BUKTI KORESPONDENSI

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Judul artikel   : Factors affecting pneumonia among children under five years old

Jurnal   : **JURNAL KESEHATAN IBU DAN ANAK**

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No	Perihal	Tanggal
1	Bukti Hasil review pertama (reviewer I)	30 Desember 2019
2	Bukti Hasil review pertama (reviewer II)	3 Januari 2020
3	Bukti revisi hasil review pertama	15 Januari 2020

1. BUKTI HASIL REVIEW PERTAMA (REVIEWER I): 30 DESEMBER 2019

PAPER EVALUATION SHEET

No.   : 07

Paper Title : Factors affecting pneumonia among children under five

A. Evaluation objects:

		Yes	No
1	Is the paper content original?	√	
2	Does the paper title represent its content?	√	
3	Does the abstract reflect the paper content?	√	
4	Do the keywords indicate the scope of the research?	√	
5	Is the research methodology or the approach of the problem solving clearly described?		√
6	Do the data presentation and interpretation valid and reasonable?	√	
7	Do the use of tables and figures help to clarify the explanation?	√	
8	Have the discussion and/or analysis been relevant with the results of the study?	√	
9	Are the references used relevant?	√	

		Very Good	Good	Fair	Poor
10	Contribution to science?		√		
11	Originality?			√	
12	Systematic?		√		
13	Language?		√		
14	Writing accuracy?			√	

B. Reviewer Decision (select one)

1	Accept Submission	
2	Revision Required	√
3	Resubmit for Review	
4	Decline Submission	

C. Comment about the paper.

1. Add the research purpose in the introduction
2. Make conclusion from the others study in the introduction
3. Complete the research method by explaining the statistic analysis

D. Note to the editors

1. Please, examine the sentences and phrases structure in the discussion section.

Signature of reviewer:

(………………………..)

Factors affecting pneumonia among children under five in sentolo 1 public health center kulon progo 2019

ARTICLE INFO

ABSTRACT

Background : Prevalence of pneumonia among children under five in Indonesia reach to 20%, in DIY 39,61% and in Sentolo 1 Public Health Center has increased from 170 pneumonia toddlers (2017) to 224 toddlers of pneumonia (2019). Pneumonia affects the deaths of infants and toddlers. **Purpose :** This study was to find out the factors that influence the incidence of pneumonia in infants. **Methods :** Analytical observational researched with case control design used secondary data from medical records from January to December 2019 and primary data from direct interviews. The subject of this study was 94 toddlers in Sentolo1 Public Health Center with a purposive random sampling technique. Data analysis used chi-square test followed by logistic regression. **Results :** The results showed that pneumonia was most prevalent among children under five with risky toddlers (66.0%), history of non-risk birth weight (83.0%), toddlers who received exclusive breastfeeding (57.4%), toddlers who had received complete basic immunization (80.9%), mothers of children under five with basic education (63.8%), toddlers who had a family history of smoking (70.2%), parents (father / mother) of toddlers who had a history of asthma (51, 1%), and toddlers who had received vitamin A (83.0%). Factors related to pneumonia in children under five were the age factor of the toddler (p-value: 0.038; 95% CI: 1.134-6.033), the last education of the mother (p-value: 0.002; 95% CI: 1.755-9,860), family smoking history (p-value: 0.036; 95% CI: 1,147-6,254), and a history of parent's asthma (p-value: 0,000; 95% CI: 2,338-18,344). **Conclusion :** Age of toddler, mother's education level, family smoking history and history of parental asthma were factors that influence the incidence of pneumonia in infants. The history of parent's asthma was the most influential factor.

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INTRODUCTION

Under-five is an age group that is prone to malnutrition and prone to disease. Under-Five children must get protection to prevent disease. The disease can cause growth and development to be disrupted or even cause death.[1] The number of Under-five Mortality Rate (IMR) according to the 2012 Indonesian Health Demographic Survey (IDHS) is 40 death per 1,000 live birth, which means one in 28 children dies before reaching the age of five.

