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Factors associated with the implementation of COVID-19 health protocols among Indonesian older adults living in rural areas: A cross-sectional study

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ABSTRACT

Introduction: Implementing health protocols became a challenge for older adults living in rural area. This study aimed to analyze the factors influencing implementation of COVID-19 health protocols among elderly in rural areas based on the Theory of Planned Behavior (TPB).

Methods: This study used an explanatory survey with cross-sectional approach. The sample consisted of 100 older adults who resided in rural areas. Data were collected using the TPB questionnaire and COVID-19 health protocol questionnaire, both have 21 items. The data were analyzed using bivariate and multivariate analysis. Bivariate analysis used Pearson correlation, Chi-square test, and Fisher's exact test. Multivariate analysis used multiple linear regression with a level of significance = 0.05. The independent variables were attitude toward behavior, subjective norm and perceived behavioral control while the dependent variable was the implementation of COVID-19 health protocols.

Results: Gender ($p < 0.001$), age ($p < 0.001$), employment status ($p < 0.001$), attitude toward behavior ($p < 0.001$), subjective norm ($p < 0.001$) and perceived behavioral control ($p < 0.001$) were significantly associated with the implementation of COVID-19 health protocols, while education level ($p = 1.000$) was not significantly associated with the implementation. The R-square shows 0.610 which indicates that TPB model can predict 61% of implementation of COVID-19 health protocols.

Conclusions: The most dominant factor in increasing the implementation of the COVID-19 health protocol is attitude toward behavior. Nurse need to provide education to elderly and their family to increase the implementation of COVID-19 health protocols as prevention of transmission of COVID-19.

Keywords: attitude; COVID-19; elderly; perceived behavioral control; subjective norm; theory of planned behavior

Introduction

Coronavirus Disease (COVID-19) is an infectious disease that has been affecting many countries globally since late-2019. Indonesia reported its first positive COVID-19 case on March 2, 2020 (Melia, Triana and Prasetyo, 2020). This disease can infect humans of all ages, including the elderly. The elderly population is a priority population in preventing the transmission of COVID-19 (Géa *et al.*, 2022). The COVID-19 patients aged 60 years and over have a higher mortality compared to younger patients (Karadavut and Altintop, 2022). Elderly with comorbidities such as heart disease, diabetes

mellitus, hypertension, chronic kidney failure and chronic lung disease have a greater risk of being infected with COVID-19 compared to the same population without comorbidities (Tobing and Wulandari, 2021; Ventura, Molinelli and Barranco, 2021).

Implementing health protocols is one of the factors to prevent the transmission of COVID-19. In Indonesia, and many countries, the protocols consist of wearing a mask, avoiding crowds, keeping a distance and implementing clean and healthy lifestyles (Ministry of Health, 2020). The protocols need to be implemented by all population groups including the elderly regardless of the residence, both rural and urban. In rural areas, people tend to have

more difficult access to health services and receiving information (Murdiyanto, 2020), especially information about COVID-19 (Cahyawati, Lestarini and Saniathi, 2021). Consequently, people living in rural areas will be more likely to have different perceptions and beliefs about the pandemic situation compared to those living urban areas, which results in the low compliance to health protocols (Benu, Febriyanti and Tahu, 2022).

By January 2022, the number of confirmed positive cases for COVID-19 globally was more than 200 million and five million people have died (Murri et al., 2022). In Indonesia, confirmed COVID-19 patients in August 2021 were 426,1759 people and until March 2022 were 5,939,082 people (Zakiah and Pujiati, 2022) . The number of confirmed cases of COVID-19 in East Java is 399,989. The highest case of death occurred in patients aged >60 years. The case fatality rate (CFR) in patients aged 60 years and over was 12.06% (Rubina et al., 2022). The data show that the elderly need more protection in preventing the transmission of the disease.

The elderly as a vulnerable group have a higher mortality rate. This shows that the elderly need to protect themselves. Changes that occur among elderly cause them to be less disciplined in implementing COVID-19 health protocols (Kristamuliana, Renteng and Datu, 2021). Information that is less than optimal for the elderly in rural areas also makes negative perceptions of the elderly in implementing of COVID-19 health protocols (Nur, 2021). A good perception can reduce the risk of the elderly from transmission of COVID-19 because prevention efforts by implementing the COVID-19 health protocol are done in a disciplined manner (Prihati et al. 2020).

