Analysis of the Effect of Maternal Perception on Completeness of Child Immunization Status with Health Belief Model

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ABSTRACT

Background: The child immunization coverage was low in several health centers in Surakarta, Central Java. Some of the health centers did not achieve GAIN Universal Child Immunization (UCI) target in 2014, for example, Penumping Health Center (HBV <7 days= 86.9%, BCG= 87.8%, Campak= 87.5%, DTP-HBV-HIB= 86.7%, Polio= 87.5%) and Banyuanyar Health Center (Measles= 89.6%). This study aimed to determine the effect of maternal perception on completeness of child immunization status using Health Belief Model (HBM).
Subjects and Method: This was an analytic observational study with case control design. It was conducted at Penumping and Banyuanyar Health Centers, Surakarta, Central java. A total sample of 120 mothers and their respective children aged <9 years was selected for this study by fixed disease sampling. This sample consisted of children with complete immunization and the other children with incomplete immunization (ratio= 1:4). The dependent variable was completeness of immunization status. The independent variables were maternal perception on various HBM constructs, including perceived susceptibility, seriousness, threat, benefit, and barrier. The data were collected by a set of questionnaire, and analyzed by path analysis.
Results: Perceived susceptibility had indirect and positive effect on completeness of immunization status via perceived threat, although it was not statistically significant (b= 0.63; 95% CI= -0.13 to 1.39; p= 0.104). Perceived seriousness had indirect positive and statistically significant effect on completeness of immunization status via perceived threat (b= 1.10; 95% CI =0.71 to 3.04; p= 0.005). Perceived threat (b= 1.88; 95% CI= 0.34 to 1.86; p= 0.002), and perceived benefit (b= 1.83; 95% CI = 0.69 to 2.96; p= 0.002), showed direct positive and statistically significant effect on completeness of immunization status. Perceived barrier had direct and negative effect on completeness of immunization status (b= -0.96; 95% CI= -1.97 to 0.05; p= 0.063).
Conclusion: Maternal perception on child susceptibility, disease seriousness, disease threat, benefit and barrier of immunization, have effects on the completeness of immunization status.

Keywords: immunization status, completeness, health belief model

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BACKGROUND

Immunization programs are very important for individuals to create immunity to avoid disease so that community immunity is achieved, but there are still many immunization problems in the world and Indonesia. Diseases that can be prevented by immunization (PD3I), for example tuberculosis (TB), diphtheria, pertussis, tetanus, measles, polio and hepatitis B. Immunization is estimated to prevent 2.5 million cases of child deaths per year worldwide. UNICEF said that 27 million children under five throughout the world still have not received routine immunization services, causing more than two million deaths each year. This figure includes 1.4 million children under five who were killed. Indonesia is one of the 10 countries that are among the highest numbers in the case of unimmu-

nized children, namely around 1.3 million children (Ismet, 2013; Kadir et al., 2014; Probandari et al., 2013).

The Government through the Health Service has made efforts to improve immunization outcomes. Immunization achievement in Indonesia until December 2014 was 86.9%. The immunization achievement in Central Java until December 2014 was 93.3%. immunization achievement in the city of Surakarta alone is 96.3%. This figure shows that immunization achievements in Surakarta City have been very good. However, if detailed, there are still villages that have not met the UCI GAIN target in 2014, namely the percentage of infants aged 0-11 months who get complete basic immunization 90%. Among 17 Health center Work Areas in Surakarta City, there are two Health center Work Areas that have not met the GAIN UCI target, namely Penumping Health center and Banyuanyar Health center. In Health center Penumping, Hb immunization coverage <7 days: 86.9%, BCG: 87.8%, Measles: 87.5%, DPT-Hb-Hib: 86.7%, Polio: 87.5%. Whereas in Banyuanyar Health center, Hb immunization coverage <7 days: 92.8%, BCG: 92.8%, Measles: 89.6%, DPT-Hb-Hib: 93.9%, Polio: 92.9%. In Banyuanyar Health center only measles immunization has not met the GACI UCI target of 89.6%. The cause of immunization achievement targets has not been met, one of which is the perception of parents or caregivers about immunization. (Surakarta Health Office, 2014; Republic of Indonesia Ministry of Health, 2010; Republic of Indonesia Ministry of Health, 2014 a; Ministry of Health Republic of Indonesia, 2015).

