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The mental health impact of COVID-19 pandemic in indonesian older people: the implication for sleep deprivation, loss of appetite, and psychosomatic complaints

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ABSTRACT

Introduction: During the COVID-19 pandemic, many individuals were concerned about being infected. Meanwhile, the older people felt isolated due to the detrimental effect on their mental and physical health. Therefore, this study aimed to identify the mental health issues suffered by the older people during the COVID-19 pandemic, the implication for sleep deprivation, loss of appetite, and psychosomatic complaints.

Methods: This was a descriptive-analytic study using a cross-sectional approach to find the mental health impact of the COVID-19 pandemic. The population of this study was older people (those aged ≥60 years) living in urban areas in West Java and Jakarta. The sample size was measured with the Lemeshow formula using a 95% confidence interval. A total of 259 older people participated in this study in cluster random sampling selection. Questionnaires were distributed to study participants consisting of sociodemographic characteristics, general anxiety disorder, history of chronic illness, COVID-19 related psychological concern, self-reported losing appetite, self-reported sleep deprivation and psychosomatic assessment. Statistical analysis used descriptive and logistic regression analysis.

Results: The average age of study participants is 65.3 years old (SD ± 6.8; min-max = 60 to 89 years old). Multivariable logistic regression model showed that sleep deprivation is significantly associated with non-college education background (OR = 2.28; 95% CI = 1.23 to 4.61), anxiety (OR = 7.09; 95% CI = 3.57 to 14.08), and the existence of chronic illness (OR = 2.75; 95% CI = 1.44 to 5.26). Subsequently, the psychosomatic symptom was associated with anxiety (OR = 5.27; 95% CI = 2.75 to 10.11) and chronic illness (OR = 2.80; 95%CI = 1.47 to 5.32). Loss appetite was associated with non-college education background (OR = 2.50; 95% CI = 1.16 to 5.41), anxiety (OR = 10.41; 95% CI = 5.01 to 21.63), and the existence of chronic illness (OR = 3.60; 95% CI = 1.72 to 7.55). The analysis showed that none of the COVID-19 related fear is associated with a sleep disorder, loss of appetite, and psychosomatic symptoms.

Conclusions: Sociodemographic factors, anxiety and medical factors contribute to the risk of mental health issues in older adults during the COVID-19 pandemic, implication for sleep deprivation, loss of appetite, and psychosomatic complaints.

Keywords: COVID-19 pandemic; losing appetite; mental health; sleep deprivation; psychosomatic symptoms

Introduction

Indonesia and almost all countries in the world have been facing a global COVID-19 pandemic since 2020 (World Health Organization, 2020). The pandemic situation has a remarkable effect on people's lives, social relations, and sociodemographic issues. The fast-spreading infectious disease has been causing universal awareness, anxiety, and distress, as natural psychological

responses to the randomly changing condition (World Health Organization, 2020). A special concern needs to be addressed to the vulnerable groups such as older people.

The mental health issues over the pandemic have become a concern in the global health context. A study in American society reported that new measures such as self-isolation and quarantine had affected people's usual activities, routines, and livelihoods, leading to increased loneliness, anxiety, depression, insomnia, substance abuse, and self-harm or suicidal behavior (American Psychiatric Association, 2020) in the community.

During the pandemic, older people face significant fallout concerning their physical and psychological wellbeing. These adults experienced disproportionately greater adverse effects during this pandemic, including severe complications and higher mortality (Liu, Chen, Lin, & Han, 2020). The Indonesian government reported that 46% of fatality cases are suffered by older people (COVID-19 Response Acceleration Task Force, 2022). These high number of fatalities in older people are a result from aging process causing gradual decline in physical capacity and decline in immune function thus placing the older people in a high-risk group during the COVID-19 pandemic (Setiati, 2014).

