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KNOWLEDGE, ATTITUDE, REFERENCE GROUP, AND BEHAVIOR OF DIPHTHERIA IMMUNIZATION IN RURAL AND URBAN AREAS

Ajeng Prameswari[1], Retnaningsih[2*)]

[1)] Department of Family and Consumer Sciences, Faculty of Human Ecology,
Bogor Agricultural University, Bogor 16880, Indonesia
[2)] Business School, IPB University, Bogor 16151, Indonesia

[*)]*E-mail: retno_ikk@apps.ipb.ac.id*

Abstract

Diphtheria is an infectious disease that has been an epidemic in Indonesia and has an average mortality rate of 5-10 percent for children under five years of age. This study aims to 1) analyze the differences and relationships of maternal characteristics, family characteristics, knowledge, attitudes, and reference groups with diphtheria immunization behavior in rural and urban areas; and 2) analyze the effect of maternal characteristics, family characteristics, knowledge, attitudes, and reference groups on diphtheria immunization behavior. This study used a cross-sectional study design. The sample was 41 mothers with children aged 5-12 months and purposively selected at one of the Integrated Services Post in Bogor City and Bogor Regency. The data obtained were processed through coding, input, cleaning, analysis, and interpretation of data. The results showed differences between knowledge, attitude, reference group, and behavior of diphtheria immunization in rural and urban areas. The factor associated with the completeness of diphtheria immunization is social media for rural areas, while it does not exist in urban areas. Factors associated with compliance with the immunization schedule were family size, attitude, interpersonal, and expert for rural areas, and years of education for urban areas. Factors that influence the completeness of immunization are the length of education, attitudes, and interpersonal reference groups. Based on the results of this study, a cross-sectoral role is needed to support community education and educate mothers regarding diphtheria immunization.

Keyword: attitudes, behavior, knowledge, diphteria immunization, reference group

PENGETAHUAN, SIKAP, KELOMPOK ACUAN, DAN PERILAKU PEMBERIAN IMUNISASI DIFTERI DI PERDESAAN DAN DI PERKOTAAN

Abstrak

Difteri merupakan penyakit menular yang pernah menjadi epidemi di Indonesia dan memiliki angka rata-rata kematian 5-10 persen bagi anak usia di bawah 5 tahun. Penelitian ini bertujuan untuk 1) menganalisis perbedaan dan hubungan karakteristik ibu, karakteristik keluarga, pengetahuan, sikap, dan kelompok acuan dengan perilaku imunisasi difteri di perdesaan dan di perkotaan; dan 2) menganalisis pengaruh karakteristik ibu, karakteristik keluarga, pengetahuan, sikap, dan kelompok acuan terhadap perilaku imunisasi difteri. Penelitian ini menggunakan desain penelitian *cross sectional study.* Contoh penelitian ini adalah 41 ibu dengan anak berusia 5-12 bulan dan dipilih secara *purposive* di salah satu Integrated Services Post Kota Bogor dan Kabupaten Bogor. Data yang diperoleh diolah melalui proses *coding, input, cleaning*, analisis, dan interpretasi data. Hasil penelitian menunjukkan terdapat perbedaan antara pengetahuan, sikap, kelompok acuan, dan perilaku pemberian imunisasi difteri di perdesaan dengan di perkotaan. Faktor yang berhubungan dengan kelengkapan imunisasi difteri adalah media sosial untuk di perdesaan, sedangkan di perkotaan tidak ada. Faktor yang berhubungan dengan kesesuaian jadwal imunisasi adalah besar keluarga, sikap, interpersonal, dan ahli untuk di perdesaan serta lama pendidikan untuk di perkotaan. Faktor yang berpengaruh terhadap kelengkapan imunisasi adalah lama pendidikan, sikap, dan kelompok acuan interpersonal. Berdasarkan hasil penelitian tersebut, diperlukan peran lintas sektor untuk mendukung pendidikan masyarakat dan mengedukasi ibu-ibu terkait imunisasi difteri.

Kata kunci: imunisasi difteri, kelompok acuan, pengetahuan, perilaku, sikap.

INTRODUCTION

Health is a condition that not only indicates freedom from disease or weakness, but also a balance of physical, mental, and social functions (World Health Organization, 2010). Efforts in maintaining health are carried out by preventing disease. Disease prevention can be done through immunization to maintain high antibody levels above the prevention threshold (Hartoyo, 2018). Complete basic immunization consists of Hepatitis B, BCG, Polio, DPT, and Measles. Follow-up immunization consists of immunization against diphtheria, pertussis, tetanus, hepatitis B, pneumonia, meningitis, and measles (Ministry of Health Regulation, 2012). Diphtheria is an infectious disease caused by infection of the mucous membranes of the nose and throat. The disease is caused by the bacterium Corynebacterium diphtheria. Diphtheria is a disease transmitted by direct contact or droplets from the patient. Diphtheria is susceptible to children, especially children aged one to ten years. Diphtheria is spread through contaminated air from the mouth or nose of the patient, fingers, and milk that has been touched by the patient. Symptoms of diphtheria are sore throat, fever, difficulty breathing, swallowing, mucus discharge from the mouth and nose, and weakness in the body. This is because the lymph nodes in the neck enlarge and a thick layer forms covering the esophagus, closing the respiratory tract and causing a lack of oxygen in the blood.

