Mothers' Intention for Measles-Rubella Vaccination at Bareng Primary Healthcare Center Malang

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ABSTRACT

Background: *Measles and rubella are infectious diseases caused by viruses. The average number of measles cases found in infancy to four years old was 1.125 cases (41.8%) in 2021, with 366 and 13 cases for East Java and Malang, respectively. To eliminate measles and rubella cases in 2023, the high coverage of measles and rubella (MR) vaccination must be met at least 95%. Since 2021, the Bareng Primary Healthcare Centre in Malang has shown the lowest MR vaccination, with 217 children vaccinated (33.23%).*
Method: *This study used a quantitative research method with observational analysis and a cross-sectional study design with a sample size of 68 people. The sampling technique used was proportionate random sampling. Then, data were analyzed by the Spearman rank correlation test.*
Results: *Based on the univariate results, most respondents were aged 27 to 35 years (55.9%) with secondary education (Senior High School/Vocational School/Islamic Senior High School) (55.9%) and had no income (41.2%). Based on the results of the bivariate analysis, intention and attitude correlated (0.0001) with subjective norm (0.0001) and perceived control over behavior (0.0001). Variables significantly related to the mother's intention to give measles-rubella vaccination were attitude over behavior, subjective norm, and perception of control over behavior. It is expected that the result of this study could raise the mother's intention to participate in counseling and socialization by providing accurate information about the MR vaccination.*

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INTRODUCTION

Measles and rubella are infectious diseases caused by viruses with certain symptoms.[1,2] In 2021, the Indonesian Health Profile Report showed 1,125 measles cases among mothers in infancy to children at four (41.8%). The estimated number of children suspected of measles was 2,931; out of that number, only 1,634 children were vaccinated. The increase in measles cases in East Java was 223 cases from 2020 to 2021 and 366 cases in total in 2021. Malang City was ranked third after Central Java Province (493 cases) and DKI Jakarta Province (489 cases) for having a measles incident rate of 0.48 per 100,000 population.[3] Malang recorded 13 measles cases.[4]

The Global Vaccine Action Plan (GVAP), a framework and collaborative product of the DoV Collaboration (experts and stakeholders who have an interest in development, health, and immunization), has set a goal to eliminate measles and rubella by providing measles and rubella (MR) vaccines to boost immunity.[5] By 2023, an MR immunization campaign was being carried out to achieve high coverage of at least 95%. Sufficient vaccination coverage will lead to herd immunity, breaking the measles and rubella transmission chain.[3,6] The campaign will prevent sources of MR transmission. The Local Area Monitoring Immunization Application of the East Java Provincial Health Office demonstrated that the coverage of MR vaccination in East Java Province had decreased by 480,301 children (86.71%) from January to December 2022.[7]

Recent reports have shown the number of vaccinated individuals suspected of measles in East Java Province was the fifth highest in the country. This statistic places East Java behind North Sulawesi Province (74.1%), South Sumatra Province (53.8%), Gorontalo Province (50%), and Bangka Belitung Islands (45%), with a vaccination coverage rate of 43.7% from January to December 2022. Additionally, Malang was ranked the fifth lowest for having MR vaccination coverage among other cities and regencies in East Java Province, with only 7,336

vaccinated children (60.20%) during the same period. On the other hand, the Bareng Primary Healthcare Centre in Malang has been reported to have the lowest MR vaccination coverage since 2021. From January to November 2022, only 217 children (33.23%) received the vaccination.[7] Specifically, the coverage of MR vaccination in primary healthcare centers in Malang was still below the target of 95%. This fact indicates that the environment has not formed herd immunity, resulting in the transmission of measles and rubella. Therefore, the minimum coverage of MR vaccination should be attained to prevent wider measles and rubella transmission.[8]

One of the reasons for low vaccination coverage was public rejection because of hoaxes or false information and the debate on halal and haram of MR vaccination.[9,10]For instance, Megang Sakti District, Musi Rawas Regency, had mothers refusing the MR vaccination. The study showed out of 1,910 student mothers, 302 (15.8%) refused to vaccinate their children. Out of 302 mothers who refused, 264 (87.4%) came from families who completed religious elementary schools.[11] Likewise, in South Labuhanbatu Regency, North Sumatra Province, as many as 54,473 (76.91%) of student guardians refused to give their children measles-rubella (MR) vaccination.[12]

