were more prone presenting with symptoms of depression as opposed to staff.
CONCLUSION: The study revealed a high prevalence of anxiety and depression among both students and staff. These findings emphasize the need for mental health services to be made available on campus to support those in the university community who are in need of assistance.

INTRODUCTION

On 11 March 2020, the World Health Organization (WHO) declared the outbreak of a new coronavirus disease, COVID-19, to be a Public Health Emergency of International Concern [1].

This meant that around the world, countries have woken up to the global health challenge that is COVID-19. None would have imagined that in this time of the year lock down and physical distancing would be the ultimate vaccine across the globe. This outbreak has profoundly affected our way of living and our dreams of life. Globally, the pandemic has spread rapidly leading to increased cases of infected people and deaths. For example, the data reported on March 27th, 2020, revealed that cases of contamination and death have passed 510,528 and 23,028 respectively; with 122, 232 recovered [2].

The COVID-19 pandemic has spread quickly in the majority of the world's nations and has had unexpected effects on health, the economy, society, education, and psychology [3-6]. People frequently experience fear and stress related to a health crisis, which can lead to depression, stress, and anxiety [7-9]; the evidence shows that the Chinese experienced a high level of psychological distress in the times of COVID-19 [1]. Most of the studies carried out in different countries found high psychological difficulties among participants during the COVID-19 crisis [10,11]. The COVID-19 pandemic also had a significant psychological impact on students, as demonstrated by Gazmararian et al., who also documented high rates of anxiety, depression, and stress among students [12]. Additionally, the study conducted by Shepherd et al showed that a majority of students confirmed that the COVID-19 limitations (quarantine and lockdown) had negatively impacted their mental health and thus expressed anxiety, panic, and depression [13].

In Rwanda, numbers were also increasing, and the country had, as of April 9th, 2020, registered 113 confirmed COVID-19 cases and 7 recovered cases [14]. For preventing the rapid spread of the coronavirus, the World Health Organization and countries' governments have taken serious measures which included washing hands regularly for 20 seconds, covering nose and mouth when you cough or sneezing, avoiding close contact, staying home and self-isolation. For example, in China, several measures like discouraging mass gatherings, cancelling or postponing large public events, the closing of schools and universities etc. were strictly enforced by the Chinese authorities as part of the social distancing mandate. Those policies have led to Chinese citizens changing their daily routines and adopting safety behaviors to protect themselves against the spread and contamination of COVID-19 i.e. by avoiding social contact and wearing protective masks [15]. Staying home and social distancing as preventive measures have demonstrated significant impact and success in preventing the COVID-19 spread and contamination[16,17]. However, it is assumed that such a health crisis which has confinement as a preventive measure might be stressful and depressing thus resulting in unhealthy coping strategies which could negatively affect the physical and mental health outcomes associated with the pandemic [16,17]. At all ages, anxiety and fear about COVID-19 can be overwhelming and cause poor outcome for both mental and physical health. Following the 2009 – 2010 H1N1 influenza pandemic, scholars have identified emotional and behavioral needs that were associated with the disease, and which in turn constituted risk factors for poor physical health improvement and recovery [4]. The existing literature has documented several risk factors that affect the development and reaction to health crises like COVID-19 such as attitudes and perception towards the pandemic or disease. At the same time, pre-existing physical and mental conditions were also considered as predicting factors of poor mental health outcomes from the direct and indirect exposure to the pandemic[18]. To this we can deduce that pre-existing anxiety and depression related disorders can be triggers and vulnerability factors for more mental disorders as a result of the COVID-19 outbreak.

