International Journal of Health Science & Medical

Vol. 2 No. 2 (2023): August

PROCESSING OF MEDICAL MASK WASTE IN GORONTALO CITY DURING THE COVID-19 PANDEMIC

Nur Ayini S. Lalu[1], Moh. Rivai Nakoe[2], Julianty Akuba[3] , Laksmyn Kadir[4]
[1,2,4] Department of Public Health, Faculty of Sports and Health, Gorontalo State University, Indonesia
[3]Department of Pharmacy, Faculty of Sports and Health, Gorontalo State University, Indonesia
email: nur.ayini@ung.ac.id

Abstract

The disposal of disposable masks has raised concerns among environmentalists. Disposable medical mask waste is currently easy to find because people throw it away everywhere in intact condition. When people throw away masks carelessly, it is difficult to distinguish the use of shows by people with excellent or diseased health conditions. The problem in this research is the improper management of medical masks. This research method aims to analyze the frequency of using masks when leaving the house and the practice of processing medical mask waste used by the people of Gorontalo City. This type of research is quantitative with a cross-sectional design and analytic descriptive method. The population in this study were all people living in the City of Gorontalo in 2 sub-districts, namely Kota Timur and Kota Utara, with a sample size of 379 samples from the City of East and 377 representatives from the City of North. The results showed that the processing of medical masks in Gorontalo City during the Covid-19 Pandemic was not on target; this was evidenced by the processing of medical mask waste in Kota Timur District, which was disposed of carelessly as much as 36.5%, while medical mask waste was processed by cutting and 16.7% were burnt for the East Kota sub-district and 15.9% processed and reused. This study concluded that in the processing of medical masks in Gorontalo City during the Covid-19 pandemic for the East City District, many were still disposed of carelessly. In contrast, most medical mask users were washed and reused for the North City District. In comparison, for the North sub-district, it was 4.2%; even out of the 377 respondents surveyed, 361 medical mask users washed and reused. This is very worrying for environmental experts because the repeated use of medical masks will particularly impact oral health.

Keywords: Processing; Waste; Medical mask.

Received : March 28th, 2023; 1st Revised April 10th, 2023;
Accepted For Publication : May 3 rd, 2023

1. INTRODUCTION

The SARS-CoV-2 (Covid-19) pandemic, first found in a case in Wuhan City, China, at the end of 2019, has now spread throughout the country (1). Reported positive points of the coronavirus in the world have infected around 3.4 million people, with the death of nearly 240 thousand people. This number is predicted to continue to grow (2). In Indonesia, the coronavirus was found to have started to spread in early March 2020, and currently, 10,551 positive cases have been found, with the death of as many as 800 people (2). The coronavirus spreads through liquid droplets of positive people when they cough or sneeze, lasting up to 9 days on the surface of objects. So this coronavirus spreads quickly (3). Various efforts have been made by the government to suppress the spread of the coronavirus, starting from calls for social distancing, requiring wearing masks, to large-scale social restrictions (4) (5).

In early April 2020, the WHO recommended using masks for all healthy and sick people (6). This recommendation is a revision of the previous appeal, which stated that covers are only intended for suffering people. This appeal was issued because coronavirus transmission can also be caused by people who are not yet symptomatic (presymptomatic) (7). The average incubation time for the coronavirus can reach 14 days, which is called the presymptomatic period. People in the presymptomatic period can spread the coronavirus to others before symptoms appear (8)

