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Abstract: ***Background:*** Face masks were considered as an effective method of preventing respiratory infections like COVID-19 infection. Identifying knowledge, attitudes, and beliefs of societies regarding face mask utilization is very important to identify gaps and intervene immediately to control the spread of the infection. Hence, the main purpose of this study was to determine the general public's knowledge, attitude, and beliefs of proper face mask utilization in Maros districts, South Sulawesi, Indonesia. ***Methods:*** This is an across-sectional, quantitative approach study was conducted from December 2020 to February 2021. The study covered 138 adults (aged >18 years old). Data were collected using a self-reported questionnaire with yes/no questions, adopted from different studies. The analysis was used SPSS version 26. A crosstab analysis (chi-square test) was used to measure the association between the predictors and outcome variable. Statistical significance was declared at *p-value* < 0.001. ***Results:*** The study showed that the overall good knowledge, positive attitude, and beliefs of the societies towards compliance of face mask utilization were only 30 (21.7%), 21 (15.2%), and 30 (21.7%), respectively. In addition, incompliances of wearing mask was associated with low knowledge, negative attitude and negative beliefs with *P-value* <0.001. ***Conclusions:*** In this study, the level of knowledge, attitude and beliefs towards face mask utilization was relatively low, and the level of proper face mask utilization was quite low in comparison with some studies. Comprehensive training about a face mask that focuses on its proper use should be designed and given by the authorities to general public in order to prevent and controlling COVID-19 cases.

Keywords: Attitude; Beliefs; Covid-19; Knowledge; Masks.

BACKGROUND

The novel coronavirus disease 2019 or COVID-19 has become a critical public health challenge worldwide. An outbreak of COVID-19 was first occurred in Wuhan (Hubei, China) at the end of 2019, and subsequently spread to more than 200 countries. Recently, in 14th of March 2021 there were over 118,754,336 confirmed cases and approximately 2,634,370 confirmed deaths worldwide (WHO. 2021 a). In Indonesia the first case of COVID-19 was confirmed in 20th of March 2020 involving two citizens. As of 14th of March 2021, Indonesia has recorded 1,410,134 positive cases involving 38,229 deaths (WHO. 2021 b).

Despite the fact that vaccination has been clinically proven to be effective and is recommended by the World Health Organization (WHO) (Hodgson, S. H. *et al.*, 2021). vaccination is only given to healthcare workers in Indonesia and not to the general public. According to recent studies highlighting how individual behaviours can dramatically reduce COVID-19 morbidity and mortality rates (Lee, M., & You, M. 2020). It is possible to control the spread of the disease when people collectively engage in preventive behaviours, such as practicing personal hygiene, face mask utilization and maintaining social distance (Anderson, R. M. *et al.*, 2020; & Ferguson, N. *et al.*, 2020). Further, face masks are widely regarded as a safe and effective way to protect the general public from respiratory infections. Face masks were also described by the majority of people as the "only" and "best protection" method available and inexpensive to protect general populations from respiratory infections or COVID-19 (Lepelletier, D. *et al.*, 2020). Furthermore, WHO and the Centres for Disease Control and Prevention (CDC) strongly recommend the use of face masks (including medical and cloth masks) as a standard for transmission-based safety measures, and a systematic review study has also approved it (Lepelletier, D. *et al.*, 2020; & Santos, M. *et al.*, 2020).

The Ministry of Health of the Republic of Indonesia implemented strict prevention methods in all cities to reduce the spread of COVID-19 among community. However, it appears that regulations aimed at preventing and controlling COVID-19 cases are limited to cities or large areas. This demonstrates a lack of consideration in rural societies when it comes to preventing and controlling COVID-19 cases. When it comes to public health interventions and policies that aim to protect everyone's health, vulnerable populations such as people in rural area also should be prioritized (Olivia, S. *et al.*, 2020).

It's also worth noting that the COVID-19 burden may be exacerbated by existing non-communicable diseases among marginalized social groups, particularly those in minority ethnic groups, socioeconomic deprivation, and poverty, making the population more vulnerable overall (Bambra, C. *et al.*, 2020; Chen, J., & Krieger, N. 2020; & Singer, M. 2009). COVID-19 related behavioural factors are also unequally distributed among people (Lee, L. Y. K. *et al.*, 2020). Males, the less educated, and the elderly had lower COVID-19 knowledge and behaviours than their counterparts, according to studies (Lau, L. L. *et al.*, 2020), and risk perception varied depending on the level of social support (Lee, M., & You, M. 2020). Given these alarming disparities in behavioural factors, identifying vulnerable populations during the COVID-19 pandemic is critical to ensuring health education and communication interventions tailored to their needs.

