Santri Smoking Behavior Determinant At "X" Islamic Boarding School in Jember Regency

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ABSTRACT

Background: *Smoke is a risk factor for various infections and increased severity of respiratory tract disease. Deaths due to smoking in the world in 2019 reached 8 million people per year, while death as a consequence of cigarettes in Indonesia reached 230,000.* ***Objective:*** *The aim of this study was to know the determinant behavior of teenage student smokers at boarding school X and including predisposing factors, enabling factors, and reinforcing factors.* ***Methods: T****his study was conducted with a quantitative method with a cross-sectional approach. Population is santris in cottage boarding school X on SMP and SMA levels as many as 325 students with a total sample of 198 students who are determined with probability sampling.* ***Results:*** *Study shows as many as 59.6% respondents smoked (respondents aged 12-15 years (65.7%) with a stay of 1-3 years (86.9%). Knowledge good (53%), negative attitude (94.9%) and negative values (79.3%) means no health support (70.2%), facilities infrastructure supporter no support (54%), kiai no support (96.5%), boarding school administrator no support (88.4%) and friend no support (80.8%). Bivariate analysis Results show variables that have a connection - age (p-value=0.004), education level (p-value=0.000), attitudes (p-value=In the majority of santri smoking, were 12-16 years old with a duration of 1-3 years and for level highest education is junior high school / equivalent. Smoke behavior was influenced by variables of age, level of education, attitudes, values, and health facility. Application rule ban smoke among santris needs to be upgraded with signs warning of a smoking ban in certain places that are often frequented by santri the form of posters or board warning as well as accompaniment from public health centers.*

Keyword: *Islamic Boarding School, Smoking Behavior, Students.*

INTRODUCTION

Smoking can cause interference with health conditions. Smoking is a risk factor for various infections and able to increase the severity of the disease especially disease in the respiratory tract such as pulmonary tuberculosis, lung cancer, coronary heart disease and so on (Fransiska & Hartati, 2019).

The prevalence of smokers is widespread in all parts of the world. The ASEAN region has a population of 10% of global smokers and accounts for 20% of global deaths from tobacco use (World Health Statistics Data Visualizations On Prevalence of Tobacco Smoking Country, 2018). Indonesia as a member of ASEAN is a region with a relatively high percentage of smokers. Based on Riskesdas data in 2018, it was found that there was an increase in the prevalence of smoking in adolescents aged 10 -18 years from 7.2% in 2013 to 9.1% in 2018 (Ministry of Health RISKESDAS, 2018). The increase in the prevalence of adolescent smokers is in line with data from the *Global Youth Tobacco Survey* (GYTS) in 2020 which shows the prevalence of using tobacco products in Indonesian students 13-15 years is 40.6% (Global Youth Tobacco Survey, 2015). The number of santri who smoke currently reaches 19.2% and 60.6% of that number is found they could furnish cigarettes unless there is ban related their age (World Health Organization, 2020). The smoking prevalence of the population aged 10-18 years in East Java province increased from 23.9% in 2013 to 23.91% in 2018. The prevalence of smokers aged 10 years in Jember Regency based on riskesdas data in 2018 was 32% (Ministry of Health, Riskesdas 2018). The existing prevalence data is still worrying, especially at the age of adolescent santri which continues to increase.

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The Indonesian government took action by publishing regulation about no-smoking areas (KTR) through the Minister of Health and the Ministry of Home Affairs in 2011. The purpose of this regulation is to provide protection to the public from the impact of smoking behavior straight away for cleanliness and health public by general constant awareness. The scope of the KRT includes health service facilities, public places, places for teaching and learning processes including Islamic boarding schools in them, workplaces, places for children to play, places of worship, public transportation and other public places (Ministry of Health, 2011).

Islamic boarding school is an Islamic educational institution that provides teaching Islamic sciences to santri with methods and techniques of typical teaching. **The b**oarding school was established and led by the same kiai (caregivers), the owner of a boarding school. A kiai is assisted by a cleric/teacher in giving teaching to students (Boarding School Management and Leadership , 2011). Kiais are among the most important figures in the pesantren who become a role model and every command and word is an obligation for the santri to obey. The boarding school community is dominated by santri who are studying in the pesantren environment and mainly santris are still in the adolescent age category (Ishomuddin MAM, 2012).

Islamic boarding schools as a place for the teaching and learning process as well as places of worship are also included in the scope of KTR. As the scope of KTR, Islamic boarding schools should be free from smoking behavior; however, based on Khoirunnisa's research in Islamic boarding schools there are still many who smoke by 63.5% with 68.7% being teenagers with a variety of reasons (Khoirunnisa, 2019).

Factors such as knowledge, attitudes, beliefs, and traditions that arise from within the individual or society itself could play a role in the formation of smoking behavior. The availability of facilities that facilitate the formation of behavior also contributes to create smoking behavior. In addition, the encouragement that is manifested in the attitudes and behavior of health workers or other people who are a reference group from the community will also shape behavior. These factors are concluded into three factors, namely, *Predisposing factors* including knowledge, attitudes, beliefs, values and so on, *Enabling factors* including the presence or absence of health facilities or facilities and *Reinforcing factors* which include attitudes and behavior of officers health or other forms of support and support from the applicable laws and regulations (Notoatmodjo, 2012).

"X" Islamic boarding school is one of the Islamic boarding schools in Jember district. Islamic boarding schools belong to the category of semi-modern Islamic boarding schools which teach the yellow book and general education. This Islamic boarding school has regulations in the form of a smoking ban for santri with the status of junior high school santri and high school students; breaking this rule is a serious violation. The sanctions given for serious violations range from the lightest as being shaved, put on display and paying *Kafarot* to be returned to his parents as the heaviest form of sanction. In addition to the prohibition against santri, administrators or teachers who teach in Islamic boarding schools are also prohibited from smoking in public or in front of santri directly. Based on the data in the case book of the boarding school of santri smoking between August and September 2021, from these data, it shows that there are still many santri who smoke even though there are written regulations regarding the prohibition of smoking in Islamic boarding schools. Therefore, based on the urgency of some of the problems that have been explained, researchers need and want to conduct a study to determine the determinants of students' smoking behavior in "X" Islamic boarding school.

METHODS

This study used quantitative methods with a cross-sectional research design approach. The population in this research is male santri of junior high and high school in "X" Islamic boarding school with a total population of 325. Determination of the sample used *Probability Sampling* with a sample of 198 santri and *proportional stratified random sampling technique* was used in study this with the results of a sample of 64 male high school santri and 134 junior high school students.

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The variables in this study were divided into two, the first independent variables included predisposing *factors* (age, length of stay, education level, knowledge, attitudes and values), *enabling factors* (health facilities and supporting infrastructure), and *reinforcing factors* (kiai support), the support of pesantren administrators, and the support of friends. The two dependent variables were the smoking behavior of adolescent santri in Islamic boarding school X.

The data collection was done by distributing questionnaires that had previously been tested for validity and reliability. The questionnaire was tested on 30 male santri at the Nurul Ulum Situbondo boarding school. Data analysis was performed using univariate and bivariate analysis with *Chi Square* test to determine the relationship between the independent and dependent variables.

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RESULTS

Table 1. Results of Univariate and Bivariate Analysis

Variable	f	%	Smoking Behavior				*p-value*	OR (95% Confidence Interval)
			Yes		Not			
			n	%	n	%		
Age								
12-15 Years	130	65.7	68	34.3	62	31.3	0.004	0.3 (0.20-0.74)
16-20 Years	68	34.3	50	25.3	18	9.1		
Long stay								
1-3 Years	172	86.9	99	50.0	73	36.9	0.198	0.5 (0.20-1.25)
4-6 Years	26	13.1	19	9.6	7	3.5		
Level of education								
Junior High School/Equivalent	134	67.7	68	34.3	66	33.3	0.000	0.3 (0.15-0.57)
High School/Equivalent	64	32.3	50	25.3	14	7.1		
Knowledge								
Well	105	53	56	51.4	49	45.0	0.127	0.9(0.11-6.44)
Currently	89	44.9	60	64.5	29	31.2		0.5(0.06-3.60)
Not enough	4	2	2	2.2	2	2.2		1
Attitude								
Positive	10	5.1	10	5.1	-	-	0.006	-
Negative	188	94.9	108	54.5	80	40.4		
Values								
Positive	41	20.7	32	16.2	9	4.5	0.012	2.9 (1.31-6.55)
Negative	157	79.3	86	43.4	71	35.9		
Health facility								
Support	59	29.8	43	21.7	16	40.4	0.020	0.4 (0.22-0.84)
Does not support	139	70.2	75	37.9	64	32.3		
Supporting Infrastructure								
Support	91	46.0	59	29.8	32	16.2	0.215	0.6 (037-1.18)
Does not support	107	54.0	59	29.8	48	24.2		
Kiai Support								
Support	7	3.5	26	13.1	12	6.1	0.443	0.6 (0.29-1.32)
Does not support	191	96.5	92	46.5	68	34.3		
Islamic Boarding School Support								
Support	23	11.6	18	9.1	5	2.5	0.086	0.3 (0.13-1.04)
Does not support	175	88.4	92	46.5	68	34.3		
Friend Support								
Support	38	19.2	3	1.5	4	2.0	0.294	2.0 (0.43-9.26)
Does not support	160	80.8	115	58.1	76	38.4		

Determinants of Student Smoking Behavior Univariately

"X" Islamic boarding school was a semi-modern Islamic boarding school which mainly taught Islamic religious knowledge. Students' activities were not only focused on teaching and learning activities in schools, both in the form of religious knowledge and general knowledge. Santri were also busy with ubudiah activities in the form of congregational prayers, qiamullain and other routine practices. In Islamic boarding school X, there was a smoking ban for santri with the same level of education in junior high and high school, but there was no prohibition smoking for santri who were students.

The predisposing factor in this study based on univariate analysis showed that most of the santri who were the respondents admitted that they had smoked (59.6%). Respondents in this study were aged 12-15 years (65.7%) with a length of stay of 1-3 years (86.9%) and the majority of junior high school education was equivalent (67.7%). The knowledge of santri regarding the dangers of smoking behavior was in the good category (53%) with negative attitudes toward smoking behavior (94.9%) and negative values toward smoking behavior (79.3%).

The supporting factor (enabling factor) in this study based on univariate analysis showed that most of the santri stated that health facilities did not support

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the application of smoking ban regulations in Islamic boarding schools (70.2%). The supporting infrastructure was in the form of shops or stalls that sold or allowed santri buy cigarettes. The majority of santri stated that the infrastructure did not support smoking behavior (54.0%).

The results of the univariate analysis of the reinforcing factor in this study showed that there was no support for smoking behavior from kiai (96.5%), there was no support from pesantren administrators (88.4%) and from friends there was also no support for the creation of student smoking behavior (80.8%).

Predisposing Factors Relationship, Supporting Factors, and Encouragement Factors with Students Smoking Behavior

The regulation on the prohibition of smoking in Islamic boarding school X did not rule out the possibility of smoking behavior in the pesantren environment. The results of the analysis of the relationship between predisposing factors and smoking behavior showed that 68 (34.3%) OF santri with smoking behavior were age 12-15 years and the Chi-Square test results obtained a p-value of 0.004 <0.05 which stated that there was a relationship between age with smoking behavior of students. Santri with a stay of 1-3 years were more likely to smoke (50%) with p-value = 0.198 > 0.05 which meant that there was not a relationship between length of stay and smoking behavior of students. The level of education in junior high school and equivalent was more dominant in smoking behavior by 68 people (34.3%) and from Chi-Square test it showed that there was a relationship between the level of education and smoking behavior of students, p-value 0.000 <0.05.

While the knowledge variable showed that santri had good knowledge about the dangers of smoking but still smoked as many as 56 santri (51.4%) with a p-value of 0.127 > 0.05 which means that there was no relationship between the knowledge of santri about the danger of smoking with smoking behavior of students. As for the attitude variable with the smoking behavior of students, the results of the Chi-Square test state that there was a relationship between the two and the results of p-value = 0.006 and the p-value of the variable values with the smoking behavior of santri was 0.012 which meant that there was a relationship between the variable values and the incidence of smoking behavior of santri and the OR value of 2.9.

For the relationship between supporting factors (enabling factors) consisting of health facilities and supporting infrastructure with smoking behavior of students. the results of the bivariate analysis showed that health facilities and smoking behavior of santri were related as indicated by the results of the Chi-Square test with a p-value = 0.020 and an OR value of 0.4. As for supporting infrastructure, there was no relationship with smoking behavior of santri because of the p-value > 0.05.

For the relationship of the reinforcing factor with the smoking behavior of the students, the results of the bivariate analysis showed that kiai's support had no relationship with the smoking behavior of the santri with a p-value of 0.443 > 0.05. The support of Islamic boarding school administrators with the smoking behavior of santri had a p-value of 0.086 > 0.05, which meant there was no relationship and the same was true for the variable of friend support with smoking behavior. The Chi-Square test results state that there was no relationship because the p-value was 0.294 > 0.05.

DISCUSSION

Determinants of Student Smoking Behavior

The regulation for prohibiting smoking for junior high school and high school santri in Islamic boarding school X was still not optimal because there were still violations committed by students. Based on the case book of the boarding school security council X, it showed that 40% of students' smoking violation data occurred from August to September.

The results of this study showed that as many as 59.6% of santri admitted that they had smoked and 40.4% stated that they had never smoked. The resulting data illustrated that there were still many teenage santri who did smoking behavior up to more than half of the existing respondents. This result was in line with the results of research conducted by Khoirunnisa which stated that 63.5% of respondents admitted that they had smoked and 36.5% said they had never smoked (Khoirunnisa, 2019).

From the predisposing factors, the research results showed that the 12-15year age range was 65.7% and in the 16-25 age

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range was 34.3% which showed that most of the respondents were in the early teen category. Results obtained had congruence with previous research by Khoirunnisa where 68.7% of santri were in the category of vulnerable early adolescents aged 12-16 years.[13]The length of stay was 86.9% 1-3 years and for the other 32.3% the length of stay had reached 4-6 years. This percentage was in line with the percentage of santri' education level which was more dominant at the junior high level equivalent (67.7%) compared to the equivalent high school level (32.3%) because most santri had just started boarding when they would start junior high school education.

Most of the santri had good knowledge about the dangers of smoking by 53% and most of the santri who smoked had moderate knowledge of 64.5%. The results of this study differed from the results of Handayani's research which stated that most of the santri who smoke, were at a level of less knowledge of 42.9% (Handayani, 2019). However, this was in line with Alamsyah's research which stated that most of those who had smoked high knowledge of cigarettes by 50.6% (Alamsyah, 2017).

The attitude of santri toward smoking behavior was 5.1% positive and the negative toward smoking behavior of adolescent santri was 94.9%. This was different from the results of Khoirunnisa's research which stated that most santri had a permissive attitude toward smoking behavior of 85.7% (Khoirunnisa, 2019). However, this was in line with Alamsyah's research which stated that 86.6% of santri who smoked had negative attitude on cigarettes (Alamsyah, 2017).

From the results of the study, it could be seen that adolescent santri who had positive values for smoking behavior are 20.7% and negative values for smoking behavior were 79.3%. Adolescent santri with positive values on smoking and smoking behavior were 16.2%, while those with negative values for smoking behavior ware 43%. The data illustrate that most had a negative point of view on smoking behavior, but even so, there were still many who did smoking behavior even though they had negative values toward smoking behavior. This was different from the results of Syaifullah's research where santri of the Al-Ihsan Islamic Boarding School had the opinion that smoking the rest of the kiai's cigarettes could get a blessing (Alamsyah, 2017).

From the enabling factors, it could be seen that those stating that health facilities support the smoking ban regulation were 29.8% and those who stated that health facilities did not support smoking behavior were 70.2 %. Most of the santri who smoked were found in health facilities that did not support, 37.9%, compared to health facilities that supported, 21.7%. This was in line with the results of direct observations of researchers at Islamic boarding school X that there was no smoke-free area and no installations are seen warning of the dangers of smoking and the prohibition of smoking for santri in the form of posters or warning boards in the environment hut.

The results showed that 46% of adolescent santri stated that supporting infrastructure suggestions supported the smoking behavior of adolescent santri and 54% stated that the infrastructure did not. It means santri stated that in the boarding school environment no there was roadside stall or shop enabling santri to buy cigarettes. Between supporting and non-supporting facilities, it was found that there were santri who smoked with the same amount of 29.8%. This was different from the results of Khoirunnisa's research which showed respondents who smoked more were found in santri who had easy access to cigarettes by 79.2% (Khoirunnisa, 2019).

From the enforcing factor in the form of kiai's support, the results showed that the kiai's encouragement to support smoking behavior was 3.5 % and the kiai's encouragement to not support the smoking behavior was 96.5%. The data illustrate that kiai were more inclined to not support the smoking behavior of adolescent students. This meant supporting the prohibition of smoking by not smoking in front of students, giving punishment to those who violated and not asking santri for help to buy cigarettes. However, most of the santri who smoked were found to have no support from the kiai by 46.5%. This was different from the results of Khoirunnisa's study which stated that santri who smoked were more common in respondents who received support from the kiai by 78% (Khoirunnisa, 2019).

The results showed that the encouragement of boarding school administrators to support smoking

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behavior was 11.6% and the encouragement of Islamic boarding school administrators not to support smoking behavior of adolescent santri was 88.4%. The data illustrated that pesantren administrators were more inclined to not support the smoking behavior of santri by giving sanctions to those who smoked and the administrators themselves did not smoke in places that could be seen by students. Meanwhile, for the support of friends, the results of the study showed that the encouragement of friends to support smoking behavior was 19.2% and the support of friends who did not support the smoking behavior of adolescent santri was 80.8%. The data illustrated that friends were more inclined to not support the smoking behavior of students. This result was not in line with the results of research conducted by Utari where peers support smoking behavior as much as 102 or 100%.[18]

Predisposing Factors Relationship, Supporting Factors, and Encouragement Factos with Student Smoking Behavior

Connection predisposing factor with behavior smoke students in the form of age was one of the characteristics that existed in the respondents in this study. The results of the study could stated that age had a relationship with the formation of smoking behavior of adolescent santri indicated by the p-value of 0.004 <0.05, which meant that there was a relationship between the two variables. The results of this study were not in line with research conducted by Khoirunnisa whose results also showed that there was no relationship between age and practice. or smoking behavior of santri with a p-value of 0.977 > 0.05 (Khoirunnisa, 2019). The study results matched those of Wijayanti who explained no there was the connection between age with behavior morocco with a p-value 0.005.[21]If viewed from Lawrence Green's theory of behavior predisposing factors that could affect a person's behavior, while in this study it had an influence on the emergence of students' smoking behavior.

The chi-square test on the variable length of stay with the smoking behavior of santri showed a p-value of 0.198 > 0.05, meaning that there was no relationship between the length of stay and smoking behavior of students. These results indicated that the period of time santri are in Islamic boarding schools is not a factor for them to have smoking behavior because it was possible that santri who smoked had been exposed to smoking behavior since before entering the Islamic boarding school.

The level of education in this study was related to significant effect on the smoking behavior of adolescent santri as evidenced by the p-value 0.000 < 0.05. This was in line with Zahrani's research which showed that there was a relationship between the level of education and smoking behavior of santri with a p-value of 0.000 <0.05 (Utari, 2020). The value of OR = 0.3 or OR < 1 means that the level of education in junior high school and equivalent was a protective factor against the smoking behavior of students. This is in contrast to the results of Zahrani's research, which showed that adolescents with a junior high school education level or below have a tendency of 1,318 times to smoke per day compared to adolescents with a high school education level or the equivalent and above (Zahrani, 2019).

The knowledge variable showed no there was connection with santri's smoking behavior, p-value of 0.127 > 0.05. In line with this research, research conducted by Khoirunnisa also showed that there was no significant relationship between knowledge and smoking behavior of adolescent santri with a p-value of 0.429 > 0.05. Results were similar to the results of research at the Al-Jihad boarding school in Surabaya by Handayani, which stated that there was no relationship between knowledge and smoking behavior of santri with p-value = 0.885 > 0.05 (Handayani, 2019).

The attitude of santri toward smoking behavior had a relationship with the formation of smoking behavior of santri based on the p-value of 0.006 <0.05. In line with the results in this study, the same research previously conducted by Khoirunnisa also suggested a relationship between attitudes and smoking behavior of adolescent santri with a p-value of 0.000 <0.05 (Khoirunnisa, 2019). Research results were similar to Prautami's which suggests that there was a relationship between student attitudes with the emergence of smoking behavior of santri with p-value =0.000 < 0.05 (Prautami, 2018).

The values in this study were the values or assumptions that santri had on smoking behavior. The variable value had a significant relationship with the

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emergence of smoking behavior of adolescent santri with p-value = 0.012 < 0.05. Based on the OR value of 2.9 or OR> 1, it meant that positive values for cigarettes were a risk factor for adolescent students' smoking behavior. Positive values on smoking behavior had a 2.9 times greater chance than negative values on smoking behavior. These results were in line with Green's behavioral theory which states that values were a predisposing factor that could influence the formation of a person's behavior.

The connection is an enabling factor with students' smoking behavior. In this study, it could be seen that the variable health facilities associated with smoking behavior of santri had a p-value of 0.020 <0.05. Based on the OR value was 0.4 or OR < 1, it meant that health facilities were a protective factor against the smoking behavior of adolescent students. Health facilities that did not support smoking behavior have 0.4 times greater protection than health facilities that support smoking behavior. The absence of health facilities in the form of smoke-free areas and posters warning of the dangers and prohibitions of smoking in the X Islamic boarding school environment affects the formation of smoking behavior of adolescent students.

The supporting infrastructure in this study was based on the p-value 0.215 > 0.05, indicating that there was no relationship between the supporting infrastructure and the smoking behavior of students. The presence or absence of infrastructure in the form of stalls or shops selling cigarettes in the pesantren environment did not affect the santri not to smoke. In a previous study by Khoirunnisa put forward different results, and explained the ease of access had a significant relationship with the smoking behavior of santri with a p-value generated.000 < 0.05 (Khoirunnisa, 2019).

The reinforcing factor relationship with student smoking behavior was the kiai support variable which showed santri who smoked were more dominant found in santri who did not receive kiai's support for smoking behavior as much as 46.5% compared to santri who received support from kiai on smoking behavior. The results of the Chi-Square test show no there was connection between the kiai endorsement variable with student smoking behavior with obtained p-value = 0.443 > 0.05. Khoirunnisa stated that there was linkages or a relationship between kiai support and students' smoking behavior with p-value = 0.002 < 0.05 (Khoirunnisa, 2019). It means results obtained in this study differ from results in research conducted previously by Khairunnisa.

For the support of pesantren administrators, the results of the Chi-Square test show a p-value of 0.086 > 0.05, which meant that there was no significant relationship between the support of the administrators and the smoking behavior of adolescent students. This study had inconsistent results with study previously done by Utari who obtained results of p-value 0.016 which stated that teacher support was related to student smoking behavior with a p-value of 0.016 <0.05 (Utari, 2020). Meanwhile, the support of friends also showed that there was no relationship with the smoking behavior of santri with p-value 0.294 > 0.05. The results of this study were not in line with the results of Utari's research which explained that there was a relationship between peer support and the smoking behavior of santri with a p-value of 0.000<0.05 (Utari, 2020).

CONCLUSION

The majority of santri are aged 12-15 years with a length of stay of 1-3 years and the most education level is junior high school/equivalent. Knowledge of adolescent santri related to cigarettes is classified as good with negative attitudes and values toward smoking behavior. In the supporting factors (enabling factors) such as health advice and supporting infrastructure are categorized as not supporting the smoking behavior of adolescent students. As for the reinforcing factor in the form of encouragement from kiai, pesantren administrators and friends do not support the smoking behavior of adolescent students.

Teenage santri mostly admitted to smoking behavior by 59.6%. There is a relationship between predisposing factors and smoking behavior of adolescent santri of Islamic boarding school X, especially on the variables of age, education level, attitudes and values. Variables of age, education level, and attitude are protective factors against the smoking behavior of adolescent students., while the variable values, especially positive

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values on cigarettes, are a risk factor for the smoking behavior of adolescent students.

There is a relationship between the supporting factors (enabling factors) and smoking behavior of santri of "X" Islamic boarding school, especially on the health facility variable. Health facilities do not support being a protective factor against the smoking behavior of adolescent students, while the supporting infrastructure variables did not have a significant relationship with the smoking behavior of students.

There is no significant relationship between the reinforcing factor and the smoking behavior of adolescent santri at Islamic boarding school X, both on the support variable from kiai, boarding school administrators and friends.

Islamic boarding schools further improve the application of smoking ban rules to santri by providing warning signs for smoking bans and the dangers of smoking in certain places, collaborating with related health centers to increase the boarding school area free from smoking behavior and provide counseling to every student who violates the smoking ban. kiai, boarding school administrators and student santri do not smoke in public places that can be seen by students. The related health centers provide socialization and assistance related to the dangers of smoking behavior to santri and pesantren administrators and facilitate health promotion facilities. For further researchers, it is expected to use qualitative research methods to find out more deeply the reasons or risk factors that allow for the emergence of smoking behavior in students.

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The Effectiveness of Peer Group WhatsApp on Adolescent Knowledge and Attitudes about Risky Sexual Behavior

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ABSTRACT

***Background**: Nowadays problems of teenagers are very complex and worrying, both those that arise from within themselves and from outside themselves. Various internal and external factors that affect adolescents will also have an impact on adolescents to have negative and unhealthy attitudes and behaviors (high risk behaviors). Efforts to increase knowledge and attitudes in adolescents can be used in preventing risky sexual behavior through WhatsApp peer groups. **Objective**: This study analyzes the effectiveness of the WhatsApp peer group on the knowledge and attitudes of adolescents about risky sexual behavior in Isen Mulang Senior High School, Palangka Raya City. **Methods**: This study is a quasi-experimental study with two groups, pretest-posttest with control group design which was carried out from July to September 2020. The population in this study were all adolescents who were in the age range of 15-21 years in Isen mulang Senior High School at SMA Isen Mulang, Palangka Raya city numbered 169 people with the sampling technique in this study using consecutive sampling with a sample of 31 respondents in the intervention group and 31 respondents in the control group. **Results**: There is a significant difference in the average value of knowledge (P-value = 0.000) and attitude score (P-value = 0.000) before and after the intervention in each group, there is a significant difference in increasing knowledge (P-value = 0.045) and attitude (P-value = 0.048) between the intervention group and the control group. The average increase in knowledge scores and attitude scores of the intervention group was higher than the control group. **Conclusion**: WhatsApp peer groups are considered effective in increasing adolescent knowledge and attitudes about risky sexual behavior. WhatsApp peer groups can be used as dynamic communication media and become one of the alternative choices in providing health education to adolescents other than face-to-face.*
***Keyword**: Attitude, Knowledge, Peer group WhatsApp.*

INTRODUCTION

Adolescence is described as an immature period which is a period of individuals undergoing major physical changes and psychological changes in addition to changes in social expectations and perceptions accompanied by physical growth and development and sexual maturation that leads to intimate relationships (WHO, 2018).

Data on the situation of adolescent reproductive health (KRR) showed that the largest proportion of dating at the age of 15-17 years was around 33.3% of female adolescents and 34.5% of male adolescents aged 15-17 years starting dating when they were not yet 15 years old. It is feared that at that age they do not have adequate life skills so they are at risk of having unhealthy dating behavior, one of which is having premarital sex which is at risk of teenage pregnancy and transmission of sexually transmitted diseases (Kemenkes RI, 2015).

Dating can lead to premarital sexual behavior, violence, unwanted pregnancies and sexually transmitted infections. The results of the Indonesian Demographic Health Survey (IDHS) in 2017 stated that, in general, 80% of teenage girls had been in a relationship and 45% of them started dating for the first time at the age of 15-17 years. Then in teenage boys. 84% have been in a relationship and 44% of them started dating for the first time at the age of 15-17 years (Kemenkes RI, 2018).

In general, more boys stated that they had had premarital sex than girls. The results of the survey found that the reason for premarital sexual intercourse in male adolescents was mostly because of curiosity (y 57.5%) then in female adolescents it just happened (38%) and was forced by a partner (12.6%) so this reflects the lack of understanding of adolescents about reproductive health-

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related healthy life skills, risk of sexual intercourse and the ability to resist unwanted relationships (Kemenkes RI, 2015).

Age at first sexual intercourse is closely related to reproductive health status, IDHS reports that adolescents aged 17 years are the highest age for both men and women to have sexual intercourse for the first time. In 2012, 59% of adolescents at the age of first having sex were 18-19 years, 59% and in the 2017 IDHS, 74% of the age at first having sex was 17-18 years. Unwanted pregnancy is closely related to teenage pregnancy. Unwanted pregnancies were twice as common in women age group 15-19 years (16%) as compared to age group 20-24 years (8%). Pregnancy in adolescents aged 10-19 years is at risk for complications of pregnancy and childbirth (Kemenkes RI, 2018).

The problems of teenagers that exist today are very complex and worrying. Sharing internal and external factors that affect adolescents has a negative impact on attitudes and behaviors that are not physically, mentally, and socially healthy (high risk behaviors). The number of adolescents who have sufficient knowledge and skills related to their sexual life is still limited, so there are still many teenagers who are at risk for problems of sexual exploitation, unwanted pregnancy, sexually transmitted infections (STIs) including HIV, as well as stigma and discrimination related to HIV and AIDS. . This is because information related to sexual and reproductive health is still a taboo subject, whereas in fact at that age there are still many teenagers who really need correct and comprehensive information about reproductive and sexual health (BKKBN, 2013).

Peer groups are teenagers whose age or level of maturity is more or less the same. While the peer group is a group of people with the same status and are usually in the same age group. Adolescents want to be liked and accepted by a larger peer group which can produce pleasurable feelings when accepted or stressed and experience extreme anxiety when ostracized and belittled by peers. For many teenagers, acceptance in their peer group is the most important aspect of their lives. Therefore, peers are very important during adolescence (Selvam, 2018).

Adolescents are susceptible to peer group influences, but these influences vary and adolescents find more identity within the peer group than in the family environment. Peer groups provide influence and control to follow the norms and interests of the group and the amount of influence depends on the nature of the group and the nature of the teenager (Dumas, 2011).

Learning media can be an alternative to increase adolescent knowledge and attitudes about risky sexual behavior, one of which is the WhatsApp peer group. WhatsApp peer group is one of the learning media in the form of providing health education about risky sexual behavior in peer groups which is given through WhatsApp group. This method is expected to increase the knowledge and attitudes of adolescents to avoid risky sexual behavior. WhatsApp is a cross-platform messaging application exchanging messages at no cost because WhatsApp is an internet data package that uses a GPRS/EDGE/3G or Wi-Fi connection for communication (Prajana, 2017).

WhatsApp groups have pedagogical, social, and technological benefits and this application provides support in the implementation of online learning (Susilawati and Supriyatno, 2020). The learning process which integrates learning activities through WhatsApp is more effective than the learning process in the classroom, so that learning activities through WhatsApp are an effective tool (Barhoumi, 2020).

Implementation of WhatsApp as a useful alternative to help teenagers in learning (Kheryadi, 2017). The results of the study concluded that learning by WhatsApp is a feasible and effective method. WhatsApp learning feedback shows a positive attitude in the form of better participation compared to conventional methods (Maske et al., 2018).

WhatsApp allows teens to be actively involved in online discussions and creates confidence and helps teens interact in their peer groups to discuss interesting topics and peer group discussions through WhatsApp helps teens build self-confidence and motivation to learn (Kheryadi, 2017). Based on this

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background, the purpose of this study was to analyze the effectiveness of the WhatsApp peer group on the knowledge and attitudes of adolescents about risky sexual behavior at Isen Mulang High School, Palangka Raya City.

METHODS

This research is a quantitative research with a quasi-experimental research design with a pretest-posttest design with control group design. The population in this study were all adolescents who were in the age range of 15-21 years at Isen Mulang High School, Palangka Raya City, amounting to 169 people. The sample in this study were teenagers who were in the age range of 15-21 years at SMA Isen Mulang, Palangka Raya City who met the inclusion criteria consisting of 31 respondents in the intervention group and 31 respondents in the control group based on the results of the statistical calculation of the study sample size.

The inclusion criteria in this study were teenagers who had an android smartphone that had a WhatsApp application in the intervention group and an android smartphone that could access the Zoom meeting application in the control group, were willing to be respondents and participated in the whole process of research activities. The sampling technique in this study used non-probability sampling with consecutive sampling technique.

In the intervention group, respondents were given health education about risky sexual behavior through the WhatsApp peer group which was held for six meetings then the control group was given health education about risky sexual behavior face-to-face online through the Zoom meeting application in one face-to-face online meeting.

The instrument used in this study was a questionnaire to measure the knowledge and attitudes of adolescents about risky sexual behavior which was filled out online by respondents, which could be accessed via Google Form according to the predetermined time before and after the intervention.

The questionnaire used to measure the knowledge and attitude variables refers to the previous research questionnaire by Muflih and Syafitri (2018) which has been modified. The questionnaire used to measure knowledge consists of 20 questions using a Guttmann scale with a Cronbach's alpha value of 0.889. Then the attitude questionnaire consists of 15 statements using a Likert scale with a Cronbach's alpha value of 0.829.

Data analysis was done by univariate analysis and bivariate analysis. In the paired group test, the knowledge variable was analyzed using the paired t-test, while in the control group it was using the Wilcoxon test. In the attitude variable in the paired test group, the intervention group used the paired t-test and the control group used the Wilcoxon test. Then in the unpaired group, test on the knowledge variable used the Mann Whitney test and the attitude variable used the independent t-test test which had previously been tested for the homogeneity of the respondents.

This research has obtained a research ethics permit from the Research Ethics Commission of the Health Poltekkes Ministry of Health Palangka Raya number 010/III/KE.PE/2020.

RESULTS AND DISCUSSION

The results of descriptive statistics on knowledge and attitudes of respondents about risky sexual behavior in the intervention group and control group can be seen in Table 1 below:

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Table 1. Descriptive Statistics of Respondents' Knowledge and Attitudes about Risky Sexual Behavior in the Intervention Group and Control Group.

Variable	Group	n	Mean	Median	Min-Max	SD
Knowledge	**Intervention**					
	Pretest	31	65.00	70	25-95	18.841
	Posttest	31	81.77	80	50-100	12.619
	Control					
	Pretest	31	75.32	80	30-95	16.276
	Posttest	31	81.77	80	65-95	9.354
Attitude	**Intervention**					
	Pretest	31	44.94	45	36-57	5.428
	Posttest	31	48.33	48	40-56	4.571
	Control					
	Pretest	31	49.26	51	34-56	4.878
	Posttest	31	50.71	50	39-57	4.444

In Table 1 it can be concluded that there is an increase in the average value of knowledge and attitude scores before and after the intervention in the intervention group and control group.

Factors that contribute to the increase in knowledge are the frequency of application of the knowledge learned, understanding of each person's knowledge, challenges in solving difficult problems, the presence of handouts although they cannot help cognitively develop the lessons that have been learned and cooperation between team members so as to encourage adolescents to communicate with each other during the problem solving process (Noordin et al., 2019).

Increased cognitive abilities are also obtained through previous experiences which play an important role in thinking, including decisions about sex, dating, sexual relationships and sexual reactions (Suwarni and Bustan, 2018).

Attitude is an assessment that can be in the form of a person's opinion on a stimulus or object and then assessing or acting on that stimulus or object. Therefore, indicators for health attitudes are also in line with knowledge about health (Mrl et al., 2019).

Behavior is formed from the interaction between knowledge and attitudes. The interaction between knowledge and attitudes can shape behavior. Then the attitude can motivate a person to gain more knowledge so that it can direct the individual to choose coping strategies as a type of behavior in dealing with health problems (Farid, Barandouzi and Valipour, 2019).

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Table 2. Differences in Knowledge Scores and Attitude Scores on Risky Sexual Behavior Before and After Intervention in the Intervention Group and Control Group

Variable	n	Group	
		Intervention	Control
Knowledge			
Pretest Mean±SD	31	65.00±18.841	75.32±16.276
Posttest Mean±SD	31	81.77±12.619	81.77±9.358
P-value		0.000*	0.036**
Attitude			
Pretest Mean±SD	31	44.49±5.428	49.26±4.878
Posttest Mean±SD	31	48.33±4.571	50.71±4.444
P-value		0.000*	0.041**

In Table 2 it can be concluded that there is a difference in the average value of knowledge and attitude scores about risky sexual behavior in each group.

The influence and contribution of peers is very strong during the adolescent period. The interaction of peers with relatively the same age has a unique role and the most important function as a source of information about things outside the family. Peer groups play an important role in adolescent change and largely influence adolescent attitudes and learning (Selvam, 2018).

WhatsApp is an online media that is considered the easiest, popular, and effective among other online media (Kheryadi, 2017). WhatsApp as a medium for communicating information delivered is more effective because it uses information technology where messages are received by the target more quickly (Trisnani, 2017).

WhatsApp group peer group has pedagogical, social and technological benefits. The WhatsApp application provides support in the implementation of online learning. WhatsApp is able to change attitudes so that it can increase student participation, accelerate the occurrence of study groups, build and develop knowledge in groups (Jumiatmoko, 2016).

The results showed that WhatsApp can be used as an effective educational media. In particular, the intervention of sending picture messages has a higher significance than the intervention through sending text messages, so it can be concluded that health promotion and education programs through WhatsApp are effective in increasing knowledge (Ekadinata and Widyandana, 2017).

In this study, the control group was given health education about risky sexual behavior through face-to-face meetings conducted online using the Zoom meeting application. One of the lessons that can be implemented in adolescents is video conferencing.

Learning with video conferencing replaces learning that is carried out face-to-face directly into face-to-face activities virtually through applications that are connected to the internet network. The use of video conferencing can help so that face-to-face interactions can still be carried out. Learning that ideally has interaction even though it is not close together, with video conferencing will help the learning process because educators will be directly involved with students (Sandiwarno, 2016).

The results of the study concluded that online learning using the Zoom meeting application was effective. There was a very good response to online learning because it is more flexible when using it, is more independent, and encourages teenagers to be more active in learning. Then the features in the Zoom make learning more interesting (Monica and Fitriawati, 2020).

The results of the study concluded that most of the respondents expressed positive opinions on the use of WhatsApp in collaboration with other online applications. The use of WhatsApp groups and Zoom meetings can improve the teaching and learning process and the rules for using the application must be set to minimize the weaknesses of the application (Fadda et al., 2020).

The results of other studies show that the effectiveness of using the Zoom meeting application is considered to be less effective due to the obstacles faced in the learning process, spending a lot of credit or internet data quota, family economic conditions and network speed in each area. One of the efforts to overcome the weakness of using the Zoom

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application is to have a plan B by utilizing the WhatsApp group (Setiani, 2020).

Table 3. Differences in Knowledge Values and Attitude Scores in the Intervention Group and the Control Group

Variable	n	Mean±SD	P-value
Knowledge			
Difference in Knowledge Value of the Intervention Group	31	36.06±21.439	0.045**
Difference in Knowledge Value of Control Group	31	26.94±14.445	
Attitude			
Intervention Group Attitude Score Difference	31	3.39±3.818	0.048*
Difference in Attitude Score of Control Group	31	1.45±3.713	

In Table 3 it can be concluded that there is a significant difference in the increase in the value of knowledge and attitude scores between the intervention group and the control group. Then the increase in the value of knowledge and increase in the score of attitudes in the intervention group was higher than the control group.

Based on the results of this study, it can be concluded that health education about risky sexual behavior through WhatsApp peer groups is effective in increasing adolescent knowledge and attitudes. The formation of one's actions requires knowledge as an impetus in growing attitudes and behavior. Knowledge is the basis for determining attitudes so that if knowledge is low, it will affect attitudes and behavior, and vice versa (Notoatmodjo, 2013).

The WhatsApp group feature is one of the high breakthroughs in supporting the learning process in accessing online information sources directly. The combination of videos, images, text, sound along with the availability of facilitators and learning anytime and anywhere makes WhatsApp a new and convenient tool for teaching and learning activities although there is no significant difference between increasing knowledge gained from WhatsApp or face-to-face lectures, but the advantages of WhatsApp overcome the drawbacks (Gon and Rawekar, 2017).

WhatsApp can be used as communication in closed groups specifically for members involved in WhatsApp groups and facilitate interactive multimedia communication through the exchange of messages via text, images, audio and video using smartphones (Rosenberg and Asterhan, 2018).

WhatsApp is effective in increasing the success of the teaching and learning process because WhatsApp groups are a forum for asking questions, link sharing platforms, discussions and collaborative workspaces (Fadda et al., 2020). Collaborative learning activities through WhatsApp groups are effective in the context of education, cognitive benefits, motivation, and attitudes. Aspects of collaborative learning include several aspects. These aspects are the productive involvement of adolescents in peer interaction, the presence of group dialogue features that lead to high-quality learning and the relationship between online group work, and the social and emotional aspects of peer interaction. These aspects make WhatsApp a good tool for online learning and more desirable than face-to-face learning (Barhoumi, 2020).

Learning using WhatsApp groups can produce positive benefits, especially developing students' writing skills, besides using WhatsApp groups can build interaction between students because they can share knowledge and information (Handayani and Aminatun, 2020).

WhatsApp can be used as a discussion forum that can increase learning, motivation, reduce anxiety and a sense of belonging so that WhatsApp can be used as a tool that can optimize learning and increase learning motivation (Awada, 2016).

Learning using WhatsApp learning groups is a feasible, effective, and friendly method. WhatsApp learning feedback shows a positive attitude in the form of enjoying the learning process using WhatsApp with better participation compared to conventional learning methods (Maske et al., 2018).

The results of a study concluded that WhatsApp is an effective medium to increase knowledge and practice of breast self-examination BSE. The use of WhatsApp groups can be a viable alternative for health education purposes on breast cancer control strategies (Saraswati, 2019).

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The results of other studies concluded that the health education media that was considered effective in improving breastfeeding behavior in the first week of birth was the WhatsApp group (Sukriani and Arisani, 2020). The use of WhatsApp Messenger is effective as a mobile learning group method to be applied in the learning process in improving learning outcomes compared to the usual face-to-face learning method (Pratama and Kartikawati, 2017).

Various advantages make WhatsApp the most potential chat medium in various academic information and communication and it is possible to form a community based on this WhatsApp application (Zakirman and Rahayu, 2018).

The use of WhatsApp groups in women as the goal of health education can be a very feasible alternative in breast cancer control strategies. This is because the WhatsApp group provides a space to discuss and exchange experiences (Pereira et al., 2020).

CONCLUSION

There is a significant difference in the increase in knowledge and attitudes between the intervention group and the control group. The average increase in knowledge and attitudes in the intervention group was higher than the control group, so it can be concluded that the WhatsApp peer group is considered effective in increasing adolescent knowledge and attitudes about risky sexual behavior.

