

Evaluation of Covid-19 Booster Vaccination Results Among Health Workers at a SM Private Hospital in North Jakarta

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Abstract: The provision of Covid-19 booster vaccines for health workers has begun to be discussed a lot as the pandemic continues. This study aims to determine the side effects and impact of menstruation, health workers exposed to Covid-19 after booster vaccines. This study used a cross-sectional research method through sampling convenience sampling. This questionnaire was distributed at a SM private hospital by getting respondents as many as (n=109) health workers. The questionnaire data used in this study were the validity and reliability tests with the value of Cronbach alpha 0.960. The results of this study revealed that there were (69.7%) of women, (62.4%) in the age group (25-45 years), nursing profession (45.9%), non-nurses profession (54.1%). *Sinovac* vaccine (41.3%), and *Moderna* vaccine (58.7%). Moreover, health workers who experienced side effects of booster vaccines were muscle pain (47.7%), fever (57.8%), allergic reactions (49.5%), joint pain (49.5%), reddish swelling pain at the injection site (52.3%), drowsiness (46.8%), and headache (43.1%). Then, health workers were exposed to covid-19 as much (22.94%). Health workers who experienced the impact of menstruation were (46.8%). There are correlations between the vaccine and AEFI, and also the impact of menstruation and health workers exposed to covid-19 after the booster vaccine.

1 INTRODUCTION

The Covid-19 pandemic that has occurred since 2020 is a catastrophic outbreak experienced by the entire world, including Indonesia. Covid-19 (coronavirus disease 2019) is a respiratory tract infection caused by the severe acute respiratory syndrome of coronavirus 2 (SARS-CoV-2), or the corona virus. (Casella M et al., 2021) Covid-19 spreads quickly because the transmission of the covid-19 pandemic outbreak occurs between people and people or people with certain media where the virus that causes covid-19 is attached (Handayani, et al. 2020).

Globally, the Covid-19 case was first discovered in December 2019 in Wuhan, China. The coronavirus spread to all parts of China within a few weeks, and within months to other countries. As of February 10, 2022, Covid-19 has been found in 225 countries, with around 405,000,000 confirmed cases. (Ministry of Health of the Republic of Indonesia, 2022.)

The Sars-Cov-2 virus that causes Covid-19 is known as the omicron variant. The omicron variant was first discovered on 24 November 2021 in South Africa. This variant must be watched out for, and

research results proved that there was an increased risk of recurrent infections that occur as a result of this variant (KOMINFO, 2021)

Preventive actions of Covid-19 are to maintain social distance (social distancing), minimize the possibility of being exposed to the virus (CDC, 2021), and implement the discipline of health protocols that must carry out by vaccinations. Vaccination aims to provide special immunity and reduce morbidity due to viral infections (Mukhi S, 2021). Vaccines are used to expose recipients to non-infectious substances or pathogens that can cause disease. Vaccines can stimulate the recipient's immune system to prevent or reduce the chances of infection in exposed pathogens (Jain S, Venkataraman A, Wechsler ME, 2021).

There are several vaccines, one of which is an attenuated vaccine. This vaccine uses pathogenic strains that have been weakened to become non-infectious in non-human tissues. These strains are then injected into the recipient and will be recognized by the immune system. (little PD, 2015). Inactivated vaccines act similarly to live attenuated vaccines. Still they can produce vaccines that weaken the immune system more than live attenuated vaccines, in which

recipients may lose their immune memory over time. (Petrovsky N, 2004)(RW, 2018).

The provision of a booster or additional Covid-19 vaccine for health workers has begun to be widely discussed as the pandemic continues. With fears of a sharp increase in the number of Covid-19 patients and research findings of a decline in vaccine-induced immune responses over time, a number of countries are starting to consider administering additional doses of the Covid-19 vaccine to the people who have been fully vaccinated.(WHO, 2022)

Health workers are at the forefront of providing health services even during the COVID-19 pandemic. In order to maximize efforts to protect the health, the government together with the ministry of health, is implementing a booster dose vaccination program to stimulate immunology so that health workers have strong immunity to protect themselves from infection of the Covid-19 variant.(Indonesia KTK, 2021).

