HEALTH PROTOCOL INFRASTRUCTURE IN PREVENTING COVID-19 TRANSMISSION IN HIGH SCHOOLS IN JAMBI PROVINCE

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Abstract. Schools are one of the places at high risk of spreading COVID-19, so face-to-face learning requires the implementation of health protocols. The Ministry of Home Affairs requires a region's readiness in New Normal Life (NNL) of infrastructure health protocols in public facilities of at least 80%. This study measures educational units' readiness to provide health protocol infrastructure in high schools in Jambi Province in 2021. This research uses a descriptive quantitative method with observation techniques, and a checklist of supervision and fosters health protocol implementation in education units. The unit analysis is senior high schools (SMA) and vocational high schools (SMK) in Jambi Province, with purposive sampling of 10% samples in each district chosen randomly, namely 8 units in Jambi City, 3 in Kerinci Regency, and 5 in Tanjung Jabung Barat Regency. The results showed that senior high school units in Jambi Province were ready to implement NNL, such that 84.23% of schools had provided health protocol infrastructure facilities, with 87.23% of the layouts being good. The infrastructure that needs to be improved is the availability of clean and flowing water, spare masks in schools, supplies of hand sanitizers, labels for social distancing in class, and health data of school residents. The Jambi Provincial Government needs to encourage efforts of education units regarding health protocol adequacy and easy health protocol implementation and to have health data for the unit.

Keywords: COVID-19, schools, health infrastructure, hand sanitizers, social distancing

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INTRODUCTION

Coronavirus Disease 2019 (COVID-19) has been declared a pandemic by the World Health Organization (WHO) since 13 March 2020 (Cucinotta and Vanelli, 2020; Ghinai *et al*, 2020; Lai *et al*, 2020; WHO WPRO, 2020). COVID-19 has spread massively, crippling almost all sectors of life in all countries around the world and even causing death. Disrupting the chain of transmission through physical distancing is the most effective step in controlling infectious diseases (Ministry of Law and Human Right Republic of Indonesia, 2018), including COVID-19 (Hellewell *et al*, 2020; Lai *et al*, 2020; WHO, 2020). The efforts set out in the social distancing policy have impacted all sectors of life, including the education sector, in Indonesia (Gras-Le Guen *et al*, 2021; Larosa *et al*, 2020; Suryahadi *et al*, 2020; WHO/UNESCO/UNICEF, 2020).

The step to limit face-to-face learning was decided for the first time through Circular Letter Number 4 of 2020 concerning the implementation of education policies during the COVID-19 pandemic emergency. Learning happens indirectly (online) or through distance learning (Ministry of Education and Culture Republic of Indonesia, 2020). The policy has been implemented and has been quite effective in preventing the transmission of COVID-19 in the educational unit (school) environment (Gras-Le Guen *et al*, 2021).

School is a high-risk factor for the spread of COVID-19. Although the incidence of transmission in children remains lower than that in adults, the impact is age-dependent (Gras-Le Guen *et al*, 2021). The results of Larosa and co-workers' study stated that the number of cases could not be ignored as happened in northern Italy, especially in the age group

10-18 years old or high school, while at the preschool level only one case was found in elementary school and no middle case, among them teachers and staff (Larosa *et al*, 2020). Likewise, the results of a study conducted in the United Kingdom found that the infection rates in school clusters were still low, with very few clusters testing positive (Young *et al*, 2021)

The online learning model in Indonesia has been developed since 2013 as an alternative to learning, but not all schools can implement it (Anugrahana, 2020; Nafrin and Hudaidah, 2021). The constraints are not only the internet network but also the economic strength of each family, as facilities and internet data packages are needed, which are burdensome for the family (Ashari, 2020; Nafrin and Hudaidah, 2021; Nakayama *et al*, 2007). Additionally, they really need the availability of time, attention, and supervision from parents to their children during the learning process at home. Teachers have difficulty communicating with students and parents and have difficulty fulfilling teaching hours (Hatmo, 2021; Nafrin and Hudaidah, 2021).

