



The Impact Of Centralized Quarantine On Mental Health Of People Affected By Covid-19: A Systematic Review

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ARTICLE INFO

Article history:

Received November 11, 2020

Accepted January 30, 2021

Published April 05, 2021

Keyword:

Quarantine
Covid-19
Mental health
Depression
Anxiety

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<https://doi.org/10.30604/jika.v6i1.477>

ABSTRACT

Quarantine is known as one of the strategies to minimize the spread of Covid-19. This study aims to seek scientific evidence regarding the impact of centralized quarantine on the mental health of people affected by Covid-19. We conducted a systematic search for articles evaluating the mental health conditions of Covid-19 sufferers and suspected cases who were undergoing quarantine. The search for articles was carried out on December 31, 2020 through the Science Direct, PubMed, and Springer databases. Among 704 articles, only seven reviews met our criteria. One study evaluating the mental condition of quarantine Covid-19 patients in hospital compared to a non-quarantine control group, found that patients experienced higher rates of depression, anxiety, and post-traumatic stress symptoms. Depression and anxiety were reported to be health problems experienced by participants in all studies. Factors related to mental health conditions, namely female gender, lower education level, lower income, and married status. Social stressors in the form of negative stigma from the community, lack of adequate information, and poor quarantine facilities worsen mental health conditions. Centralized quarantine has negative consequences for the mental health of sufferers of Covid-19. More attention need to be paid to the mental health well-being of patients undergoing in centralized quarantine. The right strategy to minimize the negative impact of quarantine needs to be implemented in order to achieve individual mental health and prevent long-term complications.

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INTRODUCTION

The Covid-19 pandemic is a biological disaster which not only affects physical health but also has an impact on mental health. The process of infection and the very rapid pattern of disease spreads results in fear, uncertainty, and the emergence of repeated stigma in society. Patients who test positive for Covid-19 experience fear of the consequences of the new potentially fatal virus (Xiang et al. 2020). Liu et al. (2020) reported that more than half of the population in China was affected by health emergencies due to the Covid-19 pandemic, 44.6% of the population experienced anxiety due to not knowing the situation related to their health condition, and 33.2% experiencing stress. This condition is also experienced by health workers who provide care for

Covid-19 patients experiencing stress, depression and anxiety (Zhu et al. 2020).

Handling mental health has become a priority during the Covid-19 pandemic. The conditions of the Covid-19 pandemic have resulted in psychological impacts not only at this time, but also long-term risks (Zhu et al. 2020). Therefore, research related to mental health conditions is an urgent need so that proper treatment can be carried out (Mahase 2020). The mental health effects of the Covid-19 pandemic on all populations and vulnerable groups need high-quality data so that the negative consequences that arise can be minimized (Holmes et al. 2020). Previous research that has been carried out is related to mental health conditions during a pandemic in the general population,

health workers and students (Liu et al. 2020; Zandifar & Badrfam 2020; Xiaoming et al. 2020; Li et al. 2021). Experience from the Severe Acute Respiratory Syndrome (SARS) pandemic in 2003, it is known that individuals undergoing quarantine have reported experiencing post-traumatic stress and depression. (Brooks et al. 2020). Individuals diagnosed positive for Covid-19 will feel anxious and afraid of the media coverage and the high death rate due to Covid-19 (Baud et al. 2020).

A literature review regarding the impact of quarantine has been carried out by Brooks et al. (2020) and it is reported that individuals undergoing quarantine experience an increase in negative psychological effects, including post-traumatic stress symptoms, confusion, and anger. This study conducted a study on the impact of quarantine on the general population, including health workers and students in quarantine before the Covid-19 pandemic. Imran et al. (2020) conducted a literature review of the psychological burden of quarantine on children and adolescents, it was reported that during the quarantine of the Covid-19 pandemic, children felt anxious, irritable, and spent more time in front of screens. The research we will do is a literature review related to the impact of centralized quarantine during the Covid-19 pandemic with participants with Covid-19 sufferers, both those who have been confirmed and in the tracking period. This study is important to do because it is in accordance with the situation in Indonesia where people with Covid-19 who have been confirmed or are still being tracked are carried out by centralized quarantine or hospital treatment as one of the early handling strategies for the Covid-19 pandemic (Kementerian Kesehatan RI 2020). Each local government is obliged to provide a special quarantine location (shelter). For example, the DIY government provides a special centralized quarantine location for Covid-19 sufferers who are still under tracking or confirmed positive with mild symptoms at the Ministry of Home Affairs Education and Training Center in Banciro with a capacity of 150 people, Wisma Haji in Mlati Sleman with a capacity of 300, and Simple Rental Flats (Rusunawa) Bener Village, Tegalrejo District (Wijaya Kusuma 2020). The government is also preparing a Covid-19 referral hospital for further treatment of patients with deteriorating health conditions (Wijaya Kusuma 2020).

