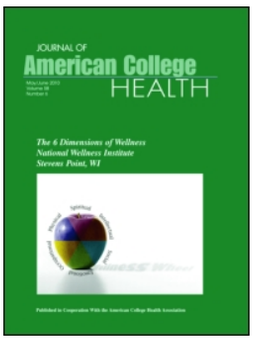

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Promoting COVID-19 prevention strategies in student dormitory setting: A qualitative study

Perigrinus Hermin Sebong[a], Cynthia Tjitradinata[b] and Roberta E. Goldman[c,d]

[a]Department of Public Health, Faculty of Medicine, Soegijapranata Catholic University, Semarang, Indonesia; [b]Faculty of Medicine, Soegijapranata Catholic University, Semarang, Indonesia; [c]Department of Social and Behavioral Sciences, Harvard Chan School of Public Health, Boston, Massachusetts, USA; [d]Department of Family Medicine, Alpert Medical School of Brown University, Providence, Rhode Island, USA

ABSTRACT

Objective: To explore the risk perceptions and COVID-19 prevention practices of dormitory residents in Indonesia. **Participants**: Nineteen dormitory residents, 3 staff and 1 dormitory manager were recruited from the Saint Theresa Avila student dormitory. **Methods:** This qualitative study used individual interviews and framework analysis. **Results:** Generally, the study confirms that there is a gap between risk perception and COVID-19 prevention practices among dormitory residents. There are barriers in accessing hand washing facilities and in complying with COVID-19 prevention protocols including not wearing masks, not following quarantine procedures and visiting friends' rooms. **Conclusion:** Dormitory managers and staff should repeatedly remind residents to wear masks and maintain safe distance through sending short messages on dormitory social media groups. In addition to psychological assistance and basic supplies during self-quarantine, providing sanitizer and installing posters detailing the hand-washing steps are essential at each hand-washing facility in the dormitory.

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COVID-19; dormitory; hand washing; quarantine; risk perception; wearing masks

Background

SARS-CoV-2 transmission can occur through direct, indirect or close contact with an infected person through saliva and respiratory secretions or respiratory droplets, which are released when an infected person coughs, sneezes, talks or sings.[1] SARS-CoV-2 transmission is mainly spread through droplets and close contact with symptomatic infected cases.[2,3] Recent studies have shown clusters of COVID-19 cases in university student housing and student dormitories due to prolonged close contact.[4–6] A recent study to analyze the setting conditions linked to the cluster transmission of SARS-CoV-2 showed that 893 of the 942 new COVID-19 cases in Singapore occurred in dormitories.[7]

As other viral pathogens, transmission of SARS-CoV-2 highly depends on the complexity of human interactions.[8] Close physical contact in a house or building such as a dormitory has more risk for spreading viral infection.[9] Densely populated dwellings such as dormitories have increased risk of disease transmission because the inhabitants have higher contact rates.[10] The consequence of close contact on the spread of disease is particularly important for those who share space in the same room such as in student dormitories.[11] From a previous study, students' gathering activities, sharing space in the same room, and mingling with others are linked with the presence of respiratory illness in student dormitories.[12]

Population density is an important factor for COVID-19 transmission in a student dormitory.[13] People living together in a dormitory face difficulties in maintaining safe and appropriate physical distancing. They often gather together for social activities, recreational activities, eating, and share equipment such as kitchen utensils, bathroom facilities, stairs, study areas and living rooms.

Since the Indonesian government released the regulation for the Implementation of Education in Coronavirus Disease (COVID-19) Emergency Period, classroom learning has been replaced with virtual learning processes online.[14] Mobilization and territorial restrictions prevent some university students from returning to their family and instead they stay in the dormitory. During this time, Soegijapranata Catholic University students in Saint Theresa Avila dormitory, Semarang City, Indonesia are required to limit their social contact with other residents by keeping a distance of 1 or 2 meters from others, wearing masks and washing hands regularly.[15]

Although there have been many reports of adherence to health protocols, several studies have shown different

