

Title of Manuscript: **A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic**

1. Proofread document received (February 21th, 2022)
-Document from proofreading service
2. Submitted to the journal "Natural Sciences Engineering and Technology Journal" (February 27th, 2022)
3. Peer Reviewer results: Revision Required (March 10th, 2021)
4. Revised version received by journal (October 17th, 2021)
5. Paper Accepted for publication (March 18th, 2022)
6. Galley proof (March 19th, 2022)
7. Paper published (March 21th, 2022)

-Document from proofreading service

February 21th, 2022

HM Publisher

Jl Sirnaraga No 99, 8 Ilir, Ilir Timur 3, Palembang, South Sumatra, Indonesia

CONFIDENTIAL

February 21th, 2022

Certificate Service Confirmation

To whom it may concern,

HM Publisher provided comprehensive editing services for manuscript entitled A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic. The edit has achieved Grade A: priority publishing; no language polishing required after editing. Should you require any additional information, please do not hesitate to contact me.

Regards,



Khrishna Murti, PhD

Head of Language Institute-HM Publisher

Email: khrishnamurti@gmail.com

Submitted to the journal "Natural Sciences Engineering and Technology Journal" (February 27th, 2022)

A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic

Rachmat Hidayat^{1*}, Riri Juliantika², Fiona Widya Sari³, Puspa Zulaika³, Ziske Maritska¹

¹Department of Biology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Undergraduate Student, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

³Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

*Corresponding author: dr.rachmat.hidayat@gmail.com

Abstract

Covid-19 is a respiratory tract infection caused by the novel coronavirus (nCov). Nasal irrigation is one of the efforts to prevent Covid-19. Nasal irrigation is an act of flushing saline solution into the nasal cavity. This research aims to determine level of knowledge, attitudes, and practices of the community regarding nasal irrigation during Covid-19 pandemic. This study was a descriptive observational study. The sample of this research was the people of Palembang city who were eligible for the inclusion and exclusion criteria with the consecutive sampling technique as many as 398 respondents. Data were obtained through primary data in the form of questionnaires, processed using the SPSS program, and analyzed using univariate analysis. The most characteristics of respondents in this study were in the age group 18-25 years (65.5%) and the last level of education was high school (58.0%). The level of public knowledge about Nasal irrigation during the Covid-19 pandemic was in the moderate category of 36.2%. The level of public attitudes regarding nasal irrigation during the Covid-19 pandemic was in the good category at 83.4%. The level of nasal irrigation practice was included in the low category of 75.6%. The community of Palembang city had a sufficient level of knowledge, a good level of attitude, and a low level of practice regarding nasal irrigation during Covid-19 pandemic.

Keywords. covid-19, nasal irrigation, public attitudes, observational study, medicine.

Introduction

Coronavirus disease (also known as Covid-19) is a respiratory disease. The etiology of Covid-19 is a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which can cause mild to severe pneumonia. The first report regarding Covid-19 outbreak found that the main source of exposure is from a seafood market in Wuhan, China, at the end of December 2019 and since then it had spread rapidly across the world including Indonesia which reported its initial case in early March 2020.^{1,2,3} The cumulative number of confirmed cases topped 1,183,555 and 32,167 deaths occurred in Indonesia on February 11, 2021.⁴

Covid-19 is transmitted through animals and human.² Coronavirus is spread in various animals, such as bird and mammals, however the animal vector caused Covid-19 is not known up.^{2,3} The most common ways of transmission are via direct contact through droplets splashes from an infected person or someone with respiratory symptoms (eg. coughing and sneezing) and via indirect contact in form of contaminated surfaces of environmental objects that has been used by an infected person, including littered used masks, then the uninfected person touch parts of their face, namely eyes, nose, and mouth, that are common routes of spreading infection.^{1,2,3,5,6}

These case constantly increasing so that efforts needed to take prevent the spread and reduce the case fatality rate. One of the measure that can be done is regular nasal irrigation. Nasal irrigation is useful to maintain nasal health, such as for removing mucous, infective pathogen, and inflammatory mediators. Nasal irrigation is defined as a procedure of spraying saline solution into the nasal cavity.⁷ The most commonly used saline solution is isotonic saline solution, for example NaCl 0,9%.⁸ However, there were studies which stated that the use of hypertonic saline solution, povidone iodine (PVI), has a superior virucidal activity and thus reduce viral load.^{8,9}

This study is a continuing study about level of knowledge regarding nasal irrigation by Nunung Mirawati at Faculty Medicine of Muhammadiyah Palembang University. This study aims to determine level of knowledge, attitude, and practice of the community regarding nasal irrigation during Covid-19 pandemic.

Methods

Design Study and Study Population

This study used a descriptive observational design with the population of Palembang City, Indonesia. The sampling technique used was consecutive sampling, samples were obtained consecutively as many as 26 samples from every district in Palembang city that met the study criteria until the number of required respondents was fulfilled. The respondents of

this study were 398 people who met the inclusion and exclusion criteria. The inclusion criteria for this study were people of Palembang City aged between 18 – 55 years old, with last education level of elementary school (SD), junior high school (SMP), high school (SMA), and bachelor (S1)/graduate (S2)/doctorate (S3) degree, who agreed to participate in the study and signed the informed consent. The exclusion criteria were respondents who did not completed and collected the questionnaire. The data from this study were primary data in the form of questionnaires with closed ended questions made by the researchers. The questions covered the sociodemographic of respondents, knowledge, attitude, and practices regarding nasal irrigation. The questionnaire was distributed online as a Google form via *Whatsapp blast, Line, dan Instagram*. The respondents were guaranteed anonymity and gave their consent. The time of research was conducted from November 24th to December 5th 2021 in Palembang city, Indonesia. Throughout the research period, there were 472 respondents who filled out the questionnaire.

Knowledge, Attitudes, and Practices Questionnaire Design

This questionnaire consists of six sections. The first section presents informed consent agreeing to participate in the study. The second section assessed general information and demographic variables including age, address, last level of education, and phone number. The third, fourth, and fifth section evaluate the level of the respondent's knowledge, attitude, and practice, respectively. The last section contains information to inform the public about nasal irrigation.

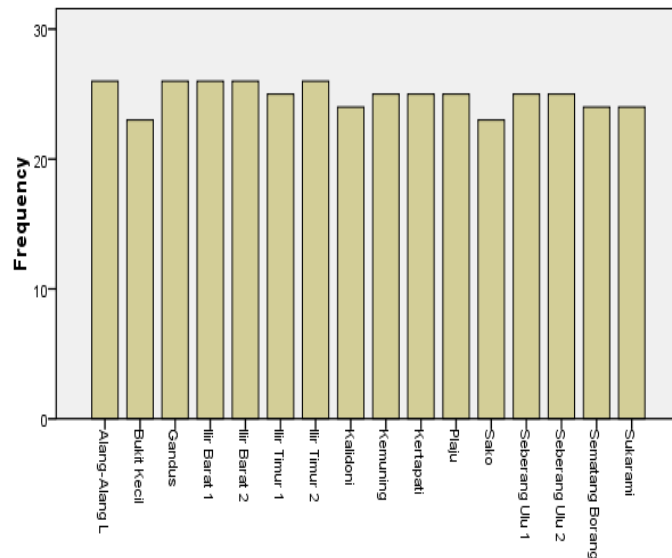
Data analysis

Univariate analysis techniques will be used data analysis using the Statistical Package for Social Sciences (SPSS). The level of knowledge (twenty-one items), attitudes (five items), and practice (two items) were calculated based on a questionnaire made by the author. Each item on the knowledge section has a value of 1 if the question is answered correctly and 0 if the question is answered incorrectly. Each item on the attitude section has a value of 1 if agreed and 0 if disagree. As for the level of practice based on the frequency of daily nasal irrigation, the value is 2 if they do it twice a day, 1 if they do once a day and 0 if they don't do it at all.

Results

Graphic 1. shows distribution data of respondents according to the districts in Palembang City, and we found that the study samples were distributed in every district in Palembang City. The distributions were as follows: Alang-Alang Lebar, Gandus, Ilir Barat 1, Ilir Barat 2, and

Iilir Timur 2 District each consisted of 26 respondents. Iilir Timur 1, Kemuning, Kertapati, Plaju, Seberang Ulu 1, and Seberang Ulu 2 Districts each consisted of 25 respondents. Kertapati, Sematang Borang, and Sukarami Districts each consisted of 24 respondents. Bukit Kecil and Sako Districts each consisted of 23 respondents.



Graphic 1. Distribution of Respondents According to the Districts in Palembang City

According to Table 1. characteristics of respondents by age and last education level, from 398 respondents, the majority were in the age category of 18 – 25 years old which was 261 respondents (65.6%), in the age category of 26 – 45 years old were 109 respondents (27.4%), and the least was in the age category of 46 – 55 years old which was 28 respondents (7.0%). According to level of education, more than half of the respondents belonged to high school category which was 231 respondents (58.5%), and the rest were no respondent (0%) in elementary school level category, two respondents (0.5%) in junior high school category, and 165 respondents (41.5%) in the higher education level category (S1/S2/S3).

Table 1. Sociodemographic Distribution of Respondents

Variables	Number (n)	Percentage (%)
Age		
18 – 25 years-old	261	65.6
26 – 45 years-old	109	27.4
46 – 55 years-old	28	7.0
Education Level		
SD	0	0

SMP	2	0.5
SMA	231	58.0
S1/S2/S3	165	41.5
Total	398	100,0

According to Table 2. the level of knowledge of the people regarding nasal irrigation as many as 141 respondents (35.4%) had good knowledge, 144 respondents (36.2%) had moderate knowledge, and 113 respondents (28.4%) had low knowledge. The level of attitude of the people regarding nasal irrigation is presented in Table 2., as many as 332 respondents (83.4%) showed good attitude, 56 respondents (14.1%) showed moderate attitude, and 10 respondents (2.5%) showed low attitude. The level of practice of the people regarding nasal irrigation is presented in Table 2., as many as 29 respondents (7.3%) showed a good level of practice, 68 respondents (17.1%) showed a moderate level of practice, and 10 respondents (75.6%) showed a low level of practice.

Table 2. Level of People’s Knowledge, Attitude, and Practice Regarding Nasal Irrigation

Variable	Number (n)	Percentage (%)
Level of Knowledge		
Good	141	35.4
Moderate	144	36.2
Low	113	28.4
Level of Attitude		
Good	332	83.4
Moderate	56	14.1
Low	10	2.5
Level of Practice		
Good	29	7.3
Moderate	68	17.1
Low	301	75.6
Total	398	100

Discussion

According to the age distribution of this study, the majority is from age category of 18 – 25 years old which belonged to the late adolescent stage.^{10,11} According to a survey conducted by Kominfo (Ministry of Information) in 2017, it shows that smartphone ownership and internet usage in Indonesia were highest in the age group of 20 – 29 years old which was 75.95% and 60.15%, respectively. This was in accordance with the result of distribution of respondents according to age category from this study. According to a survey by the Central Bureau of Statistics in 2019, smartphone usage and its implication towards internet usage of the people keep increasing during the last five years.^{12,13}

In terms of last education level of the respondents, the majority was from high school level which was 231 respondents (58.0%). In the self-development process, human has a basic necessity called education. The ease which individuals receive and develop knowledge and technology requires high education.¹⁴ From this notion, it is implied that the higher education will be the higher an individual's will in pursuing information regarding new knowledge and the easier it is to receive the knowledge they get. According to the age distribution, it can be related to the result of distribution of education level because the people in the 18 – 25 years old category are in the age group that have finished high school education and most probably is continuing education in the higher education level (college/ university).¹⁵

Knowledge is the result of an individual's sensing of objects through sense organs, the most used sense organs are eyes and ears.¹⁴ The factors that can affect the level of knowledge of an individual is an information source. Information source regarding health can be obtained from various parties, such as a physician, a specialist, other health care workers, friends, teachers, and also information media (including newspaper, health article, television, radio, etc.). More information obtained are from the environment and media than from medical professionals, therefore the information is mostly incorrect.¹⁶ The results of the study did not fully align with the result from the study by Nunung Mirawati (2020) in Faculty of Medicine Muhammadiyah University Palembang which shows that the level of knowledge of college students regarding nasal irrigation is good. This can be due to the different study population, where in that study the population was medical school students who received information regarding nasal irrigation from study materials and from their teachers whose profession was also doctors.¹⁷ Meanwhile according to a study by Adegbiyi, et al., (2020) individual's level of knowledge regarding nasal diseases were low.¹⁶

