STUDY OF THE DETERMINANTS OF ANXIETY AND DEPRESSION: A CASE STUDY IN MOROCCAN STUDENTS

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Abstract: The mental health of university students was a public health concern even before the Covid-19 pandemic. Several international studies before and during the pandemic revealed worrying prevalence of mental health disorders. In Morocco, few studies have been conducted on university students. The main objective of our study is to study and promote the management of psychological disorders among students in Morocco during and after a health crisis. A cross-sectional study with an analytical aim was conducted among university students in the RSK region. A total of 401 university students aged 18 to 29 responded to a structured electronic questionnaire, validated psychometric scales, and a pre-tested survey shared online. The data analysis was performed using Epi-Info™ 7.2. The prevalence of psychological distress among university students in the RSK region was 59% (95% CI [56%; 63%]). One in three students had symptoms of depression (95% CI [31%; 38%]), and 38% had symptoms of anxiety (95% CI [34%; 41%]). More than half of the students showed signs of loneliness (95% CI [47%; 55%]), and over half suffered from low social support (95% CI [53%; 61%]). Key determinants included a history of psychological issues, smoking habits, loneliness, and lack of social support during the crisis. Students with higher education levels (master's and doctorate degrees), those who disliked distance learning, and those facing serious financial difficulties were most at risk. The study highlights the fragility of students' mental health during a serious health crisis. The prevalence of psychological distress, depressive, and anxious symptoms is concerning.

Keywords: Moroccan, university student, determinant, Anxiete, depression.

Introduction

In December 2019, the novel coronavirus pneumonia (COVID-19) first spread in Wuhan City, Hubei Province[1]. On January 30, 2020, the World Health Organization declared the COVID-19 outbreak a public health emergency of international concern [2]. Following China, Italy, and France, Morocco implemented strict measures to curb SARS-CoV-2, confining citizens and banning non-essential travel[3,4]. Based on recorded lockdown experiences from previous outbreaks, a recent literature review concluded that quarantine measures can have negative psychological effects, including post-traumatic stress, stress, anxiety, and depression symptoms[5]. Assessments of mental health in the general populations of China and Iran in 2020, both countries significantly affected by major outbreaks, indicate increased stress levels due to the pandemic[6]. A key concern during

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the pandemic is the mental health of vulnerable populations. The Center for Collegiate Mental Health's 2019 annual report highlighted that anxiety remains the most prevalent issue, affecting 62.7% of 82,685 respondents[7]. Furthermore, general panic related to the outbreak and the risk of exposure have contributed to heightened levels of depression among students who completed the Counseling Center's Psychological Symptom Assessment [8]. College students, in particular, seem especially vulnerable to the negative effects of quarantine among the general population. Even before the COVID-19 pandemic, young adults' mental health was already a global concern[5,9]. Thus, in the "Conditions de vie 2020" survey of the National Observatory of Student Life (OVE) in France, according to the relationship to studies, budget, housing and state of health, the objective of which is to "monitor the evolution of student living conditions over time 2016-2020". An aggravated weakening of the mental health of students by the health crisis was noted, 30% of students showed signs of psychological distress. However, the highest proportions of young people in psychological distress were recorded among foreign students (42%), female students (35%) and scholarship students (34%). Added to these determinants are all the difficulties caused by confinement such as loneliness or isolation (50% of students), relational difficulties with the people with whom they cohabited (34%), grief linked to the loss of a close relative (7%) and only 15.9% of the students surveyed did not feel any psychological fragility (exhaustion, stress, depression, sleep problems, loneliness or isolation) [4]. At the national level, since the beginning of 2020, Morocco, like the majority of countries in the world, has been facing the SARS-CoV-2 pandemic. This epidemic has led the Moroccan government to take various measures in terms of restricting travel, closing businesses and even educational establishments. Thus, on March 13, the Moroccan Ministry of National Education, Vocational Training, Higher Education and Scientific Research (MEN) announced the closure of nurseries, schools, colleges, high schools and universities, from Monday March 16, 2020 and "until further notice", courses were taught remotely and educational continuity had been established[10]. On September 14, 2021, the vaccination of young pupils and students was made public with a postponement of the start of the school and university year, a resumption of face-to-face classes postponed to October 1, 2021[11].
Faced with this pandemic, little research generating scientific data concerning the mental health of Moroccan students during the Covid-19 pandemic is available. During this phase of the pandemic, it is necessary, even essential, to conduct this study in Morocco, to have an idea of the real mental health situation of students and to take stock[6,12,13]. Our study will provide evidence to support policy decision-making in this area and promote scientific research in this direction. This study will also inform Moroccan decision-makers about the effects of confinement on the mental health of Moroccan university students through various indicators, namely psychological distress, social support, loneliness, and symptoms of depression and anxiety during the health crisis phase[14,15]. The scope of this study will highlight the need to consider students' mental health during crises requiring isolation or compulsory confinement The main objective of our study is to study psychological disorders among students in the Rabat-Salé-Kénitra region in Morocco (RSK) during the COVID-19 pandemic.