The causes of the under-five children's death include infection, diarrhea, and malnutrition.[2] One of the highest causes of death due to infectious diseases in the under-five children is pneumonia.[3] Pneumonia is still the most dangerous disease that causes under-five children death and also many elderly people in the world. According to World Health Organization (WHO) in 2013, the majority of the under-five mortality is caused by pneumonia.[4] In 2015 UNICEF mentioned that the main causes of under-five mortality are; pneumonia, diarrhea, malaria, and malnutrition.[5] According to the WHO in 2013, from 8,8 million children deaths in the world, 1,6 million were due to pneumonia. More than 98% of pneumonia deaths in children occur in developing countries.[4] Pneumonia is a major public health problem in Indonesia.[6]

Pneumonia is one of the causes of 4 million deaths in infants. According to the Directorate General of Disease Control and Environmental Health, pneumonia cases in under-five children are estimated at between 10-20% per year. The incidence of pneumonia in children under-five in Indonesia in 2016 increased by 65.27% from the previous year 63.45%.6 Even though the eradication of Acute Respiratory Infection (ARI) was emphasized and focused on the prevention of under-five children pneumonia.[7] The full basic and routine immunization, and also the supply of vitamin A has also been carried out in all health services to prevent pneumonia.[8]

According to DIY Health profile year 2017, the incidence of pneumonia in toddlers in Yogyakarta is 39.61%. The number of cases of pneumonia in the highest DIY toddler is in KulonProgo Regency which is 52,17%.[8] Whereas the complete basic immunization coverage in KulonProgo has exceeded the target set and the highest coverage in DIY amounted to 99.3%, coverage The giving of breast milk (ASI) exclusively in KulonProgo Regency also occupy the second highest in DIY and the percentage of clean and healthy living behavior (PHBS) in KulonProgo Regency from 2013-2017 has always increased by 8.50%, as well as the coverage The administration of vitamin A in the KabupatanKulonProgo has reached 100%.[8] Some of these things can affect the prevention of diseases so that it increases the degree of health. The number of infants experiencing pneumonia in KulonProgo Regency in 2018 is most widely found in Sentolo Puskesmas.[1,9]

Risk factors that increase morbidity and mortality incidence of pneumonia are divided into two major groups of Instrinsik and extrinsic factors. Instrinsik factors include age, gender, nutritional status, low birth weight, immunization status, BREAST feeding, and vitamin A administration. Extrinsic factors covering housing density, air pollution, home type, ventilation, humidity, kitchen layout, Types of fuel, mosquito repellent, cigarette smoke, family income and the mother factor of good education, maternal age, and maternal knowledge.[5,10]

The results of the Aminasty study (2017) under the title "Factors related to Genesis Pneumonia in infants at the District General Hospital (RSUD) of Padangsidimpuan", based on the results of the logistic regression test indicate the presence of birth weight OR = 4.107, granting of BREASTFEEDING OR = 5,764, and asthma OR disease = 5,529 with the incidence of pneumonia in infants, while there is no link between the administration of vitamin A with the incidence of pneumonia in the District General Hospital (RSUD) of Padangsimpuan City.[5]

The results of the research of Wijaya (2014) under the title "Relations of Smoking habit, immunization with the incidence of Pneumonia in children in PuskesmasPabuaranTumpengTangerang City". The study used a research method of analytic surveys with cross sectional approaches. Data is analyzed using ChiSquare test. The research conclusion shows that there is a significant link between the immunization status with the incidence of pneumonia in infants with a P-value = 0.0001 value and an OR 0.790 value, where infants with incomplete immunization status have an opportunity Have pneumonia 0.790 times compared with a complete immunisation status.[11]

The results of the study by Hidayat (2014) with the title of the factors associated with the incidence of pneumonia in infants in the area of Mojogedang II Health Center,

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Commented [ada4]: buat kesimpulannya saja tidak perlu disebutkan dengan OR, misal bayi dengan berat lahir rendah memiliki risiko 4 kali lebih besar dari bayi dengan berat lahir normal.

Commented [ada5]: Langsung buat kesimpulannya dalam bentuk narasi.

Karanganyar Regency. The sample in this study amounted to 33 toddlers in the case group and 33 under-fives in the control group. The method of data collection was carried out by observational and interview. The statistical test used is the Chi-square test and as an alternative Fisher's Exact Test with a significance level of 95%. The results of the study explained that the factors associated with the incidence of pneumonia in infants were exclusive breastfeeding (p = 0.030 OR = 4.126 95% CI = 1.274-13.370); use of firewood (p = 0.044 OR = 4.143 95% CI = 1.17114,653); the presence of smokers (p = 0.030 OR = 4.126 95% CI = 1.274-13.370). While the factors not related to pneumonia were DPT immunization (p = 0.999 OR = 0.484 95% CI = 0.042-5,617); measles immunization (p = 0.613 OR = 0.313 95% CI = 0.0313,171); nutritional status (p = 0.999 OR = 0.999 95% CI = 0.286-3.449), low birth weight (p = 0.672 OR = 0.468 95% CI = 0.0802,750); Vitamin A (p = 0.999 OR = 0.484 95% CI = 0.042-5,617).[12]