According to the theory of Thoughts and Feeling, attitude represents someone's likes and dislikes toward an object, in this case nasal irrigation. Attitudes are formed by personal experience or the people around them which cause an individual's urge to stay away from an

object or a disease by preventing the risk of developing the disease.¹⁴ Currently, Indonesia is experiencing the Covid-19 outbreak. In the study, the people showed a good attitude, meaning that the people supported the measures to prevent Covid-19, one of the means is nasal irrigation. Results of the study are in accordance with a study conducted by Jessica Moudy and Rizma Adlia (2020) that people show a cautious attitude towards the Covid-19 disease and supported the measures to prevent Covid-19.¹⁸

According to the Lawrence Green's theory, there are three main factors that affect a person's health behavior. The first is predisposing factor, regarding the individual's knowledge. Judging from the result of level of knowledge, the majority of the people show a moderate level of knowledge regarding nasal irrigation. The second factor is enabling factor which means the availability of facilities and health care materials, including the materials used for nasal irrigation (NaCl 0.9% solution) which probably is not available in every household and the majority of people do not know how to make a saline solution at home. The third factor is reinforcing factor, which means there is relationship to the healthcare officials or other community leaders around them who never perform nasal irrigation.¹⁴ The three factors are interrelated and form the health behavior. In this case, one of the factors that cause people to never perform nasal irrigation can be because they never see their close relatives performed it so it is not emulated. Nasal irrigation is a procedure of spraying saline solution in to the nasal cavity. An incorrect nasal irrigation method may cause pain due to the water flow or the syringe tip nudging the nasal septum which then elicited a negative response in the individual. This negative response can take form as avoiding performing nasal irrigation procedure due to the discomfort.¹⁹ This can also be a factor for someone to be reluctant to perform nasal irrigation. Usually, nasal irrigation is performed by individuals with nasal disease symptoms such as rhinosinusitis, because it is advised by a doctor as an adjuvant therapy. They are more compliant and more pleased to perform nasal irrigation because they can have more control of their health, it is effective in reducing chronic rhinosinusitis symptoms, and may reduce the need to use medicine.^{20,21} To adapt to new health habits, people need to see and hear the correct information. Similarly, with hand washing and using a mask, currently, people are more obedient in doing so as a preventive measure of Covid-19. Both of them also need adaptation to be well received by the people and become new daily habits. According to a news article from Gadjah Mada University which described that the common people were not entirely aware and even neglecting nasal health problems. In the Healthy Nose Awareness Movement (*Gerakan Sadar Sehat Hidung*), the students of FKKMK UGM performed nasal irrigation demonstration for batik craftsmen and women, and it is obvious that they were enthusiastic to

perform nasal irrigation which they think to be a beneficial new habit.²² In order for the people to adapt to new health habits, in this case nasal irrigation, education and counseling by health care workers are needed.

Conclusion

The community of Palembang city had a moderate level of knowledge, a good attitude, and a low level of practice regarding nasal irrigation in the Covid-19 pandemic era.

References

1. WHO. Novel Coronavirus [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/>
2. Umakanthan S, Sahu P, Ranade A V., Bukelo MM, Rao JS, Abrahao-Machado LF, et al. Origin, transmission, diagnosis and management of coronavirus disease 2019 (COVID-19). *Postgrad Med J.* 2020;96(1142):753–8.
3. Kesehatan K. Pedoman Pencegahan dan Pengendalian Corona Virus deases (Covid-19) [Internet]. Vol. 5, Kementrian Kesehatan. 2020. 178 p. Available from: https://covid19.go.id/storage/app/media/Protokol/REV-05_Pedoman_P2_COVID-19_13_Juli_2020.pdf
4. WHO. WHO Coronavirus Disease (Covid-19) Dashboard [Internet]. 2021 [cited 2021 Feb 11]. Available from: <https://covid19.who.int/region/searo/country/id>
5. WHO. Modes of Transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>
6. Lotfi MR, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clin Chim Acta* [Internet]. 2020;508:254–66. Available from: www.elsevier.com/locate/cca Review
7. Pirochai P, Puvatanond C, Kirtsreesakul V, Chaiyasate S, Thanaviratananich S. Effectiveness of nasal irrigation devices: A Thai multicentre survey. *PeerJ.* 2019;2019(5).
8. Khan MM, Parab SR, Paranjape M. Repurposing 0.5% povidone iodine solution in otorhinolaryngology practice in Covid 19 pandemic. *Am J Otolaryngol - Head Neck*

- Med Surg [Internet]. 2020;41(5):102618. Available from: <https://doi.org/10.1016/j.amjoto.2020.102618>
9. Singh, Sheetu; Sharma, Neeraj ; Singh, Udaiveer; Singh, Tejraj ; Mangal; Singh DK ; Virendra. Nasopharyngeal wash in preventing and treating upper respiratory tract infections: Could it prevent COVID-19? *Lung India*. 2020;37(3):246–51.
 10. WHO. Orientation Programme on Adolescent Health for Health-care Providers [Internet]. Department of Child and Adolescent Health and Development. 2018. 403 p. Available from: https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_handout.pdf
 11. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *Lancet Child Adolesc Heal*. 2018;2(3):223–8.
 12. KOMINFO. Survey Penggunaan TIK 2017. 2017.
 13. Sutarsih, T. Statistik Telekomunikasi Indonesia. Jakarta: Bahan Pusat Statistik; 2019.
 14. Notoatmodjo S. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta; 2017.
 15. Bastari. Indonesia Education Statistics in Brief. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia; 2019.
 16. Adegbiyi WA, Aremu SK, Aluko AAA, Adewoye RK. Knowledge and awareness of nasal allergy among patients in a developing country. *J Fam Med Prim Care* [Internet]. 2020;9(3):1477–82. Available from: <http://www.jfmprc.com>
 17. Mirawati, Nunung. Gambaran tingkat pengetahuan tentang cuci hidung pada mahasiswa di fakultas kedokteran universitas muhammadiyah Palembang skripsi. 2020.
 18. Moudy J, Syakurah RA. Pengetahuan terkait usaha pencegahan Coronavirus Disease (COVID-19) di Indonesia. *Higeia J Public Heal Res Dev*. 2020;4(3):333–46.
 19. Çelikel Ş, Tural Büyük E, Yıldızlar O. Children’s Pain, Fear, and Anxiety During Invasive Procedures. *Nurs Sci Q*. 2019;32(3):226–32.
 20. Rabago D, Barrett B, Marchand L, Maberry R, Mundt M. Qualitative aspects of nasal irrigation use by patients with chronic sinus disease in a multimethod study. *Ann Fam Med*. 2006;4(4):295–301.
 21. Rachana R, Santhi T. Efficacy of Saline Nasal Irrigation in Chronic Rhinosinusitis.

2019;7(6):71–7.

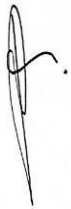
22. Agung. Meningkatkan Kesadaran Kesehatan Hidung [Internet]. 2018 [cited 2021 Jan 12]. Available from: <https://www.ugm.ac.id/id/berita/16257-meningkatkan-kesadaran-kesehatan-hidung>

Submission acknowledgement

Dear author(s),

Riri Juliantika, Fiona Widya Sari*, Rachmat Hidayat, Puspa Zulaika, Ziske Maritska has submitted the manuscript "A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic" to Natural Sciences Engineering and Technology Journal. The paper will be screened by editor and reviewed by peer review.

Cordially,



Prof. Paula Magnano, PhD

Editor



HM Publisher

(*) Corresponding author

Peer Review Results

Dear author(s),

Riri Juliantika, Fiona Widya Sari*, Rachmat Hidayat, Puspa Zulaika, Ziske Maritska has submitted the manuscript "A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic" to Natural Sciences Engineering & Technology Journal. The decision :
Revision Required.

Cordially,



Prof. Paula Magnano, PhD

Editor



HM Publisher

(*) Corresponding author

Reviewer 1

A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19

Pandemic → 1

Rachmat Hidayat^{1*}, Riri Juliantika², Fiona Widya Sari³, Puspa Zulaika³, Ziske Maritska¹

¹Department of Biology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Undergraduate Student, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

³Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

*Corresponding author: dr.rachmat.hidayat@gmail.com

Abstract → 3

Covid-19 is a respiratory tract infection caused by the novel coronavirus (nCov). Nasal irrigation is one of the efforts to prevent Covid-19. Nasal irrigation is an act of flushing saline solution into the nasal cavity. This research aims to determine level of knowledge, attitudes, and practices of the community regarding nasal irrigation during Covid-19 pandemic. This study was a descriptive observational study. The sample of this research was the people of Palembang city who were eligible for the inclusion and exclusion criteria with the consecutive sampling technique as many as 398 respondents. Data were obtained through primary data in the form of questionnaires, processed using the SPSS program, and analyzed using univariate analysis. The most characteristics of respondents in this study were in the age group 18-25 years (65.5%) and the last level of education was high school (58.0%). The level of public knowledge about Nasal irrigation during the Covid-19 pandemic was in the moderate category of 36.2%. The level of public attitudes regarding nasal irrigation during the Covid-19 pandemic was in the good category at 83.4%. The level of nasal irrigation practice was included in the low category of 75.6%. The community of Palembang city had a sufficient level of knowledge, a good level of attitude, and a low level of practice regarding nasal irrigation during Covid-19 pandemic.

Keywords. covid-19, nasal irrigation, public attitudes, observational study, medicine. → 2

Introduction → 4

Coronavirus disease (also known as Covid-19) is a respiratory disease. The etiology of Covid-19 is a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which can cause mild to severe pneumonia. The first report regarding Covid-19 outbreak found that the main source of exposure is from a seafood market in Wuhan, China, at the end of December 2019 and since then it had spread rapidly across the world including Indonesia which reported its initial case in early March 2020.^{1,2,3} The cumulative number of confirmed cases topped 1,183,555 and 32,167 deaths occurred in Indonesia on February 11, 2021.⁴

Covid-19 is transmitted through animals and human.² Coronavirus is spread in various animals, such as bird and mammals, however the animal vector caused Covid-19 is not known up.^{2,3} The most common ways of transmission are via direct contact through droplets splashes from an infected person or someone with respiratory symptoms (eg. coughing and sneezing) and via indirect contact in form of contaminated surfaces of environmental objects that has been used by an infected person, including littered used masks, then the uninfected person touch parts of their face, namely eyes, nose, and mouth, that are common routes of spreading infection.^{1,2,3,5,6}

These case constantly increasing so that efforts needed to take prevent the spread and reduce the case fatality rate. One of the measure that can be done is regular nasal irrigation. Nasal irrigation is useful to maintain nasal health, such as for removing mucous, infective pathogen, and inflammatory mediators. Nasal irrigation is defined as a procedure of spraying saline solution into the nasal cavity.⁷ The most commonly used saline solution is isotonic saline solution, for example NaCl 0,9%.⁸ However, there were studies which stated that the use of hypertonic saline solution, povidone iodine (PVI), has a superior virucidal activity and thus reduce viral load.^{8,9}

This study is a continuing study about level of knowledge regarding nasal irrigation by Nunung Mirawati at Faculty Medicine of Muhammadiyah Palembang University. This study aims to determine level of knowledge, attitude, and practice of the community regarding nasal irrigation during Covid-19 pandemic.