Measles-rubella (MR) vaccination is commonly suspected of causing paralysis.[13,14] The vaccine is presumed to contain pork and becomes a counterfeit vaccines.[14,15] However, the Indonesian Pediatrician Association clarified that the vaccines in Indonesia do not contain pork. They further explained that the manufacturing process involving polio and trypsin enzymes does contain pork, but it has been cleaned and disposed of.[16] From the religious perspective, the Indonesian Ulema Council states that immunization can provide immunity for the body and prevent certain diseases.[17]

Symptoms of measles include a high fever, red spots on the skin (a rash), a cough, and a runny nose. Rubella with complications can cause death,[18] neonatal miscarriage, and congenital rubella syndrome (CRS) in first-trimester pregnant women.[19] Eradicating measles and rubella is difficult with no specific treatment, but vaccination can prevent the transmission.[13,20,21] The MR vaccination also provides immunity against measles and rubella.[22] Besides, mothers have an important role in their children's MR vaccination.[5,23] Attitude factors, subjective norms, and perceived behavioral control affect mothers' intention to vaccinate their children against measles and rubella.[24]

Planned behavior theory suggests that an individual's intention is determined by his/her response towards behavior, subjective norms, and perception of control over behavior.[25,26] Those three aspects have a connection with mothers' intention to give their children MR vaccine, and TPB also plays an important role in behavioral change.[6,27] Several other factors related to the mother's intention include age, education, and income.[5,28–31] MR vaccination makes a child become resistant to measles and rubella.[32]

The World Health Organization (WHO) supports the claim that over the last 10 years, immunization has effectively prevented two to three million deaths each year.[33] The MR vaccine has been used in 114 countries, and no single report has been found about its side effects or dangers.[34] In addition, The Indonesian National POM Agency has also granted a distribution permit for the MR vaccines throughout Indonesia.[35]

A high rejection rate of MR vaccination and its coverage has declined public trust. Therefore, the current research on factors and mothers' intentions to give measles-rubella vaccines to their children in the working area of the primary healthcare center in Malang City, was carried out to help increase public understanding and support for MR vaccination.

METHOD

This study used a quantitative research method with a cross-sectional research design. The research was carried out in the working area of the primary healthcare center in Malang from May 20 to June 20, 2023. Using a proportionate random sampling technique, the sample size is 68 mothers. The independent variables in this study were background factors (age, recent education, and income), attitude toward giving MR immunization to children, subjective norms, and perceived behavioral control. In contrast, the dependent variable was the mother's intention to give their children MR vaccines. Data were collected through interviews with mothers having babies aged zero to 8 months. A univariate analysis was used to describe the characteristics of the respondents (age, education level, and income), attitude toward the behavior, subjective norms, and perceived behavioral control. Hypothesis testing in this study was carried out using a chi-square test to prove the influence of the independent variables on the dependent variable. The independent variables in this study were background factors (age, recent education, income, religion, and information media), attitude toward the behavior (attitude), subjective norm (subjective norm), and perceived behavioral control (perception of control over behavior) of MR vaccination. The quantitative data compiled in the previous stage were accumulated according to the variables.

Four variables i.e., attitude toward the behavior, subjective norm, and perceived behavioral control had 10 questions, and the intention variable only had one question. Each statement contained five scales: 1, 2, 3, 4, and 5. The higher the value of the scale chosen, the more the respondents agreed with the statement, and vice versa. Scoring was obtained from preparation and accumulation according to the specified variables.

The validity was tested using the Pearson product correlation test. Preliminary data were collected before the research took place with 30 mothers in the working area of Dinoyo Primary Healthcare Center. Meanwhile, the reliability was carried out by comparing Cronbach's alpha value with the significant level or level used in statistical processing software. The research instrument was declared reliable if Cronbach's alpha value was greater than the significant level.