World Health Organization (WHO) data on diphtheria shows that the number of diphtheria cases in Indonesia has fluctuated since 1980. Based on data from the Ministry of Health, diphtheria is an old disease that was once an epidemic in Indonesia. The highest number of diphtheria cases occurred in 1980, then fluctuated in the following years and increased again in 2012 and 2016. In 2016, data from the World Health Organization (WHO) showed that there were 7097 diphtheria cases reported from around the world, including 342 cases in Indonesia. In 2017, from January to November, 95 districts and cities from 20 provinces in Indonesia reported diphtheria cases with 593 cases and 32 of them died (Ministry of Health, 2017). Based on data from the Ministry of Health, 11 provinces reported diphtheria outbreaks, namely West Sumatra, Central Java, Aceh, South Sumatra, South Sulawesi, East Kalimantan, Riau, Banten, DKI Jakarta, West Java and East Java.

Diphtheria immunization is one of the mandatory immunizations promoted by the government (Ministry of Health, 2017). According to the Ministry of Health (2017), the main prevention of diphtheria is through immunization. Diphtheria immunization is included in basic and advanced immunization. In the basic immunization of children aged less than a year, diphtheria immunization is carried out three times, namely when the child is two months, three months, and four months old. Diphtheria follow-up immunization is given when the child is 18 months old, grade 1 elementary school and grade 2 elementary school. The achievement of immunization activities is guided by Universal Child Immunization (UCI). UCI is complete basic immunization coverage of at least 80 percent of children in 100 percent of villages. The national achievement of UCI in Indonesia reached 68 percent. Based on these data, it shows that the coverage of complete basic immunization has not yet reached the predetermined national minimum standard of 80 percent even though the national target for UCI in 2014 was 100 percent UCI in villages (Ministry of Health, 2017). The low coverage of basic complete immunization that has not met the national UCI standard can be an illustration of the low immunization rate in Indonesia. This immune vacuum occurs due to the accumulation of groups that are vulnerable to diphtheria, because these groups are not immunized or are incompletely immunized (Ministry of Health, 2017).

Immunization begins when the child is less than one year old. The results of previous studies show that the role of parents is related to the completeness of child immunization (Ningsih, Kasanova, & Devitasari, 2016). Parents, especially caregivers, have an important role in making decisions to follow the immunization program, because parents are the key in maintaining and caring for children (Winarsih, Imavike, & Yunita, 2013). Previous research shows that parental knowledge is significantly related to the provision of complete basic immunization in children, parents with low knowledge have a risk of not providing routine immunization (Triana, 2016). Caregiver behavior in providing immunization to children is related to several factors such as access to information, knowledge and there are other factors, namely education, maternal age, and income (Yanti, 2016). Other studies have shown that low maternal knowledge is a maternal characteristic factor that has the greatest risk of irregularity in providing complete basic immunization to children (Harmasdiyani, 2015).

Other factors such as mother's attitude towards immunization, mother's occupation, family support, total income, and distance to immunization services show varied relationships. The data shows that factors from

mothers related to immunization will greatly determine the provision of complete immunization of children (Istriyati, 2011). Previous research states that groups or figures who are role models for mothers will influence their behavior towards immunization. Mothers tend to have behaviors that are considered in line with the behavior of people they look up to or consider important (Anton, 2014). Based on this background, this study aims to: (1) identify characteristics of role models, family characteristics, knowledge, attitudes, reference groups, and diphtheria immunization behavior of mothers in rural and urban areas, (2) analyze differences in characteristics of role models, family characteristics, knowledge, attitudes, reference groups, and diphtheria immunization behavior in rural and urban areas, (3) analyze the relationship between variables, and (4) analyze the effect of maternal characteristics, family characteristics, knowledge, attitudes, and reference groups on diphtheria immunization behavior.

METHODS

The research design used in this study was a cross sectional study. The selection of research locations was carried out purposively with the criteria of representing the characteristics of rural and urban communities. This study was conducted in two locations, namely Integrated Services Post Jabal Rakhmah located in Tapos 1 Village, Tenjolaya Subdistrict, Bogor District and Integrated Services Post Dahlia located in Bubulak Village, West Bogor Subdistrict, Bogor City. The sample selection was done purposively based on consideration of the population size in each Integrated Services Post. The population of this study were all married women with children aged 5-12 months. The sample in this study were all mothers who were registered at Integrated Services Post Jabal Rakhmah and Integrated Services Post Dahlia and had children aged 5-12 months. The age of the child was chosen from 5-12 months because based on basic immunization rules, the entire series of basic diphtheria immunizations have been given when the child is 5 months old. The two Integrated Services Post in rural and urban areas were the Integrated Services Post with the most complete data and had the highest population that fit the research criteria. The number of samples taken in this study was selected as 41 samples consisting of 22 samples from rural areas and 19 samples from urban areas.