The Health Belief Model (HBM) theory develops to answer health problems that have been pursued optimally from various parties but have been less successful. This theory talks about the perception

that people have that can influence their health behavior.

Parents' perceptions can be different for each individual. This can be due to the differences in character which is also formed from differences in demographics. In this study, the relationship between parents' beliefs about vaccination was evaluated, their decision to postpone or refuse vaccination for their children, and immunization coverage for children aged 24 months. From the phenomenon above, researchers realize the importance of conducting a study on the effect of maternal perceptions of immunization reviewed with Health Belief Model on the completeness of immunizations in Surakarta.

SUBJECTS AND METHOD

This study is an epidemiological observational study with a Case Control Study research design, an epidemiological study that studies the relationship between exposure (research factors) and disease, by comparing case and control groups based on their exposure status. The sampling technique used is the fix disease sampling technique in the ratio (1: 3) with 24 case control subjects and 96 control subjects. The exogenous variables are perception of vulnerability, seriousness, benefits and obstacles. The endogenous variables are threat perception and completeness of immunization status. The analysis used was path analysis.

The characteristics of the subjects based on maternal age, education and occupation were divided into two subjects, namely the case subjects with results, the majority of mothers (20-39 years old) were 22 people (91%), the majority of them was D4-S1 of 16 people (68%), most of them do not work namely 14 people (58.5%). The second one was the control subjects, the majority of mothers were 20-39 years old of 87 people (90%), the majority of mothers

was D4-S1 graduates namely 61 people (63.5%), most of them work as private

workers of 68 people (71%).

Table 1. The characteristics of the Subjects Based on Age, Education and Occupation of Mothers

	Characteristics	Case		Control	
		n	(%)	n	(%)
	Maternal age				
a.	<20 years old	0	0	0	0
b.	20-39 years old	22	91	87	90
c.	>39 years old	2	1	9	10
	Education				
a.	PS	0	0	0	0
b.	JHS	0	0	0	0
c.	SHS	5	20	12	12.5
d.	D1-D3	3	12	23	24
e.	D4-S1	16	68	61	63.5
	Occupation				
a.	Civil Servant	1	4	4	4
b.	Private Employee	9	37.5	68	71
c.	Labors	0	0	0	0
d.	Not working	14	58.5	24	25

Immunization status description results show that there were 24 subjects under five who did not get complete immunization (25%) and 96 subjects under five who received complete immunization (75%). The description of perceived susceptibility results showed that there were 51 subjects of mothers who felt their babies were not vulnerable (42.5%) and 69 subjects of mothers who felt their babies were vulnerable (57.5%). The results of the description of the perception of seriousness showed that there were 63 subjects of mothers who felt that diseases that could be prevented by immunization were non-serious diseases (52.5%) and 57 subjects of mothers felt that diseases that could be prevented by immunization were serious diseases (47.5%). The results of the description of the perception of threats indicate that there were 52 subjects the mother felt that the disease can be prevented by immunization.

Table 2. Results of path analysis of the effect of mother's perception on health belief model against completeness of immunization status

Dependent variable		Independent variable	Path Coefficient (b)	95% CI		p
				Lower Limit	Upper Limit	
Direct Effect						
Immunization	←	Perceived threat	1.88	0.71	3.04	0.002
completeness	←	Perceived benefit	1.83	0.69	2.96	0.002
	←	Perceived barrier	-0.96	-1.97	0.05	0.063
Indirect Effect						
Perceived threat	←	Perceived susceptibility	0.63	-0.13	1.39	0.104
	←	Perceived seriousness	1.10	0.34	1.86	0.005
Likelihood= 125.80						

Non-threatening diseases were 45%) and 66 maternal subjects felt that diseases that could be prevented by immunization

were threatening diseases (55.0%). The results of the description of perceived usefulness indicate that there are 43 subjects

the mother feels immunization is not beneficial for her baby (35.8%) and 77 subjects the mother feels immunization is beneficial for her baby (64.2%). The results of the description of the perception of obstacles indicate that there are 46 subjects the mother feels there is no obstacle in immunizing her baby (38.3%) and 74 subject mothers feel there are obstacles in immunizing their baby (61.7%). The results of the path analysis of the effects of perception of vulnerability, seriousness, threats, benefits and obstacles to the completeness of immunization status are described in Table 2.

