

Suicide trends during COVID-19 pandemic in Gunungkidul, Indonesia

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ABSTRACT The COVID-19 pandemic had a tremendous impact on psychological burdens and may lead to suicide acts. Suicide is a global mental health problem that happens all over the world. This study was conducted to evaluate the effect of the COVID-19 pandemic on the suicide rates and estimate the category of male-female suicides. This study analyzed suicide data from the Gunungkidul Resort Police from April 2018 to April 2021. Gunungkidul Regency is one area in Indonesia with a high suicide rate. From that time of period, there were about 97 suicide cases as the sample of this study. This article estimated the suicide trend using time series forecasting and Chi-square tests to find potential differences before and after the outbreak. Chi-square analysis showed that there was no difference in the pattern of suicide before and since the COVID-19 pandemic ($X^2 = 12.05$; $p > 0.05$), as well as the male rates ($X^2 = 20.17$; $p > 0.05$). However, suicide among females has increased since the outbreak ($X^2 = 23.43$; $p < 0.05$), especially among the elderly. This article recommended providing a support system, strengthening social networks, and widening the access of women and the elderly to health and psychological services during the pandemic.

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1. Introduction

Suicide is a complex phenomenon with various psychosocial dynamics accompanied by experiences of isolation, depression, anxiety, and socio-economic pressures. Suicide has become a global health problem and has experienced a 60% increase in prevalence over the last 45 years. The World Health Organization (WHO) estimates that the prevalence of suicide in Indonesia reaches 3.7%, with a mortality rate of more than 8,900 people every year.¹ Indonesia does not have comprehensive suicide reports, and few areas show these statistics; data about suicide is based solely on police reports.^{2,3} The absence of a national suicide registry system makes incidents go unreported and the reporting is considered only superficial.

COVID-19 has become a global pandemic since March 2020, which has had a tremendous impact on health care systems and massively exacerbated mental health problems.⁴ Systematic review has shown that the COVID-19 pandemic has a close relationship with the onset of psychological distress that can lead to mental disorders and pose a threat to the psychological well-being of society.⁵ This increase in psychological problems can be associated with increased anxiety about contracting and being infected with the plague, job loss, increased family burden, domestic violence, social isolation, and the development of psychological distress.⁶ Mental health problems that are not handled properly can have fatal effects such as depression, traumatic experiences, decreased well-being and quality of life, any of which can encourage suicidal ideation.

The COVID-19 pandemic was expected to lead to some unanticipated increases in the prevalence of suicide, even after this pandemic ends.^{7,8} Mental

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health issues and suicide are getting less attention during the COVID-19 pandemic. This pandemic has increased the population of vulnerable groups and multiplied their bitter burden. Restricted mobility through work/school from home and stay-at-home policies make people with mental health crises increasingly isolated and disconnected from physical sources of support.⁹ The pandemic has also widened the treatment gap; more people are not getting the necessary professional treatment and care and there are strict restrictions on mental health services.¹⁰

The previous studies have shown a tendency to increase the prevalence of suicide due to prolonged macro crises, such as the uncertainty of political-security, economic recession, and war conflicts.¹¹⁻¹³ However, this situation has varying effects in different countries. Pandemics and health emergencies are reported to have contributed to the increase in the incidence of suicide, such as past experiences when SARS, Influenza, and Ebola outbreaks became pandemics/endemics in several countries.¹⁴ COVID-19 pandemic has also been reported to increase suicide rates among women and young people in Japan, black people, and minorities in the United States.^{15,16} In this regard, the impact of the health crisis and pandemics on increasing suicide rates can be understood as a manifestation of psychosocial, health distress and inequality experienced by society. Some parties in Indonesia provide a suicide prevention helpline, such as www.intothelightid.org or movementofrecovery.org, to help people who have suicidal thoughts, depression, and anxiety overcome their mental health problems.

This study covers only suicide cases in Gunungkidul Regency by considering the high number of suicides and the characteristics of local beliefs among the locals. Gunungkidul is one of the areas with a high suicide rate in Indonesia, with an incidence rate of up to 4.3 percent over the last 10 years.^{2,3,17} This high suicide incidence is also steeped in local beliefs about *pulung gantung* as the mystical cause of suicide.^{18,19} There are also accusations about socio-economic pressures, social isolation, and drought as the leading causes of the high number of suicides in Gunungkidul.^{20,21} Andari (2017) analyzed data from the Gunungkidul police resort and

suspected mental health problems as a significant contributor to suicide (52%).