The Indonesian government has socialized the implementation of COVID-19 health protocols. There has been a lot of research on the implementation of the COVID-19 health protocol in the Indonesian people. The majority have the same conclusion: the implementation of the COVID-19 health protocol was in a low category (Daoust, 2020). A research explains factors influencing implementation of the COVID-19 health protocol are economic problems, indifferent attitude, vulnerability to the COVID-19 virus and distrust of the government with many inconsistent policies (Sari, 2021). Other research explains the factors are the community reaction towards pandemic situation, the perception of the effectiveness of self-quarantine, concern about self vulnerability, gender, educational status, marital status, health status and age. People who are married, have a good education background, and a younger age demonstrated a higher level in implementing the COVID-19 health protocol than people who are older (Riyadi and Larasaty, 2021). This is in accordance with the results of the study which explained that the majority of the elderly in rural areas had the implementation of the COVID-19 health protocol in the low category (Daoust, 2020). However, studies that identified the factors associated with the implementation

of the COVID-19 health protocol, especially for the elderly in rural areas, are still limited.

The implementation of the COVID-19 health protocol is a behavior to prevent the transmission of COVID-19. Ogilvie et al. (2016) explain that behavior is formed by perceptions and beliefs. One theory that explains the behavior is the theory of planned behavior (TPB). TPB explains that behavior is influenced by attitudes toward behavior, subjective norms, and perceived behavioral control. Implementing the COVID-19 health protocol is a form of behavior that needs to be developed. TPB has analyzed a lot of behavior and has been successful in changing behavior from negative to positive. A research explains that TPB is able to improve the behavior of early detection for cervical cancer in women (Maurida, Sukartini and Indarwati, 2019), the background for changes in cataract surgery decisions (Wikamorys and Rochmach, 2017), and improve care adherence in diabetes mellitus clients (Lestarina, 2018). However, there is no research that uses TPB as a theoretical basis in analyzing the implementation of the COVID-19 health protocol for the elderly in rural areas. Based on this description, this study aimed to analyse the factors that are associated with the implementation of the COVID-19 health protocols among elderly in rural areas based on the Theory of Planned Behavior.

Materials and Methods

Study Design

This study used analytical observational with cross-sectional approach. The study was conducted in August 2021 in one of the rural areas in East Java Province, Indonesia. The independent variables were attitudes toward behavior, subjective norms, and perceived behavioral control. The dependent variable was the implementation of COVID-19 health protocols.

Respondents

The population of this study was the elderly aged 60 years and over. The total population in the study site was 7,949 people selected using quota sampling. After calculating the Slovin's formula with a confidence level of 0.1, it was determined that the sample size was 100 respondents. The study only included the elderly who were able to do activity daily living independently. The study excluded the elderly who had psychological problems or dementia.

Instruments

The instruments were questionnaires to assess the demographic data, TPB and COVID-19 health protocol. The TPB questionnaire was self-developed based on the TPB concept, consisting of attitudes toward behavior (6 questions), subjective norms (6 questions) and perceived behavioral control (9 questions) (Table 1). The TPB questionnaire used closed questions with a 4-item Likert