The chi-square test, a non-parametric analysis technique for nominal and ordinal data, was used to estimate the risk opportunity (odds ratio) of an exposure (independent or independent variable) that leads to an outcome (dependent or dependent variable). This study has been approved by the Ethic Committee of Medical Research Faculty of Dentistry University of Jember with Number: No.2027/UN25.8/KEPK/DL/2022.

RESULTS AND DISCUSSION

According to planned behavior theory, behavior and intention are correlated, meaning that intention is the closest factor to predicting behavior. This current study examined three factors that can directly influence intention, including attitude toward MR immunization, subjective norms, and individual perceived behavioral control. Sipahutar's research also found that perceived behavioral control (p = 0.025) had a relationship with perceived behavioral control and the completeness of basic immunization.[36] The better the mother's perception of immunization, the higher the intention to give her child immunization, and vice versa.

Table 1 shows respondents aged between 27 and 35 years are the most dominant. This study found that 38 respondents (55.9%) had a secondary education level, and 28 respondents (41.2%) did not have their income or were housewives.

Attitude toward MR vaccination is positive as indicated in Table 2. This study also suggests that the mothers had a positive perceived behavioral control in administering the vaccination. Additionally, the respondents' answers demonstrated that the variable related to mothers' intentions to give MR vaccines to their children fell under the five scale, mostly opted by 47 respondents (69.1%). This finding means that their intention was strong.

The respondents' attitudes towards MR vaccination are negative as shown in Table 3. This study showed 19 (27.9%) respondents included the intention category, and 14 respondents (20.7%) included the intention category. Two respondents (2.9%) had a positive attitude, including the intention category of no intention, and 33 respondents (48.5%) included the intention category of intention. The chi-square test showed a significant relationship between attitude toward MR immunization and intention (p = 0.0001). The odds ratio value of 22.393 indicates that a positive attitude results in positive intention. Attitude is the magnitude of positive or negative feelings towards objects, people, institutions, or activities.[37] Someone will show a negative attitude if she/he has an unpleasant experience with MR vaccination.

A moderate relationship was found between attitude and the mother's intention to vaccinate their children against measles and rubella. This study had 33 respondents (48.5%) having positive intentions for MR vaccination. Individual attitude also refers to the degree to which a person holds both positive and negative personal evaluations of the vaccine, either useful or not.[38]

The mothers' positive attitude indicates their interest in MR vaccination because of its benefits. The majority of the respondents had a positive attitude (60 people; 85.7%) and an interest in MR immunization (24 people; 34.3%) because they were informed about the importance of MR immunization for infants.[39] Previous research discovered a relationship between parental attitudes and interest in MR immunization in Wolio Regency Beautiful Hill, Baubau City (p = 0.004).

Table 1. Respondents' characteristics

Characteristics	f	%
Age		
19-26 years old	21	30.8
27-35 years old	38	55.9
36-43 years old	9	13.3
Education Level		
Basic Education	9	13.2
Secondary Education	38	55.9
Higher Education	21	30.9
Income		
More than minimum salary	6	8.8
Minimum salary	13	19.1
Less than minimum salary	21	30.9
No income	28	41.2

Table 2. The frequency distribution of respondents' characteristics based on attitude towards giving MR immunization to children, subjective norms, and perceived behavioral control