Populations undergoing quarantine at quarantine centers and hospitals are considered vulnerable groups at risk of experiencing mental health problems. Research on the mental health conditions of Covid-19 sufferers in Indonesia is still limited. Therefore, it is necessary to conduct a literature review related to the mental health conditions of Covid-19 sufferers who are undergoing quarantine in quarantine centers and in hospitals in order to get a further picture to determine the appropriate evidence-based treatment strategy.

METHOD

Search database

This research is a type of systematic review. Types of reporting using flows Preferred Reporting Items for Systematic Review and Meta Analyses (PRISMA) whose steps are summarized in diagram 1. Studies were identified by searching database *PubMed*, *Science Direct*, and *Springer*. Keywords used for searching databased were "Quarantine", "Coronavirus OR Covid-19", "Mental health", "Depression", "Anxiety", "Adults".

Inclusion criteria for articles and research journals published and indexed in national and international journals for the period 2020 - 2021; types of articles and original research journals; can be accessed in full text form; analyzing the mental health conditions of Covid-19 sufferers in quarantine centers or hospitals; analyzing mental health conditions in the home quarantine population; Cross Sectional Study research design; in English language. The exclusion criteria were no quantitative data, positive respondents with Covid-19 with previous mental disorders, Health Care Workers respondents.

Data extraction and reporting of findings

A data extraction form was used to include relevant data: (1) Lead author and year of publication, (2) Title, (3) Country/ region of the population studied, (4) Study design, (5) Sample size, (6) Sample characteristics, (7) Covid-19 status, (8) Type of quarantine, (9) Prevalence of mental health status, (10) Associated risk factors.

Quality Appraisal

The assessment of the quality of the design articles of the cross-sectional Study was carried out by researchers using the Checklist for Cross Sectional Study from the Joanna Briggs Institute which consists of 8 (eight) questions with the answers "Yes", "No", "Not clear", or "Not applicable". The questions for analytical cross sectional studies are: (1) Were the criteria for inclusion in the sample clearly defined?; (2) Were the study subjects and the setting described in detail?; (3) Was the exposure measured in a valid and reliable way?; (4) Were objective, standard criteria used for measurement of the condition?; (5) Were confounding factors identified?; (6) Were strategies to deal with confounding factors stated?; (7) Were the outcomes measured in a valid and reliable way?; (8) Was appropriate statistical analysis used? (Joanna Briggs Institute 2020).

RESULTS AND DISCUSSION

Search result

A total of 706 articles were identified. The check was carried out using the help of the Mendeley application to check for duplications, there were 275 duplicated articles and were excluded from the selection process. Subsequently, 271 articles were issued based on title and abstract screening. Furthermore, 160 articles were screened based on inclusion criteria. The next process was to assess the quality of 16 full text articles and 7 articles that met the criteria for review were obtained. We using checklist for analytical Cross-Sectional studies from Joanna Briggs Institute and seven articles were met the criteria.

Study characteristics

The study characteristics and findings are summarized in Table 1. The results of the seven articles reviewed show that the studies were conducted in China (2 studies), Jordan, India, Iran, Nepal, and Bangladesh. Study participants were Covid-19 sufferers or suspected cases with a total number of participants from the entire study of 1941 participants, the minimum study sample was 66 participants and the maximum sample was 505 participants. Most of the

respondents were aged 18 years and over and the majority were male. The study design used was cross-sectional. All studies were carried out on the conditions of the Covid-19 pandemic and quarantine methods as an effort to reduce the spread of Covid-19. Quarantine was carried out at the quarantine center in two studies and hospitalization in five studies. Data collection times vary for each study within the Covid-19 quarantine period.

