Journal of Midwifery Vol 6 : No 1 (2021)

http://jom.fk.unand.ac.id

ISSN 2598-3180 (Online)

JOURNAL OF MIDWIFERY

Research and Practice

Accredited by SINTA 4th

Article

Compliance with Standard Precautions among Midwives during the COVID-19 pandemic

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SUBMISSION TRACK

Received: January 28, 2021
Final Revision: June 09, 2021
Available Online: June 28, 2021

KEYWORDS

Personal protective equipment, hand washing; mask-wearing; midwife; COVID-19; pandemic

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ABSTRACT

Background: While the COVID-19 pandemic has spread across nations in significant terms, midwives who play a crucial role in offering maternal and child care amid the pandemic stand a high risk of being infected. Examining their level of compliance with the standard precautions amid the pandemic is important.

Purpose: To assess the level of compliance of midwives in Indonesia with Personal Protective Equipment (PPE) usage and hand washing.

Methods: In June 2020, an online cross-sectional survey was conducted on 1520 midwives in Indonesia during the early onset of the COVID-19 pandemic. Data were analyzed using Statistical Package for the Social Sciences version 26. Association between demographic variables and compliance with standard precautions was measured using Chi-square test.

Results: Approximately 74% of midwives used PPE and masks when outside while more than 40% of them did not always wash their hands after they touch an object outside home. A significant association was found between level of education (p =.001), region (p =.000) and mask usage. However, association between ethnicity and mask usage; region and handwashing were not significant.

Conclusion: Majority of the midwives in Indonesia complied with PPE usage, but majority did not adhere to hand washing. This highlights the need for appropriate interventions to improve compliance to standard precautions in a bid to curtail further

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spread of the pandemic.

I. INTRODUCTION

Severe acute respiratory syndromecoronavirus 2 (SARS-CoV-2), the highly transmissible coronavirus that caused the coronavirus disease 2019 (COVID-19) pandemic, has spread across nations at alarming rates. According to the World Health Organisation (WHO), as of 25 May 2021 the number of confirmed cases of the COVID-19 has reached more than 160,000,000, which constitutes more than 3,400,000 deaths (WHO, 2021). Moreover, the WHO (2021) estimated there have been more than 3,400,000 deaths due to the COVID-19 worldwide while in South-East Asia countries the cases were more than 380,000. In Indonesia, the death cases per May 2021 have been more than 49,000 cases (2.8%) (SATGASCOVID-19, 2021).

At the onset of the COVID-19 pandemic, some standard precautions were implemented to curtail the transmission. The WHO recommends mask wearing, hand hygiene, and social distancing in a bid to prevent the spread (WHO, 2020a). Similarly, the Centers for Disease Control and Prevention (CDC) continue to recommend wearing of masks, especially using non-valved multi-layer cloth masks (CDC, 2021). Also, a systematic review and meta-analysis revealed that usage of facemask can reduce the risk of respiratory virus infection by 80% (Liang et al., 2020).People with asymptomatic or pre-symptomatic of COVID-19 are more strongly advised to wear masks because these people have 50% of possibility to transmit the virus to other people (Johansson et al., 2021; Moghadas et al., 2020).

On October 15, 2020, the Global Handwashing Day, WHO observed that ten months into the pandemic, handwashing was one of the best defences against the virus (WHO, 2020b). Similarly, CDC recommended frequent handwashing for at least 20 seconds with soap and water or the usage of sanitizer with at least 60% alcohol where soap and water are not available (CDC, 2020a). Another preventive measure is social distancing, which is defined as an act of making a space physically between someone to others, at least 6 feets (CDC, 2020b). A study in South Korea discovered that practicing physical distancing can reduce the prevalence of vaccine-preventive diseases (VPDs) in a place which has adequate public health access as well as an immunization system. These VPDs are categorised as diseases which are mostly transmitted by small aqueous droplets by exhalation, including COVID-19 (Yun et al., 2021).

