

Adherence to face mask and social distancing among residents in Medan during the COVID-19 pandemics



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ABSTRACT

Introduction: Face mask is mandatory during the Covid-19 Pandemics as personal protection and limits the virus transmission in the community. The government of Indonesia has issued regulations regarding face masks and social distancing in the community. Due to that, it is important to explore the adherence to face masks and social distancing. This study aimed to assess communities' adherence to face masks and social distancing and the associated factors in Medan.

Methods: A cross-sectional study was conducted in Medan, Indonesia, in November 2020. A total of 572 residents were enrolled using a convenience - multistage sampling method from public spaces. Data were collected using direct observation.

Results: Most subjects were women (55.1%) from the adults' age group (61.9%). Only 34.3% of the subjects wore face masks properly, and only 10.6% maintained social distancing. The most common face mask used was a cloth mask (25.8%). Women and older age tended to use face mask compared. The prevalence of face mask use is significantly higher with strict regulation and control ($p=0.0001$). We also found a correlation between the type of face mask and adherence ($p=0.0001$).

Conclusions: We found that the adherence to face masks and social distancing was low in Medan. Therefore, it is very important to initiate interventions to foster face mask adherence in a community in Medan.

Keywords: COVID-19, public adherence, face mask, social distancing.

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INTRODUCTION

Coronavirus disease 19 (COVID-19) is an infectious disease caused by an RNA virus, named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).¹ Similar to other respiratory infection viruses, this virus spreads mainly through close contact, from respiratory droplets and aerosol that was emitted when someone was coughing, sneezing, or even speaking.² Moreover, to this date, viral RNA has been found in air sampling.³

Compared to SARS-CoV-1, SARS-CoV-2 was embedded in the upper respiratory tract.⁴ The incubation period is varied, started from three days up to twelve days.⁵ During the presymptomatic period, a viable virus was found in the respiratory tract with a similar viral load to the symptomatic period. In other words, during the incubation period without any symptom, the patients have the potency to transmit this virus to

others.⁶ It is not surprising to see the rapid surge of this virus. First reported in China on December 2019,⁷ this virus had already infected more than 100,000,000 people more in 200 countries with more than 2,500,000 confirmed death in late February 2021.⁸

The main principle of therapy for this disease is supportive and symptomatic since, to this date, there is no specific and effective therapy for this virus.⁹ Due to that, preventive measures, such as social distancing, face masks, and handwashing, play a notable role in managing this disease, especially in the community setting.¹⁰ Currently, evidence is accumulating to support face masks and social distancing to mitigate the virus transmission in the community. A meta-analysis conducted by Li et al. showed an association between masks and significantly reduced risk of COVID-19 (OR=0.38; 95% CI 0.21-0.69).¹¹ Furthermore, in Germany, it is said

that mask regulation could reduce the rate of daily new cases up to 47%.¹²

The World Health Organization recommends that all people wear a non-valve face mask in indoor or outdoor settings where physical distancing cannot be maintained.¹³ As of September 2020, about 95% of the world population lived in countries that recommend face mask usage in the community setting.¹⁴ The government of Indonesia also has mandated all the citizens to use face masks in the community setting, either indoor or outdoor, along with social distancing and hand hygiene.¹⁵

Given the facts and regulations above, preventive measures are essential in controlling COVID-19 in a community setting. Thus the recent study was conducted to describe the social adherence to face masks and social distancing and explore the associated factors contributing to the public's adherence in Medan, North

Sumatera, Indonesia.

METHODS

Study Settings and Period

This study was conducted in Medan, North Sumatera, Indonesia. Medan is a gateway to the western part of Indonesia. The Medan metropolitan area is the largest metropolitan area outside Java Island, with over 4.2 million in the 2011 census. This study was carried out in November 2020, when this area was stated as a “red zone” for COVID-19.

Procedure

This research was a cross sectional study to explore mask adherence in Medan. Direct observation in public places such as traditional markets, public parks, malls, schools, and public health centers was carried out to all citizens aged more than two years old. The subjects were selected using the multistage convenience sampling method. The observation was performed by trained observers in a minimal time of three minutes. Subjects were excluded if (1) their faces were fully covered so that observation could not be done and (2) inadequate exposure time so that the appropriate information could not be achieved.

Measures

The research tool included a google form regarding (1) demographic data (gender and estimated age group); (2) type of mask (“scuba mask,” cloth mask, surgical mask, or N-95 mask); (3) mask usage (correct, nose/mouth uncovered, chin/ear hang, or no mask at all); (4) social distancing > 1 m; (5) face shield usage and (5) mask regulation (strict, suggested, or not regulated).