CONTACT Perigrinus H. Sebong falconperin_consultan@yahoo.com Department of Public Health, Faculty of Medicine, Soegijapranata Catholic University, Jl. Pawiyatan Luhur IV/1 Bendan Dhuwur Semarang 50234, Indonesia

results.[16] Based on direct observations in the dormitory concerning hand washing and wearing a mask, the researchers noted that most students did not wash their hands with soap. If this is not immediately intervened upon properly, it will increase the risk of COVID-19 infection in the dormitory.[16] Another challenge is compliance with self-quarantine. One study aimed at exploring the experience of carrying out quarantine at home found that adherence to self-quarantine was still low.[17]

To promote adequate preventive behavior for the population in the university, dorm managers and students' families need to know how students in dormitories perceive infection risk, how they accept the interventions and whether they are willing and able to implement COVID-19 protocols.[18] The effectiveness of controlling outbreaks of new infectious diseases will largely depend on the population's behavior and their willingness to comply with the recommended precautions.

Few studies have qualitatively explored the risk perceptions and experiences of students in dormitories following the COVID-19 prevention protocol, especially in Indonesia, where most students live in dormitories. Presently, mostly quantitative studies have described students' perceptions of the COVID-19 pandemic, and their experiences while studying during the COVID-19 pandemic.[19] The previously mentioned studies indicate the importance of examining the perceptions, feelings, and attitudes of dormitory residents during major epidemic crises. This study aimed to explore the risk perceptions, self-quarantine, mask wearing behaviors, physical distancing and ways to improve hand washing among university dormitory students. This research may serve as a basis for developing studies to evaluate interventions to promote safer student health behavior regarding COVID-19 precautions.

Methods

Study setting

This research was conducted at the Saint Theresa Avila student dormitory of Soegijapranata Catholic University located in Semarang City, Central Java Province, Indonesia. The dormitory accommodates 106 female students and during the COVID-19 outbreak in 2020, there were only 50 students along with the manager and dormitory staff who were still in the dormitory. The dormitory has 53 double occupancy bedrooms that are 18 m^2. The dormitory also has common facilities including 4 study rooms, 3 kitchens, 1 prayer room, 16 bathrooms, 1 parking area and 1 guest room. The dormitory has 6 permanent sinks located inside the dormitory (2 sinks on each floor) and 1 portable sink located near the only entrance into the building front of the dormitory. During the COVID-19 pandemic, even after education switched to virtual learning, 50 residents, particularly those from remote islands, did not return home to their family. Only 14 students occupied the bedroom with a roommate, while 36 students occupied a room alone because their roommates had returned to their family. Dormitory managers have implemented COVID-19 prevention protocols such as physical distancing in the communal room, wearing masks, washing hands more often, self-quarantine, not gathering in communal areas, not allowing visiting in other students' bedrooms, not allowing outside visitors except families, scheduling cooking time in the kitchen, and only leaving the dormitory after obtaining permission.

Study design and participants

This qualitative study used semi-structured, individual in-depth interviews to obtain detailed descriptions of COVID-19 prevention practices of dormitory residents, managers and staff in Semarang, Indonesia. Each participant prior to the interview was given information about the purpose of the study and the voluntary nature of the study and all participants provided written and oral informed consent. Using a purposive method, interview participants were selected with different backgrounds including managers whose main role is to enforce the prevention of COVID 19 protocols in the dormitory, students from the 1st, 2nd and 3rd floors who have not returned to their families since the pandemic began, students living in the dormitory more than 1 year, and students who often ignore the COVID-19 protocols based on the dormitory managerial report. This approach allowed for in-depth problem exploration using a small sample.[20] An invitation letter was sent to 50 students, the dormitory manager and 5 dormitory staff to participate in an interview. Thirty-five participants responded to our invitation by email and telephone. Twelve who did not meet our criteria were excluded.

Procedures

Semi-structured in-depth interviews were conducted at a time convenient for participants between 20 September to 17 October 2020, either by telephone or face-to-face. When conducting face-to-face interviews, face coverings were used and a safe distance from participants was maintained in open spaces. The interview duration ranged from 20 to 40 minutes. With participant consent, all interviews were audio recorded. Participants' age, student status and length of stay in the dormitory were documented prior to the interview. Open-ended questions were used to explore the students' and dormitory staff perceptions of COVID-19 protocols and adherence barriers in the participants' own words (Table 1).

