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Factors associated with post-COVID-19 mental health in Barranquilla, Colombia university students

Factores asociados a salud mental post COVID-19 en estudiantes universitarios de Barranquilla, Colombia

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ABSTRACT

Keywords:

Mental health;
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COVID-19.

Introduction: Good mental health is essential in the development of the individual, having appropriate management of personal capacities, skills and tools allows them to adapt to the needs of today's world; There are many factors associated with mental health post COVID-19; after confinement, situations of psychosocial disturbance occurred in the higher education student population. **Objective:** Determine the factors associated with mental health after confinement due to COVID-19 in university students in Barranquilla, Colombia. **Method:** A cross-sectional study was conducted with a, the sample was 212 nursing students, using the Epi Info calculator. **Results:** 50% of the population is between 20 and 24 years old, single, from a low-low socioeconomic stratum, belonging to the subsidized health care, a significant relationship was found between age and anxiety, between gender and suicidal ideas, the psychosocial and family variables of interest significantly explain the occurrence of suicidal ideas in the population studied. **Conclusions:** There are various factors that influence mental health after confinement due to COVID-19, therefore, there is an urgent need to enhance resilience, personal growth, intra-family relationships and particularly vulnerable groups to minimize the psychosocial impact on the population.

RESUMEN

Palabras clave:

salud mental; riesgos para la salud; jóvenes; cuarentena; COVID-19.

Introducción: una buena salud mental es primordial en el desarrollo del individuo, tener un manejo apropiado de las capacidades, habilidades y herramientas personales les permite adaptarse a las necesidades del mundo actual; son muchos los factores asociados a salud mental post COVID-19; después del confinamiento se dieron situaciones de perturbación psicosocial en la población estudiantil de educación superior. **Objetivo:** determinar los factores asociados a la salud mental pos confinamiento por COVID-19 en estudiantes universitarios en Barranquilla, Colombia. **Método:** se diseñó un estudio transversal, con una muestra fueron 212 estudiantes de enfermería, utilizando la calculadora de Epi Info. **Resultados:** el 50% de la población tiene entre 20 y 24 años, solteros, de estrato socioeconómico bajo-

bajo, pertenecientes al régimen de salud subsidiado, se encontró una relación significativa entre la edad y la ansiedad, entre el género y las ideas suicidas, las variables psicosociales y familiares de interés explican de manera significativa la ocurrencia de ideas suicidas en la población estudiada. **Conclusiones:** existen diversos factores que influyen en la salud mental pos confinamiento por COVID-19, por ello, urge la necesidad de potenciar la resiliencia, el crecimiento personal, las relaciones intrafamiliares y particularmente a los grupos vulnerables que permitan minimizar el impacto psicosocial en la población.

INTRODUCTION

Good mental health is essential in the development of the individual, as it will allow them to build skills and have appropriate management of personal capacities, skills, and tools that allow them to adapt to the needs of today's world, thus showing within its characteristics autonomy, the ability to build positive interpersonal relationships and the establishment of goals that allow growth in all areas in the process of self-realization¹. Therefore, it is vital to determine that there are many factors associated with mental health post-COVID-19 since, after confinement, there were situations of psychosocial disturbance in the higher education student population².

According to the World Health Organization (WHO), mental health is a state of well-being in which each individual develops his or her potential, can cope with the stresses of life, can work productively and fruitfully, and can contribute something to his or her community³. This can be determined by different factors, which are closely related to the development of mental health problems since it is said that these problems are due to a combination of said factors⁴. Added to these factors is preventive confinement due to COVID-19. This intervention occurred at the community level, which sought to reduce the spread of COVID-19, which generated severe changes in the daily routine of young people⁵.

The stress and uncertainty generated by the situation about COVID-19, the increase in family problems, the increase in unemployment, and the fear of facing isolation, among other situations, caused mental health in general to decline. Consequently, the preventive confinement due to COVID-19 not only caused havoc on the country's economy but also brought with it severe consequences for the mental health of the general population, including young university students. According to the Ministry of Health: "The post-confinement effects are combined with historical mental health problems such as

violence, depression, suicide, the consumption of psychoactive substances, alcohol, among others"⁶, that is, those Already existing problems in Colombian society were added to new problems as a result of the post-confinement.

