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Analysis of factors affecting fear and mental health awareness of coronavirus disease infection

Nursalam Nursalam[1]*, Elsi Dwi Hapsari[2], Setiawan Setiawan[3], Ni Luh Putu Inca Buntari Agustini[4], Diah Priyantini[5], and Khatijah Lim Abdullah[6]

[1] Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

[2] Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia

[3] Faculty of Nursing, Universitas Sumatera Utara, Medan, Indonesia

[4] Magister Program of Nursing, Institute of Technology and Health Bali, Bali, Indonesia

[5] Faculty of Health Sciences, University of Muhammadiyah Surabaya, Surabaya, Indonesia

[6] Departement of Nursing, Sunway University: Bandar Sunway, Selangor, Malaysia

*Correspondence: Nursalam Nursalam. Address: Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia. Email: nursalam@fkp.unair.ac.id

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ABSTRACT

Introduction: Coronavirus disease 2019 (COVID-19) is a global health challenge that persists in causing both health emergencies and mental health crises around the world. This study aimed to analyze the factors contributing to COVID-19 infection and their impact on mental health crises on Java Island.

Methods: A cross-sectional study was conducted between June and July 2020 on Java Island, Indonesia, involving 1,218 respondents selected through convenience sampling. The independent variables included demographic, individual internal, and psychological factors, while the dependent variable was mental health crisis occurrence. Data were collected through demographic information, knowledge and attitude questionnaires, depression anxiety stress scores, the brief-COPE inventory, as well as surveys addressing encountered problems and mental health emergencies. The collected data underwent analysis using chi-square and multivariate logistic regression.

Results: Significance was observed in the relationship between demographic, individual internal, and psychological factors, and their impact on mental health crises ($p < 0.05$). Following adjustment with logistic regression, psychological factors exhibited a more pronounced relationship, with the highest association observed in stress levels ($p = 0.000$, 95% CI: 1.064-2.131).

Conclusions: Individual stress levels emerged as the foremost contributing factor to mental health crises. Psychological elements, encompassing anxiety levels, stress, coping mechanisms, and encountered challenges, played substantial roles in disrupting psychological well-being and mental health.

Keywords: COVID-19, crisis, factors, fear, mental health

Introduction

Coronavirus disease 2019 (COVID-19) remains an ongoing global health challenge, having escalated into a health emergency across the world (WHO, 2020). Its treatment remains elusive and continues to be a subject of research (Hotez, Corry and Bottazzi, 2020; Huang *et al.*, 2020). Consequently, the incidence of COVID-19 cases continues to surge (Wang et al., 2020; Wu et al., 2020). The rapid transmission of the virus has sparked widespread concern (Huang *et al.*, 2020) as people face

increased susceptibility to infection, illness, and even fatality due to this virus (Covaci, 2020). As a result, people start to have a fear of infection (Fofana, 2020) and begin to overprotect themselves to prevent the spread of the virus (Covaci, 2020). Many resort to measures such as frequent hand washing, avoiding social interactions, harboring suspicions about others carrying the virus, and stigmatizing COVID-19 patients and their close contacts (Carroll *et al.*, 2020; Dymecka, Gerymski and Machnik-Czerwik, 2020; Nursalam *et al.*, 2020). The heightened sense of fear and panic during pandemics and epidemics has taken a toll on the mental health of both individuals and communities.

The global tally of COVID-19 cases has steadily climbed day by day (Staden, 2020) since the initial case was identified in Wuhan, China, in December 2019 (Stoecklin *et al.*, 2020). By July 2020, the global COVID-19 case count had reached 16.39 million, with Indonesia contributing 86,521 cases to the total count (Staden, 2020; WHO, 2020). The total number of fatalities reached 651,000, with 65,000 critically ill patients requiring hospitalization (Jung *et al.*, 2020). Java Island holds the highest proportion of COVID-19 cases in Indonesia, accounting for 80% of the nation's total cases (Wahyuhadi *et al.*, 2022). This surge in cases has triggered a range of psychological reactions, spanning from mild to severe (Barzilay *et al.*, 2020; Carroll *et al.*, 2020). Research conducted among 7,143 Chinese students indicated that 75.1% experienced no anxiety symptoms, while 24.9% exhibited mild (21.3%), moderate (2.7%), or severe (0.9%) anxiety symptoms (Cao et al., 2020; Wang, Ma, et al., 2020). Similarly, research in Italy revealed that 31.38% of individuals reported general psychopathological symptoms, 37.19% experienced anxiety, and 27.72% showed signs of post-traumatic stress disorder (Maugeri *et al.*, 2020; Pakenham *et al.*, 2020). These findings underscore the serious nature of psychological responses that demand attention across various sectors in response to COVID-19 (Cao *et al.*, 2020; Pakenham *et al.*, 2020).