Measurement tools

The assessment of mental health status was carried out using instruments that varied between each study and all were valid. Two studies conducted measurements using the 9-item Patient Health Questionnaire (PHQ) instrument (Q. Guo et al. 2020; Samrah et al. 2020). One study used the Generalized Anxiety Disorder Assessment 7-item version (GAD-7), Perceived Stress Scale, 10-item version (PSS-10) PTSD Checklist for DSM-5 (PCL-5) (Q. Guo et al. 2020). Depression Anxiety Stress Scale (DASS) with 21 questions, consisting of 3 parts each of the 7 question domains of depression, anxiety, and stress were used by three studies (Hasan et al. 2020; Upadhyay et al. 2020; Zandifar et al. 2020). One study used the Self-Rating Anxiety Scale, Self-Rating Depression Scale, and the Pittsburgh Sleep Quality Index (Dai et al. 2020). Hasan et al. (2020) used the Impact of Event Scale (IES) instrument to evaluate more specific distress due to certain events. The study of Bahadur et al. (2020)

using the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) instruments. Study Q. Guo et al. (2020) added an interview instrument to assess the stress felt by patients and post-traumatic symptoms.

Definitions of Quarantine

Quarantine is defined as restricting movement or separating a person who has been or may be exposed to an infectious disease. Quarantines are used to keep someone who may have contracted Covid-19 away from others and help prevent the spread of the disease that can occur before someone finds out they are sick or if they have the virus without feeling symptoms. Isolation is defined as the separation of a person suffering from an infectious disease from an uninfected person to protect people who are not infected and is usually carried out in a hospital environment. (*Centers for Disease Control and Prevention* 2020). Quarantine can be implemented at the individual or group level, usually at home or at designated facilities, such as quarantine centers, shelters or temporary hospitals. Quarantines may be voluntary or mandatory (Wilder-Smith & Freedman 2020). Quarantine is recommended for someone who is in direct contact with an infected person or after traveling from a country with a history of local transmission and has symptoms such as fever or cough after traveling from a crowded place (*World Health Organization* (WHO) 2020). The types of quarantine in the articles that are reviewed are quarantine in a quarantine center or hospitalized quarantine, and home quarantine. Centralized quarantine is recommended because people with Covid-19 receive treatment and can immediately intervene if the disease conditions worsen, and help stop the spread of infection (Chen et al. 2020). Hospitalized quarantine its refer to definition from *Centers for Disease Control and Prevention* (2020) more accurately described as isolation. The terms quarantine and isolation are often used interchangeably,

especially in communications with the public (Manuell 2011 dalam Brooks et al. 2020)

Mental Health Impact of Quarantine

The results of the review show that all studies have reported negative mental health conditions for Covid-19 sufferers and suspected cases, who undergo centralized quarantine or home quarantine. Depression and anxiety are the most commonly reported mental health problems of all studies. The study of Zandifar et al. (2020) reported stress conditions experienced by 84.9% of participants in quarantine in Iranian hospitals. The study of Dai et al. (2020) reported poor sleep quality in the majority of participants (84.7%) who underwent hospital quarantine in China. The levels of stress and depression experienced by the participants varied between studies. The prevalence of depression and anxiety was mostly experienced by participants in the study Zandifar et al. (2020) who underwent quarantine in hospital with conditions confirmed positive for Covid-19, namely 97.2% experienced depression and some 99.1% reported very severe anxiety. The lowest prevalence of depression and anxiety was reported in quarantine in quarantine centers (Bahadur et al. 2020; Upadhyay et al. 2020). Quarantine can reduce the spread of Covid-19, but there are other negative consequences related to mental health conditions for Covid-19 sufferers quarantine in quarantine centers, namely the emergence of depression, anxiety and post-traumatic stress (Dai et al. 2020; Samrah et al. 2020; Upadhyay et al. 2020; Y. Guo et al. 2020; Zandifar et al. 2020). These findings are consistent with the results of previous reviews, namely individuals who undergo isolation or quarantine are at higher risk of experiencing depression, anxiety, and post-traumatic stress (Henssler et al. 2020). Tang et al. (2020) reported the same thing, namely the incidence of depression and anxiety in the group that underwent quarantine is higher than the group that did not undergo quarantine.