There are many psychosocial effects that a population exposed to an epidemic can experience after the COVID-19 epidemic. For example, in Taiwan, in the months following this, around 10% of the population saw a pessimistic outlook on life population, with a prevalence of psychiatric morbidity of 11.7%⁷.

A study carried out in China on 1,210 inhabitants of 194 cities, when applying the Impact Scale of Event Scale-Revised and Anxiety and Stress Scale, showed that 53.8% of the participants presented a moderate or psychological solid impact; 16.5% showed moderate to intense depressive symptoms; 28.8% showed symptoms of moderate to solid anxiety; and 8.1% presented moderate to substantial levels of stress⁸.

A study by Tamayo-García *et al*⁹ that sought to identify emotional disorders as a result of COVID-19 and confinement in university students in Peru found that a mismatch within their context mainly characterizes emotional disorders in young people, family, and society, which alters their emotional and social balance, as well as their academic environment, is affected.

In another cross-sectional descriptive study from Tunja, Colombia, in a sample of 328 students between the first and tenth semester of social work, after applying a questionnaire that evaluated socio-family variables, one of the symptoms for adolescents, youth, and adults (SRQ) and the family APGAR, showed that confinement generated academic problems due to the difficulty of adapting to the method of virtual classes and due to problems associated with mental health, with a more significant impact on those who perceive the absence

of support networks, also that family functionality is a relevant factor in the development of coping strategies in confinement since adequate family dynamics positively enable coexistence and family environment¹⁰. Therefore, it is necessary to identify psychosocial and family factors that impact the mental health of the adult population so that strategies for good mental health can be strengthened and thus have a better quality of life.

A cross-sectional descriptive observational study carried out in Medellín, Colombia, which sought to determine the prevalence and clinical characteristics of anxious and depressive symptoms in health institution personnel after applying a survey designed for this purpose that included two scales to screen depressive and anxious symptoms, they found that 14% presented depressive symptoms and 18% presented clinically significant anxiety symptoms with a higher proportion of moderate-severe depressive and anxious symptoms in the face-to-face work modality¹¹. Many university students during this period of confinement were in distressing conditions that triggered some problems related to mental health. The factors that most affect physical and psychological well-being are the loss of routine habits and psychosocial stress¹². The interruption of healthy habits during confinement and the practice of unhealthy habits, such as inappropriate eating behaviors, irregular sleeping patterns, sedentary lifestyles, and increased use of screens, can lead to physical problems¹³.

When considering the psychological impact of post-COVID-19 confinement on university students as a public health issue, data on this group's mental health is essential to help higher education institutions prevent, evaluate, and intervene in the possible negative psychological consequences of the pandemic on their students.

Considering the divergences in the study, the objective was to determine the factors associated with post-COVID-19 confinement mental health in university students from Barranquilla, Colombia.

METHOD

Type of study

A cross-sectional descriptive study was developed¹⁴. The participating population comprised students

from a university in Barranquilla during the post-pandemic due to COVID-19.

Population and sample

The total population of nursing students was 800; the sample selection was through non-probabilistic intentional sampling. The inclusion criteria were male or female students in the nursing program who were in the daytime shift, excluding students in the first and eighth semesters and students who were part of another university program. For the sample calculation, a margin of error of 5%, a confidence level of 95%, and a prevalence of mental illnesses according to the Pan American Health Organization (PAHO) of 25% were considered using the Epi Info calculator, which determined a sample of 212 nursing students.

Instrument

The questionnaire inquired about the different sociodemographic characteristics of the population under study. For the second objective, questions from the instrument The SRQ were used; it was designed by the World Health Organization to expand the detection and care of mental health problems in nursing students. The SRQ contains 24 questions whose response options are yes or no, which quantifies depressive, anxious, and psychotic disorder symptoms. The first twenty questions refer to depressive or anxious disorders, where ten or more positive answers determine that the person has a high probability of presenting a mental illness. For the third objective, the questions were constructed based on the literature review and sent to experts for review and suggestions. Finally, the instrument was built electronically, using the Google Forms option, allowing at the end of the execution to download a tabulation with all the information corresponding to the research for its respective analysis.

