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THE EFFECT OF THE COVID-19 PANDEMIC ON MENTAL HEALTH: QUASI-EXPERIMENTAL EVIDENCE FROM INDONESIA

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ABSTRACT

Introduction/Main Objectives: This research aims to explore and analyze the effect of the COVID-19 pandemic on mental health status as measured by DASS-21. **Background Problems:** The prolonged impact of the COVID-19 pandemic on the global economy may have adversely affected mental health. A decrease in income and consumption and the uncertainties surrounding job security and business performance have been some of the main factors contributing to mental health issues. **Novelty:** This paper aims to evaluate the effect of the COVID-19 pandemic—as a natural experiment—on mental health measured by DASS-21 and how the effect of the pandemic varied across different socioeconomic subgroups. **Research Methods:** We conducted an online survey across Indonesia to collect self-reported mental health status and socioeconomic characteristics before and during the COVID-19 pandemic to measure its impacts on mental health. **Finding/Results:** Our results suggest that the COVID-19 pandemic has had an adverse impact on mental health, particularly in terms of anxiety and stress. The effect has been higher among individuals with lower self-efficacy, lower expenditure, and lower education levels. **Conclusion:** The health and economic crisis driven by the COVID-19 pandemic affected individuals' mental health, suggesting the need for appropriate policy responses.

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) has been causing global public health and economic crises. The World Health Organization (WHO) reported more than 175 million confirmed cases, including more than 3.7 million deaths due to the virus as of June 13, 2021. Meanwhile, the International Monetary Fund (2021) reported that the global economy experienced negative growth of 3.3%, and the unemployment rate increased by about 1.5% in 2020. The COVID-19 pandemic not only caused problems with physical health but also mental well-being due to the lockdown policy—at various levels of government administrations—during the crisis period. Studies on the impacts of lockdown policies on mental health cover a wide range of socioeconomic topics (Altindag et al., 2022; Brodeur et al., 2021; Burdett et al., 2021; Fetzer et al., 2021). For example, mobility restriction policies—through partial and nationwide lockdown policies—have had various adverse effects on mental health (Adams-Prassl et al., 2020; T. Chen & Lucock, 2022; Freund et al., 2022; Gao et al., 2022; Sarasjärvi et al., 2022; Sun et al., 2021)[1], an increasing suicide rate due to economic pressures (Frasquilho et al., 2015; Freund et al., 2022; OECD, 2021; Sun et al., 2021)[2], and on mental illness and financial insecurity (T. Chen & Lucock, 2022; Gao et al., 2022; Ojewale, 2021; Sun et al., 2021)[3]. Moreover, the adverse effects have been more pronounced among lower socioeconomic classes.

Economic pressures and financial insecurity, together, seem to be one of the prominent determinants of mental health deterioration. Kumar & Kumar (2020) have found that people in lower- and middle-income countries suffered severe mental health problems during the COVID-19 pandemic. Country-level findings, such as in the United States, have shown that the youths experience a higher prevalence of anxiety and depression due to uncertainty about economic and financial circumstances in the future (Ojewale, 2021). In other studies, Chinese students were shown to experience worse mental health problems, especially if they are from lower-income families (Cao et al., 2020), and British youths with a history of mental health problems exhibited worse mental health symptoms during the COVID-19 pandemic (Saunders et al., 2022). In addition, people who faced difficulties in forming their beliefs about the future due to the uncertainty caused by COVID-19 were also prone to mental health deterioration. The mass media and perceptions of COVID-19 were also important determinants of personal economic anxiety and mental health deterioration (Fetzer et al., 2021; Sun et al., 2021).

This paper aims to evaluate the effect of COVID-19 on mental health in Indonesia in terms of socioeconomic factors. Mental health is still an underrated issue in Indonesian society. However, during a health crisis—such as the COVID-19 pandemic—mental health problems become the center of discussions. Using the measurement of years lived with disability (YLD), mental health issues had caused, as of 2017, a heavier burden among people with disability than cardiovascular, neoplasm, maternal and neonatal, and respiratory problems

[1] We have various findings on this aspect. For example, females suffer from more harmful economic anxiety in the US; however, both female and male groups suffer a similar level of anxiety and depression in the UK and in Finland, as well as a similar level of symptoms of depression and traumatic stress in China (though anxiety symptoms were higher for females).