Statistical Analysis

The completed forms were extracted from the server of google form and exported to a spreadsheet (Microsoft PowerPoint for Mac v. 16), and analyzed statistically using R studio v. 4.0.1 (R. Studio Inc, Boston, MA). Categorical data were presented in frequency and percentage. The Chi-square test was used to assess the association between categorical variables.

Table 1. Sociodemographic Characteristics of the Samples.

Characteristics	n (%)
Sex	
Male	257 (44.9)
Female	315 (55.1)
Estimated Age Group	
Children	49 (8.5)
Adolescence	135 (23.7)
Adult	353 (61.9)
Elder	35 (5.9)

Table 2. Adherence to Face Mask and Social Distancing

Characteristics	n (%)
Mask Type	
Scuba	97 (16.9)
Cloth Mask	163 (28.4)
Surgical Mask	147 (25.8)
N-95	5 (0.8)
Mask Usage	
Correct	196 (34.4)
Nose/ Mouth Uncovered	114 (19.9)
Ear Hang/ Chin	102 (17.8)
No mask at all	160 (28)
Social Distancing	
Yes	61 (10.6)
No	511 (89.4)
Face Shield	
Yes	10 (1.7)
No	562 (98.3)
Face Mask Regulation	
Strict Regulation	131 (22.9)
Suggestion	392 (68.7)
No Regulation	49 (8.4)

RESULT

Socio-demographic Characteristics

Five hundred and seventy-two participants were involved in this research. Most of them were women (n=315, 55.1%) from the adult age group (n=353, 61.9%, [Table 1](#)).

Adherence to Face Mask and Social Distancing

The most common face mask used by participants was cloth masks (n=163, 28.4%), followed by surgical masks (n=147, 25.8%). Most participants (n=216, 37.7%) did not use the face mask correctly. Instead, only 34.4% of all participants wore face masks correctly, and 28% of participants did not wear masks at all. Only 10.6% of subjects maintained social distancing in public places, and 1.7% of subjects wore

face shields. Most of the participants were observed in places where masks were only suggested (n=392; 68.7%). Only 22.9% of participants were observed in places with strict regulations. There was still 8.5% among the participants was observed in places with no mask regulation at all ([Table 2](#)).

Factors Associated with Face Mask Adherence

Regarding sex, we found larger proportion of female wore face mask properly (48.2%) compared to men (28.8%), eventhough there was no significant association (p=0.223, [Table 3](#)). Relating to age group, we observed that elderly (42.9%) tended to wear face mask more properly compared to other age groups. In contrast, most of the participants in children age group

Table 3. Factors Associated with Mask Adherence

	Correct	Nose/Mouth Uncovered	Ear Hang/Chin	No mask	p
Gender					
Male (n=257)	74 (28.8)	55 (21.4)	56 (21.8)	72 (28.01)	0.223
Female (n=315)	124 (48.24)	56 (17.7)	48 (15.2)	87 (27.5)	
Age group					
Children (n=49)	13 (26.5)	7 (14.3)	12 (24.5)	17 (34.7)	0.155
Adolescence (n=134)	45 (33.6)	15 (11.2)	28 (20.9)	46 (34.3)	
Adult (n=354)	123 (34.74)	78 (22.0)	61 (17.2)	92 (26)	
Elder (n=35)	15 (42.9)	15 (42.9)	0 (0)	5 (14.3)	
Mask Type					
Scuba (n=97)	27 (27.8)	36 (37.1)	34 (35.1)		0.0001*
Cloth Mask (n=163)	75 (46.0)	54 (33.1)	34 (20.9)		
Surgical Mask (n=147)	90 (61.2)	24 (16.3)	33 (22.5)		
N-95 (n=5)	5 (100)	0 (0)	0 (0)		
Regulation					
Strict (n=131)	80 (61.1)	39 (29.8)	12 (9.1)	0 (0)	0.0001*
Suggested (n=392)	116 (29.6)	46 (11.7)	85 (21.7)	145 (37)	
No regulation (n=49)	0 (0)	29 (59.2)	5 (10.2)	15 (30.6)	

*significant; Chi-square test

wore no face mask at all (34.7%). Even so, mask adherence and age group had no significant association ($p=0.155$, Table 3).

