Social media exposure and mental health problems during coronavirus disease 2019 pandemic in Indonesia

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Abstract:

BACKGROUND: Several preventive measures were used by governments around the world to suppress the transmission of SARS-CoV-2, including quarantine. During quarantine more people are at risk of developing mental health problems as social media exposure was increasing.

OBJECTIVES: The objective is to investigate the impact of social media exposure during coronavirus disease 2019 (COVID-19) pandemic on depression, anxiety, and stress.

MATERIALS AND METHODS: A cross-sectional study was conducted between April and May 2020 during the large scale social restriction in Indonesia using online questionnaire Indonesian citizens over 18 years of age were invited to take part by answering online questionnaire through Google forms (http://bit.ly/duniamayaCOVID). Data gathered were demographic data, depression, anxiety, and stress that were assessed using Depression Anxiety Stress Scale-21, duration of social media usage, and social media platforms used during COVID-19 pandemic. Data was analysed using Pearson Chi-square and ANOVA. Statistically significant variables and additional risk factors was analyzed using multinomial logistic regression.

RESULTS: The median age was 24 years (range 17–56 years), 121 (55.0%) samples were female. The three most frequent social media platforms used by participants were Instagram, WhatsApp, and YouTube. Female were more likely to suffer from mild-moderate depression compared to male (odds ratio [OR]: 2.344; 95% confidence interval [CI]: 1.105–4.972; \(P = 0.026\)) and more likely to suffer from severe-extremely severe anxiety (OR: 2.066; 95% CI: 1.019–4.187; \(P = 0.044\)). Social media exposure was associated with less likelihood to suffer from severe-extremely severe depression, mild-moderate, and severe-extremely severe anxiety, mild-moderate stress.

CONCLUSION: Social media exposure was associated with less depression, anxiety, and stress in the COVID-19 pandemic era. Medical professionals and government officials could use social media to disseminate knowledge about COVID-19 to bring positive psychological effect.

Keywords: Coronavirus disease 2019, mental health, social media

Introduction

In the early December 2019, pneumonia outbreak of unknown etiology was found in Wuhan City of Hubei Province, Central China. On January 2020, genomic sequencing demonstrated a novel coronavirus that is officially named by the World Health Organization (WHO) as Coronavirus disease 2019 (COVID-19).

Until the present time, this COVID-19 pandemic has affected countries worldwide. Until April 30, 2020, there were 3,090,184 confirmed cases and 217,759 deaths from 34 countries in a study based on the WHO reports. In Indonesia, as to date, the number was over 22,000 of confirmed cases along with over 1,300 death cases. Due to the alarming rate of new and death cases, there are several actions taken. There are a few strategies to control the
spread of the infections by increasing awareness, wearing protective clothing, improving treatment, and perhaps vaccination.\cite{6,7} Since vaccination and antiviral treatment are not available, thus containing further spread by isolation, hospitalization and safety measures are the key.\cite{8,9} One of the currently used measure by government all over the world is isolation, quarantine, and social distancing.\cite{10} Specifically in Indonesia, the government use large-scale social restriction (LSSR) method, which people are encouraged to stay at home except for those who need to work outside, for example, health-care personnel, journalist, security, and restricting and/or limiting public activities.\cite{11}

Social interaction has been known to interlink with psychological well-being, social opportunities, and employment; thus restriction by these measures could possibly cause a major distressing.\cite{12} The LSSR policy causes most people to start working or even study from home, loss of income, separation from family, serious health fears, some might even suffer from losing their love ones. Social media usage is increasing, some to help them with work, and others used them to get an update about the pandemic situation besides for work.\cite{13}

As social media exposure during COVID-19 outbreak is increasing, people are at risk in developing mental health problems. Although official organizations share information to improve awareness of prevention and intervention strategies of COVID-19 through website and social media,\cite{14} other information on social media might be misleading, which in turn may cause mental health problems.\cite{15} The WHO bring about the underlying reasons of insecurity, fear, anxiety of misinformation and rumor through social media.\cite{16}

Prior study in Shanghai, China, during COVID-19 pandemic showed that the prevalence of depression, anxiety and depression-anxiety combined are 48.3%, 22.6%, and 19.4% respectively from total of 4872 samples. Among the samples with mental health problems, 83.0% frequently access social media.\cite{17} With the lockdown policy was applied in China, there are two sides of quality of life resulting from the outbreak, i.e., majority of participants who are paying more attention to their mental health by doing lifestyle changes like spending more time with family, relaxing or doing activities that they have never done before the pandemic. On the other hand, there are some participants who had financial burden which increase stress and lead to avoidance behavior leading to worsen mental health, thus resulting in more passive lifestyle.\cite{18} A study in Hong Kong showed that out of 500 respondents, 19% and 14% had depression and anxiety respectively, 25.4% reported mental health deterioration since the COVID-19 pandemic.\cite{19} Another study in Australia found that negative changes in physical activity, sleep, smoking, and alcohol consumption were associated with higher depression, anxiety and stress.\cite{20}

Our study aims to investigate whether there was an impact of social media exposure during COVID-19 pandemic on mental health, particularly depression, anxiety, and stress in Indonesia.

