Determinants of mental health status using depression anxiety stress scales during the COVID-19 pandemic: a systematic review

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Article Info	ABSTRACT
	Coronavirus disease 2019 (COVID-19) is not only being a public physical health emergency, but also affecting global mental health, as evidenced by worldwide panic purchases, independent quarantine, and social distancing. Therefore, it is important to concern how a pandemic might affect one's mental state. The aim of this review was to determine mental health status in the community during COVID-19 pandemic using the depression anxiety stress scales (DASS) self-assessment. A comprehensive and systematic literature search published from January-May 2020 through electronic databases Pubmed, ScienceDirect, and Google Scholar was conducted based on guidelines from Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). This study used a self-report tool DASS to assess depression, anxiety, and stress. Seven studies with a total of 15.020 participants that were published in 2020 were included in the analysis. The characteristics that were chosen to determine the mental health status (depression, anxiety, and stress) were age, sex, level of education, and marital status. Findings from this review showed that sociodemographic characteristics (age, sex, marital status, education level) contributed to mental health status (depression, anxiety, and stress). *This is an open access article under the <u>CC BY-SA</u> license.*

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1. INTRODUCTION

The coronavirus disease 2019 (COVID-19) infection since first started in China, in December 2019, have been affecting countries all across the world. In March 2020, the World Health Organization (WHO) declared The COVID-19 infection as a global pandemic. During a crisis such as the COVID-19 pandemic, it is important to concern how a pandemic might affect one's mental state. Various things happened such as many rumors circulating about COVID-19, information about the high mortality rate, health programs that limited one's freedom during a pandemic, financial disruption, and conflicts that occurred due to the COVID-19 incident can affect one's emotional state and increase the risk of mental disorders [1]. COVID-19 pandemic also has both direct and indirect impacts on the mental health of the community, including fear of falling ill and dying, not wanting to come to health care facilities for fear of contracting while being treated, losing livelihoods, alienation from the community/quarantine because of being linked-relate with the disease, and others. The vulnerable groups affected by mental and psychological health due to the COVID-19 pandemic include people who have direct or indirect contact with the COVID-19 virus, people at high risk of

contracting (elderly, immunocompromised, and people with preexisting medical illnesses, people who are prone to psychological stressors or people with pre-existing mental disorders), health workers, and people who follow COVID-19 news through various media [1], [2].

Mental health and physical health operate simultaneously to enhance sustainable life. It is proven by the definition of health proposed by the WHO that defines "health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [3]. Stable mental health provides the ability of individuals to execute their potential, work productively, contribute to the community, and most importantly overcome the pressures of normal life [4]. Each mental disorder can have different symptoms. Symptoms that can arise are feeling excessive anxiety, fear, and sadness. In children, the symptoms might be in the form of changes in learning abilities, being hyperactive, unable to sleep, and irritable [5]. The quarantine can also affect mental health. People who have been quarantined may have a high prevalence of psychological symptoms, such as depression, emotional disturbances, low mood, irritability, stress, insomnia, and post-traumatic stress symptoms [1], [6].

According to research, it is estimated that one in four people subconsciously suffers a mental disorder in their lifetime. It is also strengthened through research by the WHO South-East Asia Region (WHO SEARO) which states that the most depressive cases are in India (56,675,969 cases or 4.5% of the total population) and the lowest in the Maldives (12,739 cases or 3.7% of the population). As for Indonesia, the estimation is 3.7% of the population [7]. Therefore disruption of mental health is a major problem without underestimation.

The COVID-19 pandemic that is concurrent with the issue of national regulations which require people to keep a physical distance between each other, going-outside bans, until the closure of the learning area for a while, may affect the physical and mental health of the people. This condition affects the nature of humankind for being social creatures who need to interact directly with others. Another factor of stress comes from the pandemic uncertainty and denouement of its time [8], [9]. WHO classifies causative factors of jeopardized mental health that determine from social, psychological and biological, economic and environmental factors, and interactions, related to behavior. Learning from various affected sectors throughout this pandemic, it is necessary to analyze further the correlation between pandemic and mental health or psychological issue which is a substantial aspect to achieve overall health [10].

