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RESEARCH **Open Access**

The Role of the Family in Preventing the Transmission of COVID-19 in Children

Fransiskus Salesius Onggang[1*], **Aben B.Y.H. Romana**[1b], **Bringiwatty Batbual**[2c]

[1] Department of Nursing, Poltekkes Kemenkes Kupang, Kupang City, East Nusa Tenggara, Indonesia
[2] Department of Midwifery Kupang, Poltekkes Kemenkes Kupang, East Nusa Tenggara, Indonesia

[a] Email address: fransiskussalesiusonggang@gmail.com
[b] Email address: abenromana@gmail.com
[c] Email address: wattybatbual155@gmail.com

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Abstract
COVID-19 is a disease that is highly communicable from infected individuals to others who are susceptible to infection. The family is the first line of defense against the spread of the COVID-19 epidemic among youngsters. There is transmission of the COVID-19 virus to children notwithstanding the inadequacy of parental efforts to prevent such transmission. The effect of COVID-19 infection on unfit parents will result in the transmission of the virus to offspring. The incidence of COVID-19 in children is influenced by the level of parental knowledge and conduct to avoid the transfer of the virus. The purpose of this study is to examine the relationship between parents' activities and attitudes regarding COVID-19 prevention, the detection of COVID-19 symptoms in children, and the level of information regarding the prevalence of COVID-19 in children. The research design employs a cross-sectional observational analysis. This study's demographic and sample consisted of proportional samples from 12 Community Health Centers, with 550 family respondents in total. The results of this study indicate that delivering the COVID-19 vaccination to the family considerably reduces the risk of COVID-19 transmission to children. The level of family knowledge correlates strongly with the transmission of COVID-19 to children (a symp=0.001, with a correlation p-value of 0.669). There is a correlation between the administration of the COVID-19 vaccine to parents and the transmission of the virus to children (symp=0.001, p=0.660). Based on the results of the study, there was a significant influence between the level of parental knowledge on the behavior of preventing COVID-19 in children in Kupang City. In addition, there is a significant relationship between the behavior and attitudes of parents who are disobedient in preventing COVID-19 in children and the incidence of COVID-19 in children. Families or parents who carry out the COVID-19 vaccination in the family also have a significant relationship with the transmission of the COVID-19 virus to children. To reduce the transmission of COVID-19 to children, efforts from the family are needed, such as implementing health protocols and carrying out vaccinations.

Keywords: COVID-19, Children, Level of family knowledge, Preventive behavior.

Corresponding Author:

Fransiskus Salesius Onggang
Department of Nursing, Poltekkes Kemenkes Kupang, Kupang City, East Nusa Tenggara, Indonesia
Email: fransiskussalesiusonggang@gmail.com

1. INTRODUCTION

The rapid spread of COVID-19 is one of the characteristics that sets it apart from other diseases that have evolved that are similar in nature. This virus's behaviour is extremely infectious to other people. This virus is rapidly spreading, and the number of people infected with it is steadily increasing. According to information obtained by The World Health Organization (WHO) on June 9, 2020 from local and national authorities, there have been more than 7 million cases of COVID-19 and more than 400,000 fatalities as a result of the disease (WHO, 2020), (Blumberg, et al., 2020), (Dong, et al, 2020).

As of 2 April, 2020, the COVID-19 pandemic has resulted in >890,000 cases and >45,000 deaths worldwide. In the United States, infants, children, and older teenagers make up 22% of the population (CDC, 2020), (CDC, 2020). According to data from China, pediatric instances of COVID-19 may not be as severe as adult cases, and children may exhibit different symptoms than adults. The China Pneumonia Emergency Response Epidemiology Team conducted research with 72,314 individuals and determined that approximately 2% of the 44,672 confirmed cases of COVID-19 were children aged 0-19, with 0.9% of these cases occurring in children under the age of 10. This outbreak has been labelled a pandemic by the WHO (WHO, 2020), (She, Liu , & Liu, 2020).

