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# Mental health state in medical students during COVID-19 pandemic

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## Abstract:

**BACKGROUND:** Before the COVID-19 pandemic, medical students had reported experiencing high rates of distress, burnout, anxiety, and depression. The psychological impact of the COVID-19 in the general population suggested that the mental health impact was increased anxiety, depression, and stress. There were no exceptions if medical students also experience the same psychological impact. The aimed to this study is analyze the mental and emotional effects of the COVID-19 pandemic among medical students.

**MATERIALS AND METHODS:** An observational analytic study was used with a cross-sectional approach. Data were obtained with questionnaires distributed through social media platforms from July 14, 2020, to July 21, 2020. This study using the Fear of COVID-19 (FCV-19) Scale and the Depression, Anxiety, and Stress Scale-21 to assess FCV-19, anxiety, stress, and depression. statistical analysis used IBM SPSS Statistics 24 was used to analyze the two-tailed Chi-square test, the Mann–Whitney test, and the Kruskal–Wallis test, which were used with statistical significance as  $P < 0.05$  for all tests.

**RESULTS:** Out of 1027 samples, 44.6% had stressed, 47.8% had anxiety, and 18.6% had depression. The gender ( $P = 0.000$ ), educational stage ( $P = 0.000$ ), and the comorbidity factor ( $P = 0.001$  for stress and anxiety,  $P = 0.036$  for depression, and  $P = 0.000$  for FCV-19) had a significant association with stress, anxiety, depression, and FCV-19 in medical students. The hometown that showed zone risk of infection only showed significant differences in FCV-19 ( $P = 0.026$ ).

**CONCLUSIONS:** Protection and psychological support for a medical student is extremely high importance given that COVID-19 is now a well-established pandemic and there will be other pandemics in the future.

## Keywords:

COVID-19, Indonesia, medical, mental health, student

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## Introduction

The COVID-19 pandemic had been producing an enormous burden with millions of confirmed cases and thousands of deaths. The coronavirus has high virulence and contagiousness. At the end of July 2020, there were a total of 102,051 confirmed cases in Indonesia, who occupy the rank 24<sup>th</sup> out of 215 countries around the world.<sup>[1]</sup> The impact of the COVID-19 pandemic was detectable at all levels of society, including economic, business,

educational, and psychological levels.<sup>[2]</sup> During the pandemic of infectious disease, there were crucial issues to consider the management and the psychological reactions to pandemics include maladaptive behaviors and emotional distress.<sup>[3]</sup>

The psychological impact of the COVID-19 in the general population suggested that the mental health impact on moderate-to-severe level, with increased anxiety, depression, and stress.<sup>[2,4,5]</sup> The COVID-19 pandemic was likely to put health-care professionals across the world to work under extreme pressures. The COVID-19 emergency suggested a strong

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need to enhance the mental health of health workers.<sup>[6]</sup> These conditions must be considered with how to balance their own physical and mental health needs with those of patients and also conditions on how to align their desires and duties to patients with those to family and friends.<sup>[2,5]</sup> This may cause some people to experience moral injury or mental health problems that include medical students.

Before the COVID-19 pandemic, medical students had been reported to experience the high rates of distress, burnout, anxiety, depression, and suicidal ideation.<sup>[7-10]</sup> Compared with many other academic fields, medical education takes a long time to study and training; this could be affected the mental health of the student.<sup>[11]</sup> The various demands and pressures faced by medical students compromise their mental, physical, and spiritual well-being.<sup>[12]</sup> Emotional disorders in medical students are common and deserve special attention.<sup>[13-17]</sup> Previous researchers found that medical students had significantly higher rates of diagnosed mood disorders, suicidal ideation, and psychological distress.<sup>[12]</sup> There was a plethora of evidence that medical students worldwide experience significant rates of burnout, psychological distress, and psychiatric morbidity.<sup>[18-21]</sup>