Dwi's research (2016) with the title "The Analysis of Multiple Linear Regression In Determining The Effect Of Low Birth Weight Infants (LBW) And Non-Exclusive Breastfeeding Occurrence Pneumonia Toward In East Java Province In 2016". Based on the results using multiple linear regression analysis, obtained significant values of each variable, namely Low Birth Weight (LBW) (0.010) and non-exclusive ASI (0.014) and also the coefficient of determination is 0.295 or 29.5%. So that there is a significant influence between Low Birth Weight Babies (LBW) and breastfeeding (ASI) Exclusive to the occurrence of pneumonia.[13]

METHOD

This study was an observational analytic study with case-control design. The sampling technique used in this study was simple random sampling. The number of samples in this study were 94 people. Respondents in this study were under-five children who conducted medical examinations at Sentolo 1 Public Health Center in 2019. This research was conducted starting in October 2018. Data collection is carried out from 12-15 March 2019. The techniques that are used in the data processing are scoring, coding, and data entry.

RESULT

The following is a factors proportion of age, birth weight, the status of exclusive breastfeeding, the status of full basic immunization, mother's education level, smoking history in family, asthma history in family, and history of supplying of vitamin A in the under-five children at Sentolo 1 Public Health Center in 2019.

Table 1. Characteristics Respondent

Variabel	p-value	OR	95% CI	
			Lower	Upper
The age of under-five children	0.038*	2.616	1.134	6.033
Birth weight	0.772	1.402	0.446	4.408
Status of exclusive breastfeeding	0.393	1.580	0,680	3.671
Status of Immunization	0.337	0.558	0.214	1.456
Education Level	0.002*	4.160	1.755	9.860
Family Smoking History	0.036*	2.679	1.147	6.254
Family Asthma History	0.000*	6.549	2.338	18.344
History of vitamin A Supply	0.793	0.759.	0.270	2.132

Table 2. The Variable Relation With Pneumonia Incidence In Under-Five Children

Notes: * significant p-value <0.05

Based on table 2, it can be seen that the results of the analysis with the chi-square test for the relationship of several factors with the incidence of pneumonia in children under five at Sentolo 1 Public Health Center in 2019 shows that the age variable of the under-five children (p-value = 0.038), under-five children mother's education level (p-value = 0.002), family smoking history (p-value = 0.036), and family asthma history (p-value = 0.000) has p-value <0.05. This shows that there is a

relationship that is statistically significant between the age factors of the under-five children, mother's level of education, smoking history of children's family, asthma history in family with pneumonia incidence in under-five children at Sentolo 1 Public Health Centre in 2019.

> **Commented [ada10]:** Narasikan saja dulu penjelasan kemudian rujukan tabel ditulis (table 2).

Based on table 2, it can be seen that the analysis result using chi square test for the relationship of birth weight factors (p-value= 0.772), status of exclusive breastfeeding (p-value= 0.393), status of immunization (p-value = 0.337), and the provision of vitamin A (p-value = 0.793) with pneumonia incidence at Sentolo 1 Public Health Centre in 2019 shows that the relationship is not statistically significant since each of those factors has p-value >0.05.

> **Commented [ada11]:** Sama dengan penulisan yang di atas

After going through the chi-square test, then the logistic regression test then carried out which is a further development as a multivariate chi square. In the final analysis of the logistic regression test, the variables that influence the incidence of pneumonia in infants were included by entering a significant variable only (p-value <0.25), then statistically shown that the risk factors were significantly which associated with the incidence of pneumonia in infants age toddlers, mother's education level, family smoking history, parents' history of asthma. Furthermore, the four variables were analyzed by a Logistic Regression Test.