Table 1 21-item Theory of Planned Behaviour questionnaire

Component	Item	Statement
Attitude toward behavior	1	For me, wearing a mask, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle are very good things
	2	For me, efforts to prevent the spread of COVID-19 by implementing a health protocol is a very good thing
	3	For me, maintaining health is a very good thing
	4	Wearing a mask, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle really help to prevent me from transmission of COVID-19
	5	Wearing masks, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle are one of the efforts to prevent COVIDd-19
	6	Wearing a mask, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle make me confident about my health status
Subjective norm	7	My family thinks that wearing masks, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle are needed to prevent the transmission of COVIDd-19
	8	My peers think that wearing masks, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle are needed to prevent the transmission of COVID-19
	9	Health workers in my area think that wearing masks, avoiding crowds, washing hands with soap and practicing a clean and healthy lifestyle are needed to prevent the transmission of COVID-19
	10	I really don't care what my family has to say and I won't follow their advice
	11	I really care what my peers say and I will follow their advice
	12	I really care what my healthcare provider has to say and I will follow their advice
Perceived behavioral control	13	I object to wearing a mask, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle
	14	I feel comfortable if I wear a mask, stay away from crowds, wash my hands with soap and practice a clean and healthy lifestyle
	15	I find it easy to wear a mask, stay away from crowds, wash my hands with soap and practice a clean and healthy lifestyle
	16	I have time to wear a mask when I leave the house, stay away from crowds, wash my hands with soap and practice a clean and healthy lifestyle
	17	I don't have a mask so I don't wear a mask
	18	I have to go outside with a lot of people so I can't stay away from the crowd
	19	I have confidence that wearing a mask when leaving the house, avoiding crowds, washing hands with soap and practicing a clean and healthy lifestyle can prevent me from catching COVID-19
	20	Wearing a mask when leaving the house, staying away from crowds, washing hands with soap and practicing a clean and healthy lifestyle costs a lot of money
	21	I show my concern for my health by wearing a mask when leaving the house, staying away from crowds, washing my hands with soap and practicing a clean and healthy lifestyle

Table 2 Bivariate correlation between gender, age, profession and education on implementation of COVID-19 health protocols (n = 100)

Variable	Implementation of COVID-19 health protocols		Total n (%)	p-value
	Good n (%)	Poor n (%)		
Gender				
Women	48 (71.6%)	19 (28.4%)	67 (67.0%)	<0.001[†]
Men	3 (0.09%)	30 (0.91%)	33 (33.0%)	
Age				
60-70 years old	36 (46.2%)	49 (62.8%)	78 (78.0%)	<0.001[†]
70-80 years old	12 (100.0%)	0 (0.0%)	12 (12.0%)	
>80 years old	10 (100.0%)	0 (0.0%)	10 (10.0%)	
Employment status				
Self-Employed	0 (0.0%)	16 (100.0%)	16 (16.0%)	<0.001[†]
Retired Public Officer	23 (100.0%)	0 (0.0%)	23 (23.0%)	
Unemployed	28 (45.9%)	33 (54.1%)	61 (61.0%)	
Educational level				
Uneducated	28 (50.9%)	27 (49.1%)	55 (55.0%)	1.000[‡]
Elementary school	6 (60.0%)	4 (40.0%)	10 (10.0%)	
Junior high school	5 (35.7%)	9 (64.3%)	14 (14.0%)	
Senior high school	5 (35.7%)	9 (64.3%)	14 (14.0%)	
Bachelor degree	7(100.0%)	0(0.0%)	7 (7.0%)	

[†] Chi-square test; [‡] Fisher's exact test

scale. Favorable questions, i.e., number 1-9, 11, 12, 14-16, 19, and 21, were scored using the following: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. Meanwhile, unfavorable questions, i.e., number 10, 13, 17, 18, and 20, have a different Likert scale (4 = strongly disagree, 3 = disagree, 2 = agree, and 1 = strongly agree). The categorization of the data results is divided to good category and poor category with the distribution based on the mean. A value less than the mean is included in poor category and a value more than the mean included in good category.

The COVID-19 health protocol questionnaire was adapted from the COVID-19 prevention and control guidelines issued by the Ministry of Health of the Republic of Indonesia, 5th Revision (Ministry of Health, 2020). The questionnaire assessed the implementation of

wearing a mask, avoiding crowds, keeping social distance and implementing clean and healthy lifestyles in 21 items of closed questions with the answer choices on a 4-item Likert scale (1 = never, 2 = sometimes, 3 = often, 4 = always) (Ministry of Health, 2020). The categorization of the data results is divided to good category and poor category with the distribution based on the mean. A value less than the mean is included in poor category and a value more than the mean included in good category.