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Method

Study design and population

This cross-sectional study with analytical purposes employed a quantitative approach, using a structured, pre-tested electronic questionnaire. The survey targeted university students aged 18 to 29 in the Rabat-Salé-Kénitra (RSK) region. Each participant was assigned a unique identification number by the application, ensuring only one response per student. To achieve better representativeness of the student population in the RSK region, we used a purposive sampling method. This method was based on the number of students from each of the two universities in the RSK region, taking into account gender, the proportion of foreign students, and the level of studies. This approach ensured that the number of female and foreign students, as well as the levels of study, in our sample was proportional to their actual distribution in the universities of the RSK region. The electronic questionnaire survey began in October 2021 and was conducted over a period of six months

Data collection tools

For the collection of quantitative data, we used an electronic self-questionnaire that ensured the anonymity of participants. The questionnaire was adapted and subjected to a preliminary pre-test. It included questions grouped into different sections:

- General Data: This section focused on identifying the socio-demographic characteristics of the students
- Knowledge about Mental Health: This section assessed the students' knowledge about mental health.[16].
- Mental Health Assessment: This section included different psychometric tests to measure various aspects of mental health:
  - ❖ Psychological Distress: Assessed using the Mental Health Inventory - 5 (MHI-5)[17].
  - ❖ Social Support: Measured through the OSSS-3 test [18].
  - ❖ Loneliness: Evaluated using the UCLA Loneliness Scale Version 3 [19].
  - ❖ Anxiety and Depression: Assessed using the Hospital Anxiety and Depression Scale (HADS)[20,21].

Data analysis plan

The data from the questionnaire were coded, entered, cleaned, and analyzed using Epi-Info version 7 software. The statistical analysis included a detailed description of the study population based on various socio-demographic and academic characteristics, medical history, habits, psychological indicators, and suicidal ideation. Results are presented through maps, graphs, and tables, utilizing descriptive statistics to describe the study population in relation to relevant variables. The prevalence of mental disorders and psychological indicators was calculated as follows:

Prevalence Calculation: The number of university students identified with mental health issues based on the psychometric scales used was divided by the total number of respondents.

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Ethical Consideration

Informed consent was obtained from all participants, ensuring they were fully aware of the study's objectives and the emphasis on their anonymity. The purpose of the study was clearly explained to the students. Collected data was stored securely with access restricted to the research team and was destroyed after the dissemination of results and publication of the research. Anonymity was maintained, with only anonymized and summarized data used in the statistical analysis. The study commenced only after obtaining official authorizations from the Ministry of Health and the Ministry of Higher Education, and approval of the study protocol by the Ethics and Research Committee in Biology (CERB) of the Faculty of Medicine and Pharmacy at Mohamed V University of Rabat.

Results

Socio-demographic characteristics of the university students surveyed

In total, 401 students responded to the entire electronic questionnaire. The characteristics of the students who responded were gathered according to the conceptual framework of the study. **(Table1)**

Tableau 1 : Socio-demographic characteristics of the university students surveyed (n=401)

Characteristics	Effective	Percentage
Gender		
Male	203	51%
Female	198	49%
Age [18; 29]		
20<	219	55%
20≥	182	45%
Nationality		
Moroccan	385	96%
International	16	4%
Number of brothers and sisters		
1≤	329	82%
1>	72	18%
Marital status		
Single	387	96.5%
Married	10	2.5
Divorced	4	1%
Education level		
Licence ≤	244	62%
Master and Doctorate	157	38%
Proportion of scholarship		

Yes	12	3%
No	389	97%
Financial level		
Low	56	14%
Average	297	74%
High	48	12%
Maintain leisure activities		
Yes	68	17%
No	333	83%
knowledge about mental health		
Low	237	59%
Average	148	37%
High	16	4%
Psychological history		
Yes	100	25%
No	301	75%
Use screens, including social networks		
More than 5 h/Day	228	57%
Less than 5h/Day	173	43%
Preferred study mode		
Face-to-face	168	42%
Alternating	124	31%
Distance learning	109	27%