2 METHOD

This study was analyzed using a cross-sectional research method of 109 health workers' respondents. Initially, the questionnaire was informed and distributed to be filled out. (Hanggoro, AY Suwarni, L., 2020). This study used a standardized questionnaire to collect data from hospital respondents. The questionnaire involved personal data (age, gender, and profession) and vaccine data (type of vaccine, side effects) given through the Google form. The instruments used in this study were the validity and reliability tests with a Cornbach alpha value of 0.960.

2.1 Ethical Approval

This research has been reviewed and approved by the ethics committee of the University of 17 August 1945 Jakarta (No.46/KEPK-UTA45JKT/EC/EXP/07/2022).

2.2 Statistic Analysis

Before collecting data, the researcher first asked for ethical approval from the ethics committee of the University of 17 August 1945 Jakarta. The collected results were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25 software. Descriptive statistics were performed for demographic variables and medical data. Chi-square test, Mann-Whitney U test, and Kruskal-Wallis test were used to find associations between risk factors

and adverse events. A p-value of 0.05 was considered significant.

3 RESULTS AND DISCUSSION

In this study, we conducted 109 participants, in which: One hundred nine participants (Health Personnel) have received booster vaccines. Health workers also received questionnaires via Whatsapp.

Table 1: Demographic characteristics of the study n = 109.

<u>Variables</u>	<u>Frequency</u>	<u>Percentage</u>
Gender		
Man	33	30.3%
Woman	76	69.7%
Age		
Teenagers 18-24	27	24.8%
Adult 25-45	68	62.4%
Seniors 46-65	14	12.8%
Profession		
Nurse	50	45.9%
Non-Nurse	59	54.1%
Vaccine Booster		
Sinovac	45	41.3%
Moderna	64	58.7%

Based on Table 1, it can be seen from a total of 109 participants, consisting of 33 men (30.3%) and 76 women (69.7%). This is in line with the study (vaccination, 2022) of men (47.5%) and women (52.5%) that women are more numerous than men. The age of adolescents is 18-24 (24.8%), adults 25-45 years (62.4%), and the elderly 46-65 years (12.8%). Nursing profession (45.9%), non-nurses (54.1%). Vaccine type of *sinovac* (41.3%), *moderna* (58.7%). Based on research (Gena N & Diana R, 2021) 406 participants consisted of 108 men (26.6%), and 208 women (73.4%) with the most age range is 18-30 y old (87.2%)

Table 2: AEFI after booster dose vaccination.

<u>Variables</u>	<u>Frequency (n=109)</u>	<u>Percentage (%)</u>
Muscle ache	52	47.7%
Fever	63	57.8%
Allergic Reaction	54	49.5%
Joint pain	54	49.5%
Pain, swelling, redness at 57 the injection site		52.3%

Drowsiness	51	46.8%
Headache/Dizziness	47	43.1%
Menstruation	51	46.8%

Based on Table 2, it can be seen that the common side effects given the response of this study at booster doses were muscle pain 47.7%, fever 57.8%, allergic reactions 49.5%, joint pain 49.5%, swollen painless at the injection site 52.3%, drowsiness 46.8%, headache 43.1%, exposed to covid-19 22.94%, and menstruation 46.8%.