As the quantity of medical waste increased during the handling of Covid-19, several researchers focused on the study of infectious medical waste management. Studies that have written about waste management during the Covid-19 pandemic include the challenges of regular waste management during the Covid-19 pandemic (9), and effective waste management designs during the Covid-19 epidemic (10). Several international institutions have also produced guidelines on medical waste management (11) and technical explanations for water, sanitation, hygiene, and waste management (12) for Covid-19. As of April 2020, there has yet to be any research in Indonesia on managing B3 medical waste, which has increased significantly in several hospitals that handle Covid-19 patients (13). The Covid-19 pandemic in Indonesia demanded massive efforts to prevent and transmit the infectious disease in various ways. The principle of preventing the transmission of the Covid-19 contagious disease is breaking the host/host/host chain. Following Minister of Environment and Forestry Regulation No, one effort can be made to properly and correctly manage hospital medical waste, categorized as Hazardous and Toxic Material (B3) waste. P.56/Menlhk-Setjen/2015 concerning Procedures and Technical Requirements for

B3 Waste Management from Health Service Facilities (14).

The disposal of disposable masks has raised concerns among environmentalists. The waste of medical covers and accompanying items, such as disposable plastic gloves, which are estimated to be very large, will later become a separate threat to the environment if they are not appropriately handled from an early stage. Based on preliminary data observations in Kota Timur District and Kota Utara District, the type of mask that people in Gorontalo City often use is nonmedical masks, 68.4.6%. In comparison, using medical masks, 31.6% of the 246 respondents. Medical/disposable mask waste is currently easy to find because people throw it away anywhere in intact condition. When people throw away masks carelessly, it is difficult to distinguish the use of shows by people with excellent or diseased health conditions. Based on preliminary observation data, on average, the people of Gorontalo City must treat medical mask waste properly. Medical mask waste processed by cutting and burning for the East Kota sub-district was 46.9%, and in the Dungingi sub-district, as much as 40.7%.

2. METHODS

This type of research is quantitative with a cross-sectional design and a descriptive-analytic method to analyze the processing of medical mask waste. The population in this study were all people living in the City of Gorontalo in 2 sub-districts. In contrast, the sample for this study was 379 samples from Kota Timur District and 377 samples from Kota Utara District. The study was conducted on age, the use of masks outside the home, the use of shows on public transportation, and the processing of mask waste.

3. RESULTS AND DISCUSSION

Research result

Distribution of the frequency of using masks when leaving the house

From the primary data obtained in the field as a result of the survey, the distribution of wearing masks when leaving the house or interacting with other people is obtained as follows:

Table 1. Distribution of Respondents According to Use of Masks When Leaving the House or Interacting with Other People in Kota Timur District

Wear a mask when leaving the house or interacting with other people	Sum	
	n	%
Often (Daily)	283	74.7
Sometimes	82	21.6
Seldom	13	3.4
Never	1	0.3
Total	**379**	**100.0**

Source: *Primary Data of Kota Timur District, 2022*

Based on Table 1. above, it can be seen that residents use masks more often (every day). Namely, 283 respondents (74.7%) when traveling or leaving the house, and only one respondent (0.3%) has never used a mask.

Table 2. Distribution of Respondents According to Use of Masks When Leaving the House or Interacting with Other People in Kota Utara District

Do you wear a mask when you leave the house or when interacting with others	Sum	
	n	%
Often	377	100
Sometimes	0	0
Seldom	0	0
Never	0	0
Total	**377**	**100**

Source: *Primary Data of Kota Utara District, 2022*

Based on Table 2. All respondents often wear masks when leaving the house when interacting with others. The distribution in the number of respondents who wear masks when leaving the house or interacting with others is known based on surveys.

Distribution of the frequency of wearing masks when on public transportation

From the primary data obtained in the field as a survey result, the distribution of using masks when using public transport is bentor, angkot, bus, or taxi as follows:

Table 3. Distribution of Respondents Using Masks When Using Public Transportation, Be It Bentor, Angkot, Buses, or Taxis in Kota Timur District

Wear a mask when using public transportation: bentor, angkot, bus, or taxi	**Sum**	
	n	**%**
Often (Daily)	323	85.2
Sometimes	49	12.9
Seldom	6	1.6
Never	1	0.3
Total	**379**	**100.0**

Source: *Primary Data of Kota Timur District, 2022*

Based on Table 3. Above respondents more often (every day) use masks, namely 323 people (85.2%) when using public transportation because it can be seen that now covers are very mandatory to use, while never only 1 respondent, as much as 0.3%.