Methods

Design Study and Study Population

This study used a descriptive observational design with the population of Palembang City, Indonesia. The sampling technique used was consecutive sampling, samples were obtained consecutively as many as 26 samples from every district in Palembang city that met the study criteria until the number of required respondents was fulfilled. The respondents of

this study were 398 people who met the inclusion and exclusion criteria. The inclusion criteria for this study were people of Palembang City aged between 18 – 55 years old, with last education level of elementary school (SD), junior high school (SMP), high school (SMA), and bachelor (S1)/graduate (S2)/doctorate (S3) degree, who agreed to participate in the study and signed the informed consent. The exclusion criteria were respondents who did not completed and collected the questionnaire. The data from this study were primary data in the form of questionnaires with closed ended questions made by the researchers. The questions covered the sociodemographic of respondents, knowledge, attitude, and practices regarding nasal irrigation. The questionnaire was distributed online as a Google form via *Whatsapp blast, Line, dan Instagram*. The respondents were guaranteed anonymity and gave their consent. The time of research was conducted from November 24th to December 5th 2021 in Palembang city, Indonesia. Throughout the research period, there were 472 respondents who filled out the questionnaire.

Knowledge, Attitudes, and Practices Questionnaire Design

This questionnaire consists of six sections. The first section presents informed consent agreeing to participate in the study. The second section assessed general information and demographic variables including age, address, last level of education, and phone number. The third, fourth, and fifth section evaluate the level of the respondent's knowledge, attitude, and practice, respectively. The last section contains information to inform the public about nasal irrigation.

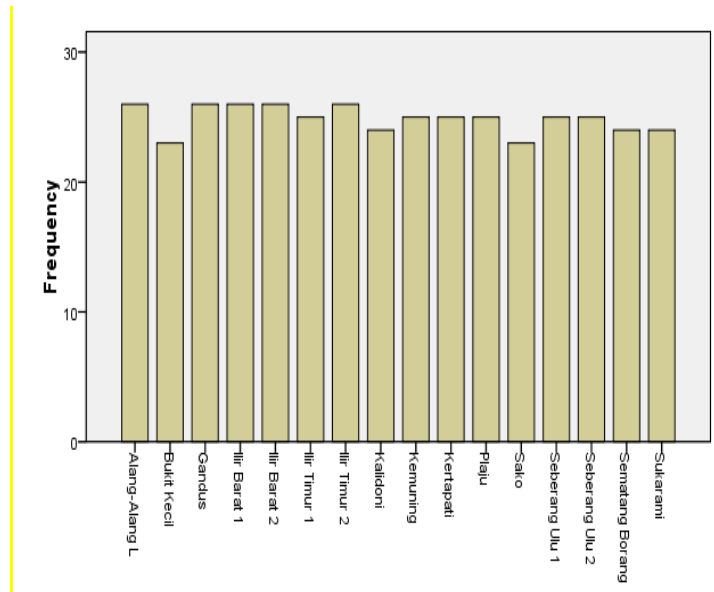
Data analysis

Univariate analysis techniques will be used data analysis using the Statistical Package for Social Sciences (SPSS). The level of knowledge (twenty-one items), attitudes (five items), and practice (two items) were calculated based on a questionnaire made by the author. Each item on the knowledge section has a value of 1 if the question is answered correctly and 0 if the question is answered incorrectly. Each item on the attitude section has a value of 1 if agreed and 0 if disagree. As for the level of practice based on the frequency of daily nasal irrigation, the value is 2 if they do it twice a day, 1 if they do once a day and 0 if they don't do it at all.

Results

Graphic 1. shows distribution data of respondents according to the districts in Palembang City, and we found that the study samples were distributed in every district in Palembang City. The distributions were as follows: Alang-Alang Lebar, Gandus, Ilir Barat 1, Ilir Barat 2, and

Iilir Timur 2 District each consisted of 26 respondents. Iilir Timur 1, Kemuning, Kertapati, Plaju, Seberang Ulu 1, and Seberang Ulu 2 Districts each consisted of 25 respondents. Kertapati, Sematang Borang, and Sukarami Districts each consisted of 24 respondents. Bukit Kecil and Sako Districts each consisted of 23 respondents.



Graphic 1. Distribution of Respondents According to the Districts in Palembang City

According to Table 1. characteristics of respondents by age and last education level, from 398 respondents, the majority were in the age category of 18 – 25 years old which was 261 respondents (65.6%), in the age category of 26 – 45 years old were 109 respondents (27.4%), and the least was in the age category of 46 – 55 years old which was 28 respondents (7.0%). According to level of education, more than half of the respondents belonged to high school category which was 231 respondents (58.5%), and the rest were no respondent (0%) in elementary school level category, two respondents (0.5%) in junior high school category, and 165 respondents (41.5%) in the higher education level category (S1/S2/S3).

Table 1. Sociodemographic Distribution of Respondents

Variables	Number (n)	Percentage (%)
Age		
18 – 25 years-old	261	65.6
26 – 45 years-old	109	27.4
46 – 55 years-old	28	7.0
Education Level		
SD	0	0

SMP	2	0.5
SMA	231	58.0
S1/S2/S3	165	41.5
Total	398	100,0

According to Table 2. the level of knowledge of the people regarding nasal irrigation as many as 141 respondents (35.4%) had good knowledge, 144 respondents (36.2%) had moderate knowledge, and 113 respondents (28.4%) had low knowledge. The level of attitude of the people regarding nasal irrigation is presented in Table 2., as many as 332 respondents (83.4%) showed good attitude, 56 respondents (14.1%) showed moderate attitude, and 10 respondents (2.5%) showed low attitude. The level of practice of the people regarding nasal irrigation is presented in Table 2., as many as 29 respondents (7.3%) showed a good level of practice, 68 respondents (17.1%) showed a moderate level of practice, and 301 respondents (75.6%) showed a low level of practice.

Table 2. Level of People's Knowledge, Attitude, and Practice Regarding Nasal Irrigation

Variable	Number (n)	Percentage (%)
Level of Knowledge		
Good	141	35.4
Moderate	144	36.2
Low	113	28.4
Level of Attitude		
Good	332	83.4
Moderate	56	14.1
Low	10	2.5
Level of Practice		
Good	29	7.3
Moderate	68	17.1
Low	301	75.6
Total	398	100

Discussion

According to the age distribution of this study, the majority is from age category of 18 – 25 years old which belonged to the late adolescent stage.^{10,11} According to a survey conducted by Kominfo (Ministry of Information) in 2017, it shows that smartphone ownership and internet usage in Indonesia were highest in the age group of 20 – 29 years old which was 75.95% and 60.15%, respectively. This was in accordance with the result of distribution of respondents according to age category from this study. According to a survey by the Central Bureau of Statistics in 2019, smartphone usage and its implication towards internet usage of the people keep increasing during the last five years.^{12,13}

In terms of last education level of the respondents, the majority was from high school level which was 231 respondents (58.0%). In the self-development process, human has a basic necessity called education. The ease which individuals receive and develop knowledge and technology requires high education.¹⁴ From this notion, it is implied that the higher education will be the higher an individual's will in pursuing information regarding new knowledge and the easier it is to receive the knowledge they get. According to the age distribution, it can be related to the result of distribution of education level because the people in the 18 – 25 years old category are in the age group that have finished high school education and most probably is continuing education in the higher education level (college/ university).¹⁵

Knowledge is the result of an individual's sensing of objects through sense organs, the most used sense organs are eyes and ears.¹⁴ The factors that can affect the level of knowledge of an individual is an information source. Information source regarding health can be obtained from various parties, such as a physician, a specialist, other health care workers, friends, teachers, and also information media (including newspaper, health article, television, radio, etc.). More information obtained are from the environment and media than from medical professionals, therefore the information is mostly incorrect.¹⁶ The results of the study did not fully align with the result from the study by Nunung Mirawati (2020) in Faculty of Medicine Muhammadiyah University Palembang which shows that the level of knowledge of college students regarding nasal irrigation is good. This can be due to the different study population, where in that study the population was medical school students who received information regarding nasal irrigation from study materials and from their teachers whose profession was also doctors.¹⁷ Meanwhile according to a study by Adegbiyi, et al., (2020) individual's level of knowledge regarding nasal diseases were low.¹⁶

According to the theory of Thoughts and Feeling, attitude represents someone's likes and dislikes toward an object, in this case nasal irrigation. Attitudes are formed by personal experience or the people around them which cause an individual's urge to stay away from an

object or a disease by preventing the risk of developing the disease.¹⁴ Currently, Indonesia is experiencing the Covid-19 outbreak. In the study, the people showed a good attitude, meaning that the people supported the measures to prevent Covid-19, one of the means is nasal irrigation. Results of the study are in accordance with a study conducted by Jessica Moudy and Rizma Adlia (2020) that people show a cautious attitude towards the Covid-19 disease and supported the measures to prevent Covid-19.¹⁸

According to the Lawrence Green's theory, there are three main factors that affect a person's health behavior. The first is predisposing factor, regarding the individual's knowledge. Judging from the result of level of knowledge, the majority of the people show a moderate level of knowledge regarding nasal irrigation. The second factor is enabling factor which means the availability of facilities and health care materials, including the materials used for nasal irrigation (NaCl 0.9% solution) which probably is not available in every household and the majority of people do not know how to make a saline solution at home. The third factor is reinforcing factor, which means there is relationship to the healthcare officials or other community leaders around them who never perform nasal irrigation.¹⁴ The three factors are interrelated and form the health behavior. In this case, one of the factors that cause people to never perform nasal irrigation can be because they never see their close relatives performed it so it is not emulated. Nasal irrigation is a procedure of spraying saline solution in to the nasal cavity. An incorrect nasal irrigation method may cause pain due to the water flow or the syringe tip nudging the nasal septum which then elicited a negative response in the individual. This negative response can take form as avoiding performing nasal irrigation procedure due to the discomfort.¹⁹ This can also be a factor for someone to be reluctant to perform nasal irrigation. Usually, nasal irrigation is performed by individuals with nasal disease symptoms such as rhinosinusitis, because it is advised by a doctor as an adjuvant therapy. They are more compliant and more pleased to perform nasal irrigation because they can have more control of their health, it is effective in reducing chronic rhinosinusitis symptoms, and may reduce the need to use medicine.^{20,21} To adapt to new health habits, people need to see and hear the correct information. Similarly, with hand washing and using a mask, currently, people are more obedient in doing so as a preventive measure of Covid-19. Both of them also need adaptation to be well received by the people and become new daily habits. According to a news article from Gadjah Mada University which described that the common people were not entirely aware and even neglecting nasal health problems. In the Healthy Nose Awareness Movement (*Gerakan Sadar Sehat Hidung*), the students of FKKMK UGM performed nasal irrigation demonstration for batik craftsmen and women, and it is obvious that they were enthusiastic to

perform nasal irrigation which they think to be a beneficial new habit.²² In order for the people to adapt to new health habits, in this case nasal irrigation, education and counseling by health care workers are needed.

Conclusion→5

The community of Palembang city had a moderate level of knowledge, a good attitude, and a low level of practice regarding nasal irrigation in the Covid-19 pandemic era.

