

Phbs Implementation And Personal Factors Of Medical Students During The Covid-19 Pandemic Period

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Abstract: The recommendation to prevent the coronavirus disease in Indonesia is to implement a clean and healthy lifestyle (PHBS). The good implementation of PHBS during the pandemic period is also the responsibility of medical students as part of the community and prospective health workers in the future. The purpose of this study is to describe the behavior in implementing PHBS and the conditions of student personal factors during the COVID-19 pandemic. This descriptive research was conducted by distributing online questionnaires in July 2020, involving 361 students from six study programs at the Faculty of Medicine Tanjungpura University. The good behavior of implementing PHBS has been carried out by medical students, such as washing their hands in 6 steps, under running water, using soap, providing hand sanitizers, not shaking hands, maintaining distance and carrying out coughing / sneezing etiquette properly. Social media, audio-visual media, and journals are sources of information used by students to obtain information about COVID-19. The impact of the pandemic on the health conditions of families and themselves, education and the family economy is a worrying factor for medical students. Medical education institutions need to provide support for the implementation of PHBS and prevent physical and mental health problems of medical students.

Keywords: PHBS, Personal factors, Medical student, COVID-19

1. INTRODUCTION

Novel Coronavirus, better known as COVID-19, is a zoonotic infection caused by Virus SARS-COV2 even though the animal host is still unknown at the moment [1]. This disease was firstly discovered in Wuhan, Hubei Province, China on 31 December 2019 and later announced as worldwide pandemic by WHO [2]. In Indonesia, the first COVID-19 case was confirmed on 2 March 2020 and since then, more cases appear and the number keeps growing. As of 14 November 2020, there were 463,007 confirmed cases with case fatality rate of 3.3%. Based on an issue from Badan Nasional Penanggulangan Bencana (BNPB) or

National Disaster Mitigation Agency, the spread of Coronavirus in Indonesia has been on the level of disaster (29 February 2020) [3], and West Kalimantan province (Kalbar) has been one of the alert region of the contagious Coronavirus because it shares border with Malaysia (West Kalimantan Mayor, 3 Feb 2020) [4]. It is estimated that the first confirmed COVID-19 case in West Kalimantan appeared back in March 2020, and as of 14 November 2020, there have been 2058 active confirmed cases of COVID-19. Even though the prevalence is considerably lower than other provinces in Indonesia, the factor of main risks of the virus spread in Kalbar is local transmission [5].

The local transmission occurred when people are in same room/location, where the transmission of COVID-19 occurred through droplets from sneezing/cough, and also through airborne [6-8]. As a result, the standard recommendation to prevent the spread of virus is by applying clean and healthy lifestyle, referred to as Perilaku Hidup Bersih dan Sehat (PHBS). The Ministry of Health of Republic of Indonesia (Kemenkes) issued a manual of prevention and control of COVID-19 since the start of the pandemic by implementation of regular handwashing using soap and clean water, avoiding eyes, nose and mouth rubbing, and also applying coughing and sneezing etiquette, wearing mask and avoiding physical contact with anyone who show respiratory problem symptoms like coughing and sneezing [9].

The application of PHBS during the pandemic period also becomes the duty of medical students in order to promote healthy lifestyle as a role model for the people [10, 11]. Moreover, medical students are a group potentially-infected by COVID-19 because of their tracks in hospitals during practice and depression during online classes because of the lack of face-to-face meetings on campus and interaction among friends [12, 13]. Several researches looked into the knowledge and lifestyle of medical students during pandemic, but not many of them were conducted in Indonesia and those which show personal factor evaluating socio-economy factor and anxiety of the students from pandemic. Also, the exploration of PHBS implementation during the pandemic will give a picture of the application of government-ruled protocols among the exposure to information during pandemic.