The table 1 shows of the survey results of the students, out of the total surveyed students 203 are male, representing 51% of the sample, and 198 are female, representing 49% of the sample.There are 219 students younger than 20 years, accounting for 55% of the sample, while 182 students are 20 years or older, accounting for 45%.The majority of the students are Moroccan, with 385 students making up 96% of the sample. The remaining 16 students are international, comprising 4%. 329 students have one or fewer siblings, representing 82%, and 72 students have more than one sibling, representing 18%. The vast majority of students, 387, are single, accounting for 96.5% of the sample. Ten students are married, representing 2.5%, and four students are divorced, representing 1%.Among the students, 244 have an education level of Licence or less, which constitutes 62% of the sample, while 157 students have more than Master and Doctorate degrees, making up 38%.

Only 12 students, representing 3%, receive a scholarship, whereas 389 students, representing 97%, do not receive a scholarship.In terms of financial status, 56 students are classified as having a low financial level (14%), 297 students have an average financial level (74%), and 48 students have a high financial level (12%). 68 students maintain leisure activities, which accounts for 17%

of the sample, while 333 students do not, representing 83%. Regarding mental health knowledge, 237 students have low knowledge (59%), 148 have average knowledge (37%), and 16 have high knowledge (4%).100 students, representing 25%, have a psychological history, whereas 301 students, representing 75%, do not. 228 students use screens, including social networks, for more than 5 hours per day, accounting for 57%, while 173 students use them for less than 5 hours per day, accounting for 43%.As for the preferred study mode, 168 students prefer face-to-face learning (42%), 124 students prefer an alternating mode (31%), and 109 students prefer distance learning (27%).

Among the 401 students surveyed, The students who responded to our questionnaire are distributed as follows: 50.63% male and 49.37% female with 251 in the Mohammed V university and 150 from Ibn Tofail university (Table **1)** . The male gender is slightly dominant. Gender Ratio M/F being: 1.02, the average age is 20.52 years plus at least 2.7 years, minimum 18 years, maximum 29 years. 54.62% of university students are in the age group between 18 and 19 years old and The most common age is 19 years old, with 96% having a Moroccan nationality and 4% a foreign nationality, the majority of whom are Senegalese or 63.6%, followed by Beninese with 18.2% then Ivoirians and Comorians with 9.1% each. The median number of brothers and sisters of the participants is 1. The majorities of students are single, 96.5%, married 2.5% and divorced 1%.More than 60% of university students in our target population belong to the Licence and less university level. Our sample is stratified and respects the proportions of our target population. The preferred study mode of students is face-to-face mode with 41.6%, followed by distance learning 31.4%, and then alternating mode 27%.The proportion of scholarship holders is 3%. Among respondents, 83% of students were unable to maintain their leisure activities during the pandemic. More than one in two students have low knowledge about mental health and 37% of students have average knowledge while just 4% have knowledge about mental health. Among the 401 students, 25% declared having a psychological history, either 118 of our study population. And 3% had a medical or surgical history. More than one in two students use screens, including social networks, for more than 5 hours a day.

Prevalence of mental disorders and psychological indicators screened among university students participating in our study:

Among the 401 university students were surveyed the psychological distress, loneliness, social support, anxiety, and depression were diagnosed according to the DSM-5 classification through several questions addressed to the participants according to the psychometric scale adopted in our study. The study screened for psychological distress, anxiety, depression **(Figure 2)** loneliness, social support, **(Figure 3)** among the university students. Out of a sample of 401 students, 59.35% suffered from psychological distress, 38% had symptoms of definite anxiety, and 36% had symptoms of definite depression. Out of a sample of 401 students, 58 suffered from a low social support and 52% suffered from solitude.