The types of data collected were primary data and secondary data. Primary data is data obtained directly from research subjects through measurement instruments including sample characteristics, family characteristics, knowledge, attitudes, reference groups, and diphtheria immunization behavior. Primary data was obtained from interviews through questionnaires that had been prepared previously. Secondary data were obtained from the latest data on Integrated Services Post and Integrated Services Post cadres in each rural and urban area. Secondary data included the name of the sample, the age of the child, and the place of residence of the sample. The method used was interviews through questionnaires. This study uses two types of variables, namely independent variables (knowledge, attitude, and reference group) and dependent variables (diphtheria immunization behavior). Knowledge in this study is the information possessed by the sample related to basic diphtheria immunization for children less than one year old. The knowledge variable was measured using 17 statements developed from Iskandar's (2009) questionnaire with 'yes' and 'no' answer options and had a Cronbach's alpha value of 0,652.

The attitude variable in this study is the tendency to study examples to then determine behavior in providing diphtheria immunization. Attitude was measured using an instrument developed from Huda's (2009) research. Attitude consists of 14 statements with a Likert scale of 1-5 (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) and has a Cronbach's alpha value of 0,805. Furthermore, reference groups in this study are groups or individuals who have direct or indirect influence on exemplary behavior, including the interpersonal environment, social media, and experts or experts. The reference group of the example is measured using an instrument developed based on the reference group of Yuliati et al. (2012). The reference group variable is measured through 11 questions with answer options 1 = yes and 2 = no, and has a Cronbach's alpha value of 0,845. Behavior in this study leads to the behavior of giving diphtheria immunization which includes completeness, suitability of schedule, and place of diphtheria immunization in children aged 5-12 months. Measurement of behavioral variables used Huda's (2009) questionnaire which has been adapted to the needs of the study, consisting of 18 questions, and answer options 1=yes and 2=no. The reliability of the diphtheria immunization behavior instrument has a Cronbach's alpha value of 0,725.

The data obtained through sample interviews were then subjected to coding, input, cleaning, analysis, and interpretation. The coding, input, and cleaning processes were processed using the Microsoft Office Excel 2010 program then the data were analyzed using the Statistical Package for Social Science (SPSS) 22.0 for Windows.

The variables studied in this study were given an assessment score according to the scale used and then processed according to each variable. The knowledge variable was calculated from the total score which was summed and converted into an index with a scale of 0-100. The index obtained was categorized based on the cut off less (score 80) (Kinanti, 2011). The data analysis used was descriptive and inferential analysis. Descriptive analysis was used to provide an overview of sample and family characteristics (age, years of education, number of children, and income per capita per month), knowledge, attitude, reference group, and diphtheria immunization behavior. Descriptive statistics used were mean, standard deviation, maximum and minimum values. Inferential analysis included: independent sample t-test to analyze differences in sample characteristics, family characteristics, knowledge, attitude, reference group, and diphtheria immunization behavior in rural and urban areas; Spearman correlation test to analyze the relationship between sample characteristics, family characteristics, knowledge, attitude, and reference group with diphtheria immunization behavior; and logistic regression test to analyze the effect of sample characteristics, family characteristics, knowledge, attitude, and reference group on diphtheria immunization behavior.

RESULTS

Overview of the Research Location

The study was conducted in two areas representing rural and urban areas. Integrated Services Post Jabal Rakhmah, located in Neighbourhood 1, Tapos 1 Village, Tenjolaya Sub-district, Bogor District, represents rural areas. Tapos 1 village is one of six villages in Tenjolaya sub-district. Tapos 1 village has an area of 4,82 km² and a total population of 9589 people with a population density of 1989 people/km². The geographical area of Tapos 1 village is divided into residential areas and agricultural land in the form of rice fields or fields. Educational facilities are available from kindergarten to public or private high school level. Health facilities and infrastructure in Tapos 1 village are 7 Integrated Services Post, 1 puskesmas, and 1 midwife office with 1 village midwife and 1 midwife assistant (Kecamatan Tenjolaya in Figures, 2018).