All research instruments were considered valid and reliable. The validity was measured using Pearson correlation product moment and the reliability test was Cronbach's alpha. The validity and reliability tests were delivered to 25 respondents who were not the study respondents. The results of the validity test showed that all items had a significance level of < 0.05 and r-count > 0.396. The reliability test showed all questionnaires had Cronbach's alpha > 0.65; the TPB questionnaire (Cronbach's alpha = 0.874) and the COVID-19 health protocol questionnaire (Cronbach's alpha = 0. 958).

Data Collection

Data collection was carried out by enumerators who have shared perceptions with the investigators so that there was no interference by the investigators during the data collection process to reduce bias. The data collection procedures were conducted through several steps. First, the enumerators contacted the respondent and explained about the research. Second, the enumerators provided an explanation of the study protocol to the respondents, especially about the study purpose, benefits and that the participation was voluntary. Third, the enumerators asked the respondents about their willingness to participate in the study and to sign an informed consent. Fourth, the enumerators delivered the questionnaires to the respondents. The enumerators provided explanation regarding the questionnaires if the respondent did not understand its meaning.

Data Analysis

Coding was carried out after the questionnaires were filled out by the respondents. The coded data were processed using SPSS 20 software. The data were analyzed using bivariate analysis and multivariate analysis. Bivariate analysis used Pearson correlation, Chi-square test and Fisher's exact test. Chi-square and Fisher's exact tests were used to analyze the correlation between demographic data (gender, age, employment status and educational level) on the implementation of COVID-19 health protocols. Pearson correlation was used to analyze the correlation among TPB variables on the health protocol implementation. A multivariate analysis, multiple linear regression with significance value 0.05, was used to identify how the TPB variables can be predictors of the implementation of the COVID-19 health protocols.

Ethical Consideration

This research received ethical approval from the Health Research Ethics Committee of dr. Soebandi University (No. 200/UDS/VII/2021).

Results

The demographic characteristic showed that the majority of respondents were women (67.0%) and most of them showed a good category on implementation of COVID-19 health protocols (71.6%). The majority of the elderly aged 60-70 years old (78.0%) and most of them showed a poor compliance to COVID-19 health protocols (62.8%). Most respondents were unemployed (61.0%) and most of them had a poor compliance on COVID-19 health protocols (54.1%). The majority of respondents were uneducated (55.0%) and most of them have a good COVID-19 health protocol implementation (71.6%). The bivariate analysis between demographic characteristics on the health protocol implementation showed that gender (p < 0.001), age (p < 0.001) and employment status (p < 0.001) were associated with the COVID-19 health protocol compliance, while educational level was not associated with the compliance (p = 1.000) (Table 2).

The attitude toward behavior had maximum score of 24, mean = 19.80 and SD = 2.13. This means that there are respondents who get maximum score for this variable. The subjective norm had a maximum score of 22, mean = 18.50 and SD = 1.35. The perceived behavioral control had maximum score of 36, mean = 29.02 and SD = 2.23 which means that the respondents were in the range "agree" and "disagree." The implementation of COVID-19 health protocol had maximum score 81, mean = 62.80 and SD = 14.3 which means that the respondents were in the range of "always" and "often." The bivariate analysis among TPB constructs showed that attitude toward behavior (r = 0.751 and p < 0.001), subjective norm (r = 0.726 and p < 0.001) and perceived behavioral control (r= 0.523 and p < 0.001) has association on the implementation of COVID-19 health protocols. The relationship between attitudes toward behavior and the implementation of COVID-19 health protocols was very strong correlation (r > 0.75). The relationship between subjective norms, perceived behavioral control and the COVID-19 health protocol implementation was in strong category (r = 0.50-0.75). The regression equation formed through this study is 'implementation of the COVID-19 health protocol among elderly in rural areas = -60.864 + 3.552 attitudes + 3.820 subjective norms – 0.620 perceived behavioral control' (Table 3).

