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COMPARISON OF THE LENGTH OF STAY OF COVID-19 PATIENTS WITH COMORBID DIABETES MELLITUS BY GENDER AT NATAR MEDIKA HOSPITAL SOUTH LAMPUNG IN 2021

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Abstract

Based on existing data, comorbid hypertension and diabetes mellitus, male gender, and active smoking are risk factors for SARS-CoV-2 infection. Diabetes mellitus (DM) is a metabolic disorder that affects insulin action in glucose absorption. A study conducted by Parveen et al showed that diabetes made the general health condition of COVID-19 patients worse. COVID-19 patients require hospitalization because COVID-19 is a highly contagious respiratory infectious disease, which can cause respiratory, physical, and psychological dysfunction of the patient, also resulting in various dysfunctions, which in turn can reduce the patient's functional capacity. This study aims to determine the difference in length of stay for COVID-19 patients with comorbid diabetes mellitus based on gender at Natar Medika Hospital, South Lampung in 2021. This type of research uses a comparative descriptive research method. The research design used in this study was cross sectional. Samples that met the inclusion and exclusion criteria were 40 patients' medical records. Gender characteristics were dominated by 24 women (60%) and 16 men (40%). A total of 14 female patients (58.3%) and 12 male patients (75%) recovered quickly. While 4 male patients (25%) and 10 female patients (41.7%) recovered for a long time. It is known that there is no significant comparison of length of stay for COVID-19 patients with comorbid diabetes mellitus based on gender where the Mann-Whitney test obtained a significance level (ρ value) of 0,466.

Keywords: *Length of Stay, COVID-19, Comorbid Diabetes Mellitus, Gender*

1. INTRODUCTION

The Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) is the virus that causes Coronavirus Disease 2019 (COVID-19). Hubei Province's capital, Wuhan, reported the first case of COVID-19 in December of 2019. SARS-CoV-2 has a substantially lower fatality rate than MERS-CoV or SARS-CoV, but is far less virulent. There were a total of 5,494,461 COVID-19 cases globally as of May 25, 2020, with a mortality number of fatalities of 346,434. The overall number of cases in Indonesia is 22,750, with a number of fatalities of 1,391 (Resmi et al., 2021).

According to current facts, concomitant hypertension and diabetes mellitus, male, and active smokers are possible causes for SARS-CoV-2 infection. Men had more gender diffusion, which is thought to be connected with a higher number of active smokers. Ace2 receptor expression is thought to be higher in smokers, people with hypertension, and people with diabetes. Some studies on the biology of viral infections and clinical disease

management have revealed that variability in the frequency and incidence of COVID-19 disease are related to gender, and smoking is related to high levels of EXPRESSION of ACE2 [receptors for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)], which could also be a major consideration (Cai, 2020).

Diabetes mellitus (DM) is a metabolic condition that interferes with insulin's ability to control glucose absorption in the body. Since the previous twenty years, the severity of this disease has risen dramatically around the world (Abdi et al., 2020). COVID-19 has diabetes as a major risk factor. Hyperglycemia, decreased immune function, and vascular and concomitant conditions including such hypertension, dyslipidemia, and cardiovascular disease all increase the risk of infection in diabetics. COVID-19 is more severe and has a greater fatality rate in diabetic patients than in non-diabetic people. People with diabetes have a lower immune response, which is one of the causes contributing to the spread of COVID-19 during this outbreak (Pomantow AL Roeroe, 2021).

As a highly contagious respiratory infection, COVID-19 can cause respiratory, physical and psychological dysfunction in the patient, which can have a negative impact on the patient's functional capacity. Hospitalization is required for COVID-19 patients. There are two rooms for COVID-19 patients who need hospitalization: a conventional treatment room and an intensive care room (Tresnasari Cice & Dharmmika Susanti, 2020). Hospital wards should be used to treat suspected and confirmed patients with moderate and severe symptoms (MOH RI, 2020).

According to the study's background, the goal of this research is to determine the difference in the length of stay between male and female COVID-19 patients with diabetes mellitus at Natar Medika Hospital in South Lampung in 2021.

2. RESEARCH METHOD

The research method employed was descriptive analytic with a cross-sectional approach. This study was carried out at Natar Medika Hospital in South Lampung. This study's sample is the patient's medical record. Those who met the inclusion and exclusion criteria were chosen for the study using a total sample technique (randomly). The sample was chosen from a group of 115 people. There are 16 men and 24 women based on gender. Secondary data was collected in this study by seeing and documenting medical records of COVID-19 patients with concomitant diabetes mellitus at Natar Medika Hospital in South Lampung. The data were analyzed by computer using the IBM SPSS Statistics version 26 program, which was then followed by the Mann-Whitney test to evaluate the significant differences between groups because the data were not normally distributed.