Integrated Services Post Dahlia, Neighbourhood 1, Bubulak Urban Village, West Bogor Sub-district, Bogor City represents urban areas. Bubulak urban village is one of 16 urban villages in West Bogor sub-district. Kelurahan Bubulak has an area of 3,14 km² and a population of 18,140 with a population density of 5777 people/km². The geographical area of Kelurahan Bubulak is filled with residential areas and public facilities. Educational facilities are available from kindergarten to high school level, both public and private. Health facilities and infrastructure in Kecamatan Bogor Barat consist of 15 Integrated Services Post, 1 puskesmas, 2 clinics, 5 practicing doctors, and 3 practicing midwives (Kecamatan Bogor Barat in Figures, 2018).

Sample Characteristics

The results showed that the age of the samples in both regions ranged from 21-45 years old. Samples in rural areas had a lower average age (27 years) compared to those in urban areas (29 years). Statistically there was no significant difference in the age of the samples in the two regions. The average education of rural samples (6 years) was lower than urban samples (10 years). Most (81,8%) of the rural samples had 6-9 years of education. More than half (63,2%) of urban mothers had 10-12 years of education. There was no significant difference between the years of education of rural and urban samples. Based on occupation, rural (100%) and urban (94,7%) samples were unemployed and housewives.

Family Characteristics

The highest percentage of husbands' occupation was as laborers in both rural (59,1%) and urban areas (42,1%). The number of family members in this study ranged from 3-8 people with an average of four people. Most families in rural areas (86,4%) were categorized as small families, similar to the sample families in urban areas (73,7%). T-test results showed no significant difference (p=0,658) in family size between the two regions. Monthly per capita income was analyzed based on the West Java poverty line according to BPS (2018) of IDR 371.376 per month. Most of the samples in rural areas (86,4%) and urban areas (89,5%) were above the poverty line. The average family income of samples in rural and urban areas is categorized as non-poor because they have per capita income above the poverty line. Based on the T-test results, there was a significant difference (p=0,018) in the monthly per capita income in the two regions even though most of them were above the poverty line.

Knowledge about Diphtheria Immunization

Knowledge is an important variable in shaping a person's behavior and actions. Behavior based on knowledge will be more persistent than behavior that is not based on knowledge. Based on the results of the study, the highest knowledge score of the sample in both regions is on the statement of immunization can be done at Integrated Services Post. The lowest knowledge score in rural areas is the statement about DPT immunization and diphtheria immunization can be done at the hospital. In urban areas, the lowest percentage of correct answers was the statement that diphtheria immunization can treat diphtheria. The results showed that the average knowledge in rural areas was much lower (45,3) than the knowledge of urban samples (80,2). Most (90%) of the rural samples' knowledge was in the low category. More than half (68,4%) of the urban samples' knowledge was categorized as good. None of the knowledge of rural samples (0,0%) was categorized as good, while only 1 sample in urban areas (5,3%) was categorized as poor. Based on the results of the t-test, there was a significant difference in the variable knowledge in the two regions (p=0,000).

Attitude towards Diphtheria Immunization

Attitude is one of the determinants of maternal behavior regarding child immunization. All rural samples (100%) had an attitude in the moderate category with an overall mean score of 64,4. Referring to Table 1 most of the urban samples (94,7%) also had an attitude in the moderate category with an average of 75,7. The average attitude of mothers towards diphtheria immunization in rural areas (64,4) is lower than in urban areas (75,7). Thus, there was a significant difference (p=0,000) in the attitude of mothers in rural and urban areas (Table 1).

Table 1 Distribution of samples based on Diphtheria immunization attitudes of samples and regions

Knowledge	Rural (n=22)		Urban (n=19)	
	n	%	n	%
Less (score <60)	0	0,0	0	0,0
Fair (score 60-80)	22	100,0	18	94,7
Good (score >80)	0	0,0	1	5,3
Min-Max	55,6-73,2		69,2-83,1	
Mean ± SD	64,4 ± 6,1		75,7 ± 3,6	
T-test (p-value)	0,000**			

Notes: *$p<0,05$ **$p<0,01$

Reference Group for Diphtheria Immunization

Based on Table 2, reference groups are divided based on three dimensions, namely interpersonal, social media, and experts. The results showed that the highest percentage of reference groups (81.8%) in rural areas was midwives from the expert/expert dimension. While the highest percentage (94.7%) in urban areas was family from the interpersonal dimension. Family and midwives are reference groups that come from groups that are occupied and often meet face-to-face with examples. Celebgrams and content creators from the social media dimension are the least chosen reference groups in rural areas (0.0%) and in urban areas (31.6%). All statements from the reference group dimension in rural areas have a lower percentage than in urban areas. Based on the results of statistical tests, most of the statements from the three dimensions have significant differences. The reference group with the largest difference (p=0.000) between the two regions was the reference group of social media networking, e.g. interested in diphtheria immunization despite a lot of information on social media, and doctors (Table 2).

