

# Relationship between maternal perception and full immunization coverage among children aged 1-3 years in Kalibagor Village, Situbondo District



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## ABSTRACT

**Background and purpose:** Full immunization coverage in Indonesia and East Java Province is reported to remain below the target of Universal Child Immunization. The purpose of the study was to determine the association between maternal perception and full immunization coverage among children aged 1-3 years.

**Methods:** A cross-sectional study was conducted with mothers who had children under 3 years in Kalibagor Village, Situbondo District, East Java Province. A total of 116 respondents were selected using systematic random sampling from 133 mothers of children aged 1-3 years. Listing of all mothers was conducted through home visits one month before data collection. Data collection was conducted by interview at respondents' house in October-May 2018. Data collected included sociodemographic characteristics, knowledge on immunization, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, information on

immunization, and support from community leader, health provider and peer. Data analysis with logistic regression was conducted to determine the relationship between maternal perception with full immunization coverage.

**Results:** This study showed that 79.3% of respondents reported to have provided full immunization to their children. The results of multivariate analysis showed that full immunization was related to the mother's perception on the benefits of immunization (AOR=59.75; 95%CI: 4.60-775.86), self-efficacy (AOR=6.25; 95%CI: 1.84-21.35) and knowledge on immunization (AOR=7.77; 95%CI: 1.92-31.49).

**Conclusion:** Maternal perceptions on immunization's benefits, self-efficacy and knowledge are related to the full immunization coverage in children. Education about the benefits of immunization needs to be prioritized in an effort to increase full immunization coverage in children.

**Keywords:** Full immunization coverage, perceived benefits, self-efficacy, knowledge, Indonesia

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## INTRODUCTION

The Indonesia Ministry of Health sets a target for Universal Child Immunization (UCI) that 90% of infants receive basic immunizations that include BCG, Hepatitis B, Diphtheria-Pertussis-Tetanus, polio and measles.<sup>1</sup> The achievement of UCI will develop herd immunity, which prevents all the population to get the diseases in the particular area.<sup>2</sup>

The coverage of infants fully receiving basic immunization in Indonesia in 2013 remained below the UCI target of 59.2%.<sup>3</sup> This was also found in East Java where full basic immunization coverage was 74.5%.<sup>4</sup> In 2015, East Java Health Office reported 255 cases of diphtheria, and in 2012 an outbreak of diphtheria was reported in Situbondo District with 129 cases and 7 deaths.<sup>5,6</sup> These events are likely associated with the low coverage of full basic immunization compared to the UCI target.

Some studies indicated that full immunization coverage is related to the perception of mothers who concerned about the side effects of immunization,

knowledge of parents, children were ill during immunization, family resistance, distance to immunization providers, time constraints, lack of information and the perception of parents who doubt that the vaccine is *halal*.<sup>3,7-9</sup>

Publications regarding maternal perception on immunization adopting The Health Belief Model (HBM) in Indonesia are still limited. This study aims to determine the relationship between maternal perception and full basic immunization coverage among children aged 1-3 years. The frameworks used in this study are HBM and several components of PRECEDE-PROCEED Model.

## METHODS

This study was a cross-sectional survey conducted in Kalibagor Village, Situbondo District, East Java Province. Respondents were mothers with children aged 1-3 years. Listing of all mothers with children aged 1-3 years was conducted through home visits in March 2018. From 133 mothers who listed, 116 mothers were selected as a sample

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using systematic random sampling. The number of samples was calculated with the confidence level of 95%, power of 80%, proportion of mothers who perceived barriers with full immunization (P1) of 36% and proportion of mother without perceived barriers with full immunization (P2) of 55%.<sup>9</sup> Data collection was carried out by face-to-face interviews conducted by researchers at each respondent's house from April-May 2018. Data collected included information on the completeness of immunization, social demographic characteristics, immunization knowledge, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self efficacy, information obtained by respondents about immunization, support from community leaders, healthcare provider and peers.