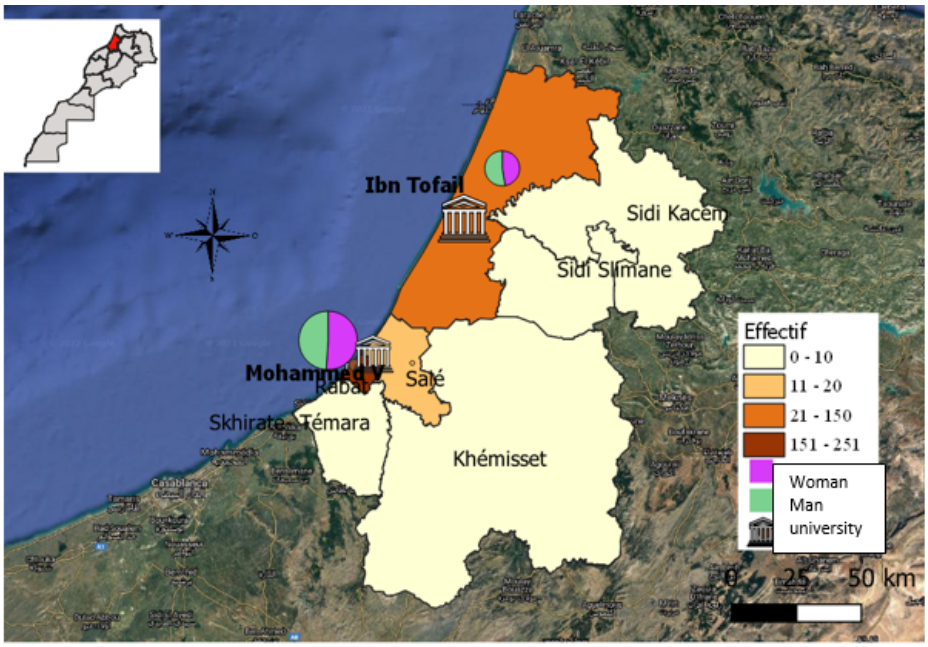

Figure 1 : Distribution of students participating in our study according to gender and province

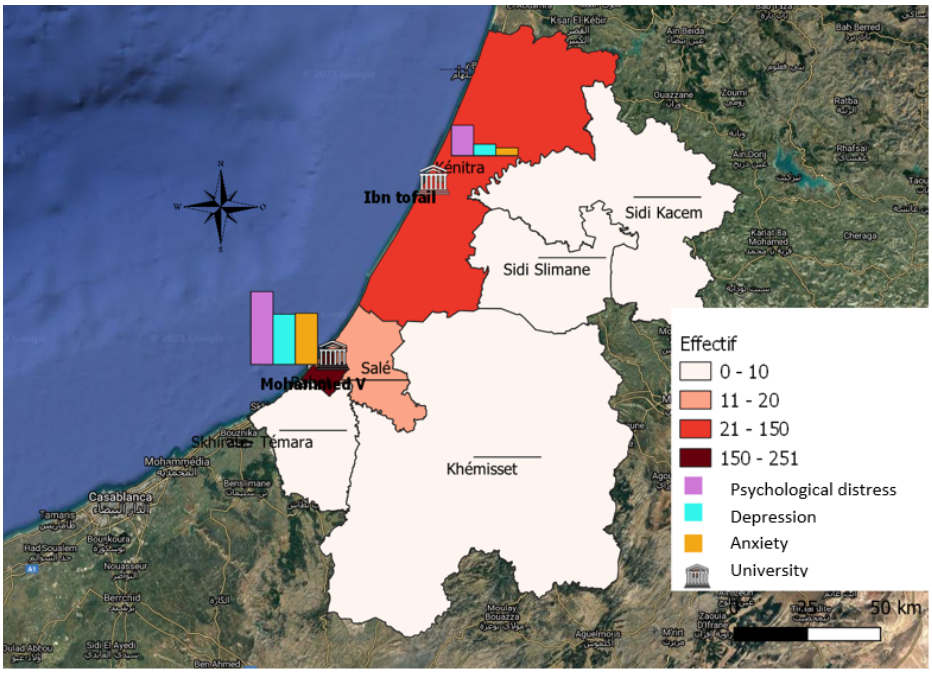

Figure 1 : Prevalence map of psychological distress, anxiety and depression among students