References→6

1. WHO. Novel Coronavirus [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/>
2. Umakanthan S, Sahu P, Ranade A V., Bukelo MM, Rao JS, Abrahao-Machado LF, et al. Origin, transmission, diagnosis and management of coronavirus disease 2019 (COVID-19). *Postgrad Med J.* 2020;96(1142):753–8.
3. Kesehatan K. Pedoman Pencegahan dan Pengendalian Corona Virus deases (Covid-19) [Internet]. Vol. 5, Kementrian Kesehatan. 2020. 178 p. Available from: https://covid19.go.id/storage/app/media/Protokol/REV-05_Pedoman_P2_COVID-19_13_Juli_2020.pdf
4. WHO. WHO Coronavirus Disease (Covid-19) Dashboard [Internet]. 2021 [cited 2021 Feb 11]. Available from: <https://covid19.who.int/region/searo/country/id>
5. WHO. Modes of Transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>
6. Lotfi MR, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clin Chim Acta* [Internet]. 2020;508:254–66. Available from: www.elsevier.com/locate/cca Review
7. Pirochchai P, Puvatanond C, Kirtsreesakul V, Chaiyasate S, Thanaviratananich S. Effectiveness of nasal irrigation devices: A Thai multicentre survey. *PeerJ.* 2019;2019(5).
8. Khan MM, Parab SR, Paranjape M. Repurposing 0.5% povidone iodine solution in otorhinolaryngology practice in Covid 19 pandemic. *Am J Otolaryngol - Head Neck*

- Med Surg [Internet]. 2020;41(5):102618. Available from: <https://doi.org/10.1016/j.amjoto.2020.102618>
9. Singh, Sheetu; Sharma, Neeraj ; Singh, Udaiveer; Singh, Tejraj ; Mangal; Singh DK ; Virendra. Nasopharyngeal wash in preventing and treating upper respiratory tract infections: Could it prevent COVID-19? *Lung India*. 2020;37(3):246–51.
 10. WHO. Orientation Programme on Adolescent Health for Health-care Providers [Internet]. Department of Child and Adolescent Health and Development. 2018. 403 p. Available from: https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_handout.pdf
 11. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *Lancet Child Adolesc Heal*. 2018;2(3):223–8.
 12. KOMINFO. Survey Penggunaan TIK 2017. 2017.
 13. Sutarsih, T. Statistik Telekomunikasi Indonesia. Jakarta: Bahan Pusat Statistik; 2019.
 14. Notoatmodjo S. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta; 2017.
 15. Bastari. Indonesia Education Statistics in Brief. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia; 2019.
 16. Adegbiyi WA, Aremu SK, Aluko AAA, Adewoye RK. Knowledge and awareness of nasal allergy among patients in a developing country. *J Fam Med Prim Care* [Internet]. 2020;9(3):1477–82. Available from: <http://www.jfmprc.com>
 17. Mirawati, Nunung. Gambaran tingkat pengetahuan tentang cuci hidung pada mahasiswa di fakultas kedokteran universitas muhammadiyah Palembang skripsi. 2020.
 18. Moudy J, Syakurah RA. Pengetahuan terkait usaha pencegahan Coronavirus Disease (COVID-19) di Indonesia. *Higeia J Public Heal Res Dev*. 2020;4(3):333–46.
 19. Çelikel Ş, Tural Büyük E, Yıldızlar O. Children’s Pain, Fear, and Anxiety During Invasive Procedures. *Nurs Sci Q*. 2019;32(3):226–32.
 20. Rabago D, Barrett B, Marchand L, Maberry R, Mundt M. Qualitative aspects of nasal irrigation use by patients with chronic sinus disease in a multimethod study. *Ann Fam Med*. 2006;4(4):295–301.
 21. Rachana R, Santhi T. Efficacy of Saline Nasal Irrigation in Chronic Rhinosinusitis.

2019;7(6):71–7.

22. Agung. Meningkatkan Kesadaran Kesehatan Hidung [Internet]. 2018 [cited 2021 Jan 12]. Available from: <https://www.ugm.ac.id/id/berita/16257-meningkatkan-kesadaran-kesehatan-hidung>

Reviewer Comment:

- 1→ Title of Manuscripts should be explained main review and declared type of literature review: narrative or systematic review.
- 2→ Keywords should be showed the main words of the study, the authors can use MeSH to develop keywords.
- 3→ Abstract should be showed the main of background, main of review and conclusion of study.
- 4→ Introduction should be showed the urgency of study (epidemiology data), biological plausibility concept, and lack of knowledge in the study.
- 5→ Conclusion should more specific and not more showed more review.
- 6→ Authors must check the references for make update references. References should no more than 10 years.

Reviewer 2

A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic → 1

Rachmat Hidayat^{1*}, Riri Juliantika², Fiona Widya Sari³, Puspa Zulaika³, Ziske Maritska¹

¹Department of Biology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Undergraduate Student, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

³Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

*Corresponding author: dr.rachmat.hidayat@gmail.com

Abstract → 3

Covid-19 is a respiratory tract infection caused by the novel coronavirus (nCov). Nasal irrigation is one of the efforts to prevent Covid-19. Nasal irrigation is an act of flushing saline solution into the nasal cavity. This research aims to determine level of knowledge, attitudes, and practices of the community regarding nasal irrigation during Covid-19 pandemic. This study was a descriptive observational study. The sample of this research was the people of Palembang city who were eligible for the inclusion and exclusion criteria with the consecutive sampling technique as many as 398 respondents. Data were obtained through primary data in the form of questionnaires, processed using the SPSS program, and analyzed using univariate analysis. The most characteristics of respondents in this study were in the age group 18-25 years (65.5%) and the last level of education was high school (58.0%). The level of public knowledge about Nasal irrigation during the Covid-19 pandemic was in the moderate category of 36.2%. The level of public attitudes regarding nasal irrigation during the Covid-19 pandemic was in the good category at 83.4%. The level of nasal irrigation practice was included in the low category of 75.6%. The community of Palembang city had a sufficient level of knowledge, a good level of attitude, and a low level of practice regarding nasal irrigation during Covid-19 pandemic.

Keywords. covid-19, nasal irrigation, public attitudes, observational study, medicine. → 2

Introduction → 4

Coronavirus disease (also known as Covid-19) is a respiratory disease. The etiology of Covid-19 is a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which can cause mild to severe pneumonia. The first report regarding Covid-19 outbreak found that the main source of exposure is from a seafood market in Wuhan, China, at the end of December 2019 and since then it had spread rapidly across the world including Indonesia which reported its initial case in early March 2020.^{1,2,3} The cumulative number of confirmed cases topped 1,183,555 and 32,167 deaths occurred in Indonesia on February 11, 2021.⁴

Covid-19 is transmitted through animals and human.² Coronavirus is spread in various animals, such as bird and mammals, however the animal vector caused Covid-19 is not known up.^{2,3} The most common ways of transmission are via direct contact through droplets splashes from an infected person or someone with respiratory symptoms (eg. coughing and sneezing) and via indirect contact in form of contaminated surfaces of environmental objects that has been used by an infected person, including littered used masks, then the uninfected person touch parts of their face, namely eyes, nose, and mouth, that are common routes of spreading infection.^{1,2,3,5,6}

These case constantly increasing so that efforts needed to take prevent the spread and reduce the case fatality rate. One of the measure that can be done is regular nasal irrigation. Nasal irrigation is useful to maintain nasal health, such as for removing mucous, infective pathogen, and inflammatory mediators. Nasal irrigation is defined as a procedure of spraying saline solution into the nasal cavity.⁷ The most commonly used saline solution is isotonic saline solution, for example NaCl 0,9%.⁸ However, there were studies which stated that the use of hypertonic saline solution, povidone iodine (PVI), has a superior virucidal activity and thus reduce viral load.^{8,9}

This study is a continuing study about level of knowledge regarding nasal irrigation by Nunung Mirawati at Faculty Medicine of Muhammadiyah Palembang University. This study aims to determine level of knowledge, attitude, and practice of the community regarding nasal irrigation during Covid-19 pandemic.

Methods

Design Study and Study Population

This study used a descriptive observational design with the population of Palembang City, Indonesia. The sampling technique used was consecutive sampling, samples were obtained consecutively as many as 26 samples from every district in Palembang city that met the study criteria until the number of required respondents was fulfilled. The respondents of

this study were 398 people who met the inclusion and exclusion criteria. The inclusion criteria for this study were people of Palembang City aged between 18 – 55 years old, with last education level of elementary school (SD), junior high school (SMP), high school (SMA), and bachelor (S1)/graduate (S2)/doctorate (S3) degree, who agreed to participate in the study and signed the informed consent. The exclusion criteria were respondents who did not completed and collected the questionnaire. The data from this study were primary data in the form of questionnaires with closed ended questions made by the researchers. The questions covered the sociodemographic of respondents, knowledge, attitude, and practices regarding nasal irrigation. The questionnaire was distributed online as a Google form via *Whatsapp blast, Line, dan Instagram*. The respondents were guaranteed anonymity and gave their consent. The time of research was conducted from November 24th to December 5th 2021 in Palembang city, Indonesia. Throughout the research period, there were 472 respondents who filled out the questionnaire.

Knowledge, Attitudes, and Practices Questionnaire Design

This questionnaire consists of six sections. The first section presents informed consent agreeing to participate in the study. The second section assessed general information and demographic variables including age, address, last level of education, and phone number. The third, fourth, and fifth section evaluate the level of the respondent's knowledge, attitude, and practice, respectively. The last section contains information to inform the public about nasal irrigation.

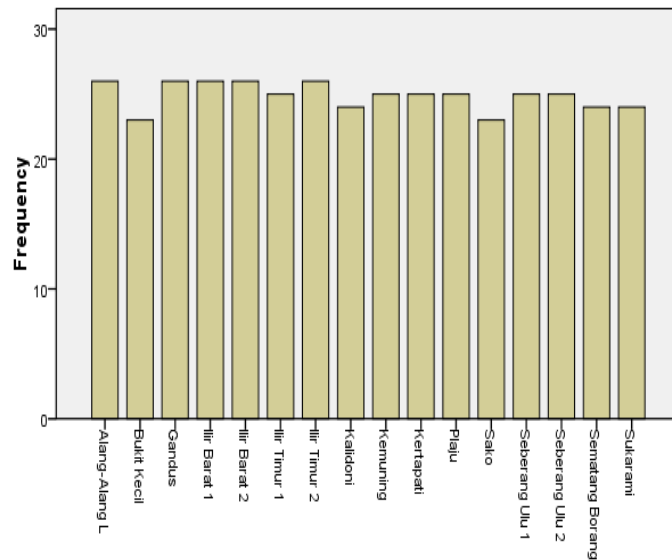
Data analysis

Univariate analysis techniques will be used data analysis using the Statistical Package for Social Sciences (SPSS). The level of knowledge (twenty-one items), attitudes (five items), and practice (two items) were calculated based on a questionnaire made by the author. Each item on the knowledge section has a value of 1 if the question is answered correctly and 0 if the question is answered incorrectly. Each item on the attitude section has a value of 1 if agreed and 0 if disagree. As for the level of practice based on the frequency of daily nasal irrigation, the value is 2 if they do it twice a day, 1 if they do once a day and 0 if they don't do it at all.

Results

Graphic 1. shows distribution data of respondents according to the districts in Palembang City, and we found that the study samples were distributed in every district in Palembang City. The distributions were as follows: Alang-Alang Lebar, Gandus, Ilir Barat 1, Ilir Barat 2, and

Iilir Timur 2 District each consisted of 26 respondents. Iilir Timur 1, Kemuning, Kertapati, Plaju, Seberang Ulu 1, and Seberang Ulu 2 Districts each consisted of 25 respondents. Kertapati, Sematang Borang, and Sukarami Districts each consisted of 24 respondents. Bukit Kecil and Sako Districts each consisted of 23 respondents.



Graphic 1. Distribution of Respondents According to the Districts in Palembang City

According to Table 1. characteristics of respondents by age and last education level, from 398 respondents, the majority were in the age category of 18 – 25 years old which was 261 respondents (65.6%), in the age category of 26 – 45 years old were 109 respondents (27.4%), and the least was in the age category of 46 – 55 years old which was 28 respondents (7.0%). According to level of education, more than half of the respondents belonged to high school category which was 231 respondents (58.5%), and the rest were no respondent (0%) in elementary school level category, two respondents (0.5%) in junior high school category, and 165 respondents (41.5%) in the higher education level category (S1/S2/S3).

Table 1. Sociodemographic Distribution of Respondents

Variables	Number (n)	Percentage (%)
Age		
18 – 25 years-old	261	65.6
26 – 45 years-old	109	27.4
46 – 55 years-old	28	7.0
Education Level		
SD	0	0

SMP	2	0.5
SMA	231	58.0
S1/S2/S3	165	41.5
Total	398	100,0

According to Table 2. the level of knowledge of the people regarding nasal irrigation as many as 141 respondents (35.4%) had good knowledge, 144 respondents (36.2%) had moderate knowledge, and 113 respondents (28.4%) had low knowledge. The level of attitude of the people regarding nasal irrigation is presented in Table 2., as many as 332 respondents (83.4%) showed good attitude, 56 respondents (14.1%) showed moderate attitude, and 10 respondents (2.5%) showed low attitude. The level of practice of the people regarding nasal irrigation is presented in Table 2., as many as 29 respondents (7.3%) showed a good level of practice, 68 respondents (17.1%) showed a moderate level of practice, and 10 respondents (75.6%) showed a low level of practice.