In Rwanda, a recent mental health survey conducted in 2018 prior to the pandemic has yielded highest prevalence rates of mental disorders both in the general population and in the sub-sample of survivors of the 1994 genocide against the Tutsi [19].Overall, the prevalence of one or more mental disorders among the general population was 20·49% (N=19,110) and 52·2% (N=1271) in the sample of survivors of the 1994 survivors of the genocide committed against Tutsi in Rwanda. Within the general population, the most prevalent mental disorders were major depressive episode (12·0%), panic disorder (8·1%) and post-traumatic stress disorder (PTSD) (3·6%), while in survivors, major depressive episode was the most prevalent mental disorder (35·0%) followed by PTSD and panic disorders (27·9% and 26·8%, respectively)

[19]. It is therefore considered that the pre-existing poor mental health within the Rwandan population can exacerbate the management of COVID-19 and lead to more mental health difficulties. In other words, the pre-existing mental precocities can worsen the situation and lead to more internalized (anxiety, depression) and externalized (e.g. addictions, sleep difficulties, social isolation, etc.) problems.

Like other Rwandans, the University of Rwanda community (staff and students) was greatly affected by COVID-19 and thus mandates such as social distancing was observed as a preventive measure of its spread. Even though social distancing and isolation mitigate the spread of COVID-19, this coping strategy limits social interaction and social sharing of emotions. In turn, reduced social support and social emotions expression constitute important risk factors to anxiety and depression related difficulties [20]. As such, students and staff were confined at home with limited social contact, which predisposes various mental health and psychosocial needs. The aim of this study was to assess the prevalence and correlates of depression and anxiety during COVID-19 pandemic in students and staff of the University of Rwanda (UR).

METHODS

Study design: This study employed a rapid screening and cross-sectional design conducted entirely online (via Google Form) in 2020. An electronic questionnaire was developed for the purpose of this study which included questions concerning socio-demographic information (age, sex, level of education, marital status, family size, occupation, etc), and chronic health conditions (mental and physical conditions), and experience about COVID-19 Additionally, participants were assessed on the following outcomes: anxiety and depression (Hopkins' Symptoms Checklist-25). Given that the participants were from the university community (both staff and students), the questionnaire was an English version.

Outcome variables: In this current study, the outcome variables were depression and anxiety. The Hopkins Symptom Check List-25 (HSCL-25) is a 25 items instrument used to measure common psychiatric symptoms of depression and anxiety in both clinical and non-clinical samples. The first 10 items assess anxiety symptoms while the remaining 15 items test for depression [21]. An average score of 1.75 indicates a significant level of distress and this was the cutoff point used in our analyses. Our sample showed a very good internal consistency for anxiety (α=0.907) and depression (α=0.911) subscales.

Covariates: Socio-demographic variables in this current study included gender (female and male), marital status (single, married, in relation, separated and cohabiting), number of children (none, 1 to 3, and more than 3), level of education (year 1-5, bachelor, master, and PhD), occupation (undergraduate students, postgraduate students, academic and administrative staff), college (Arts and Social Sciences, Agriculture and Veterinary Medicine, Business and Economics, Education, Medicine and Health Sciences, and Science and Technology); Ubudehe category (none, category 1, category 2, category 3, and category 4); religion (none, Christianity, and Muslim); age (18-24, 25-35, 36-45, 46-49, and above 50); had an existing physical health condition (yes and no), and had an existing mental health condition prior to COVID-19 Pandemic (yes and no), faced a quarantine as a result of COVID-19 (yes and no), experienced any type of the violence during lock-down/quarantine (yes and no), and have been quarantined (yes and no).

The study was submitted for review and approval to the Institutional Review Board, UR-College of Medicine and Health Sciences. All ethical principles to include informed consent, non-maleficence and minimal harm, as well as confidentiality were strictly complied with. The data collected was recorded and uploaded with a security code to limit accessibility. All investigators passed the certificate of training courses for protecting human research participants.

Data analysis: During the data analytical process, data was analyzed descriptively using frequencies, percentages and mean to describe the characteristics of participants (students and staff members). Chi-square test was applied to test if there is an association between depression, anxiety and study variables. Furthermore, a multivariate logistic regression model was used to assess whether participants' social demographic characteristics and existing health issues influence their likelihood of experiencing depression and anxiety. All analyses were conducted using Statistical Package for The Social Sciences (SPSS version 25).

