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# THE CORRELATION BETWEEN COVID-19 KNOWLEDGE AND COMMUNITY ANXIETY AND DEPRESSION IN INDONESIA'S RED ZONE DURING THE PANDEMIC

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## ABSTRAK

**Abstract:**
The rapid spread of Covid-19 has impacted physical and psychological well-being globally, including in Indonesia. Anxiety and depression are prevalent psychological challenges during the pandemic. This study aimed to assess the relationship between Covid-19 knowledge and psychological outcomes—anxiety and depression—among residents in Indonesia's high-risk "red zones." A cross-sectional design was employed, involving 394 respondents who met inclusion criteria, selected through convenience sampling. Data were collected using online surveys incorporating the Knowledge, Attitude, and Practice (KAP), GAD-7, and PHQ-9 questionnaires. Results indicated that 84.5% of respondents had good knowledge of Covid-19. However, 35.3% and 27.9% reported depression and anxiety, respectively. Spearman correlation analysis found no significant relationship between Covid-19 knowledge and either anxiety ($p = 0.311$) or depression ($p = 0.356$). These findings suggest that while knowledge levels were high, psychological issues persisted, highlighting a gap in addressing mental health during the pandemic. This study underscores the need for targeted interventions to mitigate the psychological impact of Covid-19 in high-risk communities.

***Abstrak*:**
*Penyebaran Covid-19 yang cepat berdampak pada kesehatan fisik dan psikologis secara global, termasuk di Indonesia. Kecemasan dan depresi menjadi tantangan psikologis yang umum selama pandemi. Penelitian ini bertujuan mengevaluasi hubungan antara pengetahuan tentang Covid-19 dan dampak psikologis, yaitu kecemasan dan depresi, pada warga di zona merah berisiko tinggi di Indonesia. Penelitian menggunakan desain cross sectional dengan melibatkan 394 responden yang memenuhi kriteria inklusi, dipilih melalui convenience sampling. Data dikumpulkan melalui survei daring menggunakan kuesioner Knowledge, Attitude, and Practice (KAP), GAD-7, dan PHQ-9. Hasil menunjukkan 84,5% responden memiliki pengetahuan yang baik tentang Covid-19. Namun, 35,3% dan 27,9% melaporkan mengalami depresi dan kecemasan. Analisis korelasi Spearman menunjukkan tidak ada hubungan signifikan antara pengetahuan Covid-19 dan kecemasan ($p = 0,311$) maupun depresi ($p = 0,356$). Temuan ini menunjukkan bahwa meskipun tingkat pengetahuan tinggi, masalah psikologis tetap ada, mengindikasikan perlunya perhatian terhadap kesehatan mental selama pandemi. Studi ini menyoroti pentingnya intervensi yang ditargetkan untuk mengurangi dampak psikologis Covid-19 di komunitas berisiko tinggi.*



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## INTRODUCTION

The world is currently facing an outbreak of a disease caused by the Covid-19 virus (Corona virus disease-2019). This virus began spreading in December 2019 in Wuhan, Hubei Province, China and quickly spread across the globe. By September 2020, there were 30.7 million confirmed cases worldwide, with a death toll of 955,000 [1].

In Indonesia, the situation was equally severe, with 240,687 confirmed cases and 9,448 deaths as of September 19, 2020 [2]. The rapid spread of the virus prompted the central and regional governments to implement strict measures, including school closures and restrictions on gatherings, to minimize transmission. These measures encouraged people to work, study, and practice religion from home, leading to economic slowdowns and disruptions in education [3].

The Indonesian government implemented a color-coded zone system to classify regions based on their risk of COVID-19 transmission: red zones (high risk), orange (medium), yellow (low), and green (no cases) [4]. By September 2020, 11.28% of districts were classified as red zones, directly linking these areas to heightened public health and psychological risks [2].

The psychological impact of the pandemic has been significant, with anxiety and depression affecting many individuals. Research by Suwandi et al. (2020) revealed that 70% of teenagers in Balikpapan experienced mild anxiety, characterized by fears such as death, infection, lack of medicine, or job loss [5]. These fears can escalate into more severe forms of anxiety, impacting behavior through symptoms like social withdrawal, difficulty concentrating, eating disorders, irritability, and sleep disturbances. People living in "red zones"—areas with a high risk of Covid-19 transmission—are particularly vulnerable to these effects. According to Salari et al. (2020), the prevalence of stress was 29.6%, and anxiety was 31.9% globally [6]. A survey by the Association of Indonesian Mental Medicine Specialists (PDSKJI) found that 63% of respondents reported anxiety and 66% reported depression due to the pandemic [6].