WhatsApp peer groups can be used as a dynamic communication medium and become an alternative choice in providing health education other than face-to-face. WhatsApp peer groups can be applied by health workers in providing health education in youth groups both in schools, colleges, communities and in the community of youth associations who are the target of adolescent health education.

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Paper-Based versus Mobile Apps for Colorectal Cancer Screening in COVID-19 Pandemic Setting

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ABSTRACT

***Background**: The incidence of colorectal cancer (CRC) in Asia has kept increasing in the last decade. The morbidity and mortality for CRC can be reduced with early detection; however, mass CRC screening with imaging modalities such as colonoscopy, CT scan, or MRI is unfeasible in developing countries such as Indonesia. Asia Pacific Colorectal Screening (APCS) is utilized to stratify individual CRC risk. Online screening via mobile application is an alternative method to ensure the continuity of community screening without risking COVID-19 transmission. **Objective**: We conducted a descriptive study to evaluate CRC risk using APCS in two different villages. **Methods**: This is a cross-sectional study involving 925 and 207 subjects in 2019 and 2020, respectively. The APCS survey in 2019 was done before COVID-19 pandemic with paper-based questionnaires and direct assessment by door-to-door approach. Meanwhile, the APCS survey in 2020 was done during COVID-19 pandemic using website and mobile apps available for Android and iOS. We gathered participants' characteristics and the APCS score in both groups and tabulated them. **Results**: In 2019, out of 925 subjects; 472 (51%) have been classified in average risk of CRC, 370 (40%) have been classified in moderate risk of CRC, and 83 (9%) have been classified in high risk of CRC. In 2020, out of 207 subjects; 106 (51.2%) have been classified in average risk of CRC, 86 (41.5%) have been classified in moderate risk of CRC, and 15 (7.3%) have been classified in high risk of CRC. **Conclusion**: Although there was a decrease in the participation of the screening program with mobile application in the pandemic era compared with paper-based questionnaires before the pandemic era, online screening using APCS in mobile applications is a preferred alternative for an effective screening method in this pandemic and possibly in the future in Indonesia.*

***Keyword**: APCS, colorectal cancer screening, COVID-19 pandemic, mobile apps, public health service.*

INTRODUCTION

Colorectal cancer (CRC) or colorectal adenocarcinoma arises from glandular epithelial cells of the large intestine due to mutation of genes that allows abnormal growth. This abnormally growing mass is usually benign at first but can evolve into a more malignant mass and thus becomes a carcinoma (Rawla, Sunkara and Barsouk, 2019). CRC is still one main concern because the incidence of CRC in the world keeps increasing, especially in many developing countries. CRC is one of the most diagnosed cancers and it is also the third deadliest cancer. In 2018, there were 1.8 million new cases of CRC which makes up 11% of all cancer cases in the world (Fitzmaurice et al, 2017) Although CRC is more commonly found in North America and Europe population, the incidence of CRC has markedly increased in

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Asia population in the past decade. The increasing incidence is influenced by the "western" way of life which involves red meat, alcohol, and tobacco consumption (Makassari, 2017; Kemenkes RI, 2018).

The successes in the prevention of CRC become the main factor to control CRC incidence as low as possible and prevent high rates of mortality. In developing countries, screening and early detection of CRC is always recommended not only for symptomatic patients, but for asymptomatic populations as well. However, mass screening is very limited in developing countries due to funding problems and financial situation of the general population (Arnold et al, 2017).

CRC can be screened earlier by various methods to allow identification of the disease. There are two commonly accepted methods for CRC screening: fecal occult blood test (FOBT) and visual examination. FOBT allows detection of hemoglobin or blood matters in feces as neoplasia tends to have frail vascular structure which results in minor hemorrhages. Meanwhile, visual examination via colonoscopy and flexible sigmoidoscopy allows direct observation on anatomical structure inside intestinal lumen (Rawla, Sunkara and Barsouk, 2019).

Asia Pacific Colorectal Screening (APCS) is an instrument to identify risk of colorectal neoplasia based on four criteria: age, gender, history of colorectal malignancy in family, and history of smoking. This instrument is made for the Asia region which specifically targets areas limited in both resources and funding to CRC screening. This instrument may help physicians to determine individuals to be prioritized to get CRC screening in asymptomatic populations. Some studies have already proven the association between APCS scoring result and CRC screening result (FOBT and colonoscopy method).

Although APCS is easily understandable and practiced, there is no published record of the use of APCS in Indonesia. We aimed to record and inform the use of APCS by conducting the mass screening of colorectal cancer risk in rural areas of Yogyakarta in Indonesia.

METHODS

This research was a cross-sectional study. The data were collected from screening and education events in the October to December 2019 (before COVID-19 pandemic) and other screening events from August to December 2020 (during COVID-19 pandemic).

Data collection in 2019 was carried out before the COVID-19 pandemic by paper-based questionnaires and a door-to-door direct assessment. We implemented a direct method by visiting the designated villages and giving education about CRC, as well as instructions about CRC screening using APCS paper-based translated to Bahasa Indonesia **(Figure 1)**. A local health promoter was trained by the research team to assist us in a door-to-door approach for recruiting more participants to fill the survey form.

The program in 2020 was carried out during the COVID-19 pandemic so that the data collection was taken using the websites and mobile applications available on Android and iOS. We created a mobile app, "3D Kanker Kolorektal," which provides education on CRC and self-screening with APCS questionnaire. The link for this Android (https://play.google.com/store/apps/details?id=com.deteksi.kolorektal.apps) and iOS (https://apps.apple.com/id/app/deteksi-dini-kanker-kolorektal/id1570965326) application **(Figure 2)** was distributed to various chat groups and the local health promoter to further encourage people to use the application, also a website to supplement the education material from : https://webkolo.klinikbedahdigestif.com. All of the survey forms, educational material, as well as our social media can be accessed through https://linktree.com/tumorususindonesia **(Figure 3)**. The participants of this study were randomly selected by public health promoters.

We gathered additional information outside the APCS questionnaire on subjects' characteristics comprising of highest education level achieved, body weight and height, as well as history of illness and other comorbidities. Since this was a descriptive study, we collected all the data and tabulated them into Microsoft Excel sheets. There was no statistical analysis done for this study.

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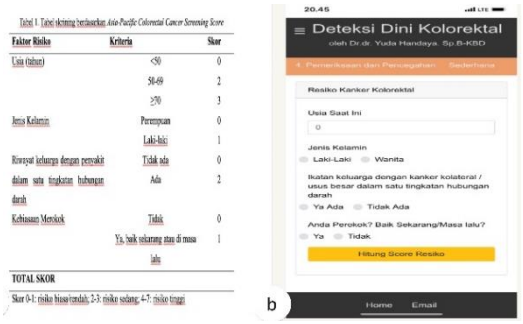

Figure 1. APCS translated to Bahasa Indonesia: (A) paper-based. (B) application-based.

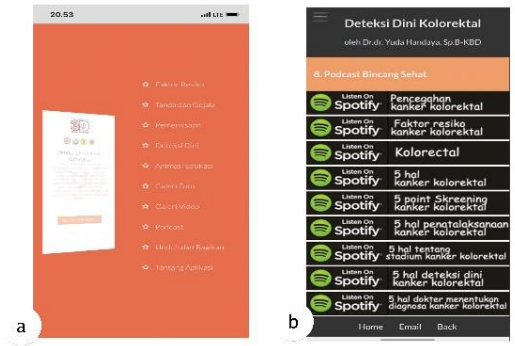

Figure 2. Mobile application feature (A) main menu (B) podcast menu directed to Spotify

Figure 3. Scannable QR barcode that will direct user to our Linktree to ease access to our content and sources of information

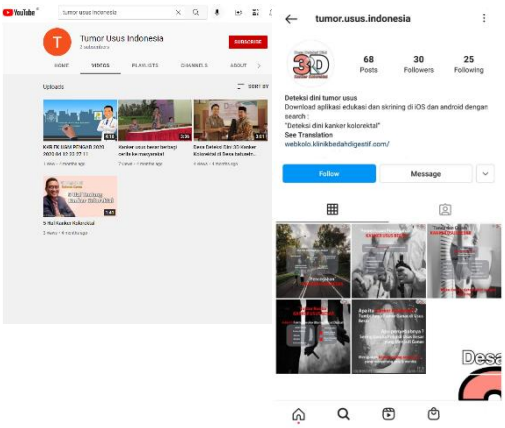

Figure 4. Online source of information using social media platforms such as YouTube and Instagram.

RESULTS AND DISCUSSION

We collected the data from 925 subjects in Baturetno village for the program in 2019 and 207 subjects in Bangunjiwo village for the program in 2020. We tabulated them and the details can be found below.

There was a great disparity in the number of recipients between the two periods of the program. The first year of our survey, we successfully gathered 925 subjects while, in the second year, we only gathered 207 subjects **(Figure 3).** Moreover, in 2019, we gathered an adequate number of subjects for each age group: 539 subjects were <50 years old, 354 subjects were between 50-69 years old, and 30 subjects were 70 years old and above. Meanwhile, in 2020, we gathered fewer number of subjects to represent each age group: 185 subjects were <50 years old, 22 subjects were between 50-69 years old and none of the subjects was 70 years old and above.

In 2019, the number of female subjects was higher than male subjects which was 694 and 231, respectively. However, in 2020, the number of female subjects was fewer than the number of female subjects, which were 72 and 135, respectively.

Most of the participants in both surveys had a tertiary level of education. The participants in 2019 generally had a lower average of education level with 33.4% participants in primary and secondary level of education and 17.4% having university level of education. On the other hand, participants in 2020 had a higher average of education level with 8.7% in primary and secondary level of

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education and 38.6% having university level of education.

Table 1. Baseline characteristics.

		2019	2020
Subjects (n)		925	207
Age group	<50	539 (58.3%)	185 (89.4%)
	50-70	354 (-)	22 (10.6%)
	>70	30 (3.2%)	0 (0%)
Sex	Male	231 (25.0%)	135 (65.2%)
	Female	694 (75.0%)	72 (34.8%)
Highest level of education achieved	Primary	188 (20.3%)	4 (1.9 %)
	Secondary	121 (13.1%)	14 (6.8%)
	Tertiary	422 (45.6%)	109 (52.7%)
	University	161 (17.4%)	80 (38.6%)
Family history of malignancy	Present	39 (4.2%)	9 (4.3%)
	Absent	886 (95.8%)	198 (95.7%)
Smoking	Yes	164 (17.7%)	73 (35.3%)
	No	761 (82.3%)	134 (64.7%)

In 2019, out of 925 subjects that we analyzed, 472 subjects (51%) were classified in average risk of CRC, 370 subjects (40%) in moderate risk, and 83 subjects (9%) in high risk. In 2020, out of 207 subjects that we analyzed, 106 subjects (51.2%) were classified in average risk of CRC, 86 (41.5%) subjects in moderate risk, and 15 subjects (7.3%) in high risk.

Table 2. The distribution of CRC risk derived from screening programs using APCS in 2019 and 2020.

		2019	2020
APCS CRC Risk	Low	472 (51.0%)	106 (51.2 %)
	Moderate	370 (40.0%)	86 (41.5%)
	High	83 (9.0%)	15 (7.3%)

Figure 5. (A) 2019 education with villager and local health promoter. (B) 2020 only attended with local health promoter

Many factors contribute to a person's risk of developing colorectal cancer. Genetics play an important role in the occurrence of colorectal cancer. Any incidence of colorectal cancer in the family means a higher risk to develop colorectal cancer. People with age 50 or above are at a significantly higher risk of developing colorectal cancer. However, it is still possible for younger people to also get colorectal cancer. The incidence of colorectal cancer may increase in the future because of a newly adopted lifestyle such as smoking, excessive consumption of red meat and processed meat, excessive alcohol consumption, and low fiber consumption. A history of gastrointestinal diseases such as polyps and intestinal inflammation is also a risk factor for colorectal cancer (Rawla, Sunkara and Barsouk, 2019).Therefore, APCS covers one of the few factors mostly associated with colorectal cancer which are age, family history, and smoking history. (Quach et al, 2018; Jiang et al, 2020) By using APCS, we can prioritize individuals with moderate and high risk to get examined as early as possible in hospitals. Individuals with moderate and high risk are eligible for further examination with simple tests such as fecal occult blood test and followed by CT scan or colonoscopy if the result of FOBT is positive. (Jiang et al., 2020)

From the analysis, the number of subjects in the two periods of time differs greatly: 925 in 2019 and 207 in 2020. In 2019, the number of participants was higher because we had a local health promoter who helped us to approach more people directly. This allowed a wider reach to the population to do the APCS screening. Hence, we got several subjects from each age group. Meanwhile, we strongly believe that the significantly lower number of participants in 2020 was influenced by few gadget possessions such as mobile phones, tablets, and computers among the residents.

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The lack of supporting infrastructure makes people who live in rural areas less able to get maximum internet access. In 2019, APJJI launched an independent internet village program so the people in rural areas can access the internet via satellite technology (V-sat). Unfortunately, this program was stopped during the COVID-19 pandemic. Currently there are 12,500 of 82,000 villages in Indonesia that have not been connected to the internet (Buletin APJII, 2021).

Furthermore, the age factor is also a handicap in accessing online information. People aged over 50 years have a very low knowledges of the gadget (Kamal et al, 2021), thus we have very few subjects for the 50-69 years old group and none for the 70 years old and above group.

The difference in the age group may be related with the difference in the highest education level of the people. There were more elderly people participating in the 2019 event than in 2020 and coincidentally there were more people with lower education levels in 2019. We believed that, in such rural areas, many of the elderly have a low education level as compared to the younger ones. In 2019, the survey was done by gathering and approaching the participants individually; therefore, reaching a higher number of elderly participants. In general, low educated people may correlate with low-income level and this was depicted in our survey event in 2020. The correlation between low education and low-income level is also reported in a study done by Nawi Ng et al. which showed that people with low levels of education and socioeconomic status had higher odds of having a poorer quality of life and health. Older people with low educational and socioeconomic status (SES) had 3.4 times higher odds of being in the worst quality of life quintile as compared to people with high education and high SES (Nawi Ng et al., 2010). In 2020, the survey was done via smartphones and gadgets. These low-income people may not have the suitable gadget or smartphones to use the survey application that we created. Therefore, we can see a very low number of participants in 2020 especially in the elderly category and in primary or secondary education level category.

In 2019, the number of female subjects was very high compared to the male subjects. We believed that the disparity between the two genders was caused by the availability of women during the survey. Most women in rural areas are housewives and some of them work from home or close to their houses, while most men tend to work far from home; therefore, there were very few male subjects present at the time of the survey. However, in 2020, the percentage of male subjects was higher than female subjects compared to the previous year. We assumed that, in low financial families, more men possess the gadgets or smartphones to allow them to fill the questionnaire through the mobile apps. In Indonesia's 2020 population census, the population of male is larger than the population of female; however, in Daerah Istimewa Yogyakarta, the number of female was recorded more than the number of male population. The sex ratio at the age of 75 years and over which is 79 indicates that the number of elderly female population is greater than the number of male elderly population (Badan Pusat Statistik,2020). Furthermore, the unemployment rate in Indonesia has increased during COVID-19 pandemic. Central Statistics Agency (BPS) in November 2021 released the fact that the unemployment rate increased tremendously. The data show that there is an increase of 7.46% of unemployment rate in male population as compared to an increase of 6.46% in female population (Ramadani et al., 2022). The increasing male unemployment rate may be one of the factors causing a higher number of male subjects participating in the 2020 survey.

Despite the difference in number of subjects and other criteria, the trend for CRC risk classification was very similar between the 2019 and 2020 period. Although the number of participants did not represent the real proportion of the population, we can at least deduce that the CRC risk in the rural population roughly follows the percentages shown in the result section because the two surveys was done in two different places with two entirely different settings but showing very similar numbers.

From the two events in 2019 and 2020, we realize that online education and screening is not as effective as a live event that is delivered directly. Online-based education and screening discourages low-

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income people from participating due to lack of suitable gadgets and smartphones. Offline events attract more participants and allow them to inquire more information and clarify their confusions directly. On the other hand, online form of surveys and data collection will be much more effective in urban areas due to easier access to smartphone, computers, and stable internet connection as well. The online form of surveys can reach a greater population when done in the city (Nugraha and Susilastuti, 2021).

During the current pandemic situation, we have no permission to organize an offline event as the government has imposed a ban on non-urgent social gatherings and, therefore, an online measure is our only choice to continue the previous year's event.

Paper-based case reports are the most commonly used data collection in field-based research studies. In this approach, the data collected are recorded on paper before being turned into digital. (Ley et al., 2019) This method has several advantages over the automated methods, which is data collection is not limited to a certain place, it is easier to be produced, modified, and implemented. Moreover, the potential of data loss is less compared to the automated data collection (Ahmed et al, 2018). Despite its easy implementation, the paper-based data system has some risk of errors both during data collection and digitization. Alongside an increase in the development and use of computer technology, electronic data collection is increasingly being used for healthcare implementation and research. Electronic data collection has several advantages compared to paper-based collection, including enabling large volumes of data to be collected and stored securely and avoiding the need to carry and store bulky paperwork (Dickinson et al., 2019). Electronic data collection has become a well-accepted alternative compared to paper-based data collection (Ley et al., 2019). This method is effective for data collection during the pandemic due to the restriction of social mobility in which data collection cannot be performed from door-to-door.

Based on a big data review conducted by the Indonesian Central Statistics Agency on the impact of COVID-19, people have begun to reduce their activities to visit public places since the enactment of WFH policy on March 17, 2020. In fact, the mobility has decreased drastically after the official PSBB program was issued on April 10, 2020. The people's activity to retail commerce and recreational places was decreased up to 70%. Moreover, the using of public transportation also decreased by about 79% (BPS, 2020). If possible, a hybrid approach of both online platform and door-to-door approach is the optimal measure for next screening events during this pandemic.

The Asia-Pacific Colorectal Screening (APCS) scoring system has been shown to be highly effective for mass CRC screening purposes. A study in Vietnam has shown that APCS is useful in identifying CRC incidence in people with irritable bowel syndrome, allowing patient stratification for colonoscopy priority (Quach et al., 2018) Furthermore, a study in China proved that APCS is very effective in detecting colorectal neoplasia in outpatient and asymptomatic patients in China where it is not feasible to conduct colonoscopy screening for the whole population at risk (Jiang et al., 2020) However, the APCS scoring system has a major flaw. The screening points overlook many other significant risk factors for CRC such as diabetes, types of diet and exercise habits, alcohol consumption, etc. (He et al., 2019). Based on many studies, people aged 50-75 years old are considered the population with high risk of CRC and, therefore, require an annual screening more than just with APCS but with fecal immunochemical test (FIT). People with present family history of colorectal cancer should undergo the screening earlier, starting from 40 years old of age. In addition to APCS, many studies recommend annual or biannual testing of fecal occult blood test (FOBT) or FIT and, if possible, colonoscopy for a more accurate and effective CRC screening (Rex et al., 2017; Bnard et al., 2018).

CONCLUSION

Through our study, we can conclude that direct approach with paper-based surveys is a more effective way in conducting screening in rural areas. Despite the low participation rate, colorectal cancer screening by using APCS which is integrated in mobile apps, is still proven useful. Mobile apps and other forms

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of online screening may become a preferred alternative for a safe screening method in this pandemic and possibly in the future.

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Health Center Utilization among the Elderly in the East Java Province

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ABSTRACT

Background: According to WHO, the elderly is one of the vulnerable groups apart from children and pregnant women. This study aims to analyze the factors related to health center utilization among the elderly in East Java. Methods: This study analyzed secondary data from the Indonesia Basic Health Survey 2018. Using the stratification method and multistage random sampling, this study recruited 25,034 elderly people in East Java as samples. In addition to health center utilization as the dependent variable, residence, age, gender, marriage, education, occupation, socioeconomics, insurance, and travel time to a health center were analyzed as independent variables. Data were analyzed using binary logistic regression. Results: The results found that age was related to health center utilization. Elderly men had 0.874 times more probability than elderly women to use health centers (OR 0.874; 95% CI 0.869-0.879). Marital, education, occupation, and socioeconomic, were also found to be significantly related to health center utilization. The elderly who had health insurance managed by the government had a 1.883 times higher probability than the elderly who did not have health insurance to make use of health center services, while other types of insurance had a lower probability. Based on the travel time to health centers, the elderly who had a travel time of 10 minutes or less were 1.099 times more likely than the elderly who had a travel time of >10 minutes to use health centers (OR 1.099; 95% CI 1.094-1.105). Conclusion: Seven variables had a relationship with health center utilization among the elderly in East Java; age, gender, marriage, education, occupation, insurance, and travel time to health centers. Policymakers can use the research results to determine specific targets to accelerate the increase in health center utilization for the elderly in East Java.

***Keywords**: Elderly, Health center, Health services, Utilization of health services, Utilization of health center.*

INTRODUCTION

Health centers are places of primary healthcare that provide health services for the community and individuals. In their role of providing health services for individuals, health centers are the initial gate of health services or gatekeepers in formal health services. As gatekeepers, health centers act as first-level health facilities whose role is to provide optimal basic health services following standards (Anita, Febriawati and Yandrizal, 2019). To improve the welfare and quality of life of the elderly, quality and comprehensive services are urgently needed starting from health centers as first-level health facilities. The fulfillment of healthcare needs for the elderly is strongly influenced by the availability of health resources, adequate equipment to support programs, government policies, and other factors. Therefore, improving access to health services has become an important public policy goal for several decades (Rahayu, 2020) (Laksono, Nantabah and Wulandari, 2019; Massie, 2019).

The elderly population is one of the vulnerable social groups because they generally have lower body resistance than the adult age group. In addition, the World Health Organization (WHO) stated that the number and proportion of the population with the elderly or the population over 60 years have begun to show an increase. In 2019, there were

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around 1 billion people aged 60 years and over. This figure was expected to continue to increase in the following year. The WHO estimated that the number of people aged over 60 years would increase in 2030 to around 1.4 billion people and 2.1 billion in 2050. This increase would continue, especially in developing countries (World Health Organization, 2017). Meanwhile, according to Statistics Indonesia, in 2021, there were eight provinces that entered the old population structure, which was, the percentage of the elderly population was greater than 10%. The eight provinces were Special Region of Yogyakarta (15.52%), East Java (14.53%), Central Java (14.17%), North Sulawesi (12.74%), Bali (12.71%), South Sulawesi (11.24%), Lampung (10.22%), and West Java (10.18%) (BPS, 2021b).

As age increases, it will cause the body to experience a decline due to the aging process; almost all organ and movement functions will decrease and be followed by a decrease in the immune system. This causes the elderly population to be a group of people who are vulnerable to disease. Several problems of decreasing physical ability in the elderly include a decrease in the function of the musculoskeletal system, nervous system, cardiovascular system, and respiratory system. The decrease in some of these body systems lowers the ability to do physical activity in the elderly population (Purnama and Suhada, 2019; Syarifah and Sugiharto, 2021). Previous research in West Java showed that 77.6% of the elderly had moderate physical activity levels, and 15.5% of the elderly had low physical activity levels. These results indicate that the elderly population has quite a hard time carrying out high physical activity.

In addition to experiencing physical health problems, the elderly population is also vulnerable to mental health problems. Research in South Lampung Regency showed that most of the elderly who experienced physical health problems also experienced mental health problems such as stress due to physical health problems. Therefore, the elderly population, especially those who have experienced physical health problems, need optimal health services to deal with their health problems and support from their closest family (Bangsawan, Al Murhan and Widodo, 2017). Generally, the elderly tend to have no control over decision-making in the family for themselves. Previous research in India also stated that some elderly people tended to lack support from their families, and their health was not a priority in their families. Especially because of the high migration rate of the young population, other family members tend to pay less attention to the health status of the elderly because it is not a top priority in the family (Jadhav, 2020).

According to the World Health Assembly, the national health system in force in a country states that health services for the elderly should be provided with primary health facilities. All levels of society have the right to get the health services they need (Jadhav, 2020). The elderly population has special health and social problems and also requires specific health services. Health services are expected to meet the infrastructure needed to provide health services to the elderly population (Smith, 2016). Previous research stated that only around 54% of the elderly population utilized free basic health services. Others had never used free basic health services and chose to self-medicate if they felt they could not access health services (Massie, 2019). The results of other studies stated that there were various obstacles that reduced the ability of the elderly population to access health services, such as socioeconomic status, geographic location of residence and so on (Laksono, Nantabah and Wulandari, 2019). There needs to be special attention related to access of the elderly population to quality primary health services, especially in preventive and promotive efforts to improve the health status of the elderly population (A. Sri S., Vinsur and Sutiyarsih, 2019). Elderly people in East Java Province with health complaints still have not made optimal use of the existence of health centers in their area, which was only about 14%; this was illustrated in a report from Statistics Indonesia entitled Statistics of the Elderly Population 2021 (BPS, 2021b). Based on the background description above, the research aims to analyze the factors related to health center utilization among the elderly in East Java.

METHODS

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This study used secondary data from the Indonesian Basic Health Survey 2018. The survey was a national-scale cross-sectional survey conducted by the Ministry of Health of the Republic of Indonesia. The research population was all elderly (≥ 50 years) in Indonesia (Wulandari *et al.*, 2019). This study described 25,034 respondents as a weighted sample through stratification and multistage random sampling. Data were collected through face-to-face interviews with the elderly or caregivers.

This study used health center utilization as a dependent variable. This variable was defined as the elderly's access to health centers, both outpatient and inpatient. Outpatients were limited to the last month before the survey, while inpatients were limited to the last year before the survey. With these time limits, it was expected that respondents could remember the events of outpatient and inpatient correctly (Balitbangkes Kemenkes RI, 2019).

This study used nine factors as independent variables including type of residence, age, gender, marital status, education level, occupation type, socioeconomic status, health insurance ownership, and travel time to health centers.

This study divided the residence type into two categories: urban and rural. The urban-rural categorization was based on the provisions of the Central Statistics Agency. Age was determined based on the last birthday. Gender was divided into male and female. Marital status was classified into three groups: never married, married, and widowed. The education level was categorized into four levels: never attended school, primary education (elementary school-junior high school), secondary education (senior high school), and tertiary education. Occupation type was categorized into six: unemployed, civil servants/national armed forces/national police/state-owned corporation/regionally-owned corporation, employees, entrepreneurs, farmers/fishers/laborers, and others.

The socioeconomic level was determined based on the wealth index formula. The wealth index was determined based on a weighted average of overall family expenses. It was calculated using major household expenses such as health insurance, food, accommodation, and other items. The income index was classified into five categories: poorest, poor, middle, rich, and richest (Wulandari *et al.*, 2022).

Health insurance ownership was categorized into four types: having no insurance, having government-managed insurance, having private insurance, and having both insurance types (government-managed and private). Travel time to health centers consisted of two categories: ≤ 10 minutes and > 10 minutes.

Data Analysis

In the early stages, the Chi-Square test was used to make bivariate comparisons. Then, the collinearity test was used to ensure that the independent variables in the final regression model did not have a strong relationship with each other. Lastly, binary logistic regression was used to examine the multivariable relationship between all independent variables and the health center utilization. The IBM SPSS 22.0 application was used for the entire statistical analysis process.

This study also used ArcGIS 10.3 (ESRI Inc., Redlands, CA, USA) to map the health center utilization among the elderly in East Java based on district/city in 2018. The Central Bureau of Statistics provided an administrative border polygon shapefile for this study.

Ethical Approval

The National Ethics Committee has approved the ethical feasibility of the Basic Health Research Ethics 2018 (Number: LB.02.01/2/KE.024/2018). All respondent identities have been removed from the dataset.

RESULTS

The results of the analysis found that the health center utilization of the elderly in East Java in 2018 reached 6.9%. Furthermore, Figure 1 illustrates the distribution map of the health center utilization among the elderly based on districts/cities in East Java. It can be seen that the distribution pattern was random. No spatial pattern or trend was found based on the map.

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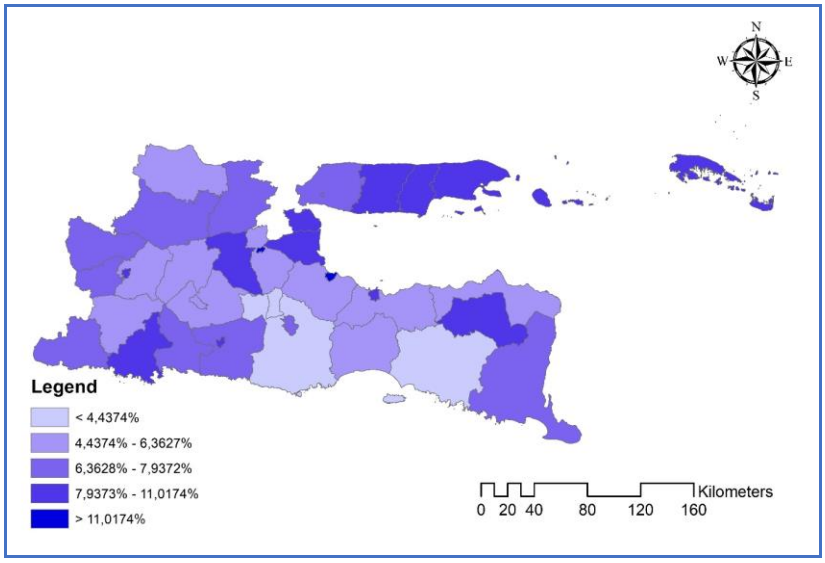

Figure 1. Distribution map of health center utilization among the elderly based on district/city in East Java, 2018.

Table 1 is the descriptive statistic of the health center utilization among the elderly in East Java. Based on the place of residence, there were slightly more elderly people living in rural areas than those living in urban areas, both in groups that utilize and did not utilize health centers. Bivariate, the relationship between these two variables was not significantly related. In general, there were five regencies/cities that had a high enough percentage in terms of health center utilization among the elderly, namely Mojokerto City (15.6%), Pasuruan City (13.5%), Blitar City (11%), Probolinggo City (10.3%), and Sampang Regency (10.3%). Meanwhile, districts with low percentages were Batu City (3.2%), Malang Regency (3.6%) and Jember Regency (4.4%).

Table 1. Descriptive Statistics of Health Center Utilization among the Elderly in East Java, Indonesia, 2018 (n=25,034)

Characteristics of the Elderly	Health Center Utilization		*p-value*
	Did Not Utilize (n=23.166)	Utilize (n=1.868)	
Residence			0.351
● Urban	49.8%	49.7%	
● Rural	50.2%	50.3%	
Gender			< 0.001
● Male	47.9%	41.5%	
● Female	52.1%	58.5%	
Age (average)	(61.39)	(62.78)	< 0.001
Marital Status			< 0.001
● Never married	1.3%	0.8%	
● Married	72.6%	68.9%	
● Widowed	26.2%	30.3%	
Education Level			< 0.001
● Never attended school	20.3%	21.5%	
● Elementary school-junior high school	64.1%	70.0%	
● Senior high school	10.4%	6.3%	
● Tertiary education	5.2%	2.2%	
Occupation Type			< 0.001

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Characteristics of the Elderly	Health Center Utilization		*p-value*
	Did Not Utilize (n=23.166)	Utilize (n=1.868)	
● Unemployed	30.6%	39.2%	
● Civil servants/national armed forces/national police/state-owned corporation/regionally-owned corporation	2.8%	1.6%	
● Employee	4.1%	2.6%	
● Entrepreneur	14.9%	15.9%	
● Farmer/fisher/laborer	43.2%	37.0%	
● Others	4.5%	3.7%	
Socioeconomic Status			< 0.001
● Poorest	25.6%	27.3%	
● Poor	20.4%	22.2%	
● Middle	17.2%	19.3%	
● Rich	18.6%	18.1%	
● Richest	18.2%	13.0%	
Insurance Ownership			< 0.001
● No insurance	36.0%	24.1%	
● Government insurance	61.8%	75.5%	
● Private insurance	1.6%	0.4%	
● Government + private insurances	0.6%	0.1%	
Travel Time to the Health Center			< 0.001
● ≤ 10 minutes	52.2%	53.9%	
● > 10 minutes	47.8%	46.1%	

Based on gender, elderly women dominated both health center utilization groups. Meanwhile, based on marital status, married elderly also dominated both health center utilization groups.

Table 1 shows that the elderly with elementary-junior high school education levels dominated both health center utilization groups. Based on occupation, the elderly who worked as farmers/fishers/laborers dominated the group that did not utilize health centers, while the elderly who did not work dominated the groups that utilized health centers.

Based on socioeconomic status, the poorest elderly dominated both health center utilization groups. Meanwhile, the elderly with government-managed insurance dominated both health center utilization groups. Furthermore, the elderly with a travel time of ≤ 10 minutes to health centers were also found to dominate both health center utilization groups.

The collinearity test of the health center utilization among the elderly in East Java showed that all independent variables did not have a strong relationship with each other. The tolerance value was more than 0.10 for all variables, and the variance inflation factor (VIF) value was less than 10.00 for all factors simultaneously. Based on the decision-making test, it can be stated that the regression model did not have multicollinearity symptoms.

Table 2 shows the binary logistic regression results of the health center utilization among the elderly in East Java. The analysis in this final stage used 'not utilizing health centers' as a reference.

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Table 2. Binary logistic regression of health center utilization among the elderly in East Java, Indonesia, 2018 (n=25,034)

Predictor	Utilizing Health Centers			
	p-value	OR	95% *Confidence Interval*	
			Lower Limit	Upper Limit
Age	**< 0.001	1.009	1.009	1.009
Gender: Male	**< 0.001	0.874	0.869	0.879
Gender: Female	-	-	-	-
Marital: Never Married	**< 0.001	0.761	0.740	0.782
Marital: Married	**< 0.001	1.040	1.034	1.047
Marital: Widowed	-	-	-	-
Education: Never Attended School	-	-	-	-
Education: Elementary-Junior High School	**< 0.001	1.105	1.098	1.112
Education: Senior High School	**< 0.001	0.622	0.614	0.630
Education: Tertiary Education	**< 0.001	0.408	0.400	0.417
Occupation: Unemployed	-	-	-	-
Occupation: Civil servants/National Armed Forces/National Police/State-Owned Corporation/Regionally-Owned Corporation	**< 0.001	1.071	1.046	1.096
Occupation: Employee	**< 0.001	0.814	0.801	0.827
Occupation: Entrepreneur	*0.013	0.990	0.982	0.998
Occupation: Farmer/fisher/laborer	**< 0.001	0.688	0.683	0.692
Occupation: Others	**< 0.001	0.764	0.754	0.775
Socioeconomic: Poorest	-	-	-	-
Socioeconomic: Poor	**< 0.001	1.018	1.011	1.025
Socioeconomic: Middle	**< 0.001	1.059	1.051	1.067
Socioeconomic: Rich	**< 0.001	0.957	0.950	0.965
Socioeconomic: Richest	**< 0.001	0.779	0.772	0.786
Insurance: None	-	-	-	-
Insurance: Government-Managed	**< 0.001	1.883	1.872	1.894
Insurance: Private	**< 0.001	0.527	0.508	0.548
Insurance: Both (government and private)	**< 0.001	0.305	0.281	0.332
Travel time: ≤ 10 minutes	**< 0.001	1.099	1.094	1.105
Travel time: > 10 minutes	-	-	-	-

Notes: *Significant at level < 0.05; **Significant at level < 0.001

Table 2 indicates that age is related to the health center utilization among the elderly in East Java. Based on gender, male elderly were 0.874 times more likely than female elderly to utilize health centers (OR 0.874; 95% CI 0.869-0.879).

Based on marital status, the elderly who were never married had 0.761 times the probability of utilizing health centers (OR 0.761; 95% CI 0.740-0.782). Meanwhile, married elderly were 1.040 times more likely than widowed elderly to utilize health centers (OR 1.040; 95% CI 1m034-1.047).

Table 2 shows that the elderly who graduated from elementary-junior high school were 1.105 times more likely than the elderly who had never attended school to utilize health centers (OR 1.105;

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95% CI 1.098-1.112). The elderly who graduated from high school had 0.622 times the probability than the elderly who had never attended school to utilize health centers (OR 0.622; 95% CI 0.614-0.630). Furthermore, the elderly who graduated from tertiary education were 0.408 times more likely than the elderly who had never attended school to utilize health centers (OR 0.408; 95% CI 0.400-0.417).

The results of the analysis showed that the elderly who worked as civil servants/national armed forces/national police/state-owned corporation/regionally-owned corporation had 1.071 times more probability than the elderly who were unemployed to utilize health centers (OR 0.1071; 95% CI 1.046-1.096). Meanwhile, other occupation types of the elderly had a lower probability than those who were unemployed to utilize health centers in East Java.

Based on the socioeconomic level, the poor and middle had a higher probability than the poorest elderly of utilizing health centers. On the other hand, the rich and the richest had a lower probability than the poorest elderly of utilizing health centers.

Table 2 illustrates that the elderly with health insurance managed by the government were 1.883 times were more likely than the elderly who did not have health insurance to utilize health center services (OR 1.883; 95% CI 1.872-1.894). Meanwhile, other types of insurance had lower probabilities of utilizing health centers.

Based on the travel time to health centers, the elderly with a travel time of ≤ 10 minutes had a 1.099 times greater probability than the elderly with a travel time of > 10 minutes to utilize health centers (OR 1.099; 95% CI 1.094-1.105).

DISCUSSION

Based on the analysis results, the age variable became the variable that affected the health center utilization. This result was in line with several existing research, both in Indonesia and outside Indonesia. One of the articles that discussed this age aspect was a study conducted by Kurniawati in 2019 which stated that most respondents (70%) accessed integrated coaching post services in the Kuta Alam health center working area (Kurniawati and Hasanah, 2019). Several studies outside Indonesia also showed the same pattern, one of which was a study conducted by Yang in 2019; the results stated that elderly age was related to accessing health services in China (Yang *et al.*, 2021).

The analysis results found that, based on gender, elderly men had a lower probability than elderly women of utilizing health centers. These results might mean that elderly women were more active and had a positive attitude toward visiting health centers and controlling their health compared to elderly men (Kusmiati, 1999; Rusdiyanti, 2018). The results were also supported by previous research, which stated that gender had a relationship with activeness in visiting health services (Irawan and Ainy, 2018). More women visited non-communicable diseases integrated coaching posts than men (Kurnia, Widagdo and Widjanarko, 2017; Rusdiyanti, 2018).

The study's results informed that marital status was also related to health center utilization. These results were supported by previous studies, which stated that the elderly who were married had a better rate of visits to health centers than the elderly who were not married (Kurnia, Widagdo and Widjanarko, 2017). The married elderly had a higher probability of getting support from their families and partners in accessing health services. Support from the family had 39.58 times more chance to make the elderly actively visit the integrated service posts for the elderly compared to families who did not support it (Gestinarwati, Ilyas and Manurung, 2016). Integrated service posts for the elderly, which are part of the health centers, are also one of the aspects related to the utilization of primary health services in the elderly, hence the utilization of the integrated service post services for the elderly is indirectly associated with the utilization of the health center services.

Furthermore, the education level was significantly related to the health center utilization. The elderly who did not attend school had a lower probability of utilizing health centers than the elderly who did. However, the higher the education of the elderly, the lower their activeness in utilizing health centers compared to the elderly with lower

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education, one of the factors was that the elderly with higher education tended to have a better quality of life than the elderly with lower education (Hidayah *et al.*, 2021). The results of the study were also supported by a previous study which stated that the education level had a relationship with the utilization of health services (Erdiwan, Sinaga and Sinambela, 2020). However, this contradicted the study conducted by Irawan and Ainy (2018), which stated that the education level was not related to the utilization of health services.

The analysis found that the occupation type was related to the health center utilization. The elderly who worked as civil servants/national armed forces/national police/state-owned corporation/regionally-owned corporation had a higher probability of utilizing health centers when compared to the elderly who were unemployed. The results of this study were supported by a previous study, which stated that the elderly who worked tended to visit the non-communicable diseases actively integrated coaching post by 0.251 times compared to the elderly who did not work (Rusdiyanti, 2018). However, the results contradicted a study by Erdiwan, Sinaga and Sinambela (2020), which stated that occupation had no relationship with the utilization of health services. It also contradicted the results of research conducted by Irawan and Ainy (2018) which stated that employment status had no relationship with the utilization of health services at health centers.

The analysis results indicated that the poor and middle had a higher probability than the poorest elderly of utilizing health centers. On the other hand, the rich and the richest had a lower probability than the poorest elderly to utilize health centers. These results were supported by a previous study, which stated that income was related to the utilization of non-communicable diseases integrated coaching posts (Rusdiyanti, 2018). It was also supported by research conducted by Rabbaniyah *et al*. (2019) that the income of the head of the family affected the utilization of health facilities. However, the results contradicted the study conducted by Oktarianita, Sartika and Wati (2021) that income was not related to the health center utilization as a primary service.

The elderly who had health insurance managed by the government had a higher probability than the elderly who did not have health insurance of utilizing health center services. Meanwhile, other types of insurance showed a lower probability of utilizing health services. The results were supported by a study conducted by Napitupulu, Carolina and Rahmawati (2018) that respondents who did not have insurance had a lower chance of utilizing health services than respondents who had insurance. The ownership of health insurance, especially the ownership of government-owned health insurance, would make it easier for people to get health services at a low cost or even free. However, a study by Fatimah and Indrawati (2019), which showed that there was no relationship between insurance ownership and utilization of health services, contradicted the results of the current study. On the other hand, the results related to the lower probability of utilizing health centers by the elderly who had other types of health insurance (not government-run insurance) could be due to the perception of comparison with other health facilities, where they feel that other health facilities were better thus they preferred visiting those health centers (Fatimah and Indrawati, 2019).

The results of the study informed that the elderly who had a travel time of ≤ 10 minutes had a better chance than the elderly who had a travel time of >10 minutes to utilize health centers. The faster the travel time, the more active the elderly were in utilizing health centers. Several things related to travel time included the close distance and ease of access. The easier it was for the community to access health centers both in terms of geography, social, and economy, the better the community would be in utilizing services at health centers (Fatimah and Indrawati, 2019). A study by Bregida, Anwary and Anggraeni (2021) stated that access had a significant relationship with interest in revisiting health centers, both long-distance access and difficult transportation. The results of the study contradict the study conducted by Kurnia, Widagdo and Widjanarko (2017) that ease of access had no relationship with community visits to health centers. Research conducted by

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Yosa aand Wahyuni (2015) also showed that distance had no relationship with the level of visits to health centers.

From several variables analyzed based on secondary data, this article has confirmed from several previous studies that the factors that strengthened the elderly to access services at health centers were age, gender, marital status, education level, type of work, insurance ownership, and travel time to health centers. six of the seven variables mentioned above could be classified as internal factors of the elderly, namely age, gender, marital status, education level, type of work and insurance ownership.

This internal factor could be attributed to the fact that East Java Province was a province with a relatively high Human Development Index (HDI) (BPS, 2021a). Meanwhile, one other factor was an external factor from the elderly, namely the travel time to health centers.