Some universities have prohibited any patient interaction. On April 14, 2020, the Association of American Medical Colleges called for a suspension of activities that involve students interacting with patients, effectively putting clinical rotations on hold.<sup>[22]</sup> Psychological reactions to pandemics including maladaptive behaviors, emotional distress, and defensive responses deserve special attention in this vulnerable group.<sup>[5,23]</sup> A higher prevalence of moderated and severe anxiety and depression symptoms among medical students during COVID-19 pandemic relating to financial impairment due to pandemic, especially among women.<sup>[23]</sup>

Decreasing the stigma about mental health state in medical students by knowing the cause is a necessary step toward building a healthier physician workforce.<sup>[24]</sup> The well-being of the physician is important for patient care. Physicians who burned out with mental health were twice as likely to demonstrate unprofessional behaviors, practice medicine unsafely, and receive a lower patient satisfaction.<sup>[25]</sup> Therefore, this research is needed to know the mental health state and emotional state during the COVID-19 pandemic among medical students. Medical schools and universities need to step up from the mental health crisis among medical students and need to find the solutions.

## Materials and Methods

### Study design and setting

This study used an observational analytic study with

a cross-sectional approach conducted on a medical student at any stage of education, fresh graduate, and internship doctor. Data of this study were obtained with questionnaires distributed through social media platforms from July 14, 2020, to July 21, 2020.

### Study participants and sampling

In this study, mental health in medical students was assessed using the Depression, Anxiety, and Stress Scale (DASS)-21 and Fear of COVID-19 Scale (FCV-19S). The DASS questionnaire was a self-report measurement tool that measures depression, anxiety, and stress. DASS-21 consists of 21 questions about symptoms of negative emotions in the past week. This questionnaire measures depression, anxiety, and stress in normal, mild, moderate, severe, extremely severe levels. The level of depression reflected using a 0–5 points. The internal consistency and concurrent validity of the DASS-21 were acceptable to excellent ranges. The results have been very positive and are in the range of good to very good for all scales.<sup>[26]</sup>

### Data collection tool and technique

The questionnaire used in this research was adapted from the FCV-19S which is useful to evaluate the fear of the COVID-19 pandemic.<sup>[27]</sup> The participants indicate their level of agreement with the statements using a five-item Likert-type scale. Answers included “strongly disagree,” “disagree,” “neither agree nor disagree,” “agree,” and “strongly agree.” The minimum score possible for each question is 1, and the maximum is 5. A total score is calculated by adding up each item score (ranging from 7 to 35). The higher the score, the greater the fear of the COVID-19 pandemic.

The data were analyzed via the IBM SPSS Statistics 24 program Armonk, NY: IBM Corp. The two-tailed Chi-square test was employed to compare the distribution of qualitative and quantitative variables, respectively. The Mann–Whitney test and the Kruskal–Wallis test were employed to compare the sociodemographic variable to FCV-19S. Statistical significance was evaluated as  $P < 0.05$  for all tests.

### Ethical consideration

This research was approved by the Ethics Committee for Medical and Health Research (Komite Etik Penelitian Kedokteran dan Kesehatan), Faculty of Medicine, Sriwijaya University, with Protocol No.: 091-2020. All participants were informed of the study and provided consent before enrolling. Attribute codes were given to the participants to maintain anonymity.

## Results

The authors collected 1027 responses from all medical

students in Indonesia from online questionnaires, broadcasted through social media from July 14 to July 21, 2020. Data from Figure 1 showed that out of 1027 samples, 44.6% had stressed, 47.8% had anxiety, and 18.6% had depression that was divided into several levels, namely mild, moderate, severe, and extremely severe. Many medical students experience more stress than anxiety and depression. This study showed that 24.1% of the medical students experience a mild level of stress. The percentage decreases with increasing the level of stress. The higher anxiety level was found at a moderate level (18.2%) followed by an extremely severe level (13.5%). Conversely, only 18.7% of the medical students were depressed. None of them experienced an extreme severity level of depression.

Data obtained from the questionnaire were analyzed using Chi-square, Man-Whitney, and Kruskal-Walis test. As shown in Table 1., gender and the educational stage had a significant association with stress, anxiety, and depression among medical students ( $p$ -value  $<0.05$ ). There were significant differences between Fear of COVID-19 and gender, also fear of COVID-19 and educational stage in medical students ( $p$ -value  $<0.05$ ). Furthermore, the hometown of the medical students only showed significant differences in Fear of COVID-19 ( $p$ -value  $<0.05$ ). Having a comorbid factor as a medical student or those families around them also showed a significant association with the mental health state and fear of COVID-19 medical students ( $p$ -value  $<0.05$ ).