In contrast to the situation in other nations, Indonesia has had a high rate of COVID-19 transmission. This has been the case since the disease was discovered there. The cross-infection that can occur between children and their parents is the primary mode of disease transmission (Anantyo et al., 2020). Because parents do not comply with health norms and do not vaccinate their children against COVID-19, the virus is able to be passed on to their children (Anantyo et al., 2020). The family is the basic structural unit that should serve as the foundation for any efforts made by the government to stop the spread of COVID-19. It is critical to have an accurate understanding of the factors that have a role in the spread of the COVID-19 virus to children such as the level of knowledge, attitudes to prevent transmission, health protocols, and the COVID-19 vaccination support preventing transmission to children (Ernawati et al., 2020; Adeyinka et al., 2021; She, Liu , & Liu, 2020).

The biggest risk in this pandemic is that someone who is infected will make it difficult to manage relationships with those who are already infected or waiting for the results of diagnostic tests (Shelmerdine et al., 2020), (Shen et al. (2020). This study will look into the family's roles and activities in stopping the spread of the COVID-19 viral infection. The goal of this study was to examine the association between the level of family awareness in avoiding COVID-19, family attitudes and behavior, and parents' COVID-19 vaccination behaviour on COVID-19 transmission to children.

2. RESEARCH METHOD

A method for doing research based on observational analytics and a cross-sectional design. This research was conducted from March 28 to May 30, 2022 in a total of 12 health sites, with 550 individuals who met the inclusion criteria volunteering their responses. The family dynamic and the children's development are the foci of this investigation. There is a level of validity and reliability in the study instrument that is equal to 91%. Interviews and a questionnaire were used to compile the data collected for this study. The interviews focused on gathering demographic information and determinants on transmission of COVID-19 virus to children. In addition, other data were collected by analyzing particular antigens and swabs taken from children who had a history of acute respiratory infections in their family. Utilizing various software programs, an analysis of the data was performed. Due to the fact that the acquired data do not follow a normal distribution, a bivariate analysis will be performed using the Spearman test and the Mann-Whitney test (with a significance level of = 0.05). In addition, the Section Kupang Ministry of Health Poltekkes Research Ethics Committee gave their stamp

of approval to this study (their number is LB.02.03/1/0075/2022, and the date is March 25th, 2022) in order to ensure that it adheres to ethical standards.

In this study, the selected respondents were families discovered in 12 Kupang Health Centers after their children had treatment for respiratory infections or coughs. The family was then informed and informed consent was obtained. Children who meet the requirements for exposure to upper respiratory tract infections are followed with a pap smear antigen test by Puskesmas health professionals to determine if they have been exposed to COVID-19. A questionnaire is utilized to assess the amount of family knowledge, attitudes, and behaviour towards the prevention of COVID-19 in children. Individuals who are at risk for COVID-19 and who have had COVID-19 immunizations can demonstrate their status using a COVID-19 vaccination card.

3. RESULTS AND DISCUSSION

Table 1. Distribution of Families respondents based on age, level of education level, and homestay status (n = 550).

Variable	Category	Total	Percentage (%)
Age	25-30	106	19,27
	30-35	129	23,45
	35-40	150	27,27
	40-45	165	30,01
Level of education	Elementary school/equivalent	155	28,18
	Junior high school/equivalent	145	26,33
	Senior high school/equivalent	160	29,09
	University/Higher education	90	16,37
Home stay status	Live with nuclear family	425	77,27
	Own house	125	22,73

Table 1 illustrates the characteristics of the respondents, which demonstrate that the majority of respondents were aged 40-45 years (30.01%) and had the highest education level, namely SMA, with 160 respondents (29.09%). According to population status, the vast majority of respondents (77.27%) lived with their nuclear family.

Table 2. Family behavior in preventing transmission of COVID-19 in children by vaccinating (n=550).