It was found that online learning activities for State Islamic Institute students have not been effective, due to problems related to unstable internet connections, electricity shortage, credit crunch, and inappropriate time. Additionally, 90.9% of respondents stated that face-to-face learning is more effective than distance learning (Hatmo, 2021). However, Maatuk *et al* (2022) stated that the implementation of e-learning is the right way compared to traditional education although many problems and challenges were found. This statement is supported by that of Lizcano *et al* (2020) that the e-learning education method is the best choice to ensure that the epidemic does not spread because it guarantees spatial distance.

Joint control efforts through the restrictions that have been set have decreased cases so that face-to-face learning has reopened in the adaptation of New Normal Life (NNL) era with requirements including the ability of schools to provide health protocol facilities (Ministry of Education and Culture Republic of Indonesia, 2020). The Ministry of Home Affairs stipulates the requirements for the readiness of an area to implement the NNL, namely

that at least 80% of health protocol facilities are available in public facilities and that the community follows mask discipline during activities outside the home (Ministry of Home Affairs, 2020).

Despite optimism about the opening of face-to-face learning , which is regulated in stages with the implementation of more stringent health protocols, it is still felt necessary to pay attention to the Indonesian Child Protection Commission (KPAI) report on the results of supervision. KPAI found that 83.3% of schools were not ready for face-to-face learning in 2020, and only 16.7% of schools were ready for the same during the pandemic. The results of supervision in 2021 reveal that 42 schools in 12 regencies/ cities in seven provinces experienced an increase where face-to-face learning readiness reached 79.54%, and those that were not were only 20.46% (KPAI, 2021).

The policy for opening face-to-face learning in Jambi Province had begun when the micro-scale public activity restriction (PPKM Mikro) was implemented and was followed up with a circular letter from the Governor. However, it was found that the readiness of the Jambi Provincial Government is still below 80%, namely the availability of handwashing with soap facilities had only reached 62.4% and hand sanitizers was only 6.8% (Research and Development Agency Jambi Province, 2020). Based on this, measuring school readiness related to the availability of health protocol infrastructure facilities in senior high schools in Jambi Province is considered important.

MATERIALS AND METHODS

Study design

This research uses a descriptive quantitative method with observation techniques. Observation uses a checklist of supervision and fosters health protocol implementation in education units by the Ministry of Health, Republic of Indonesia (MOH RI, 2020).

Location

The research location was selected considering regional representation by purposive sampling based on geographical conditions, namely Kerinci Regency (representing the western region), Jambi City (representing the central and urban regions), and East Tanjung Jabung Timur Regency (representing the eastern region). The number of senior high schools (SMA) and vocational high schools (SMK) in Jambi Province is 86 SMA and 54 SMK, and the minimum sample in this study is set at 10%. A total sample comprised 20 units with the number of each regency as follow: 11 SMA and 9 SMK in Kerinci Regency, 6 SMA and 5 SMK in Jambi City, 3 SMA and 2 SMK in East Tanjung Jabung Regency.

Variables and operational definitions

1. The availability of health protocol facilities is defined as the availability and adequacy of handwashing with soap facilities, spare masks provided by the school, disinfection equipment, hygiene facilities, and thermo-guns. Availability is assessed by being available at the time of observation, and adequacy is defined as the availability for the next one month.

2. Infrastructure arrangement is defined as the layout of health protocol facilities so that they can be utilized properly and easily by the school community including the layout of infrastructure in classrooms, toilets, prayer rooms, and school health units (UKS).

3. The availability of data on residents of the education unit is defined as the availability of data on those who carry out face-to-face learning at school, follow learning from home, are in a sick condition, have a comorbid history, do not participate in face-to-face learning, and self-isolating.

4. The implementation of school readiness in the health protocols before and after the learning process is defined as school readiness in implementing health protocols according to standards before and after learning process.