Older adults are advised to reduce their social connections as much as possible. The government advises them to stay at home and reduce face-to-face interactions with others, avoiding contact with friends and family to minimize the spread of COVID-19 (Ministry of Health, 2020). Hence, this policy creates a dilemma for the older people and their family members. They feel lonely and, at the same time, worried about being infected. Furthermore, concerns about disruptions to their daily routines and access to care, difficulty adapting to technologies like telemedicine, and social isolation exacerbate existing mental health conditions (Armitage and Nellums, 2020). A survey conducted by the Center for Family and Ageing Studies (CeFAS) in 2020 identified three mental health issues suffered by older people in community-dwelling during the pandemic, including sleep deprivation, loss of appetite, and psychosomatic symptoms (Nugraha *et al.*, 2020). This study further intended to find the contributing factors of three mental health issues during the pandemic: the implication for sleep deprivation, loss of appetite, and psychosomatic symptoms.

Materials and Methods

Design and Participants

This was a descriptive-analytic study using a cross-sectional approach to find the mental health impact of the COVID-19 pandemic. Participants from West Java and DKI Jakarta (age 60 years old or more) were invited to participate in this study. The recruitment process was using older people community associations. Sample sizes were counted using Lemeshow formula for cross-sectional methods with 95% degree of the confidence interval and counted 384 samples. Subjects were selected using cluster random sampling, with inclusion criteria including: those aged 60 years old or more, having no communication constraint, able to speak and read Bahasa Indonesia, and agree to participate in this study. Trained staff performed face-to-face interviews to collect detailed information from all participants with the COVID-19 prevention protocol. A total sample of 259 satisfied study analysis and were included in this study; 125 people were excluded due to incomplete response, confirming 67.4% response rate.

Instruments

One set of questionnaires was distributed to the older people or their family members after study participants signed an informed consent and received brief study explanation from the researcher. The questionnaire consists of sociodemographic characteristics, including age, gender, and education background, checklist for chronic illness adapted from geriatric comprehensive assessment (GCA).

The self-reported individual concern about the pandemic was measured with a checklist that consists of the following questions: "I am afraid of getting infected;" "I am worried about the increasing number of cases;" "I am worried my family member will be affected;" "I am worried of unable to perform religious activities;" "I am worried on the difficulties to unite with my family" with "Yes" and "No" as a possible answer.

The anxiety disorders were assessed with the Indonesian version of General Anxiety Disorders (GAD-7) questionnaire. It explores the psychological condition of the older people by asking whether they were bothered by the following problems over the last two weeks, such as (1) feeling nervous, anxious, or on edge; (2) unable to stop worrying; (3) worrying too much about different things; (4) trouble relaxing; (5) being restless and hard to sit still; (6) becoming easily irritable; (7) feeling afraid (Johnson *et al.*, 2019).

The outcome variable sleep deprivation was assessed with the self-reported experience in: difficulty to start sleeping, waking up suddenly, short sleep time (less than 6 hours) with four possible answers for each question (0 = not at all; 1 = several days; 2 = more than a week; 3 = nearly every day) (Han, Kim and Shim, 2012).

The perception of losing appetite was assessed using the following question: "Please tell us first how your eating behavior is affected by certain emotional states and situations by circling a number on the scale below. The scale ranges from 1 to 9, where 1 represents much less food intake than usual, 9 much more than usual, and 5 the same as usual." This measure was adopted from Emotional Appetite Questionnaire (EMAQ) (Nolan, Halperin and Galiebter, 2010).

The perceived psychosomatic symptoms were measured with: "In the past two weeks, have you felt unwell, like have a fever, stomach discomfort, chill, dizziness" and scored (0 = not at all; 1 = several days; 2 = more than a week; 3 = nearly every day) adapted from the Psychosomatic Problem Scale (PBS) (Frisenstam *et al.*, 2017).

Data Analysis

Statistical analysis consists of descriptive-analytic to explore the sociodemographic characteristics of the participants and the prevalence of anxiety, self-reported sleep deprivation, self-reported losing appetite, and self-reported psychosomatic symptoms. The bivariate Chi-square analysis was employed to assess the independent variable and outcome variables. Furthermore, a logistic regression analysis was conducted to identify factors contributing to mental health impact among older people.

Ethical Consideration

The study was conducted according to the guidelines of the Declaration of Helsinki, and informed consent was obtained from all subjects involved. The study participants have obtained written informed consent to publish this paper approved by the Institutional Review Board of the University of Respati Indonesia with ethical approval number: 023/SK.KEPK/UNR/V/2020.

