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Factors Influencing the Participation of Mothers with Toddlers Aged 2-12 Months in the Pneumococcal Conjugate Vaccine Program in Metro, Lampung, Indonesia

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ABSTRACT: Pneumonia (pneumonitis) is an infectious disease that often attacks children under five. One way to prevent and control pneumonia cases is through the Pneumococcal Conjugate Vaccine (PCV) immunization program targeting toddlers aged two months to 12 months. However, the achievement of Universal Child Immunization (UCI) in Metro Lampung, Indonesia, is below the target. This research aims to determine the factors that influence the participation of mothers of toddlers aged 2-12 months in the PCV immunization program. This cross-sectional study was conducted on 208 patients with mothers of toddlers aged 2-12 months in the PCV immunization program in Metro Lampung, Indonesia, from July to October 2023. Variable measurements were carried out using a questionnaire. The chi-square test and logistic regression were used for data analysis. The research results show that factors that have a significant influence on the participation of mothers of toddlers aged 2-12 months in the PCV program are knowledge (OR= 7.32; 95% CI= 3.38-18.85), family support OR=6, 71; 95% CI=3.09-14.57) and exposure to information media (OR=4.28; 95% CI=1.94-9.42). Mothers with toddlers aged 2-12 months should participate in the PCV program to prevent pneumonia in children.

KEYWORDS: Immunization, Pneumonia, Toddlers, Pneumococcal Conjugate Vaccine, Indonesia.

INTRODUCTION

Pneumonia (pneumonitis), also known as acute respiratory tract infection (ARI) of the lungs, is an infectious disease that often attacks children under five. Globally, there are more than 1,400 cases of pneumonia per 100,000 children or 1 case per 71 children yearly. Pneumonia has now become the leading cause of death in children throughout the world. In 2019, pneumonia was the cause of 740,180 under-five deaths or contributed to 14% of all under-five deaths (UNICEF, 2022). In Indonesia, this disease has caused high morbidity and mortality in infants and toddlers. The Indonesian Ministry of Health reported that in 2020, 309,838 children under five suffered from pneumonia, while in 2021, there were 278,261 cases of pneumonia in children under five, with a case fatality rate reaching 0.16%. Efforts to control pneumonia in Indonesia include increasing the number of pneumonia cases in children under five with a target of 65%, but as of 2021, it has only reached 31.4%. Lampung is one of the provinces with the highest coverage of pneumonia among children under five in Indonesia (40.6%) (Kemenkes RI, 2022). Meanwhile, in Metro, the target for finding pneumonia is 2.23% of children under five (9,796 children under five). It is estimated that the number of pneumonia cases diagnosed by children under five is 385 cases (3.93%). However, the actual finding of pneumonia in children under five is 38 cases (0.38%) or has not reached the target (Dinkes Kota Metro, 2022).

One of the action plans in this program is to recommend that countries with high under-five mortality rates integrate the provision of Pneumococcal Conjugate Vaccine (PCV) immunization. As of 2020, 77% of countries have introduced pneumococcal vaccines into their immunization programs. Meanwhile, the PCV immunization program in Indonesia itself has been determined to be provided in all regions of Indonesia starting in 2022 based on the Decree of the Minister of Health No.HK.01.07/Menkes/779/2022 (Kepmenkes RI, 2022). The immunization program is an effort to improve public health. It has been proven to be the most cost-effective. It has a positive impact on public health because immunization not only provides individual protection but can also provide herd immunity. To achieve herd immunity and universal child immunization, at least ≥80% of toodler in the village/district receive complete immunization. The PCV immunization program in Indonesia itself is

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included in the list of routine immunizations (complete primary immunization) that are already underway. The target for PCV immunization is toddlers aged two months to 12 months, with an achievement target of 4.6 million toddlers (Kepmenkes RI, 2022).

The low immunization coverage for toddlers currently shows that there is still a lack of maternal participation in vaccination programs for toddlers, and various factors can influence this. Based on preliminary studies conducted by researchers, it is known that since the initial launch of PCV immunization, 541 toddlers have received PCV immunization in Metro, Lampung, Indonesia, consisting of 364 PCV1 and 177 PCV2 toddlers. If we look at the number of targets, the coverage has only reached 21%, while the expected target is ≥80%. Therefore, this research aims to analyze the factors that influence the participation of mothers of toddlers aged 2-12 months in the PCV program.