Prior research on infectious disease epidemics has shown that knowledge and awareness (Lin, L. *et al.*, 2014; & Aburto, N. J. *et al.*, 2010) risk perception (Anderson, R. M. *et al.*, 2020; & Aburto, N. J. *et al.*, 2010) and efficacy belief (Lee, M., & You, M. 2020) all aid in motivating people to take preventive measures. Recent research on COVID-19 has found that knowledge (Azlan, A. A. *et al.*, 2020; Saefi, M. *et al.*, 2020; & Honarvar, B. *et al.*, 2020) perceived controllability (Azlan, A. A. *et al.*, 2020; & Zhong, B. L. *et al.*, 2020), optimistic beliefs (Saefi, M. *et al.*, 2020; & Zhong, B. L. *et al.*, 2020), emotion (Saefi, M. *et al.*, 2020), and risk perception (Honarvar, B. *et al.*, 2020) may all play a role in public safety precautions. Several KAP and belief studies have looked at the links between knowledge and attitudes or practices beyond determining their prevalence. Previous research has found that a higher level of knowledge is associated with the use of preventive measures (Lau, L. L. *et al.*, 2020; Papagiannis, D. *et al.*, 2020; Alrubaiee, G. G. *et al.*, 2020; & Tamang, N. *et al.*, 2020), and thatattitudes are also associated with preventive behaviours (Papagiannis, D. *et al.*, 2020; Alrubaiee, G. G. *et al.*, 2020; & Tamang, N. *et al.*, 2020). However, the majority of these studies focused on the impact of knowledge on the adoption of preventive behaviours in general populations in large cities. There has been very little research done on these issues among people in rural areas.

In addition, there is limited evidence concerning behavioural factors of face mask utilization during the COVID-19 pandemic in Indonesia. The present study addresses whether the public performs precautionary behaviours recommended by the national guideline and behavioural interventions, which focusing on the regulation of wearing face mask. Hence, this study specifically aims to 1) investigates he level of knowledge, attitudes and beliefs toward COVID-19, 2) explores how knowledge, attitudes and beliefs influences practices of general public in a rural district to wear face masks. This study may help the Indonesia government or stakeholder to take important prevention measures to limit the transmission of COVID-19 by developing a guideline on the urgency to use the face mask for community rural area. It is also expected to help researchers use it as a base and/or source to do further and wider research exploration on this issue. Implications for developing and implementing evidence-based health behaviour interventions and policies during the COVID-19 pandemic are also discussed in this paper.

METHODS

Study Design, ethics and measurements

This is a cross-sectional study and primary data were collected using a survey questionnaire. The data collection was conducted in Bontoa District, Maros, South Sulawesi, Indonesia, during December 2020 to January 2021. The consent forms were given to all respondents before they filled the questionnaire (self-administrated). This research was ethically approved by Research Ethic Department, Universitas Muslim Indonesia, Makassar, Indonesia.

The knowledge, attitudes, beliefs and the outcome were measured with 10 questions (yes or no questions) for each variables. The questions about COVID-19 issues, as well as prevention and controlling COVID-19.

Inclusion and exclusion criteria

For participating in this research there were several inclusion criteria that the respondents should meet; 1) the citizens of Bontoa District, 2) adults (> 18 years old), 3) willing to participated. Exclusion criteria; 1) illiterate, 2) do not willing to participate.

Sample Size and sampling

The population in this study was all citizens in Bontoa District, Indonesia with total 2.354 citizens (data from Central Bureau of Statistics, 2019). For total 138 respondents participated in this study and the *Lemeshow* formula was used for sample determination.

Statistical Analysis

Univariate analysis was used to determine the frequency and the total number of the respondent characteristic and the variables. In addition, for bivariate analysis was used cross-tabulation (chi-

square) to determine the association of the explanatory variables (knowledge, attitude and beliefs) with the outcome variables (compliance of face mask utilization). IBM SPSS version 26 computer software package was used to analyses the data.