Results

A total of 259 older people participated in this study after conducting surveys among older people and their family members from May to June 2020. Approximately 67.45% response rate or 259 responses are eligible for data analysis.

As shown in Table 1, the average age of study participants is 65.3 years old (SD ± 6.8; min-max = 60 to 89 years old), three-quarters of study participants are female, more than one-third have a college degree, and more than half of study participants have one or more chronic illness. According to the anxiety measurement using Generalized Anxiety Disorder, 26.3% of the older people are categorized as having anxiety during the COVID-19 pandemic. Concerns about the COVID-19 condition are dominated by the fear of being infected as much as 88% followed by the increasing number of cases. Assessment on the mental health related issues identified the sleep deprivation as the most issues reported by study participants followed by self-reported psychosomatic symptom and self-reported in eating disorder identified by emotional appetite status.

Appendix 1 describes the bivariate association between risk factor of sleep deprivation, psychosomatic symptom, and loss of appetite. Among older people who suffer from anxiety disorder, 60.3% of them complained of having sleep deprivation, 55.9% of them reported psychosomatic symptoms, and 57.4% of them suffer from losing appetite (p-value < 0.0001). Approximately 40% of study participants who have chronic illness are likely to suffer from sleep deprivation, 34.3% lose their appetite, and 38.6% are identified as having psychosomatic symptoms (p < 0.01). Furthermore, 38.8% of older people that are worried about the increasing number of COVID-19 cases suffered from sleep deprivation (p < 0.05), and 58% are unable to unite with their family (p = 0.05), while 41.9% lose their appetite (p = 0.045).

Table 1 Sociodemographic characteristics of the participants (N = 259)

Variables	n	%
Age		
60-70 years old	217	83.8
70 years old or more	42	16.2
Gender		
Male	65	25.1
Female	194	74.9
Education		
Non-college degree	172	66.4
College degree	87	33.6
The existence of chronic illness		
None	116	44.8
Having one or more chronic illness	143	55.2
Generalized Anxiety Disorder (GAD)		
Non-anxiety	191	73.7
With anxiety	68	26.3
To what extent do you worry about COVID-19?		
I am worried about getting infected	230	88.8
I am worried about the increasing number of cases	105	40.5
I am worried my family members will be infected	97	37.5
I am worried of being unable to unite with family	31	12.0
I am worried of being unable to perform religious activities	13	5.0
Mental health-related issues		
Sleep deprivations	80	30.9
Psychosomatic Symptom	75	29.0
Losing Appetite	65	25.1

The multivariable logistic regression model showed (Appendix 2) that sleep deprivation is associated with non-college education background (OR = 2.28; 95% CI = 1.23 to 4.61), anxiety (OR = 7.09; 95% CI = 3.57 to 14.08), and the existence of chronic illness (OR = 2.75; 95% CI = 1.44 to 5.26). The psychosomatic symptom was associated with anxiety (OR = 5.27; 95% CI = 2.75–10.11) and chronic illness (OR = 2.80; 95% CI = 1.47 to 5.32). Loss of appetite was associated with non-college education background (OR = 2.50; 95% CI = 1.16 to 5.41), anxiety (OR = 10.41; 95% CI = 5.01 to 21.63), and the existence of chronic illness (OR = 3.60; 95% CI = 1.72 to 7.55). The analysis showed that none of the COVID-19 related fear is associated with a sleep disorder, loss of appetite, and psychosomatic symptoms.

Discussions

The great pandemic of 2020 has been a unique stressor that has affected communities all around the world (World Health Organization, 2020). This study highlighted mental health issues in older adults during

the COVID-19 pandemic, implication for sleep deprivation, losing appetite, and self-reported psychosomatic symptoms. Several predictors show a statistically significant association with sleep deprivation, losing appetite, and psychosomatic complaints in this study.