Table 2. Level of People’s Knowledge, Attitude, and Practice Regarding Nasal Irrigation

Variable	Number (n)	Percentage (%)
Level of Knowledge		
Good	141	35.4
Moderate	144	36.2
Low	113	28.4
Level of Attitude		
Good	332	83.4
Moderate	56	14.1
Low	10	2.5
Level of Practice		
Good	29	7.3
Moderate	68	17.1
Low	301	75.6
Total	398	100

Discussion

According to the age distribution of this study, the majority is from age category of 18 – 25 years old which belonged to the late adolescent stage.^{10,11} According to a survey conducted by Kominfo (Ministry of Information) in 2017, it shows that smartphone ownership and internet usage in Indonesia were highest in the age group of 20 – 29 years old which was 75.95% and 60.15%, respectively. This was in accordance with the result of distribution of respondents according to age category from this study. According to a survey by the Central Bureau of Statistics in 2019, smartphone usage and its implication towards internet usage of the people keep increasing during the last five years.^{12,13}

In terms of last education level of the respondents, the majority was from high school level which was 231 respondents (58.0%). In the self-development process, human has a basic necessity called education. The ease which individuals receive and develop knowledge and technology requires high education.¹⁴ From this notion, it is implied that the higher education will be the higher an individual's will in pursuing information regarding new knowledge and the easier it is to receive the knowledge they get. According to the age distribution, it can be related to the result of distribution of education level because the people in the 18 – 25 years old category are in the age group that have finished high school education and most probably is continuing education in the higher education level (college/ university).¹⁵

Knowledge is the result of an individual's sensing of objects through sense organs, the most used sense organs are eyes and ears.¹⁴ The factors that can affect the level of knowledge of an individual is an information source. Information source regarding health can be obtained from various parties, such as a physician, a specialist, other health care workers, friends, teachers, and also information media (including newspaper, health article, television, radio, etc.). More information obtained are from the environment and media than from medical professionals, therefore the information is mostly incorrect.¹⁶ The results of the study did not fully align with the result from the study by Nunung Mirawati (2020) in Faculty of Medicine Muhammadiyah University Palembang which shows that the level of knowledge of college students regarding nasal irrigation is good. This can be due to the different study population, where in that study the population was medical school students who received information regarding nasal irrigation from study materials and from their teachers whose profession was also doctors.¹⁷ Meanwhile according to a study by Adegbiyi, et al., (2020) individual's level of knowledge regarding nasal diseases were low.¹⁶

According to the theory of Thoughts and Feeling, attitude represents someone's likes and dislikes toward an object, in this case nasal irrigation. Attitudes are formed by personal experience or the people around them which cause an individual's urge to stay away from an

object or a disease by preventing the risk of developing the disease.¹⁴ Currently, Indonesia is experiencing the Covid-19 outbreak. In the study, the people showed a good attitude, meaning that the people supported the measures to prevent Covid-19, one of the means is nasal irrigation. Results of the study are in accordance with a study conducted by Jessica Moudy and Rizma Adlia (2020) that people show a cautious attitude towards the Covid-19 disease and supported the measures to prevent Covid-19.¹⁸

According to the Lawrence Green's theory, there are three main factors that affect a person's health behavior. The first is predisposing factor, regarding the individual's knowledge. Judging from the result of level of knowledge, the majority of the people show a moderate level of knowledge regarding nasal irrigation. The second factor is enabling factor which means the availability of facilities and health care materials, including the materials used for nasal irrigation (NaCl 0.9% solution) which probably is not available in every household and the majority of people do not know how to make a saline solution at home. The third factor is reinforcing factor, which means there is relationship to the healthcare officials or other community leaders around them who never perform nasal irrigation.¹⁴ The three factors are interrelated and form the health behavior. In this case, one of the factors that cause people to never perform nasal irrigation can be because they never see their close relatives performed it so it is not emulated. Nasal irrigation is a procedure of spraying saline solution in to the nasal cavity. An incorrect nasal irrigation method may cause pain due to the water flow or the syringe tip nudging the nasal septum which then elicited a negative response in the individual. This negative response can take form as avoiding performing nasal irrigation procedure due to the discomfort.¹⁹ This can also be a factor for someone to be reluctant to perform nasal irrigation. Usually, nasal irrigation is performed by individuals with nasal disease symptoms such as rhinosinusitis, because it is advised by a doctor as an adjuvant therapy. They are more compliant and more pleased to perform nasal irrigation because they can have more control of their health, it is effective in reducing chronic rhinosinusitis symptoms, and may reduce the need to use medicine.^{20,21} To adapt to new health habits, people need to see and hear the correct information. Similarly, with hand washing and using a mask, currently, people are more obedient in doing so as a preventive measure of Covid-19. Both of them also need adaptation to be well received by the people and become new daily habits. According to a news article from Gadjah Mada University which described that the common people were not entirely aware and even neglecting nasal health problems. In the Healthy Nose Awareness Movement (*Gerakan Sadar Sehat Hidung*), the students of FKKMK UGM performed nasal irrigation demonstration for batik craftsmen and women, and it is obvious that they were enthusiastic to

perform nasal irrigation which they think to be a beneficial new habit.²² In order for the people to adapt to new health habits, in this case nasal irrigation, education and counseling by health care workers are needed.

Conclusion→5

The community of Palembang city had a moderate level of knowledge, a good attitude, and a low level of practice regarding nasal irrigation in the Covid-19 pandemic era.

References→6

1. WHO. Novel Coronavirus [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/>
2. Umakanthan S, Sahu P, Ranade A V., Bukelo MM, Rao JS, Abrahao-Machado LF, et al. Origin, transmission, diagnosis and management of coronavirus disease 2019 (COVID-19). *Postgrad Med J.* 2020;96(1142):753–8.
3. Kesehatan K. Pedoman Pencegahan dan Pengendalian Corona Virus deases (Covid-19) [Internet]. Vol. 5, Kementrian Kesehatan. 2020. 178 p. Available from: https://covid19.go.id/storage/app/media/Protokol/REV-05_Pedoman_P2_COVID-19_13_Juli_2020.pdf
4. WHO. WHO Coronavirus Disease (Covid-19) Dashboard [Internet]. 2021 [cited 2021 Feb 11]. Available from: <https://covid19.who.int/region/searo/country/id>
5. WHO. Modes of Transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>
6. Lotfi MR, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clin Chim Acta* [Internet]. 2020;508:254–66. Available from: www.elsevier.com/locate/cca Review
7. Pirochchai P, Puvatanond C, Kirtsreesakul V, Chaiyasate S, Thanaviratananich S. Effectiveness of nasal irrigation devices: A Thai multicentre survey. *PeerJ.* 2019;2019(5).
8. Khan MM, Parab SR, Paranjape M. Repurposing 0.5% povidone iodine solution in otorhinolaryngology practice in Covid 19 pandemic. *Am J Otolaryngol - Head Neck*

- Med Surg [Internet]. 2020;41(5):102618. Available from: <https://doi.org/10.1016/j.amjoto.2020.102618>
9. Singh, Sheetu; Sharma, Neeraj ; Singh, Udaiveer; Singh, Tejraj ; Mangal; Singh DK ; Virendra. Nasopharyngeal wash in preventing and treating upper respiratory tract infections: Could it prevent COVID-19? *Lung India*. 2020;37(3):246–51.
 10. WHO. Orientation Programme on Adolescent Health for Health-care Providers [Internet]. Department of Child and Adolescent Health and Development. 2018. 403 p. Available from: https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_handout.pdf
 11. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *Lancet Child Adolesc Heal*. 2018;2(3):223–8.
 12. KOMINFO. Survey Penggunaan TIK 2017. 2017.
 13. Sutarsih, T. Statistik Telekomunikasi Indonesia. Jakarta: Bahan Pusat Statistik; 2019.
 14. Notoatmodjo S. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta; 2017.
 15. Bastari. Indonesia Education Statistics in Brief. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia; 2019.
 16. Adegbiyi WA, Aremu SK, Aluko AAA, Adewoye RK. Knowledge and awareness of nasal allergy among patients in a developing country. *J Fam Med Prim Care* [Internet]. 2020;9(3):1477–82. Available from: <http://www.jfmpc.com>
 17. Mirawati, Nunung. Gambaran tingkat pengetahuan tentang cuci hidung pada mahasiswa di fakultas kedokteran universitas muhammadiyah Palembang skripsi. 2020.
 18. Moudy J, Syakurah RA. Pengetahuan terkait usaha pencegahan Coronavirus Disease (COVID-19) di Indonesia. *Higeia J Public Heal Res Dev*. 2020;4(3):333–46.
 19. Çelikol Ş, Tural Büyük E, Yıldızlar O. Children’s Pain, Fear, and Anxiety During Invasive Procedures. *Nurs Sci Q*. 2019;32(3):226–32.
 20. Rabago D, Barrett B, Marchand L, Maberry R, Mundt M. Qualitative aspects of nasal irrigation use by patients with chronic sinus disease in a multimethod study. *Ann Fam Med*. 2006;4(4):295–301.
 21. Rachana R, Santhi T. Efficacy of Saline Nasal Irrigation in Chronic Rhinosinusitis.

2019;7(6):71–7.

22. Agung. Meningkatkan Kesadaran Kesehatan Hidung [Internet]. 2018 [cited 2021 Jan 12]. Available from: <https://www.ugm.ac.id/id/berita/16257-meningkatkan-kesadaran-kesehatan-hidung>

Reviewer Comment:

- 1→ Title of Manuscripts should be explained main review and declared type of literature review: narrative or systematic review.
- 2→ Keywords should be showed the main words of the study, the authors can use MeSH to develop keywords.
- 3→ Abstract should be showed the main of background, main of review and conclusion of study.
- 4→ Introduction should be showed the urgency of study (epidemiology data), biological plausibility concept, and lack of knowledge in the study.
- 5→ Conclusion should more specific and not more showed more review.
- 6→ Authors must check the references for make update references. References should no more than 10 years.



Natural Sciences Engineering & Technology Journal (NASET Journal)

Journal Homepage: <https://nasetjournal.com/index.php/nasetjournal>

A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic

Riri Juliantika¹, Fiona Widya Sari^{2*}, Rachmat Hidayat³, Puspa Zulaika², Ziske Maritska³

¹Undergraduate Student, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

³Department of Biology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

ARTICLE INFO

Keywords:

Covid-19
Nasal Irrigation
Public Attitudes
Observational Study
Medicine

Corresponding author:

Fiona Widya Sari

E-mail address:

fionawidyasari.dr@gmail.com

All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/nasetjournal.v2i1.12>

ABSTRACT

Covid-19 is a respiratory tract infection caused by the novel coronavirus (nCov). Nasal irrigation is one of the efforts to prevent Covid-19. Nasal irrigation is an act of flushing saline solution into the nasal cavity. This research aims to determine level of knowledge, attitudes, and practices of the community regarding nasal irrigation during Covid-19 pandemic. This study was a descriptive observational study. The sample of this research was the people of Palembang city who were eligible for the inclusion and exclusion criteria with the consecutive sampling technique as many as 398 respondents. Data were obtained through primary data in the form of questionnaires, processed using the SPSS program, and analyzed using univariate analysis. The most characteristics of respondents in this study were in the age group 18-25 years (65.5%) and the last level of education was high school (58.0%). The level of public knowledge about Nasal irrigation during the Covid-19 pandemic was in the moderate category of 36.2%. The level of public attitudes regarding nasal irrigation during the Covid-19 pandemic was in the good category at 83.4%. The level of nasal irrigation practice was included in the low category of 75.6%. The community of Palembang city had a sufficient level of knowledge, a good level of attitude, and a low level of practice regarding nasal irrigation during Covid-19 pandemic.