The results of multiple linear regression showed that the variable attitude toward behavior (t = 4365; p < 0.001) and subjective norm (t = 3.298; p < 0.001) had a partial influence on the implementation of the COVID-19 health

Table 3 SD, minimum and maximum value, mean and bivariate analysis among theory of planned behavior variable (N = 100)

Variable	SD	Min-Max	Mean	Pearson correlation			
				Attitude toward behavior	Subjective norm	Perceived behavioral control	COVID-19 health protocol
Attitude toward behavior	2.13	17-24	19.80	NA	0.807*	0.727*	0.751*
Subjective norm	1.35	15-22	18.50	0.807*	NA	0.646*	0.726*
Perceived behavioral control	2.23	23-36	29.02	0.727*	0.646*	NA	0.523*
COVID-19 health protocol	14.3	35-81	62.80	0.751*	0.726*	0.523*	NA

*$p < 0.001$

Table 4 Multiple linear regression (N = 100)

Model[†]	Unstandardized coefficients		Standardized coefficients	T[‡]	p-value
	B	Std Error	Beta		
(constant)	-60.864	14.157		-4.299	<0.001*
Attitude toward behavior	3.552	0.814	0.530	4.365	<0.001*
Subjective norm	3.820	1.158	0.360	3.298	0.001*
Perceived behavioral control	-0.620	0.620	-0.94	-1.000	0.320

[†] Dependent variable: implementation of COVID-19 health protocols; [‡] T-table (df 98) 1.644; * $p < 0.05$

Table 5 Model summary

Model	R	R square	F	p-value
1	0.781	0.610	50.052	<0.001*

protocol. Perceived behavioral control (t = -1,000; p = 0.320) had no partial effect on the implementation of the COVID-19 health protocol. This explains that, if the attitude toward behavior and subjective norm have high value so the implementation of COVID-19 health protocols become higher. Otherwise, if the perceived behavioral control has high value so the implementation of COVID-19 is lower. The dominant factor that has the most influence on the implementation of the COVID-19 health protocol is attitude toward behavior because it has a standard coefficient beta value of 0.530, which is greater than the other variables (Table 4). The model summary showed that the R-square was 0.610, which indicates that the strength of the relationship between the independent variables on the dependent variable was 61%, while the remaining 39% is explained by other factors. The F-test result showed that the p-value < 0.001 with F-value was 50.052 greater than the F-table (F-table = 2.70). This means that there is a simultaneous influence between attitudes toward behavior, subjective norms and perceived behavioral control on the implementation of COVID-19 health protocols among elderly in rural areas (Table 5).

Discussions

Demographic characteristic on the implementation of COVID-19 health protocols

There was association between gender, age and employment status on implementation of COVID-19 health protocols. The majority of women respondents showed implementation pf the COVID-19 health protocol in good category, while the majority of male elderly respondents did not. This is in line with the results of research that women's compliance in implementing the COVID-19 health protocol is better than that of men (Riyadi and Larasaty, 2021). Elderly women in rural areas have a better concern for health than elderly men in rural areas. This is also related to the dominant role in maintaining health in the family. Women have a role to protect the whole family, from regulating diet, maintaining cleanliness and modifying the home environment. Some respondents in elderly category (60-70 years old) have good category and others have poor category on implementation of COVID-19 health protocols. All respondent 70-80 years old and more than 80 years old have good category. This is in accordance with research which showed that the people who are more mature will have opportunity to perform the expected behavior (Ringroad, Daya and Tamantirto, 2016). The older have more life experience and will more care about their health. In addition, families with the elderly in rural areas will pay more attention to their family members in improving their health. Families are more protective in regulating the lifestyle of the elderly with old age. All retired respondents have good category in implementation of COVID-19 health protocols. This is contrary to research which showed that employment status was not related to implementation of the COVID-19 health protocol (Niruri et al., 2021). All the elderly who have their own business need cooperation with other people so that the health protocol becomes difficult to

implement. Occupational activities, such as farm laborers and gardeners, need interaction with others as well. The results of this study explain that there is no relationship between education level on implementation of the COVID-19 health protocols. This is contrary to research which showed that educational level was related to implementation of the COVID-19 health protocol (Riyadi and Larasaty, 2021). Educational level does not fully influence individual knowledge in shaping attitudes. The majority of respondents do not have education, but the village government continues to make efforts to increase the knowledge of residents, including the elderly, about the COVID-19 health protocol.