The pandemic has taken a huge toll on health workers globally. According to Adams and Walls (2020), Healthcare personnel (HCP) are at much greater risk of getting infected by the COVID-19. A systematic review reported that in the early stages of the pandemic, approximately 1,413 healthcare personnel died due to COVID-19 infection (Bandyopadhyay et al., 2020). Furthermore, in June 2020, it was reported that 12,454 health workers in the Asia Pacific region tested positive to COVID-19 (Anadolu Agency, 2020). Similarly, in January 2021, the lives of 647 health workers were claimed in Indonesia due to COVID-19 which the Indonesia Medical Association reported as highest in Asia (Anadolu Agency, 2021).

As midwives are at the forefront of rendering maternal and child care services during the COVID-19 pandemic, accessing their level of compliance to standard precautions is important. However, the evidence available is limited. To the best of our knowledge, this will be the first study in Indonesia that will assess the compliance of midwives to standard precautions during the early onset of the COVID-19 pandemic. This study aimed to assess the PPE, mask-wearing, and hand washing behaviour of midwives during the pandemic. Assessing the level of compliance to these precautions is crucial as this might help in designing interventions that can improve the compliance, hence improving midwifery care in

Indonesia which might culminate in reducing the maternal mortality rate which was 177 per 100,000 live births in 2017 (The World Bank, 2019).

II. METHODS

Study design

The study was a descriptive cross-sectional study. An online structured survey was used for data collection.

Study setting

The study was conducted in Indonesia. The country has 34 provinces with 270,20 million residences (Central Bureau of Statistics Indonesia, 2021). The MoH (2018) reported that there were 163,541 midwives across the country in 2018 yet Maternal Mortality Rates (MMR) remain high i.e. 305 per 100,000 live births in 2015 (MoH, 2020). This number is still far behind the target of the Sustainable Development Goals in 2030 i.e. less than 70 per 100,000 live births (WHO, 2021).

Participants

Participants comprised 1,520 midwives who are midwife practitioners and lecturers from 33 provinces in Indonesia. The inclusion criteria included midwives registered and licensed by the Midwifery Council of Indonesia and who are working in various facilities like autonomous midwifery practices, village midwife clinics, sub-district level health centers, community health centers, hospitals, and universities. The exclusion criteria include all student midwives that are yet to be licensed and other health professionals.

Data and Sample

Due to the prevailing situation of the COVID-19 lockdown when the study was conducted, the midwives were recruited from an online seminar on 27th June, 2020 through a convenience sampling technique. The survey was administered via the Google form. They were provided with an information sheet describing the study and explaining that they could opt-out at any time. Moreover, they were also provided with a consent form before they commenced the survey. Compliance with standard precautions for prevention of COVID-19 was measured using questions about PPE usage, facemask usage, and hand washing. The respondent size was 1520 midwives. There were seven missing data, hence there were 1513 included in the analysis.

Measures

The question about *PPE usage* included gloves, hand sanitiser, and mask when going out. *PPE-using* was scored (1) *Never* to (5) *Always*. The dependent variables for this study are the standard practices towards prevention of COVID-19, including masks-wearing, and hand washing. *Mask-wearing* was scored (1) *Never* to (7) *Every time*. *Hand washing* was scored (1) *Never* to (7) *Every time*. The independent variables are ethnicity and level of education. Ethnicity was scored (1) *Malay*; (2) *Batak*; (3) *Javanese*; (4) *Dayak*; (5) *Sundanese*; and (6) *Others*. The level of education's scale ranged from (1) *Diploma III or IV* to (4) *Doctoral degree*. With regard to the demographic variables, the respondents self-reported their occupation, last education, ethnicity, and region of residence.

Method of Data Analysis

Data analysis was conducted using descriptive and inferential statistics. Association between demographic variables and compliance with standard precautions was measured using Chi-

square analysis. A statistical significance level of 0.05 was assigned for all statistical analyses. Statistical Package for the Social Sciences (SPSS) version 26 was used for data analysis.

Ethical Consideration

Ethical approval for the survey was granted by the Ethics Committee of State Polytechnic of Health Malang Indonesia (#931/KEPK-POLKESMA/2020). The researchers adhered to the principles of conducting ethical research as stated in the Declaration of Helsinki (World Medical Association, 2018).