3. RESULT AND DISCUSSION

3.1. Research Result

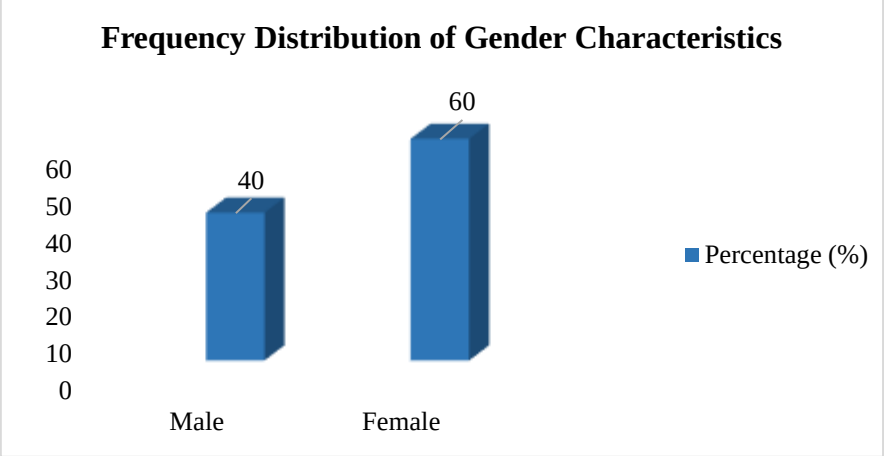

Figure 1 Results of Frequency Distribution of Gender Characteristics in COVID-19 Patients with Comorbid Diabetes Mellitus

As shown by figure 1, the total number of COVID-19 patients with comorbid diabetes mellitus is 40. Male patients accounted for 40% of the total 16 patients, and a total of 24 patients or 60% were female.

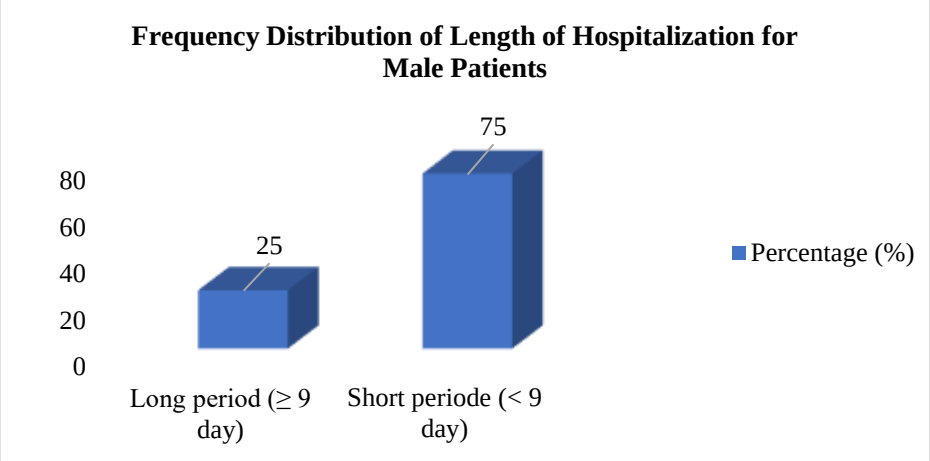

Figure 2 Frequency Distribution of Length of Hospitalization for Male Patients

Figure 2 shows that for COVID-19 patients with comorbid diabetes mellitus of male patients, the length of stay is 12 out of 16 patients with a percentage of 75 percent healing in a short period of < 9 days and 4 patients with a percentage of 25 percent recovering in a long period of time which is for ≥ 9 days.

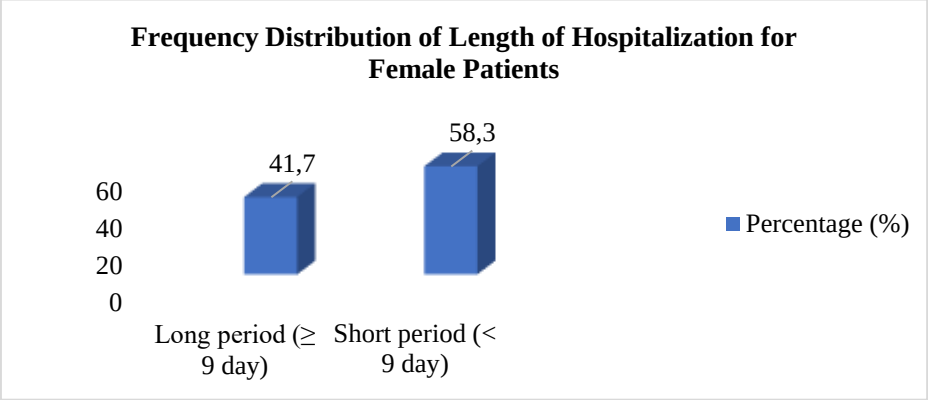

Figure 3 Frequency Distribution of Length of Hospitalization for Female Patients

According to the figure in the previous section, the length of stay for COVID-19 patients with comorbid diabetes mellitus in female was 14 patients out of 24 with a percentage of 58.3 percent recovering in a short period of time, specifically in ≥9 days, and 10 patients with a percentage of 41.7 percent recovering rapidly, which is for <9 days.