The psychological impact of the pandemic has spread to various countries besides Indonesia. Wang et al. (2020) reported that 53.8% of Chinese individuals experienced severe mental disorders, with 28.8% suffering from anxiety disorders [7]. In Spain, Merino et al. (2020) noted that fears of economic losses increased stress and anxiety [8]. In Bangladesh, Islam et al. (2020) found that 87.7% of students experienced mild to severe anxiety due to the threat of infection [9]. These findings highlight the varying degrees of anxiety—mild, moderate, and severe—that have emerged during the pandemic. Additionally, research indicates that insufficient knowledge about Covid-19 contributes to anxiety and depression. Natalia et al. (2020) found that adolescents in Lembang had only moderate knowledge of the virus [10], underscoring the importance of accurate information in mitigating psychological distress.

Given these findings, it is crucial to investigate the correlation between knowledge levels and the prevalence of anxiety and depression in red zone areas of Indonesia. This study aims to explore this relationship, providing valuable insights into how knowledge influences mental health during pandemics. By contributing to the understanding of psychological impacts, this research can inform public health strategies and interventions to address mental health challenges effectively. Ultimately, the findings will help policymakers and healthcare providers develop better approaches to mitigate psychological issues during the ongoing and future pandemics.

## RESEARCH METHOD

This quantitative research employed an analytical observational approach using a cross-sectional design. The study aimed

to examine the association between Covid-19 knowledge and the prevalence of anxiety and depression in Indonesia's red zone areas. People who resided in the red zone during the Covid-19 pandemic were the subjects of this investigation. The research sample was chosen based on the following criteria: age > 18 years, the residents of the red zone for more than one month, willingness to participate in the study, and ability to utilize internet media. If a community member had been diagnosed with severe depression or anxiety, they would be excluded. To ensure participants met the inclusion criteria, the researchers incorporated a screening section within the Google Form. This section included questions to verify eligibility, such as age, residency in a red zone, and duration of stay. Red zones were identified based on official government data and public health announcements during the study period, and participants were informed about these classifications through clear instructions in the questionnaire. Respondents self-reported their residency status, which was then cross-referenced with available demographic and geographical data to confirm eligibility and ensure accuracy. Only those who met all criteria could proceed to complete the full questionnaire.

A minimum of 84 participants was required based on sample size calculation. The study, conducted from March to June 2021 in a Covid Red Zone, used convenience sampling due to limited direct access. Online distribution via Google Forms provided a practical solution to physical limitations, enabled time and cost efficiency during the short study period, and leveraged assumed internet access in red zones to reach respondents through available technology.

The independent variable in this study was the level of knowledge about Covid-19, while the dependent variable was the occurrence of depression and anxiety in the population, as well as the other variables such as age, gender, education level, and type of work.

The researchers employed validated existing instruments for data collection. A KAP questionnaire about Covid-19 understanding was employed as the study tool. This questionnaire has 18 statements about definitions, symptoms, risk categories, transmission modalities, and prevention methods. The respondents were invited to complete a questionnaire with “Yes”, “No”, or “Don't know” answers. The scoring system employed a scoring system in which the correct answer receives a 1 and the incorrect response receives a 0. The PHQ9 is a screening tool for depression. A score 0-4 indicates normal condition, 5-9 indicates mild depression, 10-14 indicates severe depression, and 15-27 indicates significant depression. Anxiety was measured using the GAD-7 tool. GAD-7 is a set of seven anxiety symptoms. These tools have established validity and reliability based on previous research. A pilot test was conducted to ensure the clarity and appropriateness of the items before the main study. The respondents were requested to complete a questionnaire on the topic. The respondents were asked to complete an anxiety symptoms questionnaire with answers of “none at all”, “barely a few days”, “more than a week”, or “every day”. According to the GAD-7, a score of 0-4 = normal/not anxious, 5-9 = mild anxiety, 10-14 = moderate anxiety, and 15 or more = severe anxiety. The instrument used to access the respondents was a google form which was preceded by the completion of an informed consent form.