In this study, data collection occurred simultaneously with data analysis. Audio recordings were transcribed

verbatim within 24 hours of each interview and immediately reviewed by the interviewers for accuracy. Throughout the study, the researchers followed the standards for reporting qualitative research guidelines recommended by COREQ.[21]

Data analysis

Data analysis followed the stages of the analysis framework by Gale et al.[22], which included transcriptions; familiarization with the transcripts; coding; creating a framework analysis sheet; entering data into the framework matrix; and interpreting the data. The interview recordings, typed transcripts and data analysis were in Indonesian. The research team consisting of public health researchers and medical scientists (PHS and CT) conducted the analysis. The analysis included reading the transcripts several times to gain an understanding of the meaning conveyed, identifying important phrases and restating them in general terms, then formulating meanings and validating meanings through discussion by the research team to reach consensus, identifying and organizing themes into groups and categories, and developing a description of the themes. The findings were then reviewed by medical anthropology scientists (REG) to discuss emerging themes and sub-themes. All quotes presented in the paper were translated into English by CT and back translated by PHS to ensure that the meaning stayed the same through the process of translation.

To ensure the trustworthiness and credibility of the study's findings, we conducted member checking and triangulation.[23] Member checking was done by returning the transcripts to the participants with the aim of confirming their answers. Triangulation was achieved by comparing the variation in answers between students, dormitory manager and staff.

Ethics

This research protocol was approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada-Dr. Sardjito General Hospital. All data collection was conducted in accordance with the COVID-19 prevention protocols.

Results

We interviewed 23 participants including 19 dormitory residents, 3 staff and 1 dormitory manager. All participants were recruited from the Saint Theresa Avila student dormitory of Soegijapranata Catholic University located in Semarang City, Central Java Province, Indonesia. Tables 2 and 3 provide the characteristics of the participants in the study.

Our iterative data analysis allowed us to assess that data saturation was obtained after we interviewed 20 participants, and we continued with three additional interviews to ensure data saturation. Three main topics emerged from the framework analysis: Students' risk perception of COVID-19; Students' experiences in the dormitory during the global COVID-19 pandemic; and Hand washing practice by the students within the dormitory manager and staff perspectives.

Student risk perception of COVID-19 in dormitories

Knowledge of COVID-19

Most of the students confirmed that COVID-19 is a new virus for which the treatment has not yet been found. Students noted that COVID-19 can spread through the air and also from person to person due to physical closeness. Most of the students already knew the symptoms if someone becomes infected with COVID-19 and that symptoms varied from person to person. They listed that a person infected with COVID-19 may have high fever, shortness of breath, cough, dizziness, nausea, and that an infected person may also be asymptomatic.

> COVID-19 is a virus, this virus is new in the world. (P4)

> COVID-19 is a contagious disease and the cure has not been found. (P16)

Perception of self-quarantine

All participants said that self-quarantine was useful for preventing transmission of COVID-19 in dormitory. Self-quarantine also can reduce fear among dormitory residents when some students return to the dormitory after being out of the dormitory for some time.

> Self-quarantine keeps the people around us safe, so this is very important to implement… (P8)

Table 1. Semi-structured interview guide.

Questions	Probes
Can you tell me, what you know about COVID-19?	What are the symptoms?; How is it transmitted?; Why self-quarantine is needed?
Can you tell me about your experience while in the dormitory during the COVID-19 pandemic?	Why do you feel about that?
Do you feel at risk of being infected with COVID-19 while in the dormitory?	What efforts are made to prevent COVID-19 transmission in the dormitory?; What preventive efforts are done appropriately?; Can you tell me what habits of the residents increase the risk of COVID-19?
How do you practice hand hygiene during the COVID-19 pandemic?	Why is it important to wash your hands using soap and running water?; When do you usually wash your hands?; What is the facilitating factors and barriers for washing hands?; and Is there any solution to these barriers?.

Table 2. Characteristics of student participants.