## Discussion

The prevalence of depressive symptoms, anxiety, and stress among medical students was higher than in the general population.<sup>[9,19]</sup> Medical students had higher rates of burnout and depressive symptoms relative to similarly aged college students.<sup>[18]</sup> Relative to the general population of postsecondary graduates, medical students had significantly higher rates of diagnosed mood disorders, diagnosed anxiety disorders, suicidal ideation, and

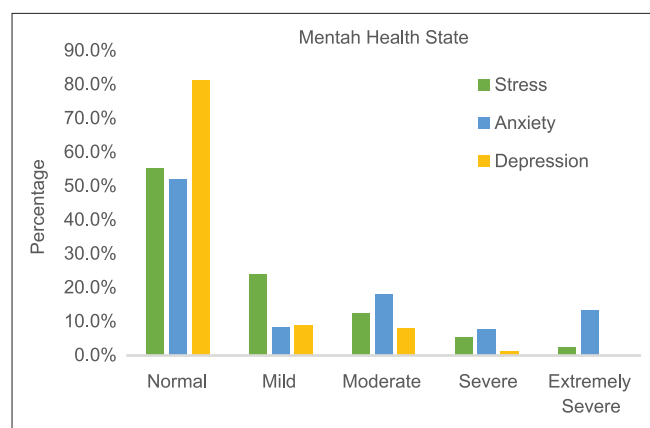


Figure 1: Prevalence of mental health in medical student during COVID-19 pandemic (n = 1027)

psychological distress.<sup>[18,28]</sup> This study showed a higher prevalence of anxiety, stress, and depression among medical students. Being a medical student and clinical training were associated with having suicidal ideation, moderate or severe psychological distress, mood, and anxiety disorders.<sup>[28]</sup> About one in three medical students globally has anxiety and was most prevalent among medical students from the Middle East and Asia.<sup>[19,29]</sup>

Burnout did not occur as the result of a single cause.<sup>[20]</sup> This is had been attributed to excessive workload, relationship difficulties with supervising consultants, the pressure to succeed, compromised sleep patterns and the pressure, fatigue, ethical conflicts, accumulating debt, and exposure to terminal illness, death, and human suffering.<sup>[8,15,24,30,31]</sup> Some of these pressures are self-imposed, such as setting the bar too high to reach, self-doubt, and equating performance to identity.<sup>[32]</sup> One of two medical students cited fear of being stigmatized as a reason for psychological distress. The most likely explanation for this difference is that earlier in medical training, students are more sensitive about how others perceive them.<sup>[24]</sup> Despite their emotional distress, medical students were unlikely to seek help.<sup>[32]</sup> Medical students also may not seek help for mental health conditions due to stigma, fear of compromising career progression, and the pressures of medical training.<sup>[31]</sup> The existence of the service or, possibly, as previous research highlights, that stigma or other barriers to seeking help still exist.<sup>[30,33-35]</sup>

Studies showed that women had a greater prevalence of depression and anxiety in the general population.<sup>[15]</sup> Among medical students, being female was associated with having a mood or anxiety disorder, lifetime suicidal ideation, and moderate or severe psychological distress.<sup>[17-19,29,36]</sup> Overall, the worsening of their perceived mental health throughout their medical training was associated significantly. The mental health in the medical student had worsened since entering medical school.<sup>[25,36]</sup> There was an association with anxiety disorders with latest year students and clinical training students.<sup>[15,18]</sup> Geographic localization significantly affected the prevalence of current burnout. A high prevalence of anxiety, stress, and depression among medical students found in the Middle East and Asia.<sup>[20]</sup> Other external reasons could explain the variations between countries, notably the living conditions (war, terrorism, and poverty), which include the COVID-19 pandemic.<sup>[21]</sup> This was explained why the comorbid factor and zonation of transmission risk of COVID-19 infection plays a significant role in FCV-19. The higher risk of COVID-19 transmission made a higher score of fear for COVID-19.

