Sex and Type of Mask to Prevent Acute Respiratory Infections in New Normal Era Among Nursing Students

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Abstract. The high incidence of acute respiratory infections (ARI) still is a health problem in Indonesia. As the new normal mandated by the government, the widespread use of masks is the key to ending the COVID-19 pandemic. The study was centered to identify the relationship between sex and type of mask to prevent acute respiratory infections during the COVID-19 new normal among nursing students in Jakarta.

This cross-sectional study selected 304 students from Universitas Binawan and the Institute of Health Husada Hospital. The independent variable was gender and mask type. The dependent variable was the incidence of ARI. Data were analyzed by the frequency distribution of gender, mask type, and ARI. Bivariate analysis using Spearman's rank correlation test and Contingency Coefficient test with a significance level of 95% ($p < 0,05$).

As many as 20 participants were male with the incidence of ARI, 182 participants were female with no incidence of ARI (59.9%), 105 participants who wore KF94 had no incidence of ARI, while 53 participants reported the ARI incidence. The Contingency Coefficient test showed a correlation between gender to incidence ARI with a significant p-value of 0.008 ($p < 0.05$). This study found a connection between sex and the type of mask worn to prevent ARI. Although the number of COVID-19 cases is declining, we propose to normalize the use of masks to prevent respiratory infections.

Keywords: Sex · Mask · Infections · Students

1 Introduction

Acute Respiration Infection (ARI) is an infectious disease of the upper or lower respiratory tract that can cause a broad spectrum of diseases ranging from mild infections to severe and deadly diseases, depending on the causative pathogen, host factors, and environmental factors. ARI is a major cause of morbidity and mortality from infectious diseases in the world. ARI is also the third leading cause of death worldwide and the main killer in low and middle-income countries. Deaths from ARI are ten to fifty times more

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in developing countries than in developed countries. ARI is included in the class of Air Borne Disease, which transmits the disease through the air. Pathogens enter and infect the respiratory tract and cause inflammation [1]. Various organisms can cause ARI, but most infections are caused by viruses and bacteria. Viruses are the most common cause of acute upper respiratory tract infections (ARI), such as rhinitis, sinusitis, pharyngitis, tonsillitis, and laryngitis. Nearly 90% of these infections are caused by viruses, and only some are caused by bacteria [2].

The prevalence of ARI in Indonesia is still based on the Basic Health Research (RISKESDA) 2018, which shows that there are 1,017,290 cases [3]. Based on a routine report from health facility service in DKI Jakarta, the number of ARI cases from 2016 to 2018 in a row as many as 1,801,968 cases (2016), 1,846,180 cases (2017), and 1,817,579 cases (2018) while in January until May 2019, there were 905,270 cases of ARI [4]. Risk Factors of ARI are pollution, bad environmental conditions, for example, air pollutants, humidity, cleanliness, season, and temperature. Several other factors, such as smoking behavior, workplace exposure, and masks, function as protective devices from dust [5].

The use of masks based on research in the world still provides limited evidence in controlling influenza and highlights potential problems such as lack of adherence and inappropriate use of masks [6]. The use of masks has been enforced in many countries, especially in Asia, where satisfactory results were reported in slowing the spread of infection in Hong Kong and Singapore. This proves that masks should not be ruled out to be very effective. The use of masks will also reduce the stigma against a person and make wearing masks a cultural phenomenon among many Southeast Asian people [7].

Choosing and using the correct mask can effectively prevent the spread of the Covid-19 virus [8]. Medical masks are currently the most effective masks for preventing foreign objects and viruses from entering the respiratory tract [9]. It is important for nursing students to understand and be aware of healthy behavior in using masks as a precaution against Covid-19 because their behavior will become role models in society. Students need to change their behavior so that they are able to provide solutions as agents of change, namely people who act as catalysts and triggers for a change to occur [10].

2 Methods

This study used a quantitative, descriptive, cross-sectional design. The study was conducted for a week starting from August 4–10, 2022, with a total sample was 304 people from Binawan University and Institute of Health Husada Hospital in Jakarta Special Region. Consecutive sampling was used to recruit participants. Inclusion criteria include cooperation, willingness to be involved in research, nursing student, not sick, student registered as a student, proven by student identification number, and active.