Participant (P)	Age	Length of stay at dormitory (year)	Floor
P 4	19	1	1st
P 5	19	1	1st
P 7	21	3	3rd
P 8	18	1	1st
P 9	19	1	1st
P 10	19	1	1st
P 11	18	1	1st
P 12	19	1	3rd
P 13	21	3	2nd
P 14	19	3	2nd
P 15	22	3	2nd
P 16	18	1.5	2nd
P 17	20	2.5	2nd
P 18	21	3.5	3rd
P 19	21	3.5	3rd
P 20	20	2.5	2nd
P 21	20	2.5	3rd
P 22	20	2.5	2nd
P 23	20	2.5	3rd

Table 3. Characteristics of dormitory manager and staff.

Participant (P)	Age	Status
P1	44	Dorm manager
P2	25	Staff
P3	23	Staff
P6	35	Staff

> Self-quarantine made my friends more relaxed and not afraid that they would be infected by the virus. (P20)

Students in the COVID-19 crisis

From the time when the Indonesian government first announced that the COVID-19 pandemic had spread in Indonesia, all participants were afraid. Participants explained their fear was caused by the emergence of unclear news and information about the new virus on online media and national television. Participants also said that being away from their family and parents also made them fearful. The dormitory manager and staff admitted that with the first spread of COVID-19 in Indonesia, they were unable to respond to residents' fears and complaints appropriately.

> When we heard the news of COVID-19 we were afraid. News and information on social media and television are very much about COVID-19 … as the dormitory leaders, at that time we only follow the recommendation from government to practice the COVID-19 prevention protocols. (P1)

> … I was afraid when I heard the news because I was far from my parents… (P4)

All participants asserted that health protocols must be followed during the pandemic to prevent the transmission of COVID-19 in the dormitory. These included taking rapid tests for residents who return to the dormitory, self-quarantine, physical distancing, wearing masks and washing hands frequently.

> When I entered the dormitory, I was required to quarantine for 14 days, always wear a mask, I also did a rapid test … (P19)

> It is important to implement hand washing and other health protocols so as not to spread the virus everywhere… (P22)

Students who had close contact with others who received positive COVID-19 laboratory test results or had contact with others who were suspected to be COVID-19 positive and/or had traveled to other places more than 1 week were required to follow self-quarantine procedures in the dormitory. The quarantine procedure that was implemented required all students to notify the dormitory manager 2 weeks before entering the dormitory and to provide medical records that show negative COVID-19 results from the rapid antigen test or RT PCR when they arrive at the dormitory. Furthermore, students who did not have a roommate currently living in their room, could continue to self-quarantine in their room, while students who had a roommate, were required to self-quarantine in a separate room that was provided for them. Meanwhile, if there was close contact, a COVID-19 test would be done. If the test results were confirmed as positive for COVID-19, the students were isolated in a separate location that had been prepared by the local government. If the test results were not confirmed as positive for COVID-19, students continued to self-quarantine in the dormitory. During self-quarantine, students had to stay in their rooms, with no contact or visits with other dormitory residents for 14 days. A separate kitchen, toilets and bathrooms were designated for those who were in self-quarantine. The quarantine rooms were located on the 1st floor.

> Two weeks before returning to dormitory, students have to confirm to us … must provide negative test results for COVID-19 (rapid antigen or RT PCR) which are still valid … we have arranged 11 separate rooms for self-quarantine, 3 toilets, 3 bathrooms, 1 kitchen. and cooking utensils … (P1)

> When I arrived at the dormitory, I showed the results of the rapid antigen test… because I live in the same room as my roommate, so I was quarantined in a separate room … (P19)

Although most residents were following health protocols, some participants said that COVID-19 prevention in the dormitory was inadequate because there were no written rules and there was lack of monitoring or oversight of the protocols' implementation.

> It might be more effective if it is a written rule and it should be stricter for dormitory residents who disobey … because there are no written regulations inside the dormitory, only those from outside the city are there … (P14)

Some students who had to self-quarantine said they did not receive assistance in managing anxiety and stress during quarantine.

> During self-quarantine I was very scared, worried… nothing had helped to reduce anxiety and bad feelings …(P20)

Dormitory situations have great potential for spreading COVID-19

Several participants stated that even though they had followed the COVID-19 prevention protocols, some students still engaged in activities that could increase COVID-19 transmission in the dormitory. They claimed they often saw their friends leaving the dorms for non-essential activities and going outside such as to visit a café. They stated that there were still many visitors to the dormitory who do not wear masks nor wash their hands. Some students still used shared utensils and engage in activities together in a room.