To ensure the validity of the findings, a comprehensive statistical analysis was conducted. Data normality was assessed using the Shapiro-Wilk or Kolmogorov-Smirnov test, guiding the choice between parametric and non-parametric tests. Parametric tests (e.g., Pearson’s correlation, t-tests) were used for normally distributed data, while non-parametric tests

(e.g., Spearman's correlation, Mann-Whitney U) were applied for non-normal data. Descriptive statistics summarized both continuous and categorical variables, ensuring the analytical approach aligned with the study objectives.

## RESULT

The study's findings yielded 576 respondents who completed the questionnaire. After that, screening was performed on the 576 respondents based on the inclusion and exclusion criteria, yielding 394 respondents who met the inclusion criteria.

Table 1 shows the gender distribution of research respondents was primarily female, with 239 female respondents (60.7%). The most recent-educated respondents were high school graduates, accounting for 218 people (55.3%). According to occupation, most respondents (237 in total) were still students or college students (60.2 %).

**Table 1.**
**The characteristics of research respondents' demography**

| Variables | Frequency n=394 | % |
|---|---|---|
| Age | | |
| 18-20 years | 110 | 27.9 |
| 21-30 years | 166 | 42.1 |
| 31-40 years | 31 | 7.9 |
| 41-50 years | 60 | 15.2 |
| 51-60 years | 25 | 6.3 |
| >60 years | 2 | 0.5 |
| Sex | | |
| Male | 155 | 39.3 |
| Female | 239 | 60.7 |
| Occupation | | |
| Student | 237 | 60.2 |
| Civil worker | 55 | 14 |
| Private worker | 62 | 15.7 |
| Self employed | 6 | 1.5 |
| Others | 34 | 8.6 |
| Education | | |
| Senior high school | 218 | 55.3 |
| Diploma | 7 | 1.8 |
| Bachelor | 114 | 28.9 |
| Master | 52 | 13.2 |
| Doctor | 3 | 0.8 |

Table 2 shows that most respondents, or 333 people, have a high degree of knowledge (84.5%). The findings of the anxiety and depression assessment showed that 110 people (27.9%) had anxiety and that the majority of those who had anxiety had a mild level of anxiety, with a total of 75 people (19%). There were 139 respondents (35.2%) who had depression, with the majority having mild depression (91 respondents or 23.1%). Anxiety was present in 27.9% of the population, whereas depression was present in 35.3% as shown in Table 3.

**Table 2.**
**The level of respondents' knowledge**

| Variable | Categories | Frequency n=394 | % |
|---|---|---|---|
| Level of Knowledge | Good | 333 | 84.5 |
| | Average | 53 | 13.5 |
| | Poor | 8 | 2.0 |

**Table 3.**
**Prevalence of anxiety and depression**

| | Categories | Frequency | % |
|---|---|---|---|
| Anxiety | Mild | 75 | 19 |
| | Moderate | 30 | 7.6 |
| | Severe | 5 | 1.3 |
| Depression | Mild | 91 | 23.1 |
| | Moderate | 25 | 6.3 |
| | Severe | 23 | 5.8 |

The p-value was 0.311, which was > 0.05, indicating no significant correlation between the level of knowledge and the incidence of anxiety in people living in the red zone, according to the results of the Spearman correlation test (Table 4). Similarly, the results of the Spearman analysis of the relationship between Covid-19 knowledge and the incidence of depression in the red zone area yielded a p-value of 0.356, indicating no significant correlation. As p-value > 0.05, it can also be concluded that there was no significant correlation. The correlation coefficient for the link between the level of knowledge

and the incidence of anxiety was -0.051, while the correlation coefficient for the relationship between the level of knowledge and the incidence of depression was -0.047. It indicated that the greater the person's knowledge is, the lower the person's anxiety and depression levels in the community will be.