Table 1: *Participants characteristics*

Study variables	Frequency	Percent
Status		
Student	512	73.9
Staff	181	26.1
Gender		
Female	212	30.6
Male	481	69.4
Marital Status		
Single	491	70.9
Married	196	28.3
Separated	4	0.6
Cohabiting	2	0.3
Level of education		
Advanced diploma	8	1.2
BSc	65	9.4
MSc	144	20.8
PhD	32	4.6
Undergraduate	444	64.1
Occupation		
Undergraduate Student	478	69.0
UR-Post-graduate Student	34	4.9
UR- Academic Staff	156	22.5
UR-Administrative Staff	25	3.6
College Affiliation		
Colleges of Arts and Social Sciences	41	5.9
Colleges of Agriculture and Veterinary Medicine	46	6.6
College of Business and Economics	31	4.5
College of Education	23	3.3
College of Medicine and Health Sciences	477	68.8
College of Science and Technology	75	10.8
Ubudehe Category		
None	46	6.6
Category 1	54	7.8
Category 2	160	23.1
Category 3	427	61.6
Category 4	6	0.9
Religion		
None	18	2.6
Christianity	661	95.4
Muslim	14	2.0
Had an existing physical health condition		
No	661	95.4
Yes	32	4.6
Had an existing mental health condition prior to COVID-19 Pandemic		
No	608	87.7
Yes	85	12.3
Faced a quarantine as a result of COVID-19		
No	432	62.3
Yes	261	37.7
Had been infected with Corona Virus and isolated as a result		
No	648	93.5
Yes	45	6.5
Experienced any violence		
No	608	87.7
Yes	85	12.3

RESULTS

Table 1 provides the descriptive statistics of our sample. Within the sample, 73.9 percent were students, while 26.1 percent were staff members. The majority of our sample were male (69.4 percent). Regarding the marital status, a vast majority of the respondents were unmarried, making up 70.9 percent; followed by married participants (28.3%). The highest proportion of participants were undergraduate and masters' students (64.1% and 20.8%, respectively). Besides this, most of the participants were affiliated to the college of medicine and health sciences (68%). With respect to participants' ubudehe categories, the results show that the majority were in the third and second categories (61.6 % and 23.1 %, respectively). In light of health conditions, 4.6% and 12.3% reported that they had existing physical and mental health conditions, respectively. Additionally, 37.7% confirmed that they faced a quarantine as a result of COVID-19, while 6.5%