Table 1 Results of the Mann-Whitney Test Comparison of Length of Stay for COVID-19 Patients with Comorbid Diabetes Mellitus by Gender

Variable	n	Mean ± SD	*p*
Man	16	18.88 ± 13.043	0,466
Woman	24	21.58 ± 8.352	

As shown by table 1, COVID-19 patients with comorbid diabetes mellitus of 16 male patients with an average of 18,88, while female is 24 with an average of 21,58. The findings of this study's data analysis are a comparison of the length of treatment of COVID-19 patients with comorbid diabetes mellitus depending on gender with a value of 0,466, which means H0 is accepted and Ha is rejected. It is possible to conclude that there is no significant difference in the length of treatment of COVID-19 patients with comorbid diabetes mellitus based on gender.

3.2. Discussion

Based on figure 1, it is known that the total number of COVID-19 patients with comorbid diabetes mellitus is 40 patients. The percentage of patients with male gender was 40% with a total of 16 patients, while female gender was 60% with a total of 24 patients. Women are a group at risk for diabetes mellitus due to hormonal factors, namely a decrease in the hormone estrogen which causes a decrease in body metabolism and triggers obesity. Apart from hormonal factors, women usually find excess fat accumulation in muscle tissue, liver tissue and visceral tissue which is manifested by obesity due to lower physical activity than men (Uswatun Khasanah et al., nd).

According to Ahmed and Dumanski, 2020 this could be due to the fact that the enzyme angiotensin 2 (ACE2), which is an integral part of the human Renin-Angiotensin-

Aldosterone System (RAAS), is a functional receptor that allows SARS-CoV-2 to attack human alveolar epithelial cells. Overall, men showed greater Renin-Angiotensin-Aldosterone System (RAAS) activity compared to women (Vahidy et al., 2021).

Based on Figure 2, the length of stay for COVID-19 patients with comorbid diabetes mellitus in male was 12 patients from 16 patients with a percentage of 75% recovering in a short period of time, which is for < 9 days and 4 patients with a percentage of 25% recovering in a long time period, which is for ≥9 days. The length of stay for COVID-19 patients with female diabetes mellitus comorbid as many as 14 patients out of 24 patients with a percentage of 58,3% recovered in a long time, namely 9 days and 10 patients with a percentage of 41.7% recovered in short period, namely < 9 days. .

This may be the first preliminary study to look into the effect of gender in SARS-CoV-2 infection morbidity and mortality. A study of 425 COVID-19 patients found that 56 percent were men. In a separate examination of 140 patients, 50.7 percent were men. In this study, males and females were shown to have similar susceptibility to SARS-CoV-2 in 1,019 patients who survived the disease (50.0 % males) obtained from public datasets and in a case series of 43 hospitalized patients (51.2 % males) (J(Jin et al., 2020).

As shown by table 1, male COVID-19 patients with comorbid diabetes mellitus account for 18.88 patients on average, whereas female COVID-19 patients with comorbid diabetes mellitus account for 24 patients on average. The comparison of the length of stay of COVID-19 patients with comorbid diabetes mellitus based on gender have of 0.466, indicating that Ha is rejected and H0 is approved. It can be stated that there is no significant gender difference in COVID-19 patient length of stay and comorbid diabetes mellitus. Due to characteristics that normally cause variances such as comorbid, (Cai, 2020) and gender, there is no significant variation in the length of stay of COVID-19 patients with comorbid diabetes mellitus by gender (Pomantow AL Roeroe, 2021). Only several journals describe gender variations in the length of stay of COVID-19 patients with comorbid diabetes mellitus, making it difficult for researchers to compare results and explain why the study's findings are what they would be.

However, results from this study differ from prior studies such as Vahidy et al., (2021) who indicated that the overall percentage of patients who were admitted to the ICU in COVID-19 was 30.9 %. This proportion was significantly higher among men 34.1% compared to women 27.6%. As per findings of the study conducted by Vahidy et al. (2021), we found a clear and strong independent association between male gender and higher SARS-CoV-2 susceptibility, likelihood of ICU admission, use of ventilation, and longer LOS – all clinical indicators of higher COVID-19 disease severity.