CONCLUSION

Based on the study's results, it can be concluded that there were seven variables related to health center utilization among the elderly in East Java. The seven variables were age, gender, marital status, education level, occupation type, insurance ownership, and travel time to health centers.

Policymakers can use the results of this study as specific targets to accelerate the increase in health center utilization among the elderly in East Java. Program managers at health centers related to the elderly can develop innovations so that the elderly are comfortable and have easier access when utilizing health centers. On the other hand, further research can be done with a qualitative approach to explore the reasons for the reluctance of the elderly who do not utilize health centers.

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The Impact of Covid-19 Social Isolation on Mental Health and Physical Activity of Older Adults

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ABSTRACT

***Background**: The ongoing COVID-19 pandemic tends to affect older adults more severely, raising the need for social isolation in this age of the population. Social isolation is likely to impact older adults' social ties and quality of life, as well as risk for illness and health. **Objective**: This study is a narrative literature review to evaluate the potential effects of social isolation on mental health and wellbeing of older adults. **Methods**: A literature search performed between January 1, 2020 and January 13, 2021, comprised an electronic search on different online databases in PubMed and ScienceDirect using the keywords COVID-19 followed by generic terms older adults or older people or aging population or elderly. Excluding duplicates, a total of 376 articles were screened, of which 21 studies were included in the final review. **Results**: Many older people could be mentally well-equipped to deal with social isolation, but some experience a negative impact on mental health. Stress, anxiety and depression symptoms were reported during the self-isolation period. The physical activity also has declined among older adults amid COVID-19. Some elderly who are not moving much may lose significant muscle strength, flexibility, and aerobic capacity. **Conclusion**: If social isolation continues, policy responses such as proactively identifying and addressing COVID-19 for elderly who are experiencing negative consequences. An effective solution such as "distance connectivity" and create safe physical activity such at home exercise are recommended.*

***Keywords**: COVID-19, Mental health, Older adults, Physical activity, Social isolation.*

INTRODUCTION

COVID-19, a new virus first discovered in Wuhan China on December 2019, has triggered a global pandemic (WHO, 2020a). The World Health Organization (WHO) proclaimed the 2019 Coronavirus Disease (COVID-19) as a global pandemic on March 11, 2020, due to the pace and scale of transmission, (WHO, 2020b). As of 31 December, 2020, a total of 83,937,826 COVID-19 cases had been confirmed worldwide, resulting in 1,834,358 deaths (Worldometer, 2021).

COVID-19 is lethal in the elderly population, and older people are the most vulnerable in terms of infection risk, negative health effects, and the potential for negative consequences in a range of social, psychological, and economic context (Ahrenfeldt *et al.*, 2020; D'cruz and Banerjee, 2020; García-Fernández *et al.*, 2020; Liu *et al.*, 2020; Wang *et al.*, 2020). Due to physiological disability, immune function decrease, multimorbidities and the pre-existing diseases, elderly are at higher risk of COVID-19 (Centers for Disease Control and Prevention, 2020; Wang *et al.*, 2020). According to data, 80% of global COVID-19 deaths have occurred among adults age 65 and older, particularly those with prior illnesses (Sadruddin and Inhorn, 2020). Italy is the second highest number of older people in the world after Japan, and 87.9% of Italians who had died of COVID-19 through March 17 were older than 70, with the case fatality rates for those aged 80-89 years were 19.7% (Sadruddin and Inhorn, 2020; Wang *et al.*, 2020). In the United States, 14% of cases and 81% of deaths linked with COVID-19 occurred in people aged 65 and older, with the highest percentage of severe outcomes among persons age 85 and older, with the case fatality rate was 10% to 27% (Centers for Disease Control and Prevention, 2020; Wang *et al.*, 2020). In Spain, adults over 60 years account for 55% of COVID-19 cases and more than two thirds of all deaths (García-Fernández *et al.*, 2020).

Governments around the world have implemented movement restrictions through population isolation as a preventive approach to minimize the

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number of contagions, (Bobes-Bascarán *et al.*, 2020; García-Fernández *et al.*, 2020; Xia *et al.*, 2020). This new situation of massive changes in people's everyday routines might be challenging for most people, and they may find it difficult to adjust to this new lifestyles while also managing the fear of the virus (Xia *et al.*, 2020). Studies on COVID-19's quarantine have identified negative outcomes for mental health and physical activity, in both in general population and elderly (Bobes-Bascarán *et al.*, 2020; Dunton *et al.*, 2020). Older persons should isolate themselves by reducing social interaction, sheltering in place, and keeping a safe physical distance from others. These changes in behavior could have negative consequences for older adults' quality of life, social engagement, and ability to engage in acceptable amounts of physical activity (Callow *et al.*, 2020; D'cruz and Banerjee, 2020; Smith, Steinman and Casey, 2020).

Studies focused on COVID-19 have identified negative consequences for mental health elderly population. Therefore, the aim of this review is to evaluate the potential effects of social isolation on the mental health and wellbeing of older adults. Furthermore, this study reviewed the recommendations and proposed activities to avoid mental and functional decline to carry out at home.

METHODS

This study was a narrative review. A literature search was performed in January 2021 to collect all articles published between January 1, 2020 and January 13, 2021, using the primary databases PubMed and ScienceDirect. To ensure greater coverage of literature, a complementary database such as Google Scholar was also used. The keywords COVID-19 were followed by the generic terms older adults or older people or aging population or elderly independently during the systematic search.

Following removal of duplicates, a total of 376 articles were screened at initial search on PubMed and ScienceDirect. Out of the 376 articles, the study excluded 123 articles without abstract and full text, eight review articles, one non-English article, 127 non aging articles (subjects <50 years old), and 96 articles were irrelevant to the review topic (unrelated subject matter). Thus, this study obtained a total of 21 articles for further discussion. The contents of the review were divided into two main areas: 1) impact of social isolation during COVID-19's quarantine on mental health and physical activity in older people, and 2) recommendations for mental health and physical activity of older adults during the COVID-19 self-isolation.

RESULTS AND DISCUSSION

Table 1 presents the 21 selected articles on mental health and wellbeing of older adults. The relevant articles were mostly cross-sectional study and online survey, with the number of the participants ranging from 142 to 7,236. The studies included the countries Spain (Bobes-Bascarán *et al.*, 2020; García-Fernández *et al.*, 2020; Ozamiz-Etxebarria *et al.*, 2020), China (Huang and Zhao, 2020; Lei *et al.*, 2020; Ping *et al.*, 2020; Xia *et al.*, 2020), USA (Callow *et al.*, 2020; Dunton *et al.*, 2020), Scotland (Corley *et al.*, 2021), Poland (Fabisiak, Jankowska and Kłos, 2020), UK (Brown *et al.*, 2020; Robb *et al.*, 2020), Czech Republic (Novotný *et al.*, 2020), Japan (Aung *et al.*, 2020), France (Goethals *et al.*, 2020), Finland (Taina *et al.*, 2020), Germany (Michalowsky *et al.*, 2020), Australia (Dawel *et al.*, 2020), Brazil (Lima-Costa *et al.*, 2020) and Paraguay (Rios-González and Palacios, 2020). Eight articles had participants of general population or aged 18 and over. All of the studies made clear distinction of the age of older adults.

Impact of social isolation on mental health and wellbeing in older people

Thirteen studies reported negative mental health impact of social isolation to elderly. Anxiety, depression and stress were three most common symptoms reported (Table 2).

One of the most typical unpleasant emotions during pandemic is anxiety (Bergman *et al.*, 2020; Coughlin, 2012). Anxiety symptoms were documented in eight studies ranged from 3.6% of older people in Spain (Bobes-Bascarán *et al.*, 2020) to 43.4% of adults in Paraguay (Rios-González and Palacios, 2020). According to Geriatric Anxiety Scale (GAS), 64.1% people aged 50 and over in North America

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have mild anxiety symptoms, 6.9% have moderate anxiety symptoms and 0.8% have severe anxiety symptoms (Callow *et al.*, 2020). Elderly over the age of 60 were nearly two times more likely than those between the ages of 30 and 44 (18.5% versus 8.8%)to experience anxiety in a study conducted in Beijing, China (Xia *et al.*, 2020). However, a study in Spain found no differences in anxiety levels of older adults aged above 60 years when compared to the younger group (<60 years of age) (García-Fernández *et al.*, 2020).

Symptoms of depression experienced by older adults were found from six studies. The corresponding values of depression were 12.8%, 25.6%, 28.1% and 48% (Bobes-Bascarán *et al.*, 2020; Callow *et al.*, 2020; Rios-González and Palacios, 2020; Robb *et al.*, 2020). Depression was classified as mild, moderate, or severe in studies conducted in the UK and North America. Almost 8% older adults in the UK met the criteria of major depression, while 1.4% matched the threshold for severe major depression (Brown *et al.*, 2020). In a North American online Qualtrics survey, 25.5% adults aged 50 and over were diagnosed with mild depression, 63.1% with moderate depression and 11.4% with severe depression (Callow *et al.*, 2020). However, a comparison study in Spain discovered that elderly (≥60 years old) are less likely to suffer depression than younger adults. The Beck Depression Inventory (BDI) scores in older groups were lower than the <60 group [3.02 (3.28) vs 4.30 (4.93)] (García-Fernández *et al.*, 2020). Furthermore, a study in Czech Republic found that the prevalence of moderate to high stress and the severity of depressive symptoms increased 1.4 and 5.5 times, respectively, during the COVID-19 lockdown, (Novotný *et al.*, 2020).

According to a study in Spain, roughly 11% of older people (60+) had stress symptoms (Bobes-Bascarán *et al.*, 2020). In the study, the assessment of symptoms of acute stress adapted clinical criteria for the diagnosis of Acute Stress Disorder Inventory (ASDI) of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). The study reported that older age groups had lower stress levels than younger age groups (<60 group) [3.66 (3.20) vs 4.45 (3.06)] (García-Fernández *et al.*, 2020).

Loneliness affects older adults more than other age groups (Carragher and Ryan, 2020). Most all the time, loneliness was experienced by less than 5% of elderly aged between 76-97 (Brown *et al.*, 2020). Loneliness has been associated with variety of chronic illnesses, including heart disease, cardiovascular disease, hypertension, and obesity (Yanguas, Pinazo-Henandis and Tarazona-Santabalbina, 2018; Smith, Steinman and Casey, 2020).

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Table 1. List of Article.

No	Authors	Type of Study	Country	Participants	Number of Participants
1	Fernandez et al., 2020 (García-Fernández *et al.*, 2020)	Cross-sectional study	Spain	People aged ≥60 vs aged <60	1,639 (150 age ≥60 and 1,489 age <60)
2	Xia et al., 2020	A cross-sectional online survey	Beijing, China	Adults 18+	7,144
3	Dunton et al., 2020	A cross-sectional and retrospective methods	USA	Adults ≥60	268
4	Bascaran et al., 2020 (Bobes-Bascarán *et al.*, 2020)	Cross-sectional study	Spain	Adults ≥60	2,194
5	Callow et al., 2020	Descriptive cross-sectional study	USA & Canada	Adults >50	1,046
6	Corley et al., 2020 (Corley *et al.*, 2021)	Online survey	Scotland	Elderly 84 years	171
7	Fabisiak et al., 2020	Electronic survey	Poland	Adults 65+	1,150
8	Brown et al., 2020	Cross-sectional telephone survey	UK	older people 76-97	142
9	Novotny et al., 2020	Ad hoc study	Czech Republic	Adults 24-68 years	715
10	Robb et al., 2020	Cross-sectional	London, UK	Adults >50	7,127
11	Aung et al., 2020	Normative Study	Japan	Adults 65+	-
12	Goethals et al., 2020	Qualitative Survey	France	Professionals (managers); older adults	8 professional; 6 older adults
13	Taina et al., 2020	Cross-sectional and longitudinal	Finland	elderly 75, 80 or 85	809
14	Ping et al., 2020	Online-based survey	China	General population	1.139
15	Michalowsky et al., 2020	Cross-sectional observational study	Germany	Patients aged 65+	2,447,356
16	Dawel et al., 2020	Longitudinal study	Australia	Adults (≥18)	1.296
17	Lima-Costa et al., 2020	Longitudinal study	Brazil	Adults 50+	6,149
18	Lei et al., 2020(Lei *et al.*, 2020)	Cross-sectional	China	Adults (≥18)	1,593
19	Huang and Zao, 2020,	Web-based cross-sectional survey	China	6-80 years old	7,236
20	Ozamis-Etxebarria et al., 2020	Cross-sectional	Spain	Adults (≥18)	967
21	Rios-Gonzales and Palacios, 2020)	Cross-sectional	Paraguay	Adults (≥18)	1.180

Social isolation is generally linked with the reduced physical activity in older adults (Goethals *et al.*, 2020; Rios-González and Palacios, 2020; Taina *et al.*, 2020). According to a qualitative study conducted in France, older peoples' participation in group physical exercise is declining, with attendance rate at physical activity workshops dropping by 20% (Goethals *et al.*, 2020). Physical inactivity can cause older adults to lose flexibility, muscle strength, and aerobic capacity (Aung *et al.*, 2020), it can also raise the risk of injury due to a lack of knowledge about physical activities or lack of adapted equipment (Goethals *et al.*, 2020).

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Table 2. Impact of COVID-19 Quarantine on Mental Health and Physical Activity

Authors	Aim	Main Results
Anxiety		
Xia et al., 2020	To evaluate the prevalence of anxiety and identify risk and protective factors associated with the presence of anxiety symptoms in the face of COVID-19 among Beijing adults.	Participants over the age of 60 were nearly two times more likely than those between the ages of 30-44 to feel anxiety (18.5% versus 8.8%).
Bascaran et al., 2020	To ascertain the early psychological correlates of the COVID-19 pandemic and to determine if a current or past personal history of mental disorder influences those correlates.	Anxiety symptoms were reported by 3.6% of participants.
Callow et al., 2020	To determine the relationship between the amount and intensity of physical activity performed by older adults in North America (U.S. and Canada) and their depression and anxiety symptoms while currently under social distancing guidelines (SDG) for the COVID-19 pandemic.	GDS participants: 63.1% were classified as having mild anxiety, 63,1% as moderately anxious, and 11.4% as severely anxious. GAS Participants: 64.1% were categorized had mild anxiety symptoms, 6.9% had moderate anxiety symptoms, and 0.8% had severe anxiety symptoms.
Brown et al., 2020	To investigate the impact of COVID-19 lockdown measures on the lives of older people.	The majority of participants said they were in good health, with low levels of anxiety and depression. 52% said they did not worry about their health, while 76% said their health as 'good', 'very good' or 'excellent'. <10% met the criteria indicative of depression or anxiety. Before the lockdown, 42% participants were less active. 72% participants were felt lonely at least some of the time.
Robb et al. 2020	To investigate the impact of COVID-19 and associated social isolation on mental and physical wellbeing.	12.3% of participants said they felt worse on the anxiety components of the Hospital Anxiety Depression Scale (HADS), consist of 7.8% men and 16.5% women. Fewer participants said they were feeling improved (4.9% for anxiety).
Ping et al., 2020	To know the impact of the COVID-19 epidemic on the health-related quality of life (HRQOL) of living using EQ-5D	The result reported that Anxiety/depression as 23.7%.
Ozamis-Etxebarria et al.,2020	To analyze stress, anxiety and depression with the arrival of the virus.	Anxiety levels in people over the age of 61 are moderate (3.9%).
Rios-Gonzales and Palacios , 2020)	To determine the symptoms of anxiety and depression during the isolation period.	Anxiety symptoms were reported by 43.42% of people aged 50 and over.
Depression		
Fernandez et al., 2020	To assess COVID-19 outbreak related emotional symptoms, identify gender differences, and study the relationship between the emotional state and environmental features in the	Emotional distress among elderly has been demonstrated to be lower. The mean (SD) Beck Depression Inventory (BDI) levels among ≥60 group were 3.02 (3.28) compared to the <60 group 4.30 (4.93).

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	elderly.	
Bascaran et al., 2020	To ascertain the early psychological correlates of the COVID-19 pandemic and to determine if a current or past personal history of mental disorder influences those correlates.	Depression symptoms were found in 25.6% of participants.
Callow et al., 2020	To determine the relationship between the amount and intensity of physical activity performed by older adults in North Amerika (U.S. and Canada) and their depression and anxiety symptoms while currently under social distancing guidelines (SDG) for the COVID-19 pandemic.	28.1% of GAS participants were categorized as having minimal depression like symptoms.
Novotny et al., 2020	To measure changes in mental health during the COVID-19 induced lockdown in order to probe for age-related changes and potential risk factors.	During the COVID-19 lockdown, the prevalence of moderate to high stress and the severity of depressive symptoms increased 1.4 and 5.5 times, respectively.
Robb et al., 2020	To investigate the impact of COVID-19 and associated social isolation on mental and physical wellbeing.	A total of 12.8% of participants, 7.8% men and 17.3% women, reported feeling worse on the depression components of the Hospital Anxiety Depression Scale (HADS). Fewer participants said they were feeling improved (1.5% for depression)
Rios-Gonzales and Palacios , 2020)	To determine the symptoms of anxiety and depression during the isolation period.	Depression symptoms were reported by 48.04% of those aged 50 and over.
Stress		
Fernandez et al., 2020	To assess COVID-19 outbreak related emotional symptoms, identify gender differences, and study the relationship between the emotional state and environmental features in the elderly.	Acute Stress Disorder Inventory (ASDI) scores among ≥60 group were lower than the <60 group. The mean (SD) 3.66 (3.20) vs 4.45 (3.06).
Bascaran et al., 2020	To ascertain the early psychological correlates of the COVID-19 pandemic and to determine if a current or past personal history of mental disorder influences those correlates.	Stress symptoms were reported by 11% of participants.
Physical activity		
Goethals et al., 2020	To evaluate the impact of this quarantine period and on the physical and mental health of older adults ; and to discuss alternatives to physical activity programs to avoid a sedentary lifestyle.	Attendance of physical activity workshop has decreased by roughly 20%.
Taina et al., 2020	To describe the changes that took place in life-space mobility, active aging and quality of life during social distancing in Finland. To assess whether changes in life-space mobility and active aging coincided with parallel changes in quality of life.	Life-space mobility, the active aging score and the quality of life score were lower during COVID-19 social distancing than two years prior.

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Rios-Gonzales and Palacios (Rios-González and Palacios, 2020)	To describe the psychological and social implications as well as health-related behaviors as a result of the lockdown in community dwelling older adults.	33.7% of participants continued to engage in activities that promote healthy aging, while 65.7% did less physical activity and 25.6% increased their intellectual activity.

Recommendation for mental health and physical activity in older people during COVID-19 social isolation

There are several recommendations for how older adults can cope with social isolation. interaction with other people, for example, phone and video calls by friends, family members, or care givers regularly; availability of helplines; availability of distance connectivity through telephone, computer, or other smart devices; and gardening, would help mitigate feelings of disconnectedness and could check elderly's general wellbeing, identify needs, engage them cognitively, offer an opportunity for socializing, and connect them to available services and resources (D'cruz and Banerjee, 2020; Smith, Steinman and Casey, 2020; Corley *et al.*, 2021).

To improve the resilience of the older population, efforts to deliver adequate information are needed, for example Information, education and communication (IEC) campaigns on media platforms promoting a healthy diet, journaling, sleep hygiene, relaxation techniques, physical activity, and meditation (D'cruz and Banerjee, 2020).

Maintaining or improving physical activity by providing home workout video; online physical activity support systems; and a clean, safe and attractive public area (Aung *et al.*, 2020; Callow *et al.*, 2020; Fabisiak, Jankowska and Kłos, 2020; Goethals *et al.*, 2020).

The COVID-19 pandemic has brought attention to the fact that social isolation is a major public health concern, and that staying physically separated from others can be both protective and dangerous to elderly. Anxiety, stress and depression are psychological challenges that many older adults face, with the prevalence ranging a from 3.6% (Bobes-Bascarán *et al.*, 2020) to 43.4% (Rios-González and Palacios, 2020) for anxiety; 12.8% (Robb *et al.*, 2020) to 48% (Rios-González and Palacios, 2020) for depression; and 11% (Bobes-Bascarán *et al.*, 2020) for stress. These are similar to earlier studies conducted during pandemics, for example, a study about SARS in 2003 found that perceived-related risk level during the outbreak increased the odds of having a high level of depressive symptoms three years later (Liu *et al.*, 2012) and the rates of suicide among older adults in Hong Kong (Cheung *et al.*, 2020). After more than a year of Ebola outbreak in 2015, 48% of general public reported anxiety symptoms (Jalloh *et al.*, 2018). During the influenza A outbreak, 16% of the public felt anxiety (Bults *et al.*, 2011). About 39% of residents reported anxiety symptoms during avian influenza in France (Saadatian-Elahi *et al.*, 2010). In the context of COVID-19 pandemic, older adults are more vulnerable psychologically, due to aging process, decreasing functional capacity, and separating from family members (Robb *et al.*, 2020; Susilowati *et al.*, 2020; Schorr, Yehuda and Tamir, 2021).

This review suggests that COVID-19 appears to have a deleterious impact on the physical health of older adults when they are socially isolated. Performing physical activity has been shown effective to alleviate depressive symptoms and function as a counter-measure to immunological senescence or age-related immune deficiency (Nieman, 2000; Carriedo *et al.*, 2020; Moro and Paoli, 2020). According to earlier studies, inactive aging population have a higher risk of all-cause mortality, fractures, recurrent falls and functional limitation than their active peers, (Cunningham and O' Sullivan, 2020). It is critical to assist older adults to integrate simple, safe ways to stay physically active in limited space that does not require specific settings and/or devices during a period of social distance.

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Table 3. Recommendations of the Literature for Maintaining Mental Health and Physical Activity among Older People during COVID-19 Quarantine

No	Authors	Aim
1	D'cruz and Banerjee, 2020	The availability of helplines would allow elderly to seek assistance in time of distress. Providing simple written instructions and/or recorded messages may aid the transition to digitization of services. Friends, family members and care workers making phone and video calls frequently to check in on elderly as channels for interaction that might help to mitigate isolation and feelings of disconnectedness. IEC campaigns on media platforms to encourage beneficial health and wellbeing practices such as eating a balanced diet, sleep hygiene, physical exercise, journaling, meditation and relaxation techniques.
2	Callow et al,, 2020	Performing lights physical activity during self-isolation in time of COVID-19 pandemic may help ease some of negative mental health consequences.
3	Corley et al,, 2020	When compared to pre-lockdown, elderly who spent more time in the garden during COVID-19 reported significantly better physical health, emotional and mental wellbeing, and sleep quality.
4	Fabisiak, Jankokowska and Klos, 2020	Providing clean and pleasant public spaces, with the provision not only antibacterial but also antiviral surface properties as well as practical application in furniture.
5	Aung et al., 2020	Older adults can download a home exercise video from the primary healthcare service provider's webpage. The exercise was three times a day, for 10 minutes of each training. Stretching, squatting and strengthening exercises for arms, legs and trunks are all part of home version exercise.
6	Robb et al., 2020	The necessity to tract, identify and implement early interventions among individuals who are at increased risk of developing loneliness as a result of social isolation. To address the maladaptive conditions associated with loneliness, the need to facilitate engagement in meaningful and satisfying group activities. The use of technologies, such as applications, may continue to be a useful tool.
7	Smith, Steinman, and Casey, 2020	The necessity for clinical and community-based organizations to collaborate and form inter-sectoral partnerships in order to continue to provide services and programs that engage and support older adults. The aging social services network is critical infrastructure for reaching older adults who are underserved and/or marginalized. Distance connectivity through telephone, computer, or other smart devices, such as telephonic reassurance and engagement efforts where community health workers, social workers, clinicians and other personnel make telephone calls to older adults to check on their general well-being, identify needs, engage them cognitively, provide an opportunity for socialization, and link them to available services and resources. The Engagement of older adults as volunteers and crisis support to assist themselves and others. Virtual service delivery.
8	Carragher and Ryan,2020.	Age-friendly programs involving local stakeholders from multiple sectors. Communities join together to form support networks and to connect with elderly in innovative ways.
9	Brown et al., 2020	Proactively identifying and addressing COVID-19 related mental health problem for those who are experiencing negative impact. Strategies to promote safe physical activity should be considered to mitigate the negative effect of current and future COVID-19 restrictions.
10	Goethals et al., 2020	Maintaining physical activity at home is critical for older adults. Several online physical activity support systems are available online.

CONCLUSION

In conclusion, this review reveals that social isolation for COVID-19 has a negative impact on older adults' mental health and physical activity. Anxiety, depression, stress and loneliness were the most common mental outcomes reported. Furthermore, many people were not exercising as much as they had been prior to the pandemic. Thus, if social isolation continues, traditional practice programs must be rapidly altered and translated to facilitate connectivity serve, support and engage older adults.

Based on the review, the study recommends that policy responses such as

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proactively identifying and addressing COVID-19-related mental health and physical activity for elderly who are experiencing negative consequences. Public health strategies to promote safe physical activity should be considered to mitigate the negative impact of current and future COVID-19 restrictions.

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The Differences between Male and Female Pupils in Accessing Porn

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ABSTRACT

***Background**: Children have begun to be exposed to pornography at a very young age, which is 4 years. Intentionally or not, access to pornography has a brain-damaging impact. Pornography damages the human brain worse than drugs. **Objective**: This study aims to identify behavioral differences in pornography consumption in male and female pupils aged 9-11 years. **Method**: The research data were obtained by using a survey method for 261 pupils aged 9-11 years who attend public elementary schools in Semarang city. The data were analyzed by univariate and bivariate to determine behavioral differences between male and female pupils. **Results**: There are 53.3% of female and 46.7% of male pupils participated in this study. Most of them are 11 years old (62.8%) and not yet pubescent (79.7%). As much as 30.7% of pupils (16.1% male and 14.6% female) have accessed pornography and 15.4% accessed it intentionally. Almost 7% of pupils access pornography more than 1 minute, by cellular phone (27.6%) and 5.4% frequently access it for more than 5 times a week. There are no significant differences between male and female students in pornography consumption (p=0.095). The government through Health Office should cooperate with schools and families in making educational programs about the dangers of pornography. Parents should control the use of cellular phone by children. Due to no behavioral difference in pornography consumption, the intervention program provided could be in equal portions between female and male pupils.*

***Keyword**: Children, Health behavior, Pornography, Pupils, Reproductive health.*

INTRODUCTION

The average age of Indonesian children entering puberty is 11-12 years (Wahab *et al.*, 2018). At this time, it is expected that children will be able to enter adolescence in a healthy attitude, behavior, and have reliable life skills. This is necessary because adolescence is considered a stormy period, meaning that teenagers will begin to be faced with various choices that can affect their future life (Kiani, Ghazanfarpour and Saeidi, 2019).

Reproductive growth and development in adolescents is one of the factors that influence behavior, especially sexual behavior, in adolescents. Adolescents' sexual behavior is determined by many factors such as curiosity and lack of knowledge. Research conducted by Irene Dora on 69 students found that access to pornographic sites was 10.1% in the low category, 88.4% in the medium category, and 1.4% in the high category. In the variable of adolescent premarital sexual attitudes, the results showed that 76.8% had traits that tended to be positive or had a tendency to approach premarital sexual behavior, and 23.2% had negative traits or tendencies to stay away from premarital sexual behavior (Hadiati and Thea, 2016).

Access to pornography is a factor that influences adolescent sexual behavior. Adult content or pornographic content is one of the most sought after and accessed by internet users in Indonesia. ECPAT (End Child Prostitution, Child Pornography and Trafficking of Children for Sexual Purposes) Indonesia states that the consumption of pornographic content among Indonesians is at an alarming level. Based on a survey conducted by an American adult video provider site as well as a presentation by the ECPAT Indonesia Coordinator, it was stated that, in 2015 and 2016, Indonesia was ranked second in terms of access and consumption of pornographic videos. Added by ECPAT Indonesia if the younger generation and minorities of adults to older age who access adult content (*End Child*

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Prostitution And Trafficking Organization Indonesia, no date).

A survey by the Indonesian Child Protection Commission (KPAI) conducted on 4,500 youth in 12 big cities in Indonesia found that access to pornographic content almost reached 100%. Of the 4,500 youth who became respondents, it was found that the reasons or factors that motivate them to access and watch pornographic content are just for fun (27%), a friend's invitation (10%) and the fear of being ridiculed by their peers (4%). From the data held by the National Commission for Child Protection, it is also stated that of the total 2,812 students, 60% of them have accessed pornography (Setyawan, 2018). The survey conducted during the COVID-19 pandemic also showed that 22% of children still watched inappropriate shows (Purnamasari, 2020).

The Ministry of Education and Culture of the Republic of Indonesia said that material containing pornography can be obtained easily by anyone at this time. In the guidelines for parents issued by the Ministry of Education and Culture of the Republic of Indonesia, it is stated that the sources of pornographic content include newspapers, comics, story books, games, magazines, television, videos, pictures, as well as pages and social media (Kementerian Pendidikan dan Kebudayaan Republik Indonesia., 2017).

Access to adult content, which is found a lot at the age of 10-19 years, can have an effect on health and social life. This age group is the age of teenagers who have a high curiosity, as well as the occurrence of changes, both in emotional, physical, and psychological terms (Schoefield and Bierman, 2018). Therefore, the experience during the pre-pubertal period greatly influences their behavior when they are in their teens. Coupled with the growth and reproductive development of adolescents during puberty, teenagers are increasingly curious to try what they see.

The government has made many efforts to prevent it by blocking adult content from various media. However, technological advances seem to be unstoppable. Children can still easily access pornography either intentionally or unintentionally. Especially during the pandemic period since the beginning of 2020 which caused children to have to study at home with the assistance of the internet. Based on preliminary studies, it was found that some children have seen adult content that appears suddenly when they are accessing the internet. This makes some children surf further and even start trying to create similar content.

Premarital sex behavior among teenagers needs to be prevented since pre-pubertal age or at least early teenager. Therefore, we need to understand first about the description of accessing pornography in children and whether there are differences between female and male children.

Based on the facts in the field above, researchers are interested in identifying the behavior of male and female pupils in pornography consumption. If there are differences in behavior between the two, it will assist in designing reproductive health programs for children aged 9-11 years more effectively.

METHODS

This study is a quantitative study using a descriptive approach and a cross-sectional study design. The population that became the subject of this research were pupils in fourth and fifth grade at the four public elementary schools in Semarang which amounted to 289 pupils. The four schools were selected based on the response rate of informed consent from the pupils' parents. Not all parents allowed their children to participate in this research because of the research topic that is considered taboo in Javanese people. We exclude schools with response rates under 80% to minimize the bias (Finchamm, 2008). The sample in this study is determined using a simple random sampling technique. The sample size was determined based on the Lemeshow formula, and the sample for this study was 261 respondents.

The data in this study were taken using a questionnaire filled directly by the pupils after the school activities were over on March 26th - April 8th, 2022. The researchers also provided that the research continues to use health protocols due to COVID-19 pandemic situation. The independent variable in this study is pupils' characteristic (sex, age and puberty status), while the dependent variable is behavior of pornography consumption (content, context, onset,

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frequency, media, duration, reason, and peer influence). The data obtained were then analyzed by univariate and bivariate analysis. We used independent sample t-test in bivariate analysis, since the data were normally distributed, to determine whether there is a difference in the mean between two unpaired groups with the intention that the two groups of data come from different subjects.

This research has been approved by ethics committee of Faculty of Public Health, Universitas Diponegoro No. 158/EA/KEPK-FKM/202.

RESULTS AND DISCUSSION

Respondents in this study were 4th and 5th grade pupils aged 9-12 years. It is known from Table 1 that most of the respondents are 11 years old (62.8%). This is the average age of Indonesian children entering puberty (11-12 years) (Wahab *et al*., 2018), although this study revealed that only 20.3% pupils had reached puberty and were mostly female pupils (14.2%). Number of respondents by gender in this study is almost equal, which is 46.7% male and 53.5% female.

Table 2 reports that 30.7% pupils have ever accessed pornography. More male pupils (16.1%) have accessed pornography than female pupils (14.6%). Males are easier to have fantasies and have more courage to access pornography. On the other hand, females can refrain from engaging on those who violate norms because of shame or a burden that is more felt by females (Donevan and Mattebo, 2017).

Pornography is defined as images or content that contains sexual exploitation, obscenity, and/or something of an erotic nature. Included in pornography are images of naked adults, images of sexual intercourse, images of genitals and breasts. Pornography itself is considered by the wider community as a taboo subject and has many negative impacts. Several studies mention several reasons that make people oppose pornography, including as a protection for the younger generation or children, as a prevention of activities that demean women's dignity, and prevent rebellions that tend to destroy the sexual values of the family and society at large. The impact that will be felt by many teenagers who access pornographic content easily is a stimulus to imitate what they see (Kementerian Pemberdayaan Perempuan Dan Perlindungan Anak Republik Indonesia, 2014).

Bandura in Social Cognitive Theory mentioned that children are more likely to attend to and imitate people who they perceive as similar to themselves . Consequently, they are more likely to imitate behavior modeled by people of the same gender. The people around them will respond to the behavior it imitates with either reinforcement or punishment (Bandura, 1989).

Table 1. Distribution frequency of pupils' characteristic

Variable	Male		Female		Total	
	n	%	n	%	n	%
Sex	122	46.7	139	53.5	261	100
Age						
9	0	0	4	1.5	4	1.5
10	41	15.7	48	18.4	89	34.1
11	79	30.3	85	32.6	164	62.8
12	2	0.8	2	0.8	4	1.5
Puberty status						
Has reached puberty	16	6.1	37	14.2	53	20.3
Not yet pubescent	106	40.6	102	39.1	208	79.7

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Table 2. Distribution frequency of variable pornography consumption.

Variable	Male		Female		Total	
	n	%	n	%	n	%
Ever pornography consumption	42	16.1	38	14.6	80	30.7
Yes	80	30.7	101	38.6	181	69.3
No						
Onset of pornography consumption	80	30.7	101	38.6	181	69.3
Never	3	1.1	0	0	3	1.1
4-6 y.o / kindergarten	5	1.9	0	0	5	1.9
7-8 y.o / first grade	4	1.5	3	3	7	2.7
8-9 y.o / second grade	4	1.5	8	3.1	12	4.6
9-10 y.o / third grade	11	4.2	14	5.4	25	9.6
10-11 y.o / fourth grade	15	5.7	13	5.0	28	10.7
11-12 y.o / fifth grade						
Media to pornography consumption	80	30.7	101	38.6	181	69.3
Never	37	14.2	35	13.4	72	27.6
Hand phone	5	1.9	4	1.5	9	3.4
Laptop/notebook	5	1.9	2	0.8	7	2.7
Book/comic	4	1.5	2	0.8	6	2.3
Film/CD						
Frequency on pornography consumption	80	30.7	101	38.6	181	69.3
Never	21	8.0	15	5.7	36	13.8
Once a week	9	3.4	8	3.1	17	6.5
2-3 times a week	6	2.3	7	2.7	13	5.0
4-5 times a week	8	3.1	6	2.3	14	5.4
More than 5 times a week						
Duration on pornography consumption	80	30.7	101	38.6	181	69.3
Never	14	5.3	13	5.0	27	10.4
< 5 seconds	13	5.0	11	4.2	24	9.2
5-30 seconds	8	3.1	3	1.1	11	4.2
31-60 seconds	10	3.8	8	3.1	18	6.9
More than 60 seconds						
Context of pornography	80	30.7	101	38.6	181	69.3
Never	16	6.1	20	7.7	36	13.8
Story text	12	4.6	6	2.3	18	6.9
Real-still picture	16	6.1	12	4.6	28	10.7
Real-motion picture	7	2.7	9	3.4	16	6.1
Still-animation picture	7	2.7	9	3.4	16	6.1
	9	3.4	9	3,4	18	6.9

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Variable	Male		Female		Total	
	n	%	n	%	n	%
Motion-animation picture						
Other						
Content of pornography	80	30.7	101	38.6	181	69.3
Never	15	5.7	11	4.2	26	10.0
Images of skimpily dressed/naked women/men	15	5.7	11	4.2	26	10.0
Images of male/female genitals/other body parts that cause sexual desire (e.g. chest, butt, thighs, crotch, etc.)	7	2.7	7	2.7	14	5.4
Cheek kiss/hug between opposite sex/same sex	3	1.1	4	1.5	7	2.7
Lip kisses between the opposite sex/same sex	1	0.4	0	0	1	0.4
Necking	5	1.9	1	0.4	6	2.3
Breasts touching	0	0	1	0.4	1	0.4
Genitals touching	1	0.4	2	0.8	3	1.2
Petting	1	0.4	1	0.4	2	1.8
Intercourse	0	0	1	0.4	1	0.4
Oral sex	0	0	4	1.5	4	1.5
Anal sex						
Reason on pornography consumption	80	30.7	101	38.6	181	69.3
Never access	26	10.0	14	5.3	40	15.3
Unintentionally	6	2.3	7	2.7	13	5.0
Curiosity	8	3.1	6	2.3	14	5.4
Peer request	7	2.7	6	2.3	13	5.0
Other						
Number of friends who have pornography consumption	86	33.0	96	36.8	182	69.7
No one	7	2.7	15	5.7	22	8.4
1	10	3.8	14	5.4	24	9.2
2-3	19	7.3	14	5.4	33	12.6
More than 3						

Media that contains things about sex or pornography have a lot of impact on someone who accesses it. This is the impact of media exposure. It is stated that media exposure is defined as exposure to media that is watched or seen by someone in a certain frequency. The media here can be in the form of films, television broadcasts, reading magazines or newspapers, or listening to the radio. Various studies and many experts say the impact of pornography is more inclined to the negative impact than the positive impact. The impact of pornography includes a decrease in brain performance and triggers premarital sex and deviant behavior (Hawari, 2010).

In this study, pupils had been exposed to pornography since they were in kindergarten (1.1%) and the most were nowadays, at the age of 11 (10.7%). The older the children, the more exposure to

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pornography. Most pupils access it in less than five seconds. A total of 13.8% pupils access it once a week. Previous research on adolescents also showed that 60.6% had accessed pornography. The teenagers who have/often accessed pornography are known to have a history of pornography consumption more than or equal to one access per day. The media used to access pornography include hand phone, laptops, computers, magazines, comics, novels, and other media where the results are video games, posters and Instagram which are used to access pornography (Gayatri, Shaluhiyah and Indraswari, 2020).

This might be one of the effects of the 2-year COVID-19 pandemic period which requires children to study at home with the help of internet-connected gadgets. Most of the pupils access pornography through hand phone (27.6%). Based on the results of the study, not a few respondents used more than one media to access pornography (Gayatri, Shaluhiyah and Indraswari, 2020). Children at this time are facilitated to obtain media to assist in meeting their needs. With the development of the media, it will make it easier for teenagers to access content with sexual substance without paying or being known by others (Nugroho, 2016). This is also supported by other research which shows 90% of adolescents choose to access and watch pornographic content alone (Donevan and Mattebo, 2017). Adolescents who choose to access pornography alone said that accessing or watching pornographic content alone makes them feel more comfortable and less embarrassed when viewed by others. They prefer to watch or access in the bedroom or bathroom so they can access alone without the need for others to know (Muhamad *et al.*, 2021). Other research shows 90% of respondents choose to access and watch pornographic content alone (Donevan and Mattebo, 2017).

Table 3. Independent sample t-test result between sex and behavior of pornography consumption.

Variable	t	df	Sig	MD	SE	95% CI	
						Lower	Upper
Pornography consumption	1.678	259	.095	1.340	0.799	-0.233	2.912

Children who do not have media can still access pornography at a friend's house or elsewhere, as well as novels and comics which can be accessed by borrowing someone else's. The lack of availability of facilities owned by children themselves does not rule out the possibility of children not being able to access pornography, where they can find other ways to be able to access pornography easily. Based on the theory of planned behavior, the availability of facilities owned by individuals can influence individuals to carry out behavior according to the facilities they have, but it is possible that, if the facilities are not supportive, individuals who already have the intention and plan to behave can make this behavior in other ways (Hack, Broucke and Kever, 2019).

According to Table 3, there is no significant difference between male and female pupils' behavior in pornography consumption (p=0.095). Age and pubertal status are likely to have influenced these findings due to most pupils had not reached puberty (Beyens, Vandenbosch and Eggermont, 2016). In contrast with previous research addressed on adolescents, it was reported that males experienced greater post-exposure arousal and less negative affect after viewing sexually explicit videos than females did. Further, males who viewed more explicit sexual depictions tended to report greater post-exposure arousal than those who saw less explicit depictions. No within-gender differences were found for females in terms of content explicitness (Paul, 2013). Females were more non-permissive toward pornography, better perceived the impact of pornography and factors contributed to pornography compared to males (Muhamad *et al.*, 2021).

Behavior of pornography consumption between male and female pupils is almost similar. Although some of them access pornography by accident (15.3%), as many as 6.9% of children access pornography over a long time, which is more than one minute. This means that they do intend to find out more and might be

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attracted by pop-up porn advertisements during playing internet games. This condition is very concerning because children in the early stages of puberty do not have adequate knowledge, attitudes and life skills (Azinar, 2013; Wulandari, 2016; Amalia and Azinar, 2017). As many as 50% of parents reported not monitoring the activities of their children and 63% providing free internet access without knowing the pages being accessed (Gayatri, Shaluhiyah and Indraswari, 2020). Parental supervision can influence individuals to plan something. Individuals with good parental supervision tend to think first about the dangers and impacts of the behavior they will do, whereas individuals with poor parental supervision will feel free so they don't think about the impact of their behavior (Baudouin, Wongsawat and Sudnongbua, 2019). Communication and the establishment of good relationships between children and parents will foster a sense of affection and a sense of being supervised in children so that children will feel awake and able to control deviant behaviors that may be possible. One of the roles of parents is as a function of protection, namely the role of providing protection to children from unwanted actions and as a way for children to grow protection against themselves from environmental influences that are not good. The ease with which children can access pornography can be even higher if there is no control from parents, such as providing unlimited facilities and parents do not supervise properly. Parents are expected to try to provide guidance and offer and give time to discuss with their teenagers access to pornography and explain sexuality (Shek and Ma, 2016).

Pupils are more exposed to pornography in the form of written stories (13.8%) and real moving pictures (10.7%). The substances seen are pictures of women or men naked or wearing skimpy clothes (10%), pictures of body parts that cause sensual desire (10%), hugging (5.4%), kissing (2.7%), hands touching the breast (2.3%), even to scenes of intercourse (1.8%) and anal sex (1.5%). Previous research of 62 teenagers obtained that the frequency of access to pornographic media was mostly found in the medium access category by 50%, then in the high access category it was 40.3% and the least was found in the high access category by 9,7% (Annisa and Sunarsih, 2013). Research in early teens shows that teens who frequently access pornography are generally more attracted to sex and pornography than their peers, have fantasies based on what they see in pornographic images or videos, think about sexuality most of the time, and access and watch pornographic content more often than they want (Donevan and Mattebo, 2017).