Table 2 Distribustion of samples based on referenced group in providing diphtheria imminization

Reference group on diphtheria immunization	Rural (n=22)		Urban (n=19)		(p-value)
	n	%	n	%	
Interpersonal					
Family	14	63,6	18	94,7	**0,013***
Community leaders.	8	36,4	13	68,4	**0,042***
Best friendship	8	36,4	14	73,7	**0,016***
Friends	7	31,8	16	84,2	**0,017***
Social Media					
Celebgrams and Content Creators	0	0,0	6	31,6	**0,010***
Social Media Networking.	2	9,1	13	68,4	**0,000****

Table 2 Distribustion of samples based on referenced group in providing diphtheria imminization (continue)

Reference group on diphtheria immunization	Rural (n=22)		Urban (n=19)		(p-value)
	n	%	n	%	
Not interested in diphtheria immunization despite a lot of information on social media and online.*	4	18,2	15	78,9	**0,000****
Expert					
Integrated Services Post cadres.	15	68,2	17	89,5	0,096
Health Center Officer	8	36,4	16	84,2	**0,001****
Doctor	1	4,5	13	68,4	**0,000***
Midwife	18	81,8	17	89,5	0,501

Notes: *$p<0,05$ **$p<0,01$

Behavior of Diphtheria Immunization

The results showed that the percentage of immunization completeness in rural areas (54,9%) was lower than in urban areas (73,7%). The figure on the completeness of immunization dimension showed that there were 12 samples in rural areas and 14 samples in urban areas who gave DPT immunization three times. There was no significant difference in the completeness of Diphtheria immunization (p=0,421). Compliance with immunization schedule was lower in rural areas (9,1%) than in urban areas (57,9%). The rate of schedule compliance showed that there were only 2 samples in rural areas and 11 samples in urban areas who gave diphtheria immunization three times and according to the immunization schedule rules. Based on the results of the T-test, there is a significant difference (p=0,012) in the dimension of suitability of immunization schedule in both regions. The score of the place of immunization was derived from three times the provision of DPT immunization in the sample. In rural samples, most (83,4%) chose to give immunization at the Integrated Services Post. However, in urban areas the percentage of immunization site selection was more spread out with the largest percentage (49,1%) at Integrated Services Post. There was a significant difference in Integrated Services Post (p=0,000), puskesmas (p=0,018), and midwife (p=0,023) (Table 3).

Table 3 Distribution of samples based on aspects of diphtheria immunization behavior and sample region

Immunization behavior for diphtheria	Rural (n=22)		Urban (n=19)		(*p-value)*
	n	%	n	%	
Completeness of immunization	12	54,9	14	73,7	0,421
Schedule conformity	2	9,1	11	57,9	0,012*
Immunization site (DPT 1, DPT 2, DPT 3)					
Integrated Services Post	55	83,4	28	49,1	0,000**
Health center	1	1,5	14	24,6	0,018*
Midwife	0	0,0	11	19,3	0,023*
Hospital	0	0,0	2	3,5	0,163

Notes: *p<0,05 **p<0,01

Relationship between Respondent Characteristics, Family Characteristics, Knowledge, Attitude, Reference Group, and Immunization Behavior

Table 4 shows that in rural areas there is a significant positive relationship between social media reference groups (r=0,462; α=0,031) and the completeness of diphtheria immunization. This result means that the higher the use of social media, the higher the completeness of immunization. Family size (r=0,440; α=0,040), attitude (r=0,610; α=0,003), interpersonal reference group (r=0,618; α=0,002), and expert reference group (r=0,501; α=0,017) were significantly positively associated with the conformity of diphtheria immunization schedule for example in rural areas. This means that the increase in family size, attitude, interpersonal, and expert will increase the suitability of immunization schedule.

The results of the study in urban areas showed that the length of education of the sample was positively associated with the completeness of immunization (r=0,537; α=0,012) and the suitability of the schedule (r=0,462; α=0,024). Therefore, the higher the education of the sample, the more complete and appropriate immunization will be. In the total sample, years of education (r=0,337; α=0,031), family monthly per capita

income (r=0,406; α=0,009), attitude (r=0,571; α=0,000), interpersonal reference group (r=0,495; α= 0,001), and expert reference group (r=0,348; α=0,026) had a significant positive relationship with schedule conformity. Thus, the higher the length of education, per capita income, attitude, interpersonal reference group, and expert/expert will increase the suitability of immunization schedule in the total sample (Table 4).