[2] In general, economic recessions are commonly found to harm mental health and cause an increase in suicidal behavior because of decreasing household income, and high rates of unemployment and debt.

[3] Mental illness can be caused by the lack of proper employment, family income, food security, education, and basic amenities. Due to those accumulations in socioeconomic vulnerabilities, the risks of mental health deterioration also accumulate.

(Ministry of Health of Republic Indonesia, 2019). Using disability-adjusted life years (DALY) between 1990 and 2017, depressive disorders and anxiety disorders remained the top two mental health problems. Despite this urgency, people with mental health problems in Indonesia often receive a negative stigma and discrimination (Hartini et al., 2018). It is still the norm to shun mental health issues and avoid people who suffer from them. As a result, the problem of mental health remains an 'iceberg phenomenon' in Indonesia.

Our contribution to the health economics literature is twofold. First, we use a quasi-experiment design to estimate the effects of COVID-19 on mental health as measured by DASS-21 (depression, anxiety, and stress scale) in the context of a developing country. We take advantage of regional variations in COVID-19 cases per head of population in Indonesia to estimate the pandemic's effect on the measure of mental health. There have been many studies that analyze the effect of COVID-19 on physical health in a quasi-experimental setting (Lin et al., 2021; Mohammadi-Nasrabadi et al., 2021; Pajaron & Vasquez, 2021; Saha et al., 2020; Sanchez et al., 2021; Sanders et al., 2022). However, to the best of our knowledge, we are among the first to analyze the pandemic and the lockdown policy's impact on mental health. A study by Ursache et al. (2022) that uses a quasi-experimental method found that parents had poorer mental health after the pandemic due to school closures. Apart from this study, studies that have used a quasi-experimental setting for this topic have mainly examined the impact of mental help intervention on improving well-being during the pandemic instead of the effects of the pandemic itself (Chowdhury et al., 2021; Hartstone & Medvedev, 2021; Zaenal et al., 2022). Additionally, our study analyzes the effect of the COVID-19 pandemic on mental health across key socioeconomic and demographic subgroups.

We find that COVID-19 impacted mental health negatively, particularly by increasing anxiety and stress. We find that the effects are higher among individuals with lower self-efficacy, lower expenditure, younger age, and lower educational attainment (particularly those with education below high school). In addition, findings from several studies have found worse mental health among those youth with a history of mental health problems (a sign of lower self-efficacy) in the United Kingdom (Saunders et al., 2022), in people who face difficulties in forming their beliefs regarding the future (a sign of lower self-efficacy) due to the pandemic uncertainty (Fetzer et al., 2021; Sun et al., 2021), in lower-income families (with lower expenditure) in China (Cao et al., 2020), in younger people in the United States (Ojewale, 2021), and people with a lower educational attainment in the United Kingdom (T. Chen & Lucock, 2022). Moreover, research into how financial constraints significantly harm mental health is highly popular. Numerous papers that were examined in a systematic literature review conducted by Frasquilho et al. (2015) showed that unemployment, a decrease in income, and uncontrollable debts increase the occurrence of mental health problems, including suicidal behavior. We would also like to find out how extensive the effect of financial issues is on mental health compared to other effects according to the level of self-efficacy, education, and gender in the results section.

In the next section, we discuss the empirical strategy and data for the estimation of the effect of COVID-19 on the measurement of mental health. We then overview the estimation results in Section 3. We discuss possible recommendations based on our empirical findings in Section 4 and conclude this paper in Section 5.