> There are some friends who often go out like to cafes. Many guests also come here. I often see there are still guests who don't use masks and when they come in don't wash their hands first … also share utensils together … (P11)

> Some came out and came back and did not immediately clean their bodies, instead they went to another friend's room. It is more contagious. (P14)

> Especially in the dormitory, we often have physical contact, for example when we eat in the dining room, … (P15)

Students' experiences during the COVID-19 pandemic

Experiences during the pandemic

Two particular experiences were described by participants. First, almost all participants confirmed having had unpleasant experiences such as feelings of boredom, sleep disturbances, and stress during the COVID-19 pandemic. Participants also complained because there were many assignments to be done during online lectures which were more than during a normal semester. Some participants also complained about the prohibition not to gather in the dormitory, and making group discussions only virtual.

> At first time, I was bored because I usually went out to have group discussions with my friends … for the first time I enrolled online lectures, I was shocked, I often felt depressed and my sleep time was irregular … (P7)

> What I feel now in the dormitory is indeed bored, it's not like before. Now just live in the dormitory… (P9)

Second, several participants described their positive experiences during staying at dormitory. They stated that following the COVID-19 prevention protocol in the dormitory was acceptable to them. Due to the requirement that they stay in their dorm rooms, they felt more focused on preparing for and completing their final exams. They also noted that they enjoyed getting closer to the dormitory manager, finding a new hobby, and having more time and opportunity for prayer.

> Already in the last semester there must be a thesis and if I do it at my home it will be difficult because I was disturbed … during the pandemic we got closer to the dormitory manager … this change is still acceptable. (P7)

> … But I also found new hobbies, like drawing and cooking …also there is a special day for prayer. (P12)

COVID-19 protocols non-adherence

The strategies for preventing the transmission of COVID-19 carried out in dormitories were social distancing, use of masks, washing hands and self-quarantine. The dormitory manager also prepared supplemental COVID prevention resources such as hand sanitizers for dormitory residents, hand washing facilities, soap and dryers. However, the dormitory manager said that many dormitory residents do not comply with physical distancing and continue to visit friends' rooms, do not wear masks when leaving their personal room and do not wash their hands properly.

> I often receive complaints and immediately see students gathering in their friends' rooms … sometimes they forget to wear masks … hand washing facilities are underutilized … (P1)

> Sometimes they forget to wear a mask when they leave their room. Sometimes when their friends come, they immediately get close to their friends and ignore the physical distancing … (P6)

Some participants explained that they did not comply with physical distancing for two main reasons: they did not go outside the dormitory and they felt bored staying in their room for such a long time.

> Feeling bored and lonely. I'm not used to wearing a mask, … sometimes when I visit a friend's room, I often forget to wear a mask … (P5)

> Because I have to study online, so I sit in front of the laptop for a long time so tired …we are not going anywhere so we don't need physical distancing. (P4)

Some participants also said that there were no written rules posted in places that were often shared, which made them think they needed to keep their distance and wear masks only when outside the dormitory. In addition, they perceived the dormitory manager was not strict with them about following the protocols.

> Rules for residents in the dormitory are not written, written rules are only for those from outside the city … (P13)

> Those who go out when they come back have not been monitored by the Sister (dormitory manager)…(P15)

Some participants who were in self-quarantine said that they actually knew the dangers of spreading COVID-19, but they admitted that using masks for a long time was too uncomfortable. In addition, they felt that self-quarantine was only a formality because they still

often left the room and had contact with other friends. One student also said that he was forced to temporarily ignore quarantine because of personal activities and needs that could not be fulfilled by others.

> Sometimes it is uncomfortable wearing a mask all the time… (P3)

> During the quarantine, I left the dormitory twice because I had to withdraw money from an ATM (Automatic Teller Machine) and repair my computer. (P19)

The dormitory manager said they were disappointed with the students who did not adhere to the rules, even though there was closed-circuit television and security. However, they were only given a warning and there was no strict punishment for these infractions. If students had serious problems related to dormitory rules, the manager would involve parents to convey the consequences of the problem.