Table 4 Relationship between sample characteristics, family characteristics, knowledge, attitude, reference group with diphtheria immunization behavior

Variable	Rural		Urban		Total	
	Complete	Compliant	Complete	Compliant	Complete	Compliant
	Standardized coefficient (β)					
Mother's age	0,168	0,186	0,109	0,052	0,094	0,168
Length of mother's education	0,147	0,244	0,537*	0,462*	0,292	0,337*
Family size	0,071	0,440*	0,067	0,042	0,056	0,197
Income per capita	0,034	0,024	0,251	0,316	0,209	0,406**
Knowledge	0,268	0,147	0,002	0,223	0,182	0,262
Attitude	0,180	0,610**	0,298	0,241	0,085	0,571**
Reference Group						
Interpersonal	0,321	0,618**	0,101	0,113	0,253	0,495**
Social media	0,462*	0,086	0,000	-0,266	0,224	0,208
Expert/expert	0,194	0,501**	0,264	0,283	0,062	0,348*

Notes: * p <0,05 ** p <0,01

Factors influencing diphtheria immunization behavior

Logistic regression tests were conducted on the combined rural and urban samples. Immunization behavior was analyzed through two dimensions, namely completeness and suitability of diphtheria immunization schedule. The results of the logistic regression test in Table 5 show that of the independent variables studied on the behavior of diphtheria immunization in the combined sample in rural and urban areas, there are three variables that have a significant effect on the completeness of immunization. Maternal education, attitude, and interpersonal reference group have a significant positive effect. There are two variables that significantly influence the suitability of the immunization schedule, namely, the length of maternal education and knowledge. The results of the study on the immunization completeness variable showed a Adjusted R2 value of 0,545. This means that 54,5 percent of the completeness of diphtheria immunization is influenced by the length of maternal education, attitude, and interpersonal, while the remaining 45,5 percent is explained by other variables not examined in this study. In the schedule suitability variable, the Nagelkerke R2 value is 0,713. This means that 71,3 percent of the suitability of diphtheria immunization is influenced by the length of maternal education and knowledge, while 28,7 percent is explained by other variables not examined in this study (Table 5).

Table 5 Effect of sample characteristics, family characteristics, knowledge, attitude, and reference group on diphtheria immunization behavior

Variable	Complete (0= incomplete, 1= complete)			Appropriate (0= not appropriate, 1= appropriate)		
	β	Exp(β)	Sig.	β	Exp(β)	Sig.
Constant	14,029	1,238	0,084	-275,38	0,000	0,997
Mother's age	-0,349	0,706	0,117	0,866	0,021	0,092
Length of mother's education	1,264	3,539	0,015*	0,336	0,504	0,000**
Family size	0,938	2,554	0,150	0,643	0,032	0,086
Income per capita	-0,423	0,655	0,494	0,318	0,098	0,995
Knowledge	-0,028	0,972	0,567	-0,902	0,406	0,018*
Attitude	-0,234	0,792	0,047*	0,636	0,889	0,998
Reference Group						
Interpersonal	0,092	1,096	0,018*	0,673	0,960	0,088
Social Media	0,006	1,006	0,796	-0,437	0,646	0,102

Table 5 Effect of sample characteristics, family characteristics, knowledge, attitude, and reference group on diphtheria immunization behavior (continue)

Variable	Complete (0= incomplete, 1= complete)			Appropriate (0= not appropriate, 1= appropriate)		
	β	Exp(β)	Sig.	β	Exp(β)	Sig.
Expert/expert	-0,073	0,930	0,140	0,293	0,275	0,105
Sig.			0,013*			0,000**
Adjusted R Square			0,545			0,713

Notes: *p <0,05 **p <0,01

DISCUSSION

Most of the studies in both regions were conducted in the early adult age range. According to Hurlock (1986), early adulthood is characterized by several factors: reproductive age, a period of adjustment to new environments and conditions, emotional tension, and dependence on changing values. Reproductive age, especially for women, is characterized by the readiness of reproductive organs to reproduce. Education, for example, only reaches the secondary school level in the village. This is in accordance with Wasak's (2010) research, which revealed that mothers' education in rural areas is low. Low education levels in rural areas are due to a lack of educational facilities and infrastructure. This study's educational facilities and infrastructure in rural areas consist of two primary schools, one private secondary school, and one public secondary school.

Most rural and urban examples do not work. According to Winnicott (2018), women with children less than a year old tend not to work. This is because children under a year are not yet independent; therefore, the primary caregiver must meet all their needs. On the other hand, women are required to complete their work properly, and of course, married women need attention to other things, namely family. Regarding family characteristics, there are fewer examples of husbands' occupations in rural areas than in urban ones. Per capita income and family income in rural areas were also lower. Family income in this study is sourced from the husband's income; however, based on the results, it can be seen that most are not working. Rijal and Tahir (2022) mentioned that labor absorption in urban areas is higher than in rural areas.

