
THE ANALYSIS OF FACTORS THAT RELATED TO ADVANCED PENTAVALENT IMMUNIZATION STATUS IN SINJAI REGENCY**Indra Dwinata¹, Dian Pratiwi Ahmad², Dian Sidik Arsyad³**¹Department of Epidemiology, Public Health Faculty, Universitas Hasanuddin, dwinata.indra@gmail.com²Department of Epidemiology, Public Health Faculty, Universitas Hasanuddin, dianpratiwi096@gmail.com³Department of Epidemiology, Public Health Faculty, Universitas Hasanuddin, diansidik.a@gmail.comCorrespondence Address: Department of Epidemiology, Public Health Faculty, Universitas Hasanuddin, Perintis Kemerdekaan Street KM.10, Tamalanrea, Makassar City, South Sulawesi, Postal Code 90245

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Keywords:*immunization;**advanced pentavalent;**booster;**toddlers***ABSTRACT**

Background: Basic pentavalent immunization coverage in Sinjai Regency in 2017 has reached the target, but the advanced pentavalent immunization rate is still low (52.90%). This condition leads to make a huge gap in toddlers' immunization status. **Purpose:** This study aims to determine the factors associated with advanced pentavalent immunization status in the work area of Kampala Health Service Center (PUSKESMAS), Sinjai Regency. **Methods:** The cross-sectional study was used in this study. The mothers who have the children aged 18-36 months were used as population. About 145 samples were obtained by using simple random sampling technique. The two-way data collection technique, namely primary data obtained through questionnaires and secondary data obtained from the evaluation data of pentavalent immunization at Kampala Health Service Center, Sinjai Regency. Furthermore, chi-square was used for data analysis. **Results:** Generally, the respondents were 25-29 years old in average (26.90%) and had a high school/ equivalent education degree (53.80%). The respondents' occupation are mostly housewives (83, 40%). Moreover, the toddlers were 24-29 months-old (46.90%) in average. This study showed that the majority of respondents did not take advanced pentavalent immunization (61.38%). Factors affecting the immunization status of the pentavalent were maternal knowledge ($p = 0.03$), family support ($p < 0.01$), and the role of health workers ($p = < 0.01$). Surprisingly, the maternal attitude ($p = 0.57$) and access to immunization services ($p = 0.17$) were not related to advanced pentavalent immunization status. **Conclusion:** There was a relationship between maternal knowledge, family support, and the role of health workers with advanced pentavalent immunization status.

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INTRODUCTION

The immunization program is an effort to prevent the transmission of certain diseases in susceptible groups. Toddlers are one of the groups

targeted by the immunization program. Toddlers are required to obtain five complete basic immunizations consisting of BCG, DPT/HB/Hib (pentavalent), polio, measles, and hepatitis immunization. In 2017 the national immunization

program was strengthened by a new policy through PERMENKES number 12, 2017 concerning about immunization administration including diphtheria, pertussis, tetanus, hepatitis B, type B haemophilus influenza (pentavalent) immunization into the national agenda. Pentavalent immunization is a development of a tetravalent vaccine (DPT-HB). There are eight antigens that can be given to children, namely hepatitis B, Oral Polio Vaccine (OPV), BCG, diphtheria, tetanus, pertussis, Hib and measles. The eight antigens include five types of vaccines, namely hepatitis B vaccine (uniject), OPV, BCG, combination DPT/HB/Hib (pentavalent) and measles vaccine. Provision of immunization serves to maintain and increase antibody and immunity in children to avoid diphtheria at the age of 15-18 months (Kemenkes RI, 2017).