During the first academic term impacted by COVID-19, individuals had reported increased anxiety, fear, stress, and

**Table 1: Sociodemographic Characteristics of Medical Students (n=1027)**

Sosiodemographic Characteristics	Mental Health State							
	Stress (n, P)		Anxiety (n, P)		Depression (n, P)		FCV-19S (n, P)	
Gender								
Male	127	<0.001*	131	<0.001*	53	0.048*	678	<0.001**
Female	331		360		137		349	
Educational Stage								
Pre-clinic	243	<0.001*	271	<0.001*	106	<0.001*	480	<0.001***
Clinical (co-assistent)	160		165		70		363	
Internship	49		53		13		156	
Freshgraduate	6		2		1		28	
Father's Occupation		0.813		0.255		0.801		0.093
Physician	66		73		26		141	
Another health profession	25		23		9		59	
Non-health-related profession	367		395		155		827	
Mothers's Occupation		0.185		0.990		0.679		0.355
Physician	38		47		19		97	
Another health profession	51		47		15		98	
Non-health-related profession	369		397		156		832	
Hometown****		0.308		0.061		0.744		0.026***
High risk	295		319		118		631	
Moderate risk	72		73		31		179	
Low Risk	72		80		34		167	
No-risk	19		19		7		50	
With comorbidity		0.002*		0.005*		0.078		0.011**
Yes	59		61		25		100	
No	399		430		165		927	
Family with comorbidity								
Yes	253	0.001*	269	0.001*	107	0.036*	508	<0.001**
No	205		222		83		519	
Has done a COVID-19 examination								
Yes	114	0.430	116		32	0.001*	268	0.031**
No	344		375	0.084	158		758	
Have ever been diagnosed COVID-19 (+)								
Yes	10	0.913	9	0.399	1	0.077	23	0.008**
No	448		482		189		1004	

\*P<0.05, using Pearson chi-square if expected count <20% (Table >2x2). \*\*P<0.05, using Man Whitney. \*\*\*P<0.05, using Kruskal Wallis Test. \*\*\*\*Divided by transmission zone of COVID-19 infection

depression symptoms.<sup>[30]</sup> Depression, anxiety, and Fear of COVID-19 increased as the COVID-19 pandemic encroached on a college campus in parallel with large-scale policy changes.<sup>[23,30]</sup> 84.71% of the medical students had declared fear of becoming infected by COVID-19 and 70.8% had declared that the COVID-19 pandemic affects their financial status and may compromise their continuity on course.<sup>[30]</sup> Medical students are facing stressors related to financial outgoings. Pressures of financial factors are not surprisingly related to stressors.<sup>[20]</sup> A higher prevalence of moderated and severe anxiety and depression symptoms among medical students during COVID-19 pandemic relating to financial impairment due to pandemic, especially among women.<sup>[24]</sup> In the case of medical students, such support needs to emanate from their universities and their clinical placements.<sup>[37]</sup> Therefore, the COVID-19 pandemic had a potential impact on the emotional and mental health state among medical students.

This study is the first observation of mental health state in medical students at any stage of education, fresh graduate, and internship doctor during the COVID-19 pandemic in Indonesia. There is a limited sample representative among medical students at any stage of education, internship doctor, and fresh graduate and various institutions.

### Conclusions

The primary conclusion of this study was that gender, educational stage, and comorbid factor of medical students and their surroundings affect the mental health state and emotions of medical students. The hometown of medical students showed the risk of transmission for COVID-19 associated with the fear of the COVID-19 pandemic. This study showed that the mental health state of medical students was already high before the existence of the COVID-19 pandemic. It was also possible that the

fear and financial impact of the COVID-19 pandemic could affect the mental health state of medical students. Medical schools need to step up to address the mental health crisis among medical students. A solution and protection to mental health among medical students must come from the mental health side. The benefits of early protection given to the mental health of medical students would likely strengthen mental health state for the transition from student to doctor. Physician wellness and quality of patient care are critical aspects of health-care efficiency.

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### Conflicts of interest

There are no conflicts of interest.

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