Research on knowledge variables in rural areas has yielded poor results. Mulyani, Shafira, and Haris (2018) revealed that knowledge related to immunization is low because mothers rarely read and understand the results of recording their baby's growth and development in the contents of the Child Identity Card (KIA) book. In addition, according to Kumar, AggaNeighbourhoodal, and Gomber (2010), low maternal knowledge of immunization is caused by the inactivity of local health workers in providing socialization. The research results in rural areas differ from those in urban areas. Examples in urban areas have good knowledge of immunization. In contrast to previous research, which found no significant differences in knowledge, behavior, and attitudes between generations in urban and rural areas (Anam & Muflikhati, 2022). Jones et al. (2012) showed that mothers have good knowledge due to high maternal education and easy acquisition of information about immunization-related health services. Furthermore, the attitude variable shows a significant difference in both regions, with the highest percentage in the moderate index. Attitude is defined as an attitude towards certain objects, which is an attitude of view or feeling, but this attitude is accompanied by a tendency to act according to the object (Notoadmojo, 2012). Significant differences in attitude variables were also found in previous studies that specifically analyzed differences in consumer attitudes in rural and urban areas (Mahardika & Yuliati, 2022). According to Oliver (2014), attitudes can be shown through behavior and are sometimes referred to as behavioral effects. Attitudes can also be assessed based on affective effects. According to Oliver (2014), affective is an attitude related to one's feelings and emotions. In this study, mothers realized the importance of diphtheria immunization, as evidenced by their behavior in providing immunization.

Reference groups play an important role in providing information on diphtheria immunization. Reference groups are considered role models for consumers when making decisions about consuming goods or

services (Sherif, 2015). The mother's reference group in providing immunization consisted of invitations and encouragement from people around her, such as family, neighbors, peer groups, midwives, and cadres, based on Nuraprilyanti's (2009) research. Reference groups are divided into three dimensions: interpersonal, consisting of family, friends, friends, and neighbors; social media; and experts or experts, consisting of Integrated Services Post cadres, puskesmas officers, midwives, and doctors. For example, in rural areas, most people choose midwives as their reference group. Health workers for immunization programs usually consist of Puskesmas officers, doctors, or midwives; however, mothers in rural areas also have a high percentage of choosing Integrated Services Post cadres as a reference in providing diphtheria immunization. According to Hidayat and Jahari (2012), cadres are men or women who are chosen by the community and are willing and able to work in a very close relationship with health service places. The high percentage of Integrated Services Post cadres is due to the Integrated Services Post being the closest health service to the community (Ministry of Health, 2011). This result is in accordance with Hoonsopon's research (2016), which states that consumers will be more influenced by information sourced from personal and group sources than by public information. The results showed that, in urban areas, the interpersonal dimension of the family was the most preferred reference group. Mothers who receive support from their families feel that immunization is important for children's health and immunity. Ilhami and Afif (2020) found that family emotional support influences the provision of immunization to children.

Behavior in providing immunization to a person is divided into two categories: completeness and compliance with the schedule. Not all examples in this study provided complete diphtheria immunization, and only a few were in accordance with the schedule. Based on the Decree of the Minister of Health No.482 on the National Immunization Acceleration Movement for Universal Child Immunization 2010-2014 (GAIN UCI 2010-2014), there are several reasons why children are not immunized or are incompletely immunized, namely the mother's lack of knowledge or fear of immunization side effects. Delays, lack of belief in the benefits after immunization, and busy parents are also reasons why children are not immunized or have incomplete immunization. Family problems such as sick mothers and the unaffordable cost of immunization (Rahmawati, 2014) are also obstacles to the completeness and suitability of the immunization schedule. The completeness and suitability of the immunization schedule of samples from urban areas were higher than those of samples from rural areas. This is in accordance with the research of Awoh and Plugge (2016), who stated that immunization behavior in children in urban areas is much higher than that in rural areas due to various factors. In the dimension of immunization, the Integrated Services Post is the place most chosen by the example to provide immunization to children, but in the example in the city, the place of immunization is more varied and does not only focus on the Integrated Services Post. Based on research and interview results, examples in the village prefer the Integrated Services Post because it is closer and does not incur costs for transportation or immunization itself. Jayanti et al. (2017) found that barriers and distance to health services had a negative effect on the completeness of immunization. Research in other areas found that immunization of infants was well implemented, but there were several activities at the Integrated Services Post that had not been carried out, such as the presence of doctors, health counseling, and inadequate facilities and infrastructure (Samosir, 2023). Overall, immunization behavior in urban areas is better than immunization behavior in rural areas. Romadhona (2015) also stated that the status of residence has a significant effect on the provision of complete basic immunization in children.