Knowledge about mental health and how to prevent them need to be understood and implemented by society to create a healthy society with a good quality of life. Therefore, this systematic review is intended to determine mental health status in the community during the COVID-19 pandemic using the Depression Anxiety Stress Scales (DASS) self-assessment.

2. METHOD

2.1. Search strategy and selection criteria

This systematic review was conducted based on guidelines from PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis). This study identified the determinants of mental health status in the community during COVID-19 pandemic using the DASS self-assessment. We performed a comprehensive and systematic literature search published from January-May 2020 through electronic databases Pubmed, ScienceDirect, and Google Scholar with the keyword ("COVID-19" OR "SARS-CoV-2" OR "2019 Novel Coronavirus") AND "mental health" AND "anxiety" AND "stress" AND "depressed" AND "DASS".

We restricted the papers to the full English text and open access (free of charge). Studies that conducted on people who were sick and did not use DASS measurement tools, published before 2020, and editorial articles were excluded as shown in Figure 1.

2.2. Data extraction and quality assessment

Potentially relevant studies were first identified by reviewing the titles and abstracts and duplicate studies in various databases were removed. After the screening process, the complete text of the remaining studies was assessed to include the studies within the review. The studies chosen were analyzed by the authors for data extraction, and the findings were discussed with the group. The data extraction table then used to extract the characteristics of each study and the main findings, which include the author, year of publication, country, study design, sample size, age range, sex, level of education, marital status, and major findings.

3. RESULTS AND DISCUSSION

There were 67 studies identified through searching various databases, of which 34 were excluded after screening for duplication, title, and abstract, leaving 33 potentially relevant studies to be retrieved for full-text assessment. Among the 33 remaining studies, 26 were excluded. The authors include seven studies that were found to match the inclusion criteria for the systematic review as presented in Figure 1.
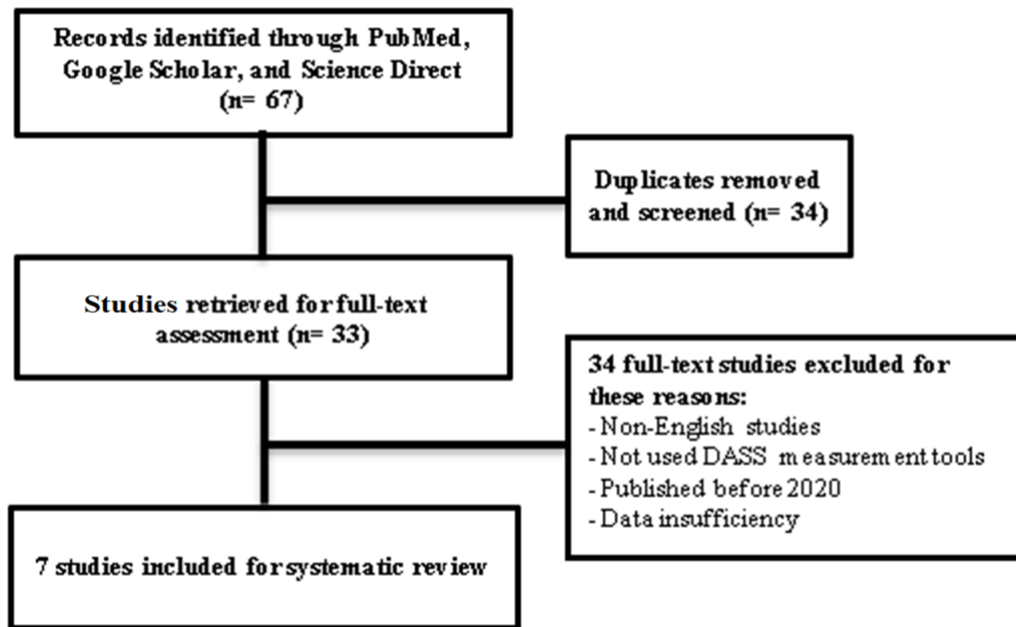

Figure 1. Flow diagram of the study selection process

3.1. Characteristics of included studies

After the study selection process, seven studies with a total of 15.020 participants that were published in 2020 were included in the analysis. These studies were conducted in Iraqi Kurdistan, China, Italia, Spain, and India. The characteristics chosen from the studies are age, sex, level of education, and marital status. The summary of the characteristics of each study is provided in Table 1.