RESULTS

Table 1. The Characteristic of respondent (N= 138)

Variable	n	%
Age (years)		
17 – 25	43	31.2
26 – 35	56	40.6
36 – 45	39	28.2
Sex		
Female	74	53.6
Male	64	46.4
Occupation		
Civil Servant	35	25.4
Entrepreneurs	54	39.1
House wife	49	35.5
Knowledge		
Sufficient	30	21.7
Insufficient	108	78.3
Attitudes		
Positive	21	15.2
Negative	117	84.8
Beliefs		
Positive	30	21.7
Negative	108	78.3
Compliance		
Positive	26	18.8
Negative	112	81.2

Source: Primary Data, 2021

The characteristic of respondents reveals that 56 (40.6%) of participants in aged group of 26-35 years old, 43 respondents (30.2 %) were 17-25 years old, and 39 respondents (28.2%) of the age group 36-45 years old. For the sex characteristics, it showed that the frequency of female and male were almost equal respectively 74 (53.6%) and 64 (46.4%). In regards of the occupations, 35 (25.4%) were working as civil servant, 54 (39.1%) as entrepreneurs, and 49 (35.5%) as house wife.

There were 108 respondents (78.3%) reported had insufficient knowledge, and only 30 respondents (21.7%) reported had good knowledge. For the attitudes, 117 participants (84.8%) were reported had negative attitude and only 21 participants (15.2%) reported had positive attitude. Regarding beliefs, only 30 respondents (21.7%) had positive beliefs and 108 respondents (78.3%) had negative beliefs. In addition, for the compliance in wearing appropriate face mask showed that only 26 participants (18.8%) had good compliance and there were 112 participants (81.2%) reported did not obey the rule of wearing face masks during COVID-19 outbreak.

Table 2. The Association of Knowledge, Attitude and Beliefs on the Compliance of Wearing Face Mask

Variables	Compliance of Wearing Face Mask						*P-Value*
	Yes		No		Total		
	n	%	n	%	n	%	
Knowledge							
Sufficient	18	13,0	12	8,7	30	21,7	0.001
Insufficient	8	5,8	100	72,5	108	78,3	
Attitudes							
Positive	8	5,8	13	9,4	21	15,2	0.001
Negative	18	13,0	99	71,7	117	84,8	
Beliefs							
Positive	18	13,0	12	8,7	30	21,7	0.001
Negative	8	5,8	100	72,5	108	78,3	

Source: *Primary Data, 2021*

The table depicts that from 108 participant (78.3%) who had insufficient knowledge about COVID-19, 100 participants (72.3%) did not wearing face mask. While, among 30 participants (21.7%) there were 18 participants (13%) had sufficient knowledge wearing face masks, this comparison showed significant difference with p-value >0.001.

In regards of attitudes demonstrated among 117 participants (84.8%) had negative attitudes towards COVID-19 issue, there were 99 respondents (71.7%) did not obey the face mask utilization, while from 21 participants (15.2%) who had positive attitude, 8 respondents (5.8%) wearing face masks, this comparison showed a significant differences with p-value >0.001.

In addition, among 108 participants (78.3%) who had negative beliefs, 100 respondents (72.5%) did not wearing masks. Compare to among 30 (21.7%) participants had positive beliefs there were 18 respondents (13%) were wearing face masks, this comparison showed a significant differences with p-value >0.001.

DISCUSSION

COVID-19 is a relatively new virus that has already catastrophic in the short time since its discovery in December 2019. Currently, there has been little published data on population knowledge, attitudes, and beliefs regarding the compliance of face mask utilization as an effort to prevent and control the spread of COVID-19, particularly in Indonesia. The novelty of this disease, along with its uncertainties, make it critical for health authorities to plan appropriate strategies to manage the public to obey the regulation of face mask utilization. It is therefore of utmost importance that the knowledge, attitudes and belief of the population be studied to guide these efforts. The face mask, regardless of its type, setting, or who wears it, serves a dual preventive purpose: protecting oneself from viral infection while also protecting others. As a result, if everyone in public wears a face mask, there is a double barrier against COVID-19 transmission (Abboah-Offei, M. *et al.,* 2021).

Further, in order to increase compliance of the people for wearing face mask, every person should have an intimate of knowledge of COVID-19 and face mask functions. The average knowledge score of Indonesian in rural area in regards to COVID-19 was very low with overall correct rate of 21.7% had good knowledge. Despite this, correct COVID-19 knowledge rates varied widely, indicating that while some participants had extensive knowledge of the disease and how to use the face mask, others did not. This low in levels of knowledge may be reflective of the current COVID-19 information landscape in the country especially in rural area. Despite the fact that health officials have consistently disseminated COVID-19 information since the disease was first discovered in Indonesia, there has been an increase in false and inaccurate information, especially in rural area they are lack of information because of the technology barriers. That most of the information by ministry of health disseminated on the internet, TV, radio and poster (that more common in the city area). The overload of information may have caused confusion and difficulty ascertaining correct information (Azlan, A. A. *et al.*, 2020). Several studies in other Asian countries have found that the general population has a high level of COVID-19 knowledge (Zhong, B. L. *et al.*, 2020). Due to differences in measurement and scoring systems, accurate comparisons of knowledge levels across these studies are impossible.