Risk Factor of Mental Health

Demographic factors associated with depression symptoms, including female gender (Dai et al. 2020; Samrah et al. 2020; Q. Guo et al. 2020); employment status, with groups of freelancers more often experiencing depression (Zandifar et al. 2020); and lower levels of education, that is below the diploma and illiteracy group (Dai et al. 2020; Zandifar et al. 2020). Married is associated with increased anxiety (Zandifar et al. 2020). Participants who had rheumatology related to stress (Zandifar et al. 2020). The results of the regression analysis also showed that the factors associated with depression and anxiety were participants who had family members confirmed positive for Covid-19, the number of physical symptoms currently being felt, changes in symptoms after hospitalization, and poor sleep quality (Dai et al. 2020).

Social Stressor Among People Under Quarantine

Participants in centralized quarantine and home quarantine have different social stressors. Quarantine participants in hospitals and quarantine centers experience social stressors in the form of negative stigma from the community (Q. Guo et al. 2020; Bahadur et al. 2020). Meanwhile, the social stressors experienced by participants in the home quarantine include financial problems, feelings of fear of transmitting infection or infected by others,

insufficient food supply, lack of information about Covid-19, and overexposure to Covid-19 news on social media and the mass media increase stress. However, studies related to

participants undergoing home quarantine were limited to the student population (Hasan et al. 2020).