III. RESULT

Descriptive statistics

Education

Figure 1 shows that all the respondents are midwives with higher education. 19.6% (297) of the respondents had bachelor degree with honours, 1.9% (29) had a master degree, 0.2% (3) had a doctoral degree and 78.3% (1184) had diploma III or IV.

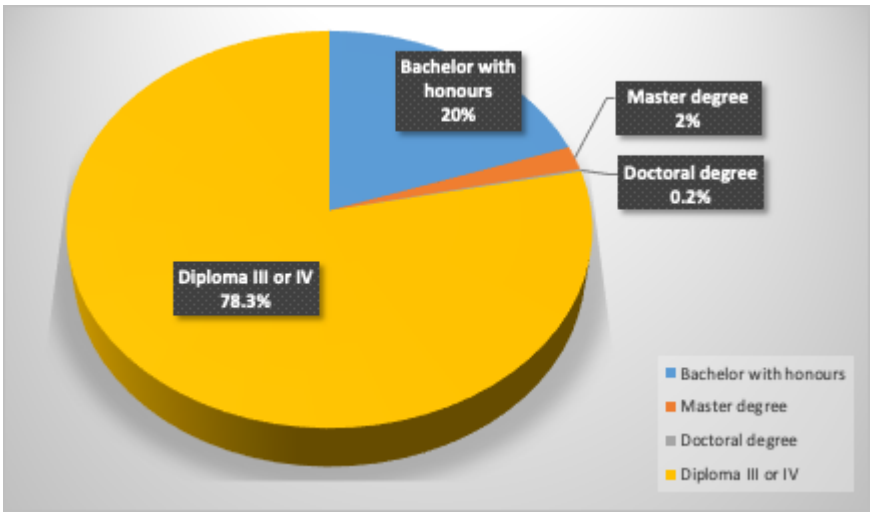

Figure 1. Level of highest education

Ethnicity

Table 1 shows that all respondents were Indonesian, which constituted 6.4% (97) of the respondents were Malay, 5% (75) were Batak, 55.5% (840) were Javanese, 1.2% (18) were Dayak, 9.7% (147) were Sundanese and 22.2% (336).

Region of Residence

Table 1 illustrates that most of the respondents were from the Java and Bali region (67%), followed by Sumatera (18.5%), Sulawesi (5.61%), Kalimantan (5.22%), Nusa Tenggara (2.37), and Papua (1.25) respectively.

Table 1. Descriptive statistics

Variables for consideration	Respondents in this study; N=1513	
	Freq (n)	Percentage (%)
1. Highest level of education		
Bachelor with honors	297	19.6
Master degree	29	1.9
Doctoral degree	3	0.2
Diploma III or IV	1184	78.3
2. Race or Ethnicity		
Malay	97	6.4
Batak	75	5.0
Javanese	840	55.5
Dayak	18	1.2
Sundanese	147	9.7
Others	336	22.2
3. Region of residence		
Java and Bali	1015	67.0
Sumatera	279	18.5
Sulawesi	85	5.61
Kalimantan	79	5.22
Nusa Tenggara	36	2.37
Papua	19	1.25
4. Frequency of wearing PPE		
Never	3	0.2
Rarely	18	1.2
Sometimes	64	4.2
Often	310	20.5
Always	1118	73.9
5. Frequency of wearing a mask outside the home		
Never	1	0.1
Rarely	1	0.1
Occasionally	9	0.6
Sometimes	13	0.9
Frequently	34	2.2
Usually	340	22.5
Every time	1115	73.7

PPE and Mask-wearing

Table 1 shows that approximately 74% of the midwives wear PPE including using gloves, hand sanitiser, and masks. Regarding masks-wearing, approximately 74% of the midwives wear masks when outside frequently (90% of the time or above) while approximately 25% of the respondents wash their hands less frequently. Nevertheless, only approximately 45.2% of midwives who always wash their hands for at least 20 seconds after touching objects outside home. In general, this suggests that the majority of the midwives in Indonesia adhere to PPE-wearing, however, many of them do not comply with hand washing.