The present study found that a large majority of participants held negative attitudes toward overcoming COVID-19 and face mask function. 8 out of 136 participants agreed that face masks would be successfully controlled COVID-19. In contrast, approximately nine out of ten participants were confident that Indonesia would be able to win its battle against the virus and that the Indonesian government was handling the health crisis very well (Azlan, A. A. *et al.*, 2020). As well as, high levels of positive attitudes were also detected in the KAP study conducted in China (Zhong, B. L. *et al.*, 2020). The authors attributed the positive attitudes to the Chinese and Indonesian governments because of the strict regulation to combat the spread viruses. In Indonesia, not strict implementation or action taken by the Indonesia government in enforcing the face mask utilization may have also contributed to these negative attitudes. Addition, the lack of health literacy among people in rural area and massive incorrect information on social media may have also contributed to these negative attitudes.

In this study, the majority of participants reported taking precautions such as avoiding crowded places and practicing proper hand hygiene in the week leading up to the implementation of the face mask regulation. This indicates that participants are generally willing to change their behaviour in the face of the COVID-19 pandemic. The week leading up to the face mask regulation's implementation fell during Indonesia's school holidays, which are a popular time for family vacations and gatherings such as weddings. Those over the age of 25 were also more likely to attend daily religious gatherings such as mosque prayers. Cultural norms, particularly among adults, may have influenced the decision to attend these gatherings despite the health risks.

Surprisingly, questions about the use of face masks elicited a mixed response. Almost half of the participants said they did not put on a face mask when they left the house. In the Indonesian context, there are two possible explanations for this behaviour. To begin with, face mask utilization is not common among

Indonesian society, particularly in rural areas. It is uncommon for the typical Indonesian to wear a face mask when get ill. The emergence of COVID-19 caused an increase in demand for medical face masks (and hand sanitizer) in the country and supplies were limited, therefore even some rural area in Indonesia did not received any mask supply (Rochmawati, E., & Nurmandi, A. 2020). The scarcity of face masks meant that many regular members of the public were unable to obtain them. The shortage of personal protective equipment was not limited to Indonesia. It had become a global problem due to increased demand in response to COVID-19 (Organization, W.H.O. 2020). Secondly, the Ministry of Health Indonesia has been adamant that medical face masks should only be worn by those who are showing symptoms of COVID-19 or similar illnesses. This was done to ensure that medical personnel on the front lines had enough personal protective equipment. Despite this, different authoritative bodies have sent mixed messages to the public about the use of face masks. It's possible that a lack of supply and confusion caused by mixed messages contributed to the split opinion on wearing face masks in public especially for rural societies.

COVID-19 has been a nascent public health issue around the world. Scientists are working hard to investigate various vaccines and treatment options. Social scientists, particularly those working in public health and health promotion, are attempting to determine the public's level of knowledge, attitudes, and practices regarding COVID-19 so that cost-effective public health campaigns and education programs can be developed. In fact, the current survey highlights the need for more comprehensive education programs that place a premium on the consistency of information provided by the government and other authorities. COVID-19 education efforts should be proactive, focusing on dispelling misinformation in the form of divergent viewpoints, old wives' tales, and incorrect information. Due to the levels of media and telecommunication usage in Indonesian society (Ida, R., & Saud, M. 2020), authorities would benefit from utilizing both mainstream and social media in disseminating these messages.

Limitation

A convenience sample was used for the study's sampling. As a result, there is a risk of bias because underserved populations may not have been able to participate in the research. Furthermore, women, people under the age of 50, and those employed as housewives were overrepresented in the study's sample. As a result, the findings have some limitations in terms of representativeness. To improve representativeness and generalizability of the findings, a more systematic, inclusive sampling method is required. Another limitation of this study is the possibility that participants will respond in a socially acceptable manner. Because this study relied on self-reported data, it's possible that participants responded positively to attitude and practice questions based on what they thought was expected of them (Van de Mortel, T. F. 2008).

CONCLUSIONS

Numerous persons in Bontoa district did not obey the regulation of wearing masks during COVID-19 pandemic. Most of individuals in the community also reported had insufficient knowledge, negative attitudes and beliefs towards COVID-19 issue. Further, limited knowledge, negative attitudes and beliefs were associated with incompliance of face mask utilization**.** The knowledge, attitudes and beliefs of using masks by the societies are efficient in the prevention and controlling of the spread of COVID-19. Therefore, an awareness campaign on face mask utilization is urgently needed in preventing and controlling the transmission of COVID-19.

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