DISCUSSION

The indirect effect between perception of vulnerability and completeness of immunization status is obtained from the first effect, namely between perception of vulnerability and perception of threat (b = 0.63; 95% CI= -0.13 to 1.39; p= 0.104), then proceed from threat perception to completeness of status immunization (b = 1.88; 95% CI= 0.71 to 3.04; p = 0.002). It can be concluded that there is an indirect effect between perception of vulnerability and completeness of immunization status through threat perception. Mothers who have a perception that their babies are vulnerable to experience diseases that can be prevented by immunization are more likely to immunize their babies than mothers who have the perception that their babies are not susceptible to diseases that can be prevented by immunization.

The results of this study are in line with the study of Smith et al. (2011) which revealed that parents who refused vaccination were less likely to believe that vaccination was needed to protect the health of their children compared to parents who gave vaccinations to their children. If someone feels at risk of an illness then he will carry out safe behaviors and preventive

measures (Hayden, 2010). According to Rosenstock (1982) in Noorkasiani (2009), those who feel they can be affected by the disease will feel threatened faster. This threat encourages individuals to take action to prevent or cure disease.

The results of this study indicate that there are still mothers who feel that their babies are not susceptible to disease (42.5%). Perceived vulnerability is often referred to as motivation in taking a health action because they do not believe that their child will not be attacked by disease. If a person feels not susceptible to the disease, it is necessary to provide more intensive stimulation so that he also triggers the desired response that is to carry out immunizations. The perceived low vulnerability to a disease can be caused by lack of knowledge about the dangers of the disease. Therefore additional research is needed on vulnerability perceptions in relation to maternal knowledge about diseases that can be prevented by immunization.

There is a positive relationship between perception of seriousness and the completeness of immunization status. The indirect effect between perception of seriousness and completeness of immunization status is obtained from the first effect, which is between perception of seriousness and threat perception (b= 1.10; 95% CI= 0.34 to 1.86; p= 0.005), then proceed from threat perception to completeness of immunization status (b = 1.88; 95% CI= 0.71 to 3.04; p= 0.002). There is an indirect effect between perception of seriousness and completeness of immunization status through threat perception. Mothers who have the perception that diseases that can be prevented by immunization are serious diseases, are more likely to immunize their babies than mothers who have the perception that diseases that can

be prevented by immunization are not serious diseases.

The results of this study agree with several existing theories about the Health Belief Model. Hayden (2010) states that the perceived seriousness determines the presence or absence of preventive measures taken against the disease. The perception of seriousness is often based on medical information or knowledge, it can also come from a person's belief that he will get into trouble due to illness and will make or have an effect on his life in general (Priyoto, 2014). Those who feel that diseases that can be prevented by immunization such as hepatitis, diphtheria, pertussis, tetanus, measles and polio are serious diseases, they will feel threatened more quickly. This threat encourages individuals to take action to prevent or cure disease (Rosenstock, 1982 in Noorkasiani, 2009).

The perceived seriousness determines whether or not any preventive action is taken against the disease. Data obtained from this study indicate that there are still mothers who perceive that diseases that can be prevented by immunization such as hepatitis, diphtheria, pertussis, tetanus, measles and polio are not serious and threatening their babies (52.5%) and decided not to immunize his child. This is due to the fact that vaccines themselves have not been the first choice in disease prevention due to lack of knowledge about the dangers of the disease. Additional research is needed on the perception of seriousness in relation to maternal knowledge about diseases that can be prevented by immunization.