Variables	Disagree				Agree
	1	2	3	4	5
Attitude toward giving MR					
Giving the measles-rubella (MR) vaccine to children aged at least 9 months		18 (26.5%)	10 (14.7%)	20 (29.4%)	20 (29.4%)
Giving vaccines because children will have immunity to prevent the disease			6 (8.8%)	22 (32.8%)	40 (58.8%)
Vaccines are given because they are safe, cheap, and effective		1 (1.5%)	9 (13.2%)	18 (26.5%)	40 (58.8%)
Vaccinating my child despite the absence of a measles or rubella outbreak.	1 (1.5%)	4 (5.9%)	6 (8.8%)	14 (20.6%)	43 (63.2%)
Taking the time to vaccinate my child because of certainty in religious law and distribution permits given by the relevant institutions		1 (1.5%)	7 (10.3%)	21 (30.9%)	39 (57.4%)
Giving the vaccine despite a lot of negative information related to MR vaccine		1 (1.5%)	11 (16.2%)	23 (33.8%)	33 (48.5%)
Giving vaccinations because, in my opinion, children will get sick if they are not given the MR vaccine		3 (4.4%)	15 (22.1%)	17 (25%)	33 (48.5%)
Giving vaccinations despite the absence of health workers telling me or taking me to an integrated health center (*posyandu)*.	2 (2.9%)	2 (2.9%)	11 (16.2%)	15 (22.1%)	38 (55.9%)
Providing vaccinations even if the *posyandu* is far away because the MR vaccine has many benefits		1 (1.5%)	11 (16.2%)	24 (35.3%)	32 (47.1%)
Giving vaccinations to prevent the danger of measles and rubella		2 (2.9%)	7 (10.3%)	14 (20.6%)	45 (66.2%)
Subjective Norm					
Husband's support for his child's MR vaccination		1 (1.5%)	6 (8.8%)	12 (17.6%)	49 (72.1%)
Family recommendations for vaccination		2 (2.9%)	11 (16.2%)	17 (25%)	38 (55.9%)
Husband provides transportation support to go to health facilities		2 (2.9%)	3 (4.4%)	12 (17.6%)	5 (75%)
Parental support for giving vaccines to children			8 (11.8%)	12 (17.6%)	48 (70%)
Support from local health workers for giving vaccines to children	5 (7.4%)	3 (4.4%)	3 (4.4%)	14 (20.6%)	43 (63.2%)
Providing education by local health workers	3 (4.4%)	2 (2.9%)	2 (2.9%)	19 (27.9%)	42 (61.8%)
Getting support from friends to give vaccines to children	2 (2.9%)	2 (2.9%)	15 (22.1%)	16 (23.5%)	33 (48.5%)
Getting support from neighbors to give vaccines to children	3 (4.4%)	5 (7.4%)	13 (19.1%)	18 (26.5%)	29 (42.6%)
Receiving encouragement from online media about the MR vaccine	8 (11.8%)	1 (1.5%)	10 (14.7%)	17 (25%)	32 (47.1%)
Parental support for children's MR vaccination.		1 (1.5%)	13 (19.1%)	24 (35.3%)	30 (44.1%)
Perceived Behavioral Control					
Able to take my child to get the MR vaccine in a primary healthcare center			7 (10.3%)	19 (27.9%)	42 (61.8%)
Confident about vaccinating my child because I heard about some friends' experiences with having their children vaccinated.		2 (2.9%)	9 (13.2%)	15 (22.1%)	42 (61.8%)
Able to take the child to the *posyandu* for MR vaccination as I have transportation to reach the place		7 (10.3%)	10 (14.7%)	13 (19.1%)	38 (55.9%)
Having a good understanding of vaccines	2 (2.9%)	2 (2.9%)	12 (17.6%)	22 (32.4%)	30 (44.1%)
Having easier access to accurate information about vaccines		2 (2.9%)	11 (16.2%)	26 (38.2%)	29 (42.6%)

Confident in accepting vaccinations because I heard my family's experience with having their children vaccinated.	3 (4.4%)	9 (13.2%)	23 (33.8%)	33 (48.5%)
The distance to the *posyandu* is not an obstacle for me to vaccinate my children	1 (1.5%)	5 (7.4%)	17 (25%)	45 (66.2%)
Confident in vaccinating children because of the state's recommendations		8 (11.8%)	12 (17.6%)	48 (70.6%)
Taking some time to go to the nearest health facility to provide vaccinations for children		4 (5.9%)	15 (22.1%)	49 (72.1%)
Confident in vaccinating because I heard an Islamic law from the MUI regarding the MR vaccination	1 (1.5%)	4 (5.9%)	17 (25%)	46 (67.6%)
Intention				
When the child is at least 9 months old, I intend to have him/her vaccinated MR		5 (7.4%)	16 (23.5%)	47 (69.1%)

Table 3. The result of multivariate analysis

Variable	Intention				Total		P-value	OR (CI 95%)
	No intention		Intend					
	f	%	f	%	f	%		
Attitude toward giving MR immunization to children								
Negative	19	27.9	14	20.7	33	48.6	0.0001	22.393 (4.587-109.312)
Positive	2	2.9	33	48.5	35	51.4		
Subjective Norm								
Negative	18	26.5	16	23.5	34	50	0.0001	11.625 (2.975-45.432)
Positive	3	4.4	31	45.6	34	50		
Perceived Behavioral Control								
Low	19	27.9	13	19.2	32	47.1	0.0001	24.846 (5.062-121.965)
High	2	2.9	34	50	36	52.9		