Attitude toward behavior on the implementation of COVID-19 health protocols

There was an influence of attitude toward behavior and subjective norm on the implementation of COVID-19 health protocols among elderly in rural areas. The perceived behavioral control has no influence on the implementation of the COVID-19 health protocol among elderly in rural areas. Attitudes are formed from beliefs about behavior and the consequences. The elderly who have belief that implementing the COVID-19 health protocol during a pandemic can prevent them from transmission of COVID-19 will have a good attitude. A good attitude causes the expected behavior to be formed, that is the implementation of the COVID-19 health protocols including wearing a mask, avoiding crowds, keeping a distance and implementing clean and healthy lifestyles. This is in accordance with the results of a study which concluded that a positive attitude could affect the use of masks during COVID-19 (Pan and Liu, 2022). The belief in doing something for the elderly in rural areas is based on the sociodemographic characteristics of the individual and the socio-cultural impact from their interactions in the community (Watson and Austin, 2021).

The beliefs of the elderly in rural areas are formed from the information received by the elderly. Knowledge is a basic factor in the formation of beliefs (Simanjorang et al., 2022). The village government provides intensive information to the community, including the elderly, about the implementation of the COVID-19 health protocols as an effort to prevent the transmission of COVID-19. Information on preventing the transmission of COVID-19 through the implementation of health protocols has been comprehensive in rural areas through health education by health workers through billboards or posters. A study explains that billboards and banners are media types that are considered effective for informing the prevention of COVID-19 in rural areas (Badri, 2020). This also shows that health workers in rural areas have optimal performance in improving health services, especially for the elderly (He and Tang, 2021). The

government give more attention to activities to prevent the transmission of COVID-19. The government moves all its units to the lowest unit, that is village. This requires the village government, including stakeholders, to apply all policies that have been set by the central government, including in socializing the implementation of the COVID-19 health protocol and collaboration between sectors and across sectors. This activity has an impact on increasing public knowledge, especially among the elderly in rural areas.

Subjective norm on the implementation of COVID-19 health protocols

Subjective norms affect the implementation of the COVID-19 health protocol among elderly in rural areas. Subjective norms are formed by an individual's perception of the beliefs of the closest people. In rural areas, the family is the closest person for the elderly. They tend to follow the directions given by the family compared to other. Families provide support in caring for the elderly, one of which is doing activities that prevent the elderly from transmission of COVID-19. This is in accordance with the results of the study which concluded that the family has a role in healthcare for the elderly who live with their family (Zulfitri, Sabrian and Herlina, 2019). Therefore, the family belief about preventing the transmission of COVID-19 by implementing a health protocol makes the elderly have the same belief as their families (Nugraha, 2020). Families need to increase their knowledge in caring for elderly. The increased family knowledge has had an impact on change in their belief and formed good subjective norm for elderly (Badriah et al., 2021).

Functional aspects of family support include the type or nature of family support and can be classified into four domains: instrumental support, emotional support, informational support and social integration. In rural areas, elderly are individuals who need protection and supervision from the family, so they can do anything to keep the elderly still health (Yuan et al., 2011). Subjective norms are also influenced by peers and health workers. Behavior change in the elderly is influenced by peer support. Elderly tend to do something if they get support from their peers (Raue et al., 2015). A good relationship between nurses and the elderly is well-established. This will have an impact on improving the quality of therapeutics so as to achieve successful implementation carried out by nurses (Happ and Raderstorf, 2019). The elderly are a vulnerable group. Families in rural areas believe that the elderly are individuals who have more life experience so they are wiser than others. Therefore, families with the elderly in rural areas will strive to maintain the health of the elderly, especially keeping the elderly from being infected with COVID-19.