So far, there have been no studies or reports evaluating the impact of the COVID-19 pandemic on the increase in suicide cases in Indonesia, both at the local and national levels. Along with some mobility restriction policies by the authorities and the spread of delta variants, the second wave became very severe.²² This study aimed to see the impact of the pandemic on the trends of suicide. This study was conducted to evaluate whether the COVID-19 pandemic affected the rate of suicide incidents by comparing the incidence rates before the pandemic. This report is expected to provide an overview of how to strengthen the community's mental health in the context of the COVID-19 pandemic.

2. Method

This research was conducted using a quantitative approach by analyzing secondary data concerning suicide. This study is limited to the trend of suicide cases in Gunungkidul Regency by analyzing suicide data from the local resort police. The data were collected from the official police reports of Gunungkidul from 18 districts (more or less 144 villages). A total of 97 suicide incidents have occurred from April 2018 to April 2021 (see Figure 1).

This study estimates the possible effect of the COVID-19 pandemic on suicide rates using time series forecasting and chi-square analysis. Descriptive quantitative analysis was also applied to compare the percentage of incidents based on existing demographic factors and to see the trend of incident patterns before and during the pandemic. Time series forecasting analysis was used to predict the number of suicide incidents from April 2018 to March 2020. These 24-month data were used to predict suicide incidents since COVID-19 in Gunungkidul in April 2020 to April 2021. Chi-square analysis was used to compare expected numbers and observed numbers at the intersection of the pandemic period. The pandemic period started from April 2020 to April 2021 as observed numbers, while data from April 2018 to March 2020 were calculated as a predictive value using time series forecasting analysis. This prediction produced the expected numbers from

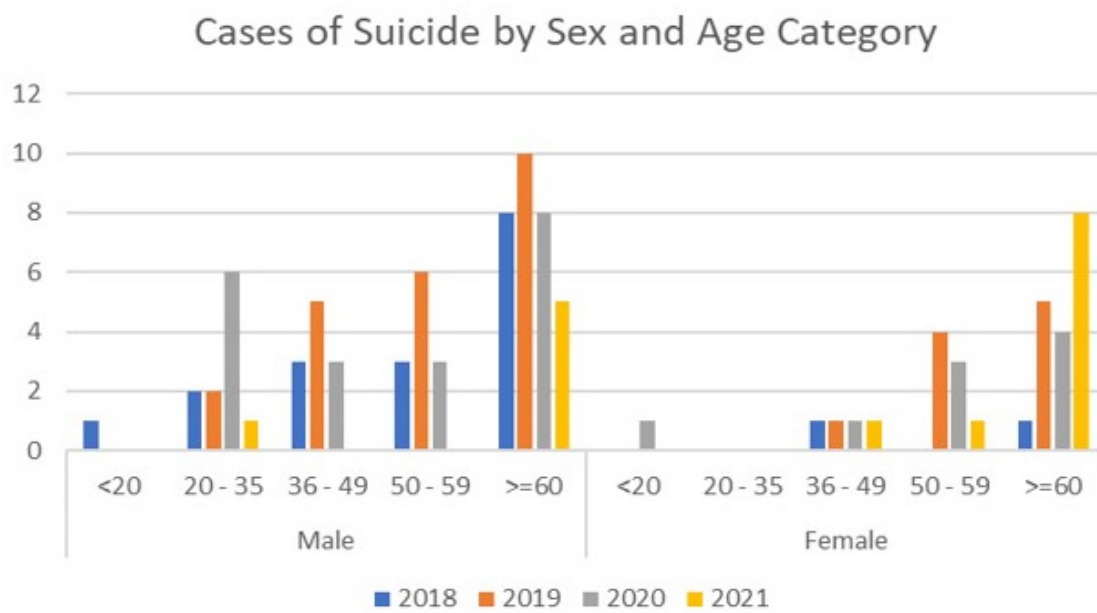


Figure 1. Cases of suicide by sex and age category.