Collection and analysis of information

The SRQ was used to evaluate the sociodemographic characteristics and psychosocial and family factors influencing the mental health of the population studied. The structured survey instrument allowed the researchers to obtain information systematically and orderly about the study variables. For tabulation and information collection, the Microsoft Office Excel software program was used, which allowed the

information to be consolidated. The Stata program was used for the descriptive analysis. In addition, the chi-squared was used to establish the correlation between age and gender with psychosocial and family variables. Likewise, suicidal ideation is correlated with these; the variables are statistically significant when the p-value is less than 0.05. In addition, odds ratios (OR) were calculated to establish the risk of occurrence of suicidal ideation with psychosocial and family characteristics through logistic regression.

Statement on ethical aspects

This study adapted the standards established in the Declaration of Helsinki of 1975¹⁵ and resolution 8430 of 1993 of the Ministry of Health of Colombia¹⁶ for research with human beings. Informed consent was also incorporated at the beginning of the questionnaire, at which point each participant authorized the participation. Likewise, the project had a favorable report from an institutional ethics board (code PRO-CEI-USB-0479-00).

RESULTS

Sociodemographic characterization of university students

The results related to the sociodemographic factors of university students show that most of the students surveyed are between 20 and 24 years old (M=21.1). Most were women studying between the third and sixth semester of their degree, single and from the low-low stratum, belonging to the subsidized regime, and living with three or four people. See Table 1.

Correlation between age and gender with psychosocial and family factors influencing the mental health of university students

Age presented a statistically significant relationship with anxiety (p=0.004) through a chi-squared test; however, with the other variables of interest, such as

the number of people with whom the respondent lives, depression, crying frequently, self-perception of usefulness and uselessness, suicidal ideas and family relationship, the age variable did not have a statistically significant relationship with these. Therefore, with this variable, it can be inferred that age does explain the appearance of anxiety. However, it is not significant with the other psychosocial and family characteristics that may influence mental disorders, such as depression, in the surveyed population. See Table 2.

Regarding gender, which was discriminated into male, female, and other, a statistically significant correlation was observed with the variables crying frequently (p=0.002), self-perception of uselessness (p=0.001), and suicidal ideas (p=0.006). With the other variables described in the table, no statistical significance established the relationship between them. With the above, it is inferred that gender is significantly related to suicidal ideas, crying frequently, and feeling worthless, persistent symptoms of the disorder (depression). However, no statistical significance was evident with this depression variable; respondents may stigmatize the diagnosis of depression, or there is no knowledge that these symptoms are associated with the disease. See Table 3.

Relationship between suicidal ideation with psychosocial and family variables

Regarding the relationship between suicidal ideation and the psychosocial and family variables of interest (Table 4). It was found that when performing the chi-squared, anxiety is significantly related to this variable (p=0.013) with a level of 95% significance. Depression also had a statistically significant correlation (p=0.001), crying frequently (p=0.001), self-perception of worthlessness (p= 0.000), and family relationships (p=0.002). Based on all of the above, it can be inferred that these variables significantly explain the occurrence of suicidal ideation in the population studied.

Table 1. Sociodemographic characteristics of university students Barranquilla, Colombia.

Age (years)	Frequency	%
Between 15 and 19	82	38.7
Between 20 and 24	106	fifty
Between 25 and 29	13	6.1
30 or more	11	5.1
Mean	21.1	
Median	20.0	
Gender		
Male	26	12.2
Female	185	87.3
Other	1	0.4
Semester		
II	25	11.8
III	50	23.6
IV	24	11.3
V	11	5.2
VI	56	26.4
VII	46	21.7
Income		
Low-low	91	42.9
Low	81	38.2
Medium-low	3.4	16
Half	6	2.8
Health regime		
Contributory	98	46.2
Subsidized	99	46.7
Special	15	7.1
Civil status		
Single	186	87.7
Married	8	3.8
Free union	16	7.5
Divorced	2	0.9
How many people do you live with?		
Live alone	4	1.9
Between one and two	54	25.5
Between three and four	120	56.6
Between five and six	25	11.8
More than six	9	4.2

Table 2. Correlation between age and psychosocial factors influencing the mental health of students.