METHOD, DATA, AND ANALYSIS

We identify the effect of the COVID-19 pandemic on mental health by taking advantage of regional variations in COVID-19 cases across Indonesia, assuming the intensity of COVID-19 at the regional level as an exogenous aggregate shock. Let Y_{ispt} indicate the mental health scale of individual *i*, in district *s*, province p, and period *t*. The periods correspond to the pre-pandemic (January 2020) and the pandemic periods (November to December 2020). Our base model to identify the effect of COVID-19 intensity is:

$$Y_{ispt} = \boldsymbol{\beta}\text{COVID-19}_{spt} + \boldsymbol{\delta}X_{ispt} + a_i + \rho_s + \boldsymbol{\zeta}_p + T_t + u_{ispt}. \quad \text{Eq. 1}$$

where COVID-19 is the ratio of accumulative COVID-19 cases to the total population at a specific period (as a proxy of COVID-19 intensity); *X* is a set of control variables that change over time at the individual, district, and province levels, such as employment status, income, and aggregate regional variables. We also include district (ρ) and province fixed effects (**ζ**) to control for unobserved factors at the district and province levels that may affect mental health. We also include a time-fixed effect to control for period-specific unobserved aggregate shocks. These include a social perception score, a dummy variable to indicate a significant change in family circumstances during the pandemic, a dummy of being unemployed during the COVID-19 pandemic, a log of mobility index for retail and recreation places, grocery, park, transit station, workplaces, and residential, as well as a log of gross regional domestic product.

We choose the ratio of COVID-19 cases to the total population as a proxy of COVID-19 intensity for two reasons. First, the data are released by the public authority and are publicly available. Second, more importantly, the intensity of the COVID-19 pandemic within a district reflects mobility and social interaction risks. Limited social interaction is one of the potential drivers of heightened mental health issues.

We try to eliminate potential bias from the intensity of COVID-19 since it might be correlated with unobserved heterogeneity at the individual, district, or province level using the first difference (FD) strategy:

$$\Delta Y_{isp} = \alpha + \boldsymbol{\beta}\Delta\text{COVID-19}_{sp} + \boldsymbol{\delta}\Delta X_{isp} + \Delta u_{isp.} \quad \text{Eq. 2}$$

The first-difference (FD) estimation strategy allows us to obtain exogenous variations in COVID-19 intensities across districts since there are various intensities of COVID-19 at the regional level.[4] We do not include time-invariant variables in Equation 2 because these would be eliminated during the estimation due to the use of the FD estimation strategy. We cluster the standard errors at the district level to account for unobserved correlation in unobserved variations within a district.[5]

[4] Let us consider a simple case in this matter. Suppose there is a high-intensity district (that experienced high COVID-19 cases relative to total the population since the start of the pandemic) and a low-intensity district. The method would allow us to estimate whether the measure of mental health is lower in the high-intensity district. To extend the example, instead of a binary high and low status, consider continuous changes in COVID-19 intensities across districts. The FD estimation strategy eliminates district-specific unobserved factors that would affect changes in COVID-19 intensity over time. Thus, the FD estimation strategy allows us to identify the effect of COVID-19 intensity on mental health.

[5] The lockdown policy in Indonesia during the COVID-19 pandemic was also enacted by the local government (at both district and provincial levels) depending upon the regional situation and the central government policy. There were various implementations for this at the regional level that resulted in various unobserved effects on individual mental health. There may also be differences in individual characteristics that were not observed or measured, such as pre-existing health conditions, socio-economic status, and access to healthcare that may have arisen during the COVID-19 pandemic at individual level.

We conducted a self-administered online survey using the SurveyMonkey platform between November and December 2020. We use a convenience sampling method by distributing invitations to participate in the survey through emails and WhatsApp messages by taking advantage of our nationwide networks. We leverage the Universitas Gadjah Mada's and the Indonesian LPDP scholarship's alumni network in the first place and other smaller communities (e.g., small businesses, hobby, and volunteers) to reach heterogeneous samples from different regions.[6] Participants reviewed and filled out an informed consent form before participating in the survey. We obtained 996 completed responses which is a 63.43% completion rate; 1,570 participants accessed our SurveyMonkey platform. We acknowledge that the sample is not representative, and the respondents are more educated individuals than average individuals in Indonesia since the sample was not randomly chosen. However, we exercise caution in interpreting the estimates so that we do not generalize them for the overall population in Indonesia.