As many as 12.6% of pupils admitted that they knew that there were more than three friends who accessed pornography. Even though small numbers, we should pay attention because peers greatly influence the attitudes and behavior of adolescents. Peers include environmental factors or individual society that has an influence on individuals in behaving. The stronger and more influential an environment is, it has a strong possibility for individuals to behave like those in their environment. Peers have a fairly strong role in the development of children and adolescents, where the role of friends is more likely to influence a child or teenager in making decisions and the role in friendship tends to be more in the middle school environment compared to the elementary school level. Peers in the school youth group have a fairly important role where adolescents are more comfortable and spend longer time with their friends outside the home. This shows that the role of peers will influence a person to be able to perform behavior. However, the role of peers may not directly influence a person's behavior (Muche *et al.*, 2017).

CONCLUSION

There is no significant difference between male and female pupils' behavior in pornography consumption (p=0.095). Pornography consumption on male and female pupils is almost similar. Age and pubertal status are likely to have influenced these findings due to most pupils had not reached puberty and it is suggested to next study to investigate the differences on pornography consumption according to age and status pubertal. Government through the Health Office should cooperate with schools and family in making educational programs about the dangers of pornography. Parents should control the use of cellular phone by children. Due to no behavioral difference in pornography consumption, the intervention program provided by The Indonesian National Population and Family

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Planning Board (Badan Kependudukan dan Keluarga Berencana Nasional / BKKBN) could be in equal portions between female and male pupils.

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Autonomy of High-Risk Pregnant Women in an Effort to Prevent Complications during Childbirth

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ABSTRACT

***Background**: Maternal mortality is a health problem that has not been resolved until now. Based on data from January-September 2020 from the Public Health Center of Panti District, most pregnant women with high risk are those who have a risk of preeclampsia. Pregnant women have an important role and personal autonomy in decision-making during the process of pregnancy. **Objective**: To analyze the autonomy of high-risk pregnant women to prevent complications during childbirth **Methods**: **Q**ualitative research with a case study approach. Determination of the main informants using a purposive technique consisted of five pregnant women at risk of preeclampsia who were under 20 years old and above 35 years old. Data collection using in-depth interview guide and documentation. Data analysis using inductive thematic analysis. **Results**: intentions, affordability of information, situations in preparing blood donors and maternity funds can form the negative autonomy of high-risk pregnant women in decision-making. Husband's social support can form positive autonomy of high-risk pregnant women in decision-making. High-risk pregnant women have negative autonomy in choosing a place for maternity care to practice a midwife even though they have been advised to carry out routine checks at the primary healthcare. High-risk pregnant women have negative autonomy in choosing the place of delivery by not changing their choice and making the primary healthcare or hospital the second and last choice. **Conclusion**: The autonomy of high-risk pregnant women that is formed is a negative autonomy in making decisions about childbirth planning and preventing complications.*

***Keywords**: Autonomy, High-risk pregnant women, Preventing complication.*

INTRODUCTION

Maternal mortality rate (MMR) is still a health problem that has not been resolved until now. It is estimated that, between 2000-2017, around 295,000 women died, both during pregnancy and childbirth. Nearly 94% of maternal deaths occur in developing countries such as low-income and lower-middle-income countries (WHO, 2019). One of them is in Indonesia the maternal mortality rate in Indonesia is still quite high, as indicated by several regions experiencing an increase in maternal mortality from year to year, one of which is in East Java.

Based on the health profile of East Java Province in 2019, the Maternal Mortality Rate in East Java Province tends to be high at 91.97 per 100,000 live births in 2017, amounting to 91.42 per 100,000 live births in 2018 and in 2019 to 89, 92 per 100,000 live births and is still far from the SDGs target. Based on the 2019 East Java Provincial Health Profile, Jember Regency ranks the 5th highest maternal mortality rate in East Java. Based on data from the Jember District Health Office, cases of maternal mortality in 2017 were 43 cases, decreased in 2018 to 41 cases and in 2019 increased to 47 cases. In 2019, the highest maternal mortality cases were in the working area of the Panti Health Center with four cases of maternal deaths.

Based on the Health Profile of East Java Province in 2019, the highest maternal mortality rate in East Java is caused by pregnant women who have a high risk such as preeclampsia/eclampsia by 31.15%, bleeding by 24.23%, other causes such as diseases that accompany pregnancy by 23.1%, metabolic disorders by 13.85% and infection by 6.73%. Based on data from January - September 2020 from the Panti Health Center, the majority of pregnant women with high risk in the Panti Health Center work area are those who have a risk of preeclampsia. Therefore, the researchers chose pregnant women at risk in their

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pregnancy because it was a factor in maternal mortality and the research site was in the working area of the Panti Public Health Center, Jember Regency.

The government provides various programs to fulfill the right to a healthy life for every pregnant woman and as an effort to prevent complications for pregnant women, one of which is the Delivery Planning and Complications Prevention Program which is usually shortened to P4K with the aim of reducing MMR caused by pregnancy complications by monitoring carefully all pregnant women who are facilitated by the midwife and assisted by cadres. The main activities of P4K are data collection and target mapping of pregnant women, preparation of blood donors, preparation of maternity savings/maternity funds, preparation of transportation/ambulances, and introduction of danger signs of pregnancy and childbirth (Kemenkes RI, 2014).

Implementation of delivery planning and prevention of complications (P4K) will not succeed without the compliance of pregnant women. Maternal compliance in the implementation of P4K is very important because the possibility of complications during pregnancy and childbirth is smaller in pregnant women who apply P4K (Werdiyanthi *et al.*, 2017). P4K makes it easier for pregnant women to plan delivery as an effort to prevent complications. Planning for delivery of pregnant women cannot be separated from the participation of their husbands and closest family, but pregnant women themselves also have an important role and personal autonomy in making decisions in the process of pregnancy.

Autonomy is a very broad and difficult concept to measure and refers to the freedom to take an action or not (Aprilianti, 2017). Women's autonomy in healthcare decision making is an ability to obtain information and make decisions about their own problems. Autonomy is considered functionally important for decision-making in a variety of healthcare situations, from seeking and utilizing health services to choosing the care to be obtained. Research conducted in Bangladesh found that women's higher autonomy status was significantly associated with maternal health-seeking behavior (Aziz, Mitra and Rahman, 2017). Several studies in Indonesia also have similar results, such as a study conducted in Palangka Raya City which showed that pregnant women had a 1.59 times greater chance of accessing birth attendants by health workers if they had high personal autonomy than those with low personal autonomy (Aprilianti, 2017). Furthermore, research conducted in the Kutai area revealed that most pregnant women already have autonomy in choosing a place and birth attendant. However, there are still decisions that are negotiated with husbands and families, causing differences in desires between husband and wife and there are cultural factors in their environment that planning delivery at health facilities is the same as expecting a problematic delivery which will eventually result in delays in handling during delivery (Nurrachmawati *et al.*, 2018).

Time-consuming decision-making can cause delays in handling complications during childbirth, such as research conducted in the work area of the Padediwatu Health Center, Manukaka District, West Sumba Regency, finding that the culture of negotiation that develops in the community also often influences decision-making to refer mothers to the hospital. Decision-making in negotiations is dominated by the husband, but in the negotiation process still collects opinions from other family members and can take quite a long time so that it results in delays in decision=-making (Bata *et al.*, 2019).

Delivery planning and prevention of complications during pregnancy have an important role in preventing delays in handling complications. In addition, access to information regarding maternity care services and delivery management by health workers for high-risk pregnant women is an important factor that can influence decision-making on delivery planning and prevention of complications, so that health promotion and the approach taken by midwives and cadres are very important to pregnant women. high risk, family and community.

The autonomy of pregnant women is very necessary as an effort to raise awareness of the importance of planning for childbirth and prevention of complications during pregnancy so as to reduce complications in pregnant women and maternal mortality. Therefore, this study aims to analyze the autonomy of

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high-risk pregnant women in an effort to prevent complications during childbirth in the working area of the Panti Public Health Center, Jember Regency.

METHODS

This research is a qualitative study with a case study approach. The main informants of this study were determined using a purposive technique, namely five main informants, pregnant women who are at high risk, pregnant women who are under 20 years old and/or above 35 years old and pregnant women who are diagnosed as having a risk of preeclampsia and are in the work area of the Panti Health Center. Jember Regency. This research was conducted from March 10-10 April 2021. This research was carried out in a pandemic situation so that face-to-face contact with informants was carried out using health protocols. Data collection was using in-depth interview guide and documentation. The data analysis of this research used inductive thematic analysis. The credibility test uses source triangulation and method triangulation. This research has passed the ethical test by the Health Ethics Commission at the Health Faculty of Jember Regency with a certificate number 10/KEPK/FKM-UNEJ/III/2021.

RESULTS AND DISCUSSION

In-depth interviews were conducted on five high-risk pregnant women with the characteristics of the informants as shown in Table 1 below:

Table 1. Characteristics of Research Informants by Age, Pregnancy, and Diagnosis

Informants	Age	Gestational Age	Diagnosis
IU1	38	35	Hypertension, history of PE
IU2	36	34	Hypertension, history of PE
IU3	38	30	PE history
IU4	36	36	History of Hypertension, DM
IU5	18	31	Hypertension

In terms of access to information regarding delivery planning in the form of preparing blood donors, all key informants only get information and actions to check blood type from key informants, without preparing and checking the blood groups of prospective donors. This situation is the main informant's decision-making factor. This situation and access to information can also make the main informant of high-risk pregnant women not have the intention to prepare the subject of blood donors from the family and only check blood type for pregnant women themselves. The following is an excerpt from an in-depth interview with one of the key informants:

> *"…Yes, I checked the blood for O. If the child was not tested. Yes, maybe later if needed, it will be there…" (IU1, 38 years)*

> *("…Iya saya diperiksa darahnya O. kalau anak enggak diperiksa. Ya mungkin nanti kalau dibutuhkan udah ada disana…" (IU1, 38 tahun))*

High-risk pregnant women only rely on blood supplies at PMI without any intention to prepare blood donor subjects because there is no blood type examination for the family. The lack of information received by high-risk pregnant women in preparing blood donors can form negative autonomy in decision-making for delivery planning and prevention of complications.

Access to information regarding the preparation of maternity funds is only in the form of submitting a BPJS application without any motivation and approach to key informants to prepare BPJS or other social security. This situation makes high-risk pregnant women have the intention of preparing maternity funds in accordance with the choice of place of delivery. The following are excerpts from in-depth interviews with key informants:

> *"…BPJS is a parent from the government, because it has BPJS so you can give birth at the puskesmas…" (IU1, 38 years)*

> *"…Used general. There is BPJS but it is no longer active, other money can be made. Moreover, I want to be a midwife so I don't use BPJS ..." (IU2, 36 years)*

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("…BPJS itu nduk yang dari pemerintah, karena punya BPJS jadi bisa lahiran di puskesmas…" (IU1, 38 tahun)

"…Pakek umum. Ada BPJS tapi udah enggak aktif, bisa dibuat yang lain uangnya. Apalagi saya pengen di bu bidan jadi enggak pakek BPJS…" (IU2, 36 tahun))

Lack of motivation and approach to preparing maternity funds in the form of BPJS or other social security makes the intention of pregnant women to be at high risk in preparing maternity funds in accordance with the choice of place of delivery. This shows that high-risk pregnant women have negative autonomy in making decisions to choose a place of delivery.

There are three informants (IU2, IU3, IU4) who have the same intention from the beginning of pregnancy to the current gestational age, namely to give birth at a village midwife practice even though they have been directed by the village midwife and cadre to give birth at the puskesmas. The following are excerpts from in-depth interviews with key informants:

"…just want to give birth at the midwife, if you go to the midwife who usually handles it, it is better but the midwife is advised to go to the puskesmas, rather than at the puskesmas, I am more comfortable with the midwife myself…" (IU2, 36 years)

("…mau melahirkan di bu bidan saja, kalau ke bidan yang biasa menangani lebih enak tapi sama bu bidan disarankan ke puskesmas, dari pada di puskesmas saya lebih nyaman di bidan sendiri..." (IU2, 36 tahun))

High-risk pregnant women have autonomy, which is indicated by their unchanging intention to give birth by a village midwife, both at the beginning of pregnancy and before delivery, on the grounds that they feel confident and comfortable. This is in line with research conducted in the work area of the Kaliangkrik Health Center, Magelang Regency which showed that pregnant women would feel safer and more comfortable when giving birth at home because they would be more freely attended by traditional birth attendants and their families (Puspitasari, 2019).

"…It is recommended to give birth at the puskesmas with cadres and midwives. Can't be at home. I just obeyed if I was told to go to the puskesmas, I went to the puskesmas…" (IU1, 38 years)

("…Disarankan lahiran di puskesmas sama kader dan bidan. Enggak boleh dirumah. Saya ya manut aja kalau disuruh ke puskesmas ya ke puskesmas…" (IU1, 38 tahun))

The state of pregnancy health and information and advice from midwives and cadres regarding the condition of pregnant women who can experience complications during childbirth can shape the autonomy of decision-making for high-risk pregnant women in planning childbirth. This is in line with research whose results show that there are differences in delivery plans in which pregnant women initially refused to be referred to the puskesmas; after receiving education from the midwife about pregnancy problems and the risk of complications, pregnant women and their families were willing to be referred to the hospital (Amdad *et al.*, 2018).

In intention to prepare transportation to the delivery place, all the key informants plan to use private vehicles in the form of motorbikes with a ride. However, if a car is needed, all key informants and the family already have a village ambulance driver contact who can be contacted to take them to the place of delivery. The following are excerpts from in-depth interviews with key informants:

"…If you can still be detained, use a bicycle, your husband will accompany you. Later, when you are in a hurry, you can use an ambulance that is in the center of the hospital..." (IU5, 18 years)

("…Kalau masih bisa ditahan pakek sepeda aja dianter suami. Nanti kalau udah mepet bisa pakek ambulan yang di pustu…" (IU5, 18 tahun))

The intention of high-risk pregnant women in preparing transportation to the place of delivery is a form of freedom of decision-making in

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planning delivery and preventing complications.

High-risk pregnant women also received information about high-risk pregnancies from midwives directly during pregnancy check-ups, along with excerpts from in-depth interviews with key midwives:

> *"…patients are our first contact, we always screen them. I have a high risk pregnancy... I've been to the hospital before, my blood pressure was suddenly found to be 200, and I've had seizures in the past. Do you want something like this to happen again? Ma'am, screening is high risk, high risk is in the order you have to consult a doctor at the puskesmas…" (IK1, 46 years)*

> *("…pasien kontak pertama ke kita, kita kan selalu mengs-screening. Mbak kehamilannya jenis risiko tinggi…. dulu pernah ke rumah sakit, dulu pernah tiba tiba tekanan darahnya ditemukan 200, dulu juga pernah tiba tiba kejang. Mbak mau kejadian seperti dulu lagi? Mbak itu - screening risiko tinggi, risiko tinggi itu urut-urutannya mbak harus konsul ke dokter puskesmas…" (IK1, 46 tahun))*

Information is obtained directly (orally) from the village midwife and/or submitted back by village cadres personally orally by coming to the residence of high-risk pregnant women. Information that can be received well by high-risk pregnant women can be caused by the close relationship that is well-established between cadres and high-risk pregnant women. Access to information that is easy and well-accepted by high-risk pregnant women can shape decision-making autonomy during their pregnancy. This is different from research in the coastal area of Palu city on decision-making behavior by pregnant women in seeking health services which states that the information obtained by mothers when visiting health services is very limited. Mothers only get information by being shown the MCH handbook without informative explanations from health workers or cadres (Syam *et al.*, 2019).

Pregnant women at high risk get emotional support in the form of attention and instrumental support in the form of action, assistance, and financial support from their husbands. The following are excerpts from in-depth interviews with key informants:

> *"…My husband told me to check his blood pressure, he was told to do it routinely, he took medicine regularly. I'm afraid, sis, that it's bleeding, I think I'm afraid…" (IU 2, 36 years)*

> *"…I never do anything at home. Every day cleaning up husband's house before leaving for work…" (IU 5, 18 years)*

> *"…Yes, I went to check with my husband if I didn't work, sometimes with my nephew if my husband worked…" (IU 4, 36 years)*

> *("…Suami nyuruh periksa tok tensinya kan polae tinggi disuruh rutin itu aja, obat juga rutin diminum. Takut mbak katanya pendarahan yo nurut ae takut…" (IU 2, 36 tahun)*

> *"…Saya enggak pernah ngapa-ngapain di rumah. Setiap hari yang beres-beres rumah suami sebelum berangkat kerja…" (IU 5, 18 tahun)*

> *"…Ya dianter periksa sama suami kalau enggak kerja kadang sama ponakan kalau suami kerja…" (IU 4, 36 tahun)*

Emotional support is in the form of attention and instrumental support in the form of taking action by the midwife, helping with homework and financially by preparing maternity funds in accordance with the wishes of the pregnant woman's place of delivery. Social support from husbands in this study in the form of emotional and instrumental support has its own value for high-risk pregnant women and can form positive autonomy in decision-making for high-risk pregnant women regarding delivery planning and prevention of complications. This is in accordance with research conducted by Amelia and Darmadja (2019)_ that giving attention and support has special value for the wife as a sign of a good bond, so that it can assist in decision-making.

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The autonomy of all key informants in choosing a place or facility for maternity care chooses to carry out prenatal care in their respective village midwife practices on the grounds that they are close to home. The following are excerpts from in-depth interviews with key informants:

> *"… since the beginning of pregnancy, I have checked with the midwife here, close to home, right, if you don't check with the midwife, where else do you want to go…" (IU5, 18 years)*
>
> *("… dari awal hamil sudah periksa ke bu bidan sini, deket dari rumah juga kan, kalau enggak periksa ke bu bidan mau periksa kemana lagi…" (IU5, 18 tahun))*

The autonomy of key informants seen in determining the place of maternity care is different from the autonomy of pregnant women in other developing countries such as the study in Ethiopia which also shows that, although every woman has the right to participate in making her own healthcare decisions, more than two-fifths of them have no role in making healthcare decisions about their own health. Husbands play a major role in making healthcare decisions about their wives (Alemayehu and Meskele, 2017).

The results of the research from Alemayehu and Meskele are different from the results of this study which shows that husbands give full freedom to high-risk pregnant women to determine the place of pregnancy care during that time for the comfort and safety of pregnant women and fetuses, according to excerpts of in-depth interviews with key informants:

> "…consult first, yes, say that the midwife gave this direction. You said yes, if you were directed to the puskesmas, my husband said it was up to me…" (IU 2, 36 years)
>
> *("…berunding dulu, ya bilang kalau bidan memberi arahan gini. Bapak langsung iya, kalau diarahkan ke puskesmas, kata suami saya terserah saya…"(IU 2, 36 tahun))*

This is in accordance with research which states that husbands leave the decision entirely to their wives and support their wives' choices for comfort and to make wives more aware of their health conditions (Nurrachmawati *et al.*, 2018).

There is one main informant (IU2) who also has personal autonomy in determining the place for pregnancy check-ups by not continuing the routine check-ups at the puskesmas and not checking with specialists and prefers to continue the pregnancy check-up at the village midwife practice for reasons of fear and thinking. The following are excerpts from in-depth interviews with key informants:

> *"…At the puskesmas, I was directed to refer to a specialist, it was up to me where I wanted to refer, but I didn't go. If I'm told to do that, my mind will go all over the place, let me just go naturally. ….. Just believe in the power, Ms. the birth was smooth…"(IU2, 36 years)*
>
> *("…di puskesmas diarahkan untuk rujuk ke spesialis, terserah saya mau rujuk kemana, tapi saya tidak berangkat. Kalau disuruh gitu pikiran saya jadi kemana-mana, biar secara alaminya saya saja. ….. Yakin sama yang Kuasa saja mbak lahirannya lancar…"(IU2, 36 tahun)*

This shows that high-risk pregnant women have negative autonomy in prenatal care by not having examinations to specialists as directed by midwives. This is in accordance with research on the choice of place of delivery, where most of the pregnant women informants have the autonomy to make decisions on the choice of place and birth attendant. Women do not want to plan a delivery at the health facility because the perception of planning for delivery at the health facility is the same as expecting a problematic delivery (Nurrachmawati *et al.*, 2018).

Delivery carried out in health facilities with the assistance of health workers is an important step to prevent complications in childbirth (Aprilianti, 2017). The results showed that all key informants (IU1, IU2, IU3, IU4, IU5) had autonomy in planning and determining

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the place of delivery in health facilities and being assisted by health workers. Seeing the condition of the main informants who are high-risk pregnant women, midwives and cadres have provided advice and suggestions for giving birth at the puskesmas. However, there are still key informants (IU2, IU3, IU4) who have the autonomy to plan deliveries in their respective village midwife practices for reasons of close proximity, comfort and trust in the village midwife. The following are excerpts from in-depth interviews with key informants:

> *"…more comfortable in their own field, like their parents, if you don't know the staff at the puskesmas, you've never been there…"(IU2, 36 years)*
>
> *("…lebih nyaman di bidannya sendiri, kan seperti orang tua sendiri, kalau di puskesmas tidak kenal dengan petugas disana, kan tidak pernah kesana…"(IU2, 36 tahun))*

The closeness and comfort of the main informant with the village midwife is influenced by the intense interaction and communication that occurs every month during pregnancy care. The main informant's decision to plan childbirth in the village midwife's practice is in accordance with research which shows that the choice of place of delivery is influenced by the proximity of the midwife and pregnant women. The high trust of pregnant women to midwives can affect the autonomy of pregnant women in choosing a place of delivery (Amdad *et al.*, 2018).

There is a key informant (IU 4) who remains with her stance in choosing to plan delivery in the practice of the village midwife and make the puskesmas or hospital the second and last option if the village midwife does not handle it at the time of delivery. Following are the statements made by key informants:

> *"…I want to go to the midwife normally, I don't need to go to the hospital, but if the midwife can't handle it, maybe I'll be referred to a cesarean hospital…" (IU4, 36 years)*
>
> *("…Saya pengen normal ke bu bidan enggak perlu ke rumah sakit, tapi kalau tidak bisa ditangani bidan ya mungkin dirujuk kerumah sakit sesar…" (IU4, 36 tahun))*

The main informant's statement shows negative autonomy by still choosing to give birth in the practice of village midwives and making puskesmas and hospitals the second and last option. This is in accordance with research which states that puskesmas are the second choice of pregnant women for delivery services after midwives and hospitals are the last option if the results of observations and follow-up examinations from midwives and puskesmas do not show better conditions (Amdad *et al.*, 2018).

In addition, there are two main informants (IU1, IU5) who have the autonomy to plan deliveries at the puskesmas according to the advice of the village midwife and cadres due to a history of complications in previous pregnancies, previous delivery experiences and for safety reasons. The following are excerpts from in-depth interviews with key informants:

> *"...just go to the puskesmas, ma'am, the situation is like this for safety's sake, so you don't have to worry about it later, just go to the puskesmas. The midwife and the cadre also suggested going directly to the puskesmas if you really want to give birth…" (IU 5, 18 years)*
>
> *"…to the health center. I obeyed if I was told to go to the puskesmas, I went to the puskesmas. The second is also at the nursing home health center…" (IU 1, 38 years)*
>
> *"…what did I say, the main thing is safe…"(IU1, 38 years)*
>
> *("…ke puskesmas aja wes mbak, keadaannya juga gini demi keselamatan, biar enggak riwa-riwi nanti sekalian aja ke puskesmas. Bu bidan sama kader juga menyarankan langsung ke puskesmas kalo memang sudah mau lahiran…"(IU 5, 18 tahun))*
>
> *("… ke puskesmas. Saya manut kalau disuruh ke puskesmas ya ke puskesmas. Yang kedua juga di puskesmas panti…" (IU 1, 38 tahun))*

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("…apa kata saya pokok nya selamat…"(IU1, 38 tahun))

Awareness of the main informants (IU1, IU5) regarding the history of complications they have and the state of their pregnancy which is at risk and can experience complications during delivery will make the main informants have positive autonomy in choosing a place of delivery in adequate health facilities such as puskesmas. This is different from research conducted in the work area of Kaliangkrik Public Health Center, Magelang Regency which showed no significant relationship between the history of complications in pregnancy and childbirth with the choice of place of delivery (Puspitasari, 2019).

The facts obtained in this study indicate the need for education and assistance to high-risk pregnant women in preparing for delivery by carrying out P4K, especially before delivery, as well as assistance in preparing administration for referrals even though high-risk pregnant women have normal KSPR, so as to facilitate the referral process if complications occur. This cannot be separated from the role of midwives and cadres to increase the knowledge of high-risk pregnant women about the importance of planning delivery assistance with health workers so that childbirth can run smoothly and safely. In addition, high-risk pregnant women also need to increase their willingness to take an active role in planning delivery by complying with P4K and preparing administration for referrals before delivery even though they do not plan to give birth in a hospital so as to avoid delays in referral and treatment.

Increased knowledge and husband's support for high-risk pregnant women can shape the compliance of pregnant women in implementing P4K. P4K socialization and implementation also need to be aimed at the wider target community to indirectly establish partnership relationships with the community so that it can be one of the factors that can influence pregnant women to plan childbirth with the P4K program. Sustainable relationships between health workers, cadres, pregnant women, families and communities can be a promotive and preventive effort in preventing complications during childbirth so as to reduce maternal mortality.

CONCLUSION

Two of all high-risk pregnant women have negative autonomy in planning delivery intentions, namely they still choose to give birth at a midwife's even though there are risks in childbirth. Emotional and instrumental support from husbands has its own value for high-risk pregnant women and can shape decision-making autonomy for high-risk pregnant women in planning delivery and preventing complications. In addition, the lack of information from midwives and cadres regarding the preparation of blood donors and maternity funds can form a negative autonomy of high-risk pregnant women.

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Dengue Hemorrhagic Fever (DHF) Behavior to Prevent

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ABSTRACT

***Background**: Dengue Hemorrhagic Fever (DHF) is a disease caused by a virus that is transmitted by female mosquitoes, especially from the Ae. aegypti species. Knowledge and attitude factors are factors that influence the prevention of DHF. **Purpose**: To find out the knowledge, attitudes and practices of the community in preventing DHF and relationship between knowledge and attitudes, knowledge and practice, attitude and practice. **Methods**: This study used a cross-sectional design. The research location was Kelurahan 30 Ilir, Palembang City which consists of RT.11 and RT.16. The population in this study was housewives with a sample of 95 respondents using purposive sampling technique. The data were collected by interview using a questionnaire. **Results**: The results of statistical analysis showed that there was a relationship between knowledge and practice in DHF prevention measures (p value = 0.006), there was no relationship between knowledge and attitudes in DHF prevention measures (p = 0.480), attitudes and practice in DHF prevention measures (p = 0.723). Providing education to the community is important to do as an effort to increase DHF prevention behavior. **Conclusion**: DHF prevention behavior comprising the aspects of knowledge, attitudes and practices were good and there was a significant relationship between knowledge and DHF prevention measures.*

***Keyword**: Attitude, Dengue, Knowledge, Practice, Prevention.*

INTRODUCTION

DHF (Dengue Hemorrhagic Fever) is a disease caused by a virus that is transmitted by female mosquitoes, especially from the Ae. species. aegypti. WHO reported that the number of dengue cases has increased more than eight times over the last two decades, and it was the only infectious disease increasing due to the urbanization and environmental changes (WHO, 2020). WHO estimates that around 40% of the world is at risk of DHF, and there are around 390 million infections per year. The WHO DHF control strategy aimed to reduce deaths by 50% by 2020 (WHO, 2019). It is estimated that there are 390 million dengue virus infections per year in the world of which 96 million are clinically manifested. Another study on the prevalence of dengue estimates that as many as 3.9 million people have been infected with the dengue virus, and billions of people are at risk of being infected with the dengue virus. Although the risk of infection exists in 129 countries, 70% of the true burden is in Asia ((Scott; Brady Oliver J;Peter W. Gething; Samir Bhatt; Jane P. Messina; John S. Brownstein; Anne G. Hoen; Catherine L. Moyes; Andrew W. Farlow; Thomas W. and Hay, 2012).

In Indonesia, based on the data, the increasing trend of dengue incidence has occurred for more than 50 years. The island of Java accounts for the highest average number of dengue cases each year. In recent years, Bali and Kalimantan had the highest incidence while Papua Island, the easternmost region of the Indonesian archipelago, had the lowest incidence (Harapan et al., 2019).

Early identification of dengue infection is very important so that timely and effective quarantine can be carried out as well as vector control measures to prevent disease outbreaks (Chang et al., 2018). The knowledge and attitude factors influence the prevention of dengue fever (Sayavong *et al.*, 2015);(Rakhmani *et al.*, 2018) (Herbuela *et al.*, 2019)(Herbuela *et al.*, 2019);(Hossain *et al.*, 2021). A study on knowledge, attitudes and preventive measures for DHF in Sri Lanka and Dhaka, Bangladesh showed that on average the respondents had good knowledge,

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attitudes and practice related to DHF prevention (Jayawickreme *et al.*, 2021) (Abir *et al.*, 2021). The study in Malaysia by Selvarajoo et al. (2020) showed that the participants who had good knowledge were 50.7%, 53.2% of the people had a bad attitude and 50.2% had poor DHF control practices. While the study by Wong and AbuBakar(2013) in Malaysia showed that, regarding the awareness about DHF, the attitudes and preventive measures were quite good. The results of the analysis showed a significant correlation between demographic background, perceptions and knowledge about DHF and prevention practices (Wong et al., 2015). In the village of Orang Asli Peninsular Malaysia, it showed that knowledge and perceptions about DHF are an obstacle in taking steps to prevent DHF. Low knowledge and perceptions are less likely to practice dengue prevention (Chandren, Wong and AbuBakar, 2015). Knowledge of DHF, in La Lisa City, Havana, Cuba, has an influence with practice, but not with perception and practice (Castro et al., 2013). The practice of covering the water container with a lid and adding temephos in the water has shown the success of preventing DHF to reduce the production of immature Aedes (Waewwab et al., 2020). Providing education with audiovisual media can facilitate an increase in changes in the level of family attitudes and practices in preventing dengue DHF disease (Boonchutima *et al.*, 2017); (Hanklang, Ratanasiripong and Sivasan, 2018); (Arneliwati, Agrina and Dewi, 2019).

The data of the Office of Health of Palembang City in 2017 - 2019 stated that the Makrayu Public Health Center working area was one of the areas with the highest DHF case rate. From 2017 to 2020 there were 21, 14, 49, and 39 cases. respectively (Dinkes, 2019). This study aimed to find out the prevention behavior of DHF including knowledge, attitudes and practices in Kelurahan 30 Ilir in 2021.

METHODS

This study was an analytic observational study using a cross-sectional design. The research variables were knowledge, attitudes and practices. The research was conducted in February – June 2021. The research location was Kelurahan 30 Ilir, Palembang City, which consists of RT.11 and RT.16. The population in this study was housewives. The sample size was calculated using the sample formula obtaining 95 people. The sample was selected using purposive sampling (Sujarweni, 2014). The data were collected by means of interviews (Notoadmodjo, 2010). The data collection instrument used a questionnaire to measure the level of knowledge, attitudes and practices of the community in preventing dengue fever (Arikunto, 2006).

The data analysis was carried out using univariate and bivariate methods. Univariate analysis was conducted by tabulation to describe a frequency table of respondents' characteristics, knowledge, attitudes and preventive measures for DHF. while the bivariate analysis was conducted to find out the relationship between knowledge and attitudes, the relationship between knowledge and practice and the relationship between attitudes and practices. Bivariate analysis used Chi-Square test with SPSS 21 application. The degree of confidence used was 95% (α = 0.05) (Budiarto, 2002).

RESULTS AND DISCUSSION

Characteristics

This research was conducted on 95 respondents who were members of RT 11 and RT 16 of Kelurahan 30 Ilir. The distribution of respondents' characteristics described aspects of education, occupation, knowledge, attitudes and practices of respondents (Table 1).

Table 1. The Characteristics Distribution of 95 Respondents

Characteristics	n	%
Education		
a. High	51	53.6
b. Moderate	24	25.3
c. Low	20	21.1-
Occupation		
a. Employed	61	64.2
b. Unemployed	34	35.8
Knowledge		
a. Good	86	93.6
b. Moderate	9	9.4
Attitude		
a. Positive	63	66.3
b. Negative	32	33.7
Practice		
a. Good	79	83.2
b. Not good	16	16.8

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The above table shows that the respondents with higher education levels were 53.6%, those who work were 64.2%. For the description of behavior including aspects of knowledge, attitudes and practices, it showed that of the 95 respondents, 93.6% of them had good knowledge, 66.3% of respondents had positive attitudes and 83.2% had good practices.

The results of Table 1 showed that the average knowledge, attitudes and practices of respondents regarding dengue prevention were good. These results are in line with the studies conducted in Malaysia, Sri Lanka and Dhaka, Bangladesh, regarding knowledge, attitudes and preventive measures for DHF which stated that on average respondents had good knowledge, attitudes and practices related to DHF prevention (Wong and AbuBakar, 2013; Abir et al., 2021; Jayawickreme et al., 2021)(Abir *et al.*, 2021)). Knowledge is the result of knowing and is obtained from a person's process for something good. Attitude is a person's closed repractice to a given stimulus. While practice is a judgment/opinion that a person believes and practices. Knowledge is very important in shaping one's practices (Soekidjo Notoadmodjo, 2003).

Knowledge and Attitude

Table 2 describes the results of the analysis of the relationship between knowledge and attitude to prevent dengue.

Table 2. Relationship Between Knowledge and Attitude in Prevention of DBD

Knowledge	Attitude				Total		P Value (95 CI)	OR
	Negative		Positive					
	n	%	n	%	n	%		
Moderate	4	44.4	5	55.6	9	100	0.480	
Good	28	32.6	58	67.4	86	100	(0.413-6.653)	1.657
Total	32	33.7	63	66.3	95	100		

From the analysis table, it showed that the p-value was 0.480, which means that there was no significant relationship between knowledge and the attitude of preventing DHF. Similarly, the research result carried out by Karimah et al in Kuantan, Pahang showed that there was no relationship between knowledge about DHF and respondents' attitudes towards DHF (Aziz et al., 2015). Attitude is a person's response or repractice that is still closed to an object, stimulus, or topic.

It can also be interpreted as a person's tendency to act, both supporting or not supporting an object. Attitude is not yet a practice, but is a predisposing factor to a behavior. A complete attitude is formed by the components of cognition, affection and conation (Sunaryo, 2004).

Knowledge, Attitude and Practice

Table 3 describes the relationship between knowledge and attitudes with DHF prevention measures.

Table 3. Relationship Between Knowledge and Practice with Attitude and Practice, in Prevention of DBD

Variable	Practice				Total		P Value (95 CI)	OR
	Not Good		Good					
	n	%	n	%	n	%		
Knowledge								
Moderate	5	55.6	4	44.4	9	100	0.006	8.523
Good	11	12.8	15	87.2	86	100	(1,981-36.67)	
Total	16	16.8	79	83.2	95	100		
Attitude								
Negative	6	18.8	26	81.2	32	100	0.723	1.223
Positive	10	15.9	53	52.4	63	100	(0.401-3.732)	

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Total	16	16.8	79	83.2	95	100

The results of statistical analysis showed that for the relationship between knowledge and practice, the value of p = 0.006, which means that there was a significant relationship between knowledge and prevention of DHF. The OR was 8.523, meaning that the respondents with poor knowledge had the opportunity to have bad practices of 8.523 times in preventing DHF. Meanwhile, for the relationship between attitudes and practices, the p value was 0.723, meaning that there was no relationship between attitude and dengue prevention measures.

The result of the analysis showed that there was a significant relationship between knowledge and practice. This is in line with the research by Nguyen et al. (2019) on the incidence of dengue outbreaks in Vietnam, people who have better knowledge tended to have better prevention practices against dengue. The study by Castro et al. (2013), in the City of La Lisa, Havana, Cuba, stated that the knowledge about DHF had an influence with practice, but not with the perception and practice). In the Orang Asli village of Peninsular Malaysia, knowledge and perception of DHF, is an obstacle in taking practice to prevent DHF. Low knowledge and perceptions are less likely to practice dengue prevention (Chandren, Wong and AbuBakar, 2015). However, the study conducted by Nurain and Raof (2017) in Sepang, Selangor, showed that the knowledge was not associated with dengue prevention measures (Ain et al., 2017). This is in line with the theory put forward by Notoatmodjo (2003) stating that a practice taken by a person will be lasting if the practice is based on high knowledge and good attitude (Notoadmodjo, 2003). The level of a person's knowledge can basically be influenced by many factors. According to Mubarak (2007), several factors can affect a person's knowledge, including age, education level, occupation, interests, experience, and sources of information. One of the factors that can affect a person's knowledge is the level of education possessed by an individual; the higher the level of education of a person, the higher the level of knowledge s/he has (Mubarak, 2007). The results showed that the average respondent had a high level of education, namely high school and above, which was one of the factors that influenced the emergence of good knowledge.

The results of the analysis of the relationship between attitudes and dengue prevention measures showed insignificant results. The attitude had no relationship with dengue prevention measures. This result is different from that conducted by Al-Maleki and Alhoot et al. (2017) stating that there was a significant relationship between attitudes and dengue prevention measures (Alwan et al., 2021).

Knowledge and attitude are very important in forming a practice. Someone taking good DHF prevention measures is certainly based on a good understanding of DHF and a desire to make efforts to prevent it. The obtained data showed that the average education level of the respondents was high education (senior high school to higher education).

Education level is one of the factors that can affect a person's level of knowledge. Education in the individual will affect the ability to think; the higher the level of education, the easier one thinks rationally and understands the information received. A person's level of education will greatly affect his cognitive ability to receive and understand something, including information about DHF prevention. This cognitive ability will encourage a person to behave and act in accordance with his/her understanding of DHF prevention. The level of knowledge, attitudes and practices that are not good about preventing DHF are at risk of developing dengue disease compared to those who have a good level of knowledge, attitudes and practices. In practice, this study has limitations, namely the possibility of obtaining biased information due to filling out questionnaires based on memory recall. This study also used a cross-sectional study design, and, therefore, could not draw conclusions regarding causality of associations.

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CONCLUSION

The results of the study showed that there was a significant relationship between knowledge and preventive measures for DHF, while there was no significant relationship between knowledge and attitudes toward preventing DHF and knowledge with DHF prevention measures. It is hoped that the community will continue to make efforts to prevent DHF and the public health centers will continue to educate the public regarding the prevention of DHF

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Mental Health Promotion: Stop Self-Diagnosing Through Social Media

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ABSTRACT

***Background**: Mental health is increasingly being recognized as a severe problem. While there has been an increasing awareness of mental health and psychological wellbeing for economic and social development over the past two decades, there has not been a corresponding increase in mental health investment. Social media platforms allow healthcare practitioners to take full advantage of the potential of social media. However, this good thing is followed by a bad thing, where more and more information is accessible; people use that information to benchmark that they also have a "mental disorder" while not consulting a professional (psychologist/psychiatrist). Incidents like this are commonly referred to as self-diagnosis. **Method**: Therefore, this study will discuss the existence of information and promotion through accurate and explicit content related to self-diagnosis, using qualitative research with a case study approach. **Results**: The results obtained are that this accessibility allows the public to seek information about the symptoms they are experiencing, thereby facilitating early detection of mental health disorders. The power of social media to engage audiences to improve communication and expand the capacity to promote programs, products, and services should be valued in health promotion. **Conclusion**: Social media platforms, regardless of time or location, allow practically infinite opportunities to interact and communicate with others. This ease of use of on-demand communication may be critical in increasing social connection among people suffering from mental illnesses who have difficulty interacting in person.*

***Keyword**: Health Promotion, Mental Health, Self-Diagnosis, Social Media.*

INTRODUCTION

The Global Burden Research of Disease, conducted by IMHE (The Institute for Health Metrics and Evaluation), states that global health has continued to improve over the last 30 years as measured by the aged standard of Disability-Adjusted Life Year (DALY). After accounting for population growth and aging, the absolute number of DALYs remained stable. As stated in 2019, the primary health concerns in adolescents aged 10-49 years are HIV/AIDS, headache disorders, walking injuries, low back pain, and depressive disorders, which differ significantly between age groups. In contrast, ischemic heart disease, stroke, and diabetes are health issues that significantly contribute to health difficulties in adults aged 50 and up (Murray, 2020). Data reveals that mental health is also a disease that needs treatment. Mental health has been one of the most discussed topics in the last few years. Mental health disorders affect people's daily lives by limiting their ability to carry out daily activities such as household chores and active social participation. However, many mental illnesses are not treated because of stigma, fear of discrimination, and self-stigma (Hebben, 2019). As a result, mental health is increasingly recognized as a severe problem. Awareness of mental health and the importance of economic and social development has increased over the last two decades, but investment in mental health has not increased correspondingly. According to the World Health Organization news release in 2020, 1 billion people live with mental illness, 3 million die each year from alcohol use disorders, and one suicide every 40 seconds. Despite a significant decline in productivity worldwide, 75% of people with mental illness in low- and middle-income countries are not treated for mental illness. Without attempting to understand it, mental health issues have a worldwide and national influence on ill health,

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premature death, human rights violations, and economic losses. Dr. Tedros Adhanom Ghebreyesus, Director-General of WHO, has chosen mental health as a priority for the 13th General Work Program (GPW13) covering 2019-2023. According to the definition, community and individual empowerment are measured to obtain the best health. This requirement can only be met if their mental health and well-being are protected, and their rights are upheld. WHO has a Special Initiatives for Mental Health Vision, which strives to achieve the highest mental health and well-being for all people (World Health Organization, 2019). According to the Republic of Indonesia's Ministry of Health's Basic Health Research 2018, the prevalence of emotional disorders in the population aged 15 and above increased from 6% in 2013 to 9.8% in 2018. In 2018, 6.1 percent of the population was depressed. According to Basic Health Research data, suicide rates in adults aged 25 and up were 0.8 percent (women) and 0.6 percent (men) in 2013. (men). The frequency of major mental diseases such as schizophrenia has increased from 1.7 percent in 2013 to 7% in 2018.

People in Indonesia need to be more aware of mental health issues, and their mental health literacy needs to improve. Many still regard mental health issues or diseases as a disgrace that should not be mentioned. Frequently, this negative stigma makes mental health issues appear to be untreatable. People with mental illnesses began to talk about what was happening as science and technology advanced, and mental health experts began to use social media to deliver and promote mental health.

Researchers and healthcare professionals are becoming interested in the social media platforms they utilize for various objectives. This comprises physician professional development and continuing education, the establishment of medical networks and self-help organizations, the funding of medical facilities, the cooperation and coordination of work promotion in medical systems, and the monitoring of infectious illnesses. While social media platforms provide many great possibilities and benefits for public health practitioners, they also present certain obstacles. Detecting contagious disease outbreaks, monitoring emergencies, predicting illness trends, and assessing public awareness and response are the most critical. There has also been research into the possible applications of social media platforms for public health communication.