2. MATERIALS AND METHODS

Design and Subject Information

This research is a descriptive research that gathered data from all students of Faculty of Medicine of Tanjungpura University West Kalimantan on the clinical training and students. Of 403 students who participated, 10.4 % were excluded because the data of respondent identity was incomplete. The spread of students based on study program was 133 students of Medicine study program, 81 students of Nursing study program, 77 students of Pharmacy study program, 20 students of Professional Medicine, 38 students of Professional Nursing, and 12 students of Professional Pharmacist study program. The research was given an ethical acknowledgment from Faculty of Medicine Tanjungpura University on 18 June 2020 with letter no. 2961/UN22.9/TA/2020. Every one of the respondents was given informed consent via online.

Data Collection

In line with circular letter of Mendikbud no 12 year 2020 and the circular letter of the Dean of Faculty of Medicine Tanjungpura University no 2021/UN22.9/TU/20205 about conducting research without taking the data directly from the respondents, the data collection process was administered online. A survey was held from 4 to 18 July 2020, comprising of 15 questions about the implementation of PHBS to prevent COVID-19 through the Students Executive Body Faculty of Medicine Tanjungpura University.

PHBS questionnaire includes questions about hand-washing, availability of hand sanitizer and disinfectants, shake hands behavior, physical distancing implementation and the cough/sneezing etiquette, the habit of consuming fruits and vegetables, physical activity and having enough sleep. The evaluation of personal factors is comprised of 20 questions about medical record, smoking habit, record of intercity trips, the increase of expenses and kinds of high spending during pandemic, clarity and types of media of information most accessed to find information about COVID-19, anxiety about infection, the risk of infection and also opinion towards the implementation of social distancing and new normal.

3. RESULTS

The subject of the research was aged between 18 and 27 years old. The subject group was dominated by female students (74.2%). Besides, students from earlier years participate the most in number (2019: 140 students, 2018: 80 students).

Implementation of PHBS

On the handwashing behavior, there were 342 students (94.7%) who did the handwashing by following 6-step advice during pandemic and 89.2% did the handwashing under running water for 20 seconds, 99.2% used soap. On the variable of daily handwashing, it was discovered that respondents washed their hands 2-5 times a day (49%), while 34.6% washed their hands 5-10 times a day. 5.8% of them washed hands 1-2 times a day and 10.5% of the respondents washed their hands more than 10 times a day.

