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Original Research

Zero Mortality During Covid-19 Outbreak: A Review in 418 Workers at a Health University

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ABSTRACT

Background: *Mortality due to Covid-19 outbreak in Indonesia are the second highest in Asia on period 2020-2021, but there is one of health university that zero mortality. Some of the factors that cause high mortality are only assumptions from researchers, need to be clarified scientifically. Aim of study is to analyze factors that causes zero mortality during covid-19 outbreak.*

Methods: *We performed a descriptive study using result of medical check up workers within the first 1 year of the pandemic. All workers consist of lecturers, administrative staff, drivers, and cleaning staff were included as much as 418 persons. Patients were assessed for their gender, age, body mass index, blood pressure, total cholesterol, and electrocardiography based on laboratory test and interview. We analyze data using descriptive based on characteristics respondents. Data collected in December 2021. The examination is carried out by a certified laboratory.*

Results: *The age of the workers is mostly young, the small incidence of hypertension, hypercholesterolemia, and heart health problems, have the potential to be a reason for zero mortality during the covid 19 outbreak in 418 workers. Hypertension, gender, obesity, hypercholesterolemia, and aritmia unrelated to mortality, but related to severity. Age directly related to mortality.*

Conclusion: *A healthy body is an asset in dealing with a pandemic. Periodic checks on blood sugar, electrocardiography, cholesterol, body mass index, is needed in preparing for the next pandemic minimum once every 6 months.*

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INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a virus new strain has turned out to be a pandemic in short period that has never been identified before in humans (Lu et al., 2023; WHO, 2022). The high transmissibility of its causative agent, causes severe acute

respiratory syndrome. This diseases is expected as an air borne disease and it have ability to spreads human to human through microdroplets which are released during exhalation, talking, and coughing (Harbuwono et al., 2022; Sarkar, Das, Borsingh Wann, Kalita, & Manna, 2021; Setyorini, Ardesa, & Darmawan, 2022).

This disease causes many unexpected deaths. Wang, Comfort, Aravkin, Fuller, & Allorant, (2022) report that mortality patient with covid-19 between Jan 1, 2020, and Dec 31, 2021, estimate that 18·2 million (95% uncertainty interval 17·1–19·6). The global all-age rate of excess mortality due to the COVID-19 pandemic was 120·3 deaths (113·1–129·3) per 100000 of the population, and excess mortality rate exceeded 300 deaths per 100 000 of the population in 21 countries. Indonesia become one of country that have high number of excess deaths due to COVID-19 was largest in the regions of Asia. Were estimated in India (4·07 million [3·71–4·36]), Indonesia (736 000 [594000–955000]), and Pakistan (664 000 [498 000–847000]) during 1 year of pandemic.

The pandemic has caused the government to place restrictions on citizens' mobilization (Heymann, 2020; WHO, 2020). The outbreak profoundly disrupted the delivery of care for patients that have chronic diseases (Lv et al., 2022). For example is patient with diabetes melitus, where they high risk for complications like end-stage renal failure, blindness, and lower-limb abnormalities are all linked to diabetes. If the disease is not controlled, it is dangerous for the sufferer if infected with Covid-19. This condition increasing chance of getting life-threatening illnesses like covid-19 (Sharma et al., 2022).

Pandemic pressure not only poses a risk to health but also to their psychology conditions (Setyorini et al., 2022). Indonesia itself is still struggling with cancer, stroke, chronic kidney disease, diabetes mellitus, and hypertension where these diseases are the highest cause of death. This disease has the potential to increase the risk of death in sufferers (Harbuwono et al., 2022; Sarkar et al., 2021; SatgasCovid-19, 2021; Sharma et al., 2022). Eryilmaz-Eren, Ture, Kilinç-Toker, Korkmaz, & Çelik, (2022) report that persons who have older age, cancer history and infected COVID-19 were determined as prognostic factors predicting increasing incident mortality. Research from Feng, (2023) revealed that factors potensials make high incident of mortality are age composition, ethnic, deprivation, care home and air pollution.