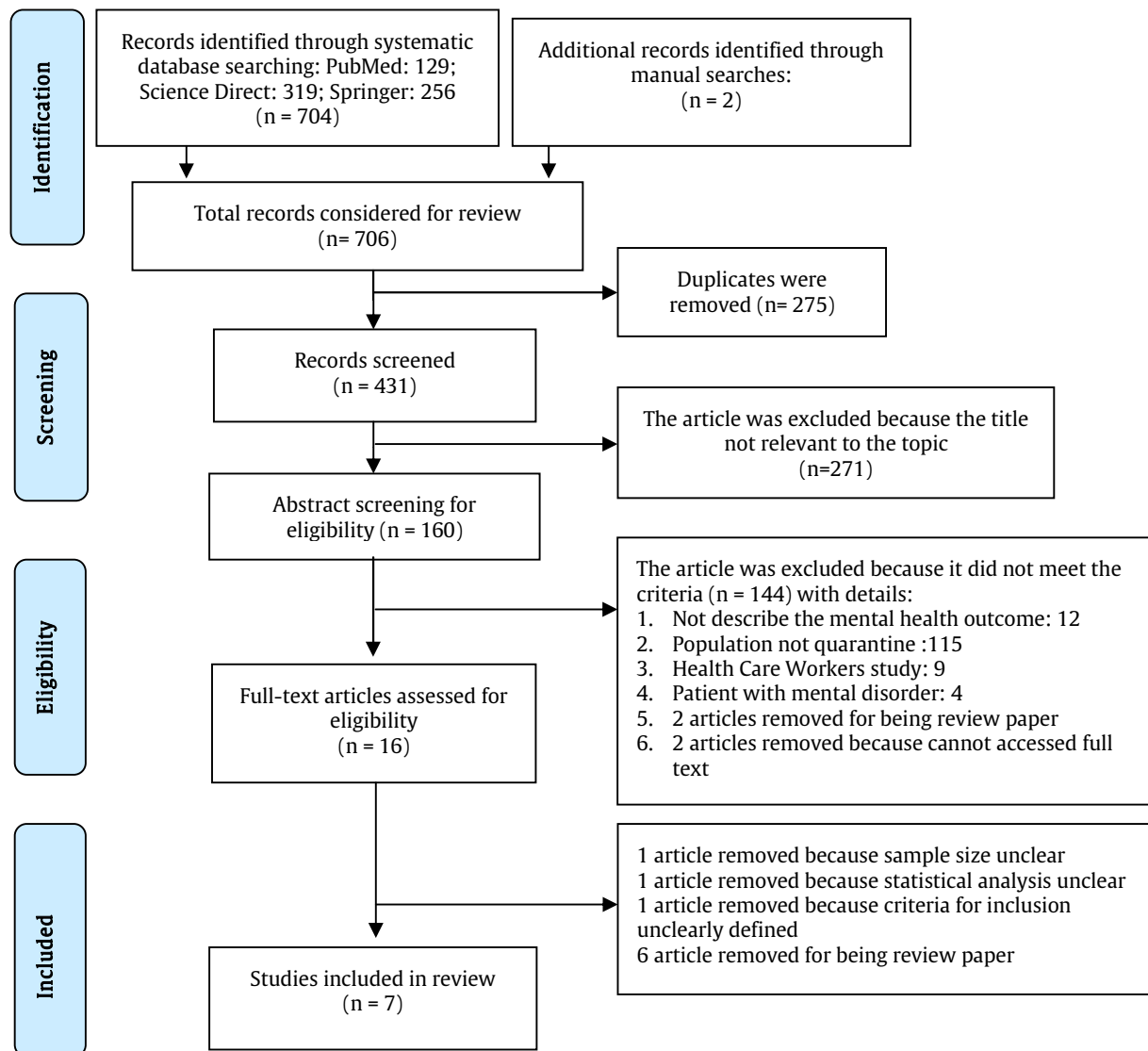


Figure 1. PRISMA flowchart

Vulnerable People in Quarantine

The vulnerable group at risk for mental health problems is women, because women have a higher risk of experiencing depression than men (Samrah et al. 2020; Q. Guo et al. 2020), but was not consistent with the result of study by Zandifar et al. (2020). This review is relevant to Hu et al. (2020) that the female gender factor can be a predictor factor for the severity of depression. Hammen (2018) states that women often experience changes in mood, such as depression, anxiety, and post-traumatic stress disorder (PTSD). Sex differences related to mental health are most likely caused by sex steroid hormones (androgens, estrogens, and progesterone) and genetic factors (Jaggar et al. 2020).

Previous studies have reported that the age factor affects the mental health conditions of participants who undergo quarantine, namely young age or less than 15 years (Peng et al. 2020). The results of the review article show that age is not related to mental health conditions in Covid-19 sufferers who are undergoing quarantine, unless the study by Zandifar et al. (2020). This is possible because most of the participants

are over 18 years old. According to Keshky, Alsabban & Basyouni (2020) someone who is older has lower levels of anxiety than younger people. This is because old age has more experience and ability to control emotions in difficult situations. Casual workers are among the population vulnerable to mental health problems. Job status is associated with depression, the highest prevalence of depression is from the freelancers group (Zandifar et al. 2020). This is associated with lower income increasing the risk of mental health problems (Wathelet et al. 2020). Lower levels of education are associated with depression severity. The group that experienced severe depression was from the diploma and illiteracy education group (Zandifar et al. 2020). These results are consistent with research Zhong et al. (2015) among migrant workers in China, a lower level of education is a risk factor for major depressive disorder. Married status is associated with increased anxiety (Zandifar et al. 2020). This may be because married people are thinking about caring for children which can increase stress during the quarantine period (Burke et al. 2020).

Strategy to Reduce Negative Mental Health Impact Among People Under Quarantine

Individuals who are undergoing quarantine, whether in a quarantine center, in a hospital or at home, really need support. Adequate information regarding Covid-19 is needed. Lack of information on students undergoing home quarantine can increase mental health problems (Hasan et al. 2020). Covid-19 sufferers who are quarantined at the hospital complain of a lack of information from health workers or information received is conflicting and this is related to an increase in depressive symptoms (Samrah et al. 2020). Financial support and food supplies are also needed for individuals undergoing home quarantine (Hasan et al. 2020). Provision of good quarantine facilities can also reduce the negative impact of mental health, because poor facilities will worsen physical and mental conditions (Bahadur et al. 2020).

Strengths and limitations

The strength of this review is that it was systematically conducted. The study is limited by several factors. The limitations of this study include the different instruments used and most of studies conducted data collection through self-report. Studies on the home quarantine population are limited to the student population.