Correlation test results in rural areas showed a significant positive relationship between social media and immunization completeness as well as family size, attitudes, interpersonal reference groups, and experts with the suitability of the immunization schedule. Social media has a relationship with immunization completeness. This is in line with the research of Odone et al. (2015) which shows that easy access to social media and other online pages will increase immunization behavior compared to those who do not have access at all. Family size has a significant positive relationship with the suitability of the immunization schedule. Indriyani and Asih (2019) stated that family size is related to the suitability status of the immunization schedule. This is because mothers already have experience with previous children related to immunization. Attitude is related to the suitability of the immunization schedule. This study is in line with Triana's research (2016) which shows that attitudes have a relationship with schedule conformity behavior so that parents who have a lack of attitude tend

not to give immunizations on time to their children. Interpersonal reference groups relate to the behavior of immunization schedule conformity. These results are in line with Budiarti's research (2019) which found a significant relationship between family support and maternal compliance with immunization. These results are in line with Budiarti's research (2019) which found a significant relationship between family support and maternal compliance with immunization. The higher the family support, the higher the mother's behavior in providing immunization. Health experts and experts have a relationship with the suitability of the immunization behavior schedule. Notoatmodjo (2012) states that the behavior of health workers such as Integrated Services Post immunization officers, puskesmas, and midwives will support the formation of good immunization behavior in mothers. The results of the correlation test in urban areas showed a relationship between the length of maternal education with the completeness and suitability of the diphtheria immunization schedule. This result is in line with the research of Dinengsih and Hendriyani (2018) which states that there is a significant relationship between maternal education and the completeness of child immunization. In the overall sample, there is a significant relationship between maternal education, per capita income, attitude, interpersonal, and expert with the suitability of the immunization schedule. Per capita income has a relationship with the appropriateness of the immunization schedule. The Indonesian Ministry of Health (2013) states that the higher the family's socioeconomic status, the higher the percentage of complete immunization in children. This is because parents can make more efforts that require funds so that children remain immunized according to schedule. Previous research also found a significant relationship between economic conditions and the provision of complete basic immunization (Lumbantoruan & Simanjuntak, 2020; Nadila, 2022).

The regression test results show the influence of the length of maternal education, attitudes, and interpersonal reference groups on the completeness of immunization. Maternal education affects the completeness of immunization. This study is in accordance with the research of Rahman and Obaidan-Nasrin (2010) which states that mothers with higher education tend to be more complete in providing immunizations to children. Attitude has a significant effect, this is in line with Anton's research (2014) which shows that maternal attitudes can be a predisposing or precipitating factor that causes mothers to bring their babies to be immunized. Attitude affects a behavior because it is influenced by the belief that behavior will lead to both desired and unwanted results. Interpersonal reference groups influence the completeness of immunization. These results are in line with the research of Rahmawati and Umbul (2014) which shows the results of the analysis of the influence between the support of the closest person and the immunization of children and toddlers. Family support and the closest person have an effect on child immunization. The regression test results show the length of maternal education and knowledge affect the suitability of the immunization schedule. This is in accordance with the research of Vikram, Vanneman, and Desai (2012) which revealed that mothers with higher education adhere more to immunization guidelines and rules not only because of the advice of health workers but really understand the importance of immunization so that immunization of children follows the applicable rules. The limitation of this study is that the results cannot be generalized because the sampling was non-probability. In addition, the analysis used is quite limited because the instrument used in the study is a closed question.

CONCLUSIONS AND SUGGESTIONS

The average age of the sample in rural areas is lower than in urban areas but not statistically different. The average years of education of rural samples is lower than urban samples and statistically different. All samples in rural areas and most samples in urban areas are housewives. The occupation of the husband of most of the samples in both rural and urban areas was laborer. Family size in both rural and urban areas is mostly small. The average per capita income in rural areas is lower than in urban areas and statistically different.

The mean knowledge of rural samples is lower than urban samples and statistically different. The mean attitude of rural samples is lower than urban samples and statistically different. There were differences in all dimensions of reference groups in rural and urban areas. The highest reference group in rural areas was midwives, while in urban areas it was family. The average behavior in rural areas was lower than in urban areas and statistically different. The factor associated with the completeness of diphtheria immunization was social media for rural areas, while in urban areas there was no associated factor. Factors associated with compliance with diphtheria immunization schedule in rural areas were family size, attitude, interpersonal, and expert, while in urban areas the length of maternal education. Factors influencing the completeness of diphtheria immunization are length of mother's education, attitude, and interpersonal reference group. Factors

influencing the suitability of diphtheria immunization schedule are length of maternal education and per capita income.

The diphtheria immunization behavior of mothers in rural and urban areas has a significant difference. Years of education and knowledge are one of the variables that have an influence on the behavior of giving diphtheria immunization. The low level of education and knowledge of mothers in rural areas is one of the causes of low diphtheria immunization behavior. Therefore, the role of family, friends, relatives, government, and health experts is needed to support community education and educate mothers regarding diphtheria immunization. Education of mothers includes knowledge about diphtheria immunization and the mandatory schedule for diphtheria immunization. Mothers will understand the impact of diphtheria disease so that there is awareness to provide complete and proper immunization according to the immunization schedule. In addition, the government is expected to increase and facilitate access to education and socialization about immunization through various media that are easily accessible to the community in rural areas and in urban areas. It is necessary to conduct further research related to other mandatory immunizations in Indonesia and differences between regions, so that solutions can be found for differences in immunization coverage.

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