The number of diphtheria cases in Indonesia tends to increase each year. In 2015 there were 529 cases, and this incidence increased in 2016 to 591 cases. The number of regencies/cities that have diphtheria cases in 2016 also increased compared to 2015. One of the affected districts is Sinjai Regency, South Sulawesi. The study noted that complete immunization in Sinjai Regency had reached the target of about 96.70%. Data also showed that basic pentavalent immunization also reached the target, namely DPT/HB/Hib-1 (94.30%), DPT/HB/Hib-2 (89.00%), DPT/HB/Hib-3 (87.50%), but the data about advanced pentavalent DPT/HB/Hib immunization that obtained is still low. This is due to the large number of children who did not continue their immunization status after getting a basic 9-month compulsory immunization (Dinkes Kabupaten Sinjai, 2017; Dinkesprov Sulawesi Selatan, 2015).

Advanced pentavalent immunization data in Sinjai Regency showed that the lowest immunization coverage area is Kampala Health Service Center. Basic pentavalent immunization (DPT/HB/Hib - 1/2/3) in this region has been quite high about 85-90%. However the advanced pentavalent immunization is considered as a low category with coverage presentation about 76.50% in 2016 and dramatically dropped to 52.90% in 2017 (Dinkes Kabupaten Sinjai, 2017).

There are several factors that can affect the low coverage of immunization which includes predisposing factors, supporting factors and driving factors. Predisposing factors are consist of knowledge and attitude. Access to health services and transportation are considering as supporting factors. Also, the supporting from family members

and the health workers are the most important supporting factors (Murti, 2018).

These factors are interrelated and have the potential to cause parents not to provide further immunization to their children, which in turn causing the low rate of pentavalent immunization. Low immunization is a serious problem because the effectiveness of pentavalent immunization possibly disappears. Immunization with diphtheria toxoid must be done at least three times. This is because the immunization effectiveness period about a year, therefore the booster must be given to increase the level of antibodies to optimize the protection at the age of 18 months. The main advantage of advanced pentavalent immunization is to avoid the immune gap. The immune gap defines as the emptiness of the immune system before reaching the school age (Ismoedijanto, Dwiyanti, Leni, Dominicus, & Bambang, 2014; Pracoyo, Edison, & Rofiq, 2015). This study aims to determine the factors that influence the advanced pentavalent immunization status (DPT/HB/Hib) in the work area of the Kampala Health Service Center in Sinjai Regency.

METHODS

This research is observational analytic with cross-sectional study design. The study was conducted from March to April 2018 in the work area of Kampala Health Service Center, Sinjai Regency. The cross-sectional study was used as study design in this study. This research was conducted to evaluate the relationship between the independent variables (knowledge, attitudes, family support, access and support of health workers with the dependent variable (advanced pentavalent immunization (DPT/HB/Hib) status).

The two-way data collection technique, namely primary data obtained through questionnaires and secondary data obtained from the evaluation data of pentavalent immunization coverage at Kampala Health Service Center, Sinjai Regency. The population in this study were 227 mothers who had 18-36 months old children at the time of the study. About 145 respondents were obtained by using the sample random sampling. The independent variables in this study were knowledge, attitudes, family support, access, and support from health workers.

The respondent's knowledge was measured through the mother's ability to understand immunization including definition, benefits, time of administration, a method of administration, and side effects. The questionnaire consists of ten

questions. The respondents grouping based on the answer. If the score is more than five, then the respondent considered as high intelligence person. If the score is under or equals five, then the respondent considered as low intelligence person.

Mother's attitude is measured through the responses given by the respondents to the provision of advanced pentavalent immunization. The measurement scale quantification based on the Likert scale, with five questions, and if the respondent's attitude score is more than or equal 60% then the attitude is positive, but if the score is under 60% then the attitude is negative.

Family support defines as the existence of support provided by the family, both in the form of emotional, assessment, material/instrumental, and information support. Questions include ten questions. If the score reaches to five, it is mean that the family condition is supportive. Vice versa, the unsupportive condition is determined if the score is under five.

In this study, access defines as mother's perception of the distance of the house to the place of immunization service, travel time, costs and transportation used. The Guttman scale measurement with five questions was used. If the access score is more than or equal to 50%, then the access is categorized as difficult to reach, but if the score is less than 50%, then the access is categorized as easy to reach.