Table 4. Distribution of Respondents Using Masks When Using Public Transportation, Be It Bentor, Angkot, Buses, or Taxis in North Kota District

Using Public Transportation	**Sum**	
	n	**%**
Often	377	100
Sometimes	0	0
Seldom	0	0
Never	0	0
Total	**377**	**0**

Source: *Primary Data of North Kota District, 2022*

Based on Table 4. It is known that the distribution of the number of respondents who use masks when using public transportation, be it Bentor, Angkot, Bus, or Taxi. Based on the survey, all respondents wear masks when using transportation, with as many as 377 respondents, or 100% of the total sample in North City.

The type of mask respondents use when leaving the house or when interacting with others

From the primary data obtained in the field as a result of the survey, the distribution of the types of masks used is as follows:

Table 5. Distribution of Respondents based on the type of mask used by respondents when leaving the house or when interacting with others In Kota Timur District

Types of masks used	Sum	
	n	%
Medical	71	18.8
Nonmedical	250	66.1
Medical/N95 and Nonmedical/Fabric	57	15.1
Total	**379**	**100.0**

Source: *Primary Data of Kota Timur District, 2022*

Based on Table 5. Most of the respondents used nonmedical masks because they could be reused, with a total of 250 respondents (66.1%). And those who use medical masks, 71 respondents (18.8%).

Table 6. Distribution of Respondents based on the type of mask used by respondents when leaving the house or when interacting with others In the Kota Utara District

Types of Masks Used	Sum	
	n	%
Medical masks	16	4,2
Nonmedical masks	361	95,8
Total	**377**	**100**

Source: *Primary Data of North Kota District, 2022*

It was based on Table 6. It is known that from 377 respondents, 16 used medical masks, and 361 used nonmedical masks. From the distribution above, it can be seen that most people in North Kota sub-district use nonmedical masks with a frequency of 95.8%, while people who use medical masks are fewer with a frequency of 4.2%.

The process of processing medical mask waste used by the people of Gorontalo City

From the primary data obtained in the field as a result of the survey, the distribution of medical mask processing after use is obtained as follows:

Table 7. Distribution of medical mask waste treatment process used by the people of East District

Mask processing after use	Sum	
	n	%
Disposed of carelessly	46	36.5
Burned	10	7.9
Scissored	21	16.7
Washed for reuse	20	15.9
Separated from other garbage	29	23.0
Total	**126**	**100.0**

Source: *Primary Data of Kota Timur District, 2022*

Based on Table 7. The above is based on a survey conducted from 126 (100%) respondents who use Medical Masks still throw carelessly, namely 46 respondents (36.5%).

Table 8. Distribution of medical mask waste treatment process used by the people of North District

Mask Processing	Sum	
	n	%
Disposed of carelessly	16	4,2
Burned	0	0
Scissored	0	0
Washed for reuse	361	95,8
Separated from other garbage	0	0
Total	**377**	**100**

Source: Primary Data of North Kota District, 2022

Based on Table 8. It is known from 377 respondents that people who use medical masks prefer to manage masks by littering, and people who use nonmedical masks more often process masks by washing them for reuse.

From the distribution above, it can be seen that 16 respondents manage medical mask waste by littering with a frequency of 4.2%, and people who choose to use nonmedical masks more often work mask waste by washing and reusing there are 361 respondents with a frequency of 95.8%.

Discussion

Use of masks when on public transportation

Based on Table 3. for the use of masks during public transportation, where respondents in the North City Location more often (every day) use masks, namely 323 people (85.2%) when using public transport, because it can be seen that now masks are very

mandatory to use, while never only one respondent as much as 0.3%. For Table 4. It is known that the distribution in the number of respondents who use masks when using public transportation, be it Bentor, Angkot, Bus, or Taxi, based on the survey of all respondents wearing masks when using transportation as many as 377 respondents or 100% of the total sample in the northern city. North City is obedient to wearing masks when wearing masks because of fear of contracting the coronavirus during the pandemic.