Information on the completeness of immunization was obtained from interviews and verified with immunization records on the Maternal and Child Health Book or Growth Chart Card available at the respondent's house. Immunization was categorized as full, if the respondent answered "yes" to immunization given in accordance with the immunization program schedule, namely at the age of 0-7 days, one, two, three, four and nine months. Knowledge was measured with 8 questions. If the respondents' answer is "correct" it was scored one and if "incorrect" scored zero (0). The total score was grouped into three categories, namely "good" knowledge with a score of 6-8, "fair" with a score of 3-5 and "poor" with a score of 0-2. Perception was measured using a Likert Scale with scales from one to four. Perception questionnaire consisted of three questions each for perceived susceptibility, perceived severity, and perceived benefits, four questions for perceived barriers and five questions for self-efficacy. The scores for each question were calculated and grouped into two categories, namely "high" if the score is the same or above the median and "low" if it was below the median. The community leader support consisted of two questions and were grouped into two categories, namely "adequate support" with a score of two, and "lack of support" with a score of below two. Healthcare provider support consisted of four questions and were grouped into two categories, namely "adequate support" with a score of more than one, and "lack of support" with a score of one or zero.

Univariate, bivariate and multivariate data analysis was performed using Stata 12.1. Multivariate analysis was performed by logistic regression with the enter method. The association was determined using adjusted odd ratio (AOR) with 95%CI. This study has been approved by the Institutional Research Board (IRB) at the Kerti Praja Foundation, Denpasar, Bali on 5 February 2018.

## RESULTS

**Table 1** shows the social demographic characteristics of respondents compared with data on female population aged 15-44 years in the Situbondo District. It was evident that the proportion of respondents was lower among those who did not attend school (3.4% vs 8.2%) and junior high school (19.0% vs 26.6%), but higher among those who had a high education (15.5% vs 6.7%). In terms of age, the majority of respondents were 25-34 years, which is different from the population of Situbondo District. This is likely because respondents in our study were women with children aged 1-3 years while the population of Situbondo District consisted of all women.

**Table 2** shows that the proportion of respondents who reported to have fully immunized their children was 79.3%. **Table 2** also presents the proportions of those who reported to have fully immunized their children based on social demographics, knowledge, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, information, and support from community leaders, healthcare providers and peers. There is a significant difference in the proportions of full immunization among children based on perceived benefits and self-efficacy. The proportion of reported fully immunized children among respondents with high perceived benefits was 82.6% and 28.6% among those with low perceived benefits ( $p=0.00$ ). The proportion of fully immunized children among respondents with high self-efficacy was 87.5% and 53.6% among those with low self-efficacy ( $p<0.01$ ). There were no significant differences in the completeness of immunization based on social demographics, maternal knowledge, perceived susceptibility, perceived severity, perceived barriers, information, and support from community leaders, healthcare providers and peers.

**Table 3** presents the results of multivariate analysis with logistic regression. Variables associated with the completeness of immunization are perceived benefits with AOR=59.75 (95%CI: 4.60-775.86), knowledge with AOR=7.77 (95%CI: 1.92-31.49) and self-efficacy with AOR=6.26 (95%CI: 1.84-21.35).

## DISCUSSION

The proportion of full immunization among children aged 1-3 years in Kalibagor Village, Situbondo District, East Java was 79.3%. This proportion is still below the UCI target. This proportion is lower than the 2016 immunization coverage in Kalibagor Village based on the Situbondo Public Health Center report, which was 91.8%.<sup>10</sup> These discrepancies may

**Table 1** Characteristics of respondents and female population aged 15-44 in Situbondo District

Characteristics	n	%	Female population of Situbondo District aged 15-44 years*)	
			N	%
<b>Education</b>				
No schooling	4	3.4	713,914	8.2
Elementary	40	34.5	2,887,653	33.1
Junior high	22	19.0	2,289,225	26.6
Senior high	32	27.6	2,236,816	25.7
Tertiary	18	15.5	586,838	6.7
<b>Total</b>	<b>116</b>	<b>100.0</b>	<b>8,714,446</b>	<b>100.0</b>
<b>Age (years)</b>				
15-24	30	25.9	2,900,165	32.1
25-34	62	53.4	3,106,738	34.4
35-44	24	20.7	3,021,529	33.5
<b>Total</b>	<b>116</b>	<b>100.0</b>	<b>9,028,432</b>	<b>100.0</b>
<b>Employment</b>				
Employed	28	24.1	NA	NA
Unemployed	88	75.9	NA	NA
<b>Family income</b>				
≥Minimum wages (IDR 1,616,903)	34	29.3	NA	NA
<Minimum wages (IDR 1,616,903)	82	70.7	NA	NA