Instrument

Research instruments to measure school readiness in COVID-19 infrastructure are a checklist sheet in the supervision and guidance of the implementation of 2020 health protocols in education units by the Ministry of Health.

Data analysis

A univariate data analysis is with a frequency distribution for each variable based on the assessment category carried out.

Ethical consideration

The research is related to quality assurance efforts through the evaluation of the readiness to implement the New Normal Life (NNL) in the education sector. The activity was carried out on the orders of the Governor of Jambi as stated in the Decree of the Governor of Jambi Number 255/Kep.Gub/Balitbangda-4/2021, as an effort to respond quickly to the local government in dealing with the NNL in senior secondary education in Jambi Province. Recommendations that are needed as soon as possible in local government policy-making are considered as data collection carried out by direct observation of the availability of health protocol infrastructure as a prerequisite for the implementation of face-to-face learning during the pandemic. Based on these considerations, interviews were not conducted with related parties at the schools that were the research locations. The research was conducted using observation techniques on the health protocol infrastructure in schools and did not involve human subjects.

RESULTS

Availability of health protocol facilities

School readiness factors according to the availability of facilities and the archiving (layout) of health protocol implementation facilities are measured through observation (observation). On the availability of health protocol facilities in 20 schools, as many as 84.23% of schools were found ready, of which the highest percentage (100%) was in the availability and adequacy of handwashing with soap facilities, and the lowest in the availability and adequacy of spare masks was only met for 14 schools (70%). For handwashing with soap facilities, what is not sufficient is hand soap (60%), and hand sanitizer (65%). For disinfection equipment, cleaning facilities and thermo-guns are available and sufficient (100%), except for disinfection atomizers (75%) (Table 1).

In the arrangement (layout) of infrastructure for the implementation of health protocols, as many as 87.23% schools are ready. The highest percentage (100%) is in the arrangement of facilities for a maximum number of learners of 18 people per class, ventilation for air circulation, and good lighting. Meanwhile, the lowest percentage, with 75% of schools that have good is on the availability and regulation of running water, soap, and information and education communication related to good and correct hand hygiene measures, as shown in Table 2.

The arrangement of facilities and infrastructure on the availability of toilets, prayer rooms, and UKS rooms in average schools has sought its readiness so that the school community can implement health protocols properly. Only the availability of clean water is still an obstacle, as is the condition of a prayer room for schools that have prayer rooms where only 4 out of 12 schools (33.3%) have provided social distancing labeling. Meanwhile, for the UKS space, an effort is still required to ensure the availability of spare masks and handwashing with soap facilities (Table 3).

Regarding out-of-class facilities, the information and education communication desks and one-way traffic arrangements in hallways/ corridors and stairs must still be made available, as well as the label of keeping a minimum distance of 1.5 meters. Most schools have resources

for other infrastructure within the pick-up and transit area near the school entrance. As for the regulations and services for introducers or pick-up students, only a few schools have implemented them, namely 8 out of 20 (40%). However, according to the school, the pick-up rules have been conveyed to students; besides, many students use two-wheeled vehicles or walk to school and are not shuttled by parents or other people (Table 4).

Table 1
Percentage of schools with availability of health protocol implementation facilities in senior high school in Jambi Province (N = 20)

Health protocol implementation facilities	*n* (%)*
Handwashing with soap facilities	
Availability of adequate handwashing with soap facilities	20 (100)
Hand soap	12 (60)
Clean water at each handwashing with soap facility	16 (80)
Hand sanitizer	13 (65)
Adequacy of spare masks	14 (70)
Disinfection fixtures	
Disinfectant liquid	20 (100)
Glove	18 (90)
Mask	18 (100)
Atomizer	15 (75)
Hygiene facilities (adequacy of cleaning tools brooms, dusters, rags, mopping tools, buckets, *etc*)	20 (100)
Thermo-Gun	
Enough	18 (90)
Works fine	13 (65)
Average percentage of schools that implemented health protocol facilities	84.23