Regarding the social media platform, Huebsch et al. have suggested that healthcare professionals can build direct relationships with their clients. Health promotion planners need to integrate their social media platforms into their strategies and use their best creativity to maximize the potential of social media in marketing health products and services (Al-Dmour et al., 2020). The social media context is vast and constantly evolving, and new communication methods are emerging rapidly. Social media is an internet-based tool that allows individuals and communities to come together, communicate, share information, ideas, private messages, and images, and sometimes collaborate with others in real-time (Lee, 2018). But this good thing was followed by the wrong something that more and more information was available. People use this information to measure a "mental disorder" when a professional (psychologist/psychiatrist) does not assess the condition. Such an event is commonly referred to as self-diagnosis. Self-diagnosis is a long-standing problem, but it is becoming increasingly familiar with increasing public access to information via the internet and mobile phone technology. Online self-diagnosis also refers to those who make their medical diagnosis using their knowledge and skills without specialists in medical care, especially mental health (Robertson, Polonsky and McQuilken, 2014). One of the main reasons for not seeking mental healthcare is the social stigma towards mental illness and society's negative attitude towards mental illness and people with mental illness (Lee, 2018).

Of course, this is a discussion about health communication. Healthcare communication occurs at different levels, including individuals, groups, organizations, communities, and the mass media. Healthcare communications are the same as communications limited to transaction processing. The main difference in health communication is that it focuses on health information rather than general health information. Kreps summarizes adding "health" to the definition of communication. This allows

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health messages (prevention, risk, awareness, etc.) to be used for education and disease avoidance.

Health communication, in general, can be defined at several levels and embodies the overall approach to health promotion (Corcoran, 2007). Health promotion is critical in public health practice, but its definition is contentious. According to the World Health Organization, health promotion is the process of assisting people in managing and improving their health (Gardner, 2014). According to the Ministry of Health of the Republic of Indonesia, health promotion is an attempt to enhance the capacity of the community, in this case, to manage several factors related to health, community-based education, communities, and districts. This is a way people can help themselves. Based on the community's social culture, we can develop activities that need to include community resources that need to be supported by public policies related to health knowledge. This is stipulated in Health Minister Ordinance No. 1114/2005 (Nurmala et al., 2018).

Health promotion is a program related to the health of the Indonesian people and is expected to play a role in realizing Indonesia's vision for health development. Health Law No. 36 of the Republic of Indonesia in 2009 has a vision from the viewpoint of health development, raising awareness. Each individual's desire, willingness, and ability to lead a healthy life to improve public health is an investment in socially and economically productive talent (Susilowati, 2016). Health promotion is H. According to Leavell and Clark, it was brought to Indonesia by Indonesian public health experts by interpreting the five levels of prevention. Immediate treatment, disability-related restrictions, and implementation of rehabilitation measures (Harahap and Putra, 2019). Health is not only physical health but also mental health. Individuals or groups can now work on mental health-related health promotion.

METHODS

Qualitative research is a research activity that places the researcher or observer in the world under study. This type of research is in the form of practice to create a theoretical view of the world. Researchers or observers in qualitative research get information or data through notes in the field, conduct interviews, discussion/focus group discussion, and documentation in photos, recordings, or small notes to expand the results obtained. In qualitative research, researchers can use interpretive and naturalistic approaches, which means that researchers can study, explore, and interpret phenomena. Qualitative research begins with assumptions and how to use a framework, either interpretive or theoretical, in informing a study related to research problems that discuss the meaning of each individual or group who thinks related to social events or problems. Learning about a problem or event, in qualitative research, the researcher will conduct an investigation, collect data that is sensitive to one or more persons, and the location under study, as well as in conducting data analysis inductively/inductively, and also assign a determination to a pattern and themes. When making a presentation, in the end, it will summarize all the results of the opinions of research participants, reflections from researchers, comprehensive descriptions, and interpretation of the problem or event being studied, and some literature on a change (Creswell and Poth, 2018). Therefore, this study uses a qualitative research method with a case study approach. The case study approach is expected to make it easier for researchers to explore the existing reality. To produce the targeted data, the researcher collected some data in the form of posting photos/videos on several social media platforms discussing mental health, especially the discussion regarding self-diagnosis. To determine which social media to use, that is, by applying the desired social media characteristics and the intended amount of social media use. From the results of observations, materials that have been/heard, several data reports, and research related to the problems observed, the researchers set four social media platforms as data sources, including Instagram, YouTube, TikTok, and Twitter, with posting periods ranging from November (in 2021) to May (in 2022).

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RESULTS AND DISCUSSION

According to the 2017 Indonesian Internet Service User Association (APJII) survey, 54.68% of Indonesia's population uses the internet, an increase of 10.56 million from 2016. The growth is due to the extraordinary public interest in the internet. The age group with the most internet access in 2018 is the young age group between 19-34 years, which is 49.52 percent of the total usage. According to the same survey, 97% of internet users have accessed social media content. (Siswandari, Gayatri, and Rachmawati, 2021). The media dramatically benefits public health by disseminating health information and encouraging preventive behavior (Hong and Kim, 2020). "Media is the message," according to Marshall McLuhan, indicates that the channel used to deliver a message also provides information and influences how the message is seen and received by the recipient. Sources that are not seen as trustworthy or credible are less likely to influence specific actions. Similar to attitudes toward messages, attitudes toward the media that transmits messages may impact whether people self-diagnose and want to act (Hebben, 2019).

Based on the findings, social media has become an essential tool in the life of every individual who is facing the challenges of mental illness. Previous research states that people can use social media platforms to connect with others via virtual networks (such as Twitter, Instagram, Facebook, Snapchat, or LinkedIn) to share, co-create, or exchange various digital materials. Examples include data, text, images, and movies (Naslund et al., 2020). Several researchers have investigated message recipients' dynamic, communicative behavior and usage of various communication channels. This implies that campaign studies should focus on information sources or how to influence individual behavior change through campaign messaging. Because of the unique characteristics of social media, three variables are particularly essential in this study: subjective norms of information, relevant channel beliefs, and social media efficacy (Yoo, Kim and Lee, 2016).

Similar to how people with mental diseases may use online forums to discuss their mental health, mentally ill people may resort to self-diagnosis without the support of a medical specialist. According to Lansing and Andreassen, if expert medical health opinions were available online, customers would seek a diagnosis online rather than seeing a doctor. Self-diagnosis, on the other hand, is problematic because people may overlook essential facts or be misled about the cause of their symptoms. Some of the responsibilities of a professional diagnosis are ignored in the self-diagnosis of mental illness. Before diagnosing a person with a mental disease, trained practitioners go through numerous processes. Practitioners, for example, analyze an individual's background to understand behaviors that may result from a psychiatric diagnosis. Practitioners are trained to judge whether a set of symptoms a person displays satisfies the criteria for a specific disorder (Roberts, 2018).

When individuals experience mental health difficulties and seek help for mental health problems, they have hostile career, social, and health outcomes. It was also discovered that barriers and facilitators of getting treatment for mental health issues, such as statements from public health campaigns and peers, may shape attitudes and beliefs about getting help (Greenwell, 2018).

Many studies have found that people with mental disorders use social media platforms at about the same rates as the general population. Use ranges from about 70% among middle-aged and older people. From older to over 97% of younger (Naslund et al., 2020). Moreover, the use of social media is not limited to individuals with mental health disorders. Mental health practitioners, such as psychologists and psychiatrists, use different platforms to promote mental health, different types of illnesses, preventative measures, and medical services. The entire community needs help.

Who needs assistance? Hospitals, health systems, professional associations, pharmaceutical companies, patient advocacy groups, and pharmaceutical benefit corporations use social media for various reasons. Some of its applications include communication with the general public and patients, increased organizational visibility, marketing products and services, creating a forum for news about activities, promotions, and

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fundraising, providing a channel for resources and patient education, and providing customer service and support. It is estimated that 70 percent of healthcare facilities in the United States use social media, with Facebook, Twitter, and YouTube being the most popular (Lee Ventola, 2014). The presence of social media divides media users because social media use is tailored to users' needs and desires, rather than just the features of social media that attract the attention of active users.

According to Nasrullah, six characteristics exist in social media, namely Network (*Network*), Information (*Information*), Archive (*Archive*), Interactivity (*Interactivity*), Social Simulation (*Simulation of society*), and content by users (*User-generated content*) (Kurnia, Johan and Rullyana, 2018). A network is a computer infrastructure (*hardware*) connecting one computer to another. That is, social media has a character that can form a network among its users. The existence of this network is what ultimately builds social ties, not only nationally but can reach an international scale. On the other hand, networks are formed through technological devices, not just *tools*.

Information is an essential characteristic of social media; social media is able to represent information in different ways. The content produced is also able to reach many audiences. Information on social media is easily exchanged, and consumed by anyone, anytime and anywhere. Information in social media has the characteristic that information is encoded (encoding), which is then distributed through various devices until it can be accessed by users (decoding) (Widada, 2018). The archive is a character of social media that can store information and be used and searched at any time. All information disseminated on social media will not just disappear because there are features that can keep information in any form. Interaction is the most fundamental characteristic of social media. The existence of social media means that all networks in the world are interconnected. It doesn't take long to interact with other users; interaction through social media is not hindered by space and time. Gane and Beer say that "interaction is a process that occurs between users and technology devices." The existence of technology and its devices has become a very close and inseparable part of everyday life (Kurnia, Johan and Rullyana, 2018).

Simulation of society is a condition of interaction with the same picture as interactions in the real world. Although not realistic, that is what happens on social media. Interaction on social media must require a *login* to connect with other users. Users must also be open with their identities; information about users can be accessed by anyone if allowed and not in *privacy*. The existence of communication and interaction does not rule out the possibility that one user will meet another user face to face and even understand each other's character in the real world. User-*generated content* and information in any form on social media are the responsibility of the owner of the social media account content *uploaded* may be reproduced by other users. In social media, content producers (people who produce it) and content consumers (people who consume content) exist (Widada, 2018).

Based on the characteristics above, several platforms were chosen to be a forum for discussing health information such as *self-diagnosis*. The results of the four social media (Instagram, YouTube, TikTok, and Twitter) are that each media has a different character in disseminating information about *self-diagnosis*. Some features on Instagram have been In addition, users can also share content in the form of photos, short videos (15 seconds) to videos that are 60 seconds long. There are 2,200 characters available in sharing posts as a caption for a seat on Instagram. Compared to some social media applications, active Instagram users must have a strategy for promoting or conveying messages/content to get the attention of other users.

The number of Instagram accounts worldwide has reached 1 billion, with the number of reports in Indonesia as many as 61,610,000. Five things can affect the Instagram algorithm: interests, relationships, time, frequency of use, and *following*. Every minute the posts on the Instagram homepage are constantly vying to be seen.

Therefore, Instagram has become a social media that has its charm in promoting, doing business, or just as a forum for *content creators* (Wijayanti, 2021). In regard to promotions related to

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mental health, according to the findings, it turns out that not only certain activists or communities are promoting it, but professional practitioners such as psychologists and psychiatrists are also discussing it.

In the Ottawa Charter, health promotion action means; Developing public health policies; Creating environmental conditions that support health; strengthening community action for health; Developing personal skills; Reorientation of health services; and building mediation and advocacy with various strengths within the community to mediate and also advocate for the entire community, both individuals and groups/communities (Liliweri, 2018).

Figure 1. Instagram @jiemiardian, content about Self-Diagnosis

Health promotion actions are those carried out with data found by researchers, among other promotional activities carried out by Dr. Jiemi Ardian, in his post using the Instagram reels feature, discusses self-diagnosis. Self-diagnosis is addressed from the point of view of a psychiatrist. The position provides a new perspective for the people who watched the video. This video is an education that self-diagnosis is not a form of self-labeling but should be used as a basis for seeking appropriate treatment assistance. The existence of content concerning a self-diagnosis can boost the intention to seek help, such as treatment or advice from others.

Previous research has revealed that stigma makes it more challenging to seek help. People are afraid of other people's adverse reactions to requesting help and report anticipating being shamed. Others appear terrified of doctors' negative responses. However, since this was discussed and went viral on social media, mental health issues have grown more widespread. Previous research has demonstrated that sharing thoughts and experiences with people through online social networks may be beneficial to one's health. Online communities have been recognized as the most crucial feature of the internet, with the most significant impact on health outcomes. Research has found that social media platforms are helpful for networking. Because people are more comfortable interacting on their trusted networks, social networking sites (SNSs) (such as Facebook, Twitter, and Instagram) outperform digital media platforms explicitly designed for research projects (such as webpages and apps), including the site in their daily routine is easy because they are already using it (Santarossa and Woodruff, 2018)

TikTok is a social networking tool that allows users to create and share videos that were previously limited to 15 seconds but can now be up to 3 minutes long, with the ability to use various filters and BGM (background music). TikTok, a rapidly growing mobile video service with millions of users worldwide, has used lip-syncing templates since its inception to connect with its audience community. Social media platforms such as TikTok had 150 million daily active users in June 2018 out of 500 million monthly active users. This application was downloaded 48.5 million times in the first quarter of 2018. This application has the appeal of an application that has the ideological and technological environment of Web 2.0, where users are allowed to exchange messages.

Figure 2. TikTok account @Ekida (Medical Student)

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User-generated content (UGC) and social media are integrated forms of communication, allowing people to create content by building their networks. This has become the norm for internet/social media users who self-publish (Omar and Dequan, 2020). The data processed by researchers explain that TikTok is the right platform for health promotion programs, especially mental health. It provides information about mental health knowledge and describes preventive measures to deal with mental health problems. The long duration makes it easy for content creators to explain to other users, as has been done by the content creator on TikTok, namely Ekida Rehan, a medical student who always shares physical and mental health information. The video explains that it should not be labeled that we have mental health disorders because the information we get is the same as how we feel. The form of information provided is one way to promote mental health by presenting information that is more youthful and inspiring.

Instagram and TikTok already have nearly identical functionalities. People can get access to a variety of information, stories, and news. Most people who come from people with mental disorders or mental illnesses have the emotional and social context that these experiences provide. Stories told from another person's point of view, in particular, were proven to be an effective persuasive tactic since these stories were deemed more acceptable. Furthermore, there is evidence that personal tales improve memory by making information more salient and easier to process and inspiring message recipients to digest information. Social media has also been demonstrated to aid in modifying health-related habits. Social media has a two-way effect, which is a form of relaxation. Simultaneously, specific other goals may raise stress, which refers to the pressure caused by excessive use of information and communication technologies (Charalambous, 2019).

The rise of user-generated medical information broadcast via YouTube, the largest video-sharing social media platform, has the potential to bridge this gap by delivering knowledge in a rich visual format that is easier to understand and demonstrate. Over 100 million videos on YouTube provide information on the pathogenesis, diagnosis, treatment, and prevention of many medical diseases. Healthcare advice in video format can make complex medical information more understandable and practical for individuals with chronic illnesses, enhancing treatment efficiency (Liu et al., 2019).

Social media such as YouTube is an effective means of promoting preventive action against mental disorders to the entire community because the message will be able to be reached by all social media users. This helps the community. Based on statistical data, YouTube is the most popular media platform in Indonesia, aged 16-64 years. The percentage of YouTube usage is 88%, WhatsApp 84%, Facebook 82%, and Instagram 79%. This percentage increased social media use in Indonesia by 160.0 million users in January 2020 (Junawan and Laugu, 2020). The use of YouTube credibility from each account is so important, affecting the accuracy and objectivity of the information submitted to the public. Content performance that provides knowledge, skills, and confidence measures an account's credibility.

Figure 3. Discussion of Self-Diagnosis with Doctor Tirta via Volix Media on YouTube)

On YouTube, users are given the freedom to produce content which, of course, is always under YouTube's supervision. Content on YouTube has different durations, content can be created for more than 1 hour, so this is the right choice if there is information and education about health. The research results explain that health information requires forums such as YouTube to clarify information on other social media. Although only a little discussion on YouTube Volix Media with Dr. Tirta, but it can be concluded that the community still needs much information and education about mental health disorders. This is

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indicated by the many people who carry out self-diagnosis, especially among young people.

The importance of health promotion carried out by individuals/groups, government agencies, and mental health service institutions because it can positively impact the community. Community involvement is also crucial in preventing behavior and understanding mental health's importance. Every message given on social media has many positive impacts where early treatment can be done if they have complaints about their mental health. Still, information overload also leads many people to misunderstand, making the trend of self-diagnosis commonplace.

Exposure to campaign messaging can also directly impact people's attitudes and intentions to change their behavior without relying on other indirect channels (Jeong and Bae, 2018). As a result, despite the tiny effect size, the overall conclusion of the study results should be that campaign-generated dialogues positively improve campaign-targeted health outcomes. Previously, the public could obtain information on diagnosing and managing the illness through leaflets and books. However, technological and communication improvements make it simpler for self-diagnosis to differ for various reasons.

This accessibility enables people to obtain information regarding the symptoms they are experiencing, aiding the early detection of mental health illnesses (Ryan and Wilson, 2008). For example, with the use of Twitter. Twitter is a social media that allows users to exchange information with only 140 characters. Twitter is one of the social media that is still popular among certain people. On July 1, 2017, Twitter was ranked third on social networking websites, with 400 million monthly visits. In early 2017, users reached 328 million, increasing by 14%. Productive users totaling 77% come from Indonesia. Therefore, Indonesia is mentioned as one of the countries with the most significant number of users worldwide (Junawan and Laugu, 2020).

For this reason, using social media such as Twitter to discuss *mental health* is the right choice to facilitate users to share opinions. The most important thing about Twitter is that every idea in the form of hashtags can invite many users to get that information. Health information such as *self-diagnosis* on Twitter is still being discussed. In other words, knowledge about mental health can also be obtained, and freedom of opinion is given.

Figure 4. Discussion of Self-Diagnosis on Twitter

In addition, Twitter is a social media platform that globally invites users from various countries to discuss, share opinions, and exchange knowledge from the community's point of view and from different professional parties who provide their arguments. Of course, this freedom is essential for Twitter to promote health about self-diagnosis. That's what Payung Jiwa does by sharing information about mental health via Twitter. This social media account is known as a platform that departs from the anxiety of psychology students about mental health problems in Indonesia. Payung Jiwa is a platform that cares and becomes a platform for sharing individual psychological issues.

Compared to ordinary social media users' secondary privacy education, healthcare professionals' engagement in social media-based communication has been more restricted and regulated. This could explain why people are increasingly sharing health information via social media. Many healthcare professional organizations have developed policies to protect patients' privacy when talking with physicians via social media. Several observations were made about the relationship between public stigma and self-diagnosis. First, while the diagnosis'

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legitimacy is still being questioned, the stigma may be reduced if the public is aware that someone is self-diagnosing. Second, because of the ubiquity of self-diagnosis on internet forums, new approaches for examining stigma were developed, focusing on how self-diagnosed persons convey the fact that they have (or believe they have) a mental illness. If the individual is not demonstrating particular symptoms associated with their sickness or the indicators are not visible, society may think there is no reason to treat the self-diagnosed individual differently.

Many people do not seek mental healthcare due to socioeconomic or geographic barriers; many do not experience these issues and continue to avoid treatment. This suggests that even when a person is experiencing distressing symptoms that interfere with daily functioning, behavioral barriers may still prevent them from seeking treatment. As a result, increased mental health literacy in the general public is required. If this is accomplished, self-diagnosis may improve due to a better understanding of mental health conditions. This increase in self-diagnosis may encourage more people to seek treatment (Atlas, 2018).

The use of social media for digital promotion, mainly through social media, directly impacts increasing access to healthcare. The ability of social media to engage audiences and expand the capacity to promote programs, products, and services should be valued in health promotion. This strategy enables more direct engagement with stakeholders through multimedia channels that can track real-time feedback on material and themes. However, it raises concerns about data security, patient privacy, trustworthiness, and information coverage in underserved areas (Pinto, Antunes and Almeida, 2021). When providing information, it is vital to pay attention to the truth, especially when discussing disease diagnosis and symptoms connected with health problems, particularly mental health diseases. The situation will worsen if social media users use existing health information to self-diagnose.

CONCLUSION

The above findings indicate that the use of social media to share health information continues to increase. The growing popularity of social media among patients and healthcare professionals could provide an excellent opportunity for researchers to create social media-based health promotion initiatives and reduce social disparities in healthcare. Social media platforms such as Instagram, TikTok, YouTube, and Twitter offer almost endless opportunities to connect and interact with others, regardless of time or place. The ease of such on-demand communication could be critical for increasing social connection among people with mental illness who have difficulty interacting in person. As seen in promoting mental health, social media can improve communication and relationships, especially when it comes to self-diagnosis due to interactions between users who may exaggerate and think they are sick, despite not having a medical evaluation.

These applications make it easier for users to share information more freely since there are fewer technical constraints. Several studies have examined the notion of collaborative behavior in forming online health knowledge. Further research is needed to fully understand the significance of social media technology for health promotion, its usefulness, and ways to use online social media (Santarossa and Woodruff, 2018). Online communication and the opportunity to connect with others anonymously may be critical features of social media, particularly for people suffering from highly stigmatizing health problems like severe mental illness. The media is an essential source of knowledge regarding mental health, especially when stigma keeps the subject hidden in interpersonal encounters. The media generally works hard to educate the public about mental illness by delivering information from numerous sources.

Some data can be trusted, while others may disseminate lies. The critical health concern is to help people recognize their vulnerability to illnesses and get them the expert care they need if they are indeed ill. People use self-reports of their behavior to determine if they are depressed or not. The three stages a person takes to accept risk and seek therapy are as follows: (1) accurately identifying behavioral symptoms, (2) believing that symptoms are diagnostic of depression, and (3) believing that the intervention may address symptoms. All three stages can be influenced by the

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design of the self-diagnosis depression inventory (Raghubir and Menon, 2005). Many people who meet the diagnostic criteria for mental disorders do not seek professional help. It is the responsibility of all parties, both the sender and the recipient of the message, to filter all health information that is shared so that there are no misunderstandings in interpreting any information. However, valuable lines of research have emerged in the field of health promotion; not only physical health but mental health is also a concern of almost all walks of life. Further research is needed to identify that using social media makes it easier to promote mental health throughout society. Not only that, but it also requires the role of patients in social media-based health interventions and how to encourage the dissemination of current, accurate, high-quality, evidence-based medical knowledge.

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The Role of the Animation Film "Kanca Cilik" in Increasing Student's in Relation to Mental Health Help-Seeking Behaviour

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ABSTRACT

***Background**: Mental health problems in adolescents or grade school students saw an increased prevalence in 2018 compared to 2013. Some causes of such an increase were poor knowledge and low self-efficacy in relation to help-seeking behaviour in adolescents, especially those attending rural schools. Preventive and promotive efforts can be applied to increase knowledge and self-efficacy in relation to help-seeking behaviour in adolescents. Using a film for health promotion is highly suitable for altering the behaviour of adolescents. **Objective**: This study aims to analyse differences in the levels of mental health knowledge and self-efficacy among students in rural schools in relation to help-seeking behaviour using the animated film "Kanca Cilik." **Methods**: This study used a quasi-experimental, time-series design and a control group. The population of this study consisted of 156 students aged 12–19 years who attended rural schools. Sampling was conducted using the purposive sampling technique. **Results**: The characteristics of respondents of the intervention and control groups had a p value > 0.05. The knowledge and self-efficacy of the intervention group in relation to help-seeking behaviour had a p value < 0.05. Meanwhile, the knowledge and self-efficacy of the control group in relation to help-seeking behaviour had a p value > 0.05. **Conclusion**: There was an equality of respondent characteristics in the intervention and control groups. There was a difference in the mean values before and after film screening intervention, but there was no difference in the control group.*

***Keywords**: Film, Knowledge, Mental Health, Self-efficacy.*

INTRODUCTION

Mental disorders and other health problems now affect all aspects of life. In a 2021 annual survey, nearly 29% of adults were projected to experience mental health problems. According to the survey, mental health problems make up the most common global health problems, with nearly 3.8% of the world's population affected by depression. Currently, an estimated 280 million cases of depression have occurred globally. However, the majority of people with mental health problems do not use any professional health services for treatment (Riskesdas, 2018).

The behaviour of seeking mental health services is called help-seeking behaviour (Mortal, 2018). In various developing countries, this behaviour is still minimally practiced (Prawira, 2020). In these countries, only one in five people with depression prefers to take modern medications, while the rest do not take any treatment at all (Umubyeyi et al, 2016). The planet-wide COVID-19 pandemic that took place in the years from 2020 to 2022 had resulted in an increase in mental health problems (Widnall et al, 2022). Forty-one studies on COVID-19-related mental health problems revealed that a person with mental health problems due to the COVID-19 pandemic experienced delays in finding mental health assistance (Mustikawati, 2021).

In Indonesia, the number of cases of mental disorders increased to 6.1% in 2018 among depressed 15-year-olds and older individuals. In that year, only 9% of the population received treatment from professionals, while the remaining 91% did not undergo any treatment[6]. The results of a survey at a tertiary institution in Indonesia revealed that out of 629 students who experienced mental health problems, 40.1% sought formal mental health assistance, 33.6% sought informal mental health assistance, and 26.3% did not seek any mental health assistance. In 2018, another survey was conducted on a

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group of adolescents, and it was found out that 180 of them did not know that there were psychological or mental health services available, perceived a stigma towards mental health services, and lacked an understanding of campaigns regarding mental health services (Jung et al, 2017).

The help-seeking behaviour is an adaptive coping mechanism done by someone with mental health problems. One of the obstacles to this help-seeking behaviour is the stigma surrounding mental disorders and mental health services (Dal Bosco et al, 2021). Stigma, distinguished into self-stigma and public stigma, creates obstacles to gaining knowledge and developing self-efficacy in seeking mental health assistance. A lack of knowledge related to mental health problems may deter a person from behaving properly in seeking mental health assistance (Alfianto, 2019). Several studies in Indonesia unveiled that a person with mental health problems is seen as being possessed by a spirit. Thus, it is a public belief that they should seek mental health assistance from traditional leaders or "*orang pintar*" (people believed to possess supernatural powers), which constitutes an informal source of assistance. Some people in isolated places or rural areas even give up seeking mental health assistance altogether and, instead, resort to the use of *pasung* (physical confinement, usually with shackles, rope, etc.) (Guntur, 2022).

Studies regarding adolescents' knowledge of mental disorders or mental health problems are scarce. Many adolescents do not think of mental health problems as important (O'Reilly et al, 2018). They assign more importance to physical health than to mental health. This has set an obstacle to the search of mental health assistance. A study in 2019 showed that adolescents prefer talking to their peers to seeking mental health services (van de Toren et al, 2020). They do not seek formal mental health services to address mental health problems. In addition, a study with 538 adolescent respondents regarding help-seeking behavior that was conducted in 2022 stated knowledge/literacy and awareness or self-efficacy factors hinder adolescents from seeking help (Siddique, 2022). School-age adolescents tend to choose formal services such as seeing a doctor or professional staff. Therefore, knowledge and self-efficacy play an important role in changing help-seeking behavior (Sanghvi, 2022).

Someone who has good knowledge and self-efficacy will be able to improve his health status (Alfianto, 2015). Therefore, it is necessary to make some efforts to conduct health promotion, whose types and methods currently vary. Health promotion is able to influence a person into behaving better (Wijayanti, 2022). One of the health promotion methods currently on the rise and well-liked by adolescents is to use content such as films. Research findings showed that health promotion media greatly influence the prevention of reproductive health problems in adolescents. There are a diversity of film types that can be used as media for health promotion (Susanto et al, 2020) one of which is animated films that are useful and suitable for all age groups. It is expected that the use of an animated film for health promotion will improve literacy about the prevention of health problems (Botchway & Simpson, 2018).

The animated film "Kanca Cilik" is a film containing education about help-seeking behavior that uses the peer education approach (Ramadhani, 2023). This approach is highly appropriate for youth, especially as some adolescents in a country also show strong social behavior in preventing mental health problems through peer relationships. This animated film has a philosophy about peers telling each other stories of their own (Harianti, 2021). This behavioral education film tells adolescents to seek mental health assistance through formal and informal approaches. This study attempted to analyze the effectiveness of the health promotion intervention using the animated film "Kanca Cilik" on self-efficacy in seeking mental health assistance among adolescents attending rural schools. The problem formulated for this study was how the animated film "Kanca Cilik" affected self-efficacy in seeking mental health assistance among adolescents attending rural schools. This research is a promotive and preventive effort of health promotion on the importance of seeking mental health assistance in the school environment.

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METHODS

This study uses a quasi-experimental time-series design with a control group. The population in this study consisted of 156 adolescents who were attending rural schools in Bantur District, Malang Regency, and 87 of them were used as sample. Sampling was conducted using the purposive sampling technique. The inclusion criteria in this study were adolescents aged 13–19 years, attending rural schools, living with or without mental health problems, and participating in the intervention activity until the end. The research was conducted at the location of one of the Islamic education foundations in Bantur District from January to February 2023.

The measuring instruments used in this research were the Mental Health Knowledge Questionnaire (MHKQ) and the General Self-Efficacy Scale (GSE). These instruments were translated into the Indonesian language by English language and mental health experts. The MHKQ has 20 close-ended questions with answers including true, false, and don't know. Each question item is added up to a total score between 0 and 20, with higher results indicating higher knowledge of mental health. The first indicator of the MHKQ is the characteristics of mental health and mental disorders (1, 2, 3, 4, 7, 8, 11, 12, 15, and 16), the second indicator is belief in the epidemiology of mental disorders (4, 5, 6, 9, 10, 13, and 14), and the third indicator is the awareness of mental health promotion activities (17 to 20) (Yin et al, 2020). The MHKQ was tested for validity and reliability, with a Cronbach's alpha of 0.912. The second instrument, the GSE, consists of 10 statement items on a Likert scale (1 = not true at all, 2 = hardly true, 3 = almost untrue, and 4 = exactly true). The GSE indicators include emotion, optimism, and satisfaction with a performance. The total score of 10–40 is obtained by adding up all statement items (Schwarzer & Jerusalem, 1995). The higher the value the better the efficacy. The GSE was tested for validity and reliability, with a Cronbach's alpha of 0.872.

This research measured knowledge and self-efficacy twice for each episode of the film. The intervention group was taken to screen the first episode of the film that focused on the behaviour of seeking mental health assistance from peers, the second episode that focused on the behaviour of seeking mental health assistance from parents, and the third episode that focused on the behaviour of seeking mental health assistance from professionals/doctors. At the end of each episode, the respondents' knowledge and self-efficacy were measured. The control group was measured twice before and after the screening of the three episodes. After the intervention was administered, a data analysis was carried out using the t-test, given that the data on knowledge and self-efficacy were normally distributed (with values of 0.619 and 0.505). A homogeneity test was conducted using the Levene's test, with values of 0.800 (> 0.05) and 0.682 (> 0.05) for knowledge and self-efficacy, respectively, indicating that the sample was homogeneous. Additionally, a chi-square test was also carried out. This research received an ethical approval from the Chakra Brahmanda Lentera Institute, with approval letter No. 0170/028/II/EC/KEP/LCBL/2023.

The methods section contains a clear description of the instruments and the research scheme and methods used, which can be useful for other researchers in the case that they intend to replicate and check for validity if necessary. Additionally, references should be given to the methods used. Studies using animal or human subjects must include research ethical approval.

RESULTS AND DISCUSSION

Table 1. Respondents' characteristics (n=87)

Characteristics	Intervention	Control	*p*
Age			
12–15 Years	21 (48.8%)	16 (36.4%)	0.562
16–19 Years	22 (51.2%)	28 (63.6%)	
Gender			

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Male	12 (27.9%)	14 (31.8%)	0.461
Female	31 (72.1%)	30 (68.2%)	
Level of Education			
Junior High School	17 (39.5%)	13 (29.5%)	0.671
Vocational High School	26 (60.5%)	31 (70.5%)	
Mental Health Experience in the Past Three Months			
None	12 (27.9%)	15 (34.1%)	
Anxiety	11 (25.6%)	15 (34.1%)	
Smoking	4 (9.3%)	7 (15.9%)	0.710
Stress	2 (4.7%)	1 (2.3%)	
Difficulty Concentrating	4 (9.3%)	2 (4.5%)	
Gaming	1 (2.3%)	1 (2.3%)	
Anger	2 (4.7%)	1 (2.3%)	
Difficulty Sleeping	7 (16.3%)	2 (4.5%)	
Experience Seeking Mental Health Assistence			
Don't Know	15 (34.9%)	20 (45.5%)	0.414
Never	26 (60.5%)	21 (47.7%)	
Once	2 (4.7%)	3 (6.8%)	
Mental Health Information Source			
Mass Media	4 (9.3%)	11 (25%)	
Internet	31 (72.1%)	32 (72.7%)	0.390
A Certain Person	8 (18.6%)	1 (2.3%)	

Table 1 provides data on the characteristics of the respondents who received the animated film "Kanca Cilik" intervention and the control group respondents. Based on the table, most of the respondents were aged 16–19 years, female, and with the latest education level of vocational high school. Most of the respondents experienced no health problems in the last 3 months, never sought mental health assistance, and gained mental health information from the Internet. The overall characteristics of the respondents in both the intervention and control groups were evenly distributed as evidenced by p values > 0.05.

Table 2. Differences in the levels of knowledge and self-efficacy of the intervention and control groups before and after intervention (n=87)

Variable	Mean ± SD	t	*p*
Knowledge of the intervention group (n=43)			
Pretest	11.23 ± 5.042	4.567	0.000
Posttest	13.79 ± 4.554		
Self-efficacy of the intervention group (n=43)			
Pretest	23.91 ± 6.233		
Posttest	29.60 ± 4.676	6.929	0.000
Knowledge of the control group (n=44)			
Pretest	15.70 ± 3.377	0.142	0.391
Posttest	15.81 ± 4.565		
Self-efficacy of the control group (n=44)			
Pretest	28.67 ± 6.007	2.079	0.337
Posttest	31.19 ± 4.344		

Table 2 shows that the average levels of knowledge and self-efficacy of the intervention group increased before and after intervention. The same was also true to the control group, but the two groups had different p values.

Mental health is important for every individual. It should be managed from pre-marriage to old age. It is important to maintain the quality of health, especially mental health, during these phases of life (Keliat, 2019). In some cases, the onset of psychiatric problems appears in adolescence, which is often where the prodromal phase starts. This phase will continue into early adulthood. Someone who is not able to carry out mental health management properly in his/her

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adolescence will experience a symptom called early psychosis. It is an early symptom indicating the development of schizophrenia (Damanik, 2019).

The main prevention effort from an early age is to carry out health promotion about mental health in schools (Källmén & Hallgren, 2021). Schools are attended by teenagers, who are at high risk for psychiatric problems such as depression, which may lead to suicide (Källmén & Hallgren, 2021). Some of the factors that cause mental health problems in adolescents are knowledge and environmental factors such as support from peers, family, and teachers. Cases of bullying, sexual violence, and physical violence are currently the biggest factor in a teenager's experience of psychiatric problems (Richter et al, 2022). Besides, nowadays, there is a stigma developing in society surrounding psychiatric problems or mental disorders, which we often experience and encounter. The stigma that arises in these cases can hinder accelerated healing or the maintenance of positive coping mechanisms for survivors of mental problems or disorders (Abuhammad & Al-Natour, 2021).

The stigma held in society about mental disorders or increased psychiatric problems can also discourage someone from seeking mental health assistance from either professionals or non-professionals (Stangl, 2018). This phenomenon is still frequent in urban areas. We still encounter cases such as people believing in shamans or *orang pintar* on family members who have mental disorders or the confinement of people with mental disorders in *pasung* in urban areas (Doll, 2021). The main factor in this problem is that the family or caregiver feels ashamed or unable to care for the family member who has mental disorders[29]. It is for this reason that stigma often arises in society against someone who consults a psychiatrist for having a mental disorder. This is a common occurrence in developing countries (Kohrt, 2020).

These cases reflect that there is a lack of knowledge and self-efficacy in relation to help-seeking among adolescents. A person's lack of knowledge is closely related to his/her inability to show a response, a change, or a pattern of human dysfunction. Adolescents' low knowledge of mental health problems and especially efforts to prevent mental health problems will have an impact on their self-management throughout their lives (Sezgin & Punamäki, 2020). Self-management itself is also influenced by how they regard the importance of help-seeking behaviour. It is true that very few among adolescents in rural areas care about mental health problems. Many people in the village think that people who experience mental problems acquire the mental problems from spirits, predecessors by hereditary means, or other people who have evil intentions against them. This results in adolescents in the village not having a clear understanding of mental health and lacking help-seeking behavior (Ayuwatini, 2018).

The lack of knowledge in adolescents also affects their self-efficacy in seeking mental health assistance (Kumboyono & Alfianto, 2020). Self-efficacy itself means a person's ability to carry out a responsibility or task to achieve a goal. If self-efficacy is changed for the better by knowledge, confidence will arise in the person's abilities to produce something optimally. Self-efficacy is also important in encouraging the person to act in preventing health problems[34]. With clear beliefs and goals, the person will have good self-efficacy. Conversely, if the person has insufficient knowledge of his/her help-seeking behavior, then his/her self-efficacy will not be maximized or optimal. This will result in the behavior of seeking mental health assistance continuously being considered unattractive or not a priority in his/her life.

A variety of methods can be applied to improve a person's behavior in seeking mental health assistance. One such method that is currently liked by or appealing to some teenagers and children is to use a film (Sowa, 2018). In many cases today, health education is carried out using audio-visual media to optimize the prevention of health problems, as in the COVID-19 pandemic last year. Health promotion is often carried out using audio-visual media, such as films or public service advertisements. The use of films as health promotion media is considered a novelty widely accepted by society. A number of health institutions currently provide education through films or digital posters. Now, people on nearly all levels

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of society, both in villages and cities, are able to easily access health services via smartphone applications (Nastiti, 2021).

Animated films can be enjoyed by people of all ages. They used to be primarily enjoyed by children only, but now they are also preferred by teenagers. They have a significant impact, especially on the level of knowledge of someone who is especially good with imaginations. Many people think that watching animated films will give a child-like impression to a person. However, in reality, animated films are often regarded as futuristic, making them well-liked by teenagers and even adults (Sri Nurani et al, 2022). Through this animated film intervention, respondents experienced changes in both their level of knowledge and self-efficacy in seeking mental health assistance. Therefore, it is concluded that the animated film intervention used in this study was highly effective as a medium for health promotion for the intervention group.

CONCLUSION

There is a similarity in respondents between the intervention group who screened the animated film "Kanca Cilik" and the control group. Both groups experienced increased knowledge and self-efficacy in seeking mental health assistance, but there were differences in the value of knowledge and self-efficacy between them. It was concluded that the animated film "Kanca Cilik" was effective in increasing the knowledge and self-efficacy of village students in seeking mental health assistance. In other words, animated films offer an alternative method of health promotion in the prevention of mental health problems in schools and communities. So that the method of health promotion through an animated film is an alternative choice in preventing mental health problems at school or in the community. Therefore, through health promotion the film can be used as a mental health school health program in improving life skills and preventing mental health problems in schools.

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The Flow of Social Environmental Determinants of Disabilities on Lepers in Tuban City

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ABSTRACT

***Background**: Leprosy is a neglected tropical disease considered rare in most areas despite having a relatively high incidence in some countries. **Objective**: Analyze the flow of determinants of the social environment that can affect the occurrence of disability in lepers and their impacts. **Method**: Research using a qualitative approach. The research was conducted in Tuban Regency, East Java Province. The informant selection technique uses a purposeful sampling technique. Data analysis uses triangulation techniques. **Results**: The frequency of leprosy in Tuban Regency tended to decrease from 2014-2019. Leprosy distribution occurred in 18 sub-districts; Lepers were found every month in 2019 with various characteristics of lepers that cause the emergence of leprosy and disability in leprosy. The total number of informants in this study was seven informants. Determinants of disability in lepers include informant characteristics and social environment, including knowledge, contact history, family support, self-confidence, and impact. **Conclusion**: In this study, the social environment that most impacts the occurrence of disability in lepers is the informant knowledge factor. Informant knowledge is influenced by education, a large network of friends, and technological literacy. Education will show the type of informant work, and the type of work will determine the income of the informant; income determines economic status. Economic status contributes to food intake, medication seeking, and the home's physical condition. The duration of leprosy treatment will affect the worsening of the disability if good self-care is not carried out and always use PPE when doing activities.*
***Keywords**: Disabilities, Environment, Knowledge, Leprosy, Social.*

INTRODUCTION

Leprosy is a neglected tropical disease considered rare in most areas, although it has a relatively high incidence in some countries, (Jariyakulwong, Julanon and Saengboonmee, 2022). The emergence of leprosy is an interaction between various causative factors, namely individual factors (host), *Mycobacterium leprae* leprosy bacteria (*agent*), and the environment, through a process known as the chain of transmission which consists of 6 components, namely the cause, source of transmission, how to get out of the source of transmission, how to enter the host and the host. By knowing the process of infection or the chain of disease transmission, appropriate interventions can be carried out to break the chain of transmission, (Kemenkes RI, 2019).

Poor management of leprosy cases can cause leprosy to become progressive, causing permanent damage to the skin, nerves, limbs, and eyes (Kemenkes RI, 2019). Leprosy is a public health concern related to disability, deformity, stigma, and discrimination of affected individuals, (Chokkakula *et al.*, 2020).

The presence of G2D at the time of diagnosis indirectly indicates delayed

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detection, due perhaps to poor awareness in the community about the early signs of leprosy and the importance of seeking treatment, (World Health Organization (WHO), 2020). The distribution and spread of endemic leprosy are closely related to the social determinants of health that cause inequality, which include poor housing conditions, low education, low income, gender inequality and ethnic-racial inequality, (Ramos *et al.*, 2021).

There are 127 countries (out of 221 countries) that provided leprosy data to WHO in 2020. The registered leprosy prevalence (number of cases on treatment at the end of 2020) was 129,192, at a rate of 16.6 per billion population. Globally, 127,396 new cases were reported, for a case detection rate of 16.4 per million population. The highest proportion of both cases registered for treatment (61.1%), and new cases detected (66.6%) were in Southeast Asia. Brazil, India and Indonesia continue to report >10,000 new cases each, (WHO, 2021).

Throughout 2020, there were 8,629 new cases detected among children, equivalent to 6.8% of all new cases. Southeast Asia accounted for 62.3% of all new child cases, with India reporting 3,753 and Indonesia 1,126 new child cases. Of all new cases of G2D leprosy, 308 (4.3%) occurred in children. Another 68 countries reported 7,198 new cases of G2D. Over a third (37.7%) reported from Southeast Asia, 33.9% from Africa and 22.4% from America, (WHO, 2021).