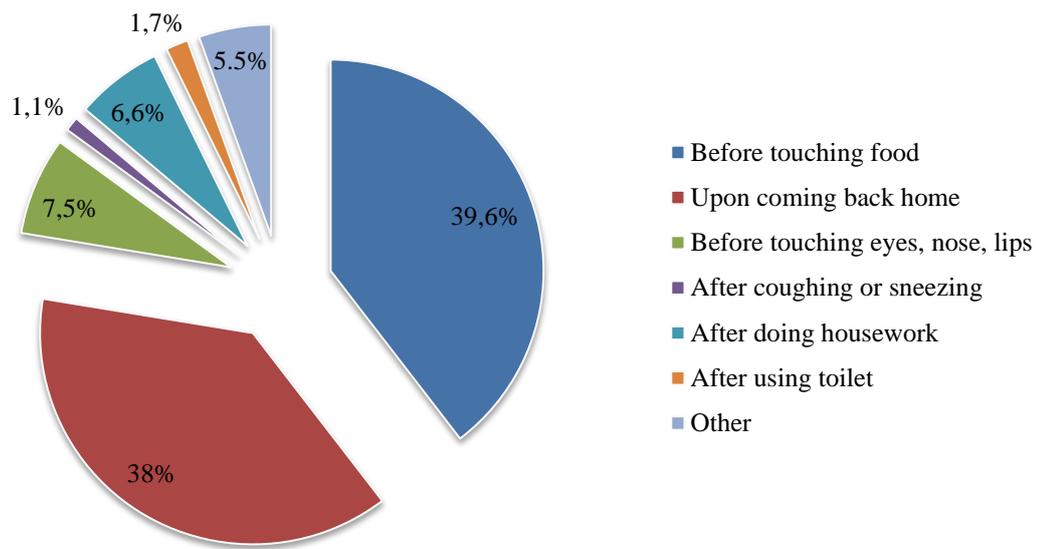


Figure 1. Handwashing Habit during COVID-19 Pandemic

On the handwashing habit of the students, it was found that 39.6% of the responded did it before touching food, and 38% did it when they got back to home especially before and after touching family members (figure 1). Other times to do handwashing were after finishing all activities, after finishing an activity that involves interaction with others, and during Wudhu (Islamic washing practice before praying).

On the behavior to prevent infection, there were 74.5% of the students who provide and bring hand sanitizer while going out. Hand sanitizer was also provided at home for 87% of the respondents. However, more than half of respondents did not use disinfectants when cleaning home (51.8%). On the behavior of shaking hands, there were 101 students (28%) who still do shaking hands, and 10.2% did not practice social distancing. On the brighter side, there is a good percentage on the practice of coughing and sneezing etiquette (covering mouth with tissue or flexed elbow), which reached 97.5%. On the behavior of staying healthy and maintaining body immunity, 80.1% of the students consume fruits and vegetables, 46.5% consume multivitamin supplement, 72.9% get 7-9 hours of sleep and 55.1% do physical activity more or less 150 minutes/week.

Personal Factors

98.6% of medical students agree with the implementation of social distancing. It is shown by several responses: 68.1% of the respondents got back to hometown, and the majority chose to stay with their parents or close relatives (87.3%), while the rest chose to stay in the dormitory, studio, or rented house. Furthermore, 69.3% of the respondents agree with the application of new normal practice.

Based on the medical records that were reported, digestive diseases became the most reported case by the students (18.3%). Typhoid fever was reported by 35 students, and acute gastritis and GERD were reported by 31 students. Respiratory diseases like Asthma and Tuberculosis were once suffered by 20 students, and endemic diseases in West Kalimantan like Dengue

Fever and Malaria were reported by 5 students. Smoking habit is reported by 2 students with the average consumption of 5-10 cigarettes a day, and 17.7% of the students were on diet program.

Tabel 1. Amount and Kinds of Spending during COVID-19 Pandemic

During Pandemic	Category	N	%
Monthly Spending	<Rp. 500,000 /Month	81	22,4
	Rp. 500,000 - Rp. 1mil / month	68	18,8
	Rp. 1mil - Rp. 2mil / month	208	57,6
	> Rp. 2mil / month	4	1,1
Kinds of Spending	Phone Credits	156	43,2
	Electricity	32	8,9
	Food	114	31,6
	Medicine/Supplement	7	1,9
	Others	52	14,4

Source: primary data, 2020

Based on table 1, the amount of spending by most of the students (57.1%) did not increase. Internet quota became the biggest spending during the pandemic. In addition, primary needs also became the biggest spending during the pandemic. Another spending that also increased was a need of online shopping for alcohol 70%, mask, antiseptic products, and skincare products.

On the variable of the information clarity obtained by the students about COVID-19, there were 52.4% of them stating that information is clear and 32.2% stated very clear information. However, 15.2% of the students felt that the information was moderate about the COVID-19 pandemic.

Figure 2 showed the types of media of information mostly used to obtain information about COVID-19 pandemic. Social media became the first media of information most accessed by the students (31.2%, \bar{X} = 89.3). The use of audio-visual media, like television and YouTube, also became an option to obtain information with the access average score of 69.7. Research articles also become the first priority for the students to obtain information at 26.6% with average score of 67.3. Media of information that was the least-used by the students were printed media and direct information from the health workers.