People you live with	Age				Total	Chi-squared	p
	15-19	20-24	25-29	30 or more			
0 to 2	19	32	4	3	58	8.7	
3 to 4	48	59	2	8	120		0.40
5 to 6	12	11	2	0	25		
More than 6	3	4	2	0	9		
Anxiety							
Yes	60	72	4	4	140	13.5	0.004
No	22	3.4	9	7	72		
Depression							
Yes	54	65	4	7	130	5.8	0.10
No	28	41	9	4	82		
Cry frequently							
Yes	44	46	4	4	98	3.8	0.20
No	38	60	9	7	114		
Total	82	106	13	11	212		
Self-perception of usefulness							
Yes	64	65	9	9	157	1.7	0.60
No	18	31	4	2	55		
Self-perception of worthlessness							
Ye	10	12	0	2	24	2.2	0.50
No	72	94	13	9	188		
Suicide ideas							
Yes	9	10	2	0	21	1.7	0.60
No	73	96	11	11	191		
Family relationship							
Excellent	33	54	7	7	101	9.5	0.30
Good	42	40	3	4	89		
Regular	6	11	3	0	20		
Bad	1	1	0	0	2		

Table 3. Correlation between gender and psychosocial factors influencing the mental health of students.

People you live with	Gender				Chi-squared	p
	Male	Female	Other	Total		
Live alone	1	3	0	4	14.7	0.06
1 to 2	11	43	0	54		
3 to 4	11	109	0	120		
5 to 6	1	23	1	25		
More than 6	2	7	0	9		
Anxiety						
Yes	14	125	1	140	2.4	0.20
No	12	60	0	72		
Depression						
Yes	11	118	1	130	5.0	0.07
No	15	67	0	82		
Cry frequently						
Yes	4	93	1	98	12.3	0.002
No	22	92	0	114		
Self-perception of usefulness						
Yeah	16	140	1	157	2.7	0.20
No	10	45	0	55		
Self-perception of worthlessness						
Yes	2	21	1	24	8.1	0.01
No	24	164	0	188		
Suicidal ideas						
Yes	4	16	1	21	10.2	0.006
No	22	169	0	191		
Family relationship						
Excellent	14	87	0	101	3.8	0.60
Good	8	80	1	89		
Regular	4	16	0	20		
Bad	0	2	0	12		

Table 4. Relationship between suicidal ideation with psychosocial and family variables.

Anxiety	Suicidal ideas			Chi-squared	p
	Yes	No	Total		
Yes	19	121	140	6.2	0.01
No	2	70	72		
Depression					
Yes	19	121	140	11.3	0.001
No	2	70	72		
Cry frequently					
Yes	17	81	98	11.3	0.001
No	4	110	114		
Self-perception of usefulness					
Yes	15	142	142	0.08	0.70
No	6	49	49		
Self-perception of worthlessness					
Yes	8	16	24	16.6	0.01
No	13	175	188		
Family relationship					
Excellent	2	99	101	14.4	0.002
Good	16	73	89		
Regular	3	17	20		
Bad	0	2	2		

When performing the logistic regression with the variables that had statistical significance in the bivariate model (Table 5), it was found that people with anxiety had a 5.4 higher risk of presenting suicidal ideas compared to those who do not have anxiety (95%CI 1.2-24.2). In people with depression, it was evident that they had a risk of having suicidal ideas 14.7 times higher than those without depression (95%CI 1.9-111.9). This variable showed the highest OR, which, although no relationship was evident with gender and age their relationship was related to

the occurrence of the event and not due to these sociodemographic variables. It was shown that people who cried frequently had a 5.7 times higher risk of having suicidal ideas compared to those who did not (95%CI 1.8-17.8). Likewise, people with self-perception of worthlessness had a 6.7 higher risk of presenting suicidal ideation than those who did not (95%CI 2.4-18.6). The family relationship was a protective factor in people with a 2.5 lower risk compared to people who reported an excellent relationship with their family (95%CI 0.2-0.7).

Table 5. Logistic regression with the variables that had statistical significance in the bivariate model.

Independent variable	OR	95%CI
Anxiety	5.4	1.2-24.2
Depression	14.7	1.9-111.9
Cry frequently	5.7	1.8-17.8
Perception of uselessness	6.7	2.4-18.6
Family relationship	0.4	0.2-0.7

DISCUSSION

The mental health of the general population and vulnerable population groups was very significantly affected by the COVID-19 pandemic; if, during the pandemic, the presence of anxiety, depression, and reaction to stress was familiar in the general population, these situations still impact the mental health of populations in general, and even more so in vulnerable populations such as in professions that are in training in health sciences¹⁷. According to the WHO, around 20% to 70% of the population continues to suffer from depression and anxiety; among the most affected are women, young people, health workers, and people with low income¹⁸.