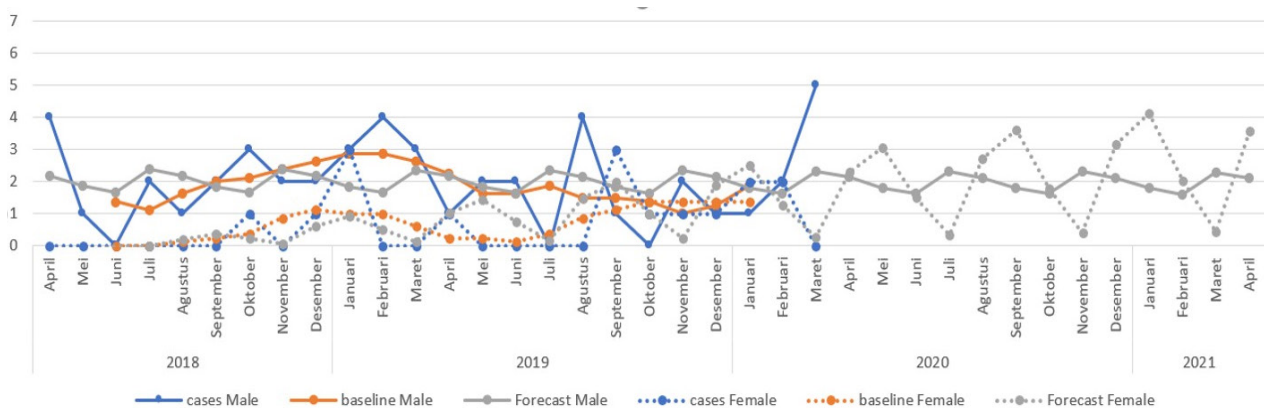


Figure 2. Time series forecasting on suicide cases based on sex.

April 2020 to April 2021. This calculation was done using the Moving Average model. Time series forecasting and chi-square analysis were calculated using the Microsoft Excel program.

Calculations were made on the overall data: both, male and female category data. To generate predictive values from April 2020 to April 2021, the analysis was done by calculating the Moving Average data with a 4-month pattern, namely the average data in month 1 (April 2018) to month 4 (July 2018), and so on. Then the baseline (Centered Moving

Average) was compiled by calculating the average of the results of the first MA(4) data and the second MA(4) data and so on, and counting cases by dividing them into baselines. Furthermore, deseasonalized data were calculated by dividing the case data by the seasonality value. The regression coefficient was formulated based on the trend component. In this case, the forecast value was obtained by multiplying the seasonality value with the trend component. The potential difference between the observed and expected numbers is seen after getting the predicted

values from April 2020 to April 2021.

3. Result

There were 97 cases of suicide from April 2018 to April 2021. During those 37 months, 66 cases (68.04%) were committed by men (M = 57.33 years old, standard deviation [SD] = 20.91) and 31 cases (31.96%) by women (M = 65.45 years old, SD = 17.14). However, throughout 2021 there was a change in trend; cases of suicide were higher in women (62.0%). Based on the age category, suicide cases also were more dominant in the elderly compared to other age groups (see Figure 1). Prior to the pandemic, the elderly women accounted for 5%-15% of the total incidence; and the proportion of suicides in elderly women contributed 50% of the total incidence in that year. In addition, the case of suicide in elderly men is also very high (31.25%) among all male suicides.

Time series analysis for men and women with the Moving Average model obtained predictive results as shown in Figure 1. The time series shows that suicides appeared to be higher in men than women before the pandemic. In addition, the pattern of cases in women looks more volatile and tends to increase. Furthermore, this analysis predicts a pattern of suicide that tends to be static in the men category and an increasing trend in women.

The pattern of forecasting data for men (gray line) shows that the pattern before and during the pandemic is flat enough, which indicated the pattern of the actual and forecasting data controlled by the baseline. Actual data for the men category could not be described. For the women category, the pattern of forecasting data is fluctuated enough (gray line with dot). The actual data for the women category show that there were some suicide cases in some periods, but there are some other periods that have no cases at all.

In general, the pattern of suicide cases seems to tend to decrease from the COVID-19 outbreak (March 2020) to April 2021. Chi-square analysis showed that there was no difference between the observed numbers and the expected numbers in the general trend of suicide ($X^2 = 12.05$; $p > 0.05$), and

in the trend of suicide in men ($X^2 = 20.17$; $p > 0.05$). This analysis only shows differences in suicide rates among women ($X^2 = 23.43$; $p < 0.05$).