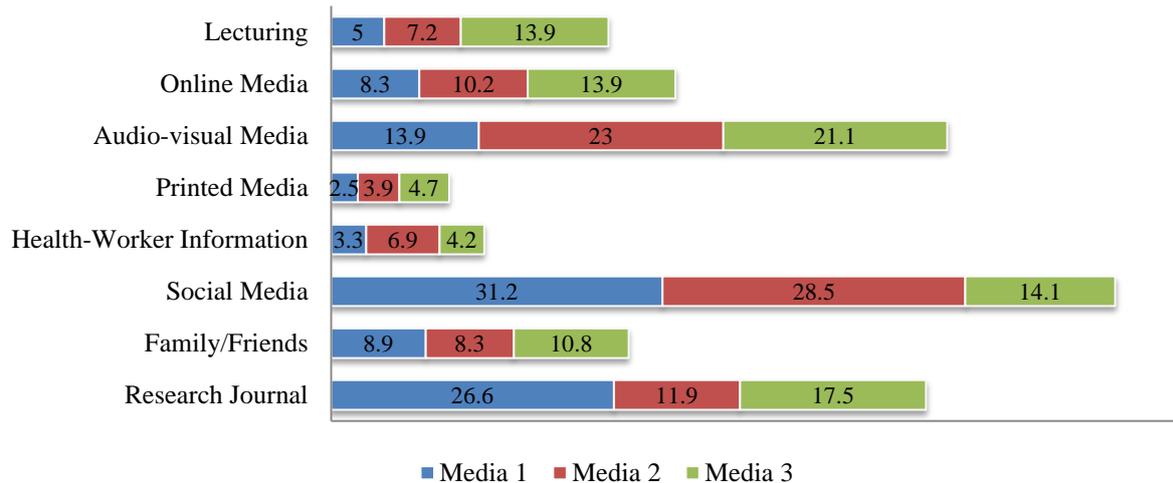


Figure 2. Types of Media of Information Regarding COVID-19

Information searches by the students using various kinds of media did not affect their level of anxiety after reading or listening to the news about COVID-19. This is shown by 38% of the respondents who felt as usual, 29.9% did not feel anxious, and 12.2% did not feel anxious at all. This also did not affect the anxiety of students about the risk of infection where 60.9% of the students did not feel anxious of the risk of being infected personally and 84.3% did not feel worried about the risk of infection to their family. Even though the students stated that they did not feel worry, the health of family members and themselves became the primary worrying factor for the students. Another worrying factor was the effect of the pandemic to the family economy sector (24.1%), education problems (25.2%) like academic score, achievement from online learning and also the length of study because of the inhibition in study and research.

4. DISCUSSION

Implementation of PHBS during Pandemic Period

Based on the review by Gasmi *et al.*, there are four primary parts in comprehensive COVID-19 prevention management; those are: (1) Doing personal prevention by practicing handwashing, maintaining personal hygiene and social distancing. (2) Paying attention to the comorbid factors like age, sex, and non-contagious disease record. (3) Personal health condition shown by physical activities, diet status, and macro-micro nutrition status traced from consumption of vegetables and fruits will determine the immunity system status and will affect the risk and severity of infection. (4) Applying potential therapeutic approach like healing with antivirus and herbal plants [14].

Students of faculty of medicine have a big role during the COVID-19 pandemic, one of which is becoming the source of health information for the public or medical volunteer, and the involvement of the students will build their professionalism as part of being a health worker [15-17]. As a result, medical students must have good knowledge regarding COVID-19 disease. In a research in Uganda, the faculty of medicine students have good knowledge (91%), attitude (74%), and behavior (57%) during the COVID-19 pandemic [18].

Furthermore, based on a research finding by Gao *et al.*, the searches on the latest information regarding COVID-19 was done mostly by medical students (85.56%) compared to students from non-medicine major (81%), especially for female students [19]. Even though the finding of the research did not show any difference between the knowledge about transmission of SARS-COV-2 on both group of students, the knowledge about the clinical signs such as diarrhea and not showing symptoms (asymptomatic) on the patience of COVID-19 is better-understood by medical students [19]. The source of information regarding the implementation of PHBS during the pandemic was not obtained only from formal education; the surroundings and the will to explore knowledge became the determining factors of someone's knowledge. As a result, education background did not become the factor that influences the implementation of PHBS among the students from medicine major and non-medicine major [20].