We found a significant association between mask adherence and type of the mask ($p=0.0001$). All of the participants who used the N-95 mask wore it correctly. More than half participants who used surgical mask (61.2%) wore it properly. Contrasting to that, only 27.8% scuba mask users and 46% cloth mask users wore their masks properly (Table 3). We also found a significant correlation between mask adherence and regulation. In place with strict regulation, none of the participants did not wear the face mask at all. Most of the participants (61.1%) wore the face mask properly. Contrary to that, 30.6% and 37% of participants did not wear face mask at all in places with no mask regulation and places where mask were only suggested, respectively. Not surprising, we found no participants wore face mask properly in places with no mask regulation (Table 3).

DISCUSSION

The ongoing COVID-19 pandemic has notably changed our behavior in the community. Many preventive measures, such as personal hygiene (hand hygiene, face mask), social distancing (stay at

home), and frequent disinfection are recommended to reduce the transmission rate of COVID-19. Even these preventive measures are supported by scientists, healthcare workers, and governments, a notable part of the community still shows unwillingness to accept. This ongoing opposition has raised the term "COVIDiots" that expressed frustration over the doubtfulness of science.¹⁶ The same situation was clearly seen in our first finding. Only 34.4% participants wore face mask correctly, 37.7% participants wore face masks improperly, and the rest 28% participants did not wear face mask at all. Several previous surveys had reported that face mask adherence in Indonesia was between 80-90%.^{17,18} The main explanation for this difference is the method to obtain data. Both of the surveys used online questionnaire, not direct observation as our research. Same contrast was also reported by Arp et al (2020), who found that face mask adherence was much lower indirect observational study compared to online survey.¹⁹

In this research, women tended to be more adherent to face mask than men. Women consider COVID-19 as a very serious health problem more than men do. Consistent with that, women show better compliance to preventive measures than men. By doing simple behavior

like wearing face masks, women are less prone to infect others or get infected by this disease.²⁰ A different public message based on gender may be needed to foster adherence among men.²¹

We found that people can mask adherence in the older population compared to the younger age group. This finding was reassuring, as mortality in older age is higher than in the young adult.²² Same finding was also obtained by previous research. Moore et al. (2020) reported that young age group demonstrated the lowest adherence to preventive measure of COVID-19 compared to the older age group.²³ Older adults understood the risk of COVID-19 better than the young age.²⁴ Moral foundation is relevant to explain this finding. There is evidence that age estimates moral foundation, with loyalty and collectivistic are more relevant for older than younger age group. These foundations are crucial to promote adherence.²⁵

In our research, regulation was significantly associated with face mask adherence. Regulations are typical case of extrinsic elements that promote the generation of controlled motivation. According to the integrated model of self-determination theory, controlled motivation would foster people to adhere to the advisory in a short time, but they are

prone to nonadherence in the long period of time compared to people who have internal autonomous motivation.²⁶ Segal et al (2021) had shown a strong relationship between adherence to COVID-19 health guideline with fear and anxiety to COVID-19. Controlled motivation along with anxiety will compromise mental health.²⁷ Fines and punishment also may give little contribution to foster compliance.²⁵ So that, government should not only rely on strict regulation, but also on basic individual psychological requirement to encourage autonomous rationale of COVID-19 prevention.

We also observed low compliance of social distancing in Medan. As reported by Hoeben et al (2021), compliance with social distancing is short lived. There is a strong correlation between the number of people on the street and number of social distancing disobedience.²⁸ In slum area, social distancing is said just to be a desire that is almost impossible to achieve.²⁹ Even though our observation was not carried in slum area, Medan lacks proper public space, compared to the population.^{30,31} Stay at home policy might be better for such a state like this.

The main limitations of our study are the nature of cross-sectional design and convenience sampling method. Besides, estimated age group and gender could be inaccurately categorized. Even more, we did not explore inter-rater reliability before doing this observation.

In conclusion, we found that face mask adherence was low in Medan, Indonesia. Face mask adherence was significantly associated with face mask type and regulation. These results urge the necessity to initiate interventions to foster face mask adherence in a community in Medan.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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ETHICAL CONSIDERATION

This study has been approved by Ethical Committee Universitas Sumatera Utara (No. 127/KEP/USU/2021). All procedures in this study are in accordance with the Helsinki Declaration of human rights.

AUTHOR CONTRIBUTIONS

AMPS, DAD, and MRN designed the methodology. HPL and MPL were the project administrator. AMPS was responsible for statistical analysis and writing the original draft. All authors had reviewed the final version of the manuscript.

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