The study involved 109 health workers who had been vaccinated booster, participants received a questionnaire that they experienced due to suffering side effects of booster vaccine. When compared with another study conducted in the UK, injection site symptoms occurred among 58.7% of study participants (Menni, 2021). In the pain study, the injection site showed 75.2%, 53.9% fatigue, a headache of 46.7%, myalgia (muscle pain) at 44%, and fever at 21.5%. (Wi YM, Kim SH, 2021). In the studies conducted by (Tiissot N, Brunel A, Bozon F & Chirouze C, 2021), fatigue (18%), headache (14%), muscle pain (20%), and 66% reported local events, such as pain at the injection site (63%) or erythema (8%). There were 90% local symptoms, such as pain and damage at the injection site, followed by about 65% system symptoms in the form of fever, headache, nausea-vomiting, and myalgia. In the study (Prevention & CDC, 2021), post-vaccine AEFI can be a loss, muscle pain, headache, fever, and nausea. These effects can provoke a decrease in activity for the recipient.

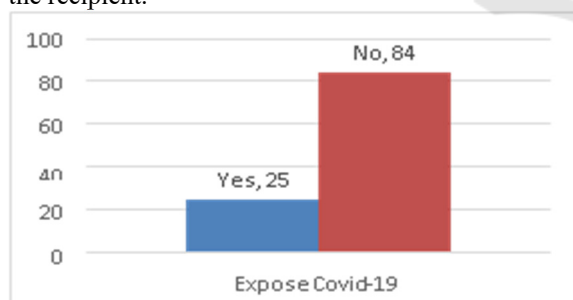


Figure 1: Expose Covid-19 After Booster Vaccination.

Based on Figure 1, it can be seen that there are 25 health workers who were exposed to covid-19 after the booster vaccine. based on different research results from (Edriani et al., 2021). the results of a study in DKI Jakarta which showed that there was a close relationship between population density and the number of positive confirmed cases of COVID-19 of 50.8%.

Table 3: Relationship between gender and AEFI.

Variables	Frequency / Percentage (%)		p-value
	Man	Woman	
Headache	8(7.3%)	34(31.2%)	0.043*
Drowsiness	10(9.2%)	41 (37.6%)	0.023*
Menstruation	0	51(46.8%)	0.000*

*Chi-square test

Based on Table 3, it can be seen that the variable that has a significant relationship with AEFI that appear is gender. Out of a total of 109 respondents, there was a significant difference between AEFI felt by patients and gender. For AEFI, headache in men at 7.3% and in women at 31.2%, with a p-value of 0.043. Drowsiness was felt in 9.2% of men and 37.6% of women, with a p-value of 0.023. Most female health workers experienced menstrual side effects (46.8%, p-value: 0.000). It was found that female vaccine recipients had more side effects than male vaccine recipients.

This is in line with research conducted by the Vaccine Center in Germany, they found that the female gender was more likely to experience side effects from vaccination (79.1%) (Hoffmann MA, Wieler HJ, Enders P, Buchholz HG, 2021). In the study (Gee J, Marquez P, Su J, Calvert GM & Myers T, Shimabukuro, 2020), 78.7% of AEFI occurred in women and tended to experience more AEFI.

Table 4: Relationship Between Age and AEFI.

Variables	Frequency Age (n:109, Median: Adult)	p-value
Muscle ache	43 (39.5%)	0.021*
Fever	54 (49.55%)	0.046#
Drowsiness	44 (40.37%)	0.011#
Exposed to Covid 3	25 (22.94%)	0.013#

*Mann-Whitney test, #Kruskal Wallis test

Based on Table 4, it can be seen that the variables that have a significant relationship are age and AEFI. In this study, the respondents' overall ages were from adolescence to old age. Most of the side effects are given by those in adulthood (25-45years). These results are consistent with studies conducted by (Jahan, Nishat, Fahad Imtiaz Rahman, Poushali Saha, and Sadia Afruz Ether, 2021) that reported significant side effects were more excellent in young adults than in older ones (p = 0.02). Detailed data are presented

in Table 4. Side effects of muscle pain 39.5% with a p-value of 0.021. Side effects of fever 49.55% with a p-value of 0.046. Side effects of drowsiness 40.37% with a p-value of 0.011. Exposure to covid-19 was 22.94% with a p-value of 0.013.