Doing self quarantine and maintaining personal hygiene by washing hands regularly are first responses given by the medical students in Jordan in preventing the spread of virus [21]. Wearing mask, washing hands, limiting activities outside of house, covering mouth while coughing and sneezing, applying disinfectants, avoiding shaking hands and kissing, not touching nose, eyes and mouth, reducing the use of public transportation, restraining from interacting with infected people, and always paying attention to personal health condition are some actions done by the students to prevent the spread of COVID-19 [18, 19, 21, 22].

Adequate Knowledge

Studying medicine and nursing with good knowledge will positively affect students' habits during the pandemic, where 42.8% of the students in Vietnam had a change in dietary to be healthier compared to the time before the pandemic [23]. Higher level of education ($p < 0,001$) and age ($p < 0,001$) became supporting factors of better preventive behavior where students wear masks more frequently, use disinfectants, restrain from touching face, and avoid crowds [22]. Those who were aged ≥ 24 years old (aOR= 1,5; $p < 0,02$) and who actively participated in online seminar (webinar) (aOR= 1,8; $p < 0,03$) significantly influence the application of COVID-19 prevention, and being 4th-year-students (aOR= 4,1; $p < 0,001$) significantly correlate with their knowledge about medicine [18].

The findings of the previous research is in line with the findings from a research in faculty of medicine Tanjungpura University where most medical students already applied the PHBS well in order to prevent the spread of COVID-19. In the group of health workers and medical students, the will to do preventive actions was stronger; this relies on the basis of love, care, and social responsibility towards family and people around, and also the goal to develop themselves by becoming a role model in application of healthy lifestyle during COVID-19 pandemic [22, 24, 25].

The advantages in getting information quickly and effectively became the main reason of social media usage as a source of information for learning by the medical students [26]. During the pandemic, communication and information searches directly to medical workers or to libraries are hard to do because of social limitations. The use of information from social media was the main media for medical students [21]. However, in utilizing social media for information regarding health, it is a must to make a comparison with another source of

information in order to make sure the information that was obtained is accurate and true [26, 27].

Different and various sources of information (*infodemic*) in social media during the pandemic is deemed as the causes of mental health problems (depression and anxiety) among the people, and this matter needs to be a concern of the government in addition to virus pandemic management [28]. Because of that, the source of information that is accurate and not exaggerated is seen as the determiner of mental health in the public.

Health research journal is one of the sources of information that is frequently used by the medical students of Tanjungpura University. Ever since COVID-19 pandemic started, Tanjungpura University medical students were given some COVID-19 cases as a trigger for their problem-based learning so that the use of journals as information and reading-writing sources became a priority for them. This caused most of the students in faculty of medicine Tanjungpura University to possess good knowledge and information regarding COVID-19 pandemic. The result of this research is supported by the research findings of Olum *et al.*, [18] stating that the source of information from journals and medical article is seen to be up-to-date and credible so that they give better understanding to the medicine-majoring students ($p= 0,03$). Also, good health-literacy could reduce the anxiety and could prevent students' unhealthy lifestyle like smoking and drinking in dealing with the pandemic [23]. This is contradictive with the result of a research conducted by Khasawneh *et al.*, where only 27% of medical students used health journals in order to obtain new information [21].

Support from Education Institutes for the Students

Great responsibility, pressure, and the demand of study which is quite heavy have been acknowledged to affect on the mental and spiritual problems of the faculty of medicine students [29, 30]. Psychological problems suffered by the students were generally in form of stress, anxiety, and depression. This condition could lead to higher psychological pressure and suicidal tendency [31-33]. One of the depression factors of the students were low socio-economic/financial condition of the family. The research of Abd-Alrazaq *et al.*, showed that economy failure of a company/country became one of frequently-discussed topics on *Twitter* during COVID-19 pandemic period [34]. The effect of social limitations could influence the financial status, and in the end also influence the ability to pay education fee in medical schools. Nevertheless, the decrease of the limitation could increase the number of patients. This conditions, in the long-run, could affect the anxiety prevalence and depression symptoms on the medical students [35, 36].