Table 1. Characteristics of studies

No	Study	Country	Design	Sample size (n)	Age range in years (%)	Sex (%)	Level of education (%)	Marital status (%)
1	[11]	Iraqi Kurdistan	Quantitative survey	548	18-25 (26.8%)	Female (50.4%) Male (49.6%)	College (70.4%)	Married (75.5%)
2	[8]	China	Cross sectional	1210	21-30 (53.1%)	Female (67.3%) Male (32.7%)	Bachelor (66.5%)	Married (76.4%)
3	[12]	Italia	Cross-sectional	2766	32.94 (13.2; range 18–90 years)	Female (71.7%) Male (28.3%)	High school (43.2%)	Unmarried (67.4%)
4	[13]	China	Cross sectional	4872	21-30 (47.9%)	Female (67.7%) Male (32.3%)	College (62.2%)	Married (54.0%)
5	[14]	China	Cross sectional	1074	14 years to 68 years (M=33.54 years, SD=11.13 years)	Female (46.8%) Male (53.2%)	High school (27.7%)	N/A
6	[15]	Spain	Cross sectional	3550	18-25 (52.1%)	Female (64.9%) Male (35.1%)	N/A	Single (66.0%)
7	[16]	India	Cross-sectional	1000	21-25 (42%)	Female (62%) Male (38%)	N/A	N/A

3.2. Mental health status (anxiety) on sociodemographic characteristics

Of the seven journals reviewed, a study conducted by Wang *et al.* [8] mentioned a significant relationship between age, sex, education, and marital status with anxiety during the COVID-19 pandemic. Respondents who experienced anxiety were mostly female with an average age of 21-30 years, married, and undergraduate education as shown in Table 2. The highest prevalence of anxiety cases occurred in Italy followed by Iraq, China, and Spain. As for India, the data was not provided.

Table 2. Mental health status (anxiety) on sociodemographic characteristics

No	Study	Country	Sample size (n)	Case (%)	Age (p<0.05)	Sex (p<0.05)	Level of Education (p<0.05)	Marital status (p<0.05)
1	[11]	Iraqi Kurdistan	548	47%	0.25	Female 0.001	0.3	0.44
2	[8]	China	1210	28.8%	21-30 0.004	Female 0.005	Bachelor <0.001	Married <0.001
3	[12]	Italia	2766	81.3%	32.94 (13.2) 0.001	Female <0.001	0.135	0.690
4	[13]	China	4872	22.6%	31–40 years (OR=1.63, 95%CI:1.06–2.51)	Female (OR=0.49, 95%CI:0.87–1.12)	High school (OR=0.88, 95%CI:0.65–1.17)	Unmarried (OR=1.07, 95%CI:0.91–1.26)
5	[14]	China	1074	29.9%	21-30 0.001	0.088	N/A	N/A
6	[15]	Spain	3550	32.4%	18-25 -0.03	1.53	N/A	N/A
7	[16]	India	1000	N/A	21-25 0.000	Female 0.000	N/A	N/A

3.3. Mental health status (depression) on sociodemographic characteristics

A study conducted by Wang et al.[8] mentioned a significant relationship between age, sex, education and marital status with depression during the COVID-19 pandemic. The remaining studies showed not all sociodemographic characteristics had a significant relationship between age, sex, education, and marital status with the incidence of depression during the COVID-19 pandemic. Respondents who experienced depression were mostly female with an average age of 21-30 years, married, and undergraduate education as shown Table 3. The highest prevalence of depression cases occurred in Italy followed by China, Iraq, and Spain. As for India, the data was not provided.