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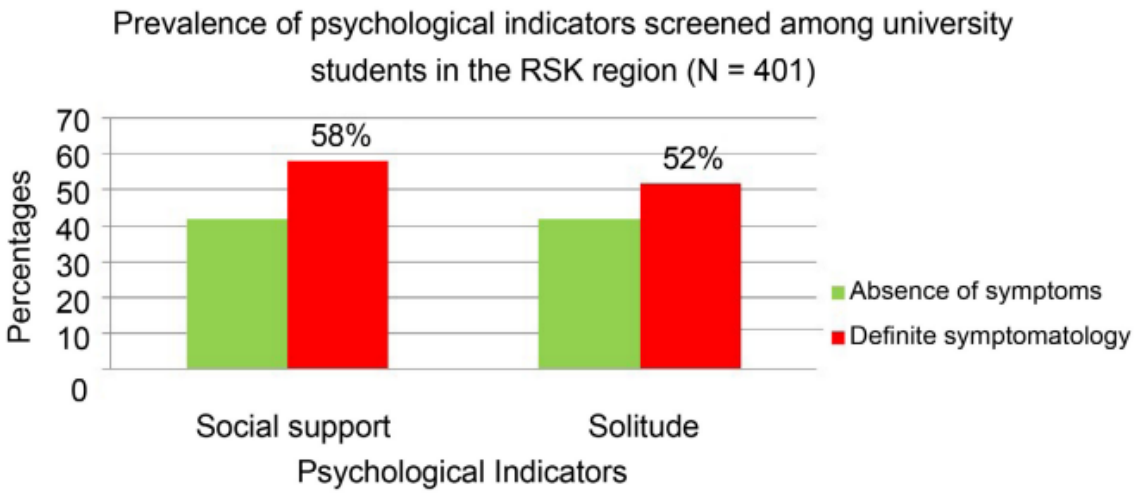

Figure 2 : Prevalence of psychological indicators screened among students

Association between anxiety and depression and sociodemographics of the respondents

A total of 401 students completed the electronic questionnaire. The characteristics of these respondents were analyzed within the conceptual framework of the study. In this part, we presented the data of significant association of the mental disorders detected during the study psychological distress, anxiety (**Tableau 2**) and depression **(Tableau 3)** with the exposure variables. As well as the strength of tobacco and drug use to explain why we did not have a significant link. The chi2 test is not applicable to low numbers.

Tableau 2: Analysis of the association between anxiety symptoms in university students in the RSK region during the Covid-19 Pandemic and their characteristics

Features	**Number of anxiety symptoms in university students**			**Odds Ratio**	**95% IC**	**X2**	**Pvalue**
	Yes	No	Total				
Education level							
Licence	16	231	247	116,3	[56,9 – 237,7]	273	10^{-10}
Master and Doctorate degrees	137	17	154				
Psychological background							
Yes	85	6	91	75,9	[29,4 – 196,0]	174,4	10^{-10}

No	55	243	298				
Tobacco consumption							
Yes	72	16	88	12,8	[7,0 - 23,4]	91,0	10^{-10}
No	81	232	313				
Preferred mode of study							
Face-to-face	139	136	275	8,1	[4,4 - 14,9]	56,9	10^{-10}
Distance	14	112	126				
Solitude							
Yes	117	39	210	5,4	[3,4 – 8,5]	57,6	10^{-10}
No	36	155	191				
Alcohol consumption							
Yes	36	2	38	NA	NA	NA	NA
No	117	246	363				
Drug use							
Yes	48	3	51	NA	NA	NA	NA
No	105	245	350				

Tableau 3: Analysis of the association between depression symptoms in university students in the RSK region during the Covid-19 Pandemic and their characteristics

Features	**Number of anxiety symptoms in university students (N=401)**			**Odds Ratio**	**95% IC**	**X2**	**Pvalue**
	Oui	Non	Total				
Social support							
Weak	136	98	234	37,2	[15,8 – 87,5]	126,6	10^{-10}
Average	6	161	167				
Solitude							
Yes	130	80	210	24,0	[12,6 – 46,3]	135,3	10^{-10}

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No	12	179	191				
Education level							
Licence	42	205	247	9,0	[5,6 – 14,4]	95	10^{-10}
Master and Doctorate degrees	100	54	154				
Preferred mode of study							
Face-to-face	128	147	275	6,9	[3,8 - 12,7]	47,4	10^{-10}
Distance	14	112	126				
Tobacco consumption							
Yes	59	29	88	5,6	[3,3 - 9,4]	49,3	10^{-10}
No	83	230	313				
Financial level							
Weak	116	135	150	4,1	[2,5 - 6,6]	34,2	10^{-10}
Average	26	124	251				
Psychological background							
Yes	86	5	91	NA	NA	NA	NA
No	44	254	298				
Alcohol consumption							
Yes	36	2	38	NA	NA	NA	NA
No	117	246	363				
Drug use							
Yes	48	3	51	NA	NA	NA	NA
No	105	245	350				