> I am disappointed if I find students disobeying… during this pandemic, we don't think to punish students who don't comply with health protocols … parents are involved if students make serious problem…(P1)

Hand washing

Hand washing practice with soap and running water

All participants agreed that washing hands with soap and running water is very important to prevent transmission of COVID-19 in the dormitory. They believed that washing their hands with soap and running water is more effective than without soap to disinfect germs and prevent the spread of viruses.

> In my opinion it [washing hand with soap and running water] is necessary and important…If we use soap it can remove bacteria and viruses. (P4)

All participants confirmed that they had been socialized about the six steps to wash hands properly. However, most admitted that they almost never follow the full six steps.

> … The proper way to wash hands has been socialized. There are about 5 or 6 steps, but I forgot the steps… (P13)

The majority of them washed their hands after doing various activities as shown in Table 4. Participants generally washed their hands before and after eating and cooking.

> … It is necessary to wash hands as often as possible, for example after handling dirty goods, after cleaning the ears, they become a source of bacteria on the hands… (P15)

Although all participants knew and believed that washing hands with soap and running water is important and effective in killing germs, most admitted that they wash their hands only using water, without soap. Some also said that they often use hand sanitizer.

> Personally, I rarely wash my hands with soap after handling common goods in the dorms. (P04)

> I sometimes wash my hands with soap but don't follow the six steps … (P19)

> After taking the food package, I immediately used a hand sanitizer …. (P22)

Student beliefs about handwashing

When all participants were asked whether there is a cultural belief that discourages hand washing, all confirmed that there is no cultural belief amongst them that prohibits hand washing. However, several participants admitted they believed that during the COVID-19 pandemic the environment outside the dormitory presents more risk for COVID-19 transmission than the dormitory. They noted that when they are in public places such as traditional markets or using public transportation, there is frequent close contact between them and others so they are more at risk of getting infected. Most participants acknowledged that they prefer to wash with soap after they have been in public places and returned to the dormitory.

> When it's really from outside, for example, I buy vegetables at the market, so when I get back from the traditional market I try to wash my hands thoroughly, then I immediately take a bath … (P18)

> Because outside, for example using public transportation, there is more contact with other people, in the dormitory you rarely get close to others … (P20)

Hand washing facilities in the dormitory

Within the dormitory there are 7 hand washing facilities. One is located in the lobby, 2 on the 1st floor, 2 on the 2nd floor and 2 on the 3rd floor. Before entering the lobby, there is also a hand sanitizer station for students and visitors. Each hand washing facility is equipped with a running water tap, soap bottle and hand dryer. All participants confirmed that only six facilities were functioning and being used. Several participants said that they believed the number of hand washing facilities were insufficient for the number of dormitory residents.

Table 4. Times when participants washed their hands.

Before doing something	After doing something
Eating	Eating
Cooking	Defecating
Community prayer	Touching and disposing of dirt
Enter dormitory	Washing ditches
Face washing	Working outside
	Disposing of garbage
	Cleaning the bedroom
	Cooking
	Received Go-food (food delivery)
	Shopping
	Touching money
	Touching telephone or computer

> Nothing has changed, there is still 1 sink in each bathroom, and 1 in the toilet hallway… (P13)

> … if all residents return to the dormitory, surely the number of sinks is not comparable to all students … (P11)

Hand washing barriers

In general, access to water was not the main barrier to washing hands. Six of 7 hand washing facilities already had running water and functioned well. However, participants located on the 2nd and 3rd floors said that their access to soap is sometimes limited because the soap bottle is not filled after it is depleted. They explained that the unfilled soap bottles were neglected for a long time by the janitor.

> The most soap, sir, because the sink on the 2nd floor rarely has soap, because the toilet is often used, so it's rarely controlled by the cleaning service … (P13)

> Sometimes there is no soap if we want to wash our hands … not enough during the COVID-19 period. (P21)

Most of the participants mentioned that the hand dryer was usually a completely soiled, rolling cloth towel and was rarely replaced with a clean one, which was the reason they did not wash their hands properly, and some participants did not wash their hands at all. They considered the hand dryer to be a source of infection because it was often used repeatedly by the dormitory residents. Participants also complained about the distance between their rooms and the hand washing facilities.