We measure mental health using the 21-item depression, anxiety, and stress scale (DASS-21) instrument (Lovibond & Lovibond, 1995). The instrument has been used in the socio-economics literature (Ali & Green, 2019; Foubister, 2017; Lee & Kim, 2022) and during the COVID-19 pandemic (Elbay et al., 2020; Ozamiz-Etxebarria et al., 2020; Verma & Mishra, 2020). We construct the DASS in two steps. First, we create trait-specific scales, i.e., scales for depression, anxiety, and stress. We sum up the respondents' responses in each trait, and then multiply the summation by two. Second, we create a sum of depression scale, anxiety scale, and stress scales to construct the DASS. Given that there are 21 items and the maximum response for each item is four, the minimum score is 21 x 1 x 2 or 42 and the maximum score would be 21 x 4 x 2 or 168. Since the measure is an ordinal scale, the interpretation is quite straightforward. A higher scale indicates a worse mental health issue, and vice versa.

In the survey, we also ask about demographic characteristics as well as socioeconomic factors such as other employment types, household financial situation, self-reported health status, household dynamic, and about loneliness according to the De Jong Gierveld loneliness scale (de Jong Gierveld & van Tilburg, 1999), and a general self-efficacy scale (Schwarzer & Jerusalem, 1995). We ask respondents to report on their mental health and several socioeconomic factors before (January 2020) and during the COVID-19 pandemic (in the past month). All respondents answered questions regarding their situation before the COVID-19 pandemic (January 2020) and during the COVID-19 pandemic (in the month prior to completing the survey). We acknowledge the potential bias inherent in the survey: recall bias. We argue that the recall issue would be minimal for the main constructs of depression, anxiety, and scale. The main argument is that respondents were asked to compare their situation in the previous month with their situation in January 2020. Respondents perform better when they are requested to make a comparison of past outcomes rather than to make a single estimation of past outcomes.

RESULTS AND DISCUSSION

First, we report the summary statistics of the demographics, socioeconomic characteristics, and mental health measures in Table 1. The gender profile of the respondents in our survey is

[6] We do not rule out the existence of a snowball process during the data collection since our network might have forwarded the message to their network. An assistant helped recapitulate the responses and report to us on the regional distribution of the ongoing sample.

quite balanced. The typical respondents in our survey are educated and working individuals living in urban areas in Java. A non-negligible share of the respondents are university students. Note that the socioeconomic profile of the respondents is a result of our convenience sampling strategy that mainly targets alumni of Universitas Gadjah Mada and the Indonesian LPDP scholarship program, as we have previously explained. We have an extensive network in these two institutions, allowing us to reach heterogeneous respondents.

We also found that the average income of the respondents during and before the COVID-19 pandemic did not differ much. This is further supported by the small share of individuals who reported being unemployed and experiencing financial or credit shocks during the COVID-19 pandemic. However, we did find that measures of mental health—both the overall DASS and sub-scales—increased during the COVID-19 pandemic, and changes in scales are all statistically significant (paired t-test, p-value of 0.000). We found that the measure of depression increased the highest by 16.89 percent, while the measures of anxiety and stress increased by 7.57 and 10.67 percent, respectively. While these changes are significant, we note that they cannot be solely attributed to the COVID-19 pandemic. We employed the empirical strategy to identify the impact of the COVID-19 pandemic on mental health measures.

Table 1. Summary statistics

Variable[7]	Proportion	Std. dev.
Demographics and socioeconomic characteristics		
Female respondents	0.578	0.494
Respondents to live in urban area	0.672	0.470
Married respondents	0.490	0.500
Respondents with high school graduates at most	0.248	0.432
Respondents with a 3-year diploma degree at most	0.046	0.209
Respondents to have completed undergraduate or graduate degrees	0.667	0.472
Formally-working respondents	0.585	0.493
Unemployed respondents	0.062	0.242
Student respondents	0.292	0.455
Java Island-based respondents	0.809	0.393
Expenditure in January 2020, before the pandemic	6,223,150	10,700,000
Expenditure in the past month (October-November 2020), during the pandemic	6,106,024	8,170,722
Experiencing a significant change in the family during the pandemic (self-report)	0.300	0.458
Experiencing a financial shock (self-report)	0.016	0.127
Experiencing a loan shock, repayment difficulty (self-report)	0.012	0.110
Measures of mental health		
DASS scale, January 2020	61.143	19.487
DASS scale, past month	68.339	23.086
DASS scale, change	7.196	15.770
Depression scale, January 2020	20.497	7.538
Depression scale, past month	23.961	9.593
Depression scale, change	3.463	7.555

[7] The expenditure is in Indonesian Rupiah (IDR) with a currency of USD1 = IDR15,555 by mid-December 2023.