Variable	Case N= 47		Control N= 47	
	n	%	N	%
Age of Children				
At Risk ($\leq$1 years)	31	66	20	42.6
No Risk (> 1years)	16	34	27	57.4
Birth Weight				
At Risk (<2500g)	8	17	6	12.8
No Risk ($\geq$2500g)	39	83	41	87.2
Status of Exclusive Breastfeeding				
At Risk (no Exclusive breastfeeding until 6 month)	20	42.6	15	31.9
No risk (exclusive breastfeeding)	27	57.4	32	68.1
Status of Immunization				
At Risk (not completed)	9	19.1	14	54.7
Risk Free (completed)	38	80.9	33	45.3
Education level				
Basic	30	63.8	14	29.8
High/Advance	17	36.2	32	70.2
Smoking History in Family				
Smoking	33	70.2	22	46.8
Not Smoking	14	29.8	25	53.7
Asthma History in Family				
Yes	23	48.9	6	12.8
No	24	51.1	41	87.2
History of vitamin A supply				
Supplied	8	17	10	21.3
Not Supplied	39	83	37	78.7

Table 3. Variable Logistic Regression Test Results

Variabel	B	Exp.(B)	Sig.	95% CI	
				Lower	*Upper*

1	Age of Toddler	1.250	3.489	0.017	1.252	9.724
	Mother's Education level	1.408	4.088	0.006	1.499	11.149
	Smoking History	0.763	2.144	0.134	0.792	5.805
	Parents' Asthma History	1.891	6.626	0.001	2.137	21.098
2	Age of Toddler	1.338	3.812	0.010	1.386	10.485
	Mother's Education	1.477	4.378	0.003	1.625	11.791
	Parents' Asthma History	1.900	6.683	0.001	2.137	20.892

Based on table 3, smoking history has p-value 0.134 (p-value> 0.05) so it must be carried out and obtained the final results in the next table as shown in the table above. Based on these results the most influential factor in the incidence of pneumonia in infants is a factor of parental asthma history with the highest OR of 6,683.

DISCUSSION

The data which acquired were analyzed through three types of tests. The test was univariate, bivariate with chi square test, and multivariate using logistic regression test. The following discussion is the results of this research. Toddlers who have a risky age (≤ 12 months) have 3,812 times the chance to experience pneumonia compared to toddlers who have a non-risk age (> 12 months) (Exp. (B) = 3,812). The results of this research are agreed with the results of research conducted by Hartati (2011) which explained that toddlers aged ≤ 12 months had a chance of 3.24 times to suffer from pneumonia compared to toddlers aged ≥ 12 months. Toddlers have defence mechanism body that still weak compared to adults, children aged 0-24 months are more susceptible to pneumonia than children over the age of 2 years. This is caused by imperfect immunity and relatively a narrow respiratory tract so that it has a high risk of diseases associated with immaturity of the central nervous system and lungs, including aspiration pneumonia because reflexes suck, swallow, and the imperfect cough and idiopathic respiratory disorder syndrome (hyaline membrane disease). Seeing this condition is very important to maintain the health of children aged ≤ 12 months by paying attention to the provision of appropriate nutrition and immunization to increase endurance so as to prevent children from infectious diseases.[21]

The results of this research are in accordance with the research conducted by Regina (2013) explaining that there is no relationship between the history of LBW and the incidence of pneumonia in children under five with the results of p-value = 0.191 (> 0.005), and Rasyid (2013). Low birth with pneumonia incidence.[30,31] The results of this study indicate that birth weight has no relationship with the incidence of pneumonia because there are other variables that greatly influence the incidence of pneumonia. So that there is no effect, toddlers who have a history of low birth weight will experience pneumonia, it is necessary to take a look at other histories associated with pneumonia in infants.

The results of this research are fit with Jayashree's research (2019) that there is no relationship between exclusive breastfeeding and the incidence of pneumonia in India. (p> 0.005) .[24] The results of this study are consistent with the research conducted by Frengki (2013) that there is no relationship between exclusive breastfeeding and the incidence of pneumonia in children under five in the work area of Global Mongolato Health Centre which produces a p-value = 0.604 (p- value => 0.05) .32 The results of this study indicate that toddlers with exclusive breastfeeding have the same risk of developing pneumonia in children under five at Sentolo Health Center 1. So that there is no effect of toddlers who have a 6-month history of non-exclusive breastfeeding. When having pneumonia, it is necessary to look at other histories related to pneumonia in infants.