Bivariate Analysis

The relationship between education level and mask wearing

Table 2. The relationship between education level and masks-wearing

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	41.135[a]	18	.001
Likelihood Ratio	11.761	18	.859
Linear-by-Linear Association	.217	1	.641
N of Valid Cases	1513		

The association is statistically significant as p value ≤ 0.05, $p = 0.001$, $df = 18$, and $X^2 = 41.13$. Therefore, the null hypothesis is rejected and thus restated as; there is a significant relationship between the respondent's highest level of education and the frequency of wearing a mask outside the home.

The relationship between ethnicity and masks-wearing

Table 3. The relationship between ethnicity and masks-wearing

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39.224[a]	30	.121
Likelihood Ratio	40.575	30	.094
Linear-by-Linear Association	.857	1	.354
N of Valid Cases	1513		

The association is not statistically significant as p value ≥ 0.05, $p = 0.121$, $df = 30$, and $X^2 = 39.22$. Therefore, the null hypothesis is accepted, hence, there is no significant relationship between the race or ethnicity of the respondents and the frequency of wearing a mask outside the home.

The relationship between region and masks-wearing

Table 4. The relationship between region and masks-wearing

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	338.016[a]	30	.000
Likelihood Ratio	115.351	30	1.000
Linear-by-Linear Association	.209	1	.647
N of Valid Cases	1513		

The association is statistically significant at p value ≤ 0.05, p = 0.000, df = 30, and X^2 = 338.0. Therefore, the null hypothesis is rejected and thus restated as; there is a significant relationship between the respondent's region and frequency of wearing a mask outside the home.

The relationship between region and hand-washing

Table 4. The relationship between region and hand-washing

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	210.301[a]	30	.174
Likelihood Ratio	195.384	30	.419
Linear-by-Linear Association	5.055	1	.025
N of Valid Cases	1513		

The association is statistically significant at p value ≥ 0.05, p = 0.174, df = 30, and X^2 = 210.3. Therefore, the null hypothesis is accepted and thus restated as; there is no significant relationship between respondent's region and the frequency of hand washing for 20 seconds or more after touching objects outside the home

IV. DISCUSSION

This study provides an insight into the compliance of midwives with standard precautions during the early onset of the COVID-19 pandemic in Indonesia. Studying the compliance of midwives to standard precautions during the pandemic is important as they occupy a crucial position in rendering maternal and child care during the pandemic even as current evidence shows that midwifery care is the most effective and efficient way to reduce maternal and neonatal mortality (Renfrew et al., 2014; Utz & Halim, 2015; WHO, 2020a).

In this study, we found a high frequency of usage of PPE among midwives as 73.9% always use PPE and 20.5% often use it. This is in consonance with the finding of Izhar et al. (2021) among midwives and obstetricians in Pakistan where 78.8% of the respondents had good practices regarding usage of PPE. Given the delicate nature of midwifery care, PPE should be used by midwives always and not sometimes as reported by 64 midwives and rarely as reported by 18 midwives in this study. Furthermore, PPE should be available for the usage of midwives just as a qualitative study conducted by González-Timoneda et al. (2020) among midwives in two Spanish hospitals revealed that midwives complained of non-availability of enough PPEs to work with.

This study reveals a high frequency of wearing masks outside the home among midwives as 73.7% wear masks every time and 22.5% wear masks usually. Wearing masks is important as several studies revealed that persons presymptomatic or asymptomatic of the COVID-19 can spread the virus. Like other respiratory pathogens, the COVID-19 virus spreads through aerosol droplets from coughing and sneezing (Cascella et al., 2021; Rothan and Byrareddy, 2020). In general, the incubation period for the Covid-19 virus is within 3 to 7 days, but could last as long as 14 or more days (Lai et al., 2020).