The results of the literature review do not show consistent data on the factors causing the high death rate from Covid 19 in a region. On the other hand, there is the composition of the age distribution, the number of workers who are chronically ill, and other factors that cannot be explained beforehand as the cause of death. The unique phenomenon of having a university where there are no deaths during an outbreak. Aim of study is to analyze the factors that cause zero mortality during a pandemic.

MATERIALS AND METHOD

We performed a descriptive study using result of medical check up workers within the first 1 year of the pandemic. We used total sampling, were all workers consist of lecturers, administrative staff, drivers, and cleaning staff were included as much as 418 persons. Patients were assessed for their gender, age, body mass index, blood pressure, total cholesterol, and electrocardiography based on laboratory test and interview. Using this dataset, we conducted a descriptive analysis to investigate based on characteristics respondents. Data collected in December 2021.

The examination is carried out by a certified laboratory. The study was approved by the Research Ethics Committee of the Indonesian Ministry of

Health. The Ethical Approval was obtained from Health Research Ethics Committee of Poltekkes Kemenkes Surakarta, number LB.02.02/1.1/2424.4/2021 dated on January 31st, 2021. The researchers applied research ethics principles of anonymity, beneficence and non-maleficence, autonomy, and justice.

RESULTS

A total of 418 workers were registered during the study period. The baseline characteristics of our study subjects are summarized in Table 1. This study consist of similar amount of gender male (51%) and female (49%). They were generally are of age 26-55 years old and only 5% in more than 55 year old. In addition, the most respondents have body mass index more than 23 or obesity (table 1).

On the other hand only 6% respondent who suffer hypertension, 25% respondent suffer hypercholesterolemia, and only 7% respondent suffer aritmia and heart rhythm disturbance. Respondent who become active smoker is 16% and 78% respondent never smooking (table 1).

Table 1. Baseline characteristics

Category	Frequency (person)	Percentage (%)
Gender		
Male	213	51
Female	205	49
Age		
< 25 years old	8	2
26-35 years old	54	13
36-45 years old	157	38
45-55 years old	175	42
> 55 years old	24	5
Body Mass Index		
< 18.5	11	3
18.5 - 22.9	55	14
23 - 24.9	112	27
25 – 29.9	192	46
> 30	48	10
Blood Pressure		
Hypertension (Systole > 140 mmHg)	25	6
Normal	393	94
Total Cholesterol		
High (>200 mg/dl)	105	25
Optimal (<200 mg/dl)	313	75
Electrocardiography		
Sinus Rhythm	387	93
Aritmia	14	3
Suspect ishcemia	17	4

DISCUSSION

Mortality incidence globally showed that male were somehow, more easy to the infection and death by Covid-19 than women. Hypertension and diabetes melitus become most diseases that found in male patients male. This diseases increasing risk predictor of mortality (Cunha et al., 2023). Report from Zakaria et al., (2021) also stated that women had a lower incidence of death than men.

Male have higher risk COVID-19 mortality rates than female at most ages (Torres et al., 2023). Even though there was no difference in mortality between men and women in this study, the factor that male have more comorbid diseases is suspect. Not only cause due to co-morbidities, the psychological conditions of female and male patients are also different. Shams & Nasreen, (2023) report that survivability and awareness level is 71.6% female more skilled in isolation management, and food stocking, in contrast with 64% of men.

The report shows women can adapt to loneliness in self-isolation. People who got loneliness is connecting with some physical and mental disorder, including hypertension and increased risk for heart disease. This feel and social isolation have been associated with an increased risk for infarct myocardial disease-associated death, even in adults without history of heart arterial diseases (Hwang, Rabheru, Peisah, Reichman, & Ikeda, 2020).

An increase in age was strongly associated with an increased risk of severe COVID-19 outcomes (Alissa et al., 2023). During first year of outbreak in 2021, the most COVID-19 mortality rates is ages 75+ (Torres et al., 2023). Patient with older age (>80 years old), dementia, CKD, and greater length of stay were associated with potentials high mortality (Zakaria et al., 2021). Prevalence and epidemiological trends of COVID-19 mortality researched by Alissa et al., (2023) and got several comorbidities like diabetes, hypertension, obesity, and cardiac arrhythmias the cause of the high death rate due to covid 19 in Saudi Arabia.