The results of this research are suitable with the research conducted by Regina (2013) explaining that there is no relationship between immunization status and the incidence of pneumonia in infants with p-value = 0.191 (> 0.005), and Sadenna's (2014)

research that there is no relationship between giving complete basic immunization with recurrent pneumonia in infants at RanotamaWeru Health Center in Manado City with p-value = 0.333. The results of the Jayashree study (2019) show that the incidence of pneumonia in infants actually occurs in infants who have received complete immunization.[24] Toddlers who have received complete basic immunization are still at risk of developing pneumonia because there are also several factors that can affect the incidence of pneumonia, namely exposure to viruses, bacteria, under-five nutrition status, as well as maternal knowledge about diseases, disease prevention and health care methods that are still lacking. If knowledge about the causes of disease, treatment and prevention is good, parents will definitely can control the health of children, therefore pneumonia will not happen to children.[33]

The results of this study indicate that the proportion of children under five who has experience pneumonia is mostly in infants with mothers who have graduated from formal education at the level of primary education, compared to children under five whose mothers have passed formal education at the high level. Based on the results of bivariate and multivariate tests showed that the relationship of factors of maternal education level with the incidence of pneumonia in infants was statistically significant.

The results of this study are in accordance with the results of a study conducted by Aminasty (2017) explained that there is an influence between the education of mothers and the incidence of pneumonia. The education variable of the mother has OR 3.773, then the chance of pneumonia is 3.773 times greater in children under five who have mothers with primary / junior high school education compared to high school / PT.[5] The education a person is lived has an influence on increasing thinking ability. Someone who is more educated will be able to make more rational decisions, generally open to accepting changes or new things compared to individuals who are low educated. In the context of health, of course, if someone's education is good enough, the symptoms of the disease will be recognized earlier and encourage the person to look for preventive measures. [43]

The mother of a toddler who has a basic education level that is education taken ≤ 9 years tends to care for her toddler who is not so good, then her toddler is easily exposed to germs through the respiratory tract so that the ISPA continues to become pneumonia. The possibility that mothers with higher education will bring their children more treatment to health facilities, but mothers with low education will prefer their children to treat by themselves. Therefore, mothers of toddlers with a primary level of education are more at risk of having their children experiencing pneumonia.[5]

The multivariate test results showed that toddlers with families who smoked had a chance of 2,144 times to experience pneumonia compared with toddlers who had families who did not smoke in one place of residence. The results of this study support previous studied that have been examined by Gothankar Research (2019) explaining that toddlers who have a family history of smoking have a higher risk than those who do not smoke. Cigarette smoke will reduce ciliary function, destroy ciliated epithelial cells that will be converted into squamous cells and reduce humoral or cellular immunity both locally and systemically.[24] Cigarette smoke and smoke from burning fuel to cook with high concentrations can damage the lung defense mechanism so that it will make it easier the onset of pneumonia.[10]

The results of the study showed that the relationship between the history of parents' asthma factors and the incidence of pneumonia in children under five in Sentolo 1 Public Health Center in 2019 was statistically significant. From the results of the multivariate test, p-value 0.001 (<0.05) was obtained. History of asthma in parents of toddlers has a value of OR = 6,592, this showed parents of toddlers (father / mother) who have a history of asthma has a chance of 6,592 times toddlers will experience pneumonia compared with toddlers, both parents do not have a history of asthma.

The results of this study support the previous studies that have been examined by Aminasty (2017) showed that there is a relationship between the history of asthma and the

incidence of pneumonia in the Regional General Hospital (RSUD) City of Padangsidimpuan in 2017.[5]The results of the study showed that the history of immunization factors with the incidence of pneumonia in infants in Sentolo 1 Public Health Center did not reach statistical significance. The results of this study are appropriate with the research conducted by Aminasty (2017) explaining that there is no relationship between the history of giving vitamin A and the incidence of pneumonia in infants with p-value = 0.825 (> 0.005), and Hartati (2011) studied that there is no relationship between history of giving vitamin A with the incidence of pneumonia in infants with p-value = 0.285. The results of this study indicate that the history of giving vitamin A has no relationship with the incidence of pneumonia, because there are other variables that greatly influence the incidence of pneumonia, namely the age of children at risk, low maternal education level, family smoking history, and a history of parents' asthma. Despite of the results of this study showed no significant relationship, it should be noted that the proportion of children under five who get vitamin A and suffer from pneumonia is still higher. This needs to be studied further by health workers how vitamin A is given. Giving vitamin A which is carried out together with immunization will cause an increase in specific antibody titers and appear to remain in a high enough value.[1,27]