**Table 4.**
**Association between level of knowledge and the occurrence of anxiety and depression**

| Level of knowledge | Normal | Mild | Moderate | Severe | P (Correlation coefficient) |
|---|---|---|---|---|---|
| Anxiety | | | | | |
| Good | 237 | 65 | 28 | 3 | 0.311 (-0.051) |
| Moderate | 39 | 10 | 2 | 2 | |
| Less | 8 | 0 | 0 | 0 | |
| Depression | | | | | |
| Good | 212 | 81 | 21 | 19 | 0.356 (-0.047) |
| Moderate | 35 | 10 | 4 | 14 | |
| Less | 8 | 0 | 0 | 0 | |

## DISCUSSION

The study's results on the level of knowledge of the people in the red zone area demonstrated a high level of knowledge among the majority of the responders, which was 333 people (84.5%). It aligns with research conducted by Geralyn Regina Suwandi and Evelin Malinti (2020), revealing that 76.7% of teenagers at Balikpapan Adventist High School had good knowledge about Covid-19 (5). Research in China by Lin et al. (2020) also demonstrated that most Chinese people had a good level of knowledge about Covid-19, with an average knowledge score of 20.3 out of a total score of 23 [14]. Knowledge is the outcome of knowing something through the sensory analysis of a specific object. Human senses, specifically the senses of hearing, sight, smell, sensation, and touch, are used in sensory processes. Knowledge is influenced by various factors, including age, gender, education, occupation and living environment. Evidence demonstrated that people's attitudes and knowledge about diseases significantly influenced their behaviours and prevented the spread of disease during an outbreak [15].

According to research on the incidence of public anxiety in the red zone area, it revealed that 284 people (72.1%) did not experience anxiety, and 110 people (27.9%) experienced anxiety, with the highest frequency of respondents who experienced mild anxiety of 75 people (19%). It aligns with the research of Celine Augla D'prinzessin (2021) entitled "The Relationship of Knowledge Levels about Covid-19 to Stress and Anxiety Levels in Pharmacy Students of the University of North Sumatra Class of 2017". In his research, it was found that most of the respondents experienced mild anxiety, which was 67.3% [16]. Another study conducted by Sogut et al. (2020) on midwifery students in Turkey also stated that most respondents had mild anxiety levels, 94.4% [17].

Based on the research on "The Relationship of Knowledge Levels about Covid-19 with Community Anxiety Incidences in the Red Zone of Indonesia", the results demonstrated that among respondents who experienced anxiety, respondents with a good level of knowledge mostly experienced mild anxiety, which was 65 people (16.5% ). However, 3 people (0.8%) who experienced severe anxiety also had good knowledge. Meanwhile, respondents with a low knowledge level (8 people) did not experience anxiety. It indicated no correlation between knowledge level and the prevalence of anxiety among residents of the red zone area. The correlation analysis findings also indicated no correlation between residents of the red zone's knowledge level and the prevalence of anxiety.

It aligns with the research of Gheralyn Regina Suwandi and Evelin Malinti (2020), which claimed there was no correlation between class XII students at Balikpapan Adventist High School's level of knowledge and their level of anxiety

regarding Covid-19 [5]. The research of Lin et al. (2020) in China also showed that the level of knowledge about COVID-19 did not significantly affect the level of anxiety [14]. However, this study's findings contradict those of Yulianti et al. (2021), who found a correlation between students' knowledge and anxiety levels at the Pancasila Islamic Boarding School in Bengkulu City [12]. It is influenced by the fact that, in addition to knowledge, anxiety can be influenced by various factors. As previously discussed, anxiety can also be influenced by age, gender, education, occupation and living environment. Most of the respondents in this study had a fairly high level of education, namely SMA/SLTA/SMK and a bachelor's degree; thus, their ability to think rationally is better, more careful, and wiser in making decisions [18].

In addition, the increase in knowledge comes from the information received by a person. Newly acquired information will be helpful if it goes through a process based on knowledge, awareness, and attitude. However, if the information is not supported by knowledge and awareness, it may result in misunderstanding that causes fear and concern or heightens anxiety [19].

Based on the research by Gheralyn Regina Suwandi and Evelin Malinti (2020), one factor that also affects anxiety is the environment. A conducive environment, guidelines for preventing the spread of Covid-19 issued by the government and education provided can reduce the anxiety experienced by a community. Lack of information can increase anxiety if it does not go along with a supportive environment [20].

The research conducted by Celine Augla D'prinzessin (2021) also stated that the lack of interpersonal communication and the above factors increase public anxiety. The lack of interpersonal communication and the rift in social relations due to restrictions imposed by the government can exacerbate the symptoms of anxiety experienced by the community [21].

The study demonstrated that most of the respondents were in normal condition, as many as 255 respondents (64.7%). Meanwhile, respondents who experienced depression were 139 people (35.2%) who were grouped based on their level of depression, namely mild depression as many as 91 respondents (23.1%), moderate depression as many as 25 respondents (6.3%), and severe depression as many as 23 respondents (5.8%).