METHODS

This cross-sectional study recruited 208 mothers with toodler aged 2-12 months with samples conducted at eleven Community Health Centers in Metro, Lampung, Indonesia, from July to October 2023. The independent variables were predisposing factors (knowledge, attitude, education, and age), reinforcers (affordability of access and economic status), and enabling factors (family support, support from health workers, and exposure to information media). The dependent variable in this study is participation in the PCV immunization program. The inclusion criteria were mothers with toddlers aged two months to 12 months who were willing to be respondents by signing an informed consent, while the exclusion criteria were unable to read and write.

The results of sample calculations using G-Power software obtained a sample of 208 respondents. The sampling technique used was proportional random sampling. Variable measurements were carried out using a questionnaire. Univariate analysis is used to determine the frequency distribution of characteristics or descriptions of each variable studied, including frequency distribution based on knowledge, attitudes, education, age, affordability of access, economic status, family/husband support, support from health workers, exposure to information media and program participation. PCV immunization. The chi-square test and logistic regression were used for data analysis. This research has received an ethical letter Number 2385/UN26.18/PP.05.02.00/2023 from the Medical and Health Research Ethics Committee, Faculty of Medicine, University of Lampung, Indonesia.

RESULTS

1. Univariat Analyiss

Table 1. Frequency distribution of knowledge, attitudes, education, age, accessibility to community health center, economic status, family support, support from health workers, exposure to information media in mothers of toodler aged 2-12 months in the PCV program (n = 208)

Variable	Frequency (n)	Percentage (%)
Knowledge		
Good	171	82,2
Less	37	17,8
Attitude		
Positve	135	64,9
Negative	73	35,1
Education		
High	167	80,3
Lower	41	19,7
Mothers' Age		
≥29 years	116	55,8
<29 years	92	44,2
Accessibility to community health center		
Far	181	87,0
Close	27	13,0

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Variable	Frequency (n)	Percentage (%)
Economic status		
High	111	53,4
Lower	97	46,6
Family support		
Support	172	82,7
No support	36	17,3
Healthcare workers' support		
Support	197	94,7
No support	11	5,3
Exposure to information media		
Good	90	43,3
Less	118	56,7
PCV Immunization Participation		
Yes	161	77,4
No	47	22,6

Based on Table 2, the majority of respondents had good knowledge about PCV immunization (82.2%), positive attitude (64.9%), high education (80.3%), and the age of mothers was ≥29 years (55.8%), close accessibility to the community health center (87.0%), high economic status (53.4%), family support for PCV immunization participation in the supportive category (82.7%), support from health workers is supportive (94, 7%), exposure to information media either through TV, radio, newspapers or the internet regarding PCV immunization is in the less category (56.7%), and 77.4% respondents have participated in the PCV immunization program.

2. Bivariate Analyis

Table 2. Factors Influencing the Participation of Mothers of Toodler aged 2-12 in the PCV Program (n=208)

Variable	PCV Immunization Participation				p-value	OR (95% CI)
	Yes		No			
	n	%	n	%		
Knowledge						
Good	145	84,8	26	15,2	<0,001	7,32 (3,38-18,85)
Less	16	43,2	21	56,8		
Attitude						
Positve	114	84,4	21	15,6	0,002	3,03 (1,54-5,86)
Negative	47	64,4	26	35,6		
Education						
High	140	83,8	27	16,2	<0,001	4,94 (2,36-10,33)
Lower	21	51,2	20	48,8		
Mothers' Age						
≥29 years	98	84,5	18	15,5	0,010	2,51 (1,29-4,89)
<29 years	63	68,5	29	31,5		

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Accessibility to community health center						
Far	141	77,9	40	22,1	0,844	1,23 (0,49-3,13)
Close	20	74,1	7	25,9		
Economic status						
High	91	82,0	20	18,0	0,128	1,76 (0,91-3,39)
Lower	70	72,2	27	27,8		
Family support						
Support	145	84,3	27	15,7	<0,001	6,71 (3,09-14,57)
No support	16	44,4	20	55,6		
Healthcare workers' support						
Support	156	79,2	41	20,8	0,026	4,57 (1,33-15,71)
No support	5	45,5	6	54,5		
Exposure to information media						
Good	81	90,0	9	10,0	<0,001	4,28 (1,94-9,42)
Less	80	67,8	38	32,2		

Based on table 2 knowledge (OR=7.32; 95%CI=3.38-18.85), attitude (OR=3.03; 95%CI=1.54-5.86), education (OR=4 .94; 95%CI=2.36-10.33), age (OR=2.51; 95%CI=1.29-4.89), family support (OR=6.71; 95%CI= 3.09-14.57), support from health workers (OR=4.57; 95%CI=1.33-15.71), exposure to information media (OR=4.28; 95%CI=1.94- 9.42) has a relationship with participation in the PCV immunization program, while accessibility to the community health center (OR=1.23; 95%CI=0.49-3.13), and economic status (OR=1.76; 95%CI=0 .91-3.39), there is no relationship with participation in the PCV immunization program.