1. Introduction

Coronavirus disease (also known as Covid-19) is a respiratory disease. The etiology of Covid-19 is a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which can cause mild to severe pneumonia. The first report regarding Covid-19 outbreak found that the main source of exposure is from a seafood market in Wuhan, China, at the end of December 2019 and since then it had spread rapidly across the world including Indonesia which reported its initial case in early March 2020.^{1,2,3} The cumulative number of confirmed cases topped 1,183,555 and 32,167 deaths occurred in Indonesia on February 11, 2021.⁴

id-19 is transmitted through animals and human.² Coronavirus is spread in various animals, such as bird and mammals, however the animal vector caused Covid-19 is not known up.^{2,3} The most common ways of transmission are via direct contact through droplets splashes from an infected person or someone with respiratory symptoms (eg. coughing and sneezing) and via indirect contact in form of contaminated surfaces of environmental objects that has been used by an infected person, including littered used masks, then the uninfected person touch parts of their face, namely eyes, nose, and mouth, that are common routes of spreading

infection.^{1,2,3,5,6}

These case constantly increasing so that efforts needed to take prevent the spread and reduce the case fatality rate. One of the measure that can be done is regular nasal irrigation. Nasal irrigation is useful to maintain nasal health, such as for removing mucous, infective pathogen, and inflammatory mediators. Nasal irrigation is defined as a procedure of spraying saline solution in to the nasal cavity.⁷ The most commonly used saline solution is isotonic saline solution, for example NaCl 0,9%.⁸ However, there were studies which stated that the use of hipertonic saline solution, povidone iodine (PVI), has a superior virucidal activity and thus reduce viral load.^{8,9}

This study is a continuing study about level of knowledge regarding nasal irrigation by Nunung Mirawati at Faculty Medicine of Muhammadiyah Palembang University. This study aims to determine level of knowledge, attitude, and practice of the community regarding nasal irrigation during Covid-19 pandemic.

2. Methods

Design study and study population

This study used a descriptive observational design with the population of Palembang City, Indonesia. The sampling technique used was consecutive sampling, samples were obtained consecutively as many as 26 samples from every district in Palembang city that met the study criteria until the number of required respondents was fulfilled. The respondents of this study were 398 people who met the inclusion and exclusion criteria. The inclusion criteria for this study were people of Palembang City aged between 18 – 55 years old, with last education level of elementary school (SD), junior high school (SMP), high school (SMA), and bachelor (S1)/graduate (S2)/doctorate (S3) degree, who agreed to participate in the study and signed the informed consent. The exclusion criteria were respondents who did not completed and collected the questionnaire. The data from this study were primary data in the form of questionnaires with

closed ended questions made by the researchers. The questions covered the sociodemographic of respondents, knowledge, attitude, and practices regarding nasal irrigation. The questionnaire was distributed online as a Google form via *Whatsapp blast, Line, dan Instagram*. The respondents were guaranteed anonymity and gave their consent. The time of research was conducted from November 24th to December 5th 2021 in Palembang city, Indonesia. Throughout the research period, there were 472 respondents who filled out the questionnaire.

Knowledge, attitudes, and practices questionnaire design

This questionnaire consists of six sections. The first section presents informed consent agreeing to participate in the study. The second section assessed general information and demographic variables including age, address, last level of education, and phone number. The third, fourth, and fifth section evaluate the level of the respondent's knowledge, attitude, and practice, respectively. The last section contains information to inform the public about nasal irrigation.

Data analysis

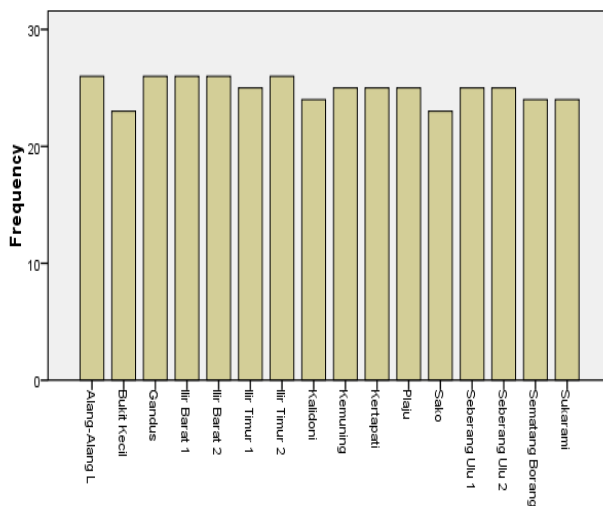
Univariate analysis techniques will be used data analysis using the Statistical Package for Social Sciences (SPSS). The level of knowledge (twenty-one items), attitudes (five items), and practice (two items) were calculated based on a questionnaire made by the author. Each item on the knowledge section has a value of 1 if the question is answered correctly and 0 if the question is answered incorrectly. Each item on the attitude section has a value of 1 if agreed and 0 if disagree. As for the level of practice based on the frequency of daily nasal irrigation, the value is 2 if they do it twice a day, 1 if they do once a day and 0 if they don't do it at all.

3. Results & Discussion

Graphic 1. shows distribution data of respondents

according to the districts in Palembang City, and we found that the study samples were distributed in every district in Palembang City. The distributions were as follows: Alang-Alang Lebar, Gandus, Ilir Barat 1, Ilir Barat 2, and Ilir Timur 2 District each consisted of 26 respondents. Ilir Timur 1, Kemuning,

Kertapati, Plaju, Seberang Ulu 1, and Seberang Ulu 2 Districts each consisted of 25 respondents. Kertapati, Sematang Borang, and Sukarami Districts each consisted of 24 respondents. Bukit Kecil and Sako Districts each consisted of 23 respondents.



Graphic 1. Distribution of respondents according to the districts in Palembang city

According to Table 1. characteristics of respondents by age and last education level, from 398 respondents, the majority were in the age category of 18 – 25 years old which was 261 respondents (65.6%), in the age category of 26 – 45 years old were 109 respondents (27.4%), and the least was in the age category of 46 – 55 years old which was 28 respondents (7.0%). According to level of education,

more than half of the respondents belonged to high school category which was 231 respondents (58.5%), and the rest were no respondent (0%) in elementary school level category, two respondents (0.5%) in junior high school category, and 165 respondents (41.5%) in the higher education level category (S1/S2/S3).

Table 1. Sociodemographic distribution of respondents

Variables	Number (n)	Percentage (%)
Age		
18 – 25 years-old	261	65.6
26 – 45 years-old	109	27.4
46 – 55 years-old	28	7.0
Education Level		
SD	0	0
SMP	2	0.5
SMA	231	58.0
S1/S2/S3	165	41.5
Total	398	100,0

According to Table 2. the level of knowledge of the people regarding nasal irrigation as many as 141 respondents (35.4%) had good knowledge, 144 respondents (36.2%) had moderate knowledge, and 113 respondents (28.4%) had low knowledge. The level of attitude of the people regarding nasal irrigation is presented in Table 2., as many as 332 respondents (83.4%) showed good attitude, 56

respondents (14.1%) showed moderate attitude, and 10 respondents (2.5%) showed low attitude. The level of practice of the people regarding nasal irrigation is presented in Table 2., as many as 29 respondents (7.3%) showed a good level of practice, 68 respondents (17.1%) showed a moderate level of practice, and 10 respondents (75.6%) showed a low level of practice.

Table 2. Level of people’s knowledge, attitude, and practice regarding nasal irrigation

Variable	Number (n)	Percentage (%)
Level of Knowledge		
Good	141	35.4
Moderate	144	36.2
Low	113	28.4
Level of Attitude		
Good	332	83.4
Moderate	56	14.1
Low	10	2.5
Level of Practice		
Good	29	7.3
Moderate	68	17.1
Low	301	75.6
Total	398	100

4. Discussion

According to the age distribution of this study, the majority is from age category of 18 – 25 years old which belonged to the late adolescent stage.^{10,11} According to a survey conducted by Kominfo (Ministry of Information) in 2017, it shows that smartphone ownership and internet usage in Indonesia were highest in the age group of 20 – 29 years old which was 75.95% and 60.15%, respectively. This was in accordance with the result of distribution of respondents according to age category from this study. According to a survey by the Central Bureau of Statistics in 2019, smartphone usage and its implication towards internet usage of

the people keep increasing during the last five years.^{12,13}

In terms of last education level of the respondents, the majority was from high school level which was 231 respondents (58.0%). In the self-development process, human has a basic necessity called education. The ease which individuals receive and develop knowledge and technology requires high education.¹⁴ From this notion, it is implied that the higher education will be the higher an individual’s will in pursuing information regarding new knowledge and the easier it is to receive the knowledge they get. According to the age distribution, it can be related to the result of distribution of education level because the people in the 18 – 25

years old category are in the age group that have finished high school education and most probably is continuing education in the higher education level (college/ university).¹⁵

Knowledge is the result of an individual's sensing of objects through sense organs, the most used sense organs are eyes and ears.¹⁴ The factors that can affect the level of knowledge of an individual is an information source. Information source regarding health can be obtained from various parties, such as a physician, a specialist, other health care workers, friends, teachers, and also information media (including newspaper, health article, television, radio, etc.). More information obtained are from the environment and media than from medical professionals, therefore the information is mostly incorrect.¹⁶ The results of the study did not fully align with the result from the study by Nunung Mirawati (2020) in Faculty of Medicine Muhammadiyah University Palembang which shows that the level of knowledge of college students regarding nasal irrigation is good. This can be due to the different study population, where in that study the population was medical school students who received information regarding nasal irrigation from study materials and from their teachers whose profession was also doctors.¹⁷ Meanwhile according to a study by Adegbiyi, et al., (2020) individual's level of knowledge regarding nasal diseases were low.¹⁶

According to the theory of Thoughts and Feeling, attitude represents someone's likes and dislikes toward an object, in this case nasal irrigation. Attitudes are formed by personal experience or the people around them which cause an individual's urge to stay away from an object or a disease by preventing the risk of developing the disease.¹⁴ Currently, Indonesia is experiencing the Covid-19 outbreak. In the study, the people showed a good attitude, meaning that the people supported the measures to prevent Covid-19, one of the means is nasal irrigation. Results of the study are in accordance with a study conducted by Jessica Moudy and Rizma Adlia (2020) that people show a cautious attitude towards

the Covid-19 disease and supported the measures to prevent Covid-19.¹⁸

According to the Lawrence Green's theory, there are three main factors that affect a person's health behavior. The first is predisposing factor, regarding the individual's knowledge. Judging from the result of level of knowledge, the majority of the people show a moderate level of knowledge regarding nasal irrigation. The second factor is enabling factor which means the availability of facilities and health care materials, including the materials used for nasal irrigation (NaCl 0.9% solution) which probably is not available in every household and the majority of people do not know how to make a saline solution at home. The third factor is reinforcing factor, which means there is relationship to the healthcare officials or other community leaders around them who never perform nasal irrigation.¹⁴ The three factors are interrelated and form the health behavior. In this case, one of the factors that cause people to never perform nasal irrigation can be because they never see their close relatives performed it so it is not emulated. Nasal irrigation is a procedure of spraying saline solution in to the nasal cavity. An incorrect nasal irrigation method may cause pain due to the water flow or the syringe tip nudging the nasal septum which then elicited a negative response in the individual. This negative response can take form as avoiding performing nasal irrigation procedure due to the discomfort.¹⁹ This can also be a factor for someone to be reluctant to perform nasal irrigation. Usually, nasal irrigation is performed by individuals with nasal disease symptoms such as rhinosinusitis, because it is advised by a doctor as an adjuvant therapy. They are more compliant and more pleased to perform nasal irrigation because they can have more control of their health, it is effective in reducing chronic rhinosinusitis symptoms, and may reduce the need to use medicine.^{20,21} To adapt to new health habits, people need to see and hear the correct information. Similarly, with hand washing and using a mask, currently, people are more obedient in doing so as a preventive measure of Covid-19. Both of them

also need adaptation to be well received by the people and become new daily habits. According to a news article from Gadjah Mada University which described that the common people were not entirely aware and even neglecting nasal health problems. In the Healthy Nose Awareness Movement (*Gerakan Sadar Sehat Hidung*), the students of FKKMK UGM performed nasal irrigation demonstration for batik craftsmen and women, and it is obvious that they were enthusiastic to perform nasal irrigation which they think to be a beneficial new habit.²² In order for the people to adapt to new health habits, in this case nasal irrigation, education and counseling by health care workers are needed.