> … Sometimes when I come back from the kitchen and want to wash my hands, just wet my hands and don't use the dryer … sometimes students whose hands are dirty also wipe there without washing their hands… (P13)

> I'm a little lazy to walk to the hand washing facility because it's far from my room. My suggestion is to add a sink in the middle … (P22)

Participants explained their noncompliance with hand washing was also driven by individual awareness and inadequate control by dormitory managers who do not provide consequences to students who defy the COVID-19 prevention protocols.

> Because in the dormitory no one reminds students and no one controls, because students are not aware. (P22)

> There are still many students who do not have adherence, washing their hands and hand sanitizers are rarely due to self-awareness, and also lack of enforcement… (P21)

Regarding the implementation of the six steps to properly washing hands, most participants admitted that they forgot the steps to wash their hands. The hand washing facilities did not provide a demonstration poster of the six-step washing hands procedure. All participants asserted that hand washing facilities should be equipped with the six-step hand washing instruction.

> I agree if there are instructions for students to see the steps, they must be followed, sir, so students have to care more… (P22)

Discussion

Interviews with university dormitory manager, staff and dormitory residents in Semarang City, Indonesia, provided insights to help understand both individual and external factors that are important for the adoption of COVID-19 prevention protocols in dormitories. To our knowledge, this is the first qualitative study in Indonesia to assess risk perceptions and implementation of COVID-19 prevention protocols in a female student dormitory.

The study found that dormitory residents, dormitory manager and staff were aware about COVID-19 and have basic knowledge of COVID-19. Dormitory managers have provided self-quarantine procedure and hand washing facilities. However, residents, dormitory managers and staff have not recognized the risk of COVID-19 transmission related to dormitory conditions and individual habits in the dormitory. There are barriers in accessing hand washing facilities and in complying with COVID-19 prevention protocols such as not following quarantine procedures, not wearing masks and visiting friends' rooms.

Risk perception can affect individuals' behaviors and also affect acceptance of new habits.[24,25] Risk perception about COVID-19 is a vital component for any behavior change during a pandemic.[26] This research found that there is a gap between risk perception and COVID-19 prevention practices among dormitory residents. Even though they already know they are at risk, dormitory residents have not fully followed COVID-19 prevention protocols. This finding is consistent with previous research which found a weak correlation between perceived risk and the community's practice of preventing COVID-19.[27] Risk perception about certain diseases is affected by demographic factors such as gender, for example, women are typically more aware than men.[26] Risk perception is also related to the context, for example, exposure to information through the media.[28,29] This research raises a new dimension of habitual adaptation as a factor that strengthens the perception of the risk of COVID-19 by female students in the dormitory. This study also indicates that the risk perception of female students in this dormitory about COVID-19 is also driven by emotional qualities, namely negative emotions such as stress, boredom, fear and being away from their family and parents.[30,31]

The research found that the dormitory manager and staff have implemented COVID-19 prevention protocols such as self-quarantine, wearing masks, maintaining physical distancing and providing hand washing facilities. However, in reality, COVID-19 prevention behaviors are not uniformly practiced, and some students ignore them altogether. The attitude of neglecting disease prevention is influenced by various factors such as risk perception, lack of knowledge, and limited facilities or supporting infrastructure.[32] Previous research by Coroiu et al.[33] showed that the main barrier to physical

distancing during the COVID-19 pandemic is individual-level factors such as feeling stress when alone, socializing to avoid loneliness, having to carry out tasks outdoors, and being unable to do work remotely. This study found that female students' beliefs concerning the risk of transmitting COVID-19 in the dormitory are lower than outside. This perception may be driven by the consideration that public places are always crowded so it is difficult to maintain physical distancing. The risk of virus transmission is higher with a physical distance of less than one meter.[34] Bish and Michie[35] showed that there is a relationship between perceptions of personal vulnerability to disease development and avoidance of going to public places. Our findings also show that the dormitory setting does not allow students to maintain physical distance because they still use a shared space or room at the same time, for example, the dining room, kitchen, bathroom and living room. This condition can increase the opportunity for virus transmission if it is not immediately noticed.[36]