Table 2: *Prevalence of depression and anxiety among students*

Study variables		Had depression symptoms				Had anxiety symptoms			
		No		Yes		No		Yes	
		Freq	%	Freq	%	Freq	%	Freq	%
Status	***p*-value**	**0.027**				**0.168**			
Student		315	61.5	197	38.5	304	59.4	208	40.6
Staff		128	70.7	53	29.3	118	65.2	63	34.8
Gender	***p*-value**	**0.343**				**0.853**			
Female		130	61.3	82	38.7	128	60.4	84	39.6
Male		313	65.1	168	34.9	294	61.1	187	38.9
Marital status	***p*-value**	**0.431**				**0.399**			
Single		305	62.1	186	37.9	295	60.1	196	39.9
Married		134	68.4	62	31.6	122	62.2	74	37.8
Separated		3	75.0	1	25.0	4	100.0	0	0.0
Cohabiting		1	50.0	1	50.0	1	50.0	1	50.0
Level of education	***p*-value**	**0.367**				**0.438**			
Advanced diploma		5	62.5	3	37.5	5	62.5	3	37.5
BSc		40	61.5	25	38.5	42	64.6	23	35.4
MSc		97	67.4	47	32.6	89	61.8	55	38.2
PhD		25	78.1	7	21.9	24	75.0	8	25.0
Undergraduate		276	62.2	168	37.8	262	59.0	182	41.0
Occupation	***p*-value**	**0.177**				**0.509**			
Undergraduate Student		294	61.5	184	38.5	283	59.2	195	40.8
UR-Post-graduate Student		21	61.8	13	38.2	21	61.8	13	38.2
UR- Academic Staff		110	70.5	46	29.5	103	66.0	53	34.0
UR-Administrative Staff		18	72.0	7	28.0	15	60.0	10	40.0
College Affiliation	***p*-value**	**0.363**				**0.645**			
Colleges of Arts and Social Sciences		24	58.5	17	41.5	26	63.4	15	36.6
Colleges of Agriculture and Veterinary Medicine		32	69.6	14	30.4	29	63.0	17	37.0
College of Business and Economics		20	64.5	11	35.5	18	58.1	13	41.9
College of Education		16	69.6	7	30.4	13	56.5	10	43.5
College of Medicine and Health Sciences		311	65.2	166	34.8	297	62.3	180	37.7
College of Science and Technology		40	53.3	35	46.7	39	52.0	36	48.0
Ubudehe Category	***p*-value**	**0.935**				**0.065**			
None		32	69.6	14	30.4	31	67.4	15	32.6
Category 1		35	64.8	19	35.2	24	44.4	30	55.6
Category 2		100	62.5	60	37.5	95	59.4	65	40.6
Category 3		272	63.7	155	36.3	267	62.5	160	37.5
Category 4		4	66.7	2	33.3	5	83.3	1	16.7

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Table 2. Continued

Religion	***p*-value**		**0.460**				**0.586**	
None		9	50.0	9	50.0	13	72.2	5	27.8
Christianity		425	64.3	236	35.7	401	60.7	260	39.3
Muslim		9	64.3	5	35.7	8	57.1	6	42.9
Had an existing physical health condition	***p*-value**		**0.193**				**0.581**	
No		426	64.4	235	35.6	404	61.1	257	38.9
Yes		17	53.1	15	46.9	18	56.3	14	43.8
Had an existing mental health condition prior to COVID-19 Pandemic	***p*-value**		**<0.001**				**<0.001**	
No		420	69.1	188	30.9	393	64.6	215	35.4
Yes		23	27.1	62	72.9	29	34.1	56	65.9
Faced a quarantine as a result of COVID-19	***p*-value**		**0.024**				**0.001**	
No		290	67.1	142	32.9	283	65.5	149	34.5
Yes		153	58.6	108	41.4	139	53.3	122	46.7
Had been infected with Corona Virus and isolated as a result	***p*-value**		**0.571**				**0.088**	
No		416	64.2	232	35.8	400	61.7	248	38.3
Yes		27	60.0	18	40.0	22	48.9	23	51.1
Experienced violence	***p*-value**		**<0.001**				**<0.001**	
No		413	67.9	195	32.1	392	64.5	216	35.5
Yes		30	35.3	55	64.7	30	35.3	55	64.7

Freq: Frequency; %: Percentage

have been infected with Corona Virus and isolated as a result, and a further 12.3% experienced any type of violence. The mean age was 28.61years (SD=9.36).

Table 2 shows that the prevalence of depression among students (38.5%), was significantly higher compared to staff members (29.3%). On the other hand, the prevalence of anxiety was almost equal between both students and staff members (39.6% and 38.9%, respectively). Participants who had existing mental health conditions prior to the COVID-19 pandemic had a higher prevalence of depression and anxiety than participants who had no existing mental health conditions. A significantly higher prevalence of depression and anxiety was noted among participants who had experienced any type of violence compared to those who did not experience violence during COVID-19. Findings also indicated that depression and anxiety was more prevalent among participants who faced a quarantine because of COVID-19 than those who did not face it. Tables 3 and 4 shows the results of multiple logistic regression model. Students had significant higher odds for having depression symptoms compared to UR staff members (OR=1.51, 95%CI=1.05-2.18). Participants who had existing mental health conditions prior to COVID-19 pandemic also had significantly higher odds of depression symptoms than those who had no pre-existing mental health conditions (OR=4.91, 95%CI=2.90-8.31). On the other hand, participants who had experienced any type of violence were associated with increased risks of having depression symptoms (OR=2.95, 95%CI=1.76-4.88). Additionally, the participants who faced a quarantine because of COVID-19 were more likely to have depression symptoms than those who did not face the quarantine (OR=1.47, 95%CI=1.04-2.06).