There was a positive influence between perceived threat and completeness of immunization status (b = 1.88; 95% CI = 0.71 to 3.04; p = 0.002). That is, mothers who have the perception that diseases that can be prevented by immunization are diseases that threaten the health of their babies, are 1.88 more likely to immunize their babies than mothers who have the perception that diseases that can be prevented by immunization are not diseases that threaten the health of their babies.

According to Rosenstock (1982) in Noorkasiani (2009), individuals' perceptions about their likelihood of being exposed to a disease (perceived susceptibility) make them more quickly feel threatened. The individual's view of the severity of the disease (perceived seriousness), namely the risks and difficulties that will be experienced from the disease makes it likely that the individual feels will be easily attacked by the disease. This causes increasingly greater perceived threat (perceived threats). This threat encourages individuals to take action to prevent or cure disease.

The results of the study show that mothers who think that diseases that can be prevented by immunization are diseases that do not threaten their babies (45%). This is because the understanding of the threats that can be caused by diseases that can be prevented by each individual's immunization is different, depending on his medical knowledge about the disease. It would be better if a study was conducted on the perception of threats in relation to the mother's knowledge about diseases that can be prevented by immunization so that the effect of knowledge on the perception of disease threats can be known.

There was a direct positive effect between perceived benefits and completeness of immunization status (b= 1.83; 95% CI= 0.69 to 2.96; p = 0.002). Mothers who have the perception that infant immunizations are beneficial have a 1.83 greater chance to immunize their babies than mothers who have the perception that infant immunizations are not beneficial.

The results of this study are in line with the study of Smith et al. (2011). This study shows that parents who disagree with their children being given the vaccine feel less of the benefits associated with vaccines. Parents who agree with vaccines consider vaccination to be beneficial for their child's health. Perceived benefits are one's opinions about the value or usefulness of a new behavior in reducing disease risk. Someone will tend to implement healthy behaviors when he feels the behavior is beneficial to reduce cases of the disease. This study shows that a person will carry out the vaccination if he feels the action is beneficial and vice versa, so that the presentation of the mother who does not immunize her baby is still found because the mother does not feel the benefits of the immunization. The perception of the benefits of immunization has not been felt directly, especially for mothers who do not immunize their children because the vaccine, according to him, is not effective in preventing disease.

The immunization of infants not only provides prevention of certain diseases to the child but also has a wider impact because it can prevent transmission of the disease to others. Therefore, the knowledge and attitude of parents, especially mothers, is very important to understand the benefits of immunization for their babies.

There is a negative influence between the perception of the direct obstacle to the completeness of immunization status (b= -0.96; 95% CI= -1.97 to 0.05; p= 0.063). Mothers who have the perception that there are many obstacles when immunizing their babies are 0.96 less likely to immunize their babies than mothers who have the perception that there are no obstacles when immunizing their babies.

Perception of obstacles is the obstacle felt by the mother when she wants to take the decision to immunize her baby. Barriers in this study mean that there are distance constraints, maternal anxiety, and norm / cultural barriers. Perceived barriers relate to the individual's own evaluation process for the obstacles faced to adopt new behaviors. Perception about the obstacles that will be felt is a significant element in determining whether there is a change in behavior or not. Regarding the new behavior to be adopted, one must believe that the benefits of the new behavior outweigh the consequences of continuing the old behavior. This allows obstacles to be overcome and new behaviors to be adopted (Priyoto, 2014). The results of this study are in line with the study of Smith et al. (2011) which states that parents who do not immunize their children are less likely to assume that the vaccine is safe compared to parents who immunize their children.

There are many obstacles that one must go through to be able to take a health action. Before adopting a behavior, one must believe that the magnitude of the obstacles experienced when taking preventive action is smaller than the consequences of the action or the old behavior. For example, from the experience of parents that they did not receive immunization but were healthy, and they had to take new actions, namely to carry out immunization actions to their children, they must believe that the obstacles and consequences of immunization are smaller than other preventive measures such as maintaining hygiene. Therefore, it is necessary to instill an understanding to mothers about the difference between old and new behaviors and the spread of disease in their environment.

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