Variable[7]	Proportion	Std. dev.
Anxiety scale, January 2020	19.487	6.431
Anxiety scale, past month	20.963	7.251
Anxiety scale, change	1.476	4.502
Stress scale, January 2020	21.157	7.965
Stress scale, past month	23.414	8.869
Stress scale, change	2.257	5.764
Total observations	980	

Next, we report our main estimation in Table 2, where the ratio of accumulative COVID-19 cases to the total population is positively significant to the mental health detrimental in general; as measured in DASS-21.[8] Breaking down the DASS-21 by subscales, we find that the COVID-19 effect on anxiety and stress subscales is significant but not on the depression subscale. One potential explanation of this finding is the significant effect of the COVID-19 pandemic on individuals' or households' economies. Many individuals lost their jobs or experienced a significant loss of income, compounding issues affecting their mental health. Our finding is similar to that of Freund et al. (2022), who found an increase in anxiety levels due to unemployment during the COVID-19 pandemic in Vietnam. An increase in anxiety level was not significant enough to have a negative effect on the depression level since, psychologically, it follows a severe level of anxiety. However, one study (Ojewale, 2021) found a significant detrimental impact on both anxiety and depression for young people who had financial difficulties during the pandemic in the United States. There is a higher prevalence of anxiety than depression found in the study, unlike a study by Sun et al. (2021) that found a higher prevalence of depressive symptoms than anxiety among Chinese university students.

Given the socioeconomic statuses of our sample, we also divided the estimation by subgroup, as shown in Table 3. The lower socioeconomic groups were more vulnerable to the COVID-19 impact. These groups are at risk of losing jobs and income since the pandemic hit the economy quite hard. Economic loss may have been one of the significant contributors to rising mental health issues. This vulnerable group most likely had no financial coverage for their consumption, and the economic slowdown due to COVID-19 only made things worse for this group. In general, economic recessions are commonly found to harm mental health and increase suicidal behaviors through decreasing income in households, high unemployment rate, food insecurity, and debts (Brik & Gilbert, 2021; Frasquilho et al., 2015; OECD, 2021). This has been demonstrated globally, specifically in lower- and middle-income countries, in which income heavily affected mental health during the pandemic (Kumar & Kumar, 2020). In China, for example, college students whose families experienced financial stress consistently exhibited predicted psychiatric symptoms and mental health problems (Cao et al., 2020; Sun et al., 2021). Therefore, we divided the sample by above- and below-median expenditure to represent financial stress.

[8] Both models (one does involve control variables and one does not) yield the consistent effect of Covid-19 toward DASS-21 score: positive and significant.

Table 2. The impact of the COVID-19 pandemic on mental health

Dependent variables	DASS-21	DASS-21	Depression scale	Anxiety scale	Stress Scale
COVID-19	1.635***	1.356***	0.368	0.382**	0.606***
	(0.587)	(0.512)	(0.236)	(0.159)	(0.206)
Covariates	N	Y	Y	Y	Y
Obs.	978	956	956	956	956
F-stats	7.760	4.304	2.302	2.141	3.376
Adj. R-sq	0.00905	0.0300	0.0235	0.0272	0.0248

Notes: *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. We include the social perception score, monthly expenditure, change in a dummy variable to indicate a significant change in family circumstances during the pandemic, a dummy if being unemployed during the COVID-19 pandemic, log of mobility index for retail and recreation place, grocery, park, transit station, workplaces, and residential, as well as a log of gross regional domestic product. We have not reported those estimated coefficients for brevity.