This is in line with Nurdin's research. AN, 2021 where motorized trishaw (bentor) drivers are a group of workers at risk of contracting or becoming a medium for transmission of Covid-19 (15). The daily activities of bump drivers, which generally require actions in public places so that they are at risk of direct contact with the community, and the frequent activities with the district, make bump drivers categorized in the moderate exposure level group. Based on the background above, bump drivers can be classified as workers at risk of being exposed to the COVID-19 virus due to their daily activities, which still interact pretty frequently with the community. This research aims to discover the factors related to the use of masks by motorized trishaw drivers in Makassar City. The results showed 25 respondents (25%) had good mask-wearing behavior, and 75 respondents (75%) had poor behavior. The bivariate analysis showed that age had no relationship with mask use (P = 0.336) and knowledge (P = 0.105). The variables attitude (P = 0.000), comfort (P = 0.001), support (P = 0.011), and noise (P = 0.022) have a relationship with the use of masks by motorized trishaw drivers (mentor) in Makassar City in 2021.

As for the use of masks in public transportation, if people do not comply with the rules, it will accelerate the transmission of Covid-19. Then the rules for limiting the use of public transit will be followed up by the government. This is also supported by research from Muhajid Ibu Rudi, 2022. His research results showed that the policy of operating public transportation during the Covid-19 pandemic in Sukabumi City affected reducing people's interest in using public transit in the Sukabumi City area. By reducing the interest of people who travel using public transportation, it is possible to prevent transmission of Covid-19 in public transit. Conclusion: Implementing the policy for operating passenger public transport during the Covid-19 pandemic achieved its goal of reducing Covid-19 cases, but this policy had several negative impacts that must be resolved immediately.

Using masks on public transportation is a safe and secure solution when mobilizing to avoid exposure to infectious diseases, in this case, Covid-19. In the research area in the northern city, all respondents used masks when using public transportation because they

felt safe using them and protected from disease transmission. as a red zone with a high risk of spreading Covid-19 in South Sumatra. Based on the latest news in November 2020 obtained from the Palembang City Health Office, it is known that the number of Covid-19 sufferers in Palembang City with positive confirmations has increased by 33 people with a total of 4,092 cases. One of the community activities that need to be continuously monitored so that its implementation continues to comply with the Covid-19 protocol is transportation activities. To overcome this, the government issued Minister of Transportation Regulation (Permenhub) Number 41 of 2020 concerning amendments to Permenhub Number 18 of 2020 concerning transportation control to prevent the spread of Covid-19. In Permenhub Number 41 of 2020, the government issues new regulations in the transportation sector.

One of them is the issue of the maximum capacity limit for public transport passengers, which was previously set at a maximum of 50 percent, now no longer exists. Based on the current condition of the spread of the Covid-19 outbreak in Palembang City, in this community service activity, there will be socialization regarding the safety of using public transportation in the new standard era. The socialization was conducted through counseling regarding personal protective equipment that must be used in public transit, surveys on understanding health protocols to several drivers and passengers, and demonstrating how to use personal protective equipment. In addition, counseling was also given to bus and public transport drivers on how to maintain the cleanliness of their fleet during the Covid-19 pandemic and how to maintain a safe distance for passengers on public transportation. Based on the questionnaire results regarding respondents' attitudes in dealing with the Covid-19 pandemic, only 37% of respondents always comply with health protocols.

Analyze the type of mask respondents use when leaving the house or interacting with others.