The (**Tables 2;3)** shows the association between anxiety and depression with sociodemographic characteristics, Loneliness is strongly associated with psychological distress; it is one of the indicators psychological aspects sought in our study through the UCLA-3 scale. Students, who consume tobacco, prefer face-to-face mode and who have a Master and Doctorate degrees are more predisposed to psychological distress. Through the associations made with anxiety, it emerges that,

the occurrence of symptoms certain anxiety among students with a Master and Doctorate degrees and above is much more common only among first and second year students after the baccalaureate. The students with a psychological background, who prefer the face-to-face mode or who suffer from loneliness are more vulnerable to certain symptoms of anxiety than others. The two psychological indicators in our study are strongly associated with depression; university students with low social support or suffering from a feeling of loneliness are more vulnerable to depression than other students. It also comes out that students with a Master and Doctorate degrees level, those who prefer the face-to-face study method, who consume tobacco, or those who have a low economic level are more predisposed to depression than others.

Discussion

Our study aimed to identify the determinants and prevalence of mental disorders among university students in the Rabat-Salé-Kenitra region during the Covid-19 pandemic. It encompassed students from various higher education institutions in the region, differing in size, academic programs, and disciplines taught (including both grandes écoles and university environments). The diversity of our target population suggests that our findings may be applicable to Moroccan students more broadly.

The notable increase in mental health issues raises the hypothesis of a significant impact resulting from Covid-19-related measures on student well-being. Additionally, it is plausible that successive lockdowns have exacerbated the isolation experienced by certain students, as evidenced by the 52% (95% CI [47%; 55%]) of respondents reporting feelings of loneliness, with over half indicating very weak social support. Our findings reveal that 36% (95% CI [31%; 38%]) of surveyed students exhibit definite symptoms of depression, a figure consistent with prior research such as the French OVE study published in 2021 (37%) and a study conducted at the Faculty of Medicine of Rabat (ranging from 27% to 30.6%)[22]. In terms of anxiety prevalence, our study reports a rate of 38% (95% CI [34%; 40%]), closely aligning with the 37.7% found in the study on medical faculty students in Rabat but surpassing the OVE study's rate of 27%. To contextualize our findings within regions with cultural similarities to Morocco, we reference research on mental health among medical students in Tunisia (indicating a 50% prevalence of psychological distress), Egypt (reporting higher rates of anxiety and depression), and Lebanon (reporting lower rates of anxiety and depression)[23–25]. Discrepancies in data may stem from variations in the psychometric measurement scales employed across studies, influencing prevalence estimates. The determinants associated with the various mental disorders in our study align with some identified in existing literature but not with others. Strong associations were observed between depression and psychological indicators (loneliness and social support), as well as with factors such as academic level (Master and Doctorate degrees), preference for face-to-face learning, and tobacco consumption. These determinants, strongly linked to the studied psychological disorders, suggest potential avenues for support interventions targeting students. Furthermore, each psychological disorder was assessed using validated French psychometric scales, facilitating accurate prevalence estimates and comparability with future studies. While our study may have been subject to

selection bias, given that individuals experiencing psychological distress, depression, or anxiety might have been more inclined to respond to the questionnaire, comparison of prevalence rates across key indicators with previous studies did not reveal significant differences. Nonetheless, despite deploying statistical methods to mitigate this bias, it's possible that the prevalence of psychological disorders is overestimated, a limitation that may also affect other studies on the topic. Finally, although student mental health was a pressing concern prior to the Covid-19 crisis, we lack pre-pandemic prevalence estimates for psychological disorders among this population in Morocco, hindering the establishment of reference values. To address this gap, we extrapolated from a collection of studies conducted in similar contexts, focusing on psychological distress, loneliness, social support, anxiety, and depression.

4. Conclusion

This study highlights the significant mental health challenges faced by university students in the Rabat-Salé-Kenitra region during the COVID-19 pandemic. The study found that 59% of students suffer from psychological distress, 33% show symptoms of depression, and 38% show anxiety, and the prevalence of mental health problems is alarming. In addition, more than half of the students reported feelings of loneliness and inadequate social support.Key determinants of poor mental health include a history of psychological problems, smoking habits, loneliness, and lack of social support. Students with higher education levels (Master and Doctorate degrees), those who do not like distance learning, and those facing severe financial difficulties were particularly at risk. The findings underscore the need for immediate action to address these mental health issues. The lack of psychosocial support structures and health facilities left many students without the necessary resources. There is an urgent need for a multi-sectoral strategy to prevent psychological risks. This strategy should include creating listening platforms, providing professional psychosocial support, and strengthening peer support networks.

By recognizing and addressing these mental health challenges, authorities can better support students, help them overcome their fears and improve their overall well-being.

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