*Unless otherwise stated

Table 2
Percentage of schools with facilities and infrastructure arrangements related to the implementation of health protocols in senior high schools in Jambi Province (N = 20)

Arrangement of facilities and infrastructure	*n* (%)*
Grade conditions	
Table/bench arrangement each 1.5 meters apart	19 (95)
Setting for a maximum number of students of 18 people per class	20 (100)
Ventilation for good air circulation	20 (100)
Good lighting	20 (100)
Trash cans in every classroom	19 (95)
Handwashing with soap and running water facilities	14 (70)
Running water	15 (75)
Soap	15 (75)
information and education communication of handwashing steps	15 (75)
Average percentage of schools that arranged the facilities and infrastructure related to the implementation of health protocols	87.23

*Unless otherwise stated

Availability of data on education unit citizens

Only 30.83% of the schools have provided the school readiness factor on the availability of data on the residents of the education unit both at the time of the start of the learning school year and periodically. The highest percentage (70%) of available data is on all residents of the education unit who learn face to face, followed by data on students who learn from home (55%), data on education unit residents with sick conditions (25%), data on students who do not learn face to face (20%) for reasons unrelated to health (such as constraints on transportation/access), and data on residents of the education unit who are self-isolating (15%). As for the health data of

Table 3

Percentage of schools with facilities and infrastructure arrangements related to the implementation of health protocols in senior high schools in Jambi Province (N = 20)

Arrangement of facilities and infrastructure	*n* (%)
Toilet	
Hygiene	18 (90)
Clean water	18 (90)
Mosque	12 (100)
Clean conditions	10 (83.33)
Rolled up and opened carpet during the implementation of congregational prayers even though each worshipper brings their prayers	10 (83.33)
Has good lighting	10 (83.33)
Has good air ventilation	10 (83.33)
Label for keeping a minimum distance of 1.5 meters	4 (33.33)
Door	
Clean conditions	8 (90)
Beds, tables, and chairs	18 (90)
Handwashing with soap facilities and running water	16 (80)
Closed bins	17 (85)
Has good lighting	17 (85)
Has good air circulation ventilation	18 (90)
First aid kit	18 (90)
Health equipment according to the Ministry of Education and Culture's School Health Units (UKS) Development Guidebook; sphygmomanometers, thermometers, weight scales, and other equipment	18 (90)
Simple medicines	19 (95)
Spare masks and/or translucent masks	17 (85)

Table 4
Percentage of schools with facilities and infrastructure arrangements related to the implementation of health protocols in senior high schools in Jambi Province (N = 20)

Arrangements of facilities and infrastructure	*n* (%)
Out-of-class facilities	
Clean conditions	20 (100)
A minimum distance of 1.5 meters	16 (80)
Information and education communication table for coronavirus disease 2019 (COVID-19) prevention and strategic healthy living behaviors	15 (75)
1-way traffic arrangement in the hallways/corridors and stairs	15 (75)
Other infrastructure	
Drop-off/pick-up areas with social distancing arrangements available	18 (90)
There is an area or transit room near the entrance to the school	18 (90)
Regulations and services	
Health protocols for delivery persons, pick-ups, guests	8 (40)
Information on coronavirus disease 2019 (COVID-19) prevention behaviors	17 (85)
Regulations on access to health care facilities and referrals	15 (75)

residents of the education unit based on comorbidities, very few schools have not provided (0%). More details can be seen in the following table (Table 5).