The role of health workers defines as everything related to the attitudes and behaviour of health workers in providing services. The measurement of this content consists of ten question items. supportive category if the score of the role of health workers is more than or equals to 50%, but if the score is less than 50%, then the role of health workers is stated to be unsupportive.

The dependent variable in this study was the status of advanced pentavalent immunization given by health workers at the age of 18-36 months as evidenced by direct observation in the baby cohort book of midwives /registers of POSYANDU officer (the center for pre- and postnatal health care and information for woman and for children under five) or KIA/KMS books owned by respondents. The data analysis used was univariate and bivariate analysis followed by using the chi-square test.

RESULTS

The Respondents Characteristics

Toddlers' age in this study were 24-29 months old on average (46.90%) (Table 1).

Moreover, the majority age of respondents were 25-29 years old (26.90%) and have completed the high school/ equivalent education (53.80%), and work as a housewife (83.40%) (Table 2).

Table 1
Toddlers Characteristics Distribution

Toddlers' age (month)	n	%
18-23	38	26,20
24-29	68	46,90
30-36	39	26,90
Total	145	100,00

Table 2
Mothers Characteristics Distribution

Variabel	n	%
Mothers' age (years)		
15-19	3	2,07
20-24	35	24,14
25-29	39	26,90
30-34	35	24,14
35-39	17	11,72
40-44	16	11,03
Education		
None	1	0,69
Elementary School	25	17,24
Junior High School	22	15,17
Senior High School	78	53,79
College	19	13,10
Employment		
Joblessness/Housewife	121	83,45
Government Worker	15	10,34
Enterpreneur	9	6,21
Total	145	100,00

The Relationship between Knowledge and Advanced Pentavalent Immunization Status

The results showed that almost some of the respondents who had advanced pentavalent immunization had high knowledge (48.39%). Most of the respondents who did not take advanced pentavalent immunization to their children had low knowledge (68.68%). Based on the statistical tests with chi-square test showed that p-value is equal to 0.03. This is mean that knowledge of respondents with advanced pentavalent immunization status (DPT/HB/Hib) has a significant correlation (Table 3).

The Relationship between Attitudes and The Advanced Pentavalent Immunization Status

The chi-square test showed that the p-value between the attitude and advanced pentavalent immunization status was 0.57. This result

demonstrated that there is no relationship between the attitudes of respondents with advanced pentavalent immunization status (DPT/HB/Hib) (Table 3).

The Relationship between Family Support and The Advanced Pentavalent Immunization Status

The results showed that the majority of respondents who did not take advanced pentavalent immunizations to their children had an unsupportive family (74.60%). The results of the statistical test showed that there was a relationship between family support and pentavalent immunization status with p-value <0.01 (Table 3).

The Relationship between Access Variable and The Advanced Pentavalent Immunization Status

The relationship between the access variable with advanced pentavalent immunization status (DPT/HB/Hib) also showed insignificant results. The chi-square test showed that p-value was 0.18. Therefore there is no relationship between the access variable to advanced pentavalent immunization status (DPT/HB/Hib) (Table 3).

The Relationship between Health Workers Support and The Advanced Pentavalent Immunization Status

The results of the chi-square test showed that there was a relationship between the support of health workers with pentavalent immunization status with p-value <0.01. This can be seen in Table 3, which shows almost all respondents who did not receive the support from health workers will give negative response to the immunization program (95.20%).

DISCUSSION

The Respondents Characteristics

In general, the results of this study indicate that the coverage of advanced pentavalent immunization (DPT/HB/Hib) in Kampala Health Service Center is still low by counting only 56 children (38.62%). The distribution of toddlers with the age range from 24 to 29 months as many as 68 people (46.90%). About 39 respondents were mostly young between 25-29 years old (26.90%). Mother's education is quite high; most of them have high school/equivalent education level (53.79%). The most of respondents were housewives (83.45%).