On the educational level, 78.3% of the respondents had diploma III or IV. Currently, the educational trajectory of midwives in Indonesia ranges from Diploma I to master's degree. This includes Diploma I, Diploma III, Diploma IV, Bachelor with honours, and master of Midwifery. There is no doctoral degree in midwifery for Indonesian midwives at the moment, hence, interested midwives offer health-related doctoral programs. The Indonesian Midwives Association (2018) reported that as of 2018 there had been 32 institutions offering bachelor with honours programs across the country.

A large percentage of midwives (73.7%) reported wearing a facemask always outside the home and 22.5% reported wearing a face mask usually. This shows a high level of compliance of midwives to face mask usage. Also, a significant association was found between the highest level of education and the frequency of wearing a mask outside the home (p=.001). This was in tandem with the finding of Fashafsheh et al. (2016) among midwives and nurses in a Palestinian hospital before the pandemic where a significant association was found between the level of education and the frequency of usage of face masks. Similarly, during the pandemic, a study among health workers in Ethiopia found a significant association between proper utilization of facemask and the level of education (Tadesse et al., 2020). This was corroborated by a study in Ghana that found lower compliance with PPE usage among health workers with only a secondary level of education (Ashinyo et al., 2021).

This study revealed no significant association between ethnicity and usage of facemask (p = 0.121). This was unlike the finding of Hearne and Niño (2021) who observed from a national survey that different races- Black, Latino and Asian respondents- were likely to report using facemask in response to COVID-19 than white respondents. Similarly, a Gallup poll reported that white people are 30% less likely to use facemask outside than people of colour (Gallup, 2020). However, there was a significant association between region and facemask usage in this study (p =.000). This might be because midwives in this study were more from Java and Bali, and they were more educated than other regions even as this study found a significant association between level of education and mask wearing (p=.001).

Wearing a mask itself inadequately stops the transmission of and protects the populace from COVID-19, hence, people should also do other measures namely physical distancing, keeping rooms well ventilated, avoiding crowds, cleaning your hands, and coughing into a bent elbow or tissue. Moreover, the WHO (2020) advised to keep being updated on the local guidance. Wang et al. (2020) suggested other three strategies regarding masks, which include ensuring the quantity of masks, enhancing people's understanding about masks waste management, and finally advancing the mask.

The frequency of washing the hands after touching objects outside the home in this study was not satisfactory as only 45.2% of the midwives wash their hands every time when they touch objects outside the home. This was in line with the findings of Ashinyo et al. (2021) who found that compliance with hand hygiene was significantly lower in midwives and pharmacists than registered nurses. Given the delicate nature of the care rendered by midwives to mothers and the possibility of transmission of COVID-19 to neonates when they contact confirmed cases (Lotfinejad et al., 2020), it becomes imperative for more midwives and all health professionals to take more precautionary measures as it relates to regular hand washing following the recommended guideline for handwashing.

In order to support and bolster the prevention programs during the COVID-19 pandemic, it is suggested that Health systems consider creative alternatives, including an investment in some crucial sectors, such as information technology and personnel. After the pandemic, significant resources need to be invested to improve and sustain infection prevention infrastructures from the local to the national level. Moreover, other important considerations are to have training and expand the infection prevention workforce (Stevens et al., 2020).

Strengths and Limitations

A large and diverse midwife population that covered all the provinces in Indonesia was included in the study which provides a useful insight into some standard precaution practices by midwives during the early onset of the pandemic in Indonesia. However, the study has some limitations. Only three standard precautions (face mask usage, handwashing and PPE usage) were assessed in this study. Focusing on other precautionary measures that were not covered in this study will give a more detailed insight into the standard precaution practices by midwives. Similarly, the

procedure of wearing the mask or hand hygiene was not observed and as practices were self-reported, it might have been subjected to social desirability response bias. These should be noted when interpreting the results.

V. CONCLUSION

The majority of midwives in Indonesia had good practices in wearing PPE, however, more than half of them did not comply with hand washing. Moreover, there is a relationship between the level of education of midwives and mask-wearing. It is important to improve the adherence of the COVID-19 measures among midwives in response to the reduction of the risk of the COVID-19 transmission.

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