There are 23 global priority countries for leprosy, accounting for 121,358 new cases or 95.3% of all new cases globally, corresponding to a rate of 40.3 per million population. India (65,147 new cases), Brazil (17,979 new cases), and Indonesia (11,173 new cases) accounted for 83.21% of new leprosy cases detected worldwide in 2020, (WHO, 2021).

In 2020 in Indonesia, there were 10,976 new cases of leprosy, with 4.03 per hundred thousand population and 12,254 registered cases of leprosy. There were 1,229 new leprosy cases in PB and 9,747 new leprosy in MB. There were 1,134 cases of leprosy in children <15 years (10.33%). There were 6,915 cases of male gender and 4,061 cases of female. The level of disability 0 is 9,176 cases (83.60%), and the level of disability 2 is 673 cases (6.13%). The level 2 disability rate per one million population is 2.47. There were 19 cases (1.68%) of leprosy in children <15 years with level 2 disability, (Kemenkes RI., 2022).

East Java contributed the highest number of new leprosy cases, with the main spread on Madura Island and the North Coast of Java. There were 1,696 cases with a new case finding rate of 4.22 per hundred thousand population. There were 90 new cases of PB-type leprosy and 578 new cases of MB-type leprosy. There were 1,280 (75.47%) for grade 0 disability and 164 cases (9.67%) for grade 2 disability, with a grade 2 disability rate per one million population of 4.08. There were 98 cases of leprosy in children <15 years (5.78%), and leprosy in children <15 years with level 2 disability, there were 5 cases (5.10%), (Kemenkes RI., 2022).

Tuban in 2020 was included in the top 10 regencies/cities in East Java with the highest cases of leprosy; there were 66 new cases of leprosy (8 of them were new cases of child leprosy), and 101 cases of leprosy were registered. There were 46 new cases of male leprosy and 20 new cases of female leprosy. There were four new cases of PB-type leprosy and 62 new cases of MB-type leprosy. New leprosy with grade 0 disability was 44 cases (66.7%), and grade 2 disability was 4 cases (6.1%). One new case of child leprosy <15 years old, (Dinas Kesehatan Provinsi Jawa Timur, 2022).

Several factors influence the implementation of leprosy management, which is not yet optimal, among others; the community has not fully received information about leprosy and has the assumption that leprosy cannot be cured because of the disability it causes; lack of ability of puskesmas staff in early detection and management of leprosy sufferers; inadequate MDT management; lack of cross-program and cross-sector involvement in leprosy management; stigma and discrimination are still high; and the magnitude of the problem of controlling other diseases such as tuberculosis and HIV. This affects the lack of attention to leprosy prevention, (Kemenkes RI, 2019). So do not be surprised if leprosy is one of 17 neglected tropical diseases (NTD). This requires world attention because the incidence rate is high, (WHO, 2016).

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WHO treatment of leprosy (MDT) began in 1985 by recommending three-drug regimens, namely rifampicin, dapsone, and clofazimine, for all leprosy patients, with a treatment duration of 6 months for PB leprosy and 12 months for MB leprosy, (Jariyakulwong, Julanon and Saengboonmee, 2022). The National Leprosy Eradication Program (NLEP) conducts an active case detection campaign involving social health activists and other public health volunteers. In April 2016, WHO launched a global leprosy strategy which aims to further reduce the burden of leprosy at both global and local levels with the main targets: Zero G2D (Disability level 2) in children diagnosed with leprosy; reduce new leprosy cases with G2D to < 1 per million population; and zero countries with laws that allow discrimination due to leprosy, (Reddy *et al.*, 2022).

Many studies have shown that healthcare organizations are characterized by network decentralization, provision of additional screening, surveillance of contacts, health promotion measures, and active case tracing to be a determinant of diagnosis and, therefore, of increasing coefficients, at least in the short term. In the long term, a marked and sustainable reduction of endemic diseases is expected, (de Sousa *et al.*, 2020), (Sato *et al.*, 2021).

Given the above information, it is necessary to carry out further research to understand the occurrence of disabilities in leprosy patients in Tuban. The condition of leprosy sufferers who tend to close themselves to people they have never known is due to the psychological burden they experience, such as stigma against themselves and/or those around them, so the research approach used is qualitative. Through a personal approach and assistance from the officer in charge of the leprosy program at the health centers, it is expected to obtain an analysis of the path of social-environmental determinants that can affect the occurrence of disabilities in leprosy sufferers and their impacts. For this reason, it is necessary to conduct a study entitled **"Flow of Social Environmental Determinants of Disabilities on Lepers in Tuban Regency."**

METHODS

The research was conducted in 4 sub-districts (5 health centers) out of 20 (33 health centres) in Tuban Regency, East Java Province. The research subjects were leprosy cases of the MB type with disability levels 1 and 2, totalling 17 subjects.

Research informants were determined according to inclusion and exclusion criteria. Inclusion criteria included new treatment status, diagnosis with leprosy for more than five months, type of MB leprosy, level I and II disability, disability score of more than 1, aged more than 15-10 years, open to new people, and willing to become informants. Exclusion criteria include limitations such as being blind and deaf and living alone or neighbours who are next to/around the house are not relatives.

The condition of leprosy sufferers who tend to close themselves to people they have never known is due to the psychological burden they experience, such as stigma against themselves and/or those around them, so the research approach used is qualitative. Through a personal approach and assistance from the officer in charge of the leprosy program at the health centers, it is expected to obtain an analysis of the flow of social-environmental determinants that can affect the occurrence of disabilities in leprosy sufferers and their impacts; so that the informant selection technique used is the purposive sampling technique. Data collection methods were obtained through in-depth interviews with informants and research-supporting subjects. The research instrument was field notebook, camera, and a closed questionnaire using Indonesian about the characteristics of the informants and the social environment, including knowledge, contact history, family support, self-confidence, and impact. Data analysis uses triangulation techniques, and data presentation uses narrative text, image, and tables.

RESULTS AND DISCUSSION

The frequency of leprosy in Tuban

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Regency tends to decrease from 2014-2019. This trend is shown in Images 1:

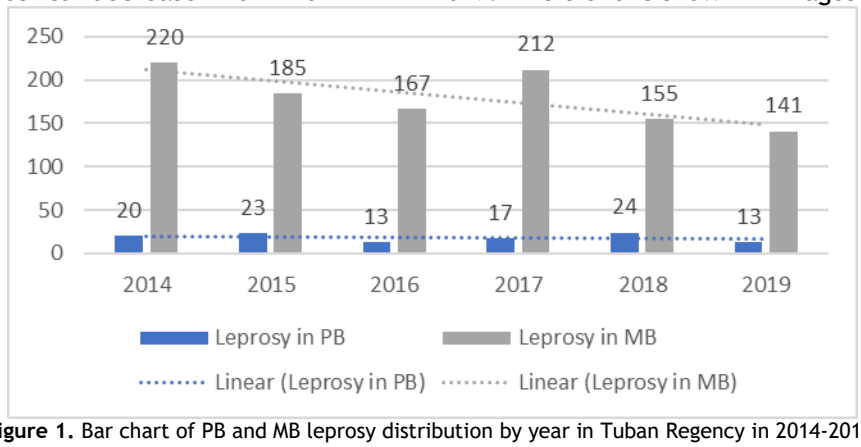

Figure 1. Bar chart of PB and MB leprosy distribution by year in Tuban Regency in 2014-2019. Source: Secondary Data from The Tuban Regancy Health Office, 2019 processed.

The distribution of leprosy occurs in 18 districts (27 health centres) out of 20 districts (33 health centres) in Tuban Regency, East Java Province. Leprosy sufferers were found every month in 2019 with various characteristics of leprosy sufferers, which led to the emergence of leprosy and disabilities in leprosy sufferers. The determinants of disability in leprosy patients include the characteristics of the informants and the social environment, including knowledge, contact history, family support, self-confidence, and impact. The results of this study will be distributed in tabular form.

Table 1. Characteristics of research informants.

	Total (n=7)
Gender	
Man	6 (85.71%)
Woman	1 (14.28%)
Age	
10-19	2 (28.57%)
20-19	0
30-39	2 (28.57%)
40-49	0
50-59	2 (28.57%)
60-69	1 (14.28%)
Marital status	
Marry	4 (57.14%)
Single	3 (42.85%)
Education	
No school	2 (28.57%)
Didn't graduate from elementary school	1 (14.28%)
Elementay school	3 (42.85%)
Junior High School	1 (14.28%)
Income per month	
<UMK	6 (85.71%)
>UMK	1 (14.28%)
Number of occupants of the house	
One person	0
Two persons	1 (14.28%)
Three people	3 (42.85%)
Four people	1 (14.28%)
Five people	2 (28.57%)

Table 2. Access to the informant health centre.

	Total (n=7)
Distance from home to the health centre	
±3-5 km	2 (28.57%)
±6-10km	2 (28.57%)
±10-20 km	3 (42.85%)
Travelling time	
10-30 minutes	7 (100%)
Cost to the health centre	
Rp. 10,000.00	7 (100%)

The total number of informants in this study was seven informants. The sex of the informants was 6 (85.71%) male and 1 (14.28%) female. There were 2 (28.57%) informants aged 15 years, aged 36-38 years; there were 2 (28.57%) informants, and aged 59-60 years, there were 3 (42.85%) informants. In finding leprosy, there were 2 (28.57%) informants with active detection status and 5 (71.43) informants with voluntary discovery status. Level 1 disability was 1 (14.28%) informant and 6 (85.71%) informants with level 2 disability. RFT treatment status there were 3 (42.85%) informants and 4 (57.14%) informants still undergoing MDT.

Informant educational status; There were 2 (28.57%) informants who did not go to school, 1 (14.28%) did not graduate from elementary school, 3 (42.85%) had

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passed elementary school, and 1 (14.28%) graduated from junior high school. There was 1 (14.28%), informant who did not work, 1 (14.28%) housewife informant, 1 (14.28%) farmer informant, 1 (14.28%) factory worker, there was one student (14.28%) informant, and there was 1 (14.28%) informant who chose to drop out of school. There were 4 (57.14%) informants with married status and 3 (42.85%) with single status. All informants rode motorbikes to seek treatment at the puskesmas alone or accompanied by their children, 3 (42.85%) informants and 4 (57.14%) other informants accompanied by their wives, fathers/mothers and siblings.

Table 3. History of leprosy Informants.

	Total (n=7)
Discovery state	
Volunteer	5 (71.42%)
Active	2 (28.5%)
Been feeling sick for a long time	
<1 year	1 (14.28%)
>1 year	6 (85.71%)

Table 4. The informant's history of disability.

	Total (n=7)
Level disability	
1st-degree disability	1 (14.28%)
2nd-degree disability	6 (85.71%)
Treatment status	
RFTs	3 (42.85%)
Not RFT yet	4 (57.14%)
Disability conditions before MDT	
Ulcers all over the body	7 (100%)
The right/left hand is stiff and numb	5 (71.42%)
Fingers that are not straight	2 (28.5%)
Feet numb	2 (28.5%)
Disability conditions during MDT	
Ulcers all over the body	7 (100%)
The right/left hand is stiff and numb	5 (71.42%)
Fingers that are not straight	2 (28.5%)
Feet numb	2 (28.5%)

Research in Brazil, India, and Bangladesh reveals that age, poor sanitation, socioeconomic conditions, past food shortages, food insecurity, household contact, manual labour, crowded households, inequality, poor health care, and low education are leprosy risk markers, (Dwivedi *et al.*, 2019). There were 5 (71.42%) informants who did not correctly explain the meaning of leprosy, and 2 (28.57%) informants did not know the definition of leprosy even though all informants during their first visit to the health centre took part in the leprosy program had been explained by the person in charge of the leprosy program. There were 5 (71.42%) informants who did not know the causes of leprosy and 2 (28.57%) informants who knew the causes. There were 6 (85.71%) informants who did not know the signs and symptoms of leprosy, and 1 (14.28%) informant knew the signs and symptoms of leprosy.

Table 5. Knowledge of leprosy informants.

	Total (n=7)
Leprosy definition	
Not true	5 (71.42%)
Don't know	2 (28.5%)
Causes of leprosy	
Know	5 (71.42%)
Don't know	2 (28.5%)
Source of transmission of leprosy	
Don't know	7 (100%)
Methods of transmission of leprosy	
Don't know	7 (100%)
Signs and symptoms of leprosy	
Know	1 (14.28%)
Don't know	6 (85.71%)
Free leprosy drug knowledge	
Don't know	7 (100%)
The impact of breaking up leprosy drugs	
Don't know	7 (100%)

How they manage their lives depends on how they interpret their illness and give meaning to their existence, (Rahman *et al.*, 2022). Various studies across India have reported lower levels of knowledge and awareness among most people, (Reddy *et al.*, 2022). Follow-up efforts should be continued even after completing MDT. In addition, many are lost to follow-up because they stop being evaluated regularly by healthcare professionals. They are taught self-care and advised to return if their symptoms recur or worsen. Some individuals do not receive timely treatment or follow-up because of their age, lack of knowledge, poor perception of symptoms, stigma, or inability to go to

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a health centres due to distance and economic hardship. The deteriorating status of leprosy and physical disability is not managed because they are ostracized from their environment, (Rahman *et al.*, 2022)(Banna *et al.*, 2022).

Dysregulation of the immune system of leprosy sufferers is related to poor nutritional status, failure of health services to reduce the stigma of leprosy, low number of vaccinations, low nutritional status, inappropriate breastfeeding, and low environmental hygiene and sanitation, including clean water facilities, type of floor, humidity, intensity sunlight, ventilation, and residential aspects that can be found in several endemic areas, (Ramona *et al.*, 2021).

Informants' knowledge is influenced by education, the number of friendship networks, and technological literacy. Education will indicate the type of work of the informant, the type of work will determine the informant's income, and income will determine the economic status. Economic status contributes to food intake, treatment seeking, and physical housing conditions. The length of time seeking treatment for leprosy will affect the severity of the disability if good self-care is not carried out and always use PPE when doing activities.

Symptoms of leprosy may appear within a year, but for some people, symptoms may take 20 years or more to occur, (Farag *et al.*, 2022). House contacts with leprosy cases are at the highest risk, (Tió-Coma *et al.*, 2021). Households with greater population density facilitate transmission through close contact, (da Paz *et al.*, 2022).

Leprosy is associated with poverty, indicating that the comorbidities of poverty can promote leprosy transmission, (Dennison *et al.*, 2021). In this study, there were 2 (28.57%) informants who had a history of family contact, 1 (14.28%) of informants had a history of contact with neighbours, and 1 (14.28%) of informants had a history of contact with peers. Or colleagues, and 3 (42.85%) informants had no contact history with family or neighbours.

Table 6. Contact history of leprosy informants.

	Total (n=7)
Leprosy contact	
Family	2 (28.5%)
Neighbour	1 (14.28%)
Peers/Colleagues	1 (14.28%)
No contact	3 (42.85%)
Examination of contacts (suspect/BTA+ after the informant	
There are suspects after informants	1 (14.28%)
There are no suspects after the informants	6 (85.71%)

Many studies suggest that *Mycobacterium leprae* can be found in the environment and may have a role in continuing disease transmission. Cleanliness is always associated with disease because it drastically smoothes and prevents the risk of exposure, (Turankar *et al.*, 2019). Additional socioeconomic factors that reflect exposure to contact tangles and increased levels of deprivation, such as urbanization and household density, have also been associated with an increased risk of leprosy detection, (Pescarini *et al.*, 2020). Delays in diagnosing and treating leprosy and its complications can result in permanent deformities, (Ortuño-Gutiérrez *et al.*, 2021) and social exclusion (van Hooij *et al.*, 2021).

Post-exposure prophylaxis (PEP) with a single dose of rifampicin (SDR) reduces the risk of developing leprosy among contacts of leprosy patients (Barbieri et al., 2022). Several villages in the working area of the health centers in Tuban Regency refused when the program officer in charge of the leprosy program carried out chemoprophylaxis activities; the residents claimed that they were healthy and did not feel sick, so they refused to be given and take a single dose of rifampicin. In several villages where the health centers work's, it receives and takes a single dose of rifampicin, which requires good cooperation between residents and staff.

Despite advances in treatment and political commitment at a global level with reductions in the worldwide leprosy burden, further reduction of the leprosy burden is met with enormous challenges. This challenge consists of three prongs, including further reductions in new cases, registered prevalence, and social stigma and exclusion through the prevention and management of disability. The full involvement of endemic communities and people with leprosy is fundamental in

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reducing the burden of leprosy, (Tabah *et al.*, 2018).

The existence of contact before the informant determines the cause of the infection of the informant. Informants can become a new home transmission source to the family if they do not immediately carry out a leprosy MDT treatment program. The intense relationship with informants influences the occurrence of leprosy in new patients, the size of the house, the physical condition of the house, and food intake related to immunity.

The first person to know that an informant has leprosy is a family member; there are 6 (85.71%) informants and 1 (14.28%) informant whose neighbours know when the informant has signs and symptoms of leprosy. There were 3 (42.85%) informants for treatment accompanied by their children, 1 (14.28%) informant for treatment accompanied by his wife, 1 (14.28%) informant for treatment by his mother and sometimes his junior high school teacher, 1 (14.28%) the informant was seeking treatment accompanied by a sibling or brother-in-law. There was 1 (14.28%) the informant was seeking treatment accompanied by his father.

Table 7. Family support to informants

	Total (n=7)
The person who first knew the informant had signs and symptoms of leprosy	
Family	6 (85.71%)
Neighbour	1 (14.28%)
Family members accompanying treatment	
Child	3 (42.85%)
Wife	1 (14.28%)
Mother	1 (14.28%)
Father	1 (14.28%)
Siblings	1 (14.28%)

The existence of support from the family gives sufferers the hope of enthusiasm for recovery. The government's free medical treatment program for leprosy should not affect families providing moral, material and social support to sufferers. In this study, all lepers received full support from their families.

The demand for a speedy recovery became the motivation for the informants. Roles and responsibilities also accompany the demands before being diagnosed with leprosy and after being diagnosed with leprosy. Most leprosy sufferers choose to rest completely or only when a reaction occurs. This resulted in changing roles and responsibilities, which were originally able to help the economy in the family by working after being diagnosed with leprosy to taking complete rest so that income was reduced, which impacted economic status. Furthermore, economic status affects the food consumed daily and the house's physical condition.

The existence of family support will bring hope to the spirit of recovery to the informants. Furthermore, demands, roles, and responsibilities are important in raising hopes for a speedy recovery. Roles and responsibilities before and after being diagnosed with leprosy can affect employment, income, and economic status.

Self-concept will affect the informant's self-confidence. Then, self-confidence will impact the informants' ability to interact well. The existence of social interaction is also influenced by ability. The length of friendship, experience, and age influence's ability.

Leprosy is a disease of public health concern associated with disability, deformity, stigma, and discrimination of affected individuals, (Chokkakula *et al.*, 2020). Stigma can be divided into applied stigma and perceived stigma. Prejudice and discrimination against patients by family members deprive them of emotional and material support, (Tembei *et al.*, 2022). Overcoming leprosy is how people manage stressful or traumatic situations to maintain their emotional well-being, (Rahman *et al.*, 2022).

There were 2 (28.57%) informants that their school-age children had no talent. Unlike the productive age informants, there were 5 (71.52%) of their informants who tended to be skilled and had many talents. This is because the informants of productive age have conditions that force them to be skilled in finding talent to work so that they can fulfil their daily needs independently. Psychological problems for lepers are a very serious threat because the consequences can go beyond the disease itself. Leprosy stress creates a psychological burden because it impacts physical, psychological and social

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conditions, affecting all life processes, (Nasir *et al.*, 2022).

Table 8. Confidence of informants.

	Total (n=7)
Difficulty doing activities	
Have no difficulty doing activities	6 (85.71%)
Have difficulty exercising	1 (14.28%)
Social interaction	
Informant relationship with family, neighbours, friends peers, and good co-workers	7 (100%)
The views of family, neighbours, peers and co-workers on informants were favourable	7 (100%)
Self-description	
Just looking at him normally	6 (85.71%)
Seeing himself is different	1 (14.28%)
Role and responsibility before being diagnosed with leprosy	
Head of family and work	3 (42.85%)
Wife and work	1 (14.28%)
Child and work	1 (14.28%)
Children and students	2 (28.5%)

There were six informants (85.71%) who had no difficulties in their activities and 1 (14.28%) who sometimes still had difficulties. All informants did not limit their activities when the leprosy reaction did not recur. All views of family, neighbours, peers or co-workers tend to be normal and treat informants like other members, neighbours and friends. This is because they see that the informant can still carry out activities like a normal human being without any restrictions, and special treatment is required due to the illness they are experiencing.

There were 6 (85.71%) informants who saw themselves as normal by accepting the pain they were experiencing and 1 (14.28%) who saw themselves as different from the others. All informants did not have an unconscious attitude that could harm their physical and psychological condition of the informants and the conscious attitude carried out by all informants, namely obedient treatment and routine self-care.

Self-care is important for individuals affected by leprosy to encourage them to change their behaviour to adapt to the permanent damage caused by the disease. Self-care in leprosy is a daily activity that requires the active involvement of individuals to care for themselves, reduce the number of ulcers, prevent further damage, improve their physical health and increase self-confidence and self-esteem, (Rahman *et al.*, 2022).

The results of this study indicate that all informants do not have certain demands in their lives. So that they lead a quiet life; according to the elderly informants, they are sufficient to make ends meet because their children are already married. The informants at school age did not have any specific demands because, at school, they chose to be ordinary students, such as not joining organizations and others.

The results of this study indicate that all informants have accepted the current conditions. This is shown by their motivation to recover by routinely checking and taking medicines at the puskesmas, doing good and proper self-care, and following the recommendations and prohibitions of the officer in charge of the leprosy program at the health centers.

Health services mainly focus on curative treatment and the biophysical impact of disease but less on psychosocial and economic aspects. Due to chronic leprosy, studying the life experiences of affected individuals will allow us to understand more deeply the effects of the disease, how they seek help and adhere to treatment, and cope with the disease, (Rahman *et al.*, 2022).

Impact on the body includes changes in urine colour and skin colour. Every drug must have side effects. Rifampicin rarely causes side effects because it is only given once a month. The appearance of symptoms is a change in the colour of the urine to yellow or even red. This is only temporary. Sufferers need to be notified so they are not surprised (Ministry of Health RI, 2019). The results of this study indicate that the side effect felt by all informants after taking the drug was that the urine turned yellow. Handling the side effect of changing urine colour after taking

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rifampin, namely *reassurance* (soothing the patient with the correct explanation) and counselling, (Kemenkes RI, 2019).

Serious side effects when drinking lampren include skin and mucosal hyperpigmentation (skin changes to brown), dryness, ichthyosis, pruritus, acneiform eruptions, skin rashes, and photosensitivity reactions. Hyperpigmentation side effects will disappear 6-12 months after the lampren is stopped. The side effects of lampren can usually be tolerated so that treatment does not need to be stopped, (Kemenkes RI, 2019).

The side effects of rifampicin are flu-like symptoms *(flu-like-syndrome)*, such as fever, chills, and bone pain which can be given symptomatic treatment, (Kemenkes RI, 2019). The results of this study indicate that the effect on the body after taking the drug by all informants is that all body skin turns black (hyperpigmentation) and often feels chills when there is a reaction to leprosy or exposure to the night wind. Handling the side effect of changing urine colour after taking rifampicin is *reassurance* (calming the sufferer with the correct explanation) counselling, (Kemenkes RI, 2019).

Psychosocial impacts occurred on school-age informants and productive-age informants. The results of this study indicated that there was 1 (14.28%) informant who felt scared, uneasy, and offended when at school; this is because the informant still remembers and always screams uneasy and is afraid to meet the teacher who reprimands him due to ignorance of changes in skin colour which are quite prominent among his friends due to the illness experienced by the informant. There was 1 (14.28%), informant who felt embarrassed or uncomfortable going to school with his niece, so the informant was too lazy to go to school, resulting in him not wanting to go to school anymore and choosing to stop going to school. Self-acceptance from the social environment of the informant's current condition will lead to self-confidence. It is proven that 2 (28.57%) school-age informants have good social interactions with their peers outside the school environment.

The results of this study showed that there were 2 (28.57%) male informants of reproductive age who felt ashamed and tended to close themselves off from the social environment, such as neighbours, peers, and co-workers, before undergoing the leprosy MDT treatment program and began to be confident and open oneself with the social environment when the ulcers on the body begin to heal and finish the leprosy MDT treatment program (RFT). It is proven that when the ulcers began to heal, the informants began to open themselves to the social environment; however, the mental rehabilitation efforts of the officer in charge of the leprosy program would not be successful without emotional support from the family and social environment.

The social environment determinants that become the fundamental problem of disability in leprosy are the characteristics of the informants and the social environment, including knowledge, contact history, family support, self-confidence, and impact.

Analys flow of social environmental determinants of disabilities on lepers in Tuban Regency.

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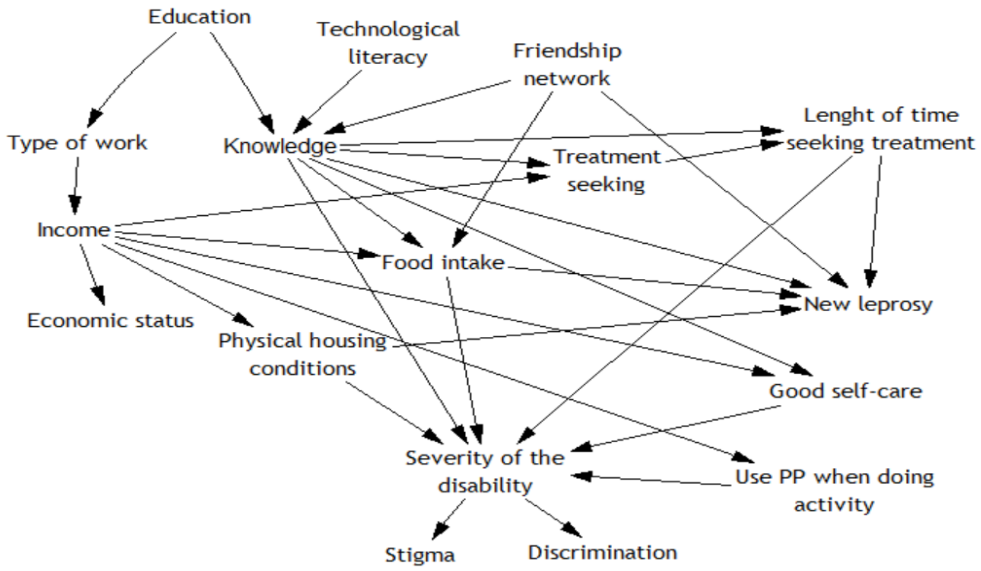

Figure 2. Flow of social environmental determinants of disabilities on lepers in Tuban Regency.

Informants' knowledge is influenced by education, the number of friendship networks, and technological literacy. Education will indicate the type of work of the informant, the type of work will determine the informant's income, and income will determine the economic status. Economic status contributes to food intake, treatment seeking, and physical housing conditions. The length of time seeking treatment for leprosy will affect the severity of the disability if good self-care is not carried out and always use PPE when doing activities.

Efforts that should be made so that global and national targets in preventing level 2 disability in leprosy include the following:

1. Government
   a. Public Health Office
      1) Providing facilities related to the needs of officers holding the leprosy program in handling BPJS or assistance with leprosy assessment results that require immediate surgery, self-care needs, and PPE for leprosy sufferers.
      2) Establish cooperation in early detection and eradication of leprosy with Penta helix collaboration starting from the Social Service, sub-district government, village government, RW and RT.
   b. Social services
      1) Ensuring leprosy sufferers are included in poor community programs such as rice rations, BPJS, and other social assistance.
      2) Helping to increase the economy of leprosy sufferers following the results of the assessment of the health office and puskesmas.
2. Health Center
   a. Improving nerve examinations in leprosy patients for preventive action on the occurrence of leprosy defects.
   b. Coordinate with the sub-district government, village government, RW and RT to detect and eradicate leprosy as early as possible.
   c. Increase outreach activities for new leprosy sufferers and their families and neighbours in the environment of leprosy sufferers during ICF and community activities.
   d. In puskesmas that have not yet formed KPD, it is hoped that they will form it soon to teach self-care to new leprosy sufferers.
   e. Submit as soon as possible to request a referral to the Sumberglagah Leprosy Hospital in Mojokerto Regency when sufferers need a referral.
   f. Form leprosy cadres of 4 people per health centre with a total of 132 people for cadre from the Health Office.
3. Public

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a. Eliminate stigma and discrimination against leprosy sufferers by having good social interactions with leprosy sufferers.
b. Immediately check with the puskesmas when you find family members, neighbours, peers, and/or co-workers if you find signs and symptoms of leprosy.

The limitation of this study is that interviews with informants and supporting subjects were only conducted once. Observations were made to look at the conditions around the informant's house. The results of this study can only be used in other areas if some similar situations and conditions follow this research.

CONCLUSION

In this study, the social environment that had the most impact on the occurrence of disability in leprosy patients was the informant's knowledge factor. Informants' knowledge is influenced by education, the number of friendship networks, and technological literacy. Education will indicate the type of work of the informant, the type of work will determine the informant's income, and income will determine the economic status. Economic status contributes to food intake, treatment seeking, and physical housing conditions. The length of time seeking treatment for leprosy will affect the severity of the disability if you do not take good self-care and always use PPE when doing activities.

The existence of contact before the informant determines the cause of the infection of the informant. Informants can become a new home transmission source to the family if they do not immediately carry out a leprosy MDT treatment program. The intense relationship with informants influences the occurrence of leprosy in new patients, the size of the house, the physical condition of the house, and food intake related to immunity.

The existence of family support will bring hope to the spirit of recovery to the informants. Furthermore, demands, roles, and responsibilities are important in raising hopes for a speedy recovery. Roles and responsibilities before and after being diagnosed with leprosy can affect employment, income, and economic status.

Self-concept will affect the informant's self-confidence. Then, self-confidence will impact the informants' ability to interact well. The existence of social interaction is also influenced by ability. The length of friendship, experience, and age influence's ability.

Impact on the body; changes in urine and skin colour experienced by informants can be handled by counselling the officer in charge of the leprosy program. Impact on psychosocial; self-acceptance from the social environment to the informant's current condition will lead to self-confidence and good social interaction. The feeling of shame and the tendency to withdraw from the social environment is due to ulcers on the informant's body. It is proven that when the ulcers started to heal, the informants started to open up to the social environment.

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Reflecting on Communication Practices for Health Literacy among People with Hearing Impairment in Tanzania amid Covid-19 Pandemic

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ABSTRACT

***Background**: Lack of proficiency in using languages (except sign languages) among people with hearing impairment poses difficulties for them to comprehend health-related information, thus, having low health literacy. To bridge this gap, healthcare providers adopt various communication practices to reach people with hearing impairment (HI), some of which prove success while others prove a failure. Consequently, reflection on health literacy communications becomes paramount for the sustainability of health education for people with HI. **Objective**: The present study reflects on communication practices during Covid-19 pandemic control in Tanzania contexts concerning people with hearing impairment. **Methods**: The study adopted a qualitative research approach in which the data were collected through interviews from five (5) people with HI obtained through a snowball sampling technique, and three (3) healthcare providers who were purposively sampled. **Results**: Findings showed that adopted communication practices (writing on papers, lip-reading, and using family members as interpreters) were perceived as less effective by people with hearing impairment. Instead, people with HI preferred communication from other sources that used sign language. **Conclusion**: Therefore, there are calls for healthcare providers' pre-service and in-service training programs to impart skills for communicating properly with HI to all healthcare providers.*

***Keywords**: Communication Practices, Covid-19, Health Literacy, Hearing Impairment.*

INTRODUCTION

Health literacy is vital for individual protection against health-related risks. The more access and use of health information by the community, the more people can protect themselves from health risks (McQueen et al., 2007). However, people with hearing Impairment exhibit low Health Literacy (HL) because of their lack of proficiency in using conventional communication such as spoken and written communication (Pollard Jr et al., 2009; Middleton et al., 2010; McKee et al., 2015; Chiluba et al., 2019), which is related to their low literacy level (Ladd, 2003; McKee, 2012; Glickman and Hall, 2018; Leigh, Andrews and Harris, 2018). Therefore, the adoption of alternative communication practices such as the use of sign language, use of sign interpreters, and emphasis on communication reliance on friends and family members, seemed to cater to some communication deficits with people with HI despite their weaknesses such as contradicting deaf culture and medical privacy (Harmer, 1999; Cardoso, Rodrigues and Bachion, 2006; Middleton, Turner et al., 2010; Mathews et al., 2011; Alexander et al., 2012; Shuler et al., 2013). However, the emergency of Covid-19 worsened the communications between healthcare providers and people with HI, which called for the rethinking of existing alternative communication practices. This is because Covid-19's control measures interfere with alternative communication practices for people with HI. For instance, the use of face masks prevents people with HI to access information through lip-reading. Social distancing limits access to interpreters and access to lip-reading communication. Consequently, a new communication framework was inevitable. In response, various scholars and health organizations proposed several communication frameworks with similar communication aspects, such as digital-based communication, using transparent masks, using sign language, and multimodal communication. Furthermore, these frameworks emphasized the use of a transparent face mask to facilitate lip-reading when necessary, and the use of

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digital-based communication (McKee, Moran and Zazove, 2020; West, Franck and Welling, 2020). However, it is unknown whether all healthcare centers, including in Tanzania, could afford such requirements. To meet these requires preparations in terms of infrastructure and human resources. As a result, most of the world's countries fail to accommodate people with HI. Thus, reflecting on these practices becomes a central focus of this study. Specifically, the study intends to identify and examine adopted communication practices and enhance HL among people with HI during Covid-19 in the Tanzania context where infrastructure to support people with HL is still low.

METHODS

Research Approach and Design

This study uses a qualitative research approach. Qualitative research involves investigation related to people's social practices in their natural setting (Dawson, 2002; Hennink, Hutter, and Bailey, 2011; Creswell and Creswell, 2018). The study focused only on the effectiveness of health-related communication to people with HI in Tanzania contexts to gain in depth-understanding of the phenomena, thus a case study research design. A case study research design focuses on specific individual, events, or topic using few participants to gain in-depth understanding of a natural phenomenon (Dawson, 2002; Hennink, Hutter, and Bailey, 2011; Creswell and Creswell, 2018). This study involved five people with HI from different parts of Tanzania who were obtained through the snowballing sampling technique. The decision to use only five participants was determined by the data saturation point. The researcher collected data until there were no new information emerging from participants. It also involved three health workers (doctors) from various public hospitals located in Dar es Salaam who were obtained through a purposive sampling technique.

Data collection was done by using in-depth interviews. Because of the communication challenge between the research and people with HI, the interviews were conducted through WhatsApp chat. Interview guides were sent to the respondents. After receiving responses, the researcher continued to probe until the respondents hit the point. The interviews with doctors were conducted orally. Data were recorded and stored in the computer for transcription and were analyzed thematically. The researcher adhered to ethical review by seeking clearance from responsible bodies and consent from the participants.

RESULTS AND DISCUSSION

The presentation and discussion of findings are categorized into two subsections based on the specific objectives, namely adopted communication practices, and effectiveness of the adopted communication practices.

Adopted Communication Practices

Data indicate that healthcare providers adopted lip-reading, written communication, and using relatives as interpreters to reach information related to HL for people with HI during Covid-19 in the Tanzanian context. The majority of people with HI who participated in this study stated to force doctors to remove masks so that they can lip-read or write on the paper, while some stated to be accompanied by their relatives as interpreters. This is supported by data from doctors who admitted that there were no specific communication plans that accommodated people with HI rather than asking them to write, lip-read, and come with relatives. For instance, one of participants with HI stated

> *"I told them that I was deaf and I asked them to speak to me without face masks that I can lip-read them or write on the paper. Eventually they opted to write on paper to accommodate me."* (**A, person with HI, female**).

Another participant stated,

> *"The method used was through lip-reading where I used to force the doctor to remove a mask so that I could read the mouth as they do not know the Sign Language."* **(M, person with HI, female**).

Those statements were supported by a participant from the healthcare providing group that stated,

> "We just use written communication or gesture if the person with HI has no one

to interpret for him or her." **(A, health worker, male**).

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Therefore, it is clear that communication applied to improve HL among people with HI are lip-reading, written communication, and interpretation by the accompanying relative.

Lack of usage of sign language to people with HI perpetuates the view that they are medically disadvantaged. According to Ladd (2003), most the service providers, such as educational institutions, believe that people with HI are medically disadvantaged. They force people with HI to adopt communication strategies of hearing people such as communicating through spoken language by lip-reading. This is against the communication culture of people with HI who prefer sign language (Harmer, 1999; Ladd, 2003; Leigh et al., 2020). As Harmer (199, p.90) emphasizes, Doctors also tend to view disability as a deviation from the mainstream norm that should be corrected if possible. These beliefs and preconceptions affect both provider and patient expectations, interactions, and decisions. Additional problems occur when the physician fails to recognize or appreciate the different frames used by hearing and deaf individuals when viewing many situations, including health care delivery.

Therefore, it can be argued that adopted communication practices to increase HL among people with HI during Covid-19 are related to healthcare providers' lack of awareness of the communication culture of people with HI.

This finding corresponds to several studies (Chiluba et al., 2019) in Kapiri Mposhi, Zambia, (Middleton, Niruban et al., 2010) in the UK, and (McKee et al., 2015) in the US that reported that information to improve HL for people with HI was available in oral and written communication. Those similarities could be influenced by the medical model approach to people with HI as alluded to by Ladd (2003) that the model requires that such people should be treated according to the mainstream norm rather than accommodating their differences. Therefore, it is necessary to change the attitude among health workers toward people with HI.

Effectiveness of the Adopted Communication Practices

Data suggest that the communication practices adopted during Covid-19 were not effective to enhance HL literacy among people with HI as the majority perceived such practices as problematic, challenging, and difficult. The employed communication practices forced many people with HI to search for HL-related information from social networks groups created by deaf as they believed information from such platforms was friendlier for them.

During the interview a participant with HI stated,

> *"I had to search for additional information on the internet and deaf platforms like WhatsApp and Facebook where health education was provided by various people. Tanzania Association of the Deaf has posted friendly information using sign language and also distributed CDs and publications that provide that education."* **(A, person with HI, male**)

Such dissatisfaction with HL information offered by various healthcare centers was also clear from another participant with HI, who stated,

> *"Serious catastrophe like this was not supposed to be taken as a joke; 85% of people with HI do not know how to write and read, they depend only on sign language communication."* **(D, person with HI, male).**

It shows that the failure to communicate information related to HL in sign language made people with HI unable to understand the message.

The Tanzania Deaf Association used friendly ways such as Drama via CDs and social networks, but the information was released late. This implies that people with HI will still have low HL literacy despite the effort of the Tanzania Deaf Association. Also, the fact that a lot of information available on digital media means most people with HI may not have access to smartphones or TVs. Moreover, the WHO communication practice framework requires government, health centers, and health workers to ensure that all health-related information is available in sign language to accommodate people with HI (WHO, 2020). The governments, health centers, and health workers should be the trusted sources of HL-related information during Covid-19 rather than private entities such as the Tanzania Deaf Association.

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Therefore, if these reliable sources of HL information can't communicate effectively with people with HI, it will cause low HL among people with HI.

This finding is similar to those from McKee et al. (2019) in the US, Middleton et al. (2010) in the UK, and Chiluba et al. (2019). These scholars noted that poor communication practices in health service providing centers lead to low HL among people with HI. This correspondence can be attributed to poor training among health workers on the communication culture of people with HI. According to Mathews et al.(2011), the training of prospective healthcare workers raises their awareness to communicate properly with people with HI. Therefore, prospective health workers should be trained to communicate with people with HI.

As people with HI found the information provided by the Tanzania Deaf Association interesting, HL communication should fit their needs. Pollard Jr et al. (2009) revealed that people with HI in the US expressed positive experiences toward HL-related information presented in sign language and dialogic mode. They noted that the use of written text and interpreters is the major concern of people with HI in education contexts. It shows how cultural disparity in communication raises a significant challenge. Perhaps, this is what makes the proposed framework for health-related communication practices during Covid-19 emphasizes the use of sign language Therefore, it can be argued that the use of sign language could promote HL among people with HI.

In contrast, the use of assistants from families, written communication, and lip-reading is not attractive to people with HI for various reasons. The use of anyone who is not a medical professional may lead to misleading information (Shuler et al., 2013; Chiluba et al., 2019). Also, lip-reading seems not to be effective for all people as Gregory reports that people with HI who can lip-read effectively only decode 30% of the message communicated (Shuler et al., 2013). Likewise, written communication is challenging for people with HI because most of them have low reading literacy (McKay and Weinstein-Shr, 1993; Harmer, 1999; McKee and Paasche-Orlow, 2012McKee et al., 2019). Therefore, there is a need for the healthcare professionals to understand the implications of all communication practices adopted for enhancing HL among people with HI.

CONCLUSION

The main communication practices adopted during the pandemic are using family members as interpreters, writing on paper, and lip-reading. These communication practices were not effective because it raises challenges for people with HI to understand HL-related information. As a result, people with HI preferred information provided by the Tanzania Deaf Association because they use sign language.

It is recommended that health professional training and development should incorporate communication skills with people with HI in their curriculum. Moreover, healthcare providers should work collaboratively with the Tanzania Deaf Association to address urgent needs of communication to improve HL communication.

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Why After Fully Covid-19 Vaccinated, We are Still Obliged to Implement Health Protocols: An Evidence-Based on Agent-Based Simulation

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ABSTRACT

***Background**: The current outbreak of COVID-19 affected many countries in the world, including Indonesia. The Indonesian government has taken various actions to prevent the spread of COVID-19. One of them is by applying the 3M health protocols (wearing masks, washing hands, and maintaining distance). Considering that vaccines are a critical tool in the battle against COVID-19, the Indonesian government began the COVID-19 Vaccination program on January 13, 2021. Unfortunately, many people believe that the vaccines can fully protect against COVID-19 so they are not applying the 3M health protocols anymore. Admittedly the efficiency of vaccines is not completely protective, the virus itself is still mutating and even can spread more massively. Several simulations of the spread of COVID-19 have been carried out by several researchers. However, only a few research has included variables about compliance with health protocols and vaccine programs. **Objective**: This study aims to provide empirical evidence for health promotion by showing why after fully COVID-19 vaccinated, people are still obliged to implement health protocols. **Methods**: We conducted 12 scenarios of simulations to understand the effect of complying and not complying with these two programs. **Results**: The simulation results show that after being fully vaccinated against COVID-19, it is proven that people are still required to implement health protocols such as wearing masks, washing hands, and practicing physical and social distancing because there is still the possibility of contracting the COVID-19 virus and spreading the virus. **Conclusion**: Our simulation results provide empirical evidence for health promotion by showing why after fully COVID-19 vaccinated, people are still obliged to implement health protocols. This can be evidence for the government and related agencies to educate the public to be more compliant in implementing health protocols so that we can hope that no one will be infected with the COVID-19 virus and everyone can return to their normal activities.*

***Keyword**: Agent-based, COVID-19, Health protocols, Simulation, Vaccine.*

INTRODUCTION

The COVID-19 outbreak is currently hitting many countries in the world, including Indonesia. COVID-19 is a new disease caused by the severe acute respiratory syndrome virus or SARS-CoV-2 for short (Satuan Tugas Penanganan COVID-19, 2022). The SARS-CoV-2 virus is a new variant of the Corona Virus which caused the SARS outbreak in 2002-2003. When compared to other Corona Viruses, this new virus is easier to attach to human cells so the ability to infect and spread occurs more quickly. For this reason, various steps have been taken by the government so that the spread of the SARS-CoV-2 Virus can still be handled. One of the important steps taken is to provide referral hospitals in various cities (the list is in (Kementrian Kesehatan RI, 2022). Besides, the socialization of the application of health protocols (Satuan Tugas Penanganan COVID-19, 2020; Center for Disease Control and Prevention, 2022; World Health Organization, 2022a), such as wearing masks, washing hands, and maintaining distance, has also been continuously improved. Moreover, people who are suspected of being infected are asked to carry out isolation.