3. Multivariate Analysis

Table 3. Multivariate Analysis (n=208)

Variable	OR (95% CI)	p-value
Knowledge	3,2 (1,01-10,19)	0,05
Education	1,54 (0,46-513)	0,48
Economic status	0,51 (0,20-1,32)	0,17
Family support	5,89 (1,69-20,62)	0,01
Support from healthcare workers	0,27 (0,05-1,39)	0,12
Exposure to information media	3,33 (1,38-8,01)	0,01
Constant	0,09	0,00

The final results of the multivariate analysis above show that three variables have a significant influence on the participation of mothers of toddlers in the PCV program, namely knowledge (OR=3.2; 95%CI=1.01-10.19), family support (OR=5 .89; 95%CI=1.69-20.62) and exposure to information media (OR= 3.33; 95%CI=1.38-8.01). The most dominant variable influencing the participation of mothers of toddlers in the PCV program is family support, where mothers of toddlers who receive family support are more likely to participate in the PCV program, which is 5.9 times greater than mothers of toddlers who receive less family support.

DISCUSSION

The research results show that three factors have a significant influence on the participation of mothers of toddlers aged 2-12 months in the PCV program, namely the value knowledge factor (OR=7.32; 95%CI=3.38-18.85), meaning that mothers of toddlers aged 2-12 Months who have good knowledge are 7.3 times more likely to take part in the PCV program compared to

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mothers of toddlers who have less knowledge after controlling for educational variables, maternal age, economic status, family support, support from health workers and exposure to information media. Knowledge is an essential factor in health behavior. People with good knowledge are expected to have better health behavior (Notoatmodjo, 2014a). The results of this research align with research in Gorontalo Regency, showing that maternal knowledge has been proven to influence toodler not receiving complete primary immunization (Noveriani, 2019). Research conducted by Safitri et al., (2017) also proves that knowledge is one of the variables that influences low coverage in providing immunizations.

Family support factors significantly influence the participation of mothers of toodler aged 2-12 months in the PCV program (OR=6.71; 95% CI=3.09-14.57). In the results of multivariate modeling, family support is the most dominant factor influencing the participation of mothers of toddlers aged 2-12 months in the PCV program, where mothers of toodler aged 2-12 months who receive family support are 6.7 times more likely to participate in the PCV program than mothers of toodler aged 2-12 months who receive family support. The results of this research align with the previous study by Sari et al., (2022) that the role of the family is one of the factors related to providing immunizations to toodler. Research conducted by Widaningsih, (2022) also found that family support is one of the variables related to public knowledge about immunization. This research is also by Abukhaer et al., (2023) that family support is one of the factors related to achieving immunization targets for toddlers.

Exposure to information media is one of the factors that significantly influence the participation of mothers of toddlers in the PCV program. Media is anything that can be used to channel messages from the sender to the recipient so that it can stimulate thoughts, feelings, attention, and interest. The results of this research align with research conducted by Asih & Putri, (2022) that one of the factors related to immunization status is exposure to information media. Research conducted by Suraya et al., (2020) also proves that exposure to media, including newspapers, radio, television, and the internet, is proven to have a relationship with immunization status in toddlers.

Based on logistic regression tests, the most dominant variable in the participation of mothers of toddlers 2-12 months in the PCV program is the family support factor with a value of (OR=5.89; 95%CI=1.69-20.62), meaning that mothers of toodler aged 2-12 months who have good support are 5.8 times more likely to participate in the PCV program compared to mothers of toddlers who receive less good support after controlling for the variables education, mother's age, economic status, knowledge, support from health workers and exposure to information media. A previous study by Sari et al., (2022) found that the role of the family is one of the factors related to providing immunizations to toodler. Research conducted by Widaningsih, (2022) also found that family support is one variable related to public immunization knowledge. This finding also aligns with Abukhaer et al., (2023) , who state that family support is one of the factors related to achieving immunization targets for toddlers.

CONCLUSION

Good knowledge, good family support, and maternal exposure to information media influence the participation of mothers of toddlers aged 2-12 months in the PCV program in Metro, Lampung, Indonesia. It is suggested that mothers with toddlers aged 2-12 months should be able to participate in the pneumococcal conjugate vaccine (PCV) program to prevent pneumonia in children. Healthcare workers should continue to make efforts to carry out health promotion about the PCV program through various media, including online media (internet) or offline (pamphlets, leaflets, and brochures), because disseminating this information can contribute to increasing the achievements of the PCV program.

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