The data was collected via a self-completed questionnaire using Google Forms. The questionnaire was turned into three statements. The first sex is divided into female and male. Furthermore, the type of masks is divided into five types: cloth mask, surgical mask, KF94, KF95, and N95. The last ARI is divided into “no” if respondents had never felt the symptoms of ARI and “yes” with the addition of having visited a health facility for treatment.

Table 1. Characteristics of the participants (n = 304)

Characteristics	n	%
Sex		
Male	37	12.1
Female	267	87.8
Type of mask		
Cloth mask	2	0.7
Surgical mask	60	19.7
KF94	158	52
KN95	75	24.7
N95	9	3
ARI		
Had no incidence of ARI	199	65.5
Had incidence of ARI	105	34.5

The Research analysis used IBM SPSS 27 software. The frequency distribution consists of sex, mask type, and ARI. Bivariate analysis using Spearman's rank correlation test and Contingency Coefficient test with a significance level of 95% ($p < 0,05$). This study uses human subjects and followed approval by the University of Binawan and STIKes RS Husada. It must not be unethical, the purpose of this learning must be ethical, and the rights of the respondents must be protected. The ethical Passed the feasibility test of the Health Researcher Ethics Committee State Polytechnic of Health Malang number 600/KEPK-POLKESMA/2022 issued on June 3, 2022.

3 Result

The characteristics of the participants are shown in Table 1. The data stated that more than half of the participants reported being female (86.9%). Then, the majority are KF94/KN95 masks (76.5%). Moreover, almost all the participants did not have ARI (65.5%).

The cross-tabulation in Table 2 shows that 17 participants were male with an incidence ARI and 182 participants were female with no incidence ARI (59.9%). After that, 1 participant used a cloth mask with no incidence ARI and incidence ARI (0.3%), 33 participants used a surgical mask with no ARI (10.9%), and 27 participants with incidence ARI (8.9%). The result of the Contingency Coefficient test received that there is a correlation between sex to the incidence of ARI with a significant p-value of 0.008 ($p < 0.05$). Similarly, there is a relationship between mask type with incidence ARI with a significant test p-value of 0.036 ($p < 0.05$).

Table 2. Cross Tabulation of Sex and Type of Mask with ARI in Nursing Students New Normal Era in Jakarta

Variables	ARI		Total n (%)
	No	Yes	
Sex			
Male Female	17 (5.6%) 182 (59.9%)	20 (6.6%) 85 (28%)	37 (12.2%) 267 (87.8%)
Total	199 (65.5%)	105 (34.5%)	304 (100)
Contingency Coefficient test		r = 0.151	p = 0.008
Type of mask			
Cloth mask Surgical mask KF94 KN95 N95	1 (0.3%) 33 (10.9%) 105 (34.5%) 52 (17.1%) 8 (2.6%)	1 (0.3%) 27 (8.9%) 53 (17.4%) 23 (7.6%) 1 (0.3%)	2 (0.7%) 60 (19.7%) 158 (52%) 75 (24.7%) 9 (3%)
Total	199 (65.5%)	105 (34.5%)	304 (100)
Spearman Rho test		r = -0.121	p = 0.036

4 Discussion

Higher COVID-19 testing in Jakarta makes infections more likely to be easily identified [11]. Although these tests have caused Jakarta to become the center of the most infection, spread since 2020, the decline in COVID-19 cases that occurred until 2022 made the government switch the status of the pandemic to the new normal [12]. In 2020, the COVID-19 pandemic forced educators to revisit the pros and cons of online teaching and learning with greater urgency [13].

From early March 2020, Indonesian education adept changes in activities due to the COVID-19 pandemic. The government is stepping up the implementation of distance education and online learning. Thorough nationwide online learning is the first experience in Indonesia. The implementation of online learning remains the responsibility of the teacher in monitoring the learning development of their students cognitively, affectively, and psychometrically [14].