Some vaccines have been developed to protect people from COVID-19, e.g: The Pfizer/BioNTech Comirnaty vaccine, The Sinovac-CoronaVac vaccine, etc (World Health Organization, 2022b). The first Indonesian vaccination activity was conducted on January 13, 2021 (Kementrian Kesehatan RI, 2021) and until July 27, 2021, only 21.74% of people are vaccinated in the first dosage and

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from those, only 8.9% of people are fully vaccinated from the national vaccination target on more than 208 million people. Then a booster shot is recommended at least 5 months after completing 2 doses to improve body's protection against COVID-19 especially for people ages 65 years and older. Admittedly these vaccines have various protection effectiveness. None of them has full protection (Mancuso, Eikenberry and Gumel, 2021; Badan Pengawas Obat dan Makanan - Republik Indonesia, 2022). In fact vaccine Antibody can be fades after 6 months (Pan *et al.*, 2021). In some cases, vaccinated people still can be infected (World Health Organization, 2021, 2022c). The different public health conditions among regions in Indonesia and the characteristics of the SARS-CoV-2 virus, which continues to develop and can mutate aggressively, have caused the COVID-19 outbreak in Indonesia to be ongoing.

Various simulation modeling techniques can be used to study the dynamic conditions that exist in society. One of these simulations is an agent-based model simulation. Agent-Based Modeling (ABM) can be used to model interactions within a population so that decision-makers can learn how small changes in behavior and interactions can affect output in the population (Currie *et al.*, 2020). Simulations with ABM have been widely used in various fields (Billari *et al.*, 2006). Various applications of ABM in social, political, and economic science include evacuation modeling simulations, traffic, customer flow management, stock market, operational risk, organizational design, diffusion of innovation, and dynamics of adoption (Bonabeau, 2002). In our study, we used ABM to simulate to show why after fully covid-19 vaccinated, we are still obliged to implement health protocols.

One of the simulations with ABM that can be done is to simulate the spread of the virus by Yang & Wilensky (2011) and Wilensky (1999). This means that agent-based simulations can also be done for COVID-19, which is currently a pandemic. Agent-based simulations are suitable for simulating pandemics (Epstein, 2009). This is also confirmed by Currie et al. (2020) that ABM is stochastic so that it can see the variability of human behavior.

Simulations on the spread of COVID-19 have been carried out by several researchers, one of which is Valdez (2020), but the research only considers the characteristics of the virus (such as the chance of infection, incubation time, severity, mortality rate, and duration of illness), level of physical distancing, number of agents in an area and hospital capacity. The simulation aims to determine the effect of maintaining physical distance on the development curve of the pandemic that occurs. In this simulation, it is assumed that all agents have the same characteristics. However, there are other influencing things such as congenital or comorbid diseases where COVID-19 is known to be 6% more severe and 12% more deadly in comorbid patients (Stokes *et al.*, 2022).

Besides, there are people who are healthy enough to be infected without symptoms known as People Without Symptoms (asymptomatic carriers) (Long *et al.*, 2020; World Health Organization, 2022d). Furthermore, in the simulation, agents who recover from illness are assumed to have immunity forever. This is different from the real condition that the acquired immunity only lasts for two to three months (Long *et al.*, 2020). Some of these variables have been added to previous simulation (Maghfiroh and Siagian, 2020). Another previous study conducted a similar simulation, but their simulation assumed that immune people have forever protection and recovered people cannot be reinfected (Li and Giabbanelli, 2021).

Based on the above discussion, this study aims to build evidence-based on an agent-based simulation and then see their effects on the simulation results. The simulation results can be empirical evidence for health promotion to show why after fully COVID-19 vaccinated, people are still obliged to implement health protocols.

METHODS

The model simulation in this study is based on Agent-Based Modeling (Bonabeau, 2002; MacAl and North, 2017). For some variables, we used data for the Indonesian region, while for other variables that are not yet known for Indonesia, we use generally accepted data. We combine and modify simulation

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previous simulations (Yang, C. & Wilensky, 2011; Maghfiroh and Siagian, 2020; Valdez, 2020). Simulation by Valdez (2020) have been taken into account in the simulation such as morbidity (chance of infection, incubation time, severity, mortality rate, duration of illness), level of physical distancing, number of agents in an area, and hospital capacity. Agents represent people in a region. The condition of the agent is divided into six stages, namely the condition of being healthy, infected, sick, severe, immune, and dead. Maghfiroh et al (2020) advanced the simulation by adding some variables, such as comorbid, asymptomatic carrier, and temporary immune. Besides, Yang (2011) has carried out model-based simulations to see the movement of the epidemic but only involved the characteristics of the virus, the tendency for people to move, the tendency to isolate, the tendency to go to the hospital, and the availability of ambulances. This simulation does not yet involve public health protocols and hospital capacity.

In our simulation, we added several new variables, namely: the number of agents with congenital diseases, the severity of agents with congenital diseases, the number of infected agents without symptoms, and the duration of immunity. In the simulation, three levels of the number of agents with congenital diseases were used, namely, 1.5%, 11%, and 63 (World Health Organization, 2020). The severity of the agent with the congenital disease is 12%. For the number of asymptomatic infected agents, we used three levels of numbers, namely 2%, 4%, 6%, 10%, and 14%. The duration of immunity obtained after recovering from illness is 60-90 days. After that, the agent will return to a state without immunity and can become infected again. We also consider health protocol and vaccination conditions as inoculation. This condition will decrease infection chances.

In general, the simulation flow for the spread of COVID-19 can be explained as follows:

a. The initial conditions of the healthy agent: normal, comorbid, and asymptomatic carrier.
b. At the start of the simulation, one agent was infected. (an infected agent can still travel).
c. Randomly depending on the inoculation rate, some agents will be inoculated.
d. Randomly depending on the chance of infection, other agents within the infectious radius will be infected.
e. inoculated infection rate and health protocol will affect infection rate.
f. An infected agent within more than the incubation time will become immune if it includes an asymptomatic carrier and otherwise will become sick (the sick agent will stop activities).
g. A sick agent with a duration of illness for a predetermined duration of illness will become severe. The random chance of being severe depends on the severity that has been determined and the comorbid is 6% more severe. Besides, the sick agent can recover and have immunity.
h. If there is a severe agent and the hospital capacity is full, then this agent may die. However, if space is still available, the agent will be treated in the hospital and the condition depends on the duration of the illness. The randomized chance of a severe agent dying depends on the death rate determined and the comorbid 12% greater chance of dying. Besides, the sick agent can recover and have immunity.
i. The agent which has immunity only lasts for the specified immune time.

Considering that the characteristics of the population of each region in Indonesia may be different, therefore in this study, an agent-based simulation was carried out with 12 different case scenarios. These differences are in the condition of healthy agents, comorbid agents, asymptomatic carrier agents, levels of health protocol maintenance, and inoculation as follows:

#1. initial 1000 agent, asymptomatic 2%, comorbid 1.5%, no protocol, travel, inoculation chance 50%, inoculated infection rate 50%;
#2. initial 1000 agent, asymptomatic 4%, comorbid 11%,no protocol, travel, inoculation chance 50%, inoculated infection rate 50%;
#3. initial 1000 agent, asymptomatic 6%, comorbid 63%, no protocol, travel, inoculation chance 50%, inoculated infection rate 50%;
#4. initial 1000 agent, asymptomatic 10%, comorbid 63%, no protocol, travel, inoculation chance 50%, inoculated infection rate 50%;

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#5. initial 1000 agent, asymptomatic 14%, comorbid 11%,no protocol, travel, inoculation chance 50%, inoculated infection rate 50%;
#6. initial 1000 agent, asymptomatic 14%, comorbid 63%,no protocol, travel, inoculation chance 50%, inoculated infection rate 50%;
#7. initial 1000 agent, asymptomatic 14%, comorbid 11%, protocol 50%, travel, inoculation chance 50%, inoculated infection rate 50%;
#8. initial 1000 agent, asymptomatic 14%, comorbid 11%, protocol 75%, travel, inoculation chance 50%, inoculated infection rate 50%;
#9. initial 1000 agent, asymptomatic 14%, comorbid 11%, protocol 90%, travel 50%, inoculation chance 50%, inoculated infection rate 50%;
#10. initial 1000 agent, asymptomatic 14%, comorbid 11%, protocol 90%, no travel, inoculation chance 50%, inoculated infection rate 50%;
#11. initial 1000 agent, asymptomatic 14%, comorbid 11%, protocol 90%, no travel, inoculation chance 75%, inoculated infection rate 25%;
#12. initial 1000 agent, asymptomatic 14%, comorbid 11%, protocol 90%, no travel, inoculation chance 90%, inoculated infection rate 10%.

RESULTS AND DISCUSSION

Twelve simulations with different conditions on healthy agents, comorbid agents, asymptomatic carrier agents, levels of health protocol maintenance, and inoculation have been discussed above. Meanwhile, the parameter values of other variables in this simulation are considered constant. The simulation was carried out with the help of the NetLogo software (Wilensky, 1999). The simulation results observed were the percentage of the number of affected agents, the percentage of the number of agents who died, and the duration of the outbreak. Simulations are carried out repeatedly to see variations in simulation results. The simulation view can simulation can be obtained from the author.

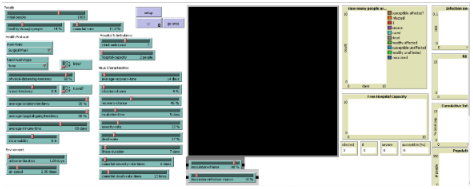

Figure 1. Proposed COVID-19 simulation in NetLogo.

From simulation results we can compare different results affected by different number levels of asymptomatic agents and comorbid agents. This comparison can be seen in Figure 5. From the comparison, we can see that number of asymptomatic agents and comorbid agents make a different number of affected agents, especially dead agents. The more comorbid agent, the more dead agent. Of course, this condition is undesirable in any country in the world. This effect is due to the virus on the co-agent which is 12 times more severe. If these agents do not have special treatment in the hospital (no more capacity in the hospital), it will be fatal for them.

From simulation results on cases 3, 4, and 6, we can compare different results affected by different levels of the asymptomatic agent. The more asymptomatic agent, the faster duration of the pandemic. This is because the infected asymptomatic agent can still move everywhere. This results in the movement of the virus, carried by asymptomatic agents, whether consciously or not, will increase. But what needs to be considered is the number of infected agents that require serious treatment in the hospital. Because of the increasing number of asymptomatic agents, it turns out that the number of severe agents that have to be treated in a short time is increasing. If the hospital capacity is insufficient, the number of agents who die will increase.

From simulation results on cases 5, 7, 8, and 9, we can compare different results affected by the implementation of health protocol in the same different levels of inoculation chance and inoculation infection rate. The more stringent the health protocols are implemented; the fewer agents will be affected and the faster the pandemic duration will be. This is because the more stringent our health protocols are, the less chance we are to be affected and also infect other people. Thus the total number of people affected will be smaller and the pandemic will also end more quickly and no one will be infected with the COVID-19 virus anymore. From this result, we can see that although we get protection from the vaccine (inoculated) but none of those vaccine provide full protection so that we still need to implement health protocol (Li and Giabbanelli, 2021) .

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From simulation results on cases 9 and 10, we can compare different results affected by a decision to travel between areas. Traveling to an area will certainly result in the spread of the virus. From the simulation, it can be seen that even though the health protocol is already strict, it turns out that traveling, will still increase the number of agents affected, and in the end, it will extend the duration of the pandemic. These results are in line with previous research which states that limiting travel will reduce the rate of virus spread (Chang *et al.*, 2020; M. J. Hanly *et al.*, 2022).

From simulation results on cases 10, 11, and 12, we can compare different results affected by different levels of inoculation chance and also inoculation infection rate in high level of health protocol. From these simulation results, we can see that the greater chance to be inoculated and the greater protection, it will help us in protecting from the virus. Lower inoculation levels, which represent vaccination rates, may result from high levels of vaccine indecision or low logistics potentially prolonging the time required to achieve adequate population coverage and may even make it impossible to achieve herd immunity (M. Hanly *et al.*, 2022). From this result we can see that combination of high level of health protocol implementation and high protection from vaccine will give us best result of protection.

From all the simulations that have been carried out, we can see that increasing the chance of inoculation by vaccines can help us in dealing with the COVID-19 pandemic. However, protection from Covid-19 vaccines are different (McDonald *et al.*, 2021; Rotshild *et al.*, 2021). Therefore, what we can do is increase the number of people who are vaccinated and also choose the best vaccine so that we can get the best protection. However, it is not the only way to get protection from viruses, because none of those vaccines give us full protection forever (Pan *et al.*, 2021; World Health Organization, 2021, 2022c). In other words, people also remain obligated and continue to apply health protocols and minimize travel, so that people can take care of themselves and shorten the duration of the COVID-19 pandemic.

CONCLUSION

In this study, we carried out 12 Agent-based simulation scenarios to understand the effects of complying and not complying with these two programs (health protocol and vaccination). The simulation results show that after being fully vaccinated against COVID-19, it is proven that people are still required to implement health protocols such as wearing masks, washing hands and practicing physical and social distancing because there is still the possibility of contracting the COVID-19 virus and spreading the virus.

Based on the results of this simulation, the central and local governments, related agencies, COVID-19 task force or other parties can educate the public to be more obedient in implementing health protocols. In addition, the community must also be able to instill self-discipline to maintain the application of health protocols wherever and whenever needed. The more people who are aware of this condition, the more likely it is that no one will be infected with the COVID-19 virus, so that people can live more safely and can return to their normal activities.

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The Effect of Attitudes, Subjective Norms, and Perceptions of Behavioral Control on Pregnancy Check-ups in Bojonegoro

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ABSTRACT

***Background**: In Indonesia, the use of antenatal care services has not been carried out according to standards. According to WHO, 99% of maternal deaths are due to the lack of information for pregnant women about the importance of regular prenatal check-ups.* ***Objective**: This study aims to examine the relationship strength between attitudes, subjective norms, and perceptions of behavioral control regarding antenatal care with the intention of pregnant women in conducting early pregnancy check-ups (K1) using a quantitative approach with a cross-sectional study design.* ***Methods**: The population in this study were 234 pregnant women who had their first antenatal contact with K1 at the Dander Health Center in Bojonegoro Regency, which collected from March to August 2020. Probability sampling utilizing a basic random sample methodology was employed. Furthermore, 129 pregnant women were used as samples for this study. Data is collected in the form of primary data through a questionnaire, while the secondary data were analyzed using logistic regression. Dependent variable is the intention of pregnancy check-ups, while the independent variables are attitudes, subjective norms and perceptions.* ***Results**: The results showed that there was a relationship between the attitude of pregnant women (p=0.001) and subjective norms (p=0.038) regarding pregnancy check-ups with the intention of pregnant women to visit K1 (a=0.05). However, there was no relationship between perceptions of behavioral control regarding antenatal care and the intention of pregnant women to visit K1 (p=0.142).* ***Conclusion**: The findings revealed an association between pregnant women's attitudes and subjective norms about prenatal care and their intention to attend K1. This study suggests that pregnant women's knowledge needs to be improved, including through classes about the importance of good subjective attitudes and norms related to antenatal care to support the intention to check pregnancy regularly, especially K1 visits. As a result, early and regular pregnancy check-ups will detect high-risk pregnancies so that they can be handled immediately, thereby reducing maternal and infant mortality.*

***Keyword**: Attitudes, K1 visit, Perceptions of behavior, Subjective norms.*

INTRODUCTION

Pregnancy check-up is a scheduled program of observation, education, and medical care for pregnant women with the goal of maintaining mothers' health during pregnancy, childbirth, and the postpartum period, as well as attempting to reduce maternal and fetal morbidity and mortality rates (Peahl & Howell, 2021). However, in Indonesia, not all pregnant women have accessed antenatal care services in accordance with established guidelines. According to the World Health Organization (WHO) up to 99% of maternal deaths occur during childbirth or birth complications. One of the leading causes of maternal mortality is pregnant women's lack of information and understanding about the critical nature of normal prenatal care, delivery, and postpartum care (Agustine & Sukartiningsih, 2019; Aryanty et al., 2021).

K1 refers to the initial visit (K is the abbreviation of *Kunjungan* in Bahasa) that pregnant women make during their pregnancy. It is classified into two types, namely Pure K1 and Access K1. Pure K1 refers to the number of first encounters between pregnant women and health professionals who are less than 12 weeks gestation, whereas K1 Access refers to all first contacts between pregnant women and health workers. Additionally, K4 is a quarterly visit for pregnant women beginning in the first quarter, followed by a quarterly visit in the second quarter and a quarterly visit in the third quarter (Ministry of Health of the Republic of Indonesia, 2016).

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Indonesia had a total of 5,283,165 pregnant women in 2018, with K1 accounting for 4,650,937 of those (88.03%). Meanwhile, in East Java Province in the same year, there were 627,901 pregnant women with K1 and 572,025 (91.10%) with K2 (Profil Kesehatan Indonesian, 2018). In 2018, there were 18,307 pregnant women in Bojonegoro Regency with a K1 level of 100.89% and a K4 level of 87.01%, compared to a target of 100 percent for K1. At Dander Health Center, 78% (476) of pregnant women achieved Pure K1 status, while 98% (597) achieved K1 Access status. According to Dander Health Center data, there were 599 pregnant women in 2019, with 450 persons (75%) having Pure K1, and 583 having K1 Access (97.83%). Thus, K1 achievement in this health center fell short of the aim, with a disparity of more than 20% between Pure K1 and Access K1. This demonstrates that a large proportion of pregnant women do not do an early pregnancy test (*Pemantauan Wilayah Setempat Kesehatan Ibu dan Anak*, Dander Health Center, 2019).

Many pregnant women do not continue with prenatal care visits following the initial appointment, as evidenced by the huge gap in K1 coverage. This condition increases the risk of death for both the mother who is giving birth and the baby she is carrying (Ministry of Health of the Republic of Indonesia, 2016). According to the Theory of Planned Behavior (TPB), there are numerous elements that influence behavior (Ajzen, 1991). Hence, Ajzen adds another determinant, namely the regulation of behavioral perceptions of the ease or difficulty of the behavior being performed. According to TPB, attitudes, subjective standards, and behavioral control, all have an effect on intentions (Asadifard et al., 2015; Kan & Fabrigar, 2017)).

Efforts should be made to identify hazards to pregnant women as early as possible through P4K stickers (Birth Planning and Complications Prevention Program) and MCH (Maternal and Child Handbook) books engaging cadres and village officials. Additionally, other efforts include expanding the scope of antenatal care by increasing knowledge and also changing mothers' and families' attitudes and behaviors through the implementation of classes for pregnant women, improving service quality through the implementation of the integrated antenatal care concept, and implementing (Walyani, 2015; Wulandari et al., 2022). Therefore, the purpose of this study was to determine the effect between the variables investigated separately using logistic regression (see Method section for more details).

METHODS

This study employs a correlational analytic technique with a quantitative approach. A cross-sectional study was conducted on 234 pregnant women (as the population) who received their first K1 prenatal contact at the Dander Health Center in Bojonegoro Regency, which collected from March to August 2020, approved by Ethical Committee from Health Polytechnic of Health Ministry, Surabaya (No.EA/0363/KEPK-Poltekkes_Sby/V/2020).

This study enrolled 129 pregnant women, as a result of random sampling, who made their initial K1 antenatal contact at the Dander Health Center in Bojonegoro Regency. Probability sampling utilizing a basic random sample methodology was employed in this investigation. Primary data comes from questionnaires, while secondary data comes from a cohort of pregnant women's registry and the Maternal and Child Handbook (MCA).

The data in this study were analyzed using a logistic regression test with a significance threshold of 0.05. If p is less than 0.05, it is concluded that there is a relationship between pregnant women's attitudes, subjective norms, and perceptions of behavioral control over pregnancy check-ups and their desire to visit Dander Health Center Bojonegoro Regency for K1 visits.

RESULTS AND DISCUSSION

This early stage is beneficial for testing and quantifying the strength of the dependent and independent variables' influence. Additionally, this stage serves as a screening stage to determine which variables should go to the multivariate test stage.

Correlation between Attitudes and Intentions

Table 1 illustrates the effect between pregnant women's opinions

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toward antenatal care and their goals during visits to the Dander Health Center.

Table 1. Cross-tabulation of the Relationship between Attitudes Regarding Antenatal Care and the Intention of Pregnant Women to Conduct K1 Visits at the Dander Health Center, Bojonegoro Regency in 2020.

Attitudes regarding antenatal care	Intentions				Total	
	Intended		Unintended			
	n	%	n	%	n	%
Support	62	98.4	1	1.6	63	100
Moderate	51	96.2	2	3.8	53	100
Less	0	0.0	13	100	13	100
Total	113	87.6	16	12.4	129	100

According to Table 1, the majority of pregnant women support and intend to have their pregnancies checked at the Dander Health Center in the Dander District of the Bojonegoro Regency. Additionally, the outcomes of the analysis were validated using logistic regression (Table 2).

Because the P-value (0.001) is less than 0.05, the null hypothesis is rejected. Thus, a correlation exists between attitude (regarding prenatal care) and intention (pregnant women conducting K1 visits) at Dander Health Center in Bojonegoro in 2020.

Table 2. Logistic Regression Analysis for the Relationship of Attitudes about Pregnancy Check-ups with Pregnant Women's Intentions in K1 Visits.

Variable	B	S.E	W	P-value	Exp (B)
Attitude	4.352	1.333	10.649	0.001	77.605
Constant	-18.882	5.197	13.118	0.000	0.000

Pregnant women who have a supportive attitude about prenatal care are 77.6 times more likely to visit K1 than those who are less supportive of antenatal care. The initial purpose of this study was to examine the association between pregnant women's opinions toward prenatal care and their desire to attend the Dander Health Center in Bojonegoro Regency for K1 visits.

The findings indicated that the majority of pregnant women had a supportive attitude toward prenatal care and intended to schedule a K1 visit. Additionally, only a minority of them are less supportive and want to conduct K1 visits.

The logistic regression analysis revealed a correlation between pregnant women's perceptions toward prenatal care and their propensity to attend K1. According to Azwar (2016), attitudes are influenced by personal experience, influential persons, culture, mass media, educational attainment, religious organizations, and emotional reasons.

The study findings support the hypothesis that an individual's level of education has an effect on their attitude (Pardana et al., 2019). The majority of respondents have completed high school and support pregnancy screenings. The lesser their educational attainment, the more limited their knowledge and experience will be, which will have a detrimental effect on their attitudes and conduct. In the opposite direction, the more education a person has, the more knowledge and experience they has, resulting in more positive and helpful attitudes and conduct. This is also consistent with Green's theory, as discussed in Notoatmodjo (2012), that education and knowledge are attitude-altering, i.e. predisposing, factors. A healthy mindset or body of knowledge will dictate healthy behaviors and attitudes.

Pregnant women on average are between the ages of 20 and 35, and it is clear that pregnant women's age influences their attitudes and intentions regarding pregnancy checkups. If a person is mature and strong enough, he or she will consider maturely about their health needs, one of which is reporting their pregnancy to health personnel at an early age (Hurlock, 1998).

On the other hand, if a person is still too young to become pregnant (less than 20 years old), they have a limited knowledge of the need of antenatal care. If pregnant women are too old (over 35 years of age), they may believe they have had prior pregnancy experiences, resulting in a lack of knowledge of the purpose to have a pregnancy check. Mothers will think maturely and make more informed judgments about their own health when they are not too old or too young. Pregnant women aged 20-35 years will believe that pregnancy checks are necessary for their own and their fetuses' health, prompting

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moms to check their pregnancy as soon as possible after learning they are pregnant/having a late period. Pregnant women over the age of 35 are frequently already parents. The more children a mother has, the less likely she is to want to terminate her pregnancy early. Apart from being preoccupied with her children, the mother also believes her pregnancy is normal.

Thus, the role of health workers, particularly midwives, is critical to ensuring that all pregnant women have a favorable attitude toward antenatal care. We intend to increase the coverage of K1 visits to ensure that Ante Natal Care (ANC) services are provided in accordance with government-mandated standards, ensuring the safety of the mother and fetus until later birth.

The Relationship between Subjective Norms and Intentions

The relationship between subjective norms regarding pregnancy check-ups with pregnant women's intentions in K1 visits at Dander Health Center can be seen in Table 3. Subjective norms were divided into three categories, i.e., good, moderate, and deficient according to the perception of each respondent towards the norms on antenatal care.

Table 3. Cross-tabulation of the relationship between subjective norms regarding antenatal care and the intention of pregnant women to conduct K1 visits at the Dander Health Center, Bojonegoro Regency in 2020.

Subjective norms on antenatal care	Intentions				Total	
	Intended		Unintended			
	n	%	n	%	n	%
Good	26	96.3	1	3.7	27	100
Moderate	84	96.8	3	3.4	87	100
Deficient	3	20.0	12	80.0	15	100
Total	113	87.6	16	12.4	129	100

As shown in Table 3., the majority of pregnant women who intend to visit K1 have relatively good subjective norms (96.8%). Additionally, there were 26 respondents (96.3%) of pregnant women who intended to attend K1 and had subjective norms regarding good pregnancy check-ups. In addition, a small proportion of pregnant women in the K1 visit had poor subjective norms regarding pregnancy check-ups and mostly did not intend to do K1 visit.

In conclusion, most pregnant women intend to visit K1 and have a fairly good subjective opinion about pregnancy check-ups at the Dander Health Center, Dander District, Bojonegoro Regency compared to those who do not intend to do so. The results of the analysis with the logistic regression test can be seen in Table 4.

Table 4. Logistic Regression Analysis for the Relationship of Subjective Norms about Pregnancy Check-ups with Pregnant Women's Intentions in K1 Visits

Variable	B	S.E	W	P-value	Exp (β)
Attitude	2.256	1.085	4.323	0.038	9.543
Constant	-18.882	5.197	13.118	0.000	.000

According to Table 4., the logistic regression test produces a significance value of 0.038 (less than 0.05), indicating that the null hypothesis is rejected. In conclusion, there is a relationship between subjective prenatal care norms and pregnant women's desire to attend the Dander Health Center in Bojonegoro Regency in 2020 for K1 visits.

Pregnant women who have a reasonable subjective standard of prenatal care are 9.5 times more likely to have a K1 visit than pregnant women who have a poor subjective standard of prenatal care. The results showed that most pregnant women had a fairly good subjective norm of antenatal care and intended to do a K1 visit, although a small portion had no intention of going to a K1 visit. Furthermore, the logistic regression test results showed a relationship between subjective norms about antenatal care and the intention of pregnant women to visit K1.

Subjective norms are functions based on beliefs called normative beliefs. It mainly concerned about the agreement and/or disagreement from referents or people and groups that influence individuals (significant others) such as

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parents, spouses, close friends, coworkers, or others to a behavior. Subjective norms are defined as individual perceptions of social pressure to perform or not to perform a behavior (Ajzen, 1991).

Subjective norms are determined by a combination of individual normative beliefs and motivation to comply. Usually, the more individuals perceive that their social referents support them in performing a behavior, the more individuals will feel social pressure to elicit that behavior. And conversely, the more individuals perceive that their social referents do not approve of behavior, the individuals tend to feel social pressure not to perform the behavior.

The study results are in accordance with the theory that subjective norm (subjective norm) is the extent to which a person has the motivation to follow people's views of the behavior he will do (normative belief). Thus, if the individual feels it is his personal right to determine what he will do, it is not determined by other people around him, and then he will ignore people's views about the behavior he will do (Ajzen, 1991).

Most of the respondents have quite good subjective norms. Supposedly, with a good subjective norm, a person should not be influenced by the views of others in his behavior about his pregnancy check-up and his intention to make a K1 visit. All pregnant women with fairly good subjective norms should encourage themselves to have an intention to have a pregnancy checkup, but a small proportion does not intend to do a K1 visit. This happens because a small number of respondents have a negative attitude towards pregnancy check-ups. A negative attitude towards pregnancy checks makes the mother not intend to do pregnancy tests.

The results of this study show that subjective norms are individual beliefs about the expectations of those around them who are influential, both individuals and groups, to perform or not to perform a certain behavior. To understand a person's intentions, measuring the subjective norms that influence his intention to act is also necessary. Subjective norms can be measured directly by assessing consumers' feelings about how relevant other people who become their role models (such as family, classmates, or coworkers) will approve or disapprove of certain actions they take (Suprapti, 2010; Kan & Fabrigar, 2017).

The Relationship between Behavior Control Perceptions and Intentions

The relationship between perceptions of behavioral control of pregnant women regarding pregnancy check-ups with pregnant women's intentions during visits to Dander Health Center can be seen in Table 5.

Table 5. Cross-tabulation of the relationship between behavioral control perception regarding antenatal care and the intention of pregnant women to conduct K1 visits at the Dander Health Center, Bojonegoro Regency in 2020.

Subjective norms on antenatal care	Intentions				Total	
	Intended		Unintended			
	n	%	n	%	n	%
Good	65	92.9	5	7.1	70	100
Moderate	48	85.7	8	14.3	56	100
Deficient	0	0	3	100.0	3	100
Total	113	87.6	16	12.4	129	100

Based on Table 5, the relationship between perceptions of behavioral control about pregnancy check-ups with the intention of pregnant women in K1 visits at the Dander Health Center, Bojonegoro Regency in 2020, most pregnant women have a perception of behavioral control about pregnancy checks to visit K1 is good as many as 65 respondents (92.9%).

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Table 6. Logistic Regression Analysis for the Relationship of Control Behavior Perceptions about Pregnancy Check-ups with Pregnant Women's Intentions in K1 Visits.

Variable	B	S.E	W	P-value	Exp (B)
Attitude	1.687	1.150	2.154	0.142	5.405
Constant	-18.882	5.197	13.118	0.000	.000

In conclusion, most pregnant women who intend to visit K1 at the Dander Health Center, Bojonegoro Regency, have a lesser perception of controlling good behavior about pregnancy checks than those who do not. The results of the analysis with the logistic regression test can be seen in Table 6.

Based on Table 6, the results of the logistic regression test have a P-value (0.142), which is larger than 0.05, meaning that the null hypothesis is accepted. In conclusion, there is No. relationship between behavioral control perceptions about pregnancy check-ups and the intentions of pregnant women in K1 visits at Dander Health Center, Dander District, Bojonegoro Regency in 2020.

The third objective of this study was to analyze the relationship between perceptions of behavioral control of pregnant women regarding antenatal care to visit K1 at Dander Health Center, Bojonegoro Regency. Most pregnant women have a good perception of prenatal care and intend to do a K1 visit. However, the logistic regression test results showed no relationship between perceptions of behavioral control regarding pregnancy check-ups with the intention of pregnant women in K1 visits at Dander Health Center, Bojonegoro Regency in 2020.

This is not in accordance with the theory of perceived behavioral control, which describes the individual's self-efficacy in performing a behavior. According to La Barbera & Ajzen (2021), perceived behavioral control refers to the perceived ease or difficulty in carrying out the behavior and a person's amount of control over achieving the goals of the behavior. Perception of behavioral control can influence behavior directly or indirectly through intention (Achmat, 2010).

Most pregnant women have a good perception of behavioral control, hoping that it will affect the good intentions of pregnant women to carry out pregnancy checks, especially during K1 visits. Khayeri et al. (2019) stated that behavioral control has a positive and significant effect on the intention variable. Furthermore, perceived behavioral control significantly predicts the intention to behave (Cheng et al., 2011; Otogara et al., 2018). This study is also not in accordance with the results of Qoma'iah's research (2018), which showed a significant relationship between behavioral perceptions and antenatal care visits.

CONCLUSION

The results showed that there was a statistically significant relationship between the attitude of pregnant women and subjective norms regarding pregnancy check-ups with the intention of pregnant women to visit K1. However, the relationship between perceptions of behavioral control regarding antenatal care and the intention of pregnant women to visit K1 is not statistically significant. This study suggests that the understanding of pregnant women needs to be improved, including through classes for pregnant women about the importance of good subjective attitudes and norms related to antenatal care to support the intention to check pregnancy regularly, especially K1 visits. As a result, early and regular pregnancy check-ups will detect high-risk pregnancies so that they can be handled immediately, thereby reducing maternal and infant mortality.

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Teenage Pregnancy in Rural Indonesia: Does Education Level Have a Role?

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ABSTRACT

***Background**: Teenage pregnancy is a high-risk pregnancy. Teenage pregnancy often gets social sanctions in the form of stigma from the community, and the loss of school rights. **Objective**: The research aims to analyze the role of education in teenage pregnancy in rural Indonesia. **Methods**: This study analyzed the data from Indonesian Demographic and Health Survey 2017 using a cross-sectional approach. The unit of analysis was women aged 19-24 years old. The study pooled 1,982 women as samples. Besides the education level, other independent variables analyzed were marital, employment, and wealth. In the final stage of the study, a multivariate test with binary logistic regression was carried out. **Results**: The results showed that women with secondary education were 0.451 times less likely to experience teenage pregnancy than women with primary education (95% CI 0.354-0.574). Higher education was 0.110 times less likely to experience teenage pregnancy than primary education (95% CI 0.070-0.171). The study found two other variables related to teenage pregnancy in rural Indonesia besides educational factors. The two variables are employment status and wealth status. **Conclusion**: The study concluded that education level is associated with to teenage pregnancy in Indonesia's rural areas. The lower the education level, the higher the chances of experiencing teenage pregnancy.*

***Keyword**: Education level, Indonesia, Maternal health, Teenage pregnancy.*

INTRODUCTION

Teenage marriage is a global problem. The majority of adolescents who marry at an early age do not have sufficient readiness to become parents. The shackles of poverty often crush teenage couples, so the pregnancy and childbirth care are not guaranteed properly (Panjaitan, 2019). Teenagers are faced with severe consequences for their lives due to early marriage. Some of the values that will be met by adolescents who marry at an early age include psychological impacts and unfulfilled reproductive health rights. Women become subordinate groups because of the low bargaining position of their husbands in married life. Women's opportunities to be involved in decision-making in the household are very weak; they do not get the chance to go to school and earn a living, so often choked with poverty (Wulandari and Laksono, 2020a).

Based on data from the 2013 Indonesian Basic Health Survey, it was reported that 2.6% of women aged 10-54 years were married at the age of 15 years old, and 23.9% married at the age of 15-19 years, thus contributing the highest maternal mortality due to pregnancy complications (Priyadarshini, 2020). Meanwhile, the 2017 Indonesia Demographic and Health Survey (IDHS) informed that 10% of married women were under 18 years old (National Population and Family Planning Board *et al.*, 2018). The high number of teenage marriages was influenced by several factors, including low education, socioeconomic status, culture, religion, and internet access (Kasiati and Isfentiani, 2020; Ningsih *et al.*, 2020). Early marriage in Indonesia is strongly related to the socio-economic and cultural conditions of the community, so it is only natural that marriage is determined by the parents than the bride and groom. Low family economic conditions, economic levels at the poverty line, and not having the opportunity to get education increase the risk of young girls in early motherhood

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(Widyastari, Isarabhakdi and Shaluhiyah, 2020).

Globally, it is estimated that 14 million children are born to women aged 15-19 years each year. Meanwhile, in low-middle-income countries, an estimated 2.5 million babies are born to women under 16 (Indarti *et al.*, 2020). Adolescents who marry at a very young age are very vulnerable to high risk pregnancy, including miscarriage, low birth weight babies, maternal mortality, and infant mortality (Kasiati and Isfentiani, 2020; Laksono and Wulandari, 2020). Global teen pregnancy trends in 2015 showed 47 per 1000 births for women under 20. Twenty-one million girls aged 15-19 are in developing countries, and around 2 million are under the age of 15. Teenage pregnancies are unwanted because of child marriage, which is common in rural areas with low socioeconomic status (Sharaztasya Putri, 2016).

This condition is also reinforced by social and religious values that perceive marriage as a way to ease the burden on the family (Pratiwi *et al.*, 2019). Spiritual values are often used as an excuse for teenagers to marry to avoid sexual acts that violate the law (Widyastari, 2019). Besides, strong cultural values, especially in rural areas, make young girls very vulnerable to the practice of teenage marriage to meet family law standards that expecting their daughter to marry before 16 years old, as happened in rural Indramayu, West Java- Indonesia (Grijns and Horii, 2018).

Pregnant teenagers often receive social sanctions in the form of stigma from the society and the loss of school rights.. Education is the right of every citizen, regulated in article 31 of the 1945 Constitution, and aims to improve the community's quality of life and welfare. However, in reality, there are still cases of pregnant teenagers who are expelled from school. It is difficult to regain their confidence to return to school, so that it becomes a double burden for adolescents, their right to education is not fulfilled and the responsibility for reproductive health. The Indonesian government does not yet have clear rules regarding legal protection and education discrimination against adolescents who experience pregnancy. Education is crusials for young women to increase their knowledge and skills, and open up opportunities to improve their welfare (World Health Organization, 2020a). This study aims to analyze the role of education in teenage pregnancy in rural Indonesia

METHODS

Data Source

The authors used data from the 2017 Indonesian Demographic Data Survey (IDHS) as analysis material. The analysis unit in this cross-sectional study is women aged 19-24 in rural Indonesia. The sample was determined using stratification and multistage random sampling methods. The study analyzed 1,982 participants as a sample.

Variables

The dependent variable was teenage pregnancy. Teenage pregnancy is a pregnancy that occurs in adolescence at the age of less than 20 years. This variable consists of two categories: not experiencing teenage pregnancy and experiencing it.

The study tested four independent variables: education level, marital status, employment status, and wealth status. The education level is based on the husband's last education certificate, which consists of three criteria: primary, secondary, and higher education. Marital status is divided into three categories: never in a union, married/living with a partner, and divorced/widowed. Employment status comprised of two categories: unemployed and employed.

The wealth index is calculated based on wealth (amount and type of goods owned). The most important things in terms of wealth include televisions, bicycles, or vehicles, as well as housing aspects such as drinking water supplies, bathroom amenities, and the main materials used to construct the house's foundation. The survey determined the score trough an analysis of the principal component used in the survey. The household score for each household member is used to construct national wealth quintile, which is then distributed into five equal categories, each representing 20% of the population (Wulandari *et al.*, 2019, 2022). Moreover, the wealth status comprised of five levels: poorest, poorer, middle, richer, and richest.

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Data Analysis

In the early stages of the analysis, a bivariate test with chi-square was done. In the second stage, this study conducted a multivariate test with binary logistic regression. Moreover, the research used SPSS 26 software for all analysis stages.

Ethical Approval

The National Institute for Health Research and Development of the Indonesian Ministry of Health has approved the 2017 IDHS after conducting ethical tests. ICF International permitted this study to use the 2017 IDHS data via https://dhsprogram.com/data/new-user-registration.cfm

RESULTS

Table 1 displays the bivariate test results between education level and other variables involved in this analysis. Table 2 informs that all education levels are dominated by women who experienced teenage pregnancy, except for women who have higher education, which is dominated by those who do not experience teenage pregnancy.

All education categories are dominated by married women/living with partners based on marital status. Meanwhile, regarding employment, all types of education levels are dominated by unemployed women. Then all education level categories are dominated by the poorest women based on wealth status.

Table 1. The Bivariate Analysis Results (n=1,982).

Characteristics	Education Level						p-value
	Primary		Secondary		Higher		
	n	%	n	%	n	%	
Teenage pregnancy							** <0.001
- No	110	21.1	524	39.6	100	72.5	
- Yes	412	78.9	798	60.4	38	27.5	
Marital status							0.855
- Never in union	3	0.6	8	0.6	1	0.7	
- Married/Living with partner	500	95.8	1259	95.2	129	93.5	
- Divorced/Widowed	19	3.6	55	4.2	8	5.8	
Employment status							* 0.001
- Unemployed	318	60.9	913	69.1	83	60.1	
- Employed	204	39.1	409	30.9	55	39.9	
Wealth status							** <0.001
- Poorest	342	65.5	589	44.6	47	34.1	
- Poorer	105	20.1	356	26.9	25	18.1	
- Middle	55	10.5	224	16.9	26	18.8	
- Richer	16	3.1	109	8.2	19	13.8	
- Richest	4	0.8	44	3.3	21	15.2	

Note: ∗ p < 0.01; ∗∗ p < 0.001.

Table 2 shows the binary logistic regression results of teenage pregnancy in rural Indonesia. The education level is proven to affect teenage pregnancy in rural Indonesia. Secondary education is 0.451 times less likely than primary education to experience teenage pregnancy (AOR 0.451; 95% CI 0.354-0.574). Higher education is 0.110 times less likely than primary education to experience teenage pregnancy (AOR 0.110; 95% CI 0.070-0.171). The results show that the better the education level, the lower the likelihood of women in rural Indonesia experiencing teenage pregnancy.

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Table 2. Binary logistic regression of teenage pregnancy in Indonesia's rural area (n=1,982).

Predictors	Teenage Pregnancy			
	p-value	AOR	95% CI	
			Lower Bound	Upper Bound
Education level: Primary	-	-	-	-
Education level: Secondary	*** <0.001	0.451	0.354	0.574
Education level: Higher	*** <0.001	0.110	0.070	0.171
Employment status: Unemployed	-	-	-	-
Employment status: Employed	*** <0.001	1.470	1.195	1.808
Wealth status: Poorest	-	-	-	-
Wealth status: Poorer	* 0.014	0.744	0.588	0.942
Wealth status: Middle	*** <0.001	0.595	0.452	0.782
Wealth status: Richer	** 0.003	0.572	0.395	0.828
Wealth status: Richest	0.481	0.827	0.488	1.402

Note: $*$ p < 0.05; $**$ p < 0.01; $***$ p < 0.001.