Variable	Category	Total	Percentage (%)
Administering COVID-19 vaccinations to families	The family has been given the COVID-19 vaccine	242	44
	The family has not been given the COVID-19 vaccine	308	56
	Total	550	100

According to the data shown in Table 2, which can be found above, greater than half of the respondents who had the status of parent did not be vaccinated against COVID-19. This amounts to 308 families, or 56% of the total.

Table 3. The attitude of the family in prevention the transmission of COVID-19 in children (n=550).

Variable	Category	Total	Percentage (%)
The attitude of the family in efforts to prevent the transmission of COVID-19 in children	Good for prevention	100	18.18
	Enough prevention efforts	125	22,73
	Lacking in prevention	325	59,09
	Total	550	100

Based on table 3, more than half of the respondents, 325 respondents (59.09%), displayed poor attitudes and behaviours regarding the prevention of COVID-19 virus transmission.

Table 4. The level of family knowledge and preventing preventive behavior COVID-19 in children in Kupang City in 2022 (n=550).

Variable	Category	Total	Percentage (%)
The level of family knowledge and preventing preventive behavior COVID-19 in children	The knowledge level is good	68	12,04
	An adequate level of knowledge	237	43,09
	Lack of knowledge level	245	45,00
Total		550	100

According to table 4, it is possible to infer that just 68 (12.04%) of the total respondents had strong knowledge. This is fewer than one-eighth of the total respondents. Although the majority of respondents (245) had inadequate knowledge and 237 (43.09%) had sufficient knowledge, the majority of respondents had inadequate knowledge (43.09).

Table 5. The transmission rate in children from pap smear examination results in children who have upper respiratory infections with antigen swabs (n = 100).

Variable		Category	Total	Percentage (%)	Category	Total	Percentage (%)
Age	5 years	Reactive (positive for covid 19	20	20	non-reactive (negative for covid 19)	13	13
	6-10 years	Reactive (poistive for covid 19	12	12	non-reactive (negative for covid 19)	15	15
	11-16 years	Reactive (positive for COVID-19)	10	10	non-reactive (negative for covid 19)	30	30
Total			42	100		58	100

Table 5 displays the findings of the Pap smear for 100 children with symptoms of acute respiratory infection. There were 42 (42%) children with reactive nasal and throat smear results, while there were 58 (58%) children with non-reactive results.

Table 6. The relationship between age, level of family knowledge, and family behavior to prevent COVID-19 in children and to give vaccines to parents of children in against transmission of COVID-19 in children.

Variable	Asymp. Sig. (2-sided)	p = value Correlation
The relationship between the age of parents and the transmission of COVID-19 in children	0,100	0,261
The relationship between the level of family knowledge and transmission of COVID-19 in children	0,001	0,669
Relationship between family transmission prevention behavior and COVID-19 transmission in children	0,001	0,561
The relationship between the administration of the COVID-19 vaccine to parents and the transmission of COVID-19 to children	0,001	0,660

Spearman test

*p-value > 0.05 (0.00 to 0.20 means: there is almost no correlation 0.21 to 0.40, meaning: low correlation 0.41 to 0.60, meaning: moderate correlation 0.61 to 0.80, meaning: high correlation 0.81 to 1.00, meaning: perfect correlation)

On the basis of the data shown in table 6, it is possible to draw the conclusion that the administration of the COVID-19 vaccine to children is the factor that has the most significant impact on the rate at which COVID-19 is passed on to children. According to the information in the table that was just presented, there is a significant correlation between the level of knowledge that children have and the transmission of COVID-19 (a sym=0.001, with a correlation p=value of 0.669). Vaccination of parents is protective against the passing on of COVID-19 to their offspring (symp=0.001, p=0.660); this protective effect is statistically significant.

In terms of family involvement in COVID-19 prevention in children, the findings of this study indicate that families have implemented COVID-19 prevention in children. The majority of the 550 heads of households (64.50%) have implemented methods for preventing COVID-19 in children based on their attitudes and level of knowledge about the topic. For instance, if a family member has respiratory tract infection symptoms, the family maintains physical distance, washes hands after handling objects, and wears a mask when coughing and facing patients to prevent droplet transmission. Aerosolized COVID-19 infections are the norm (Ernawati et al, 2020), (Sinha et al., 2020). There is a substantial risk of COVID-19 transmission in non-circulating settings, such as houses, for all variants of COVID-19 with genetically engineered MRa viruses (Assaker et al., 2020), (Bandi, Nevid, & Mahdavinia, 2020). The extent to which families adopt this preventive relies on their level of perception, individual experience, access to adequate information, and prior exposure to COVID-19. In families with a high level of education, this preventive behaviour is typically performed naturally and without education from the outside environment or health professionals. In contrast, a lack of education will influence preventative behaviour (Syadidurrahmah et al, 2020), (Ashidiqie, 2020).

Researchers identify children with acute respiratory infections symptoms by using nose and throat swabs with the COVID-19 antigen test. This allows the researchers to determine whether or not children are exposed to COVID-19. Children who are exposed to the virus exhibit a variety of symptoms, including coughing, difficulty breathing, fever, and runny or stuffy nose (rhinorrhea) (Liu et al., 2020). The level of perception, individual experience, proper information, and previous experience of suffering from COVID-19 all have a role in

determining the amount of family implementation in the carrying out of this preventive. This preventative behaviour is instinctive and frequently carried out without any education from the outside environment or health workers in homes where the family members have received an acceptable education.

On the other hand, preventative behaviours will be impacted by a low degree of education. In 2019, the Ministry of Health reported that those who had been exposed to COVID-19 as well as those who had not been exposed had followed the preventative practises. The prevention of COVID-19 can be enhanced by regulating and improving individual and community health by maintaining patterns of behaviour and lifestyle that can effect health improvement. This can be done by keeping healthy patterns of behaviour and lifestyle (Huang, et al., 2020). A New Normal Adaptation Behavior for the Prevention of COVID-19 (Syadidurrahmah et al, 2020). Understanding what a person can do about health problems, using the resources that are already available, and making decisions that are most appropriate to improve health are the three primary goals of giving health education in order to enable the individual to determine the problems and needs the person goals.

During the time of the COVID-19 pandemic, the immune system plays a very essential role as the entry site for the onset of COVID-19 symptoms. This is because the immune system is the entry point for the virus. COVID-19 symptoms will appear rapidly in those with a compromised immune system. Vaccination against COVID-19, as well as subsequent vaccinations, is required of all families and households that contain children as part of the efforts to reduce the risk of transmission (Sari, Agata & Patria, 2020). An individual's decision to get vaccinated may be influenced by factors such as anxiety and a lack of adequate family knowledge. The development of unpleasant symptoms in response to vaccination is a physiological marker that indicates that immunity has been established in the body (Graff, et al, 2021). This results in psychological anguish for families with a limited level of awareness, which ultimately results in their refusal to participate in re-vaccination. When making a decision about whether or not to vaccinate or take preventative measures, the level of knowledge that a family possesses is a crucial factor to consider. The higher the level of perception and cognition, the more it will effect the behaviour of the family in terms of taking preventive actions (Ernawati, et al, 2021). The primary vehicle for the transmission of COVID-19 in children is the household setting. Families with a high occupancy rate who live in a house with a narrow room space may put their children at risk of contracting COVID-19 and other diseases related to aerosol or droplet infections (Graff, et al, 2021).