Adherence to self-quarantine is related to perceptions of the benefits of the COVID-19 quarantine.[37] The belief that quarantine will reduce the risk of transmission increases adherence to quarantine protocols.[38,39] Notably, our findings suggest that students also believed that quarantine could reduce their friends' fear of being infected with the virus. In addition, low adherence to quarantine protocols is also influenced by other factors such as anxiety, boredom, fear and unavoidable activity.[38,40] Our research found that some students did not comply with quarantine procedures due to needs that could not be delayed and fulfilled for them by others. This finding is in line with previous research that found that people break quarantine for essential activities such as to get equipment and medication.[17,41,42] We also found that lack of enforcement in the dormitories may be the reason some students are not compliant.

The feeling of discomfort when wearing masks for a long time and forgetting to bring out a mask are important reasons that dormitory residents sometimes remove their masks when doing activities in common rooms such as in the kitchen, and study room. This finding is consistent with Sim et al.[43] that found the cause of people not wearing masks is the perception of barriers such as discomfort, forgetfulness, inconvenience, and difficulty with respiration. Interestingly, our research findings show that female students perceive that the risk of getting infected with COVID-19 is greater when they go to crowded public places where social distancing is impossible, such as traditional markets and mass transportation where people spend prolonged periods of time. Recent studies have shown that short-range airborne transmission dominates exposure during close contact.[44] This confirms that the risk of COVID-19 transmission in dormitories is higher than it is in public locations because people are in the same building for a long time, the ventilation system is poor, and interactions (such as laughing, talking and gathering) cannot be avoided.[45]

The practice of washing hands with soap occurs at a low level in the dormitory studied due to limited availability of soap and access to hand washing facilities, but not limited by availability of running water. Hands are usually washed before and after eating, cooking, using toilets, after receiving food delivery and times when hands look dirty, sticky, or uncomfortable. This category can be useful for improving female student handwashing practices in the dormitory with the right promotional approach.[46] Handwashing awareness relates to individual knowledge about the reasons or the relationship between hand washing and disease prevention. Okello et al.[47] showed that school students have the capacity to wash their hands consistently because it is driven by their awareness and knowledge. Our research identified factors such as availability, access to hand washing facilities, and well-situated educational information are important. This is in accordance with previous formative research in Indonesia which found the availability of hand washing facilities is related to the practice of washing hands with soap.[48] Additionally, our study found that limited soap and hand dryer conditions were the main reasons for the low practice of washing hands with soap in resident dormitories. Transmission of disease agents is more likely to occur from wet skin than dry skin, so proper hand drying after washing should be an important component of hand hygiene procedures.[49] This reason provides consideration for other alternatives to improve hand washing practices, for example hand sanitizers. The use of alcohol-based hand sanitizers has so far been effective in killing contaminants and minimizing the risk of skin damage.[50] Hand sanitizer stations situated throughout the building can be chosen as an alternative to improve hand hygiene in connection with COVID-19, especially in situations where access to hand washing facilities is limited, such as in student dormitories.[51]

Our study has several limitations, since some of the participants were interviewed by telephone so it was not possible to see their gestures and expressions. One of the interviewers is a lecturer at the university so some of the interviewees may not have felt comfortable expressing their thoughts openly and honestly. Also, this study was conducted in only one dormitory in one university, including only female students. Students in different university dormitory settings may hold different opinions and have alternate behaviors. Further research is warranted to compare different types of dormitories and student populations in other universities in Indonesia.

Conclusions

This qualitative research provides new information on strategies to improve mask wearing, physical distancing, compliance with self-quarantine protocols and hand washing practices by university dormitory residents during the COVID-19 pandemic in Indonesia. To

motivate students to adhere to the university's safety protocols concerning the use of masks and physical distancing, we recommend enhancing mask wearing and maintaining the safe, necessary distance through sending short messages on social media groups. Compliance with quarantine procedures might be heightened by providing students with: psychological support; clear information on activities that are necessary and unnecessary during quarantine; basic supplies including food and other important items for daily living; and strengthening a sense of togetherness through strategic use of social media. To promote and increase handwashing compliance among all individuals living and working in the dormitories, it is critical to make liquid sanitizers readily available, and install hand washing facilities with demonstration posters.

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Disclosure statement

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