Other than dividing the sample into above- and below-median expenditure, other subgroups were created based on educational attainment and gender, as they are important social determinants in mental health (Braveman et al., 2011). Interestingly, we found that the more-educated group (those in post-secondary education) suffered more harmful effects from the COVID-19 pandemic on their mental health than people in the less-educated group. This was likely to have happened to university students—who were fatigued due to online learning—and white-collar workers—who were fatigued due to the work-from-home arrangements. We also found a more unfavorable effect of the COVID-19 pandemic on mental health towards females compared to males, though it does not rule out the fact that both males and females received a harmful impact of the COVID-19 pandemic. These two important findings highlight the ubiquitous effect of the COVID-19 pandemic on mental health, and it will be hard work to restore the human surrounding environment for every impacted group (Adams-Prassl et al., 2020; Freund et al., 2022; Marques et al., 2022; S. Yang et al., 2021).

Lastly, we also divided the estimation by the level of self-efficacy, representing a respondent's belief in his or her capability to successfully perform a task (Schwarzer & Luszczynska, 2016).[9] In addition, it was strongly related to mental health, so we divided the sample into above- and below-median self-efficacy (Heslin & Klehe, 2006). We found that those with lower self-efficacy (self-reported) were positively correlated with a mental health problem following the COVID-19 pandemic. Self-efficacy helped individuals to form efficient coping strategies to encounter problems and difficulties caused by the COVID-19 pandemic. This finding aligns with recent studies in which individuals with higher levels of self-efficacy were more likely to have fewer mental health problems during the COVID-19 pandemic (Bidzan et al., 2020; Mo et al., 2021; Zhou et al., 2021).

Figure 1 below depicts the estimated effects of the ratio of accumulative COVID-19 cases to the total population to socioeconomic aspects of our respondents—as also explained in Table 2 above. According to the averages, the lower self-efficacy group (by its median) has a higher DASS-21 score due to COVID-19 cases, as shown in Table 2. Those who became unemployed due to COVID-19, as well as those who

[9] Schwarzer & Luszczynska (2016) show that efficacy is a significant predictor for many psychological aspects of an individual such as effort, perseverance, and strategy, as well as their future training and work performance.

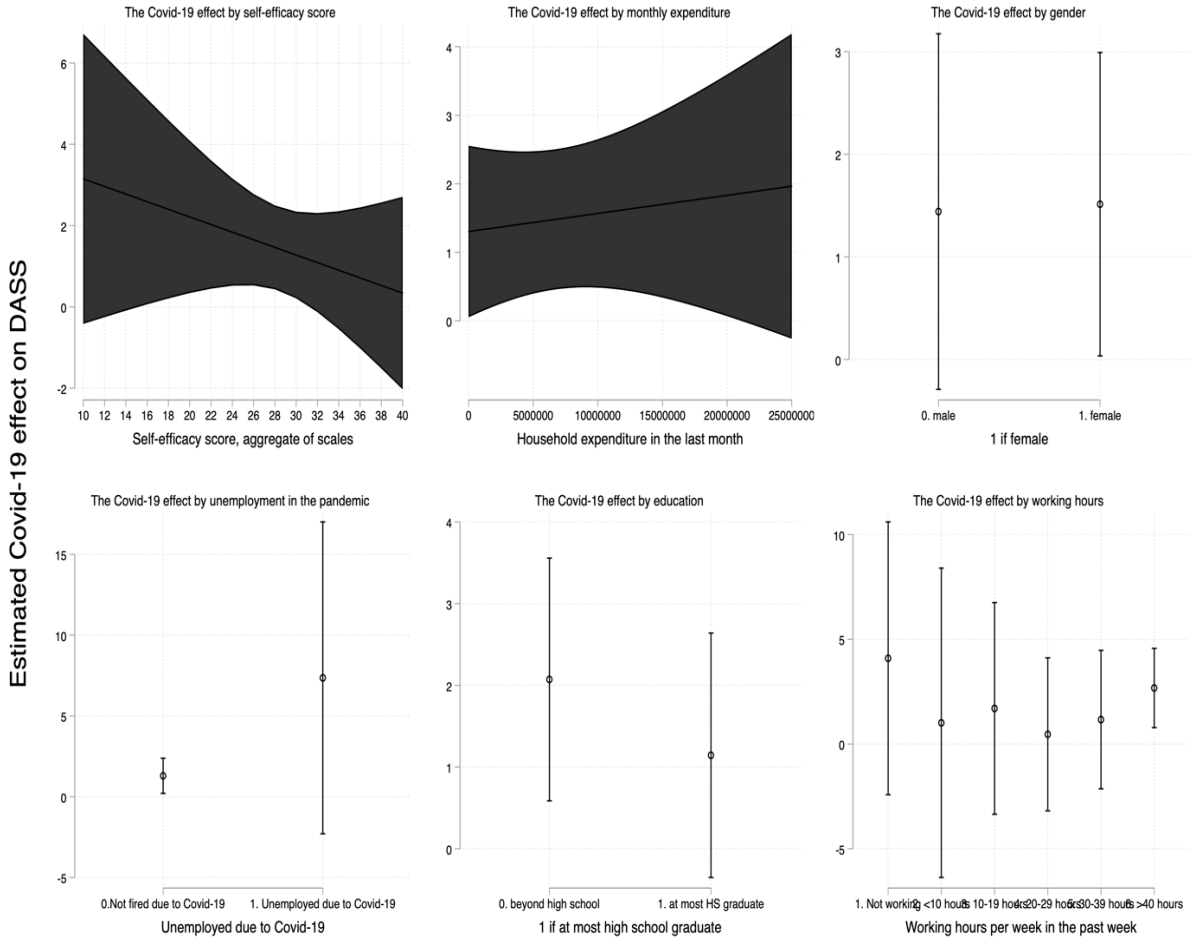
completed school beyond high school, experienced a higher impact of the pandemic on their mental health compared to their counterparts in other demographic groups. Lastly, those who worked (at the time the survey was conducted) 20-29 hours a week suffered the least impact of the COVID-19 pandemic on their mental health compared to others, including those who were not working.

Table 3. The impact of the COVID-19 pandemic on mental health by sub-group

Dependent variables	Above-median self-efficacy	Below-median self-efficacy	Female	Male	Above-median expenditure	Below-median expenditure	At most high school	Beyond high school
COVID-19	0.672	2.209***	1.317*	1.883**	1.231	1.986**	1.231	1.986**
	(0.865)	(0.735)	(0.684)	(0.859)	(1.152)	(0.762)	(1.152)	(0.762)
Obs.	438	518	549	407	477	479	233	723
F-stats	2.25	1.924	3.5	1.351	3.695	3.002	2.942	2.583
Adj. R-sq	0.066	0.018	0.035	0.081	0.081	0.01	0.001	0.038

Notes: *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. Standard errors are clustered at the district level. As in Table 1, we use the same control variables in the estimation but do not report the estimated coefficients for brevity.

Figure 1. The COVID-19 effect on the DASS-21 scale by subgroups[10]



[10] The outer lines indicate 95 percent confidence intervals. Standard errors are clustered at the district level.

Similar to findings from Fetzer et al. (2021), Saunders et al. (2022), and Sun et al. (2021), individuals with lower self-efficacy have worse mental health, and people with lower expenditure also exhibit worse measures of mental health as found by Cao et al. (2020) in China. There are two important findings from our analysis here: (i) there is no significant difference in COVID-19 impact on mental health by gender; and (ii) the group with higher educational attainment (beyond high school) has a higher and significant negative impact on mental health than the lower educational attainment group (at most high school). The former is found to be contrary to most of the findings in the literature that we have reviewed which shows the mental health of women will be harmed more than that of men. In Finland, however, men and women are impacted to similar degrees (Sarasjärvi et al., 2022). In China, depressive symptoms and traumatic stress also did not differ based on gender (Sun et al., 2021). This may be related to why there is not a significant impact. The latter, however, is in line with the existing literature where the depression level is higher in respondents with a tertiary educational level than those with a primary or secondary educational level (Lemuel et al., 2021). There are higher levels of depressive symptoms than before the pandemic for individuals with higher educational attainment (Wanberg et al., 2020).

DISCUSSION

The impact of COVID-19 began to spread worldwide in early 2020 and became a global public health emergency that affected many aspects of society. Our main findings highlight how the impact of the COVID-19 pandemic on mental health manifested itself in the prevalence of anxiety and stress, where its impact was much greater on levels of stress. The literature shows that this impact was due to economic and job pressure—as a result of policies that sought to prevent the spread of COVID-19—among various groups of the population (Adams-Prassl et al., 2020; Cao et al., 2020; Freund et al., 2022; Kumar & Kumar, 2020; Marques et al., 2022; Ojewale, 2021; Sun et al., 2021; S. Yang et al., 2021). Being isolated and lonely due to the lockdown policy, anxiety and fear caused by the spread of the virus, financial stress due to job losses and other economic instability, as well as grief and loss of family members and friends, was detrimental to the mental health of individuals at that time. In addition, the long-term impact of the pandemic on mental health will likely continue to be a significant concern and may require ongoing support and resources.

We also found that the lower socioeconomic groups (as measured by the self-efficacy score, expenditure, and educational background) tend to exhibit more problems with mental health. At the sub-group level, individuals with lower self-efficacy and expenditure levels (measured by the median of the sample) were in a worse condition in terms of mental health during COVID-19. This asserts the influence of socioeconomic status on mental health extends beyond individual experiences to encompass other pressures caused by the COVID-19 pandemic. These findings receive support from previous literature where an individual with low socioeconomic status—including those who live under conditions of socioeconomic inequality—may lack positive interpersonal relationships and personal internal resources, which further exacerbates disparities in mental health, hence contributing to lower levels of mental health (León-Giraldo et al., 2021; Macintyre et al., 2018; D. Yang et al., 2022). The importance of socioeconomic indicators should be the main concern in the post-pandemic recovery process and the mitigation strategy if a crisis strikes again. Individuals

with a higher level of self-efficacy were more resistant to mental health issues during the COVID-19 pandemic (Bidzan et al., 2020; Mo et al., 2021; Zhou et al., 2021). However, we found an interesting case where individuals with a higher educational background suffered harmful impacts of the pandemic; some explanations that support this are that it was due to changes in the teaching process among university students (Ding et al., 2022; Gopalan et al., 2022; Wood et al., 2022), high pressure for healthcare professionals (Lange et al., 2020; Xiang et al., 2020), and changes in lifestyle habits among white-collar workers (Blom et al., 2021; Y. Chen et al., 2022).

Our study sheds light on relevant recommendations to minimize the negative impact of a mental health crisis and the subsequent recovery process. Comprehensive approaches addressing the physical, psychological, and social aspects of individuals' well-being are important. First, improving the effectiveness of social safety net and support is essential since both lower-income and lower-self-efficacy groups were suffering mental health problems as a result of the COVID-19 pandemic. The effect of the pandemic seemed to be multidimensional rather than affecting a limited and specific group. Second, improving the social environment (in the workplace, school, neighborhood, etc.) would be a huge task for both the government and society to reshape sociocultural resilience in the face of incoming crises. Finally, we shall suggest several follow-up studies to reshape our knowledge and preventive action to cope with mental health issues. Firstly, future reserachers would need a wider stratification of the sample to better understand the prominent impacts of the COVID-19 pandemic on mental health problems within the general population; our sample represents the more educated individuals. Further studies could also evaluate to what extent the negative impact of COVID-19 on mental health would affect other outcomes, such as labor market performances.

CONCLUSION

This paper has identified how the COVID-19 pandemic contributed to the incidence of mental health issues at the individual level in terms of different socioeconomic factors in Indonesia. We used a quasi-experimental design and collected the data through an online survey across Indonesia using a convenience sampling method. Building on the literature on the economy and mental health—especially during the COVID-19 pandemic—and the vast growing concern for mental health in Indonesia, we found that COVID-19 cases had a positive correlation to a measure of mental health. The prevailing impact of COVID-19 is seen in both anxiety and stress which reached worse levels during the COVID-19 pandemic compared to the period prior to the pandemic. Breaking the data down by socioeconomic group, for the lower socio-economic group (as measured by self-efficacy and monthly expenditure) it was found that the pandemic had a harmful impact on mental health. This harmful impact was found to be pervasive in both men and women, though women suffer a more harmful impact than men. We also found that the more-educated individuals (beyond high school) experience a more harmful impact than those less-educated individuals (at most high school), indicating a more widespread impact of COVID-19 on mental health. Our findings testify to the negative impact of COVID-19 in aspects that are broader than just physical health and the economy.

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