5. Conclusion

The community of Palembang city had a moderate level of knowledge, a good attitude, and a low level of practice regarding nasal irrigation in the Covid-19 pandemic era.

6. References

1. WHO. Novel Coronavirus [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/>
2. Umakanthan S, Sahu P, Ranade A V., Bukelo MM, Rao JS, Abrahao-Machado LF, et al. Origin, transmission, diagnosis and management of coronavirus disease 2019 (COVID-19). *Postgrad Med J*. 2020; 96(1142): 753–8.
3. Kesehatan K. Pedoman Pencegahan dan Pengendalian Corona Virus deases (Covid-19) [Internet]. Vol. 5, Kementerian Kesehatan. 2020. 178 p. Available from: https://covid19.go.id/storage/app/media/Protokol/REV-05_Pedoman_P2_COVID-19_13_Juli_2020.pdf
4. WHO. WHO Coronavirus Disease (Covid-19) Dashboard [Internet]. 2021 [cited 2021 Feb 11]. Available from: <https://covid19.who.int/region/sear/country/id>
5. WHO. Modes of Transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. 2020 [cited 2021 Jan 10]. Available from: [room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations

 6. Lotfi MR, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clin Chim Acta* \[Internet\]. 2020; 508: 254–66. Available from: \[www.elsevier.com/locate/cca\]\(http://www.elsevier.com/locate/cca\) Review
 7. Pirochchai P, Puvatanond C, Kirtsreesakul V, Chaiyasate S, Thanaviratananich S. Effectiveness of nasal irrigation devices: A Thai multicentre survey. *PeerJ*. 2019; 2019\(5\).
 8. Khan MM, Parab SR, Paranjape M. Repurposing 0.5% povidone iodine solution in otorhinolaryngology practice in Covid 19 pandemic. *Am J Otolaryngol - Head Neck Med Surg* \[Internet\]. 2020; 41\(5\):102618. Available from: <https://doi.org/10.1016/j.amjoto.2020.102618>
 9. Singh, Sheetu;Sharma, Neeraj ;Singh, Udaiveer;Singh, Tejraj ;Mangal;Singh DK ;Virendra. Nasopharyngeal wash in preventing and treating upper respiratory tract infections: Could it prevent COVID-19? *Lung India*. 2020; 37\(3\): 246–51.
 10. WHO. Orientation Programme on Adolescent Health for Health-care Providers \[Internet\]. Department of Child and Adolescent Health and Development. 2018. 403 p. Available from: \[https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_hando ut.pdf\]\(https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_hando ut.pdf\)
 11. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *Lancet Child Adolesc Heal*. 2018; 2\(3\): 223–8.
 12. KOMINFO. Survey Penggunaan TIK 2017. 2017.
 13. Sutarsih, T. Statistik Telekomunikasi Indonesia. Jakarta: Bahan Pusat Statistik; 2019.
 14. Notoatmodjo S. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta; 2017.
 15. Bastari. Indonesia Education Statistics in Brief. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia. 2019.
 16. Adegbiyi WA, Aremu SK, Aluko AAA, Adewoye RK. Knowledge and awareness of nasal allergy among patients in a developing country. *J Fam Med Prim Care* \[Internet\]. 2020; 9\(3\): 1477–82. Available from: <http://www.jfmpc.com>
 17. Mirawati, Nunung. Gambaran tingkat pengetahuan tentang cuci hidung pada mahasiswa di fakultas kedokteran universitas muhammadiyah Palembang skripsi. 2020.](https://www.who.int/news-

</div>
<div data-bbox=)

18. Moudy J, Syakurah RA. Pengetahuan terkait usaha pencegahan Coronavirus Disease (COVID-19) di Indonesia. *Higeia J Public Heal Res Dev*. 2020;4(3):333–46.
19. Çelikol Ş, Tural Büyük E, Yıldızlar O. Children's Pain, Fear, and Anxiety During Invasive Procedures. *Nurs Sci Q*. 2019; 32(3): 226–32.
20. Rabago D, Barrett B, Marchand L, Maberry R, Mundt M. Qualitative aspects of nasal irrigation use by patients with chronic sinus disease in a multimethod study. *Ann Fam Med*. 2006; 4(4): 295–301.
21. Rachana R, Santhi T. Efficacy of Saline Nasal Irrigation in Chronic Rhinosinusitis. 2019; 7(6): 71–7.
22. Agung. Meningkatkan Kesadaran Kesehatan Hidung [Internet]. 2018 [cited 2021 Jan 12]. Available from: <https://www.ugm.ac.id/id/berita/16257-meningkatkan-kesadaran-kesehatan-hidung>

Paper Accepted for publication (March 18th, 2022)

Natural Sciences Engineering and Technology Journal



Letter of Acceptance

Manuscript “A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic“ by Riri Juliantika, Fiona Widya Sari*, Rachmat Hidayat, Puspa Zulaika, Ziske Maritska, has been accepted to publish in Natural Sciences Engineering and Technology Journal Vol 2 issue 1 in March 2022.

Cordially,



Prof. Paula Magnano, PhD

Editor **HM Publisher**

(*) Corresponding author

The Corresponding Author can access the account in website :

<https://nasetjournal.com/index.php/nasetjournal/login>

User: rachmat_hdyt

Password: 210587



Natural Sciences Engineering & Technology Journal (NASET Journal)

Journal Homepage: <https://nasetjournal.com/index.php/nasetjournal>

A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic

Riri Juliantika¹, Fiona Widya Sari^{2*}, Rachmat Hidayat³, Puspa Zulaika², Ziske Maritska³

¹Undergraduate Student, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

³Department of Biology, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

ARTICLE INFO

Keywords:

Covid-19
Nasal Irrigation
Public Attitudes
Observational Study
Medicine

Corresponding author:

Fiona Widya Sari

E-mail address:

flonawidyasari.dr@gmail.com

All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/nasetjournal.v2i1.12>

ABSTRACT

Covid-19 is a respiratory tract infection caused by the novel coronavirus (nCov). Nasal irrigation is one of the efforts to prevent Covid-19. Nasal irrigation is an act of flushing saline solution into the nasal cavity. This research aims to determine level of knowledge, attitudes, and practices of the community regarding nasal irrigation during Covid-19 pandemic. This study was a descriptive observational study. The sample of this research was the people of Palembang city who were eligible for the inclusion and exclusion criteria with the consecutive sampling technique as many as 398 respondents. Data were obtained through primary data in the form of questionnaires, processed using the SPSS program, and analyzed using univariate analysis. The most characteristics of respondents in this study were in the age group 18-25 years (65.5%) and the last level of education was high school (58.0%). The level of public knowledge about Nasal irrigation during the Covid-19 pandemic was in the moderate category of 36.2%. The level of public attitudes regarding nasal irrigation during the Covid-19 pandemic was in the good category at 83.4%. The level of nasal irrigation practice was included in the low category of 75.9%. The community of Palembang city had a sufficient level of knowledge, a good level of attitude, and a low level of practice regarding nasal irrigation during Covid-19 pandemic.

1. Introduction

Coronavirus disease (also known as Covid-19) is a respiratory disease. The etiology of Covid-19 is a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which can cause mild to severe pneumonia. The first report regarding Covid-19 outbreak found that the main source of exposure is from a seafood market in Wuhan, China, at the end of December 2019 and since then it had spread rapidly across the world including Indonesia which reported its initial case in early March 2020.^{1,2,3} The cumulative number of confirmed cases topped

1,183,555 and 32,167 deaths occurred in Indonesia on February 11, 2021.⁴

Covid-19 is transmitted through animals and human.² Coronavirus is spread in various animals, such as bird and mammals, however the animal vector caused Covid-19 is not known up.^{2,3} The most common ways of transmission are via direct contact through droplets splashes from an infected person or someone with respiratory symptoms (eg. coughing and sneezing) and via indirect contact in form of contaminated surfaces of environmental objects that

has been used by an infected person, including littered used masks, then the uninfected person touch parts of their face, namely eyes, nose, and mouth, that are common routes of spreading infection.^{1,2,3,5,6}

These case constantly increasing so that efforts needed to take prevent the spread and reduce the case fatality rate. One of the measure that can be done is regular nasal irrigation. Nasal irrigation is useful to maintain nasal health, such as for removing mucous, infective pathogen, and inflammatory mediators. Nasal irrigation is defined as a procedure of spraying saline solution in to the nasal cavity.⁷ The most commonly used saline solution is isotonic saline solution, for example NaCl 0,9%.⁸ However, there were studies which stated that the use of hipertonic saline solution, povidone iodine (PVI), has a superior virucidal activity and thus reduce viral load.^{8,9}

This study is a continuing study about level of knowledge regarding nasal irrigation by Nunung Mirawati at Faculty Medicine of Muhammadiyah Palembang University. This study aims to determine level of knowledge, attitude, and practice of the community regarding nasal irrigation during Covid-19 pandemic.

2. Methods

Design study and study population

This study used a descriptive observational design with the population of Palembang City, Indonesia. The sampling technique used was consecutive sampling, samples were obtained consecutively as many as 26 samples from every district in Palembang city that met the study criteria until the number of required respondents was fulfilled. The respondents of this study were 398 people who met the inclusion and exclusion criteria. The inclusion criteria for this study were people of Palembang City aged between 18 – 55 years old, with last education level of elementary school (SD), junior high school (SMP), high school (SMA), and bachelor (S1)/graduate (S2)/doctorate (S3) degree, who agreed to participate in the study

and signed the informed consent. The exclusion criteria were respondents who did not completed and collected the questionnaire. The data from this study were primary data in the form of questionnaires with closed ended questions made by the researchers. The questions covered the sociodemographic of respondents, knowledge, attitude, and practices regarding nasal irrigation. The questionnaire was distributed online as a Google form via *Whatsapp blast, Line, dan Instagram*. The respondents were guaranteed anonymity and gave their consent. The time of research was conducted from November 24th to December 5th 2021 in Palembang city, Indonesia. Throughout the research period, there were 472 respondents who filled out the questionnaire.

Knowledge, attitudes, and practices questionnaire design

This questionnaire consists of six sections. The first section presents informed consent agreeing to participate in the study. The second section assessed general information and demographic variables including age, address, last level of education, and phone number. The third, fourth, and fifth section evaluate the level of the respondent's knowledge, attitude, and practice, respectively. The last section means information to inform the public about nasal irrigation.

Data analysis

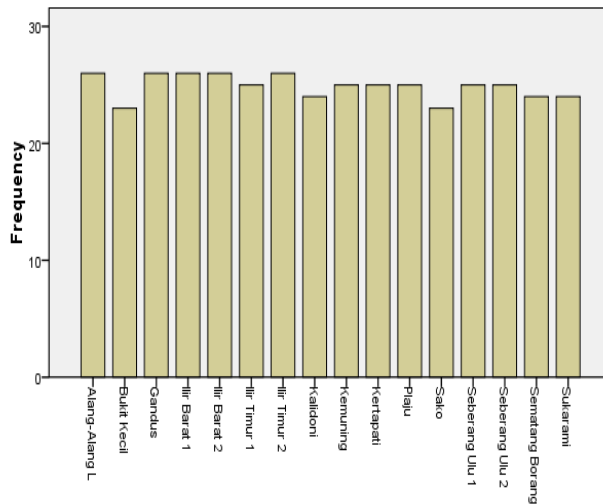
Univariate analysis techniques will be used data analysis using the Statistical Package for Social Sciences (SPSS). The level of knowledge (twenty-one items), attitudes (five items), and practice (two items) were calculated based on a questionnaire made by the author. Each item on the knowledge section has a value of 1 if the question is answered correctly and 0 if the question is answered incorrectly. Each item on the attitude section has a value of 1 if agreed and 0 if disagree. As for the level of practice based on the frequency of daily nasal irrigation, the value is 2 if they do it twice a day, 1 if they do once a day and 0 if

they don't do it at all.