The stability of learning process during the pandemic also became the concern of the students. Responses given by the medical schools/institutions in Indonesia during the pandemic are mixed, and this matter became the concern of medical students as well. Learning process through online platforms, practicum that was not taught and done live, clinical skills practice which used doll as a substitute of mannequin, exams which are cancelled or administered online, and the delayed clinical practice became the effects of pandemic on the medical education which needs human interaction [37, 38].

This worrisome situations were also faced in this research where the effects of COVID-19 pandemic on the financial/economic condition of family and achievement of study during the online sessions were a few causes of anxiety of Tanjungpura University medical students. As

a result, early detection, open communication and social support from colleagues or lecturers, and an offer of free mental health consultation could be a strategy to prevent mental health problems of medical students during the pandemic [12, 39]. Providing complete personal protective equipments, enough supply of food, water, place to live ,and sufficient financial support along with good hygiene also became the priorities to maintain physical health of the students during the pandemic [12]. Besides, reorganizing education curriculum that is clear and fast with minimum obstacles would help to reduce anxiety and complexity of education system challenges that must be faced [37, 40].

5. CONCLUSION

The implementation of PHBS of medical students of Tanjungpura University is already on good level. It is shown by the implementation of handwashing with 6 steps using soap under running water every time they are about to touch food and every time they come home. In addition, providing hand sanitizer, avoiding shaking hands, applying social distancing, and practicing coughing or sneezing etiquette by covering mouth with flexed elbow is already implemented well. Three media of information that were frequently used by the students were social media, audio-visual media and journal. The causing factors of students' anxiety during COVID-19 pandemic were: personal and family health, the effect of pandemic towards the financial/economic sector of the family, and education problems. Medical education institutions need to give support towards the implementation of PHBS and to prevent physical and mental health problems of the medical students. This research still has several limitations, some of which were non-validated questionnaire because it was scored only by using identity data and the implementation of daily behavior of the subject, and the research did not evaluate the correlation between PHBS implementation and personal factors of the students so that it can be considerations to do similar or better researches.

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Conflicts Of Interest

The authors declare that there is no conflict of interest that may influence them in writing this article.

6. REFERENCES

- [1] Lin, L., et al., *Hypothesis for Potential Pathogenesis of SARS-CoV-2 Infection-A Review of Immune Changes in Patients With Viral Pneumonia*. *Emerg Microbes Infect*, 2020. **9**(1): p. 727-732.
- [2] Ayuningtyas. D., et al., *Local Initiatives in Preventing Coronavirus Based on Health Policy Perceptive*. *Journal of IHPA*, 2020. **5**(2): p. 66 - 77.