Based on Table 5, the research results table in the East City said that most respondents used nonmedical masks because they could be reused, with 250 respondents (66.1%). And those who use medical masks, 71 respondents (18.8%). Meanwhile, based on Table 6, for respondents in the North City area, it is known that out of 377 respondents, 16 used medical masks, and 361 used nonmedical masks. The distribution above shows that most people in the Kota Utara sub-district use nonmedical masks with a frequency of 95.8%, while people use fewer medical masks with a frequency of 4.2%.

Community indiscipline in using cloth masks as a preventive effort by the government to prevent the transmission of Covid-19 has led to an increase in Covid-19 cases. This is in line with research from Putri Santy Irene 2020 that the government has

established health protocols for adapting to new habits, one of which is the use of cloth masks for healthy people. In his research, it can be concluded that the use of cloth masks is not recommended in preventing the transmission of Covid-19 (16). There is only 1 article that mentions that a combination of several variations of the fabric used globally for the production of cloth masks can protect the respiratory organs from the transmission of aerosol particles. Based on this, it was concluded that the use of cloth masks was less effective in preventing the transmission of Covid-19, but using cloth masks was far better than not using masks at all.

Similar research also from Utari S & Khidoyah N in 2020 said that using masks during the Covid-19 pandemic was essential to protect yourself and others from the risk of transmitting this virus. As you need to know that most of the transmission of Covid-19 is through droplets, it is felt necessary to protect yourself. Masks can be a barrier both from within and from other people (17). The research objective was to describe the use of face masks during the Covid-19 pandemic in Grobogan Regency, Central Java, with a sample of 330 respondents. Where the results of the study show that the majority of respondents in Grobogan Regency always use masks when going out of the house (65.8%) of respondents. However, there were still (29.7%) respondents who admitted that they rarely used masks when leaving the house, and there were (4.54%) respondents claimed not to use masks when leaving the house.

Using masks during the Covid-19 pandemic is significant to protect yourself and others from the risk of transmitting this virus. As it is known that most of the transmission of Covid-19 is through droplets, it is felt necessary to protect oneself. Masks can be a barrier for droplets from within and from other people. The purpose of this study was to describe the use of face masks during the Covid-19 pandemic in Muna Regency, Southeast Sulawesi. This type of research is descriptive research with a cross-sectional study approach. The sample of this research is 431 respondents. Data analysis was performed using a frequency distribution table. The results showed that most respondents in Muna District always wore masks when leaving the house (57.8%). However, there are still 35.5% who admit that they rarely use masks when leaving the house, and 6.7% accept that they do not use masks when leaving the house (18).

How to process medical mask waste used by the people of Gorontalo City

Table 7. above is based on a survey of 126 (100%) Respondents who used Medical Masks still disposed of them carelessly, with 46 respondents (36.5%). Table 8 shows that from 377 respondents, people who use medical masks prefer to manage masks by discarding them carelessly. People who use nonmedical masks process masks more often by washing them for reuse.

From the above distribution, it can be seen that 16 respondents manage medical mask waste by carelessly disposing of it with a frequency of 4.2%, and those who choose to use nonmedical masks more often work mask waste by washing and reusing it. There are 361 respondents with a frequency of 95.8%.

Handling infectious waste is a major global problem for public health and the environment if not handled properly. Personal protective equipment using masks and gloves, is the main contributor to waste volume. The purpose of this literature study is to discuss how to handle household infectious waste during the Covid-19 pandemic (19). The review results show that the amount of medical waste during the Covid B3-19 pandemic has increased; this contagious waste is classified as medical waste, hazardous and toxic material waste or B3, medical waste originating from households and waste from healthcare facilities, the public does not fully know. It still needs to implement treatment of infectious waste and families, hence the lack of information regarding the effectiveness of handling Covid-19 contagious waste. It is hoped that health facilities and the community can carry out burial procedures with Permenlhk Number P.56/Menlhk-Setjen/2015 concerning Procedures and Technical Requirements for Management of Hazardous Toxic Waste from Health Service Facilities and Circular Letter Number SE/MENLHK/PSLB3/3/2020 discussing Management of Infectious Waste (B3 Waste) and Household Waste from Corona Virus Disease (Covid-19) (20).