Table 4 above provides information related to associated factors of anxiety symptoms. The results show that participants from category 1 were

Table 3: *Factors associated with depression symptoms*

			95% C.I	
	***p*-value**	**aOR**	**Lower**	**Upper**
Occupation				
Undergraduate Student	0.523	1.360	0.530	3.490
UR-Post-graduate Student	0.538	1.444	0.448	4.655
UR- Academic Staff	0.871	1.085	0.404	2.910
UR-Administrative Staff (ref)				
Had an existing physical health condition				
No(ref)				
Yes	0.154	1.752	0.811	3.786
Had an existing mental health condition prior to COVID-19 Pandemic				
No (ref)				
Yes	<0.001	4.911	2.904	8.307
Faced a quarantine as a result of COVID-19				
No (ref)				
Yes	0.028	1.466	1.042	2.062
Experienced any type of violence				
No (ref)				
Yes	<0.001	2.935	1.764	4.882
Status				
Student	0.027	1.510	1.047	2.179
Staff (ref)				

C.I.: Confidence interval; aOR: Adjusted odds ratio, ref: reference category

associated with increased risks of having anxiety symptoms (OR=9.08, 95%CI=1.80-16.42). Those who had an existing mental health condition prior to COVID-19 were associated with higher odds of having anxiety symptoms (OR=3.16, 95%CI=1.90-6.26) than those who did not. There was an association between facing a quarantine and having higher odds of anxiety symptoms (OR=1.67, 95%CI=1.20-2.34). Furthermore, experiencing any type of violence was associated with higher odds of anxiety symptoms than having not experienced any type violence (OR=2.83, 95%CI=1.71-4.68).

DISCUSSION

To the best of our knowledge, this is the first study to examine the prevalence and correlates of anxiety and depression among the University of Rwanda community (staff and students) during the pandemic of COVID-19. Overall, the study has found that prevalence of depression among students (38.5%), was significantly higher compared to staff members (29.3%). On the other hand, the prevalence of anxiety was almost equal between both students and staff members (39.6% and 38.9%, respectively). These results were confirmed by other studies conducted in Bangladesh where 82% of the university community suffered from moderate to severe depression and anxiety [22].

In another study conducted in China, the symptoms of depression and anxiety were also found in students during lockdown periods, 1 year after the onset of the pandemic [23,24]; Similarly, in Malaysia, a significant prevalence of anxiety in students was observed during the first year of the pandemic [25]. However, the case of Sweden was different [26]. The DASS21 survey was launched in Swedish students during the first 3 months of the pandemic and no significant increase in stress,

Table 3: *Factors associated with anxiety symptoms*

			95% C.I	
Study variables	***p*-value**	**aOR**	**Lower**	**Upper**
Ubudehe category				
None	0.347	3.186	0.284	35.695
Category 1 (very poor)	0.049	9.075	0.804	102.429
Category 2 (poor)	0.206	4.644	0.429	50.248
Category 3 (middle)	0.263	3.817	0.365	39.923
Category 4(upper) (ref)				
Had an existing mental health condition prior to COVID-19 Pandemic				
No (ref)				
Yes	<0.001	3.156	1.895	6.256
Status				
Students	0.461	0.857	0.569	1.291
Staff (ref)				
Faced a quarantine because of COVID-19				
No				
Yes	0.002	1.674	1.199	2.338
Suspected of having been infected with Corona Virus and isolated as a result				
No (ref)				
Yes	0.244	1.454	0.775	2.728
Experienced any type of violence				
No (ref)				
Yes	<0.001	2.829	1.710	4.681