- [3] BNPB, *Perpanjangan Status Keadaan Tertentu Darurat Bencana Wabah Penyakit Akibat Virus Corona di Indonesia*, in *13.A. Tahun 2020*, Badan-Nasional-Penanggulangan-Bencana-Republik-Indonesia, Editor. 29 Februari 2020, Badan Nasional Penanggulangan Bencana Republik Indonesia: Jakarta.
- [4] Gubernur, *Intruksi Gubernur Kalbar: Kewaspadaan Terhadap Masuknya Virus Corona di Kalbar*, in *Nomor: 800/0351/SEKRT-A/2020*, Gubernur-Kalbar, Editor. 3 Februari 2020: Pontianak.
- [5] CNN-Indonesia, *Positif Corona di Kalbar Naik, Transmisi Lokal Bertambah*, dho, Editor. 6 Mei 2020, CNN Indonesia: <https://www.cnnindonesia.com/nasional/20200506142944-20-500699/positif-corona-di-kalbar-naik-transmisi-lokal-bertambah>.
- [6] Morawska, L., et al., *How Can Airborne Transmission of COVID-19 Indoors Be Minimised?* Environ Int, 2020. **142**: p. 105832.
- [7] Tellier, R., et al., *Recognition of Aerosol Transmission of Infectious Agents: A Commentary*. BMC Infect Dis, 2019. **19**(1): p. 101.
- [8] Domingo, J.L., M. Marques, and J. Rovira, *Influence of airborne transmission of SARS-CoV-2 on COVID-19 pandemic. A review*. Environ Res, 2020. **188**: p. 109861.
- [9] Kemenkes, *Pedoman Pencegahan dan Pengendalian Coronavirus Disease (COVID-19) Revisi ke-4*, Direktorat-Jenderal-Pencegahan-dan-Pengendalian-Penyakit, Editor. 27 Maret 2020, Kementerian Kesehatan Republik Indonesia: Jakarta.
- [10] Rose, S., *Medical Student Education in the Time of COVID-19*. JAMA, 2020. **323**(21): p. 2131-2132.
- [11] Gallagher, T.H. and A.M. Schleyer, *"We Signed Up for This!"—Student and Trainee Responses to The Covid-19 Pandemic*. N. Engl. J. Med, 2020. **382**(e96).
- [12] Chandratre, S., *Medical Students and COVID-19: Challenges and Supportive Strategies*. J Med Educ Curric Dev, 2020. **7**: p. 2382120520935059.
- [13] Azim Majumder, M., *COVID-19 Pandemic: Medical Education is Clinging on A Knife's Edge!* AHB, 2020. **10**(3): p. 83.
- [14] Gasmi, A., et al., *Individual Risk Management Strategy and Potential Therapeutic Options for The COVID-19 Pandemic*. Clin Immunol, 2020. **215**: p. 108409.
- [15] Bauchner, H. and J. Sharfstein, *A Bold Response to the COVID-19 Pandemic: Medical Students, National Service, and Public Health*. JAMA, 2020. **323**(18): p. 1790-1791.
- [16] Miller, D.G., L. Pierson, and S. Doernberg, *The Role of Medical Students During the COVID-19 Pandemic*. Ann Intern Med, 2020. **173**(2): p. 145-146.
- [17] Tempski, P., et al., *The COVID-19 Pandemic: Time for Medical Teachers and Students to Overcome Grief*. Clinics., 2020. **75**(e2206).
- [18] Olum, R., et al., *Perspective of Medical Students on the COVID-19 Pandemic: Survey of Nine Medical Schools in Uganda*. JMIR Public Health Surveill, 2020. **6**(2): p. e19847.
- [19] Gao, Z., et al., *A Cross-Sectional Study: Comparing The Attitude and Knowledge of Medical and Non-medical Students Toward 2019 Novel Coronavirus*. J Infect Public Health, 2020. **13**(10): p. 1419-1423.