Mask waste is an infectious waste that requires good management. Mask waste production in Semarang City reached 1.2 kg daily (21). This study aimed to discover the knowledge, accessibility of information and practice of managing disposable mask waste by households in Semarang City. The sample in this study was 130 respondents aged 15-64 years who live and are domiciled in the city of Semarang. In this study, the results of the univariate analysis were obtained: the majority of respondents had good knowledge of 52.3% of respondents, good information accessibility 66.9% of respondents, and good practice 54.6% of respondents. The bivariate analysis showed a relationship between respondents' knowledge and practice regarding disposable household waste management (p-value = 0.002). There was no relationship between information accessibility and respondents' training regarding household mask waste management (p-value = 0.002). = 0.352). So that the conclusion from this research is that the people of Semarang already have the knowledge, information accessibility, and good practices for managing disposable mask waste in households. The ease of accessing information already owned by the community is exemplary in managing mask waste that has been carried out so far.

Utilizing medical mask waste was very effective during a pandemic, where the research results were empty land for farming and reforestation. Verticulture cultivation is the right way for alternative solutions to agriculture on the limited ground (20). Therefore, training on viticulture cultivation was held at Rt.001/06 Pondok Cabe Ilir, to be precise, at the Multipurpose Hall Rt.001/06 Pondok Cabe Ilir. This viticulture training was chosen because it can be a solution to meet food needs, especially vegetables, during the Covid-19 Pandemic. Containers for planting viticulture can use paragons, bamboo, polybags, pots, waste plastic bottles, and disposable masks. This training activity can be concluded as one of the breakthroughs that can increase productive businesses supporting family needs during the Covid-19 Pandemic.

4. CONCLUSION

During the Corona Virus (Covid-19) pandemic, and until now, many still use masks to avoid exposure to the virus, but in the processing of medical masks in Gorontalo City during the Covid-19 pandemic, many were not on target. Research shows that medical mask waste processing in East Kota District is still widely disposed of carelessly, while in North Kota District, most medical mask users are washed and reused. This is very worrying for environmental experts because the repeated use of medical masks will particularly impact oral health.

ACKNOWLEDGMENTS

Thank you to those who have helped in this research so the study can run smoothly.

REFERENCES

1. Ladimo MP, Irwan I. Middle East Respiratory Syndrome- Corona Virus (MERS-CoV) Menggegerkan Dunia Bagian Timur. J Heal Sci Gorontalo J Heal Sci Community [Internet]. 2020;4(2):18–28. Available from: https://ejurnal.ung.ac.id/index.php/gojhes/article/view/4666
2. Worldometer. 2020. COVID-19 Coronavirus Pandemic. Retrieved Mei 2, 2020, from Worldometer.
3. European Standards. UNE EN 14683:2019+AC:2019. Medical Face Masks-Requirements and Test Methods. 2019;
4. Mokodompis Y, Irwan. Detection of Anti-Severe Acute Respiratory Syndrome Coronavirus 2 (Sars-International Journal of Health Science & Medical Research. Int J Heal Sci Med Res. 2022;1(1).
5. Amalia L, Irwan I, Hiola F. Analisis Gejala Klinis Dan Peningkatan Kekebalan Tubuh Untuk Mencegah Penyakit Covid-19. Jambura J Heal Sci Res [Internet]. 2020 Jul 19;2(2):71–6. Available from: https://ejurnal.ung.ac.id/index.php/jjhsr/article/view/6134
6. COVID-19. WHO 2020. AMPM dalam