Result of this study is 84% respondent are obese, and no one has died during the pandemic. These results are in line with report from Abumweis, Alrefai, & Alzoughool, (2022) that obesity is not associated with mortality in COVID-19 (OR = 1.1; 95%, CI: 0.8 to 1.3), but it associated with severity (OR = 2.4; 95%CI: 1.7 to 3.3). Patients with higher nutritional risk was positively associated with mortality in critical ward COVID-19 patients, regardless of obesity.

This conditions showing the importance of maintain nutritional status and calculate appropriate nutritional (Palermo dos Santos et al., 2022). Patients with BMI above 40 kg/m^2 or Class III obesity showed a higher in-hospital mortality and higher incidence rate of AKI during admission compared to patients with BMI between 25 and 30 kg/m^2 (So et al., 2022). Almost half of the sample 773 patients with COVID-19 hospitalized had obesity, and It was significantly increasing risk of AKI, RRT and mortality in hospitalized patients with COVID-19 (Martín-del-Campo et al., 2021).

Some researchers argue that hypertension or uncontrollable BP increases the risk of death. In fact is that only 6% of respondents have hypertension, so there are no deaths from Covid 19. An et al., (2021) report that from 12,548 patients with hypertension and COVID-19 with mean age 60 years, had 63% hypertension prior to COVID-19. Patient with hypertension and Covid-19 among them 21% were hospitalized or died within 30 days after infected.

Uncontrolled BP was not associated with higher hospitalization or mortality, and it did not appear to be an important risk factor for 30-day mortality or hospitalization.

This study contradicts the report from Du, Zhou, Zha, & Lv, (2021) that state hypertension was independently associated with a significantly increased risk of critical COVID-19 (aOR: 1.82; 95% CI: 1.19 2.77; P Z 0.005) and inhospital mortality of COVID-19 (aOR: 2.17; 95% CI: 1.67 2.82; P < 0.001). Hypertension is related to heart and kidney damage and increases the risk of stroke, thereby increasing the risk of death (Alissa et al., 2023; An et al., 2021; Du et al., 2021; Dyusupova et al., 2021).

A quarter of the respondents to this study had hypercholesterolemia, and there were no deaths from Covid 19. Uric acid to high density lipoprotein ratio is associated with mortality in Covid19. High level of high density lipoprotein cholesterol related increasing risk of sepsis (Bölen, Baycan, Cesur, & Agirbasli, 2022). Study from 3,933 COVID-19 patients with 7.53% patients in criticall condition, find positive association was found between TG/HDL ratio and serious complications of COVID-19 (adjusted OR, 1.09; 95% CI[1.03–1.15], p = 0.004) (Chang, Jeon, Song, & Kim, 2023).

Nadakinamani et al., (2023) found that high level of cholesterol can causes a large proportion of people covid 19 become with fever, sore throats, and coughs. High cholesterol also increasing risk of stroke, hypertension, diabetes, obesity, and experience chest discomfort. Results showed that respondents had arrhythmia (3%) and suspected ischemia (4%). This condition is not enough to make the incidence of death in workers.

Hernández-Vásquez, Visconti-Lopez, Alburqueque-Cruz, & Rojas-Roque, (2023) report that decrease amount of patient with heart failure (HF) in hospitalizations and an increase in the in-hospital mortality of patients with HF before and after the mandatory lockdown due to the COVID-19 pandemic in Peru. The pandemic has reduced heart patients coming to the hospital (Yamamoto et al., 2023). This condition is dangerous, because the patient's health is not controlled. Hypertensive diseases, diabetes, and IHD were the most prevalent cardiovascular conditions among COVID-19 related deaths (Vasudeva et al., 2022).

CONCLUSION

Research findings show that the majority respondent have age of the workers is mostly young, the small incidence of hypertension, hypercholesterolemia, and heart health problems. This condition have the potential to be a reason for zero mortality during the covid 19 outbreak in 418 workers. Hypertension, gender, obesity, hypercholesterolemia, and aritmia unrelated to mortality, but related to severity. Age directly related to mortality. Periodic checks on blood sugar, electrocardiography, cholesterol, body mass index, is needed in preparing for the next pandemic.

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