- [20] Antari, N.P.U., et al., *Perilaku Hidup Bersih dan Sehat Mahasiswa Universitas Mahasaraswati Denpasar Selama Pandemi COVID-19* Jurnal Ilmiah Medicamento 2020. **6**(2): p. 94-99.
- [21] Khasawneh, A.I., et al., *Medical Students and COVID-19: Knowledge, Attitudes, and Precautionary Measures. A Descriptive Study From Jordan*. Front Public Health, 2020. **8**: p. 253.
- [22] Haque, A., et al., *Comparing The Preventive Behavior of Medical Students and Physicians in The Era of COVID-19: Novel Medical Problems Demand Novel Curricular Interventions*. Biochem Mol Biol Educ, 2020.
- [23] Nguyen, H.T., et al., *Fear of COVID-19 Scale-Associations of Its Scores with Health Literacy and Health-Related Behaviors among Medical Students*. Int J Environ Res Public Health, 2020. **17**(11).
- [24] Duong, T.V., et al., *Digital Healthy Diet Literacy and Self-Perceived Eating Behavior Change during COVID-19 Pandemic among Undergraduate Nursing and Medical Students: A Rapid Online Survey*. Int. J. Environ. Res. Public Health 2020. **17**(7185).
- [25] Kinder, F. and A. Harvey, *Covid-19: The Medical Students Responding to The Pandemic*. BMJ, 2020. **369**: p. m2160.
- [26] Saenger, A.K., et al., *The Power of Social Media in Medicine and Medical Education: Opportunities, Risks, and Rewards*. Clin. Chem, 2018. **64**(9): p. 1284-1290.
- [27] Saadeh, R.A., N.A. Saadeh, and M.A. de la Torre, *Determining The Usage of Social Media for Medical Information by The Medical and Dental Students in Northern Jordan*. J Taibah Univ Med Sci, 2020. **15**(2): p. 110-115.
- [28] Gao, J., et al., *Mental Health Problems and Social Media Exposure During COVID-19 Outbreak*. PLoS One, 2020. **15**(4): p. e0231924.
- [29] Nurrezki, S. and R. Irawan, *Hubungan Stres, Cemas, dan Depresi dengan Kejadian Migrain Pada Mahasiswa Kedokteran di Jakarta*. DJM, 2020. **19**(1): p. 1-7.
- [30] Wahjudi, J.W., A. Findyartini, and F. Kaligis, *The Relationship Between Empathy and Stress: A Cross-Sectional Study Among Undergraduate Medical Students*. Korean J Med Educ, 2019. **31**(3): p. 215-226.
- [31] Maser, B., et al., *Medical Student Psychological Distress and Mental Illness Relative to the General Population: A Canadian Cross-Sectional Survey*. Acad Med, 2019. **94**(11): p. 1781-1791.
- [32] Bustamam, N., R.M. Theresa, and S. Wahyuningsih, *Student Support Program to Reduce Stress, Anxiety, and Depression on Medical Students* JPKE, 2020. **9**(2): p. 170-181.
- [33] Coentre, R. and C. Góis, *Suicidal Ideation in Medical Students: Recent Insights*. Adv Med Educ Pract, 2018. **9** p. 873–880.
- [34] Abd-Alrazaq, A., et al., *Top Concerns of Tweepers During the COVID-19 Pandemic: Infoveillance Study*. J Med Internet Res, 2020. **22**(4): p. e19016.
- [35] Sartorao Filho, C.I., et al., *Impact Of Covid-19 Pandemic On Mental Health Of Medical Students: A Cross-Sectional Study Using GAD-7 And PHQ-9 Questionnaires (Preprint)*. DOI: 10.1101/2020.06.24.20138925, 2020.
- [36] Saputra, H. and N. Salma, *Dampak PSBB dan PSBB Transisi di DKI Jakarta dalam Pengendalian COVID-19*. MKMI, 2020. **16**(3): p. 282-92.

- [37] O'Byrne, L., B. Gavin, and F. McNicholas, *Medical Students and COVID-19: The Need for Pandemic Preparedness*. J Med Ethics, 2020. **46**(9): p. 623-626.
- [38] Xiao, H., et al., *Social Distancing among Medical Students during the 2019 Coronavirus Disease Pandemic in China: Disease Awareness, Anxiety Disorder, Depression, and Behavioral Activities*. Int J Environ Res Public Health, 2020. **17**(14).
- [39] Komer, L., *COVID-19 amongst The Pandemic of Medical Student Mental Health*. IJMS, 2020. **8**(1): p. 56-57.
- [40] Choi, B., et al., *The Impact of The COVID-19 Pandemic on Final Year Medical Students in The United Kingdom: A National Survey*. BMC Med Educ, 2020. **20**(1): p. 206.