4. Discussion

Gunungkidul has attracted researchers attention to draw up a map of how to overcome the high rate of suicide. Although, no efficacious solution has yet been found. Several reports have estimated the prevalence of suicide in Gunungkidul to exceed the national trend.^{2,3} Several parties have proposed explanations and factors behind the high number of suicides in Gunungkidul, such as poverty and social change, distortion of meaning applied to the belief of "pulung gantung", mental health issues, and to the absence of adequate resources.^{17,18,19,21}

This study was conducted to estimate the effect of the COVID-19 pandemic on suicide patterns. This article underlines no difference in the trend of suicide before and since the COVID-19 pandemic in Gunungkidul, Indonesia. This article reports that the pandemic did not affect the increase in the trends of suicide in Gunungkidul, but there has been a marked increase in women since the pandemic was announced in March 2020. The COVID-19 pandemic has the potential to increase the risk factors for suicide in women and the elderly. Previous studies have shown that the vulnerability of the elderly to commit suicide is related to loneliness, such as the absence of a caregiver and lack of social support, illness, decreased independence in carrying out activities of daily living, depression, and anxiety disorders.^{20,23} The increase in suicide in women has been linked to gender inequality associated with psychosocial stressors, such as low social economic status (SES), domestic violence, and economic dependence.²⁴ Suicide susceptibility in women is associated with women reported as the most affected party, and the increase in domestic violence, health inequality, and a doubled household burden.²⁵⁻²⁷

Decreasing suicide rates during the COVID-19 pandemic can be attributed to strengthening social integration in society as a community coping mechanism in dealing with broad crises, as in the experience of the SARS outbreak or war crisis.^{13,14} This strengthening of social integration has increased

community engagement and connectedness, which can be protective factors against suicidal behavior. During a pandemic, people become more open to emotions and internal conditions towards other people. The community has actively made various efforts to provide mutual support, especially vulnerable groups with low SES. This effort has become a collective consciousness as well as a social mechanism to work together and connect with people. Besides that, there are sociocultural factors that can lead to suicide in women, such as childhood adversities, including physical, emotional, and sexual abuse.²⁴

The report of this article has a similar pattern to some reports from Saudi Arabia, Argentina, Nepal, and Japan that noted an increase in female suicides during the pandemic. The meta-analysis study also estimated that during the pandemic, women thought more about suicide, attempted self-harm, and attempted suicide.^{15,29-32} Social restriction policies by the authorities are associated with the emergence of anxiety, fear, and depression, which can lead to suicidal thoughts; this situation is more commonly reported in women.³³

This article also suggests potential reporting and data management gaps on attempted suicides. Higher rates of suicide in men are associated with greater capability and choice of fatal method.^{34,35} However, women have a higher intensity and make more suicide attempts than men.¹ The increase in suicides in women indicates an increase in the intensity and variety of trials that preceded it. All parties should be aware of this situation, considering that attempted suicide is an “iceberg phenomenon” in suicide reports. On the other hand, there is no national registry mechanism that records and reports attempted suicide attempts, which causes increasing focus on handling and recovering from the pandemic.

It is crucial to strengthen the community, especially women and the elderly, in suicide prevention. Strengthening the domestic economy can be done by providing incentives, social assistance, access to capital, and relaxation of payments. The role of women in the family economy can help overcome the economic difficulties experienced during the COVID-19 pandemic. It is

also important for empowering community mental health with supporting policies and infrastructure by strengthening mental health services at the basic service level and collaboration between stakeholders, such as schools, communities, and health centers.

This study acknowledges there are limitations and suggests some practical aspects to anticipate. Suicide data in this study cannot explain whether the suicide perpetrators are people who are directly affected (e.g., patients, family members of COVID-19 patients, and layoffs) or who are indirectly affected by the COVID-19 pandemic. The results of this study are not intended to generalize or be understood causally, considering the act of suicide contains a complexity of factors that cannot only be affected by the COVID-19 pandemic. Although this study found a limited difference in trends, this change may be a manifestation of random patterns as in previous studies.³ This study also analyzes limited data and also influences the level of sensitivity of predictive patterns. In addition, this article does not reveal whether the decline in the trend of suicide is also accompanied by a decrease in suicidal ideation or the attempts.

5. Conclusion

This study analyzed local suicide data and found that the COVID-19 pandemic did not significantly affect the increase in suicide incidents in Gunungkidul. The trends of suicide before the pandemic did not show a significant difference with the pandemic period. However, gender-level analysis shows that there has been an increase in female suicides since the pandemic. Most of the suicide perpetrators are elderly people, both men and women.

This study proposes evaluating the pandemic's impact on suicide rates longitudinally and using a broader surveillance system. This suicide prevention strategy needs to be implemented by prioritizing women and the elderly. This study also recommends providing support systems, strengthening social networks for women and the elderly during the pandemic, and widening access to health and psychological services. As reported above, the results of this study have the same pattern as some studies that showed women had a higher risk for suicide.

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Conflict of interests

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