Tabel 3

Hubungan Pengetahuan, Sikap, Dukungan Keluarga, Akses dan Dukungan Petugas Kesehatan Terhadap Status Imunisasi *Pentavelen* (Dpt/Hb/Hib) Lanjutan di Puskesmas Kampala Kabupaten Sinjai Tahun 2018

Independent Variable	Advanced Pentavelen Immunization (DPT/HB/Hib)				Total		p
	Yes		No		n	%	
	n	%	n	%			
Knowledge							
High	30	48,39	32	51,61	62	100,00	0,03
Low	26	31,32	57	68,68	83	100,00	
Attitude							
Positive	54	39,13	84	60,87	138	100,00	0,57
Negative	2	28,57	5	71,43	7	100,00	
Family Support							
Supportive	40	48,78	42	51,22	82	100,00	0,01
Unsupportive	16	25,40	47	74,60	63	100,00	
Access							
Difficult to reach	6	26,10	17	73,90	23	100,00	0,18
Easy to reach	50	41,00	72	59,00	122	100,00	
Health Worker Support							
Supportive	53	64,63	29	35,37	82	100,00	0,01
Unsupportive	3	4,76	60	95,24	63	100,00	
Total	56	38,62	89	61,38	145	100,00	

The Relationship between Knowledge and Advanced Pentavalent Immunization Status

Health behaviour is composed of three construct variables, namely knowledge, attitudes and actions. Change in knowledge level is a domain that can affect personal behavior. Low maternal knowledge about immunization has an adverse impact on their children because the mothers tend to avoid the immunization for their children (Schneeberg et al., 2014).

The results of this study indicate that there is a relationship between the knowledge of respondents with advanced pentavalent immunization status (DPT/HB/Hib). The lower respondents' knowledge about immunization means the lower action for immunization. The low knowledge of respondents can be seen from the respondents' answers. Most mothers did not know the meaning of advanced pentavalent immunization. The respondents also did not know that there was further immunization given to 18 months old children. Mothers only know that the immunization program is only up to the age of 9 to 12 months. This research is supported by Vezzosi, Santagati, & Angelillo (2017) in the Naples City, Italy, which shows that mothers' knowledge about complete basic immunization programs is a barrier to achieving basic immunization coverage in these areas with an adjusted odds ratio (AOR) of 2.40 and a 95% CI value of 1.20 - 4.90. This research is in line with the study conducted by Meronica, Angraini, & Graharti (2018) and Legesse & Dechasa (2015) which stated that there was a significant relationship between the knowledge of mothers and their compliance with giving their children immunization. The same results were also obtained by Emilya, Lestari, & Asterina (2017) which stated that there was a significant relationship between knowledge and attitudes of mothers with the provision of complete basic immunization in Padang City.

The Relationship between Attitudes and The Advanced Pentavalent Immunization Status

The attitude variable is also the most important variable in shaping health behaviour. The positive attitude shown by respondents was influenced by health workers, POSYANDU officers as well as from neighboring information, and from the other parents who had children aged 18-36 months. Statistical test demonstrated that there was no association between attitudes with advanced pentavalent immunization status (DPT/HB/Hib). This is because almost all respondents have a positive attitude or agree with

immunization but are not aware of the continued immunization. Lack of understanding about the advantages by taking advanced immunization and the ignorance of the mother regarding the age at which children get advanced immunization also affects the immunization status of the children.

The results of this study are in line with the research conducted by Emilya, Lestari, & Asterina (2017) which stated that positive maternal attitudes do not affect the actions of mothers in immunization. This is due to the fact that respondents who lack knowledge about immunization have the willingness and desire to immunize their children to promote the children health regardless of the type of immunization. Unfortunately, because the lack of information commonly the mothers do not know the schedule of immunization which in turns they do not take the advanced immunization action for 18-month-old toddlers. The results of this study indicate that respondents who have positive and negative attitudes tend not to immunize their children. In contrast to the Yuda & Nurmala (2018) study which showed the same results, there was a relationship between maternal attitudes and immunization compliance ($p= 0.01$). The results of the study were different because the groups of respondents studied were different. Previous studies highlighted more about complete basic immunization with respondents aged 0-11 months, while this study evaluate about immunization status in children aged 18-36 months.