\*) Source: Statistics Bureau of Situbondo District (2017)

**Table 2** Relationship between independent variables with completeness of immunization

Variables	Completeness of immunization		p
	Complete n (%)	Incomplete n (%)	
<b>Education</b>			
≥Senior high school	41 (82.0)	9 (18.0)	0.53
≤Junior high school	51 (77.3)	15 (22.7)	
<b>Age (years)</b>			
15-24	21 (70.0)	9 (30.0)	0.31
25-34	52 (83.9)	10 (16.1)	
35-44	19 (79.2)	5 (20.8)	
<b>Employment</b>			
Employed	22 (78.6)	6 (21.4)	0.91
Unemployed	70 (79.5)	18 (20.5)	
<b>Family income</b>			
≥Minimum wages (IDR 1,616,903)	24 (70.6)	10 (29.4)	0.14
<Minimum wages (IDR 1,616,903)	68 (82.9)	14 (17.1)	
<b>Knowledge</b>			
Good (score 6-8)	44 (88.0)	6 (12.0)	0.12
Fair (score 3-5)	27 (75.0)	9 (25.0)	
Poor (score 0-2)	21 (70.0)	9 (30.0)	

**Table 2** *Continue*

Variables	Completeness of immunization		p
	Complete n (%)	Incomplete n (%)	
<b>Perceived vulnerability</b>			
High (score 6-10)	77 (80.2)	19 (19.8)	0.60
Low (score <6)	15 (75.0)	5 (25.0)	
<b>Perceived severity</b>			
High (score 8-12)	77 (81.1)	18 (18.9)	0.32
Low (score <8)	15 (71.4)	6 (28.6)	
<b>Perceived benefits</b>			
High (score 8-12)	90 (82.6)	19 (17.4)	<0.01
Low (score <8)	2 (28.6)	5 (71.4)	
<b>Perceived barriers</b>			
High (score 6-12)	77 (79.4)	20 (20.6)	1.00
Low (score <6)	15 (78.9)	4 (21.1)	
<b>Self-efficacy</b>			
High (score 13-20)	77 (87.5)	11 (12.5)	<0.01
Low (score <13)	15 (53.6)	13 (46.4)	
<b>Information</b>			
Ever received	92 (79.3)	24 (20.7)	-
Never received	0 (0.0)	0 (0.0)	
<b>Community leader support</b>			
Adequate	92 (79.3)	24 (20.7)	-
Low	0 (0.0)	0 (0.0)	
<b>Health care provider support</b>			
Adequate	36 (78.3)	10 (21.7)	0.82
Low	56 (80.0)	14 (20.0)	
<b>Peer Support</b>			
Adequate	91 (79.8)	23 (20.2)	0.37
Low	1 (50.0)	1 (50.0)	
<b>Total</b>	92 (79.3)	24 (20.7)	

**Table 3** Adjusted OR of independent variables with the completeness of immunization

Variables	AOR	95%CI		p
		Minimum	Maximum	
<b>Education</b>				
≤Junior high school	1.00			0.55
≥Senior high school	0.66	0.17	2.61	
<b>Age (years)</b>				
<35	1.00			0.70
≥35	1.37	0.28	6.55	
<b>Employment</b>				
Unemployed	1.00			0.87
Employed	0.89	0.25	3.25	