Table 3. Mental health status (depression) on sociodemographic characteristics

No	Study	Country	Sample size (n)	Case (%)	Age (p<0.05)	Sex (p<0.05)	Level of Education (p<0.05)	Marital status (p<0.05)
1	[11]	Iraqi Kurdistan	548	45%	0.85	Female 0.02	College 0.05	0.12
2	[8]	China	1210	16.5%	21-30 0.009	Female 0.003	Bachelor 0.003	Married <0.001
3	[12]	Italia	2766	67.3%	0.236	Female <0.001	High school <0.001	0.860
4	[13]	China	4872	48.3%	31–40 years (OR=1.63, 95%CI:1.06–2.51)	Female (OR=0.49, 95%CI:0.87–1.12)	High school (OR=0,88, 95%CI:0.65–1.17)	Unmarried (OR=1.07, 95%CI:0.91–1.26)
5	[14]	China	1074	37.1%	21-30 0.001	0.261	N/A	N/A
6	[15]	Spain	3550	44.1%	18-25 -0.05	1.24	N/A	N/A
7	[16]	India	1000	N/A	21-25 0.000	Female 0.002	N/A	N/A

3.4. Mental health status (stress) on sociodemographic characteristics

Wang *et al.* [8] mentioned a significant relationship between age, sex, education, and marital status with stress during the COVID-19 pandemic. The remaining studies showed not all sociodemographic characteristics had a significant relationship between age, sex, education, and marital status with the incidence of stress during the COVID-19 pandemic. Respondents who experienced stress were mostly female with an average age of 21-30 years, married, and undergraduate education as shown in Table 4. The highest

prevalence of stress cases occurred in Italy followed by Spain, Iraq, and China. As for India and several studies [13], [14] from China, the data was not provided.

Table 4. Mental health status (stress) on sociodemographic characteristics

No	Study	Country	Sample size (n)	Case (%)	Age (p<0.05)	Sex (p<0.05)	Level of education (p<0.05)	Marital status (p<0.05)
1	[11]	Iraqi Kurdistan	548	18%	0.1	0.4	College 0.007	0.36
2	[8]	China	1210	8.1%	21-30 0.007	Female 0.004	Bachelor <0.001	Married 0.001
3	[12]	Italia	2766	72.8%	32.94 (13.2) <0.001	Female <0.001	0.219	0.554
4	[13]	China	4872	N/A	N/A	N/A	N/A	N/A
5	[14]	China	1074	N/A	N/A	N/A	N/A	N/A
6	[15]	Spain	3550	37.0%	18-25 -0.05	1.85	N/A	N/A
7	[16]	India	1000	N/A	21-25 0.000	Female 0.000	N/A	N/A

From studies reviewed, there is a significant correlation between mental health status and the age group of young adults (21-30 years), similar to research which suggests young people tend to get large amounts of information from social media so that they can easily trigger stress [17]. Age is also a factor identifies as one of the determinants of anxiety, conforming searched by Haynes with his opinion stating young people are prone to stress and anxiety [18]. Manuaba argues that young age is more at risk of anxiety because of mental unreadiness as an adolescent with inadequate experience[18]. According to Indonesian Basic Health Research (RISKESDAS), mental disorders have started from 15 to 24 years old, and increase with age [19]. Furthermore, with the development of technology, it is easier to access news through social media, thus increasing anxiety during the pandemic [20]-[22].

This review showed that the level of anxiety and stress was high in females than males. In sync with the findings of the National Mental Health Survey of India 2016, which suggests that females show a higher level of Anxiety as compared to males, similar result has shown in China and Turki [23], [24]. This could be linked to several biological mechanisms that led to depression and anxiety disorders may be more vulnerable in to women, like a difference in the processing of serotonin between the female brain and the male brain which results in dissimilar manifestations of symptoms [25], [26]. The concept of femininity inherent in women causes women to experience more "internalization" disorders such as depression and anxiety [27], [28]. Female also has responsibility for household tasks and the main caregiver for family, so it could have increased, moreover, due to the temporary closure of schools during the lockdown [29], [30].

Marital status is related to one's own mental well-being, as married means the addition of life partners who share emotional sensitivity, both joy and sorrow, in living together. This result is similar with previous study [31], [32] and reinforced by the research of Kessler and Essex which concluded that married people can handle problems better than unmarried people [33]. Further explained that marriage collided with two individuals who have more endurance in reducing emotions from a problem [34]. The impact of the pandemic on the economic sector has caused some employees to be laid off so that it can affect the family economy, such as financial hardship which can lead to an increase in stress levels [35], [36].