The Relationship between Family Support and The Advanced Pentavalent Immunization Status

The results of this study indicate a relationship between family supports of respondents with advanced pentavalent immunization status. Respondents with families who did not support caused a lack of enthusiasm of respondents to the immunization program. This is in accordance with the results of research conducted by Fajriyah (2014) and Supriatin (2015) which states that there is a relationship between family support and immunization status. Family support is needed.

Support does not only come from the mother, but also from the father or husband and other family members. Husband as head of the family becomes a policy determinant in making decisions in a family, including for children's health (Arumsari, 2015).

Support from husbands and other family members is needed in terms of caring for children

and bringing children to immunization services. The results of Anokye et al (2018) and Rahma, Suryoputro, & Fatmasari (2019) studies indicate that family or husband support determine the success rate of immunization program. Mothers who have work outside the home need more assistance from their husbands and families to replace the role of mothers to bring children to be immunized in health services.

The Relationship between Access Variable and The Advanced Pentavalent Immunization Status

The accessible spot will increase the visitors' number. The results of this study indicate that there is no relationship between access to immunization services and advanced pentavalent immunization status. Conditions in the working field indicate that each village has more than one POSYANDU. This place condition is affordable in terms of distance, cost, and travel time. This is in line with the research conducted by Nainggolan, Tjandrarini, & Indrawati (2018) showed that there is no significant relationship between access to transportation equipment and transportation costs to health services with immunization. Research conducted in China by Cao et al (2018) also revealed that travel time to immunization service providers (>40 minutes) is not a variable that affects immunization coverage. The results of the study showed that transportation and travel time were not the main obstacles for non-immunized children. The main reason of the respondents did not bring the children to immunization because the children condition who suffer from low fever or diarrhea, ignorance of the schedule for advanced immunization and lack of information from health workers.

Different results were found in Nepal. The time needed to health facilities and locations in rural areas were the main causes of incomplete children immunization. This is because the geographical area that mainly composes of the mountains and hills which require considerable travel time and travel costs. This condition where the increase in costs of travel may significantly reduce the immunization success rate (Devkota & Panda, 2016).

The Relationship between Health Workers Support and The Advanced Pentavalent Immunization Status

The results of this study indicated that there was a relationship between the supports of health workers with advanced pentavalent immunization

status (DPT/HB/Hib). Mothers who get positive support from health workers, tend to bring their children to continued pentavalent immunization. This is because, they have a better understanding and know about the importance of additional immunization for child development. Health workers also act as educators who help families improve their health knowledge, know the symptoms of the disease and actions to prevent disease (Sutikno, Haida, & Sari, 2018).

The results of this study are in line with previous studies conducted by Triana (2016) and Rachman, Handayani, & Ridwan (2015) which showed that there was a significant relationship between the support of health workers and immunization coverage. The support needed is not only emotional support but also information support needs to be improved to increase knowledge and information about advanced pentavalent immunization (Legesse & Dechasa, 2015).

The results of the research conducted by Tiani, Bakhtiar, & Usman (2016) and Rahma, Suryoputro, & Fatmasari (2019) showed that one of the main aspects affecting the success rate of advanced pentavalent immunization program was the perception of health workers who assumed that advanced pentavalent immunization was not important. According to the study conducted by Sutikno, Haida, & Sari (2018) showed that the socialization of advanced pentavalent immunization carried out by health workers could increase the coverage of the advanced immunization. An absolute immunization program requires the support of all parties including health workers. Health workers must play an active role in providing socialization and counselling regarding the importance of advanced pentavalent immunization, because immunization is not only related to individual immunity but also to the community groups' immunity.

CONCLUSION

Knowledge, family support and the role of health workers have a relationship with advanced pentavalent immunization status (DPT/HB/Hib) while attitudes and access do not have a significant relationship to advanced pentavalent immunization status in Kampala Health Center, Sinjai Regency.

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