3. Results & Discussion

Graphic 1. shows distribution data of respondents according to the districts in Palembang City, and we found that the study samples were distributed in every district in Palembang City. The distributions

were as follows: Alang-Alang Lebar, Gandus, Ilir Barat 1, Ilir Barat 2, and Ilir Timur 2 District each consisted of 26 respondents. Ilir Timur 1, Kemuning, Kertapati, Plaju, Seberang Ulu 1, and Seberang Ulu 2 Districts each consisted of 25 respondents. Kertapati, Sematang Borang, and Sukarami Districts each consisted of 24 respondents. Bukit Kecil and Sako Districts each consisted of 23 respondents.



Graphic 1. Distribution of respondents according to the districts in Palembang city

According to Table 1. characteristics of respondents by age and last education level, from 398 respondents, the majority were in the age category of 18 – 25 years old which was 261 respondents (65.6%), in the age category of 26 – 45 years old were 109 respondents (27.4%), and the least was in the age category of 46 – 55 years old which was 28 respondents (7.0%). According to level of education,

more than half of the respondents belonged to high school category, which was 231 respondents (58.5%), and there were no respondent (0%) in elementary school level category, two respondents (0.5%) in junior high school category, and 165 respondents (41.5%) in the higher education level category (S1/S2/S3).

Table 1. Sociodemographic distribution of respondents

Variables	Number (n)	Percentage (%)
Age		
18 – 25 years-old	261	65.6
26 – 45 years-old	109	27.4
46 – 55 years-old	28	7.0
Education Level		
SD	0	0
SMP	2	0.5
SMA	231	58.0
S1/S2/S3	165	41.5
Total	398	100,0

According to Table 2. the level of knowledge of the people regarding nasal irrigation as many as 141 respondents (35.4%) had good knowledge, 144 respondents (36.2%) had moderate knowledge, and 113 respondents (28.4%) had low knowledge. The level of attitude of the people regarding nasal irrigation is presented in Table 2., as many as 332 respondents (83.4%) showed good attitude, 56

respondents (14.1%) showed moderate attitude, and 10 respondents (2.5%) showed low attitude. The level of practice of the people regarding nasal irrigation is presented in Table 2., as many as 29 respondents (7.3%) showed a good level of practice, 68 respondents (17.1%) showed a moderate level of practice, and 301 respondents (75.6%) showed a low level of practice.

Table 2. Level of people's knowledge, attitude, and practice regarding nasal irrigation

Variable	Number (n)	Percentage (%)
Level of Knowledge		
Good	141	35.4
Moderate	144	36.2
Low	113	28.4
Level of Attitude		
Good	332	83.4
Moderate	56	14.1
Low	10	2.5
Level of Practice		
Good	29	7.3
Moderate	68	17.1
Low	301	75.6
Total	398	100

4. Discussion

According to the age distribution of this study, the majority is from age category of 18 – 25 years old which belonged to the late adolescent stage.^{10,11} According to a survey conducted by Kominfo (Ministry of Information) in 2017, it shows that smartphone ownership and internet usage in Indonesia were highest in the age group of 20 – 29 years old which was 75.95% and 60.15%, respectively. This was in accordance with the result of distribution of respondents according to age category from this study. According to a survey by the Central Bureau of Statistics in 2019, smartphone

usage and its implication towards internet usage of the people keep increasing during the last five years.^{12,13}

In terms of last education level of the respondents, the majority was from high school level which was 231 respondents (58.0%). In the self-development process, human has a basic necessity called education. The ease which individuals receive and develop knowledge and technology requires high education.¹⁴ From this notion, it is implied that the higher education will be the higher an individual's will in pursuing information regarding new knowledge and the easier it is to receive the

knowledge they get. According to the age distribution, it can be related to the result of distribution of education level because the people in the 18 – 25 years old category are in the age group that have finished high school education and most probably is continuing education in the higher education level (college/ university).¹⁵

Knowledge is the result of an individual's sensing of objects through sense organs, the most used sense organs are eyes and ears.¹⁴ The factors that can affect the level of knowledge of an individual is an information source. Information source regarding health can be obtained from various parties, such as a physician, a specialist, other health care workers, friends, teachers, and also information media (including newspaper, health article, television, radio, etc.). More information obtained are from the environment and media than from medical professionals, therefore the information is mostly incorrect.¹⁶ The results of the study did not fully align with the result from the study by Nunung Mirawati (2020) in Faculty of Medicine Muhammadiyah University Palembang which shows that the level of knowledge of college students regarding nasal irrigation is good. This can be due to the different study population, where in this study the population was medical school students who received information regarding nasal irrigation from study materials and from their teachers whose profession was also doctors.¹⁷ Meanwhile according to a study by Adegbiyi, et al., (2020) individual's level of knowledge regarding nasal diseases were low.¹⁶

According to the theory of Thoughts and Feeling, attitude represents someone's likes and dislikes toward an object, in this case nasal irrigation. Attitudes are formed by personal experience or the people around them which cause an individual's urge to stay away from an object or a disease by preventing the risk of developing the disease.¹⁴ Currently, Indonesia is experiencing the Covid-19 outbreak. In the study, the people showed a good attitude, meaning that the people supported the measures to prevent Covid-19, one of the means is nasal

irrigation. Results of the study are in accordance with a study conducted by Jessica Moudy and Rizma Adlia (2020) that people show a cautious attitude towards the Covid-19 disease and supported the measures to prevent Covid-19.¹⁸

According to the Lawrence Green's theory, there are three main factors that affect a person's health behavior. The first is predisposing factor, regarding the individual's knowledge. Judging from the result of level of knowledge, the majority of the people show a moderate level of knowledge regarding nasal irrigation. The second factor is enabling factor which means the availability of facilities and health care materials, including the materials used for nasal irrigation (NaCl 0.9% solution) which probably is not available in every household and the majority of people do not know how to make a saline solution at home. The third factor is reinforcing factor, which means their relationship to the healthcare officials or other community leaders around them who never perform nasal irrigation.¹⁴ The three factors are interrelated and form the health behavior. In this case, one of the factors that cause people to never perform nasal irrigation can be because they never see their close relatives performed it so it is not emulated. Nasal irrigation is a procedure of spraying saline solution in to the nasal cavity. An incorrect nasal irrigation method may cause pain due to the water flow or the syringe tip nudging the nasal septum which then elicited a negative response in the individual. This negative response can take form as avoiding performing nasal irrigation procedure due to the discomfort.¹⁹ This can also be a factor for someone to be reluctant to perform nasal irrigation. Usually, nasal irrigation is performed by individuals with nasal disease symptoms such as rhinosinusitis, because it is advised by a doctor as an adjuvant therapy. They are more compliant and more pleased to perform nasal irrigation because they can have more control of their health, it is effective in reducing chronic rhinosinusitis symptoms, and may reduce the need to use medicine.^{20,21} To adapt to new health habits, people need to see and hear the correct

information. Similarly, with hand washing and using a mask, currently, people are more obedient in doing so as a preventive measure of Covid-19. Both of them also need adaptation to be well received by the people and become new daily habits. According to a news article from Gadjah Mada University which described that the common people were not entirely aware and even neglecting nasal health problems. In the Healthy Nose Awareness Movement (*Gerakan Sadar Sehat Hidung*), the students of FKMK UGM performed nasal irrigation demonstration for batik craftsmen and women, and it is obvious that they were enthusiastic to perform nasal irrigation which they think to be a beneficial new habit.²² In order for the people to adapt to new health habits, in this case nasal irrigation, education and counseling by health care workers are needed.

5. Conclusion

The community of Palembang city had a moderate level of knowledge, a good attitude, and a low level of practice regarding nasal irrigation in the Covid-19 pandemic era.

6. References

1. WHO. Novel Coronavirus [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/news-room/detail/2020-01-30-novel-coronavirus-china>
2. Umakanthan S, Sahu R, Reade A V., Bukelo MM, Rao JS, Abrahao-Machado LF, et al. Origin, transmission, diagnosis and management of coronavirus disease 2019 (COVID-19). *Postgrad Med J*. 2020; 96(1142): 753–8.
3. Kesehatan K. Pedoman Pencegahan dan Pengendalian Corona Virus deases (Covid-19) [Internet]. Vol. 5, Kementerian Kesehatan. 2020. 178 p. Available from: https://covid19.go.id/storage/app/media/Protokol/REV-05_Pedoman_P2_COVID-19_13_Juli_2020.pdf
4. WHO. WHO Coronavirus Disease (Covid-19) Dashboard [Internet]. 2021 [cited 2021 Feb 11]. Available from: <https://covid19.who.int/region/sear/country/id>
5. WHO. Modes of Transmission of virus causing COVID-19: implications for IPC precaution recommendations [Internet]. 2020 [cited 2021 Jan 10]. Available from: <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>
6. Lotfi MR, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clin Chim Acta* [Internet]. 2020; 508: 254–66. Available from: www.elsevier.com/locate/cca Review
7. Piroomchai P, Puvatanond C, Kirtsreesakul V, Chaiyasate S, Thanaviratananich S. Effectiveness of nasal irrigation devices: A Thai multicentre survey. *PeerJ*. 2019; 2019(5).
8. Khan MM, Parab SR, Paranjape M. Repurposing 0.5% povidone iodine solution in otorhinolaryngology practice in Covid 19 pandemic. *Am J Otolaryngol - Head Neck Med Surg* [Internet]. 2020; 41(5):102618. Available from: <https://doi.org/10.1016/j.amjoto.2020.102618>
9. Singh, Sheetal; Sharma, Neeraj; Singh, Udaiveer; Singh, Tejraj; Mangal; Singh DK; Prasad. Nasopharyngeal wash in preventing and treating upper respiratory tract infections: Could it prevent COVID-19? *Lung India*. 2020; 37(3): 246–51.
10. WHO. Orientation Programme on Adolescent Health for Health-care Providers [Internet]. Department of Child and Adolescent Health and Development. 2018. 403 p. Available from: https://www.who.int/maternal_child_adolescent/documents/pdfs/9241591269_op_handout.pdf
11. Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *Lancet Child Adolesc Heal*. 2018; 2(3): 223–8.
12. KOMINFO. Survey Penggunaan TIK 2017. 2017.
13. Sutarsih, T. Statistik Telekomunikasi Indonesia. Jakarta: Bahan Pusat Statistik; 2019.
14. Notoatmodjo S. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta; 2017.
15. Bastari. Indonesia Education Statistics in Brief. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia. 2019.
16. Adegbiyi WA, Aremu SK, Aluko AAA, Adewoye RK. Knowledge and awareness of nasal allergy among patients in a developing country. *J Fam*

- Med Prim Care [Internet]. 2020; 9(3): 1477–82.
Available from: <http://www.jfmpe.com>
17. Mirawati, Nunung. Gambaran tingkat pengetahuan tentang cuci hidung pada mahasiswa di fakultas kedokteran universitas muhammadiyah Palembang skripsi. 2020.
 18. Moudy J, Syakurah RA. Pengetahuan terkait usaha pencegahan Coronavirus Disease (COVID-19) di Indonesia. *Higeia J Public Heal Res Dev*. 2020;4(3):333–46.
 19. Çelikol Ş, Tural Büyük E, Yıldızlar O. Children's Pain, Fear, and Anxiety During Invasive Procedures. *Nurs Sci Q*. 2019; 32(3): 226–32.
 20. Rabago D, Barrett B, Marchand L, Maberry R, Mundt M. Qualitative aspects of nasal irrigation use by patients with chronic sinus disease in a multimethod study. *Ann Intern Med*. 2006; 4(4): 295–301.
 21. Rachana R, Santl T. Efficacy of Saline Nasal Irrigation in Chronic Rhinosinusitis. 2019; 7(6): 71–7.
 22. Agung. Meningkatkan Kesadaran Kesehatan Hidung [Internet]. 2018 [cited 2021 Jan 12]. Available from: <https://www.ugm.ac.id/id/berita/16257-meningkatkan-kesadaran-kesehatan-hidung>

Galexy Proof

CERTIFICATE

O F P U B L I C A T I O N

For the article titled:

A Study of Knowledge, Attitude, and Practice of Nasal Irrigation During Covid-19 Pandemic

Authored by;

Riri Juliantika, Fiona Widya Sari, Rachmat Hidayat, Puspa Zulaika, Ziske Maritska

Published in

Natural Sciences Engineering and Technology Journal Volume 2 Issue 1 2022

Indexed in:

