



Health Belief Model Analysis with Perception and Behavior of Mothers of Children Under Five Years Old with Diarrhea

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ARTICLE INFO

Article History:

Received Jan, 22nd, 2022

Accepted Jul, 29th, 2022

Published online Sept, 30th, 2022

Keywords:

HBM;
perceptions;
behaviors;
diarrhea;

ABSTRACT

Diarrhea is still a public health problem in Indonesia. Many children are victim of diarrheal diseases which are easily preventable and treatable. This study aimed to determine the perception and behavior of mothers of children under five years old with diarrhea based on the Health Belief Model (HBM). This research used qualitative with a phenomenological approach and analyzed based on the theory of the Health Belief Model (vulnerabilities, severity, benefits, barriers, cues to action). Collecting data from 12 informants through in-depth interview, observation, and documentation. The results showed that, based on the results of the HBM analysis with 5 indicators, the informants agreed on the susceptibility to diarrhea in children in the area. This is due to unqualified drinking water sources, poor waste management systems, and poor environmental and personal hygiene for each child. The main obstacle for informants is the absence of a strong will and the nature of not caring about the mother's and her children's living condition and personal hygiene. In conclusion, the informant's perception of diarrheal disease is a harmless disease. The behavior of the informants did not care about living conditions which could cause repeated diarrhea for their children.

INTRODUCTION

Diarrhea still becomes a health problem in the world. According to WHO data (2019), diarrhea is the cause of low life expectancy of 1.97 years in sufferers. In 2016, availability of drinking water that met the requirements and poor environmental sanitation were the main factors in infant mortality caused by diarrhea for 0,9 million people or 470.000. therefore, diarrhea is a problem that must be considered to overcome by government and also world organizations.¹

Globally the main cause of diarrhea in Children is malnutrition. Every year 1.7 billion cases of diarrhea disease occur in children. Those who experience diarrhea and can be life-threatening are children who are malnourished or have compromised immune systems such as children infected with HIV. Diarrhea is a symptom of infection in the intestinal track which can be caused by various bacterial, viral, parasitic infections spread through contaminated food and beverage or from person to person to as a result of poor sanitation.²

Diarrhea in Indonesia becomes the second leading cause of death in children under 5 years old.³ The mortality rate of Children under five years old is one of health indicators which is considered as the most sensitive and has been agreed upon nationally as Parameter of health status of a region. Nationally, the SDGs target is to reduce the mortality rate of children under five years old in Indonesia in the 2015-2030 period to 25 per 1000 live births, in 2016, the under-five mortality rate in Indonesia was recorded at 26 per 1000 live births.⁴

Melvani et al (2019) the results of multivariate data analysis, the variable hygiene, sanitation, food, and beverage become the most dominant variable that affects diarrhea in Children. It shows that mothers of Children who do not pay attention on food and beverage sanitation as well as cooking utensils and also kitchen hygiene cause diarrhea for 95.2%.⁵

Based on data obtained from the Diskominfo Sectoral Statistics of Samarinda City (2020), the number of diarrhea cases in the last three years which the number of sufferers of diarrhea was 12,036 cases started in 2017, there were 8,427 cases in 2018, there were 11,105 cases in 2019, while there were 2666 cases in June 2020.⁶

Sempaja Samarinda Public Health Center is one of the health centers with Quite high diarrhea cases and increase every year, the number of cases of diarrhea in children under five years old in 2016 was 75 cases, it increased to 87 cases in 2017, while it was 99 cases in 2018 and about 53 cases on January until September in 2019.⁷

The purpose of the study was to determine the perceptions and behavior of mothers of children under five with diarrhea based on Health Belief Model (HBM) indicators.

MATERIAL AND METHOD

This study used a qualitative method with a phenomenological approach, to be able to dig deeper into the perceptions and behaviors of mothers of children with diarrhea and are analyzed based on the theory of Health Belief Model (perceptions of vulnerability, severity, benefits, barriers, cues to action, and clean and healthy living behavior). The total of informants were 12 people which consisted of 8 mothers with diarrhea (it is the mother who is more intense in taking care of her child), the village head (policy makers on environmental hygiene and waste management systems in the society), 1 public shop (which knows more about the sociocultural and public habits in maintaining the cleanness of the living environment and individual hygiene), 1 health care worker of the Health promotion program (knows what programs have been carried out, how many times and what the results are), and the head of Sempaja Public Health Center (as policy makers in program priorities).⁸

Collecting data from 12 informants through; a) In-depth interview,⁹ b) Observation,¹⁰ c) Documentation.¹¹ The data that has been collected through in-depth interview, observation, and documentation were then categorized, reduced, and compiled based on the research objectives and coded based on the data source, then displayed and verified, if the data is considered as lack or can be triangulated if the data obtained is saturated and according to the research objectives, a conclusion was drawn.¹²

The research site is in the working area of Sempaja Health Center, Samarinda City. This research has received permission from the Ethics Committee of Widyagama Mahakam Sa-

marinda University Number 132/LPPM-UWGM/B/2020.

RESULTS

The total of informants in this study were 12 people, 9 main informants, and 3 supporting informants. Characteristics of informants based on age, occupation, education, and gender. Based on the results of in-depth interview and documentation, the characteristics of the informants are presented in Table 1.

Perception of Mothers of Children under five years old with Diarrhea is an important factor in the first response of mothers with diarrhea to support the process of handling diarrhea. The mother's perception that was observed was based on the components of Health Belief Model which are perceptions of vulnerability, severity, benefits, barriers, and cues to action. Based on the results of in-depth interview with 7 key informants regarding the perception of vulnerability as follows;

"The children of the informants are vulnerable to get diarrhea repeatedly when many children have diarrhea." (W.A1.NY.12)

"The cause of recurrent diarrhea in children is due to the transmission process from children who suffer from diarrhea to healthy children, and this is due to the misunderstanding of the child's parents." (W.A2.YU.12)

Mothers of children under five years old who suffer from diarrhea got severe diarrhea, it was

still safe for the condition of diarrhea which often suffered by their children, the informants considered that diarrhea was an ordinary disease that was not too dangerous, as quoted from the interview as follows;

"Diarrhea is a serious disease, but for us, diarrhea is a common disease because we have had diarrhea repeatedly and it always heals on its own." (W.A3.M.11)

"Diarrhea is not a very serious disease if it is experienced by children because there has been no experience of children dying from diarrhea." (W.A4.AL.13)

The belief of mothers who have children suffering from diarrhea to look for treatment at health services only exists when their children suffer from diarrhea. As the following interview excerpt;

"I visited the Public health center when there were signs that my child was going to be dehydrated, if at the beginning of diarrhea, I often gave guava leaves, crushed and squeezed, then the water was drunk to the child, with traditional medicine like this, my child would recover quickly." (W.A5.SP.10)

Mothers' perception on the importance of keeping their environment clean and healthy so that their children do not get recurrent diarrhea is very low. Based on the results of observation and documentation carried out by the author, the condition of residence and sources of clean water for mothers with diarrhea are quite alarming, as documented in Figure 1.

Table 1. Characteristics of Informant

Informan	Age (Years)	Job	Education	Sex
W.A1.NY	29	House Wife	Junior High School	Women
W.A2. YU	31	House Wife and Entrepreneur	Junior High School	Women
W.A3.M	40	House Wife and Entrepreneur	Primary School	Women
W.A4.AL	30	House Wife and Entrepreneur	Senior High School	Women
W.A5.SP	26	House Wife	Junior High School	Women
W.A6.YA	35	House Wife	Senior High School	Women
W. A7.YS	35	House Wife and Entrepreneur	Junior High School	Women
W.A8.SM	26	Entrepreneur	Junior High School	Women
W.A9.RA	30	House Wife	Junior High School	Women
W.A10.IR	26	Health Promotion Officer	First Degree Education	Women
W.A11.IK	46	Head of Public Health Center	Second Degree Education	Women
W.A12.HI	51	Neighborhood Association	First Degree Education	Male

Source: Primary Data, 2021



Source: Primary Data, 2021

Figure 1. Sources of Clean Water Informants A6

Hygiene conditions in the house where the mother of Children with diarrhea lives, such as family latrines, trash cans in the house, and other hygiene conditions are not well taken care of, so they are dirty and messy which create a breeding ground for bacteria, viruses, and even disease vectors and other rodents. As the results of the author's observations and documentation are as follows in Figure 2, Figure 3, and Figure 4.



Source: Primary Data, 2021

Figure 2. Informant Family Latrine A3



Source: Primary Data, 2021

Figure 3. Informant Family Latrine A5



Source: Primary Data, 2021

Figure 4. Trash Condition

Mothers of Children with diarrhea have never tried how to try to live a clean and healthy life for themselves, their children, and their place to reside. The perception of obstacles or discomfort is never felt because there is no effort to change the habits so far that can cause recurrent diarrhea events that are often experienced by their children. as the following interview excerpt;

"Keep the house and the environment clean is very important, in this case, they are indeed still less, this is because they are very busy to make meatball and then they are brought to be sold. Go home from selling just to clean up, bathe the kids and tidy up the house if you have time." (W.A7.YS.14)

The perception of Cues to Action for mothers of Children with diarrhea is very low, mothers do not feel the need to immediately take concrete actions in clean and healthy living behavior so that their children avoid diarrheal diseases. In addition to the lack of knowledge and awareness of clean and healthy living behavior, support or encouragement from the health workers and the living environment is also lack, be its local government policies or advice from public shops, as quoted from the following interview;

"The parents of children with diarrhea are often given counseling during visits to the public health center, whether it is the treatment for diarrhea with ORS or prevention by maintaining personal hygiene and the environment, especially the management of clean water sources." (W.A10.IR.15)

"It is quite difficult to remind residents, especially those who live behind the stadium, if they are told, they will

listen to it but they never do it, that is why the environment where they live is quite apprehensive and that is the limit of our ability as health care workers.” (W.A12.HI.15)

“The work area of East Sempaja Public Health Center is quite wide and located in the middle of Samarinda City which is automatically densely populated. The implementation of programs such as counseling to residents has been carried out, but it is not specific to the problem of diarrhea, because the residents’ problems are not only diarrhea but also ARI and DHF because the rainy season is happening now. Conditioned the problem of what happen is the program that will runs”. (W.A11.IK.16)

Behavior on Mothers of Children with diarrhea did not experience a significant change after receiving counseling during a visit to public health center when taking their child for treatment. For mothers, diarrheal disease is a harmless disease because there is no experience of their child dying from diarrhea, so when their child has diarrhea, it is enough for their child to be brought to the public health center, as quoted from the following interview;

“We are very grateful because there has been no experience of our children dying from diarrheal diseases so far. If anyone has diarrhea, I immediately take them to the public health center. Because my first child had diarrhea in the morning, diarrhea started in

the afternoon and I was already weak and dehydrated. At that time, I got panicked and immediately rushed to Midwife Indri’s house. I took it to the public health center, not brave to think that diarrhea was trivial anymore.” (W.A8.SM.9)

“It often happens that the messages that have been conveyed by the health care workers at public health center are forgotten when they are at home and see that the children also start to get healthy. What we as parents think about is that the child will get healthy and we can start working again to earn a living.” (W.A6.YA.17)

Table 2 below displays four HBM indicators that can influence informants’ perception, including vulnerability, severity, benefits and barriers. All of the main informants did not agree that doing *Perilaku Hidup Bersih dan Sehat (PHBS)* would get a lot of obstacles if they did *PHBS*, although four of nine informants agreed that they were prone to diarrhea because they did not do clean and healthy lifestyle *PHBS*, and one of nine informants who agreed that not practicing *PHBS* could exacerbate the incidence of diarrhea in their children. Shows in Table 2 that there are two informants who have sufficient knowledge on the incidence of diarrhea, but they cannot do *PHBS* to prevent diarrhea.

Table 2. Health Belief Model and *Perilaku Hidup Bersih dan Sehat (PHBS)*

Perceptions	Key Informant						
	W.A1	W.A2	W.A3	W.A4	W.A5	W.A6	W.A7
Vulnerability	Agree vulnerable to diarrhea	Disagree prone to diarrhea	Disagree prone to diarrhea	Agree vulnerable to diarrhea	Agree vulnerable to diarrhea	Disagree prone to diarrhea	Disagree prone to diarrhea
Severity	Disagree that if you don’t use <i>PHBS</i> it can make diarrhea worse	Disagree that if you don’t use <i>PHBS</i> it can make diarrhea worse	Disagree that if you don’t use <i>PHBS</i> it can make diarrhea worse	Disagree that if you don’t use <i>PHBS</i> it can make diarrhea worse	Disagree that if you don’t use <i>PHBS</i> it can make diarrhea worse	Agree that not using <i>PHBS</i> can make diarrhea worse	Disagree that if you don’t use <i>PHBS</i> it can make diarrhea worse
Benefits	Disagree that There are many benefits if you use	Disagree that There are many benefits if you use	Disagree that There are many benefits if you use	Disagree that There are many benefits if you use	Disagree that There are many benefits if you use	Disagree that There are many benefits if you use	Disagree that There are many benefits if you use
Barriers	Agree there are obstacles when doing <i>PHBS</i>	Agree there are obstacles when doing <i>PHBS</i>	Agree there are obstacles when doing <i>PHBS</i>	Agree there are obstacles when doing <i>PHBS</i>	Agree there are obstacles when doing <i>PHBS</i>	Agree there are obstacles when doing <i>PHBS</i>	Agree there are obstacles when doing <i>PHBS</i>
Cues to Action (CTA)	No CTA	No CTA	No CTA	No CTA	No CTA	No CTA	No CTA
Clean and Healthy Living Behavior	No action	No action	No action	No action	No action	No action	No action

Source: Primary Data, 2021

DISCUSSION

As a mother, she has a role to take care of the house and take care of her child. Mother's parenting pattern is giving love, attention to the needs and development of children and a sense of security and warmth.

As for the characteristics of the main informants, the age is distributed starting from the youngest at the age of 26 years old and the oldest at the age of 40 years old. While other jobs than taking care of the household most of them are self-employed, such as selling necessities, selling snacks and drinks, meatballs and others. The double role played by housewives makes time-limited in taking care of children, cleaning the house, and preparing healthy food according to the nutritional needs of their children.

Education 8 out of 9 informants' graduation from junior high school and one graduated from elementary school. The level of education is quite influential on a person in dealing with and solving problems as well as in understanding the message received.¹³ It is supported by Yunitasari AR et al (2020), the factors that are significantly related to the incidence of underweight in urban and rural areas in children, one of them is the level of education of parents.¹⁴

The perceptions of mothers of children under five years old with diarrhea on susceptibility, severity, benefits, obstacles, cues to action, and clean and healthy living behavior are as follows. Perception of vulnerability, 4 of 7 mothers of children under five years old with diarrhea agree on vulnerability. The 4 informants realized that the condition of their children was susceptible to diarrhea, this was because their children often had diarrhea repeatedly. The informants realized that the cause of the diarrhea susceptibility experienced by their children was caused by drinking water sources that did not meet the requirements such as dug wells where the water was colored, spiky, and slightly smelly. Based on the results of observation and data triangulation, the informants had tried to manage water before it was consumed by depositing it in a column with a width of 1 meter, length 4 meters and height of 2 meters for 24 hours, after that it is transferred to another reservoir (drum) for water that is consumed or used for cooking and drinking, the result is clear,

odorless but still has a slight taste. While the need for water for bathing and washing toilets is immediately used after being accommodated for a while in the pool, the results are a little clear and have a taste.

In addition, the houses where they live are also not clean such as available trash cans using plastic bags with the condition that they are hung above the stove which the trash can fall at any time and contaminate the food on the stove and the food ingredients under the trash hanger. Meanwhile, other informants also used the same trash can using a plastic bag, some were hung in the corner of the kitchen and some were hung on the wall, the reason was that the trash was hung so that the cat will not reach it and scatter it. In addition, the schedule for waste disposal at garbage dumps is not regular; waste collected in plastic bags is not immediately disposed of even though it is full, while wet waste and dry waste are mixed and cause unpleasant odor. The cleanness of the floor in the house is not clean because there is a lot of dust and garbage from food wrappers which scattered on the floor with children's toys, furniture, and cooking/kitchen utensils are also not clean. After all, there is still a lot of dust attached and consumable traces that are stored before being washed clean. It is supported by Kurniawan RN et al (2018) that the incidence of diarrhea that occurred in residents after the implementation of the traditional *sapu kiki* party was caused by unhygienic food and drink ingredients, personal hygiene of food managers, and unclean cooking utensils.¹⁵

Most of the informants knew the causes of diarrhea experienced by their children because every visit to the public health center for treatment was given counseling by health care workers about the causes of diarrhea, but 7 mothers of children under five years old did not apply clean and healthy living behaviors as taught by the health care workers. In contrast to the results of research by Aristi et al (2020), respondents' beliefs about threats are low so personal hygiene parameter is also low, this is due to lack of knowledge and motivation of respondents to take personal hygiene actions. It is supported by Asitua E et al (2019) who said that the correlation between knowledge of mothers about *Perilaku Hidup Bersih dan Sehat (PHBS)* with the incidence of diarrhea, where

there is a significant correlation between lack of knowledge and the incidence of diarrhea in the work area of Pancur Health Center.^{16,17}

Perceptions of severity, most mothers of children with diarrhea perception to disapprove that doing clean living in the environment where they live can help their children avoid diarrheal disease. This is due to the experience in the daily life of mothers with diarrhea who have never practiced clean living in their living environment, but their children have not been exposed to diarrhea for a long time. Because mothers of Children with diarrhea have very low perception of severity to effect on clean living behavior in their living environment is also very low, such as; the floor is dirty with dust and children's toys are scattered on the floor, the cleanness of the children is lack because sometimes they do not take a bath twice a day, the source of drinking water does not meet the requirements for consumption and the cleanness of the kitchen and the way of managing food ingredients is also not clean.

Based on the results of observation and in-depth interview, 6 out of 7 mothers with diarrhea have low perception, because they have assumption that their child has diarrhea because of the transmission system from children with diarrhea to other children. If a child in their neighborhood gets diarrhea, it will become an epidemic for other children, so parents need to be vigilant or keep their children away from children suffering from diarrhea. For this reason, mothers of Children with diarrhea do not care about clean living behavior in their living environment. This is not in line with the results of research conducted by Wartiningsih M et al. As mothers who stated that they agreed that children under five years old being cared could be prone to diarrhea related to the mother's perception. Likewise, the results of research conducted by Irnawati P et al. Stated that the mother's choice to take her child to a pediatrician during diarrhea was influenced by perceptions of perceived vulnerability and seriousness.^{18,19}

Benefit perception, all mothers of children under five years old with diarrhea do not agree with the benefits they have if they carry out clean living behavior in their living environment. This is in line with the results of a study

conducted by Debby D which shows that there is no significant correlation between hand washing with soap, clean water facilities, the condition of the trash can with the incidence of diarrhea during the last three months using analytical and observational methods. data analysis by test *chi-square*.²⁰

The perception of mothers with children regarding clean living behavior in their living environment require time and money, while most mothers of children with diarrhea have additional jobs besides their function as housewives, such as selling *pentol*, necessities, and ice drinks, meatballs, etc. Many activities make mothers do not have time to clean the environment where they live, such as sweeping the floor in the house at least once a day, maintaining the cleanness of the bathroom, cleaning wet and dry garbage, and taking out the trash every day, paying attention to the cleanness of cooking utensils and food hygiene. as well as good and correct management methods so that the nutrients contained in these food stuff persist, pay attention to a good and correct water management system, so that the water consumed by children meets the requirements, pay attention to personal hygiene of children and mothers, take a bath twice a day, wash hands before eating using soap and running water.

Mothers of children with diarrhea also think about the high cost of carrying out clean living behaviors in the environment where they live such as buying a good broom, a good mat, a trash can that meets the criteria requires hand soap, bath soap, detergent, and dish soap and a lot of cooking utensils. As well as the high cost of managing clean water supplies properly and correctly so that water that meets health requirement is available for family consumption. The perception that it requires more time and money makes mothers not feel that there are many benefits when carrying out clean living behaviors in their living environment. Based on the results of in-depth interview with informants, the benefits felt when carrying out clean living behavior in the environment where they live are only temporary which is the house looks beautiful, beautiful to view, comfortable to rest, and has not been paid for with a lot of time wasted in making *pentol* snacks, meatballs, iced

drinks and maintaining a basic food stall, as well as feeling a loss in expenses and little income for family finances.

Perception of barriers to informants in carrying out their functions as housewife which are taking care of children, cleaning the place to reside and the surrounding environment as well as providing food according to the nutritional needs of children in daily life related to willingness, if there is a will, the informants can perform clean living behavior in the environment where they stay. It is not because of the lack of facilities and infrastructure, but in fact, there is no will from mothers of children with diarrhea. This is in line with research conducted by Shao C, et al (2018).²¹ While, it is very different from the results of research conducted by Khani JA et al, if the mother perceives that the obstacles faced are easy to overcome, then the mother is easily motivated to carry out clean living behaviors in the environment where she lives, maintain the personal hygiene of the mother and her child and able to get clean water suitable for consumption by their children. Mothers of children with diarrhea agreed that there will be obstacles in carrying out their duties as housewife.²² Due to tired conditions when returning home after selling, so they are not motivated to carry out a clean lifestyle such as throwing out garbage, cleaning the floor of house, cleaning the kitchen and throwing out stale food leftovers, and washing the kitchen utensils that have been used. In line with the results of research conducted by RK Sari et al, with the logistic regression method, it was significantly proven that family poverty, as well as education and the status of working mothers, had a significant effect on the utilization of health services, especially outpatients.²³

Cues to action, the understanding of mothers with children under five with diarrhea about the diarrheal disease itself is very simple because they do not think that diarrheal disease is dangerous for their children. Diarrhea has often been experienced by their children and will eventually recover as usual and this diarrheal disease is a seasonal disease for them, so if the diarrheal disease season arrives and the child is infected, then they just have to be treated and will recover. From this understanding, no action

makes mothers of children feel the need to take real action or as soon as possible to carry out healthy living behaviors for all members of their family and the environment in which they live.

Strengthened by the low support from health care workers and support from local public figure. From the public health center, they only provide counseling when people who are susceptible to diarrhea come to visit for treatment at public health center because the condition of children is affected by diarrhea so the counseling time is also limited with perfunctory methods. Not in line with the results of research conducted by Indar et al, health care workers at Tamangapa Public Health Center provide services at auxiliary Public Health Center that close to the landfill so that it is affordable to serve residents who live close to the landfill and susceptible to disease.^{23,24}

While the local public shops do not care about the condition of the residents behind the stadium, this is because they have been reminded to improve their living environment and maintain cleanness, but these residents do not pay attention to the advice given by the public shop.

The behavior of mothers with children under five years old with diarrhea who do not practice clean living in their environment to prevent recurrent diarrhea in their children, such as cleaning their home and surrounding environment, maintaining personal hygiene of mothers and children, and the behavior of mothers in getting clean water sources that are suitable for consumption. This is due to the obstacles that are felt when carrying out a clean and healthy lifestyle, such as feeling awkward because doing something out of the ordinary is also related to the lack of time available for mothers of children with diarrhea. Most mothers of children with diarrhea are busy outside their function as housewife. When you are at home and you are busy with preparing your merchandise, for example, managing basic ingredients into products that are ready to be sold. The results of this study are not in line with the results of research conducted by B Putra, where there is no significant correlation between the work of mothers with Children and the prevention of diarrhea in their children ($p= 0.686$).²⁵

In Bandura learning model, the person factor (cognitive) plays an important role which is self-efficacy will be very easy to face challenges, do not feel doubt because they have full confidence in their abilities. The process of observing, and imitating the behavior and attitudes of others as a model is an act of learning.²⁶

Mothers of children with diarrhea have low self-efficacy, this is due to the absence of other people's attitudes and behaviors that can be observed, imitated as a model in learning actions, so that it has no effect and forms conditions for social learning patterns in the environment around the place where mothers stay.²⁷

CONCLUSION AND RECOMMENDATION

Mothers' perceptions of children with diarrhea according to HBM analysis, mothers of children with diarrhea agree and realize that their children often experience recurrent diarrhea due to poor environmental sanitation and clean water sources from dug wells which do not find the requirements. Besides that, the transmission system from children with diarrhea often occurs in their environment. Even though, mothers of children with diarrhea still disagree if carrying out clean living behaviors in their living environment can prevent diarrhea in their children because they think that carrying out routine clean-living behaviors need more time and costs which are quite crucial for their family.

There is no clean and healthy living behavior towards all members of their family and the environment where they live.

ACKNOWLEDGMENTS

The author would like to thank the Rector of the University of Widya Gama Mahakam Samarinda for the research funding assistance through LPPM. Mrs. drg. Aprilia Lailati as Ad interim of Sempaja Samarinda Public Health Center and all health promotion staff for their permission and assistance so that the research process that we carried out went well. Members of the research team for their cooperation in conducting research.

AUTHOR CONTRIBUTIONS

All authors have a role in the research process as well as the creation of this article. R designed

and compiled the research; SEN took care of research permits and determined informants and made research results, the research was conducted in threes; DY analyzed the data. R = Rosdiana; SEN = Sri Evi Newyears; DY = Dewi Yuniar.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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