Table 3 explains the relationship between subjective norms and maternal intentions to give MR vaccination. Most respondents showed a low subjective norm (18 people; 26.5%). Subjective norms were high, with three respondents (4.4%) having no intention and 31 respondents (45.6%) having intention. The chi-square test showed a significant relationship between subjective norms and intentions (p = 0.0001). The odds ratio value of 11.625 indicates that mothers with positive subjective norms were 11.625 times more likely to have intention than mothers with negative subjective norms.

Subjective norms are based on the beliefs of influential people and groups, such as parents, spouses, and co-workers, regarding approval or disapproval.[40] Subjective norms in this study came from family, spouses, neighbors, friends, the primary healthcare center's cadres, and/or local midwives.

Subjective norms and the mother's intention to vaccinate their children with measles and rubella were moderately related. Most respondents had high subjective norms (31 people; 45.6%). The higher a person's subjective norm, the greater the possibility of planning for measles and rubella vaccinations. Subjective norms are measured by perceived social pressure and behavior. Specifically, the norms help people decide to approve or disapprove of a behavior.[38] A high subjective norm is associated with a high concern about people's recommendations on MR vaccination.

Previous research discovered most respondents had positive subjective norms about MR vaccination (60.5%).[24] A previous study confirms that subjective norms were the factor that influenced the mother's intention to MR vaccination at the Halmahera Health Center in Semarang City.

Regarding the relationship between perceived behavioral control and the mother's intention to MR vaccination, most of the respondents showed low perceived behavioral control. The lowest number was respondents with high perceived behavioral control. The chi-square analysis test claimed a significant relationship between perceived behavioral control and intention (p = 0.0001). The odds ratio value of 24.846 indicates that mothers with high perceived behavioral control were 24.846 times more likely to have more intention than mothers with low perceived behavioral control. Perceived behavioral control is an individual's perception by displaying certain behaviors adjusted to constraints or ease that influence them.[41]

Perceived behavioral control can be divided into two: positive perceived behavioral control and negative one. Positive perceived behavioral control is the mother's belief about her ability to respond to MR vaccination. A mother can take her child to a health facility and believes that

having her child vaccinated MR encourages her to have positive behavior.

Perceived behavioral control does not only include the feeling of affordability to make a decision and action.[38,41] An assumption is related to the ease of accessing information, skills, opportunities, resources, and obstacles influencing a behavior. A moderate relationship existed between perceived behavioral control and the mother's intention to vaccinate their children with MR. Most respondents had intentions with high perceived behavioral control (34 people; 50%). The higher the perceived behavioral control, the greater the intention to MR vaccinations. Perceived behavioral control is one's belief in resources, opportunities, and obstacles someone needs to anticipate.[42] Driving and inhibiting factors in this study included the mother's desire, experience from family or friends whose children had been vaccinated, availability of transportation, good understanding, ease of accessing information, distance, and time to go to health facilities, suggestions, and vaccine distribution permits from related institutions. Perceived behavioral control showed a p-value of 0.025, suggesting a relationship between perceived behavioral control and the completeness of basic immunization. The better the mother's perception of immunizations, the higher the intention.[36]

Data collection and selection of theoretical approaches were limited. The data could not give answers to the research hypothesis completely. This study provides insights to increase public understanding of vaccination strategies and programs to be more effective and targeted.

CONCLUSION

The MR vaccination in the working area of the Bareng Primary Healthcare Center in Malang was researched among respondents mostly aged between 27 and 35 years (55.9%), having secondary education (55.9%), and having no income (41.2%). A relationship between attitude towards MR immunization and intentions was found. This relationship also applies to subjective norms and intentions. Similarly, perceived behavioral control and intentions were correlated. This study recommends health workers provide education regarding MR vaccination to improve public attitudes, subjective norms, and perceived behavioral control toward MR vaccination.

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