This age group of Mayors has relatively high mobility with a history of out-of-town travel, which is also more frequent. (Vermonte, P., & Wicaksono, 2020).

Research by (World Health Organization (WHO)., 2021) related to the *Moderna* vaccine showed that 90.6% of respondents aged 18-64 years had a fever with a temperature of < 39 polyurethanes. On research (Simanjorang et al., 2022), the proportion between the ages of 34 is almost the same as the age group > 34 years (57.7% and 42.3%). The age range of participants is between 20-59 years.

Table 5: Relationship between Profession and AEFI

Variables	Frequency		p-value
	Nurse	Non-Nurse	
Muscle pain	29 (26.61%)	23 (21.11%)	0.048*
Menstruation	29 (26.61%)	22 (20.19%)	0.031*
Joint pain	28 (25.69%)	26 (23.86%)	0.039*

*Chi-square test

Based on Table 5, it can be seen that the variables that have a significant relationship are profession and AEFI. In this study, health professionals are divided into nurses and non-nurses. For side effects of muscle pain (myalgia) in nurses, 26.61% and non-nurses, 21.11%, with a p-value of 0.048. For side effects of joint pain in nurses, 25.69% and non-nurses 23.86% with a p-value of 0.039. There is an impact or irregular menstruation in women because women have a greater level of antibody response to viruses, infections, and vaccinations.

Most respondents work as nurses. This is in line with mapping data on the number of health workers in Indonesia. (Ppsdm Health Agency, 2020). There was an impact of menstruation on nurses, 26.61% and non-nurses, 20.19%. This is in contrast to the study (Romadhan et al., 2022). The majority did not experience menstrual cycle changes after vaccination (84.5%) and 15.5% had menstrual cycle changes. There are reported changes in the menstrual cycle and volume after vaccination. In this case, further studies are still being conducted.

Table 6: The relationship between vaccine types and AEFI.

Variables	Frequency		p-value
	Sinovac	Moderna	
Muscle ache	17 (15.6%)	35(35.15%)	0.000*
Fever	26 (23.9%)	37(33.95%)	0.000*
Allergic Reaction	22 (20.2%)	32 (29.4%)	0.000*
Joint pain	17 (15.6%)	37(33.95%)	0.000*
Pain, redness at the injection site	26 (23.9%)	31 (28.5%)	0.000*
Headache	14 (12.9%)	28 (25.7%)	0.000*
Drowsiness	20 (18.4%)	31 (28.5%)	0.000*
Exposure to Covid-19	6 (5.51%)	19(17.43%)	0.000*

*chi-square test

Based on table 6, it can be seen that the variable that has a significant relationship is the type of vaccine with AEFI. In the *sinovac* vaccine, side effects include muscle pain 15.6%, fever 23.9%, allergic reactions 20.2%, joint pain 15.6%, redness at the injection site 23.9%, headache 12.9%, drowsiness 18.4%, and exposure to covid-19 5.51%. In contrast, *Moderna* vaccine recipients experienced a large increase in the frequency of side effects. The percentage of side effects by Moderna vaccine recipients were muscle pain 35.15%, fever 33.95%, r 29.4%, joint pain 33.95%, redness at the injection site 28.5%, headache 25.7%, drowsiness 28.5%, and exposure to covid-19 17.43%.

In the study (Kadali R, Janagama R, Peruru S & SV, 2021), muscle, bone, and joint pain were the most for 48 hours (42.3%). The *moderna* vaccine study found that 54.17% of 432 vaccination respondents experienced muscle pain.

4 CONCLUSION

The side effects contained in this booster vaccine were muscle pain, fever, allergic reactions, joint pain, redness and swelling at the injection site, drowsiness, headache, and menstruation. Health workers who have been vaccinated with the booster were still exposed to Covid-19. There were several risk factors associated with the side effects of this type of vaccine, which was *Moderna* vaccine had higher side effect than *sinovac* vaccine.

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