Psychological responses within communities exhibit considerable diversity (Barzilay et al., 2020; Dymecka, Gerymski, & Machnik-Czerwik, 2020). While some individuals harbor fears about COVID-19 and consider it a conspiracy (Georgiou, Delfabbro and Balzan, 2020), such misinformation hampers efforts to control virus transmission (Fofana, 2020), including excessive psychosomatic symptoms and repetitive adherence to health protocols (Barzilay *et al.*, 2020; Carroll *et al.*, 2020; Dymecka, Gerymski and Machnik-Czerwik, 2020). Since March 2020, Indonesia's declaration of a national health emergency has intensified the community's apprehension of COVID-19 (Fofana et al., 2020). The substantial caseload and death toll have bred a negative stigma, leading people to shun those at risk of transmitting the virus, including healthcare workers (Efendi *et al.*, 2023). Even deceased COVID-19 patients face rejection due to persistent community belief in their contagion potential (Hotez, Corry and Bottazzi, 2020). Moreover, misleading information from various media sources fosters negative psychological outcomes such as heightened anxiety, culminating in mental health crises and social stigmatization (Covaci, 2020; Dymecka, Gerymski and Machnik-Czerwik, 2020).

Prompt intervention is imperative to address the psychological issues, including mental health crises and

Table 2. Distribution of research variables

Variable	N	%
Age		
Late teenager (17-25 years)	544	44.7
Early adult (26-35 years)	315	25.9
Late adult (36-45 years)	224	18.4
Early elderly (46-55 years)	135	11.1
Gender		
Male	377	31.0
Female	841	69.0
Educational background		
Elementary school	10	0.8
Junior high school	24	2.0
Senior high school	225	18.5
Diploma degree	136	11.2
Bachelor's degree	698	57.3
Master's degree	103	8.5
Doctoral degree	22	1.8
Knowledge		
Less	76	6.2
Moderate	275	22.6
Good	867	71.2
Attitude		
Less	73	6.0
Moderate	276	22.7
Good	869	71.3
Stress level		
Very severe	143	11.7
Severe	128	10.5
Moderate	189	15.5
Mild	103	8.5
Normal	655	53.8
Anxiety level		
Very severe	288	23.6
Severe	144	11.8
Moderate	131	10.8
Mild	117	9.6
Normal	538	44.2
Coping mechanism		
Less	32	2.6
Moderate	280	23.0
High	906	74.4
Problems faced		
Less	150	12.3
Moderate	874	71.8
High	194	15.9
Mental health crisis		
No disorder	933	76.6
Need mental health services	148	12.2
Need counseling	123	10.1
Mental health crisis	14	1.1

stigma, pervasive in Indonesian society, thus preventing more severe repercussions (Nursalam *et al.*, 2020). While physical interventions have been implemented in Indonesia, psychological support has received less attention. Consequently, many individuals grapple with anxiety stemming from misinformation (Dymecka, Gerymski and Machnik-Czerwik, 2020). Given these challenges, a deeper exploration is necessary to ascertain the most suitable psychological interventions to tackle the psychological impacts, mental health crises, and social stigma prevalent within the community. Thus, this study aimed to analyze the contributory factors of COVID-19 in relation to mental health crises on Java Island.

Materials and Methods

Research design and samples

This cross-sectional study was conducted between June and July 2020 on Java Island, Indonesia. The study aimed to include individuals aged 20 to 54 years residing on Java Island. The research sample comprised 1,218 respondents from five provinces on Java Island: Jakarta, West Java, Yogyakarta, Central Java, and East Java. Respondents were selected using convenience sampling techniques through both online and offline media channels. To assess demographic factors, individual internal factors, psychological factors, and community mental health crises, confidential questionnaires were administered to the participants to ensure data privacy and reliability.

Variable and instruments

The study's independent variables encompassed demographic factors, individual internal factors, and psychological factors. Demographic factors included residence location, ethnicity, marital status, income, religion, and health status. Individual internal factors covered age, gender, education level, knowledge, and attitude. Psychological factors encompassed stress levels, anxiety, coping mechanisms, and encountered challenges. The dependent variable was the occurrence of a mental health crisis. The research instruments included a structured questionnaire comprising demographic information, knowledge, and attitude (adopted from Dauda Goni, 2018), the Depression and Anxiety Stress Scale (Lovibond and Lovibond, 1995), the brief-COPE inventory (Carver, 1997), questions about faced challenges (Gilhooly *et al.*, 2007), and mental health crises (Talevi *et al.*, 2020). Utilizing a Likert rating scale with four items, ranging from 1 (strongly disagree) to 4 (strongly agree), the questionnaire encompassed 5-21 questions. Total scores ranged from 0 to 84. The instrument underwent initial validation and reliability testing, yielding Cronbach's α values between 0.875 and 0.995.