A study by Al-shannaq et al. (2021) investigating depression, coping skills, and quality of life of adults in Jordan during the Covid-19 pandemic, using the BDI-II questionnaire, revealed the same results as this study. The study consisted of 511 respondents experiencing minimal/normal depression of 179 people (35%), mild depression of 169 people (33%), moderate depression of 97 people (19%) and major depression of 66 people (13%) [22].

In Namora (2016), it is explained that depression is a mental disorder that often occurs in society and begins with stress difficult to handle so that it continues to become depression. According to Rathus (1991) in Namora (2016), depressed people usually experience emotional, motivational, functional, cognitive, and behavioral disturbances. Meanwhile, according to Atkinson (in Namora, 2016), depression is described as a mood disorder with the following characteristics: hopelessness and heartbroken, helplessness, inability to make decisions and concentrate, having no enthusiasm for life, always being tense, and even up to attempt suicide [23].

The results showed that most respondents had a good level of knowledge and included as many as 212 (53.5%) respondents in the normal category. This finding also showed that out of 333 people who had good knowledge, 81 (20.6%) respondents experienced mild depression, 21 (5.3%) experienced moderate depression, and 19 (4.8%) experienced severe depression. Meanwhile, of the 53

people with sufficient knowledge, 10 (2.5%) experienced mild depression, 4 (1.0%) experienced moderate depression, and (4.8%) experienced severe depression.

This study aligns with the findings of Suwistianisa et al. (2015), revealing no association between knowledge level and the prevalence of depression [24]. However, this study differs from that of Ariasti and Sutrisno (2016), who found a strong relationship between residents of Majasto Tawangsari Village in Sukoharjo's level of knowledge about the aging process and their level of depression [25].

According to Rahmawati (2021), the level of knowledge is related to the incidence of depression. Better knowledge can improve coping mechanisms, and wider knowledge can help control individual emotions and solve problems properly, thereby preventing stress or depression [26]. In this study, there was no correlation between the level of knowledge about Covid-19 and the incidence of depression, as several aspects, including a person's age, gender, educational level, occupation, and place of living, might contribute to depression [27].

Some of the factors that influence the incidence of depression include 1). A place to live, where people who live in urban areas have a higher potential for depression, due to psychological pressure caused by the Covid-19 pandemic, such as fear of being infected with Covid-19, fear of not being able to meet the need for masks, and fear of not being able to work outside the home. 2). Employment status, where individuals who worked as medical personnel or lost their jobs or experienced a decrease in income due to the Covid-19 pandemic can increase the incidence of depression. 3). Marital status can also affect depression during the Covid-19 pandemic, where single individuals spend more time with gadgets and social media than married couples or those busy with their work. It affects the incidence of depression when the information accessed on social media is excessive and inaccurate [28]. 4). Furthermore, age also affects the incidence of depression, where ages 18-35 years show more symptoms of depression than older ones. Depression in adolescents is related to the implementation of social isolation, which allows teenagers to be addicted to the internet, social media, and games. This condition can result in poor sleep quality, leading to anxiety and depression. 5). The fifth aspects is gender. In this case, women are more likely to experience depression than men as they are more sensitive to psychological problems and mental health, according to Lempang et al [29].

This study offers a novel contribution by exploring the correlation between Covid-19 knowledge and anxiety /depression prevalence in red zone areas, yet it has limitations. The cross-sectional design restricts causal inference, while uncontrolled confounding variables may have affected results. Self-reported data, particularly Likert-scale responses, could introduce biases like social desirability or misinterpretation, and online data collection might exclude those without internet access, impacting sample representativeness. Thus, findings may not fully capture anxiety and depression prevalence. Future research should adopt more robust methods, such as in-person assessments, to improve validity and generalizability.

## CONCLUSION

Based on the study results on the correlation between covid-19 knowledge and the prevalence of anxiety and depression in Indonesia's red zone, it can be concluded that covid-19 knowledge and the incidence of anxiety and depression in the red zone did not significantly correlate. The correlation between community anxiety and depression and Covid-19 knowledge was tenuous, with the direction of the association pointing in the opposite direction, suggesting that community anxiety and depression will decrease as knowledge increases.

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