CONCLUSIONS AND RECOMMENDATIONS

The impact of centralized quarantine on the mental health of Covid-19 sufferers, are an increase in depression, anxiety, stress, and poor sleep quality. Depression and anxiety are the most common mental health problems. The prevalence of depression and anxiety in suspected Covid-19 cases who undergo quarantine at a quarantine center (Centralized Quarantine) is lower than other types of quarantine. Centralized quarantine as one of the strategies chosen for handling public emergencies needs to pay attention to several aspects, namely the impact on mental health, provision of supporting facilities and resources, and the condition of sufferers and culture in the community. The right strategy should be studied further to treat mental health problems early on and prevent long-term complications.

Declaration of Conflicting Interests

The authors declared that no potential conflicts of interests with respect to the authorship and publication of this article.

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Table 1. The characteristics samples of articles on the impact of quarantine on the mental health of Covid-19 sufferers

Author	Journal Rank	Country	Study Design	Sample Size (n=)	Sample Characteristics	Covid-19 Status	Type of Quarantine
(Q. Guo et al. 2020)	Q1	China	Cross-sectional Study	103 Covid-19 patients and 103 non-Covid control groups	Age range: 18-75. Mean Age 42.50 (SD = 12.53) Sex (f/m): 44/59	Covid-19 (+) mild case	Hospitalized Quarantine
(Samrah et al. 2020)	Q2	Jordan	Cross-sectional Study	66 patients	Age Range: 18-79 Mean Age: 35.8 ±16.2 Sex (f/m): 39/27	Covid-19 (+)	Hospitalized Quarantine
(Upadhyay et al. 2020)	-	North India	Cross-sectional Study	310 patients	Mean Age (N=120): 33.54 ±12.49 Sex (f/m) (N=120): 33 (27.1 %) /87 (72.9 %)	Suspect case of Covid-19	Quarantine Centers
(Zandifar et al. 2020)	Q2	Iran	Cross-sectional Study	106 patients	Mean Age: 55 (SD=16.92) Sex (f/m): 51 (48,1 %) /55 (51.9 %)	Covid-19 (+)	Hospitalized Quarantine
(Dai et al. 2020)	Q1	China	Cross-sectional Study	307 patients	Age ≤ 44: 156 (50.8 %) Age 45-59: 119 (38.7 %) Age ≥ 60: 32 (10.4 %) Sex (f/m): 133 (43.3 %) / 174 (56.6 %)	Covid-19 (+)	Hospitalized Quarantine
(Bahadur et al. 2020)	-	Nepal	Cross-sectional Study, Mixed Method Study	441 patients	Age < 18= 13.2 % 18-35= 63.9 % 36-53 = 20 % > 54 = 2.9 %	Suspect case of Covid-19	Quarantine Centers
(Hasan et al. 2020)	Q1	Bangladesh	Cross-sectional study	505 patients	Age: ≤19: 64 (12.67 %), 20-24: 396 (78.42 %), ≥25: 45 (8.91 %). Sex: Female: 188 (37.23 %); Male: 317 (62.77 %)	Suspect case of Covid-19, close contact	Home Quarantine

Table 2
Summary of articles on the impact of quarantine on the mental health of Covid-19 sufferers

Author	Title	Assessment tool	Prevalence n/total (%)	Associated risk factor
(Q. Guo et al. 2020)	Immediate psychological distress in quarantined patients with Covid-19 and its association with peripheral inflammation: A mixed-method study	PHQ-9 GAD-7 PSS-10 PCL-5	Depression, Minimal: 41/103 (39,8 %); Mild: 44/103 (42,7 %); Moderate: 16/103 (15,5%) Anxiety, Minimal: 46/103 (44,7 %); Mild 50/103 (48,5 %); Moderate 4/103 (3,9 %); Severe 3/103 (2,9)	Female gender factor observed on the score "Perceptions of helplessness", subscale PSS-10, it was found that female patients showed higher scores compared to male patients (Z = 2.56, P = 0.010), women (Z = 2.37, P = 0.018) and male controls (Z = 2.87, P = 0.004)
(Samrah et al. 2020)	Depression and coping among covid-19-infected individuals after 10 days of mandatory in-hospital quarantine, Irbid, Jordan	PHQ-9	PHQ-9 Severity Categories: Normal 37 (56,5 %), Mild 15 (22,7 %), Moderate 10 (15,2%), Severe 4 (6,1%)	Female gender factor (PHQ-9 score ≥10: 13 (92.9%) versus 1 (7.1%), p value = 0.004
(Upadhyay et al. 2020)	Psychological impact of quarantine period on asymptomatic individuals with COVID-19	Depression Anxiety Stress Scale (DASS)	N= 310 Depression: Normal 50,6 %, Mild 23,2 %, Moderate 18,2 %, Severe 6,1 %, Extremely Severe: 1,9 % Anxiety: Normal 59,1 %, Mild: 11,9 %, Moderate 14,8 %,	There is a relationship between depression, anxiety, and stress with individuals undergoing quarantine at the Quarantine Center