Table 3. The relationship between individual internal factors and mental health crisis

Variable	Mental health crisis								p-value
	No Disorder		Need Mental Health Services		Need Counseling		Mental Health Crisis		
	N	%	N	%	N	%	N	%	
Age									
Late teenager (17-25 years)	390	71.7	84	15.4	60	11.0	10	1.8	0.033
Early adult (26-35 years)	253	80.3	32	10.2	28	8.9	2	0.6	
Late adult (36-45 years)	184	82.1	17	7.6	22	9.8	1	0.4	
Early elderly (46-55 years)	106	78.5	15	11.1	13	9.6	1	0.7	
Gender									
Male	298	79.0	40	10.6	34	9.0	5	1.3	0.518
Female	635	75.5	108	12.8	89	10.6	9	1.1	
Educational background									
Elementary school	6	60.0	4	40.0	0	0.0	0	0.0	0.000
Junior high school	12	50.0	3	12.5	9	37.5	0	0.0	
Senior high school	146	64.9	35	15.6	36	16.0	8	3.6	
Diploma degree	119	87.5	13	9.6	4	2.9	0	0.0	
Bachelor's degree	531	76.1	89	12.8	72	10.3	6	0.9	
Master's degree	97	94.2	4	3.9	2	1.9	0	0.0	
Doctoral degree	22	100.0	0	0.0	0	0.0	0	0.0	
Knowledge									
Less	55	72.4	12	15.8	2	2.6	7	9.2	0.000
Moderate	189	68.7	47	17.1	37	13.5	2	0.7	
Good	689	79.5	89	10.3	84	9.7	5	0.6	
Attitude									
Less	56	76.7	10	13.7	2	2.7	5	6.8	0.000
Moderate	201	72.8	25	9.1	43	15.6	7	2.5	
Good	676	77.8	113	13.0	78	9.0	2	0.2	

able 4. The relationship between psychological factors and mental health crisis

Variable	Mental Health Crisis								p-value
	No Disorder		Need Mental Health Services		Need Counseling		Mental Health Crisis		
	N	%	N	%	N	%	N	%	
Stress Level									
Very severe	32	22.4	41	28.7	59	41.3	11	7.7	0.000
Severe	73	57.0	28	21.9	27	21.1	0	0.0	
Moderate	117	61.9	39	20.6	33	17.5	0	0.0	
Mild	77	74.8	22	21.4	2	1.9	2	1.9	
Normal	634	96.8	18	2.7	2	0.3	1	0.2	
Anxiety Level									
Very severe	118	41.0	73	25.3	86	29.9	11	3.8	0.000
Severe	83	57.6	33	22.9	28	19.4	0	0.0	
Moderate	98	74.8	24	18.3	7	5.3	2	1.5	
Mild	113	96.6	3	2.6	1	0.9	0	0.0	
Normal	521	96.8	15	2.8	1	0.2	1	0.2	
Coping Mechanism									
Less	26	81.3	3	9.4	1	3.1	2	6.3	0.000
Moderate	183	65.4	46	16.4	43	15.4	8	2.9	
High	724	79.9	99	10.9	79	8.7	4	0.4	
Problems Faced									
Less	112	74.7	20	13.3	18	12.0	0	0.0	0.000
Moderate	674	77.1	106	12.1	82	9.4	12	1.4	
High	147	75.8	22	11.3	23	11.9	2	1.0	

Data analysis

SPSS version 22.0 was employed for data analysis, employing inferential statistics such as the chi-square test and logistic regression. Descriptive statistics were used to summarize the demographic characteristics of the respondents. Bivariate analysis, utilizing the chi-square test as a nonparametric approach was employed to examine significant relationships between sample characteristics, individual internal factors, psychological factors, and mental health crises. Significant variables were subjected to multivariate logistic regression analysis to identify the most influential factor among all variables. Relationships were presented through odds ratios (OR) alongside 95% confidence intervals (CI), considering a p-value of 0.05 as statistically significant.

Ethical considerations

This study received ethical approval from the Ethics Committee of the Faculty of Nursing, Universitas Airlangga, Indonesia, with certificate number 2038-KEPK. After receiving explanations and research procedure instructions, all respondents voluntarily provided informed consent to participate in the research. The research procedure adhered to the principles outlined in the Declaration of Helsinki for research involving human participants.

Results

Characteristics of respondents and distribution of research variables

The results of the demographic information provided insights into various characteristics of the respondents. A significant portion of the sample, comprising 569 respondents (46.7%), resided in East Java. Furthermore, 895 respondents (73.5%) identified as Javanese, and 1,139 respondents (93.5%) identified as Muslims. Additionally, 813 respondents (66.7%) were unmarried, 376 respondents (30.9%) were students, and 240 respondents (19.7%) were employed as nurses. The

Table 5. Multivariate analysis of the contributing factors to a mental health crisis

Variable	p-value	Odds Ratio (OR)	95% CI	
			Lower	Upper
Age	0.004*	0.912	0.764	1.089
Gender	0.177	1.162	0.784	1.721
Location	0.000*	0.819	0.710	0.944
Marital status	0.000*	0.788	0.509	1.219
Ethnicity	0.933	1.064	0.918	1.232
Religion	0.255	0.878	0.680	1.135
Occupation	0.008*	1.041	0.978	1.108
Educational background	0.000*	1.082	0.895	1.307
Income	0.005*	0.825	0.559	1.217
COVID-19 status	0.974	0.939	0.753	1.170
Knowledge	0.001*	0.578	0.396	0.843
Attitude	0.238	0.494	0.347	0.702
Anxiety level	0.000*	0.756	0.540	1.058
Stress level	0.000*	1.506	1.064	2.131
Coping mechanism	0.000*	0.297	0.177	0.498
Problems faced	0.869	1.131	0.755	1.693

*p < 0.05

majority of respondents (53.5%) reported an income level falling below the regional minimum wage. Concerning health status, 1,122 respondents (92.1%) reported being in good health, while 59 respondents (4.8%) had tested positive for COVID-19 (Table 1).

Table 2 illustrates the variables related to individual internal factors, encompassing age, gender, education level, knowledge, and attitude. It also presents psychological factor variables, including stress levels, anxiety levels, coping mechanisms, and challenges faced by the respondents. The results reveal that the majority of respondents were female (69.0%). Among them, 544 respondents (44.7%) fell within the age range of 17 to 25 years, and 698 respondents (57.3%) held a bachelor's degree. In terms of knowledge, 867 respondents (71.2%) demonstrated good knowledge levels, while regarding attitude 869 respondents (71.3%) displayed positive attitudes. The assessment of stress levels indicated that the majority of respondents experienced normal stress levels, with 143 respondents (11.7%) reporting high stress levels. Regarding anxiety, 538 respondents (44.2%) exhibited normal levels, while 288 respondents (23.6%) experienced high levels of anxiety. Moreover, a significant proportion of respondents (906, 74.4%) displayed strong coping abilities, with 874 of them (71.8%) encountering moderate challenges. Finally, 23.4% of the respondents reported experiencing a mental health crisis, necessitating counseling services.

Factors influencing relationships with mental health crisis

The analysis of individual internal factors revealed a significant relationship between age, education level, knowledge, and attitude, and the occurrence of mental health crises ($p < 0.05$). Notably, late teenagers exhibited the highest incidence rate of mental health issues, with 15.4% requiring mental health services, 11.0% seeking counseling, and 1.8% experiencing mental health crises. Furthermore, gender emerged as a factor linked to heightened mental health challenges among women. Additionally, a higher education level was associated with a greater likelihood of mental health problems. Conversely, lower levels of knowledge and less positive attitudes were also found to potentially contribute to mental health issues (Table 3).

Psychological factors were demonstrated to be significant contributors to mental health issues. As indicated in Table 4, individuals exhibiting high levels of stress, elevated anxiety, and limited coping abilities, especially when confronted with substantial challenges, displayed more pronounced mental health crises. Notably, individuals with very severe stress levels (7.7%) and inadequate coping mechanisms (6.3%) reported the highest prevalence of mental health crises.

Multivariate analysis was conducted using logistic regression with a 95% CI. The factor exhibiting the strongest association with mental health crises was stress level ($p = 0.000$; 95% CI: 1.064-2.131). This outcome highlights that the relationship between stress levels and mental health crises was threefold higher or more significant than other variables (Table 5).

Discussions

Psychological factors, particularly individual stress levels, have been strongly associated with mental health crises (Wu et al., 2020). The findings indicated a prevalence of severe and very severe stress levels due to the COVID-19 pandemic. This aligns with research conducted in the US, Israel, and several other countries, which consistently reported elevated stress levels globally. The identified stressors within the community encompassed fear of infection, COVID-19-related fatalities, community-level discomforts such as mask-wearing and social distancing, interpersonal suspicion and distancing, familial exposure to the virus, asymptomatic carriers unknowingly transmitting the virus, and economic hardships resulting in financial strain (Barzilay *et al.*, 2020; Carroll *et al.*, 2020). Incorrect information and misconceptions emerged as a common underlying factor, reflecting a broader trend observed by Georgiou, Delfabbro and Balzan (2020), who highlighted the prevalence of conspiracy theories that discredited COVID-19. This misinformation contributed to a surge in cases, as evidenced by studies such as Qiu et al. (2020). The impact on health workers was also evident, with a significant proportion displaying moderate to severe stress responses in the face of public reluctance to participate in prevention efforts (WHO, 2020).

Demographic factors also played a pivotal role in the onset of mental health crises. The situational context of specific locations influenced individual behavior (Giallonardo *et al.*, 2020). Self-quarantine and social restrictions further amplified fear (Dymecka, Gerymski and Machnik-Czerwik, 2020). Notably, regions with higher COVID-19 caseloads and more rigorous social distancing measures reported a higher prevalence of mental health crises. The pandemic's economic and educational disruptions rendered students and entrepreneurs particularly vulnerable to heightened stress levels and the need for counseling (Bonaccorsi et al., 2020; König, Jäger-Biela and Glutsch, 2020). Comparable trends were noted in China, where students

encountered graduation delays and employment challenges due to digital adaptation limitations (Fernandes, 2020; König, Jäger-biela and Glutsch, 2020). Entrepreneurs faced financial crises as their businesses dwindled, except for those offering essential pandemic-related goods (Ashraf, 2020; Bonaccorsi *et al.*, 2020). A decrease in community income due to pandemic-related unemployment and remote work contributed to employee burnout and subsequent mental health crises (Zar *et al.*, 2020).

Among individual internal factors, age, education level, knowledge, and attitude emerged as influential in the onset of mental health crises (Nursalam *et al.*, 2020). Education played a critical role, with higher education levels often associated with better health literacy, contrasting those subscribing to COVID-19 conspiracy theories (Boulle *et al.*, 2020; Nepomuceno *et al.*, 2020). Education level also plays an important role. People with higher education levels tend to be easier to receive health education than people who considered COVID-19 as a conspiracy theory (Georgiou, Delfabbro and Balzan, 2020; Nepomuceno *et al.*, 2020). Challenges arose for those with limited awareness who hesitated to contribute to transmission prevention efforts (Nursalam *et al.*, 2020). Furthermore, the community exhibited varying knowledge and attitudes, ranging from strict adherence to health protocols to nonchalance, necessitating tailored interventions (Wang, Di et al., 2020; Williamson et al., 2020; C. Wu et al., 2020).

Social psychology emerged as pivotal in managing mental health challenges. The proliferation of misinformation triggered heightened anxiety and fear (Boulle et al., 2020; Dymecka, Gerymski and Machnik-Czerwik, 2020), resulting in stigmatization of COVID-19 patients and their families. This extended to health workers who were often barred from returning home (Bagcchi, 2020; Ramaci, Barattucci and Ledda, 2020). While healthcare professionals demonstrated adaptive coping strategies, the loss of family members due to COVID-19 and strict burial procedures induced significant grief among the broader community (Benussi *et al.*, 2020). Psychosomatic symptoms and health-related anxieties further exacerbated the situation. These psychological concerns are central to understanding mental health crises, warranting prompt attention and resolution.

This study does possess limitations, chiefly in relation to external or environmental factors that could precipitate mental health crises. The use of convenience sampling may have compromised the representativeness of the national sample. Moreover, the study was conducted during the peak crisis period of the COVID-19 pandemic, before transitioning into a more normalized phase in the later months of the year. Consequently, psychological and mental health issues may have evolved as the pandemic persisted. Nevertheless, the study's strength lies in its robust methodology and the use of valid and reliable instruments in accordance with established standards. The study's findings can serve as a valuable supplementary resource concerning factors contributing significantly to mental health crises.

Conclusions

Individual stress levels were identified as the most influential factor contributing to mental health crises. Among the primary contributors disturbing psychological well-being and mental health are psychological factors, encompassing levels of anxiety, stress, coping mechanisms, and challenges faced. These elements played pivotal roles in disrupting psychological equilibrium and mental well-being. Consequently, psychological interventions are imperative for effectively addressing these concerns.

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Conflict of interest

We declare that there is no conflict of interest in this study.

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