Level of education or educational background is proven to affect one's anxiety level [16]. Educational background is a form of additional knowledge for individuals on the grounds of recent relationships with the COVID-19 pandemic [37]. An educated individual, particularly in the medical field, should be better aware of the outbreak conditions, because health workers must be required to understand the illness. Therefore, higher levels of education have better adaptation responses, with rational thinking and broad understanding of stimulus [38].

The correlation of certain variables in this study shows the similarity with the risk factors proposed by Benjamin and J Sadock. In theory, it is stated that half of the depressed patients have an average age of 40 years and about 50% of patients have onset between the ages of 20 and 50 years [38]. This is in accordance with the research conducted by Sarwono and Menslin, regarding the theory that the population who are the most vulnerable to depression is young adults aged 18-29 years [26], [39]-[40]. In this study, respondents were female-dominated. it is similar to the research conducted by a previous study, which shows that female students do experience more depressive symptoms because of hormonal conditions in a woman's body [41], [42]. A higher level of education and marital status of marriage had a significant relationship with the

respondent's depression levels at the time of the COVID-19 pandemic. This is similar to research conducted by Demak and Suherman [17] which states that depression is a mental problem that involves many factors in regulation. Depression reflects the interaction between knowledge factors, biological factors, age, and stressors in the environment and social [34].

Furthermore, age is also known as a factor that is associated with stress, this is because the older age is considered to have a greater tolerance for stress regardless of the type of stressor that happened in an individual's life. Adults are considered capable of controlling stress compared to children and the elderly [43], [44]. National Mental Health Survey of India, shows that stress is highest in the 40-49 years age group. The possible impact that millennials might be experienced due to the locking that affects their personal and professional relationships and dynamics, can be one of the reasons [43], [45].

Women are more susceptible to stress and pain makes mental disorders more likely to occur [46], [47]. A study by APA 2010, shows that women are more likely to become stressed compared to their male counterparts because women tend to link their stress with money and the economy while men do not link their stress with work. This result not only reflects the negative impact of poor quality interpersonal relationships but also the positive effects of good interpersonal relationships, especially people who live together during confinement. Quality of life has been inversely associated with stress, anxiety, and depression, and social relationships and environmental conditions have been linked to stress [8].

Higher education can lead to stress or even fear because someone receives more new information about COVID-19, symptoms, medications, and prevention. Higher education level have sufficient of knowledge about COVID-19 (81.2%) [37]. So it could be affect the level of acceptance and understanding of an object or material, including awareness during pandemic [48]. This awareness then triggers to take various preventive actions, which can trigger mental health disorders [49], [50]. It differs from the research by Wang *et al.* [8], found that a person felt far from stressed when he knew the cure rate of COVID-19 increased every day. Perhaps, this result would be more effective if people knew the treatments to manage COVID-19, so the risk of depression, anxiety, and stress could be avoided even further.

This study has limitations. First, self-rating scales were used to assess anxiety, depression, and stress. As the whole country under lockdown, face to face in-depth interview was unlikely to conduct. Therefore, there are always risks of false judgment or over judgment. Moreover, self-report data are subjected to social desirability bias. Second, the Lacking DASS-21 baseline of pre-pandemic data, accurate pre-post analysis cannot be carried out; therefore, we cannot confirm the increased level of difficulty or whether there is an increase (if validated) related to COVID-19.

4.   CONCLUSION

In conclusion, this systematic review provides more information about the determinants of mental health status during the COVID-19 pandemic in the community. Other findings from this review showed that sociodemographic characteristics (age, sex, marital status, education level) contributed to mental health status (depression, anxiety, and stress). Findings can be used as a reference to provide accurate and factual health information about COVID-19 and create mental health services so that people can reduce levels of anxiety, stress, and depression. Raising public awareness about depression, anxiety, and stress and coping strategies is important to improve mental health, especially in the state of the pandemic.

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