Author	Title	Assessment tool	Prevalence n/total (%)	Associated risk factor
			Severe 10 %, Extremely Severe 4,2% Stress: Normal 24,2 %, Mild: 7,1 %, Moderate 21,9 %, Severe 16,5 %, Extremely Severe 30,3 %	
(Zandifar et al. 2020)	Prevalence and severity of depression, anxiety, stress and perceived stress in hospitalized patients with COVID-19	DASS-21 PSS-4	Depression: 97,2 % Anxiety: Severe 0,9 % Very Severe: 99,1 % Stress: 84,9 %	There is no significant relationship between gender and age with depression, anxiety, stress and stress perception. There is a significant relationship between work status and depression (p value = 0.006). There is a significant relationship between education level and depression severity (p value 0.001). The prevalence of patients with severe and very severe depression in the diploma and illiterate education patient groups. Married status is associated with increased anxiety (p value = 0.010). Having rheumatology disease is associated with stress (p value <0.001).
(Dai et al. 2020)	Anxiety and depressive symptoms among COVID-19 patients in Jiangnan Fangcang Shelter Hospital in Wuhan, China	Self-Rating Anxiety Scale, Self-Rating Depression Scale, and Pittsburgh Sleep Quality Index.	Anxiety: 57 (18.6%) Depression: 41 (13.4%) Bad sleep quality: 260 (84.7%)	Multivariate logistic regression analyzes: having family members who have been confirmed positive for Covid-19, current number of physical symptoms, changes in symptoms after hospitalization, and poor sleep quality. Factors associated with depressive symptoms are female gender, lower education level, history of smoking, history of drinking alcohol. Covid-19 sufferers who are treated at Fangcang Shelter Hospital are known to experience higher rates of depression and anxiety than the general population in China.
(Bahadur et al. 2020)	Anxiety and depression among people living in quarantine centers during COVID-19 pandemic: A mixed method study from western Nepal	Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) tools	Depression: 13.6%; Mild: 9.1%; Moderate: 3.4%; and Severe: 1.1%. Anxiety: 20.9%, Mild: 16.1%; Moderate: 4.1%; and Severe: 0.7%.	Individuals living in quarantine centers are afraid of illness and death, think about the health conditions of themselves and their family members and their financial responsibilities, the existence of discrimination and community stigma against migrants who are considered to be at high risk of contracting Covid-19, and the quality of the quarantine center is less and less worsening the physical and mental health conditions of the individual.
(Hasan et al. 2020)	The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: A cross-sectional pilot study	DASS-21 IES	Stress 28,5 % Anxiety 33,3 % Depression (DASS 21) mild to extremely severe: 46,92 % IES : 69,31 % had event specific distress from mild to severe	Bivariate linear regression: The age group 20 to 24 was significantly associated with a higher IES score (B = 0.28, 95% CI: 0.06 to 0.50), but the age group 25 or over had a significant association with the score. Higher IES (B = 0.53, 95% CI: 0.21 to 0.84). Gender, marital status, and number of family members were not related to mental health status. Students report social stressors related to Covid-19, namely financial uncertainty (35.64%), fear of infection (50.89%), insufficient food supply (16.24%), lack of information about Covid-19 (31.49%) , excessive exposure to Covid-19 news on social media and mass media (38.22%).

Abbreviations: PHQ-9 (9-item Patient Health Questionnaire); GAD-7 (Generalized Anxiety Disorder Assessment 7-item version); PSS-10 (Perceived Stress Scale, 10-item version); PCL-5 (PTSD Checklist for DSM-5); DASS-21 (Depression Anxiety Stress Scale with 21 item); IES (Impact of Event Scale)