CONCLUSION

There was a statistically significant relationship between the age factor of the toddler, the last education of the mother, family smoking history, and a history of asthma in the elderly with the incidence of pneumonia. The most influential factor in the incidence of pneumonia in children under five at Sentolo 1 Public Health Center in 2019 is a factor in the history of parents' asthma.
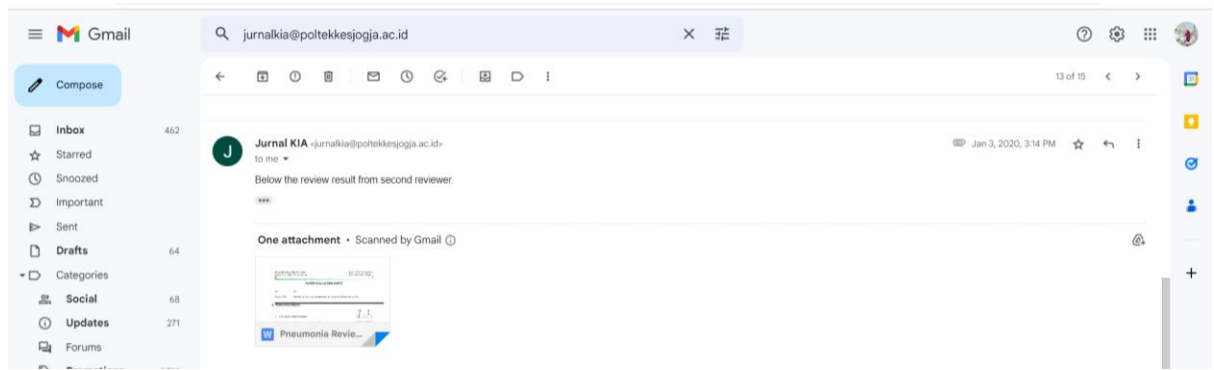
SUGGESTION

Improving health promotion to improve clean and healthy lifestyle, especially reducing smoking / not smoking at all in the home to prevent pneumonia so that families can pay more attention to pneumonia risk factors. Improve monitoring and early detection of pneumonia risk factors, namely in infants with risky toddlers, mothers of children under five with basic education, family smoking history and especially in toddlers with parents of children under five who have a history of asthma so that they can be caught early and get immediate treatment.

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2. BUKTI HASIL REVIEW PERTAMA (REVIEWER II): 3 JANUARI 2020

PAPER EVALUATION SHEET

No. : 07

Paper Title : Factors affecting pneumonia among children under five

A. Evaluation objects:

		Yes	No
1	Is the paper content original?	X	
2	Does the paper title represent its content?		X
3	Does the abstract reflect the paper content?		X
4	Do the keywords indicate the scope of the research?		X
5	Is the research methodology or the approach of the problem solving clearly described?		X
6	Do the data presentation and interpretation valid and reasonable?		X
7	Do the use of tables and figures help to clarify the explanation?	X	
8	Have the discussion and/or analysis been relevant with the results of the study?		X
9	Are the references used relevant?	X	

		Very Good	Good	Fair	Poor
10	Contribution to science?			X	
11	Originality?			X	
12	Systematic?				X
13	Language?				X
14	Writing accuracy?				X

B. Reviewer Decision (select one)

1	Accept Submission	
2	Revision Required	
3	Resubmit for Review	X
4	Decline Submission	

C. Comment about the paper.

1.Title needs to be revised, suggest to include these keywords in title e.g. determinants, factors associated, etc.
2.Abstract are poorly arranged and written, suggest to refer similar available publications.
3.Introduction section needs to be rewritten, especially on (a) problem statement, (b) study objective(s), (c) scientific rationale/justifications to conduct proposed study i.e. associated factors, etc.
4.Content in Method section is different to those in abstract, and need to be written with more details.
5.Results, Discussions and Conclusion sections are poorly arranged and written, suggest to refer similar available publications.
6.Suggest to combine Suggestion section into Conclusion.
7.Ensure whole manuscript is in English, e.g. daftar pusaka.
8.Suggest to include keyword e.g. determinants, factors associated.

D. Note to the editors

1. Major revision is required.
2. Suggest editor to consider re-review only if author revises whole manuscript according to provided comments, and engages medical/scientific writer to rewrite manuscript.