Living at home with respiratory infections or isolated at home with inadequate family attitudes like a separate isolation room will have a significant risk of passing the infection on to children (Lu et al, 2020), (Natera-de Benito, et al., 2021). This is also true of isolating at home with respiratory infections. The transmission of the Corona virus is comparable to that of an acute pneumonia infection that has a high rate of transmission. The relationship between the horizons of increasing the distribution of COVID-19 in children is the relationship between the horizons of the interaction between knowledge, attitudes, and behaviour. When it comes to selecting the appropriate behaviour in the interest of prevention, one's level of knowledge will have an effect on one's attitudes; subsequent behaviour will be improved if family comprehension and attitudes are sufficient (Graff, et al, 2021).

Adjustments to new routines are made by individuals no matter where they are, including at home, in the office, at school, and at their places of worship. People who are health conscious and who have the knowledge and awareness to live a life that maintains cleanliness and satisfies health standards are created when clean and healthy behaviour is maintained in public areas. This highlights the necessity of keeping clean and healthy behaviour in public spaces (Naja, Wedderburn, & Ciurtin, 2020). Lately, we have been hearing a lot about something called the "New Normal," which refers to returning to a life that is clean and healthy and living according

to the standards established by the health sector in order to stop the spread of COVID-19. Therefore, maintaining a safe distance, wearing protective masks, and often washing one's hands are all important components of clean and healthy living behaviours that will be incorporated into everyday life.

The family is the source of all COVID-19 transmission in children. The risk of spreading COVID-19 to children and other diseases associated to aerosol or droplet infections is increased among low-occupancy families living in houses with a small room area. Individuals who suffer from Acute Respiratory Illness or self-isolation by staying at home with their family are provided with insufficient isolation rooms that provide a high risk of transmission to children. Yuliana, (2020), stated that the spread of the corona virus is comparable to a highly transmissible acute pneumonia infection. The link between knowledge, attitudes, and behaviour relates to the likelihood of increasing COVID-19 transmission among offspring (Assaker et al, 2020). When choosing the correct behaviour in prevention, the level of information will influence attitudes, therefore behaviour will be better if family comprehension and attitudes are adequate (Han et al., 2021), (Wajdi et al., 2020). Knowledge, attitudes, and proactive activities to maintain and prevent the risk of disease, protect oneself from the threat of disease, and participate actively in the public health movement constitute healthy behaviour. Maintaining a safe distance, using a mask, and washing one's hands will be part of clean and healthy everyday habits (Yuliana, 2020), (Ashidiqie, 2020).

Concerning the spread of COVID-19 in children, the findings of pap smears performed on discharge from the nose and throat of 100 children diagnosed with Acute Respiratory Infection showed that 42 children, or 42%, were reactive, whereas 58 children, or 58%, were non-reactive. The droplet infection or saliva splashes that are inhaled through the air or aerosols can transfer the corona virus to other persons (Ho et al., 2020), (Ludvigsson, 2020), (Woodruff, et al., 2022). The use of masks, avoiding staying in closed rooms or living in the same house with persons who are considered carriers of the corona virus, and avoiding close contact with other people who have the virus are all highly important preventative measures (Mustajab et al., 2020). Individual immunity to the Corona 19 virus does not rule out the possibility of transmission to others, even in families that have been certified cured of the virus. In order to stop the spread of the COVID-19 virus, members of the family need to create an area for isolation by paying attention to the room ventilation, using separate bathrooms and dining addresses, and remembering to wear masks when interacting with one another (WHO, 2020), (Pavone et al., 2020), (Sari, Agata & Patria, 2020), (Zimmermann, Pittet, & Curtis, 2021).

4. CONCLUSION

According to the findings of the research, there was a substantial relationship between the level of parental understanding and the behaviour of preventing COVID-19 in children living in the city of Kupang. In addition, there is a substantial correlation between the rebellious actions and attitudes exhibited by parents in regard to the prevention of COVID-19 in children and the prevalence of COVID-19 in children. Families or parents who provide the COVID-19 vaccination to other members of the family also have a substantial association with the virus's transmission to children. It is necessary for families to make steps, such as putting in place health procedures and ensuring that children are vaccinated, in order to limit the risk of COVID-19 being passed on to their children.

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