Before and after learning

As many as 86.25% of schools have implemented school readiness in the implementation of health protocols before and after the learning process. In the process before learning, the lowest percentage that has not been implemented is disinfection of infrastructure and health monitoring

Table 5
Percentage of schools with availability of data on education unit citizens in senior high schools in Jambi Province (N = 20)

Availability of data on education unit citizens	*n (%)**
Data on all residents of the education unit who carry out face-to-face learning	14 (70)
Data on all residents of the education unit who carry out learning from home	11 (55)
Data on all residents of the education unit with sick conditions	5 (25)
Data on all residents of education units with comorbidities	0 (0)
Data that should not conduct face-to-face learning, not for health reasons (*eg*, due to transportation access)	4 (20)
Data on all residents of the education unit who are self-isolating *etc*	3 (15)
Average percentage of schools that available of data on education unit citizens -	30.83

*Unless otherwise stated

(80%), while those not implemented after completion of learning include the results of daily health monitoring of residents of the education unit to the head of the education year (80%) as well as disinfection of infrastructure facilities (85%) (Table 6).

DISCUSSION

The readiness of educational units (schools) in providing the sufficient infrastructure needed in the health protocol to prevent the transmission of COVID-19 is a basic thing that cannot be bargained, considering that schools are a high-risk factor in the spread of COVID-19 even though the incidence rate is not too high (Gras-Le Guen *et al*, 2021).

The results of Larosa *et al* (2020) show that the number of cases cannot be ignored precisely in the age group of 10-18 years or high school

Table 6

Percentage of schools related to the implementation of health protocols before and after learning in senior high schools in Jambi Province (N = 20)

Implementation of health protocols before and after learning	*n (%)**
Before learning	
Infrastructure disinfection	16 (80)
Health monitoring	16 (80)
Ensuring proper use of masks	19 (95)
Ensuring the implementation of handwashing with soap	18 (90)
After completion of learning	
Infrastructure disinfection	17 (85)
Ensuring the adequacy of disinfectant liquids, hand soap, clean water in each handwashing with soap facility, and hand sanitizer	18 (90)
Ensuring the thermo-gun is functioning properly	18 (90)
Report the results of monitoring the health of residents of the daily education unit to the Head of the Education Unit	18 (80)
Average percentage of schools that implemented health protocols before and after learning	86.25

*Unless otherwise stated

as happened in northern Italy. Prevention efforts carried out in schools by educating students to be able to take preventive actions will have a positive impact on students' families. Students can become advocates for disease prevention and control at home, and their community by talking to others about how to prevent the spread of viruses (Bender, 2020).

School readiness in the implementation of NNL in this study as measured through the availability of infrastructure related to health protocol facilities in senior high schools in Jambi Province shows that as many as 84.23% of schools have provided well, while related to layout as much as

87.23% (showing an increase from the previous year which was less than 80%). However, the availability of clean and flowing water, as well as the availability and adequacy of spare masks, hand sanitizers, social distancing labels both in classes/other rooms and in the school environment as well as health data on the residents of the education unit need attention from the school.

Referring to the Ministry of Home Affairs No. 440-830 of 2020 concerning Guidelines for the New Normal Order of Productive and Safe COVID-19 for State Civil Apparatur (ASN) within the Ministry of Home Affairs and Regional Governments who state that the readiness of an area in the implementation of NNL is that at least 80% of health protocols are available in public facilities, and community discipline is required in wearing masks when active outside the home; it can be stated that high schools in Jambi Province are already implementing NNL.

The implementation of health protocols requires the readiness of adequate and easily available infrastructure. Considering that the learning hours per day take a short time to allow contact between residents in the education unit during the implementation of face-to-face learning hours, the availability in implementing health protocols is a must. The next step is to make it easier for residents of the education unit to implement health protocols regularly through the right placement of facilities while still paying attention to aesthetic values.

In summary, the results showed that senior high school units in Jambi Province were ready to implement NNL, but improved availability of clean and flowing water, spare masks in schools, supplies of hand sanitizers, labels for social distancing in class, and health data of school residents are needed. The Jambi Provincial Government needs to encourage the efforts of education units towards adequate health protocols, more easy health protocol implementation and health data generation for the education unit.

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CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflicts of interest.

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