4. CONCLUSION

The study's findings indicate that there is no significant difference in duration of stay between genders for COVID-19 patients with comorbid diabetes mellitus, as determined by the Mann-Whitney test with a significance level (value) of 0,4666. Thus, it is hoped that this research can be used as a reference and source of data to add insight and continue research on a more accurate comparison of the length of stay of COVID-19 patients by gender in the future. It is also hoped that it can increase the number of samples to ensure more accurate results, as well as complete the data by collecting and researching. patient's medical record (what causes contribute to the patient taking a lengthy time during treatment, such as

uncontrolled blood sugar in patients with comorbid diabetes mellitus, unimproved vital signs, and maybe other issues), as well as doing research in other or many locations. Not only comorbid diabetes mellitus, but also hypertension, heart disorders, lung diseases, tumors, and cancer might be used as research subjects.

For health care professionals, it is envisaged that this can be used to give information about the comparison of length of stay for COVID-19 patients with comorbid diabetes mellitus by gender as a preventive measure for those at risk. For those who have been exposed to COVID-19, it is expected that comorbid diabetes mellitus in men and women can be treated carefully in order to recover and regain health, thereby reducing mortality. Furthermore, it is suggested that this research can be used to learn about the length of stay of COVID-19 patients with comorbid diabetes mellitus by gender, which is expected to help those exposed to COVID-19 with diabetes mellitus take better care of their own health, family, and environment, which is expected to help minimize the chance of risk, morbidity, and mortality during the COVID-19 pandemic.

REFERENCES

Abdi, A., Jalilian, M., Sarbarzeh, P. A., & Vlaisavljevic, Z. (2020). Diabetes and COVID-19: A systematic review on the current evidences. In *Diabetes Research and Clinical Practice* (Vol. 166). Elsevier Ireland Ltd. https://doi.org/10.1016/j.diabres.2020.108347

Cai, H. (2020). Sex difference and smoking predisposition in patients with COVID-19. In *The Lancet Respiratory Medicine* (Vol. 8, Issue 4, p. e20). Lancet Publishing Group. https://doi.org/10.1016/S2213-2600(20)30117-X

Dwi Uswatun Khasanah, Fatchurrozak Himawan, & Suparjo Suparjo. (n.d.). Stress Levels for People with Diabetes Mellitus during the COVID-19 Pandemic. *Politekkes Kemenkes Semarang* , 39–43.

Jin, J. M., Bai, P., He, W., Wu, F., Liu, X. F., Han, D. M., Liu, S., & Yang, J. K. (2020). Gender Differences in Patients With COVID-19: Focus on Severity and Mortality. *Frontiers in Public Health*, *8*. https://doi.org/10.3389/fpubh.2020.00152

Pomantow A. L. Roeroe, 1Bisuk P. Sedli.2Octavianus Umboh2. (2021). Faktor Risiko Terjadinya Coronavirus Disease 2019 (Covid-19) pada Penyandang Diabetes Melitus Tipe 2. *E-CliniC*, *9*(1), 154–160. https://doi.org/10.35790/ecl.9.1.2021.32301

Putranto Terawan Agus. (2020). *Keputusan Menteri Kesehatan Republik Indonesia Nomor Hk.01.07/Menkes/413/2020*.

Resmi, M., Dokter, P., Indonesia, P., Arifin, P. M., Faisal, N., Agus, Y., Susanto, D., Jawab, P., Redaksi, P., Fachrucha, F., Pemimpin, W., Winariani, R., Redaksi, A., Fitriani, F., Permatasari, A., Jamal, T., Farih, Z., Mia, R., Ginanjar, E., … Putra Pratomo, I. (2021). Respirologi Indonesia Susunan Redaksi. In *J Respir Indo* (Vol. 34, Issue 1). http://www.jurnalrespirologi.org

Tresnasari Cice, & Dharmmika Susanti. (2020). COVID-19dan Tatalaksana Kedokteran Fisik serta Rehabilitasi Pasien. In *KOPIPEDIA: Bunga Rampai Artikel Penyakit Virus Korona (COVID-19)*. repository.unisba.ac.id

Vahidy, F. S., Pan, A. P., Ahnstedt, H., Munshi, Y., Choi, H. A., Tiruneh, Y., Nasir, K., Kash, B. A., Andrieni, J. D., & McCullough, L. D. (2021). Sex differences in susceptibility, severity, and outcomes of coronavirus disease 2019: Cross-sectional analysis from a diverse US metropolitan area. *PLoS ONE*, *16*(1 January). https://doi.org/10.1371/journal.pone.0245556