This study identified the older people with anxiety, an existing chronic disease, and low education background (non-college degree) as likely to have greater sleep deprivation during the COVID-19 pandemic. Apart from the disease's effect, these psychological problems are also triggered by social distancing following the government regulation to stay at home and prohibition of going home for family gatherings in celebration of religious events (Ministry of Health, 2020). As a result of these policies, the older people lost their daily routines, such as regularly meeting friends and family and causing the older people to feel lonely. This can be a stressful mental health condition triggered by loneliness due to social isolation (Bergman *et al.*, 2020). More than 80% of the study participants reported that they are afraid of being infected by the COVID-19 while worrying about the increasing number of cases. These concerns can trigger a higher stress levels and lead to anxiety disorder that may affect deterioration of the normal sleep pattern (Han, Kim and Shim, 2012). The body's circadian rhythm regulation between sleep and awakening is regulated by two components, namely the circadian component (~24 hours) and the homeostatic component (Cardinali *et al.*, 2020). The circadian timing system is controlled by sunlight exposure, social adaptation, and environmental problems with daily routines such as waking up at a certain time, exercising, eating, socially engaging, and recreational activities. During the pandemic, some activities have changed due to limitations at certain times. This condition causes the older adult with anxiety to experience sleep deprivation. Anxiety is an emotional memory with theta frequency that may influence the rapid eye movement (Essien *et al.*, 2018). The complex interplay between sleep deprivation and anxiety could worsen the mental health condition. Furthermore, lower education background is likely to increase the stress level. Previous study identified the reverse association between education background and the stress level (Johnson *et al.*, 2019). One can assume that older people with higher education have better knowledge to cope with the pandemic and easily identify accurate information. In contrast, older people with lower-level education are likely vulnerable to wrong news (hoax), which may increase their anxiety level. Moreover, those with a college education background have a good circle of friendship to share accurate information. This finding proves that low level of education is also associated with a lack of sense of control and resilience (Niemeyer *et al.*, 2019) during the pandemic situation.

Anxiety, the existence of chronic illness and a non-college education background are significantly associated with self-reported losing of appetite. An Australian study explains that those who felt a high level of the adverse impact of the pandemic restrictions had significantly increased odds of being bothered by poor appetite (Owen *et al.*, 2021). The COVID-19 pandemic makes older adults worry about being infected and vulnerable to stress. Emotional eating is most commonly reported in anxiety. Stress can suppress appetite, and loss of appetite is a common feature of depression (Simmon *et al.*, 2016). Older adults with decreased physiological conditions interfere with their appetite. Furthermore, those with chronic diseases during the COVID-19 pandemic felt more anxious because they had comorbidities such as hypertension and diabetes mellitus, which can increase the risk of developing severe and fatal COVID-19 (Fang, Karakiulakis and Roth, 2020). Chronic illness can interfere with appetite through impaired agility and pain. It interferes with the eating process, which takes longer to reduce appetite.

Psychosomatic symptoms are reported by nearly 29% of the study participants. This finding is in line with previous study on the mental health impact of the pandemic. This study identified a statistically significant association between self-reported psychosomatic symptom with anxiety and chronic illness. Psychosomatic symptoms are decreased psychological state, hence negatively impacting physiological function (somatic) (Levenson, 2007). This occurs due to dysfunction or structural damage to organs by activating the involuntary nervous system and biochemical responses (Levenson, 2007). Older adults with anxiety are likely to have psychosomatic symptoms because pain and anxiety should be recognized as physiological problems associated with neurobiochemical changes (Satsangi and Brugnoli, 2018). Neuro-biochemistry is associated with stress resulting from stimulation of the sympathetic nervous system, specifically the fight-or-flight response. In acute stress especially in the COVID-19 pandemic, this response triggers the release of catecholamines, including Norepinephrine-Epinephrine (NE) and cortisol, from the adrenal glands. In prolonged or chronic stress, the sympathetic nervous system creates a continuous stimulus of the fight-or-flight response (Levenson, 2007). The secretion of catecholamines occurs continuously under prolonged stress conditions because catecholamines, such as NE, act as neurotransmitters in the brain. These substances can change cognition and other mental condition such as poor concentration, mood variations, tension, depression, and anxiety. At the same time, long-term stress-induced cortisol secretion from the adrenal glands can reduce immune function (Satsangi and Brugnoli, 2018). The increasing number of cases and a lot of uncertain issues spread around the older people, produce significant stressors that may increase stress level of older people and are likely to increase their psychosomatic complaints.