Signature of reviewer:

$(\ldots\ldots\ldots)$

1

Factors affecting pneumonia among children under five in sentolo 1 public health center kulon progo 2019

ABSTRACT

Background : Prevalence of pneumonia among children under five in Indonesia reach to 20%, in DIY 39,61% and in Sentolo 1 Public Health Center has increased from 170 pneumonia toddlers (2017) to 224 toddlers of pneumonia (2019). Pneumonia affects the deaths of infants and toddlers. **Purpose :** This study was to find out the factors that influence the incidence of pneumonia in infants. **Methods :** Analytical observational researched with case control design used secondary data from medical records from January to December 2019 and primary data from direct interviews. The subject of this study was 94 toddlers in Sentolo1 Public Health Center with a purposive random sampling technique. Data analysis used chi-square test followed by logistic regression. **Results :** The results showed that pneumonia was most prevalent among children under five with risky toddlers (66.0%), history of non-risk birth weight (83.0%), toddlers who received exclusive breastfeeding (57.4%), toddlers who had received complete basic immunization (80.9%), mothers of children under five with basic education (63.8%), toddlers who had a family history of smoking (70.2%), parents (father / mother) of toddlers who had a history of asthma (51, 1%), and toddlers who had received vitamin A (83.0%). Factors related to pneumonia in children under five were the age factor of the toddler (p-value: 0.038; 95% CI: 1.134-6.033), the last education of the mother (p-value: 0.002; 95% CI: 1.755-9,860), family smoking history (p-value: 0.036; 95% CI: 1,147-6,254), and a history of parent's asthma (p-value: 0,000; 95% CI: 2,338-18,344).
Conclusion : Age of toddler, mother's education level, family smoking history and history of parental asthma were factors that influence the incidence of pneumonia in infants. The history of parent's asthma was the most influential factor.

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INTRODUCTION

Under-five is an age group that is prone to malnutrition and prone to disease. Under-Five children must get protection to prevent disease. The disease can cause growth and development to be disrupted or even cause death.[1] The number of Under-five Mortality Rate (IMR) according to the 2012 Indonesian Health Demographic Survey (IDHS) is 40 death per 1,000 live birth, which means one in 28 children dies before reaching the age of five.

The causes of the under-five children's death include infection, diarrhea, and malnutrition.[2] One of the highest causes of death due to infectious diseases in the under-five children is pneumonia.[3] Pneumonia is still the most dangerous disease that causes under-five children death and also many elderly people in the world. According to World Health Organization (WHO) in 2013, the majority of the under-five mortality is caused by pneumonia.[4] In 2015 UNICEF mentioned that the main causes of under-five mortality are; pneumonia, diarrhea, malaria, and malnutrition.[5] According to the WHO in 2013, from 8,8 million children deaths in the world, 1,6 million were due to pneumonia. More than 98% of pneumonia deaths in children occur in developing countries.[4] Pneumonia is a major public health problem in Indonesia.[6]

Pneumonia is one of the causes of 4 million deaths in infants. According to the Directorate General of Disease Control and Environmental Health, pneumonia cases in under-five children are estimated at between 10-20% per year. The incidence of pneumonia in children under-five in Indonesia in 2016 increased by 65.27% from the previous year 63.45%.[6] Even though the eradication of Acute Respiratory Infection (ARI) was emphasized and focused on the prevention of under-five children pneumonia.[7] The full basic and routine immunization, and also the supply of vitamin A has also been carried out in all health services to prevent pneumonia.[8]

According to DIY Health profile year 2017, the incidence of pneumonia in toddlers in Yogyakarta is 39.61%. The number of cases of pneumonia in the highest DIY toddler is in KulonProgo Regency which is 52,17%.[8] Whereas the complete basic immunization coverage in KulonProgo has exceeded the target set and the highest coverage in DIY amounted to 99.3%, coverage The giving of breast milk (ASI) exclusively in KulonProgo Regency also occupy the second highest in DIY and the percentage of clean and healthy living behavior (PHBS) in KulonProgo Regency from 2013-2017 has always increased by 8.50%, as well as the coverage The administration of vitamin A in the KabupatanKulonProgo has reached 100%.[8] Some of these things can affect the prevention of diseases so that it increases the degree of health. The number of infants experiencing pneumonia in KulonProgo Regency in 2018 is most widely found in Sentolo Puskesmas.[1,9]

Risk factors that increase morbidity and mortality incidence of pneumonia are divided into two major groups of Instrinsik and extrinsic factors. Instrinsik factors include age, gender, nutritional status, low birth weight, immunization status, BREAST feeding, and vitamin A administration. Extrinsic factors covering housing density, air pollution, home type, ventilation, humidity, kitchen layout, Types of fuel, mosquito repellent, cigarette smoke, family income and the mother factor of good education, maternal age, and maternal knowledge.[5,10]