Table 3 Continue

Variables	AOR	95%CI		p
		Minimum	Maximum	
<b>Family income</b>				
<Minimum wages (IDR 1,616,903)	1.00			
≥Minimum wages (IDR 1,616,903)	0.50	0.14	1.73	0.27
<b>Knowledge</b>				
Poor (score <5)	1.00			
Good (score ≥5)	7.77	1.92	31.49	0.00
<b>Perceived vulnerability</b>				
Low	1.00			
High	1.16	0.30	4.46	0.83
<b>Perceived severity</b>				
Low	1.00			
High	0.20	0.03	1.29	0.09
<b>Perceived benefits</b>				
Low	1.00			
High	59.75	4.60	775.86	0.00
<b>Perceived barriers</b>				
Low	1.00			
High	2.34	0.45	12.24	0.31
<b>Self-efficacy</b>				
Low	1.00			
High	6.26	1.84	21.35	0.00
<b>Health care provider support</b>				
Low	1.00			
Adequate	1.26	0.38	4.17	0.71
<b>Peer support</b>				
Low	1.00			
Adequate	4.58	0.05	442.92	0.51

be due to difference in denominators, wherein the number of women with 1-3 years old children used by the public health center is lower than the number of women with 1-3 years children available in Kalibagor Village. Another possibility is the difference in the numerator, where the completeness of the immunization through interviews in this study was under reported because the respondents were unable to recall or the immunization records in Maternal and Child Health Book or Growth Chart Card were incomplete. Another possibility is the difference in the time of the survey which was conducted in 2018 whereas the Situbondo Public Health Center immunization report was in 2016. Basic Health Survey (*Riskesdas*) data in 2013 showed that full immunization coverage nationally was 53.9%.<sup>3</sup> For East Java was 74.5% and for Situbondo District was 63.9%.<sup>4</sup> These data show that immunization coverage in Kalibagor Village is

higher than the national coverage, almost equal to the coverage of East Java Province and higher than the coverage in Situbondo District. However, the time of survey of *Riskesdas* differs from the time of our study.

In our study the HBM components found to be associated with the provision of full immunization were knowledge, perceived benefits and self-efficacy. However, there was no association with the other HBM components, namely social demographics, perceived susceptibility, perceived severity and perceived barriers. Our study neither did find any association between full immunization with support from community leaders, healthcare providers and peers and information obtained by respondents.

The association between perceived benefits and full immunization in our study is consistent with other study findings conducted in Surakarta,

which showed that there was an association between perceived benefits and the completeness of immunization. However, the study in Surakarta showed that the completeness of immunization was significantly associated with perceived severity.<sup>11</sup> Another study conducted in Yogyakarta showed different results wherein perceived benefits was not associated with Hepatitis B immunization at 0-7 days.<sup>12</sup> A study conducted in Pamekasan also found that perceived benefits was not associated with full basic immunization.<sup>13</sup> A study in Surakarta showed that perceived benefits was not associated with measles immunization.<sup>14</sup>

Our study indicates that maternal knowledge is associated with the completeness of immunization. This finding is consistent with a study conducted in Padang which showed that knowledge was associated with full basic immunization in infants.<sup>9</sup> Another study in Boyolali also indicated that maternal knowledge is associated with the completeness of basic immunization.<sup>15</sup> Other studies in some countries also showed that knowledge is associated with full immunization.<sup>16-19</sup> However, studies in North Africa and Nigeria showed that knowledge was not associated with full immunization.<sup>20,21</sup>

Our study finds that self-efficacy is associated with the completeness of immunization. Another study conducted in Pamekasan showed that self-efficacy was also associated with complete basic immunization.<sup>13</sup> Unlike the study conducted in Surakarta which found that self-efficacy was not associated with measles immunization.<sup>14</sup>

The possible bias in this study is that there was no validation on the questionnaires. This study was only carried out in one village, so that the generalization of the results must be taken in caution.

## CONCLUSION

Completeness of immunization in children was found to be associated with perceived benefits, knowledge and self-efficacy, and not associated with social demography, perceived susceptibility, perceived severity, perceived barriers, information obtained by respondents, support from community leaders, healthcare providers and peers. In order to increase the immunization coverage, education on the benefits of immunization must be enhanced.

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