The strength of this study is that it captures the state of the COVID-19 pandemic related to mental health issues, and its associated factors. To the best of our knowledge, this is one of the few studies examining the association of mental health issues focusing on the implication for sleep deprivation, loss of appetite, and psychosomatic complaints with COVID-19. On the other hand, this study has many limitations that may arise from sample distribution and lower response rate. Selection bias could be present in the data collection, because, in the pandemic situation, researchers should limit their contact to older people, and wearing certain personal protective equipments, which may become communication barriers for older people with decreasing visual and hearing capacity. Another limitation is due to the fact that we did not identify other factors that could become potential confounding that may distort the association between independent and dependent variables.

Conclusions

This study identified mental health issues suffered by the older people during the COVID-19 pandemic. Anxiety and chronic illness were identified as the risk factors for all mental health issues such as sleep deprivation, loss of appetite, and psychosomatic symptom. Additionally, lower education attainment is likely to increase the risk of sleep deprivation and loss of appetite two times above higher education.

These results have implications for delivering adequate education on COVID-19 through trustworthy information to alleviate fear and boost understanding among individuals with poor education and chronic illnesses. Awareness of these contributing factors and implementation of coping strategies and interventions may help safeguard older people as vulnerable group from psychological complications that impact quality of life and health span. Understanding the factors and mechanisms that drive older people's resilience can guide intervention approaches for other people. In addition, increasing components of wisdom like emotional regulation, empathy, and compassion can reduce any mental health issues. Further research should be conducted to understand the psychological and mental health effects of the ongoing COVID-19 pandemic among the older population.

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APPENDICES

Appendix 1 The association of sociodemographic factors with sleep deprivation, loss of appetite, and psychosomatic symptom

Variables	Sleep Deprivation			Loss of Appetite			Psychosomatic Symptoms		
	No = 0 (n (%))	Yes = 1 (n (%))	p-value	No = 0 (n (%))	Yes = 1 (n (%))	p-value	No = 0 (n (%))	Yes = 1 (n (%))	p-value
Gender									
Female	40 (62.5)	24 (37.5)	0.298	159 (74.6)	54 (25.4)	0.998	150 (70.4)	63 (29.6)	1.000
Male	134 (70.5)	56 (29.5)		30 (73.2)	11 (26.8)		29 (70.7)	12 (29.3)	
Age									
60-70 years	146 (68.5)	67 (31.5)	1.000	45 (70.3)	19 (29.7)	0.482	40 (62.5)	24 (37.5)	0.145
>70 years	28 (68.3)	13 (31.7)		144 (75.8)	46 (24.2)		139 (73.2)	51 (26.8)	
Education Background									
College degree	109 (65.3)	58 (34.7)	0.180	120 (71.9)	47 (28.1)	0.275	116 (69.5)	51 (30.5)	0.773
Non-college degree	64 (74.4)	22 (25.6)		68 (79.1)	18 (20.9)		62 (72.1)	24 (27.9)	
Anxiety Disorder Category									
Non anxiety	147 (79.0)	39 (21.0)	<0.0001	160 (86.0)	26 (14.0)	<0.0001	149 (80.1)	37 (19.9)	<0.0001
With anxiety	27 (39.7)	41 (60.3)		29 (42.6)	39 (57.4)		30 (44.1)	38 (55.9)	
Having chronic illness									
No	90 (78.9)	24 (21.1)	0.002	97 (85.1)	17 (14.9)	0.001	93 (81.6)	21 (18.4)	0.001
Yes	84 (60.0)	56 (40.0)		92 (65.7)	48 (34.3)		86 (61.4)	54 (38.6)	
To what extent do you worry about COVID-19?									
I am worried about getting infected	155 (68.9)	70 (31.1)	0.876	169 (75.1)	56 (24.9)	0.626	162 (72.0)	63 (28.0)	0.204
I am worried about the increasing number of cases	80 (76.2)	25 (23.8)	0.038	81 (77.1)	24 (22.9)	0.489	80 (76.2)	25 (23.8)	0.124
I am worried my family members will be infected	66 (71.7)	26 (28.3)	0.486	74 (80.4)	18 (19.6)	0.131	68 (73.9)	24 (26.1)	0.446
I am worried of being unable to perform religious activities	7 (53.8)	6 (46.2)	0.389	9 (69.2)	4 (30.8)	0.745	9 (69.2)	4 (30.8)	1.000
I am worried of being unable to unite with family	14 (45.2)	17 (54.8)	0.005	18 (58.1)	13 (41.9)	0.045	19 (61.3)	12 (38.7)	0.324