C.I.: Confidence interval; aOR: Adjusted odds ratio, ref: reference category

anxiety, and depression levels was revealed. On the contrary, Swedish students' mental state was improved, especially during the summer months of the first year of the pandemic [26].The exact reason for the difference is not firm, but there is a possibility that the students were well informed which resulted in proactive behaviors for taking care of their mental well-being [25].

Concerning the issues of staff and students, there's no specified reason for why students suffered more than staff, but we can consider staff as mature and being more informed about what to do which can lessen their depression and anxiety. Furthermore, being married and having children may have served as a protective factor from mental illness for the staff members.

On the other hand, participants who experienced any type of violence (e.g., domestic violence, sexual violence, intimate partner violence, emotional abuse) were associated with increased risks of having depression symptoms. Additionally, the participants who faced a quarantine because of COVID-19 were more likely to have depression symptoms than those who did not face the quarantine. These results were supported by other studies which indicated that students who witnessed domestic violence in the family are more likely to suffer from depression and anxiety compared to those who did not [27,28].

Our results also show that, participants from category 1(from very poor family) were associated with increased risks of having anxiety symptoms. This was supported by a study conducted in the United States of America which revealed that students with low quality of life and health, low income, and of young age were at risk of

psychological distress due to the pandemic [29].
We also observed that students who perceived their families' economic condition as poor are more depressed, anxious, and co-morbid compared to those who think that they are financially well-off, and the results are statistically significant. Students judge their economic well-being in terms of how well-off their friends and other classmates are. In this era of social media, people are constantly engaging in comparison of their own purchasing capacity against others [30]. In the case of the students in our sample, such perception seemed to be more important compared to quantifiable levels of income.
Furthermore, participants who had existing mental health conditions prior to the COVID-19 pandemic had higher prevalence of depression and anxiety than participants who had no pre-existing mental health conditions. Those who had an existing mental health condition prior to COVID-19 were associated with higher odds of having anxiety symptoms than those who did not have the symptoms. This was supported by theoretical framework on the previous studies which described anxiety disorders as recurrent especially during a stressful period [31], Contrary to the other studies, the respondents in a study conducted by Falade et al. with previous history of mental illness were less likely to have anxiety disorders. This was because COVID-19 pandemic has generated fear amongst the general population [32] , therefore, respondents with no history of mental illness may have been experiencing this level of anxiety for the first time compared to respondents who had previous history of mental illness and might have experienced a stressful event for which they had already been attending regular mental health clinics. Our findings also showed that, participants with pre-pandemic mental health conditions had higher odds of depression than those with no pre-pandemic mental health conditions. Nevertheless, our findings are supported by previous studies that found having pre-existing mental health diagnosis was associated with increased depression scores [33-36].

CONCLUSION

The findings of the present study indicate that the prevalence of depression and anxiety was high among the University of Rwanda community during COVID-19 pandemic. This study also highlighted a significant association between facing quarantine during COVID-19, having existing mental health conditions prior to the pandemic, experiencing any type of violence, and being in poor category of Ubudehe and mental disorders (depression and anxiety). Finaly, the findings call for mental health services provision, availability and accessibility to respond to the mental health and psychosocial support needs expressed by the participants to this study. Governments should allocate resources and work with experts to establish mental health support programs. Community organizations play a vital role in mobilizing resources and advocating for prioritizing mental health. Student clubs must be empowered to advocate for services, engage in self-care, and foster supportive environments. Universities must establish mental health support facilities for students. Digitalization of mental health support and mental health resources is important and plays a vital role in special cases like the COVID-19 pandemic

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