On another side, Prasetyo et al. (2021) stated that online learning is ineffective and that face-to-face learning is better. Therefore, Governments have started developing strategies to enable face-to-face learning. A new policy has been issued to conduct limited in-person classes starting in July 2021. However, all teaching staff are vaccinated and learning is contingent upon limiting session times and implementing strict health protocols. This policy divided students into study groups or schedules based on shifts, intending to limit the number of students in one room [15].

Whether we realize it or not, the new normal has started to occur globally since the COVID-19 pandemic. Blended learning is the new normal that is currently used in education. Usually carried out face-to-face, teaching and learning activities where

educators and students are physically present in classrooms and learning places are now being replaced by learning activities through electronic media (e-learning) either synchronously or non-synchronously [16]. Countries have already issued the instructions on the use of masks. They are legally implementing the wearing of masks in public places for their people to minimize the spread of the virus [17].

As our study was conducted among nursing students, there was still no change in sex characteristics. A previous study also found that the 'caregiver' role of the nursing profession has been identified strongly with the female gender role around the world. Sex is primarily female. It is because nursing student female is dominant and more painstaking than males. Florence Nightingale's extensive writings, which began with military reform, helped formulate nursing as a profession for women [18]. Despite reductions in gender inequality in other occupations, such as medicine, law, and business, nursing remains a female-dominated profession. In the United States, the number of male nurses in 2019 accounted for 12% of the nursing workforce (Statistic Stats, 2020). Nurses have been described as humble, calm, submissive, empathetic, and masculine characteristics such as aggressive and dominant are not fitted for careers in nursing. This stereotypical concept has pressured men to decide to enter or continue nursing [19]. The role of men in the nursing profession has been neglected. Men are also aware of this fact, but they are less concerned. This may be due to gender stereotypes of healthcare workers and their inappropriate views of the presence of men in the profession [20]. Although men are not considered or accounted for as natural caregivers, they appear to do well in nursing, given patients' positive perceptions of men [21]. Therefore a strategy should be developed to attract men to this profession. Conversely, men are at higher risk of dropping out of nursing programs [22].

Consequently, the new policy came into effect during the COVID-19 pandemic era that everyone in public areas wears masks not to transfer their germ to others. Long-term implementation of such policies could be difficult without the imminent threat of a pandemic. Although a proper assessment of the feasibility of this policy has not been fully evaluated, it appears to settle in as the 'new normal' these days. Therefore it is essential to determine what type of mask is appropriate for the policy [23]. Given the global shortage of N95 during the COVID-19 pandemic, the Korean filter 94 (KF94) mask was recommended for respiratory protection in Korea for situations involving any contact with suspected or confirmed COVID-19 patients under the guidelines of the Korea Center for Disease Control and Prevention (KCDC) [24]. All fit factors (FFs) of all ear-loop-type KF94 masks escalated significantly when worn tightly with a simple alteration using a clip. In particular, KF94 masks with adjustable face seals had remarkably higher FF in both common and snug-fit methods, and the use of clips improved FF and QNFT pass rates. Therefore, our study showed that adjusting the length of the earloop or using a clip to tension the earloop so that the mask fits snugly on the face should ensure proper fitting performance of the earloop mask. Even though the N95s become more reachable, KF94 masks are preferred in general healthcare settings in Korea. The important factors when choosing a mask type are not only safety but also the comfort of wearing the mask, especially if prolonged wearing is needed [25]. In a study on long-term use of N95, the blood CO_2 levels of nurses became significantly elevated, and many subjective

symptoms, such as perceived exertion, dyspnea, headache, and lightheadedness, also increased over time compared to beginning-of-shift baseline measures [26].

5 Conclusion and Suggestion

Based on the finding of the study, it can be concluded that nursing student globally is still dominated by female though the caregiver job also needs physical power like assisting and moving patient to go to bed. Sex also seems to be able to influence the method of selecting masks because women have more concern and patience in determining the type of mask that is safer and more comfortable to wear, as evidenced by the large number of respondents who chose KF94 during the new normal period. The absence of incidents of ARI was also due to the fact that most of the respondents in this study were dominated by women. In the next study, the researcher would like to add a male sample so that the incidence rate in men can also be known.

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