### Materials and Methods

#### Participants

A cross-sectional study was conducted from April to May 2020 using online questionnaire. Indonesian citizens over 18 years of age were invited to take part by answering online questionnaire through Google forms (http://bit.ly/duniamayaCOVID). A total of 220 participants completed the survey.

#### Ethical consideration

This study has been approved by the Ethical Committee of Faculty of Medicine, Pelita Harapan University no. 142/K-LKJ/ETIK/IV/2020.

#### Sociodemographic data

In this study, sociodemographic data, we collected including sex, age, marital status, number of housemate, education, occupation as health-care personnel, working online or offline, presence of family member working as health-care personnel and family member infected with SARS-CoV-2, social media duration and platforms used.

#### Measurements

##### Mental health problem

In this study, we assessed depression, anxiety and stress using Depression Anxiety Stress Scale-21 (DASS-21) which consist of 5 types of severity (normal, mild, moderate, severe, extremely severe) for depression, anxiety and stress each. Depression was classified as normal (score 0–4), mild (score 5–6), moderate (score 7–10), severe (score 11–13), extremely severe (score above 13). Anxiety was classified as normal (score 0–3), mild (score 4–5), moderate (score 6–7), severe (score 8–9), extremely severe (score above 9). Stress was classified as normal (score 0–7), mild (score 8–9), moderate (score 10–12), severe (score 13–16), extremely severe (score above 16). The severity was grouped into three category for analysis purpose: normal, mild-moderate, and severe-extremely severe. Response options were “did not apply to me at all”, “applied to me to some degree, or some of the time,” “applied to me a considerable degree or a good part of the time,” “applied to me very much or most of the time,” scored as 0, 1, 2, 3 respectively. A study showed the Cronbach’s alpha (α) that measures the reliability of DASS-21 according were $\alpha = 0.076$ for depression, $\alpha = 0.82$ for anxiety, and $\alpha = 0.75$ for stress.

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\[\alpha\]
As for the validity, the $r$ value between anxiety and stress ($r = 0.713$), depression and stress ($r = 0.698$), and depression and anxiety ($r = 0.68$), showed close, positive, and strong relationship between those factors.[19]

**Social media exposure**

We ask each participant about the duration of social media usage (hour per day). We also obtain data regarding which social media platforms the participants used during COVID-19 pandemic.

**Statistical analyses**

Data were analyzed using SPSS for Windows, version 23.00; IBM Corporation, Armonk, NY, USA. The categorical data were presented in frequency (%), while numerical data were presented in median (range). The Pearson Chi-square and ANOVA analyses were used to describe prevalence of depression, anxiety, and stress by categorical variables and covariates including social media exposure. Adjusted ORs and 95% confidence intervals (CIs) for the association between the prevalence of depression, anxiety, and stress and social media exposure after controlling for categorical variables of independent variables were described using multiple logistic regression analyses.

**Results**

In total, 220 samples were approached. The median age was 24 years (minimum 17 years, maximum 56 years), 121 (55.0%) samples were female, most of the samples were single/not married (60.9%), and living alone (80.9%). One hundred and forty-nine samples (67.7%) were employed, whereas the majority was not health-care personnel (84.5%), and 55.0% were working from home. Most of samples did not have family member who works as healthcare personnel (71.4%) and 98.2% did not have family members who were suffering from COVID-19.

The three most frequent social media platforms used by participants were Instagram, WhatsApp, and YouTube [Table 1].

Samples that suffered from mild-moderate and severe-extremely severe depression were 65 (29.5%) and 102 (46.4%), mild-moderate and severe-extremely severe anxiety were 43 (19.6%) and 134 (60.9%), and mild-moderate and severe-extremely severe stress were 36 (16.3%) and 84 (38.2%), respectively.

Sociodemographic characteristics of the samples associated with depression, anxiety, and stress were shown in Table 2. Female were more likely to suffer from depression (mild-extremely severe) compared to male (72.6% vs. 67.7%, $P = 0.036$). Median age (range) of samples who did not had depression compared to samples who had mild-moderate, and severe-extremely severe depression were not significantly different ($P = 0.144$). Samples who rented a place were more likely to suffer from depression compared to samples who lived in their own house (80.9% vs. 64.7%, $P = 0.297$). Samples who were still employed and had depression were relatively higher than those who were unemployed (78.6% vs. 70.5%, $P = 0.417$). Samples who did not worked as healthcare personnel samples had higher frequency

| Table 1: Sociodemographic characteristic of the samples |
|--------------------------------------------------------|
| Characteristics                                           | Total (n=220) |
| Sex, n (%)                                               |              |
| Male                                                     | 99 (45.0)    |
| Female                                                   | 121 (55.0)   |
| Age (years), median (minimum-maximum)                    | 24 (18-56)   |
| Marital status, n (%)                                    |              |
| Single                                                   | 134 (60.9)   |
| Married                                                  | 86 (39.1)    |
| House, n (%)                                             |              |
| Owned                                                    | 178 (80.9)   |
| Rented                                                   | 42 (19.1)    |
| Number of housemate, median (minimum-maximum)            | 4 (0-15)     |
| Education, n (%)                                         |              |
| High school                                              | 39 (17.7)    |
| Beyond High school                                       | 181 (82.3)   |
| Occupation, n (%)                                        |              |
| Employed                                                 | 71 (32.3)    |
| Unemployed                                               | 149 (67.7)   |
| Health-care personnel, n (%)                             |              |
| Yes                                                      | 186 (84.5)   |
| No                                                       | 34 (15.5)    |
| Work, n (%)                                              |              |
| Work from home                                           | 121 (55)     |
| Work outside                                             | 37 (16.8)    |
| Alternate work outside and work from home                | 62 (28.2)    |
| Family member working as health-care personnel, n (%)    |              |
| Yes                                                      | 63 (28.6)    |
| No                                                       | 157 (71.4)   |
| Family member infected with SARS-CoV-2, n (%)            |              |
| No                                                       | 216 (98.2)   |
| Yes                                                      | 4 (1.8)      |
| Social media duration, median (minimum-maximum)          | 5 (1-15)     |
| Social media platforms used by participants, n (%)        |              |
| Instagram                                                | 210 (95.5)   |
| WhatsApp                                                 | 209 (95)     |
| YouTube                                                  | 193 (87.7)   |
| Line                                                     | 148 (67.3)   |
| Spotify                                                  | 129 (58.6)   |
| Zoom                                                     | 105 (47.7)   |
| Online shopping                                          | 97 (44.1)    |
| Facebook                                                 | 94 (42.7)    |
| Twitter                                                  | 50 (22.7)    |
| Online movie streaming                                   | 91 (41.4)    |
| Online news                                              | 66 (30)      |
| Online trading                                           | 26 (11.8)    |
| Other                                                    | 5 (2.4)      |
### Table 2: Sociodemographic characteristic of the samples associated with depression, anxiety, and stress

| Depression       | Total  | Normal | Mild-moderate | Severe-extremely severe | P     |
|------------------|--------|--------|---------------|--------------------------|-------|
|                  | (n=220)| (n=53) | (n=65)        | (n=102)                  |       |
| **Sex**          |        |        |               |                          |       |
| Male             | 99 (45.0) | 32 (32.3) | 26 (26.3) | 41 (41.4)                | 0.036 |
| Female           | 121 (55.0) | 21 (17.4) | 39 (32.2) | 61 (50.4)                |       |
| **Age (years), median (minimum-maximum)** | 24 (18-56) | 24 (18-50) | 24 (17-51) | 24 (17-56) | 0.144 |
| **Marital status** |        |        |               |                          |       |
| Single           | 134 (60.9) | 31 (23.1) | 41 (30.6) | 62 (46.3)                | 0.878 |
| Married          | 86 (39.1) | 22 (25.6) | 24 (27.9) | 40 (46.5)                |       |
| **House**        |        |        |               |                          |       |
| Owned            | 178 (80.9) | 45 (25.3) | 55 (20.9) | 78 (43.8)                | 0.297 |
| Rented           | 42 (19.1) | 8 (19.0) | 10 (23.8) | 25 (57.1)                |       |
| Number of housemate, median (minimum-maximum) | 4 (0-15) | 4 (0-9) | 4 (0-10) | 4 (0-15) | 0.551 |
| **Education**    |        |        |               |                          |       |
| High school      | 39 (17.7) | 9 (23.2) | 13 (33.3) | 17 (43.6)                | 0.848 |
| Beyond High school | 181 (82.3) | 44 (24.3) | 52 (28.7) | 85 (47.0)                |       |
| **Occupation**   |        |        |               |                          |       |
| Unemployed       | 71 (32.3) | 21 (29.6) | 19 (26.8) | 31 (43.7)                | 0.417 |
| Employed         | 149 (67.7) | 32 (21.5) | 46 (30.9) | 71 (47.7)                |       |
| **Health-care personnel** |        |        |               |                          |       |
| No               | 186 (84.5) | 44 (23.7) | 51 (27.4) | 91 (48.9)                | 0.162 |
| Yes              | 34 (15.5) | 9 (26.5) | 14 (41.2) | 11 (32.4)                |       |
| **Work**         |        |        |               |                          |       |
| Work from home   | 121 (55.0) | 26 (21.5) | 40 (33.1) | 55 (45.5)                | 0.742 |
| Work outside     | 37 (16.8) | 10 (27) | 9 (24.3) | 18 (48.6)                |       |
| Alternate work outside and work from home | 62 (28.2) | 17 (27.4) | 16 (25.8) | 29 (46.8)                |       |
| **Family member working as health-care personnel** |        |        |               |                          |       |
| Yes              | 63 (28.6) | 15 (23.8) | 22 (34.9) | 26 (41.3)                | 0.507 |
| No               | 157 (71.4) | 38 (24.2) | 43 (27.4) | 76 (48.4)                |       |
| **Family member infected with SARS-CoV-2** |        |        |               |                          |       |
| No               | 216 (98.2) | 53 (24.5) | 64 (29.6) | 99 (45.8)                | 0.421 |
| Yes              | 4 (1.8) | 0 (0.0) | 1 (25.0) | 3 (75.0)                |       |
| **Social media duration, median (minimum-maximum)** | 5 (1-15) | 5 (1-15) | 5 (1-15) | 5 (1-15) | 0.928 |
| **Anxiety**      |        |        |               |                          |       |
|                  | (n=220)| (n=43) | (n=43)        | (n=134)                  |       |
| **Sex**          |        |        |               |                          |       |
| Male             | 99 (45.0) | 25 (25.3) | 20 (20.5) | 54 (54.5)                | 0.120 |
| Female           | 121 (55.0) | 18 (14.9) | 23 (19.0) | 80 (66.1)                |       |
| **Age (years), median (minimum-maximum)** | 24 (18-56) | 24 (18-50) | 24 (18-51) | 24 (18-56) | 0.049 |
| **Marital status** |        |        |               |                          |       |
| Single           | 134 (60.9) | 23 (17.2) | 29 (21.6) | 82 (61.2)                | 0.413 |
| Married          | 86 (39.1) | 20 (23.3) | 14 (16.3) | 52 (60.5)                |       |
| **House**        |        |        |               |                          |       |
| Owned            | 178 (80.9) | 36 (20.2) | 36 (20.2) | 106 (59.6)               | 0.697 |
| Rented           | 42 (19.1) | 7 (16.7) | 7 (16.7) | 28 (66.7)                |       |
| Number of housemate, median (minimum-maximum) | 4 (0-15) | 4 (0-9) | 4 (0-10) | 4 (0-15) | 0.694 |
| **Education**    |        |        |               |                          |       |
| High school      | 39 (17.7) | 6 (15.4) | 10 (25.6) | 23 (59.0)                | 0.509 |
| Beyond High school | 181 (82.3) | 37 (20.4) | 33 (18.2) | 111 (11.3)               |       |
| **Occupation**   |        |        |               |                          |       |
| Unemployed       | 71 (32.3) | 18 (25.4) | 12 (16.9) | 41 (57.7)                | 0.308 |
| Employed         | 149 (67.7) | 25 (16.8) | 31 (20.8) | 93 (62.4)                |       |
| **Health-care personnel** |        |        |               |                          |       |
| No               | 186 (84.5) | 36 (19.4) | 32 (17.2) | 118 (63.4)               | 0.097 |
| Yes              | 34 (15.5) | 7 (20.6) | 11 (32.4) | 16 (47.1)                |       |
| **Work**         |        |        |               |                          |       |
| Work from home   | 121 (55.0) | 21 (27.0) | 24 (24.3) | 76 (48.6)                | 0.853 |

Contd...
Table 2: Contd...

| Depression                                      | Total (n=220) | Normal (n=53) | Mild-moderate (n=65) | Severe-extremely severe (n=102) | P   |
|-------------------------------------------------|---------------|---------------|----------------------|---------------------------------|-----|
| Work outside                                    | 37 (16.8)     | 7 (3.2)       | 8 (3.6)              | 22 (10.0)                       |     |
| Alternate work outside and work from home       | 62 (28.2)     | 15 (27.4)     | 11 (25.8)            | 36 (46.8)                       |     |
| Family member working as health-care personnel  |               |               |                      |                                 |     |
| Yes                                             | 63 (28.6)     | 13 (20.6)     | 15 (23.8)            | 35 (55.6)                       | 0.525|
| No                                              | 157 (71.4)    | 30 (29.1)     | 28 (17.8)            | 99 (63.1)                       |     |
| Family member infected with SARS-CoV-2          |               |               |                      |                                 |     |
| No                                              | 216 (98.2)    | 43 (19.9)     | 43 (19.9)            | 130 (60.2)                      | 0.271|
| Yes                                             | 4 (1.8)       | 0 (0.0)       | 0 (0.0)              | 4 (100.0)                       |     |
| Social media duration, median (minimum-maximum) | 5 (1-15)      | 5 (1-15)      | 5 (1-15)             | 5 (1-15)                        | 0.062|

| Stress                                           | Total (n=220) | Normal (n=100) | Mild-moderate (n=36) | Severe-extremely severe (n=84) | P   |
|--------------------------------------------------|---------------|---------------|----------------------|--------------------------------|-----|
| Sex                                              |               |               |                      |                                 |     |
| Male                                             | 99 (45.0)     | 52 (52.5)     | 11 (11.1)            | 36 (36.4)                       | 0.075|
| Female                                           | 121 (55.0)    | 48 (20.7)     | 25 (39.7)            | 48 (21.8)                       |     |
| Age (years), median (minimum-maximum)            | 24 (18-56)    | 24 (18-51)    | 23 (18-39)           | 23 (18-56)                      |     |
| Marital status                                   |               |               |                      |                                 |     |
| Single                                           | 134 (60.9)    | 62 (46.3)     | 18 (13.4)            | 54 (40.3)                       | 0.324|
| Married                                          | 86 (39.1)     | 38 (44.2)     | 18 (20.9)            | 30 (34.9)                       |     |
| House                                            |               |               |                      |                                 |     |
| Owned                                            | 178 (80.9)    | 85 (47.8)     | 29 (16.3)            | 64 (36.0)                       | 0.317|
| Rented                                           | 42 (19.1)     | 15 (35.7)     | 7 (16.7)             | 20 (47.6)                       |     |
| Number of housemate, median (minimum-maximum)    | 4 (0-15)      | 4 (0-10)      | 4 (0-9)              | 4 (0-15)                        | 0.654|
| Education                                        |               |               |                      |                                 |     |
| High school                                      | 39 (17.7)     | 19 (48.7)     | 4 (10.3)             | 16 (41.0)                       | 0.524|
| Beyond high school                               | 181 (82.3)    | 81 (44.8)     | 32 (17.7)            | 68 (37.6)                       |     |
| Occupation                                       |               |               |                      |                                 |     |
| Unemployed                                       | 71 (32.3)     | 35 (49.3)     | 11 (15.5)            | 25 (35.2)                       | 0.729|
| Employed                                         | 149 (67.7)    | 65 (43.6)     | 25 (16.8)            | 59 (39.6)                       |     |
| Health-care personnel                            |               |               |                      |                                 |     |
| No                                               | 186 (84.5)    | 79 (42.5)     | 31 (16.7)            | 76 (40.9)                       | 0.096|
| Yes                                              | 34 (15.5)     | 21 (61.8)     | 5 (14.7)             | 8 (23.5)                        |     |
| Work                                             |               |               |                      |                                 |     |
| Work from home                                   | 121 (55.0)    | 54 (44.6)     | 20 (16.5)            | 47 (38.8)                       | 0.949|
| Work outside                                     | 37 (16.8)     | 19 (51.4)     | 5 (13.5)             | 13 (35.1)                       |     |
| Alternate work outside and work from home        | 62 (28.2)     | 27 (43.5)     | 11 (17.7)            | 24 (38.7)                       |     |
| Family member working as health-care personnel   |               |               |                      |                                 |     |
| Yes                                              | 63 (28.6)     | 33 (52.4)     | 8 (12.7)             | 22 (34.9)                       | 0.386|
| No                                               | 157 (71.4)    | 67 (42.7)     | 28 (17.8)            | 62 (39.5)                       |     |
| Family member infected with SARS-CoV-2           |               |               |                      |                                 |     |
| No                                               | 216 (98.2)    | 99 (45.8)     | 36 (16.7)            | 81 (37.5)                       | 0.288|
| Yes                                              | 4 (1.8)       | 1 (25.0)      | 0 (0.0)              | 3 (75.0)                        |     |
| Social media duration, median (minimum-maximum)  | 5 (1-15)      | 5 (1-15)      | 5.5 (1-15)           | 5 (1-15)                        | 0.687|

of severe-extremely severe depression compared to health-care personnel (48.9% vs. 32.4%, P = 162). The duration of time dedicated to social media between groups of depression were not significant (P = 0.928).

According to our study, anxiety mostly suffered by female compared to male (85.1% vs. 75.0%, P = 0.120). Samples who were single more likely to suffer from anxiety compared to married samples (82.8% vs. 76.8%, P = 0.413). All participants whose family members were infected with COVID-19 had anxiety compared to those who did not had family members infected with SARS-CoV-2 (100% vs. 80.1%, P = 0.271). The duration of time dedicated to social media between groups of anxiety were not significant (P = 0.062).

Regarding variables associated with stress, male were more likely to suffer from severe-extremely severe stress compared to female (36.4% vs. 21.8%), and female tend to suffer lower stress (mild-moderate) compared to male (39.7% vs. 11.1%), P = 0.075. Samples who were not healthcare personnel had higher frequency of stress.
compared to health-care personnel (57.6% vs. 38.2%, \( P = 0.096 \)). Duration of time dedicated to social media between groups of stress were not significant (\( P = 0.687 \)).

In our study, only two variables in the bivariate analysis were statistically significant (age and gender) and thus taken into account in the multinomial logistic regression analysis with additional risk factors such as duration of social media exposure, occupation as healthcare personnel or nonhealth-care personnel, and family member working as healthcare personnel. Variables associated with mild-moderate and severe-extremely severe depression, anxiety, and stress compared to no depression, anxiety, and stress are shown in Table 3. Females were more likely to suffer from mild-moderate depression compared to male (odds ratio [OR]: 2.344; 95% CI: 1.105–4.972; \( P = 0.026 \)). While age was associated with less likelihood to suffer from severe-extremely severe depression to the extent that each 1-year increment decreases the likelihood by 0.044 (OR: 0.956; 95% CI: 0.900–1.017; \( P = 0.275 \)). Social media exposure was associated with less likelihood to suffer from severe-extremely severe depression as for each one-hour increment decreases the likelihood by 0.014 (OR: 0.986; 95% CI: 0.792–1.282; \( P = 0.765 \)).

Health-care personnel were less likely to suffer from severe-extremely severe anxiety compared to nonhealth-care personnel (OR: 0.484; 95% CI: 0.239–0.981; \( P = 0.044 \)). Social media exposure was associated with less likelihood to suffer from mild-moderate and severe-extreme severe anxiety as for each 1-h increment decreases the likelihood by 0.132 (OR: 0.876; 95% CI: 0.756–1.016; \( P = 0.081 \)) and 0.164 (OR: 0.849; 95% CI: 0.383–1.882; \( P = 0.849 \)) respectively. On the contrary of depression and anxiety, female were less likely to suffer from mild-moderate stress compared to male (OR: 0.705; 95% CI: 0.387–1.282; \( P = 0.251 \)). Social media exposure was associated with less likelihood to suffer from mild-moderate stress as for each 1-h increment decreases the likelihood by 0.014 (OR: 0.986; 95% CI: 0.900–1.081; \( P = 0.765 \)).

**Discussion**

Studies have been conducted to assess factors associated with mental health problem during period of global health emergency in various countries. A study by Gao *et al.* in China founded that the prevalence of depression and anxiety were 48.3% and 22.6% consecutively. Other studies in China also describe similar result that social media use time was associated with more depression, anxiety and stress. The result of our study showed that social media exposure was associated with less likelihood to suffer from severe-extremely severe depression, mild-moderate and severe-extremely severe anxiety and mild-moderate stress. A possible explanation based on our study, bivariate analyses on variables associated with depression, anxiety, and stress showed that sex is significantly associated with depression while age is associated with anxiety. On the multinomial logistic regression, female were more likely to suffer from mild-moderate depression and severe-extremely severe anxiety compared to male. On the contrary of depression and anxiety, female were less likely to suffer from mild-moderate stress compared to male. Our data correspond with a study in Turkey where depression was higher in female than male. Another study by Ozamiz-Etxebarria *et al.* in Spain also showed female tends to suffer depression, anxiety and stress compared to male. A study in India, found different result, i.e., male were more susceptible to anxiety than female. It was hypothesized that the anxiety was associated with lockdown and sharing household responsibilities between both male and female.

Occupation as health-care personnel was associated with mental health problems during COVID-19 pandemic corresponding with data from prior study by Lu *et al.* that showed health-care personnel have higher level of depression and anxiety than nonhealth-care personnel. In situation of rapidly increasing number of positive cases in Indonesia, our study showed that health-care population have lower percentage of mental health problems during COVID-19 pandemic, similar to previous studies in Egyptian population during COVID-19 pandemic, and in India during swine flu pandemic in 2015 where health-care personnel have lower psychological impact than nonhealth-care personnel. Authors from those studies suggested that raised of awareness would increase protective measure with favorable attitude during pandemic, therefore, resulting in lower level of depression and anxiety.

Gao *et al.* showed the effect of social media exposure to mental health, that higher frequency of exposure was associated with depression although the association was not statistically significant, and significantly associated with anxiety. Other studies in China also describe similar result that social media use time was associated with more depression, anxiety and stress. The result of our study showed that social media exposure was associated with less likelihood to suffer from severe-extremely severe depression, mild-moderate and severe-extremely severe anxiety and mild-moderate stress.
Table 3: Variables associated with mild-moderate and severe-extremely severe depression, anxiety, and stress compared to no depression, anxiety, and stress

| Variables | B     | SE    | Wald  | df | P    | OR    | 95% CI       |
|-----------|-------|-------|-------|----|------|-------|--------------|
| Depression |       |       |       |    |      |       |              |
| Mild-moderate |       |       |       |    |      |       |              |
| Intercept  | 1.240 | 0.933 | 1.766 | 1 | 0.184 | 0.941 | 1.029        |
| Age       | -0.016 | 0.023 | 0.520 | 1 | 0.471 | 0.984 | 1.023        |
| Sex (female) | 0.852 | 0.384 | 4.932 | 1 | 0.026 | 2.344 | 1.105-4.972 |
| Health-care personnel (No) | -0.322 | 0.501 | 0.414 | 1 | 0.520 | 0.724 | 0.271-1.934 |
| Family as health-care personnel (Yes) | 0.175 | 0.425 | 0.170 | 1 | 0.680 | 1.192 | 0.518-2.740 |
| Social media exposure | 0.007 | 0.058 | 0.014 | 1 | 0.906 | 1.007 | 0.899-1.128 |
| Severe-extremely severe |       |       |       |    |      |       |              |
| Intercept  | 1.906 | 0.905 | 4.438 | 1 | 0.035 |       |              |
| Age       | -0.044 | 0.022 | 3.856 | 1 | 0.050 | 0.957 | 0.916-1.000 |
| Sex (female) | 0.817 | 0.353 | 5.361 | 1 | 0.026 | 2.344 | 1.134-4.517 |
| Health-care personnel (No) | 0.452 | 0.507 | 0.793 | 1 | 0.373 | 1.571 | 0.581-4.248 |
| Family as health-care personnel (Yes) | -0.065 | 0.403 | 0.026 | 1 | 0.872 | 0.937 | 0.425-2.064 |
| Social media exposure | -0.012 | 0.054 | 0.046 | 1 | 0.831 | 0.989 | 0.890-1.098 |
| Anxiety    |       |       |       |    |      |       |              |
| Mild-moderate |       |       |       |    |      |       |              |
| Intercept  | 0.862 | 1.020 | 0.714 | 1 | 0.398 | 0.862 |            |
| Age       | 0.007 | 0.025 | 0.080 | 1 | 0.777 | 1.007 | 0.959-1.058 |
| Sex (female) | 0.541 | 0.445 | 1.474 | 1 | 0.225 | 1.717 | 0.717-4.109 |
| Health-care personnel (No) | -0.742 | 0.573 | 1.676 | 1 | 0.195 | 0.476 | 0.155-1.464 |
| Family as health-care personnel (Yes) | -0.069 | 0.488 | 0.020 | 1 | 0.887 | 0.933 | 0.359-2.427 |
| Social media exposure | -0.132 | 0.076 | 3.052 | 1 | 0.081 | 0.876 | 0.756-1.016 |
| Severe-extremely severe |       |       |       |    |      |       |              |
| Intercept  | 1.524 | 0.895 | 2.900 | 1 | 0.089 | 1.524 |            |
| Age       | -0.034 | 0.023 | 2.128 | 1 | 0.145 | 0.967 | 0.924-1.012 |
| Sex (female) | 0.726 | 0.360 | 4.052 | 1 | 0.044 | 2.066 | 1.019-4.187 |
| Health-care personnel (No) | -0.726 | 0.360 | 4.052 | 1 | 0.044 | 0.484 | 0.239-0.981 |
| Family as health-care personnel (Yes) | 0.251 | 0.513 | 0.240 | 1 | 0.624 | 1.286 | 0.470-3.514 |
| Social media exposure | -0.164 | 0.046 | 0.163 | 1 | 0.686 | 0.849 | 0.383-1.882 |
| Stress     |       |       |       |    |      |       |              |
| Mild-moderate |       |       |       |    |      |       |              |
| Intercept  | 0.067 | 0.774 | 0.007 | 1 | 0.931 | 0.067 |            |
| Age       | -0.060 | 0.034 | 3.046 | 1 | 0.081 | 0.942 | 0.881-1.007 |
| Sex (female) | -0.351 | 0.306 | 1.316 | 1 | 0.251 | 0.704 | 0.387-1.282 |
| Health-care personnel (No) | 0.295 | 0.571 | 0.267 | 1 | 0.606 | 1.343 | 0.439-4.112 |
| Family as health-care personnel (Yes) | -0.472 | 0.483 | 0.958 | 1 | 0.328 | 0.624 | 0.242-1.606 |
| Social media exposure | 0.013 | 0.059 | 0.045 | 1 | 0.832 | 1.013 | 0.901-1.138 |
| Severe-extremely severe |       |       |       |    |      |       |              |
| Intercept  | -0.167 | 1.182 | 0.020 | 1 | 0.888 | -0.167 |            |
| Age       | -0.035 | 0.020 | 3.029 | 1 | 0.082 | 0.966 | 0.929-1.004 |
| Sex (female) | 0.575 | 0.428 | 1.799 | 1 | 0.180 | 1.776 | 0.767-4.113 |
| Health-care personnel (No) | 0.881 | 0.460 | 3.663 | 1 | 0.056 | 2.414 | 0.979-5.952 |
| Family as health-care personnel (Yes) | -0.175 | 0.346 | 0.255 | 1 | 0.614 | 0.840 | 0.426-1.655 |
| Social media exposure | -0.014 | 0.047 | 0.089 | 1 | 0.765 | 0.986 | 0.900-1.081 |

OR=Odds ratio, CI=Confidence interval

for this contradictory result is that social media exposure could have positive and negative psychological effect. Positive effect was associated with viewing heroic act of ordinary people, and also knowledge on disease and its prevention. Negative effect was associated with viewing reports from hospitals about the shortage of medical supplies or hospital capacities, information about COVID-19 pandemic such as increasing number of cases of infection and deaths.[25] Studies found that social media can be used by medical professionals and government officials to disseminate information, especially health knowledge management that would bring positive psychological effect.[27,28] In this study, we did not collect data on the content of social media exposure, thus we do not know which psychological effect the exposure had on the samples.
Conclusion

This study showed high frequency of depression, anxiety and stress in Indonesian population in the COVID-19 pandemic. Female were more likely to suffer from depression and anxiety, male were more likely to suffer from stress. Social media exposure was associated with less likelihood to suffer from mental health problems.

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Conflicts of interest

There are no conflicts of interest.

References

1. Chen Y, Liu Q, Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. J Med Virol 2020;92:418-23.
2. World Health Organisation. Available from: https://covid19.who.int. [Last accessed on 2020 Jul 31].
3. Kazemi-Karyani A, Safari-Faramani R, Amini S, Ramezani-Doroh V, Berenjian F, Dizaj MY, et al. World one-hundred days after COVID-19 outbreak: Incidence, case fatality rate, and trend. J Educ Health Promot 2020;9:199.
4. Kemenkes. https://covid-monitoring.kemkes.go.id. [Last accessed on 2020 Jul 31].
5. Kato F, Tainaka KI, Sone S, Morita S, Iida H, Yoshimura J. Combined effects of prevention and quarantine on a breakout in SIR model. Sci Rep 2011;1:1-3.
6. Chen Y, Liu Q, Guo D. Emerging coronaviruses genome structure, replication, and pathogenesis. J Med Virol 2020;92:418-23.
7. Nature news Coronavirus Latest: WHO Declares Global Emergency; 2020. Available from: https://www.nature.com/articles/d41586-020-00154-w. [Last accessed on 2020 Jul 31].
8. Celtron M, Simone P. Battling 21st-century scourges with a 14th-century toolbox. Emerg Infect Dis 2004;10:2053-4.
9. Setiati S, Azwar MK. COVID-19 and Indonesia. Acta Med Indones 2020;52:84-9.
10. Holmes EA, O’connor RC, Perry H, Tracey J, Wessely S, Arseneault L, et al. Position Paper Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. Lancet 2020;7(6):547-60.
11. Brooks SK, Webster RK, Smith L, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. Lancet 2020;395(10227):912-20.
12. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: Address mental health care to empower society. Lancet 2020;395:e37-8.
13. Bontcheva K, Gorrell G, Wessels B. Social media and information overload: Survey results. ArXiv; abs/1306.0813.
14. World Health Organization. COVID 2019 PHEIC Global Research and Innovation Forum: Towards a Research Roadmap. Available from: https://www.who.int/news-room/detail/12-02-2020-world-experts-and-funders-set-priorities-for-covid-19-research. [Last accessed on 2020 Jul 31].
15. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S, et al. Mental health problems and social media exposure during COVID-19 outbreak. PLoS One 2020;15:e0231924.
16. Zhang Y, Ma ZF. Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Lianoning province, China: A cross-sectional study. Int J Environ Res Public Health 2020;17(7):2381.
17. Choi EP, Hui BP, Wan EY. Depression and anxiety in Hong Kong during COVID-19. Int J Environ Res Public Health 2020;17:3740.
18. Stanton R, To QG, Khalesi S, Williams SL, Alley SJ, Thwaite TL, et al. Depression, Anxiety and Stress during COVID-19: Associations with Changes in Physical Activity, Sleep, Tobacco and Alcohol Use in Australian Adults. Int J Environ Res Public Health 2020;17(11):4065.
19. Ozamiz-Etxebarria N, Dosil-Santamaria M, Picaza-Gorrochategui M, Idiaga-Mondragon N. Stress, anxiety, and depression levels in the initial stage of the COVID-19 outbreak in a population sample in the Northern Spain. Cad Saude Publica 2020;36:e00054020.
20. Verma S, Mishra A. Depression, anxiety, and stress and sociodemographic correlates among general Indian public during COVID-19. Int J Soc Psychiatry 2020;66(8):756-62.
21. Özdin S, Bayrak Özdin Ş. Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. Int J Soc Psychiatry 2020;66:504-11.
22. Lu W, Wang H, Lin Y, Li L. Psychological status of medical workforce during the COVID-19 pandemic: A cross-sectional study. Psychiatry Res 2020;288:1132936.
23. El-Zoghby SM, Soltan EM, Salama HM. Impact of the COVID-19 pandemic on mental health and social support among adult Egyptians. J Community Health 2020;45:689-95.
24. Mishra P, Bhadauria US, Dasar PL, Sandesh N, Kumar S, Lalani A, et al. Knowledge, attitude and anxiety towards pandemic flu: a potential bio weapon among health professionals in Indore City. Przegl Epidemiol 2016;70:41-5,125-7.
25. Chao M, Xue D, Liu T, Yang H, Hall BJ. Media use and acute psychological outcomes during COVID-19 outbreak in China. J Anxiety Disord 2020;74:102248.
26. Ni MY, Yang L, Leung CM, Li N, Yao X, Wang Y, et al. Mental health, risk factors, and social media use during the COVID-19 epidemic and cordon sanitaire among the community and health professionals in Wuhan, China: Cross-sectional survey. JIMIR Ment Health 2020;7:e19009.
27. Latha K, Meena KS, Pravitha MR, Dasgupta M, Chaturvedi SK. Effective use of social media platforms for promotion of mental health in young adults during the COVID-19 pandemic. J Med Virol 2020;92:776-82.
health awareness. J Educ Health Promot 2020;9:124.

28. Ghalavand H, Panahi S, Sedghi S. Opportunities and challenges of social media for health knowledge management: A narrative review. J Educ Health Promot 2020;9:144.

29. Zhang Y, Ma ZF. Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Liaoning Province, China: A Cross-Sectional Study. Int J Environ Res Public Health 2020;17(7):2381.