Appendix 2 Multivariable logistic regression model examining the mental health impact of COVID-19 pandemic in older people (N = 259).

Variables	Sleep Deprivation		Loss of Appetite		Psychosomatic Symptoms	
	Crude OR (95%CI)	aOR (95%CI)	Crude OR (95%CI)	aOR (95% CI)	Crude OR (95%CI)	aOR (95% CI)
Gender						
Female (ref)	1	1	1	1	1	1
Male	0.69 (0.38 to 1.26)	1.20 (0.60 to 2.38)	0.76 (0.403 to 1.42)	1.05 (0.50 to 2.23)	0.61 (0.34 to 1.11)	1.53 (0.78 to 3.01)
Age						
≥70 years old (ref)	1	1	1	1	1	1
<70 years old	1.01 (0.49 to 2.07)	1.50 (0.65 to 3.47)	1.08 (0.51 to 2.30)	1.31 (0.53 to 3.24)	0.99 (0.47 to 2.05)	1.21 (0.53 to 2.77)
Education Background						
College degree (ref)	1	1	1	1	1	1
Non-college degree	0.64 (0.362 to 1.15)	2.28 (1.13 to 4.61)*	0.68 (0.36 to 1.26)	2.50 (1.16 to 5.41)*	0.88 (0.50 to 1.56)	1.45 (0.75 to 2.80)
General Anxiety Category						
Non-anxiety (ref)	1	1	1	1	1	1
With anxiety	5.72 (3.14 to 10.43)*	7.09 (3.57 to 14.08)*	8.27 (4.39 to 15.61)*	10.41 (5.01 to 21.63)*	5.10 (2.80 to 9.29)*	5.27 (2.75 to 10.11)*
Having Chronic Illness	1	1	1	1	1	1
No (ref)						
Yes	0.86 (0.38 to 1.94)	2.75 (1.44 to 5.26)*	2.98 (1.60 to 5.55)*	3.60 (1.72 to 7.55)*	2.78 (1.55 to 4.98)*	2.80 (1.47 to 5.32)*
To what extent do you worry about COVID-19?						
I am afraid of being affected	0.86 (0.38 to 1.94)	0.95 (0.64 to 1.40)	0.74 (0.32 to 1.71)	0.71 (0.45 to 1.12)	0.55 (0.25 to 1.22)	1.20 (0.82 to 1.76)
I am worried about the increasing number of cases	0.53 (0.31 to 0.93)	0.51 (0.17 to 1.53)	0.78 (0.44 to 1.40)	0.34 (0.10 to 1.25)	0.62 (0.35 to 1.09)	0.69 (0.23 to 2.06)
I am worried my family members will be affected	0.40 (0.95 to 0.85)*	0.99 (0.83 to 1.17)	0.90 (0.80 to 1.02)	0.86 (0.70 to 1.06)	0.95 (0.85 to 1.06)	1.00 (0.84 to 1.19)
I am worried of being unable to perform religious activities	1.18 (0.89 to 1.56)	1.14 (0.76 to 1.71)	1.07 (0.79 to 1.45)	0.84 (0.53 to 1.35)	1.02 (0.75 to 1.37)	1.02 (0.67 to 1.56)
I am worried of being unable to unite with my family	1.76 (1.20 to 2.57)*	1.60 (0.86 to 2.98)	1.54 (1.04 to 2.27)*	1.04 (0.51 to 2.11)	1.27 (0.86 to 1.87)	1.18 (0.63 to 2.20)

*p-value < 0.05