Apart from educational factors, two other variables are also significantly related to teenage pregnancy in rural Indonesia. The two variables are employment status and wealth status. Employed women have 1,470 times more likely than unemployed women to experience teenage pregnancy (AOR 1.470; 95% CI 1.195-1.808).

On the other hand, Table 2 shows that wealth status partially affects teenage pregnancy in rural Indonesia. According to wealth status, the poorer is 0.744 times less likely than the poorest to experience teenage pregnancy (AOR 0.744; 95% CI 0.588-0.942). The middle group is 0.595 times less likely than the poorest to experience teenage pregnancy (AOR 0.595; 95% CI 0.452-0.782). Meanwhile, the richer is 0.572 times less likely than the poorest to experience teenage pregnancy (AOR 0.572; 95% CI 0.395-0.828). Otherwise, there is no significant difference between the richest and the poorest in influencing the incidence of teenage pregnancy in rural Indonesia.

DISCUSSION

Teenage pregnancies are more common in marginalized communities and are frequently triggered by poverty, lack of education, and job opportunities (Siniša, 2018). This issue, however, has become a global concern in low, middle, and high-income countries. Teenage mothers aged 10 to 19 years account for 11% of total births worldwide, with the majority (90-95%) occurring in low- and middle-income countries (Jaramillo-Mejía and Chernichovsky, 2019).

Early pregnancies frequently have serious health consequences for both mothers and babies. Pregnancies in girls aged 15 to 19 years are associated with a higher risk of mortality and morbidity than pregnancies in women aged 20 and older (Siniša, 2018; Utami *et al.*, 2020). Teenage mothers are also more likely to develop eclampsia than older women, puerperal endometritis, and systemic infections (World Health Organization, 2015). On the other hand, babies born to adolescent mothers have a higher risk of low birth weight, premature delivery, and severe neonatal health issues (World Health Organization, 2020b; Yoto *et al.*, 2020, 2022). Furthermore, 3.9 million unsafe abortions occur yearly, contributing to maternal mortality and morbidity (Darroch, Woog and Bankole, 2016).

This study indicates that the better the education level, the lower the likelihood of women in rural Indonesia experiencing teenage pregnancy. Several studies in various countries found the same results, and similar research information is reported in Colombia and Bangladesh (Drewry and Garcés-Palacio, 2020; Trommlerová, 2020). Better education for women and mothers is often associated with positive health outcomes for themselves and their children (Seran *et*

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al., 2020; Masruroh *et al.*, 2021; Ridwanah, Nugraheni and Laksono, 2022).

Better education is related to the individual's ability to understand the risks and consequences of each attitude and action taken (Laksono and Rachmawati, 2013; Wulandari and Laksono, 2020b). A better level of education is also related to women's independence, which can reduce teenage marriage due to matchmaking that often occurs in the eastern region (Grijns and Horii, 2018; Trommlerová, 2020). When teenagers are still of school age and have not received information about sex education, they engage in sexual behavior that leads to pregnancy. They experience a double burden, become pregnant and lose the opportunity to get a higher education (Nkosi and Pretorius, 2019; Nikmatur Rohmah *et al.*, 2020).
Women with higher education have more opportunities to develop themselves and get jobs to increase their welfare to escape poverty, which encourages them to experience teenage marriage (Ahorlu, Pfeiffer and Obrist, 2015; Kumar and Lakhtakia, 2021). Several previous studies have confirmed better education levels as a positive determinant of various performances in the health sector (Ipa *et al.*, 2020; Megatsari *et al.*, 2020). Otherwise, low levels of education were a barrier to various health performance to achieve better quality (Rohmah *et al.*, 2021; Laksono and Wulandari, 2022).

Furthermore, the results inform that employment is a risk factor for teenage pregnancy in rural Indonesia. The information on the results of this study is in line with previous studies, which also found the same information that employment status is a determinant of teenage pregnancy (N. Rohmah *et al.*, 2020). In developing countries, including Indonesia, earning a living is a duty and responsibility (Devy and Suheri, 2020; Andayani *et al.*, 2021). Meanwhile, when women work, it is often caused by low family income, and women are in a position to help their husbands meet household needs (Kidan Ayele *et al.*, 2018).

The analysis found that wealth status determines the incidence of teenage pregnancy in Indonesia. The same information is reported in several previous studies, especially in developing countries (Razu, 2018; Kohno *et al.*, 2019). In the Indonesian context, poverty encourages early marriage (Chirwa *et al.*, 2019; Rahayu and Wahyuni, 2020). This situation is also supported by the permissive local culture of early marriage (Laksono and Wulandari, 2019; Laksono *et al.*, 2020). However, legally, a regulation provides a minimum age limit of 19 years for women to marry (Rahman and Yuandari, 2020).

CONCLUSION

The study concludes that the education level relates to teenage pregnancy in rural Indonesia based on the research results. The better the education level, the lower the possibility of a woman in rural Indonesia experiencing teenage pregnancy.

The study results guide the government with specific policy targets. To control teenage pregnancy in rural Indonesia, the government can focus on girls in rural areas with a low education level.

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The Role of Telemedicine as Health Promotion Media during the Covid-19 Pandemic in Indonesia: A Systematic Review

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ABSTRACT

***Background**: WHO has declared COVID-19 as a worldwide pandemic in March 2020, which has prompted several countries to take steps to prevent its spread due to the increasing number of cases. One of the policies implemented in Indonesia is the PSBB, so it has an impact on all aspects including access to health services. The rapid development of information technology in the era of the industrial revolution 4.0 has a positive impact, especially for the effectiveness and efficiency of health services, namely the development of e-health which is one component to bring health services closer to the community, one of which is in the form of telemedicine. This study aims to describe the role of telemedicine as health promotion media during the current COVID-19 pandemic. **Methods**: This research used a literature study approach. This study used 6 reviewed articles. The data was extracted by determining the key variables and then analyzed descriptively which is presented in tabular form. **Results**: Telemedicine is widely used as a medium of health communication by the public. One of the reasons people use telemedicine in health communication at this time is that the COVID-19 pandemic condition makes patients too afraid and anxious to conduct face-to-face consultations and visit hospitals. Besides that, telemental Counseling on Reducing Adolescent Anxiety Due to Exposure to Covid 19 Information. In addition, telemedicine can also be applied in the field of nutrition in the implementation of nutritional care in hospitals. **Conclusion**: Telemedicine as a health promotion media can be utilized in various fields such as telegizi, telemedicine in midwifery and emergency room, telemental and telepsychology.*

***Keyword**: COVID-19, Health Information, Health Promotion, Telemedicine.*

INTRODUCTION

Sar-Cov 2 or COVID-19 which was determined by the World Health Organization (WHO) as a form of Public Health Emergency of World Concern (KMMD). The disease that spreads to all countries in the world is then designated as a pandemic in 2020. This is due to the development of COVID-19 cases which have increased significantly or have increased continuously in various countries in the world. In Indonesia, the first confirmed case of COVID-19 was on 02 March 2020 with two cases (Mustopa, Budiman and Supriadi, 2020). In May 2020, the death rate for COVID-19 cases also continued to increase, although the number of recovered COVID-19 patients also increased. The number of cases in Indonesia itself has increased continuously, up to November 18, which was still at 478,720 positive cases with 402,347 recovered and 15,503 people died (Kementerian Kesehatan Republik Indonesia, 2020) while the Case Fatality Rate (CFR) due to COVID-19 in Indonesia are in the range of 3-4% percentage. The percentage of deaths due to COVID-19 in Indonesia is still quite high compared to other countries. This condition illustrates that Indonesia is one of the countries with the highest number of COVID-19 cases and effective handling efforts are needed so that the number of cases does not increase and the death rate can be reduced.

The Government of Indonesia has issued Presidential Decree No. 11 of 2020 concerning the Determination of the COVID-19 Public Health Emergency which states that the COVID-19 disease is a public health emergency that efforts must be made to overcome it. Based on this, the government has designed several strategies for implementing health protocols through the Decree of the Minister of Health of the Republic of Indonesia No. 382/2020 Regarding Public

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Health Protocols in Public Places and Facilities in the Context of Prevention and Control of COVID-19. This is done as an effort to prevent and control COVID-19 (Kementerian Kesehatan Republik Indonesia, 2020). Several countries with an increase in cases have made efforts to prevent the spread, one of which is a lockdown policy. Indonesia is one of the countries that has implemented a lockdown to limit the spread of SARS-CoV2, in the form of large-scale social restrictions (PSBB) stipulated in Government Regulation (PP) Number 21 of 2020 concerning PSBB in the Context of Accelerating Handling of Covid-19. The PSBB policy issued has an impact on all aspects of daily life, including the difficulty of the community in getting access to health (Irianti *et al.*, 2021). This policy is also followed by a policy to limit activities outside the home and meeting people (physical distancing) as well as an appeal to use the telemedicine platform to obtain health services (Lubis, 2020).

The rapid development of information technology in the era of the industrial revolution 4.0 has a positive impact, especially for the effectiveness and efficiency of health services, namely the development of e-health which is one of the components to bring health services closer to the community. E-health is currently growing rapidly, mainly due to the perceived limitations of the health care system in developing countries. Coupled with the COVID-19 pandemic which forced the Indonesian people to do physical distancing, so that not a few consumer buying behavior also experienced a change from direct or offline purchases to online purchases (Tarmidi *et al.*, 2021).

One of them in the form of e-health is telemedicine. Telemedicine is the use of information technology as a communication medium in the provision of health services remotely or without face-to-face using telephone media, video calls, electronic messages, internet sites and other sophisticated communication tools (Mustikasari, 2020). Communication between doctors and patients is an important component in the patient's healing process because it includes providing good, friendly and calming services that actually triggers positive energy for patients to be optimistic about healing their illness. Empathy provided by doctors through verbal and nonverbal communication will ultimately create good interpersonal relationships (creating a good interpersonal relationship), exchange of information (exchange of information), and medical decision making (Liansyah and Kurniawan, 2015).

Telemedicine, also known as healing at a distance, is becoming increasingly important, as the number of users increases significantly. The number of people using telemedicine services increased by 44% during the Covid-19 pandemic. Telemedicine can be done in two ways, namely direct (synchronous) and store-and-forward (asynchronous). In synchronous the client and service provider meet at the same time for interaction to occur, while asynchronous does not require direct attendance (filling out a complaint form on the google form or other methods as applied in the field), to be then carried out synchronously as a follow-up (Abigael and Ernawaty, 2020). This is an advantage in providing the right information to clients. In addition, it can also provide an increase in terms of effectiveness, increase in productivity and decrease the use of costs (Harno, K., T., Carlson and Viikinkoski, 2000).

The number of health application services (apps) or digital health service start-ups, continues to increase. These services include Halodoc, Alodokter, ProSehat, Yesdok, Klik doctor, Apasakitku, Pakdok, Go Doc, or the Ministry of Health's telemedicine application – Temenin (Telemedik Indonesia), Sehatpedia and others. From these applications, quite a lot of free services, thus the potential to attract users will be higher (Ganiem, 2020). Online health consultations are supported by doctors who have a background in health sciences who are able to analyze and diagnose the health conditions of their patients. However, it cannot be ignored, the existence of this online consultation site is also not without problems, difficulties in facilitating behavior and motivating patients are not effective. Another difficulty that arises and is quite serious is that the health information conveyed is sometimes less relevant so that it risks reducing the quality of service and patient trust (Iqbal and Husin, 2017). Furthermore, the question that often arises is how a doctor diagnoses a patient's illness only through the complaints submitted (not what is

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shown) by the patient and how the patient trusts the results of the diagnosis.

Telemedicine is widely used health promotion media by the public. Telemedicine can be used as health promotion media in various fields such as in the field of maternal and child health within the scope of professional care of midwives, Telemental Counseling on Reducing Adolescent Anxiety Due to Exposure to Covid 19 Information. Telemedicine is very important to use during the covid-19 pandemic because it has many benefits, one of which is that people get health information (Fatmawati, 2021). One of the reasons people use telemedicine as health promotion media at this time is that the COVID-19 pandemic condition. Therefore, researchers are interested in conducting a systematic review of the role of telemedicine as health promotion media during the COVID-19 pandemic. This study aims to describe the role of telemedicine as health promotion media during the current COVID-19 pandemic.

METHODS

This study uses a literature review approach which examines research related to the use of telemedice during the COVID-19 pandemic. The author uses Google Scholar as a literature source with the keyword that the author uses in the search for research articles is "The Use of Telemedice during the Covid-19 Pandemic". This literature resource contains research conducted in Indonesia and visited. The source of the library is very complete and has keywords used in the search, making it easier for research that will be used as a guide in this research topic.

The technique used to extract and organize information is to create tables and variables such as research title, type, research design used, sampling method, data collection method and keys. information/research results. In this case, I read carefully the literature that I got and put it in the table that I made according to these variables. The first research procedure was by entering the keyword "Use of Telemedice during the Covid-19 Pandemic" in Google Scholar and obtained as many as 228 articles. Then the author again limited the number of articles obtained based on articles published within a period of 2 years with the same title, so that the number of articles found was 16 articles. The articles were then re-selected using several criteria set by the author, namely the inclusion and exclusion criteria used to limit the literature search. The inclusion criteria are:

1. The type of article is an article in a published journal
2. The article discusses the role of telemedicine during the COVID-19 pandemic
3. Articles can be downloaded

The exclusion criteria are research articles are only in the form of letters or abstracts. Then the articles selected based on the inclusion and exclusion criteria were 10 articles. Then selected 5 articles that are appropriate and support the topic. The data were analyzed descriptively which were presented in tabular form. The table contains the role of telemedicine during the Covid-19 pandemic.

RESULTS AND DISCUSSION

The following is the selection process for the article The Role of Telemedicine During The Covid-19 Pandemic in Indonesia. The selection process is as follows.

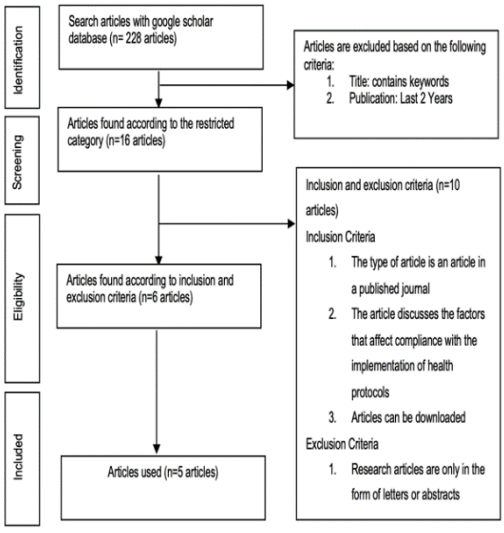

Figure 1. Article Selection Process The Role of Telemedicine as Health Promotion Media During The Covid-19 Pandemic in Indonesia

In the initial stage, 228 articles were found and then re-selected according to categories so that 16 articles were obtained. Then the 16 articles were re-selected with inclusion and exclusion criteria and 5 articles were obtained. The articles used in this study were 5 articles.

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Based on the literature review, several roles of telemedice as health promotion media were found during the Covid-19 pandemic. The roles are as follows

Table 1. The Role of Telemedicine as Health Promotion Media during The Covid-19 Pandemic in Indonesia

No	The Role Telemedicine	Description
1	The role of Telemedicine in the form of Tele-Nutrition (Briliannita, Marlissa and Kamaruddin, 2020)	Telemedicine in the form of telegizi is carried out with the aim of nutrition officers being able to understand and apply telemedicine in the implementation of nutritional care during the Covid-19 pandemic. This shows that telegizi can be used as one of the current health promotion media. Activities carried out with education use educational media in the form of an internet network video conference zoom meeting.
2	Telemedicine in the form of Midwifery Online Consultation (Irianti *et al.*, 2021)	Telemedicine in midwifery services can be used as health promotion media. Telemedicine in midwifery services as health promotion media is carried out in the form of online consultations using the Google Form media as the initial registration medium and electronic messages using WhatsApp as the follow-up media for consultations. The steps taken are to make online consultation information dissemination media in the form of electronic posters which is carried out by distributing through online media such as WhatsApp, linked, telegram, Instagram, Facebook, Twitter. The information listed on the poster includes the service provider's WhatsApp contact number, service time, types of services that can be accessed. The consultations were carried out as pregnancy consultations, postpartum consultations, family planning consultations, toddler and preschool baby consultations, reproductive health consultations.
3	Telemedicine in the form of Telemental Counseling (Freska, Sarfika and Refnandes, 2021)	Telemedicine can also be applied as a media for health promotion in the form of telemental health. Telemental health is a health promotion medium with an effective delivery method for treating various mental, emotional, behavioral, and relational health problems. While many of the therapeutic skills that lead to the effectiveness of face-to-face treatments are transferable, the effectiveness of telemental health requires unique skills
4	Telemedicine in the Emergency Room (IGD) (Martini, 2021)	Telemedicine can be used as health promotion media in health services, especially in the emergency room. The use of technology such as telemedicine is expected to minimize direct contact with the public with health workers, and break the chain of the spread of COVID-19. In addition, in order to improve the quality of health services, especially during the pandemic.
5	Telemedicine in the form of Telepsychology (Praptomojati, 2020)	Telemedicine can also be used as health promotion media in the field of psychology. This is implemented through the use of tele-psychology which covers several areas, including: as a provider of mental health information; screening, assessment, and monitoring; providing interventions and social support Online and distance interventions are also seen as being able to minimize the obstacles encountered in the face-to-face mental health service model.

The Covid-19 pandemic is a global pandemic that has had a major impact on all countries in the world. Experts explain that Covid-19 is a contagious infectious disease caused by a new type of corona virus. Genomic analysis revealed that SARSCoV-2 is phylogenetically related to several bat viruses such as acute respiratory syndrome (SARS-like) (Shereen *et al.*, 2020). During the industrial revolution 4.0, when technology and information progress was rapid,

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computers, internet and smart phones were not strangers in everyday activities in society. Advances in technology and information provide very positive things, especially for effectiveness and efficiency in health services. One form is telemedicine. Telemedicine is the use of information technology as health promotion media in the provision of health services remotely or without face-to-face using telephone, video calls, electronic messages, internet sites and other sophisticated communication tools (Mustikasari, 2020). This can provide more variety in providing or carrying out activities related to improving the health status of the community. During the Covid-19 pandemic, this is the right condition to further implement telemedicine in the health sector. Based on the literature review, there are several roles of telemedicine that have been carried out including telegizi, online midwifery consultation, telemental counseling, telemedicine in the emergency room and in the form of telepsycology.

Nutrition workers are tasked with providing nutritional care to Covid-19 patients who are at risk of malnutrition and need proper nutritional support for optimal immunity and nutritional status. The provision of food for Covid-19 patients is no less important so that food is available that meets nutritional needs and is safe. Therefore, as a form of utilizing information and communication technology in the context of preventing the spread of Covid-19, the implementation of nutritional care can be carried out through telegizi. According to research telegizi helps parents in managing children's weight, improving protein and energy nutrient intake (Chai LK, Collins CE, May C, Brown LJ, Ashman A, 2020). Telegizi is one of the health promotion media that can be given for nutritional care to Covid-19 patients. Telegizi as a health promotion media is carried out through video conference zoom meetings. The role of telegizi as a health promotion medium in the implementation of nutritional care to patients during diet management, monitoring and evaluation of diet therapy to patients in hospitals effectively improves the condition or nutritional status of patients during treatment. This is evident in the research conducted by Kelly et al. (2016) that patients with chronic conditions experienced improved dietary intake of vegetables, fruit and sodium through nutritional diet therapy using telegizi (Kelly *et al.*, 2016). The implementation of telegizi has been suggested by the government through the PermenkesNo.HK.02.01/Menkes/303/2020 about the implementation of health services through the use of information and communication technology in the context of preventing the spread of COVID-19 so that telegizi can used in nutrition services in hospitals with reference to the nutritional care process in hospitals (Yunita, Asdie and Susetyowati, 2013). However, based on the results of research it was found that the use of telegizi applications as a health promotion media was still limited by patients and their families. This is due to the limited internet quota by nutrition officers and patients so that the implementation of nutrition services still uses visits to non-Covid-19 and Covid-19 patients while still implementing the health protocols that have been set (Briliannita, Marlissa and Kamaruddin, 2020). This shows that the application of telegizi as health promotion media is still experiencing several obstacles and is not optimal, especially during the Covid-19 pandemic. This condition can be caused by people's habits that tend to do face-to-face and are not accustomed to using technology and information.

One of the problems that arise in the health sector, especially women's health, is the limited access of women to contraception and maternal and child health services. The widespread Covid-19 pandemic and health care centers that are not ready for this pandemic have caused primary service centers to restrict activities, including restrictions on midwifery service activities. This has an impact on the high contraceptive drop out rate which is around 10% of acceptors, a 15% increase in the number of unwanted pregnancies, delays in early detection of complications in pregnancy, increased morbidity in children who are not treated. Therefore, one of the roles of telemedicine as health promotion media, in this case, is in the form of online midwifery consultations using Google Forms as registration media and WhatsApp media as consultation media. In direct health services, people are usually less interested in discussing menstrual and vaginal

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discharge problems because they are considered normal or embarrassing. This condition is caused because these problems are related to reproductive health. The existence of telemedicine in the form of online consultations makes a positive impact because clients feel they do not need face-to-face contact during consultations so that their situation will not be known directly (Irianti *et al.*, 2021). This creates openness when conducting counseling which is of course realized by fostering good relations and the sense of trust that is grown from a professional counseling process. The online consultation provided provides information services regarding women's health, both reproductive health and maternal and child health during the Covid-19 pandemic. The existence of telemedicine in the form of online consultation using online media, namely whatsapp media, provides an convenience for users of health services, especially midwifery. The use of telemedicine in Indonesia is very useful and considered efficient to bring health services closer to the geographical situation of Indonesia. The existence of online consultation using whatssap media that has been provided is one of the media that helps in solving health problems, especially services for women's health (Prawirohardo, Pukovisa; Pratama, Peter; Librianty, 2019).

One of the other roles of telemedicine as health promotion media is in the form of telemental health. Telemental counseling has an important role in the use of teleconferencing software for therapy sessions during the COVID-19 pandemic. Telemental health is an effective delivery method for treating a variety of mental, emotional, behavioral, and relational health problems. While many of the therapeutic skills that lead to the effectiveness of face-to-face care are transferable, the effectiveness of telemental health requires unique skills (Freska, Sarfika and Refnandes, 2021). The form of telemental health applied can be in the form of text media and also social media. Text media can be leveraged to help people overcome the mental health challenges posed by COVID-19. This is because texts are also sent through individual devices so that texts are easily given to many people at once using an automated text messaging platform. Text messaging interventions have shown effectiveness in behavioral health promotion and disease management. In addition, forms such as social media play a complex role in the management of mental health. On the one hand, it can provide a positive and supportive connection during times of physical isolation. Many people with mental illness are increasingly turning to social media to share experiences and seek mental health information and advice (Naslund, Potts and Michie, 2010).

In addition, telemedicine can also be used as health promotion media in emergency room services. Telemedicine services are carried out in the emergency room to reduce the number of people in the hospital, especially in the emergency room, the implementation of telemedicine in the emergency room can be carried out in the form of virtual video conference consultations carried out by patients and doctors or health workers before heading to the emergency room in the form of online communication using media social media such as whatsapp, telegram or short message service to carry out the initial diagnosis of the patient. Telemedicine is one of the strategies during the COVID-19 pandemic that can be used to increase patient satisfaction in health services (Martini, 2021). This is done to reduce contact between staff and patients. Another role of telemedicine is in the form of telepsycology. Telepsychology can cover several areas, including: as a provider of mental health information; screening, assessment, and monitoring; providing intervention; and social support (Lal and Adair, 2014). Online and remote interventions are also seen as being able to minimize the barriers encountered in the face-to-face mental health service model (Ritterband, L. M., Gonder-Frederick, L. A., Cox, D. J., Clifton, A. D., West, R. W., & Borowitz, 2003). Many studies show that these services have several advantages, such as better accessibility, lower costs, as well as flexibility, interactivity, and wider consumer engagement opportunities (Basavarajappa and Chand, 2017) (Christensen and Hickie, 2010) (Comer, 2015).

CONCLUSION

Telemedicine as a health promotion media can be used in various fields, namely in the field of nutrition for the implementation of nutritional care in

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hospitals, namely telegizi, in the field of maternal and child health, namely midwifery consultation, telemental counseling on reducing adolescent anxiety due to exposure to Covid 19 information and telemedicine in the emergency room. In addition, telemedicine can also be applied in the field of psychology, namely telepsychology. Telemedicine is very important to use during the Covid-19 pandemic because it has many benefits for the community in obtaining health information. Therefore, telemedicine needs to be studied and applied in health care facilities gradually so that health services can run more effectively and efficiently.

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Supportive Environment as Mental Health Intervention on Psychological Well-Being from Foreign Language Learning Activity

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ABSTRACT

***Background**: Mental health issues' awareness is increasing alongside the COVID-19 pandemic. While offline activities are shutting down, people require to adjust both rest and activities from home. That being said, there can also be a possibility to save more time because mobilization from home to another place is not necessary. However, excess free time does not always guarantee a better mental health situation if it does not fulfill the psychological needs. By all means, creating and surrounding in a supportive environment becomes essential to adjust to the new lifestyle and obligations. Foreign language learning activity turns out not only give new knowledge but also create a supportive environment to fulfill the desire for authentic interaction, which might contribute to psychological well-being at home during the pandemic season. **Objective**: This study aimed to explore deeper about the role of the supportive environment from foreign language learning activity on psychological well-being. Later, this finding could be used as a recommendation for the public health sector to promote psychological well-being through mental disorder prevention programs. **Methods**: This study uses a literature review from international journals, data reports, and theses that discuss about the supportive environment benefit on psychological well-being from the foreign language learning activity. The sources used are published in the last ten years. **Results**: The result shows several benefits of the supportive environment from foreign language learning activity to the psychological well-being aspects (pleasure, joy, life value, and resilience) and also alternatives of productive activity during an abundance of free time, social support, empathy, positive mind, and open-mindedness.*

***Keyword**: Foreign language learning, Intercultural communication, Mental health, Psychological well-being, Supportive environment.*

INTRODUCTION

The covid-19 health crisis has caught massive global attention for more than 2 years. The infection first emerged in Wuhan, China in December 2019 to then declared by World Health Organization (WHO) as a global pandemic. This virus is contagious via droplet transmission (Akhtar, 2021). To anticipate this situation, countries around the world issued a plan to restrict mass gatherings, strengthen the pandemic control by monitoring public behavior such as testing and contact tracing by the government, and encourage people to stay at home (Vallejo and Ong, 2020; Ansah *et al.*, 2021).

Public behavioral prevention policies such as lockdown, social gathering limitations, and travel bans have been used in flattening the number of cases, especially during the peak period of the pandemic (Gwee *et al.*, 2021; Dergiades *et al.*, 2022). Indonesian government stated PSBB (The Large Scale Social Restrictions) in 2020 to then level up the restriction into PPKM (Limiting Micro Community Activities) in 2021 when declared as the new epicenter of delta variant (Menteri Kesehatan Republik Indonesia, 2021).

These responses to severe public health emergencies affected and changed our ways of socializing, working, studying, and living. The drastic changes in physical and social activities make people experience long-term stress (Giuntella *et al.*, 2021). The anticipation for COVID-19 prevention is quite impactful for general physical health and other aspects such as economic decrease, environment, and mental health(Qi *et al.*, 2021; Shams, Alam and Mahbub, 2021; Belitski *et al.*, 2022).

Mental health awareness and trends are rising significantly during this 2-year of an ongoing pandemic (Quaglia, 2022). The prevalence of anxiety and depressive symptoms increased globally by

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25% in 2021 (WHO, 2022a). Psychology issues have been reported higher since the outbreak of COVID-19. A mental health survey through online self-examination conducted by the Association of Indonesian Mental Medicine Specialists on 14,998 respondents regarding psychological issues such as anxiety, depression, and trauma increased by 11.8%(PSDKJI, 2022).

These COVID 19-related traumatic events (e.g., losing loved ones, lockdown stringent measures, poor economic incomes) may impact directly enhance depressive symptoms, anxiety, and perceived stress, or indirectly, lowering one's buffering effect of resilience (Rossi *et al.*, 2021). The COVID-19 crisis has significantly affected the lives of young people (15-24 year-olds), and alarming surge in mental health issues among this age group. This finding is that younger people are more interested in spending a consistent amount of time in the digital world than the older population. As a result, the overloaded information, conspiracy theories, and sense of fear of missing out are more likely to attract the younger generation (Rossi *et al.*, 2021; Takino *et al.*, 2021)

Social isolation and public gathering restriction policy make things that can easily be done with face-to-face interaction somehow become more complicated, especially because of the unequal access, education level, and specific age group (Beaunoyer and Dup, 2020; Moore and Hancock, 2020). The lack of refreshment choices and feeling stuck also contribute to the overuse of smartphone usage (Serra *et al.*, 2021). However, excessive non-productive screen-time activity can lead to negative thoughts such as a feeling of guilt, lack of sense of purpose, and lower well-being(Liu, Du and Li, 2021; Wacks and Weinstein, 2021).

In order to strengthen mental health during crisis, it's necessary to create a supportive environment which involve the participation of the community. Community-based mental health care is more accessible and easier than in institutional settings (WHO, 2022). Supportive environments for health offer people protection from threats to health and enable people to expand their capabilities (WHO, 2021).

Psychological well-being is a core feature of mental health. Good mental health conditions (emotionally stable, and happy) will lead to better psychological well-being (the intention to face life challenges, personal growth, and better quality of life) (Johal and Pooja, 2016). Psychological well-being refers to the levels of positive functioning which include one's relatedness with others and attitude control in personal growth (Burns, 2016). Psychological well-being consists of hedonic well-being (pleasure and joy) and eudaimonic well-being (life value and resilience) (Keyes, 2016).

Learning a new language has been a new trend during this pandemic era. Alongside with travel ban policy both local and international departure, this could be one of the alternatives to cure the longing feeling of travel and cultural differences exposure (Hardach, 2021). Language learning demand has reached a sky-rocketing number of new users during the pandemic (Andress, Star and Balshem, 2020; Kelleher, 2021). This situation is also supported by creating a supportive environment in order to adjust to a new lifestyle. Learning a new language is also known capable to stimulate better cognitive function. In this case, a healthy cognitive function could play a huge role in psychological well-being during an under-pressure situation (Fessler, Michael B.; Rudel, Lawrence L.; Brown and Sheean, 2013). Online language learning with the self-directed method outside of the school setting has proved to create a more personal and less pressure. This situation can contribute to individual's well-being by surrounding with the opportunity to enjoy the new skill learning and meaningfulness in one time (Resnik and Schallmoser, 2019).

Therefore, this study aimed to see the role of the supportive environment from language learning activity on psychological well-being outside of the structured language class in the school setting.

METHODS

The method used in this study is a literature review. Articles were taken from various search engine sources such as Google Scholar, Science Direct, PubMed, data reports, and theses published in 2012-2021. The inclusion criteria of the selected article are:

- International article.

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- Article which discusses the aspect of a supportive environment for health (physically, emotionally, and socially safe space) in the language learning activity.
- Article which includes language learning experience outside of the traditional classroom setting.
- Article which focused on psychological well-being aspect (hedonic and eudaimonic) from language learning activity.

From 26 specific articles found, 15 articles focused more on simultaneous bilingualism research and 11 articles on language learning. After the reading and analysing process, 5 articles were met the criteria based on the supportive environment and its role related to one or more aspects from psychological well-being (pleasure, joy, life value, and resilience) at the final stage.

RESULTS AND DISCUSSION

Table 1. Summary of Articles on Supportive Environment Role from Language Learning Activity on Psychological Well-Being

No	Authors	Title	Methods	Participant	Aspects	Results
1.	(Resnik and Schallmoser, 2019)	Enjoyment as a key to success? Links between e-tandem language learning and tertiary student's foreign language enjoyment	Qualitative research using in-depth interview	19 English and German students (9 English students and 10 German students) in tertiary education level. The age range is from 20-32 years old.	The relationship between e-Tandem language learning and the sense of foreign language enjoyment.	• Social dimensions in foreign language enjoyment contribute the most to the enhancement of participant's perceived enjoyment • Feeling at ease, sense of accomplishment and meaningfulness in through authentic conversation • Boost a positive mood and culture curiosity and respect through social bonding during the learning process
2.	(Woll and Wei, 2019)	Cognitive Benefits of Language Learning : Broadening our perspectives Final Report to the British Academy	Report	502 participants from 5 different study with the age range from 7-57 years old. The studies criteria as follows : • The participants reported to study foreign language outside of	The benefit of cross-cultural interaction from language learning and the factor which might supported behind.	• The relationship between language learning and function skills is complex, vary, and need to be tested more as it also depends on age and the language exposure • There is a potential of creativity, problem solving-skills,

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				classroom setting • Research has included both foreign language learner's group and monolingual participants as the control group.		empathy, and confidence enhancement on language learning experience
3.	(Talebzadeh, Elahi Shirvan and Khajavy, 2020)	Dynamics and mechanisms of foreign language contagion	Qualitative research using self-rating and video recording observation	5 students (3 male, 2 female) with average age 18 years old of from University Bojnord, Iran + 1 teacher.	The patterns of enjoyment contagion in the ecology of foreign language learning	• The interaction between teachers and learners within the ecology of a foreign language classroom is not only verbal but also an emotional side • Mimicry and contagion don't always match with the real situation • There are some behaviors to check the positive emotional contagion during the learning process such as eye contact, smiling, nodding, lean-forward posture, and laughter
4.	(Gojkov-Rajić and Prtljaga, 2013)	Foreign language learning as a factor of intercultural tolerance	Systematic non-experimental observation	240 students from Belgrade University who started to learn a foreign language for the first time.	Foreign language learning and its impact on intercultural tolerance	• Foreign language learning with familiarization and cultural exposure can make people more open to novelties, respect more to the diversity, more acceptance with multicultural and intercultural

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						living in the future, and tolerant individual
5.	(Klimova, 2018)	Learning a Foreign Language: A Review on Recent Findings About Its Effect on The Enhancement of Cognitive Functions Among Healthy Older Individuals	Mini review article	12 articles were chosen with the age group from 60-83 years old	The effect of learning a foreign language on the improvement of cognitive functions in healthy older individuals	• There are some benefits from learning a foreign language for the elderly found : enhancement of brain function, self-esteem, and more opportunity to socialize • Learning a new language can be considered as cost-effective activity which also has a long-term effect in public health

Table 1 shows that the safe space environment from foreign language learning can contribute in some aspects to increase psychological wellbeing (Resnik and Schallmoser, 2019). Authentic conversation between a native speaker and language learner also produces a feeling of joy and meaningfulness instead of anxiety.

Sense of accomplishment received from knowing the new way of delivering a message during language engagement. Achievement goals are associated with a better individual's life satisfaction. A higher level of life satisfaction from the socially supportive environment will be related to not only a better psychological status, but also to behavioral and physical well-being (Kim *et al.*, 2021).

Language learning can train creative thinking, problem-solving skills, empathy, and also boost self-confidence (Woll and Wei, 2019). As brain impairment is not only affected by aging but also by poor stress management (Mah, Szabuniewicz and Fiocco, 2016), language learning can be one of the non-pharmacological options to endure cognitive dysfunction. This activity also provides more opportunities for the individual to socialize with people (Klimova, 2018).

Language learning experience shows the various psychological well-being impact on different age groups and exposure. However, starting from the young adult age group to the elderly, learning a language besides the mother tongue can be beneficial for psychological well-being. Confidence, self-esteem, openness, and creativity are relatively found in the young adult and adult age group (Chen, He and Fan, 2022).

Positive emotion contagion can also be achieved during language exchange engagement. There is some indicators to ensure this by checking from physical gesture such as eye contact, nodding, lean-forward posture, smiling, and laughter. These results can be achieved by the exchange partner's (teacher or peer) creativity during the interaction and language learner's proactive (Talebzadeh, Elahi Shirvan and Khajavy, 2020)

The Abundance of Free Time and Productive Activity

Self-isolation makes people have more time in a day since physical activity and lifestyle mostly switched to online. Having leisure time during the day is necessary to maintain our mental health and motivation.(Kroesen, 2022) proved the death time saved from work mobilization can provide better well-being, especially for people who spent a long duration commuting. However recent research reported that having too much leisure time can't always be a better option for maintaining our psychological health

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especially when there is no social interaction in it.

The lack of free time and an overabundance of discretionary hours both can contribute to lower subjective well-being. This is because having too much free time in a day can undermine people's sense of life purpose and productivity. Supportive environment becomes essential to fill the excess free time with activities that included three fundamental psychological needs: relatedness (having a social interaction), autonomy (freedom to choose an enjoyable activity), and competence (doing a productive activity)(Sharif, Mogilner and Hershfield, 2021)

Learning a new language can include these psychological needs and provide a sense of joy indirectly by creating a space to have a conversation and challenge ourselves to express the idea from a new perspective. In this case, learning with peers in 1-on-1 online class, tandem, or student-centered learning is better than classroom setting because people can choose which languages they're interested to learn and the way they want to learn (Resnik and Schallmoser, 2019)

Social Support and Empathy

Social isolation is one of the reasons the mental health crisis rise during the pandemic. Grief, loneliness, financial worries, boredom, and fear of missing out stressors can lead to mental disorders such as anxiety and depression. There is a high intention to do a self-suicide among people who suffered from depression (Kamelia and Terry, 2022). On another hand, depression and anxiety scores are high in individuals who focused on the negative thoughts from the pandemic situation in their life, especially those living alone and low household individuals (Qi *et al.*, 2021). There is also a likelihood from people who suffer from mental disorders to involve in violent acts when it is combined with high-risk factors such as substance abuse, unsafe environments, and social isolation (Elbogen, Dennis and Johnson, 2016).

Supportive environment through community engagement and social support groups could mediate the mental disorder. The prior research from (Mote *et al.*, 2021) found that virtual one-on-one group conversation with strangers has been proved as a helpful solution to facing loneliness, social anxiety, and depression during isolation. Perceived social support in quality conversation through phone or video contact can reduce depressive symptoms and improve social connectedness.

During this pandemic, access to technology-based learning becomes easier and various. Online learning alternatives are divided into two types which are online interactive lessons and recorded online courses or massive open online courses (MOCC). At this point, an online interactive lesson works better to build a supportive environment because the student can discuss and have a real-time conversation with peers or the teacher (Kang, 2021). Learning language through an online learning platform that provides both community and tutor in 2 ways communication and video comments can fulfill the learner's desire with not only a structured lesson to boost self-confidence, but also an authentic conversation, increase motivation, expand the worldview, meeting new people, exchanging stories, and building friendships. This is also linked with the positive vibes carried by a moment to greet, thank, and express good wishes to someone we just met. This attitude will make individuals more appreciate the small things in their life and might boost the sense of belonging, empathy, and social connection which can be assumed a better psychological well-being predictor. (Gunaydin *et al.*, 2021)

Positive Mind and Creativity

During COVID-19 physical isolation, people are forced to shut down their offline gathering, outdoor activity and real life interaction. This phenomenon could lead to some negative emotions such as : anger, fear, anxious, and feeling of guilt especially in young adults (Id, Dehzangi and Saadati, 2022) .

Several studies have proved the positive relationship between creativity and psychological well-being to handle negative emotions. This includes joyful, optimism, and pleasant feelings (Us and Salavera, no date). The engagement from creative activity can encourage individuals to grow as a person, and do their responsibility (Review, 2013). Individuals with a decent level of well-being show better physical health, work performance, life satisfaction, and less possibility of being trapped in negative emotion. The relationship between creativity and subjective well-being is mutualistic

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because well-being can stimulate an individual's creativity, and creativity can enhance well-being at the same time. By all means, creativity might be one of the beneficial solutions which can be promoted to cope with turbulence mental situations (Tan *et al.*, 2021).

Language learning can also improve creativity through divergent thinking and multicultural aspect. In this atmosphere creativity can be achieved through flexible practice to face novelties i.e., new perspectives, engaging with new cultures, new linguistic systems, and a new way of delivering a message (Ghonsooly, 2012). While multicultural aspects can also play a role to increase creativity, however, it will work when the subject has a certain understanding of the new culture. For example, it's easier for non-native English speakers to gain inspiration by watching English resources than for the native English speaker who consumed another language's resources, especially when it has a different alphabet system. This is because English is a lingua franca and its cultural exposure is more widely spread and taught worldwide from an early age (Tan *et al.*, 2019). The flow state through the engagement of divergent thinking tasks is conducive to psychological well-being.

Open-Mindedness

Mental disorder symptoms commonly force the individual to see the world only from the small perspective from the negative side, losing nerves and unlikely to feel peace (Gillihan, 2018). In real-life practice, health guidance might focus on mandatory action and little consideration may be given to whether it's likable or not, including COVID-19 prevention policy. Therefore, maintaining an open-minded mind is crucial to avoid overload stress while adapting to a new culture and way of life during uncertainty (Cherry, 2022). Travel ban and social isolation indeed are still considered the best way to prevent the spread of the oral transmission virus. However, as we know, a long period of isolation could overwhelm, narrow our life perspective, and possibly grow into depressive symptoms (Pietrabissa and Simpson, 2020).

When we learn a new language, we also discover a new opinion, refresh and broaden our minds to move from our negative mode. Prior research showed that people who decided to learn a new language outside of the foreign language at school based on their will and experience an intercultural conversation with locals are significantly more open-minded (Tiurikova, Haukås and Storto, 2021).

CONCLUSION

The COVID-19 pandemic has brought a new perspective to a lot of our current living aspects, including mental health issues. Social isolation affects the way people socialize and value time management. By doing a lot of home-based activity, the overabundance of time becomes one of the challenges for our mental health damage. Surrounding with supportive environment is necessary to maintain positive mind and resilience while adjusting to the new lifestyle.

Online learning has taken over the education system during the pandemic. Online language learning has surged attention as a new activity at home because not only to upgrade personal skills but also opening the border and have a real-time interaction with the different culture and perspective.

Learning a foreign language can be beneficial to fulfill our human desire for social interaction, challenges, and mental disorder prevention. Exposing ourselves to a foreign culture and sharing each of our country's struggles can create a supportive environment and handle the loneliness feeling from staying at home. This activity can also act as a safe space for people to share and learn to accept the new circumstances. Furthermore, language learning can also level up the individual skill as well which can contribute to increase the quality of life.

One-on-one video chat sessions with native speakers or peers based on the individual language choice, customised, and student-led can bring not only a structured lesson but also a positive mindset like joy and respect along the process.

There are three suggestions that can be considered for the public health sector to promote this activity:

- Educational (high school and university)
  This collaboration can enable to facilitate an online intercultural language learning group between students and international students or teacher.
- Parenting organization

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The aim of this option is to promote this activity through parents which can be applied for their children, elderly people, or themselves.

- Elderly Foundation and Hospital
  This suggestion is to share about learning activity as a method to maintain psychological well-being which also contribute to older adult disease prevention.

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