The present study showed that age is related to the appearance of anxiety, thus impacting the mental health of the population studied, which shows similarity with studies such as that of Ma et al¹⁹. Psychosocial factors, factors related to the COVID-19 epidemic, and mental health problems were evaluated in 746,216 university students in China, where the age groups of students over 19 years of age had a relationship statistically significant with acute stress, depression, and anxiety, showing a risk of suffering from these mental disorders that increased progressively with increasing age.

Concerning gender, it was observed that the highest proportion of respondents was female, 87.2%, and this variable was significantly associated with symptoms of depression such as crying frequently, self-perception of worthlessness, and suicidal ideas.

However, it was not directly associated with depression itself. Unlike the study by Wang *et al*²⁰, they examined the mental health status and severity of depression and anxiety in students from an American university system during the COVID-19 pandemic, and where they found that gender was significantly related to the different levels of depression in the students surveyed.

Regarding suicidal ideation, in the present research, it was significantly related to depression, symptoms of depression, and anxiety, similar to Ma et al²¹, in which psychological risk factors for suicidal ideation were estimated during the outbreak and remission periods of COVID-19 among university students in China, where suicidal ideation was significantly related to depression, anxiety, stress, insomnia, and obsessive-compulsive symptoms. It was also possible to see in that same study that psychological factors behaved as risk factors in the occurrence of suicidal ideation, with depression being the most substantial risk factor before controlling for the other mental variables. In the case of the present investigation, depression was also the factor in which a more significant risk was evident in the occurrence of suicidal ideation in the population studied.

Regarding the family relationship, it was significantly related to suicidal ideation ($p=0.002$), and when carrying out the logistic regression, it behaved as a protective factor in the occurrence of the event; this differs from Chen et al²², in which the correlation of suicidal ideation with family characteristics and social support was explored and it

was found that the relationship with parents had no statistically significant relationship with suicidal ideation. However, a precarious relationship with the mother and little social support from the family had significant effects on suicidal ideation in women.

LIMITATIONS

The present study was limited in the statistical analysis section because multivariate analysis and OR calculation could not be done with the sociodemographic variables and psychosocial characteristics. These calculations did not obtain a relationship between the variables and statistical significance. Therefore, it made inferences regarding the objectives of the research complex. Therefore, a bivariate analysis with chi-squared and an OR calculation with the variables where a statistically significant relationship was obtained was chosen. Researchers are encouraged to choose data collection methods aimed at multivariate calculations and risk estimation based on them so that, with more significant scientific evidence that further supports what is proposed here, they are inclined to health interventions that affect the mental health problems that afflict the population, especially children and young people.

CONCLUSIONS

post-COVID-19 confinement mental health. It was evident that the students were between 20 and 24 years old, the majority were women, studying between the third, sixth, and seventh semester of their degree, single and from the low-low stratum, the majority of the population belonged to the subsidized regime and lived together in their homes between 3 to 4 people. Age is one of the causes that determines the appearance of anxiety. Likewise, gender is significantly related to suicidal ideation, crying frequently, and feeling worthless, persistent symptoms of depression. Likewise, the state of depression is a risk factor for having suicidal ideas.

It was found that they are statistically significant with the variable suicidal ideation and anxiety. They were also related to depression, self-perception of worthlessness, and frequent crying. Therefore, the effect of social isolation due to COVID-19 can aggravate the general population's mental health; therefore, it is recommended to establish strategies that can enhance resilience, personal growth, and

intra-family relationships that can minimize the impact—psychosocial of the epidemic in the population.

STATEMENT ON CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest, the project was carried out with the authors' resources linked to the Simón Bolívar University, and the data is available as required.

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CONTRIBUTION OF THE AUTHORS

The **first author** participated in the study's conceptualization and design, bibliographic review, methodology, data analysis, supervision, visualization, writing, and final approval of the manuscript.

The **second author** made data curation, methodology, bibliographic review, formal analysis, The **third author** participated in the research, bibliographic review, draft writing, information collection, and data analysis.

The **fourth author conducted** research, conducted a bibliographic review, wrote an original draft, collected information, and analyzed data.

The **fifth author** participated in the research, bibliographic review, writing a writing-original draft, information collection, and data analysis.

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