Perceived behavioral control on the implementation of COVID-19 health protocols

There is a relationship between perceived behavioral control and implementation of the COVID-19 health protocol in the elderly in rural areas. This is in line with other studies which explain that perceptions of behavioral control affect behavior (Sin and Rochelle, 2022).Perceived behavioral control is formed from the individual's perception of support or obstacles. The influence formed by subjective attitudes and norms still needs to be strengthened with the support of the social environment to improve the implementation of the COVID-19 health protocol for the elderly in rural areas. Impact of perceived behavioral control actually depends on the factors determining behavior, such as access to information, access to health services, self-efficacy, availability of materials, financial and time (Zhang *et al.*, 2021). A sense of togetherness and cooperation is still entrenched in people in rural areas, including the elderly in East Java (Windarwati *et al.*, 2020). This is an inhibiting factor in the elderly, limiting interaction with other people (Utomo *et al.*, 2019). Changes that occur in the elderly because the aging process makes the elderly unable to make decisions on their own without assistance (Chen, Dai and Xia, 2022). Perceived behavioral control is individual perceptions of assessing barriers to behavior. The perception is about self-efficacy, self-awareness, time availability, access, infrastructure and individual financial conditions in implementing the COVID-19 health protocol. Some of the elderly in rural areas still work to meet their daily needs. Its makes the elderly difficult to implement the COVID-19 health protocol, especially in the aspect of staying away from crowds. The work that is mostly done by the elderly in rural areas is as farm laborers or garden workers. This makes the elderly do work in groups. The majority of the educational background of the elderly in rural areas did not attend school. Its causes the elderly to have low self-efficacy and self-awareness about their vulnerability to contracting COVID-19 and their belief in implementing the COVID-19 health protocol is still low. However, efforts to increase knowledge carried out by the village government by emphasizing policies that compel and bind the community to implement of COVID-19 health protocols have caused the elderly in rural areas to be able to override perceived barriers and implement COVID-19 health protocols.

Effect of attitude toward behavior, subjective norm and perceived behavioral control on implementation of COVID-19 health protocols

Attitude toward behavior, subjective norm and perceived behavioral control had simultaneous effect on implementation of COVID-19 health protocols among elderly in rural areas. Across a range of health behaviors,

interventions to change attitudes, norms, or perceived behavioral control effectively changed behavior or behavioral intentions (Watson and Austin, 2021). Attitudes toward behavior, subjective norms, and perceived behavioral control have a strong relationship in conducting analyses to change behavior in individuals. The elderly in rural areas are a minority group and tend to have homogeneous characteristics and uphold the local culture. Good knowledge is the background for the formation of beliefs in implementing behavior. However, the existing belief needs to get support from family, health workers, and peers in terms of availability of time, infrastructure, and the financial condition of the elderly.

Limitations

There are some limitations of this research. The number of respondents is as many as 100 older persons. This can be improved to describe the real condition. Characteristic demographics were not included in the multivariate analysis because the scale was categorical and not a dichotomous table. In the process of collecting data, the information provided by the respondent through questionnaires sometimes does not show the actual opinion of respondents, this happens because sometimes there are differences of opinion, assumptions and different understanding of each respondent, as well as other factors such as honesty factor in filling respondents' opinions in the questionnaire. Respondents have different educational backgrounds. This will have an impact on the respondent's level of knowledge in determining attitudes that was not identified in this research. The pandemic situation at the time of the study showed an increasing fluctuation in transmission. The situation at the time of the study could affect the results of similar studies.

Conclusion

TPB construct and demographic characteristic such as gender, age and employment status have influence on the implementation of the COVID-19 health protocols among elderly in rural areas. The most dominant factor in increasing the implementation of the COVID-19 health protocol is attitude toward behavior. Based on the research above, it is necessary to improve attitudes, subjective norms and perceived behavioral control among elderly in rural areas to improve the implementation of the COVID-19 health protocol by increasing perceptions and beliefs of the elderly in implementing the COVID-19 health protocols, which will be in line with increasing knowledge of the elderly. This can be done use counseling methods or health education by involving the elderly group. Health workers need to work together with stakeholders in rural areas, including culture figure or religious leaders, to increase the perceptions and belief of the elderly in implementing the COVID-19 health protocol. Besides that, there is a need for

family involvement to make good family support in preventing the transmission of COVID-19 in the elderly in rural areas. Recommendation for further research is to use knowledge variables in identifying factors that influence the implementation of the aCOVID-19 protocol.

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