K. No Title.

7. Kimball A, Hatfield KM, Arons M, James A, Taylor J, Spicer K, et al. Asymptomatic and Presymptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility — King County, Washington, March 2020. MMWR Morb Mortal Wkly Rep [Internet]. 2020 Apr 3;69(13):377–81. Available from: http://www.cdc.gov/mmwr/volumes/69/wr/mm6913e1.htm?s_cid=mm6913e1_w
8. World Health Organization. WHO Coronavirus (COVID-19) Dashboard [Internet]. 2022. WHO. 2022.
9. van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N Engl J Med [Internet]. 2020 Apr 16;382(16):1564–7. Available from: http://www.nejm.org/doi/10.1056/NEJMc2004973
10. Yu H, Sun X, Solvang WD, Zhao X. Reverse Logistics Network Design for Effective Management of Medical Waste in Epidemic Outbreaks: Insights from the Coronavirus Disease 2019 (COVID-19) Outbreak in Wuhan (China). Int J Environ Res Public Health [Internet]. 2020 Mar 9;17(5):1770. Available from: https://www.mdpi.com/1660-4601/17/5/1770
11. Faridi S, Niazi S, Sadeghi K, Naddafi K, Yavarian J, Shamsipour M, et al. A field indoor air measurement of SARS-CoV-2 in the patient rooms of the largest hospital in Iran. Sci Total Environ [Internet]. 2020 Jul;725:138401. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0048969720319148
12. World Health Organization. 2020. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19).
13. Deni, M.C.N. 2020. Tinjauan Kebijakan Pengelolaan Limbah Medis Infeksius Penanganan Corona Virus Disease 2019 (Covid-19).
14. Kementerian Lingkungan Hidup dan Kehutanan RI. 2020. Surat Edaran Menteri Lingkungan Hidup dan Kehutanan.No.SE.2/MENLHK/PSLB3/PLB.3/3/2020 Tentang Pengelolaan. Limbah Infeksius (Limbah B3) dan Sampah Rumah. Tangga dari penanganan Corona Virus Disease (Cov.
15. Nurdin AN. Faktor Yang Berhubungan Dengan Penggunaan Masker Di Masa Pandemi Covid-19 Pada Pengemudi Becak Motor (Bentor) Di Kota Makassar Tahun 2021. Universitas Hasanuddin; 2021.

16. Putri SI. Studi Literatur: Efektivitas Penggunaan Masker Kain dalam Pencegahan Transmisi COVID-19. J Kesehat Manarang [Internet]. 2020 Oct 28;6(Khusus):9. Available from: http://jurnal.poltekkesmamuju.ac.id/index.php/m/article/view/280
17. Untari S, Kodiyah N. Gambaran Penggunaan Masker Di Masa Pandemi Covid-19 Pada Masyarakat Di Kabupaten Grobogan. J TSJKeb. 2020;5(2):291–6.
18. Pratiwi, Arum Dian. 2020. Gambaran Penggunaan Masker di Masa Pandemi Covid-19 Pada Masyarakat di Kabupaten Muna. Prosiding Seminar Nasional. Membangun Optimisme di Tengah Pandemi COVID-19. 2020-06-11.
19. MacIntyre CR, Seale H, Dung TC, Hien NT, Nga PT, Chughtai AA, et al. A cluster randomised trial of cloth masks compared with medical masks in healthcare workers. BMJ Open [Internet]. 2015 Apr 22;5(4):e006577–e006577. Available from: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2014-006577
20. Axmalia A, Sinanto RA. Pengelolaan Limbah Infeksius Rumah Tangga pada masa Pandemi COVID-19. J Kesehat Komunitas [Internet]. 2021 Apr 30;7(1):70–6. Available from: https://jurnal.htp.ac.id/index.php/keskom/article/view/857
21. Triyani Lubriyana, Nurjazuli NAYD. Gambaran Pengetahuan Dan Praktik Pengelolaan Limbah Masker Sekali Pakai Oleh Rumah Tangga Pada Masyarakat Di Kota Semarang. Ris Kesehat Masy [Internet]. 2022;2(2):1–8. Available from: https://eprints2.undip.ac.id/id/eprint/5053/