The results of the Aminasty study (2017) under the title "Factors related to Genesis Pneumonia in infants at the District General Hospital (RSUD) of Padangsidimpuan", based on the results of the logistic regression test indicate the presence of birth weight OR = 4.107, granting of BREASTFEEDING OR = 5,764, and asthma OR disease = 5,529 with the incidence of pneumonia in infants, while there is no link between the administration of vitamin A with the incidence of pneumonia in the District General Hospital (RSUD) of Padangsimpuan City.[5]

The results of the research of Wijaya (2014) under the title "Relations of Smoking habit, immunization with the incidence of Pneumonia in children in PuskesmasPabuaranTumpengTangerang City". The study used a research method of analytic surveys with cross sectional approaches. Data is analyzed using ChiSquare test. The research conclusion shows that there is a significant link between the immunization status with the incidence of pneumonia in infants with a P-value = 0.0001 value and an OR 0.790 value, where infants with incomplete immunization status have an opportunity Have pneumonia 0.790 times compared with a complete immunisation status.[11]

The results of the study by Hidayat (2014) with the title of the factors associated with the incidence of pneumonia in infants in the area of Mojogedang II Health Center,

Karanganyar Regency. The sample in this study amounted to 33 toddlers in the case group and 33 under-fives in the control group. The method of data collection was carried out by observational and interview. The statistical test used is the Chi-square test and as an alternative Fisher's Exact Test with a significance level of 95%. The results of the study explained that the factors associated with the incidence of pneumonia in infants were exclusive breastfeeding (p = 0.030 OR = 4.126 95% CI = 1.274-13.370); use of firewood (p = 0.044 OR = 4.143 95% CI = 1.17114,653); the presence of smokers (p = 0.030 OR = 4.126 95% CI = 1.274-13.370). While the factors not related to pneumonia were DPT immunization (p = 0.999 OR = 0.484 95% CI = 0.042-5,617); measles immunization (p = 0.613 OR = 0.313 95% CI = 0.0313,171); nutritional status (p = 0.999 OR = 0.999 95% CI = 0.286-3.449), low birth weight (p = 0.672 OR = 0.468 95% CI = 0.0802,750); Vitamin A (p = 0.999 OR = 0.484 95% CI = 0.042-5,617).[12]

Dwi's research (2016) with the title "The Analysis of Multiple Linear Regression In Determining The Effect Of Low Birth Weight Infants (LBW) And Non-Exclusive Breastfeeding Occurrence Pneumonia Toward In East Java Province In 2016". Based on the results using multiple linear regression analysis, obtained significant values of each variable, namely Low Birth Weight (LBW) (0.010) and non-exclusive ASI (0.014) and also the coefficient of determination is 0.295 or 29.5%. So that there is a significant influence between Low Birth Weight Babies (LBW) and breastfeeding (ASI) Exclusive to the occurrence of pneumonia.[13]

METHOD

This study was an observational analytic study with case-control design. The sampling technique used in this study was simple random sampling. The number of samples in this study were 94 people. Respondents in this study were under-five children who conducted medical examinations at Sentolo 1 Public Health Center in 2019. This research was conducted starting in October 2018. Data collection is carried out from 12-15 March 2019. The techniques that are used in the data processing are scoring, coding, and data entry.

RESULT

The following is a factors proportion of age, birth weight, the status of exclusive breastfeeding, the status of full basic immunization, mother's education level, smoking history in family, asthma history in family, and history of supplying of vitamin A in the under-five children at Sentolo 1 Public Health Center in 2019.

Table 1. Characteristics Respondent

Table 2. The Variable Relation With Pneumonia Incidence In Under-Five Children

Notes: * significant p-value <0.05

Based on table 2, it can be seen that the results of the analysis with the chi-square test for the relationship of several factors with the incidence of pneumonia in children under five at Sentolo 1 Public Health Center in 2019 shows that the age variable of the under-five children (p-value = 0.038), under-five children mother's education level (p-value = 0.002), family smoking history (p-value = 0.036), and family asthma history (p-value = 0.000) has p-value <0.05. This shows there is a

Variable	Case N= 47		Control N= 47	
	n	%	N	%
Age of Children				
At Risk (<1 years)	31	66	20	42.6
No Risk (> 1years)	16	34	27	57.4
Birth Weight				
At Risk (<2500g)	8	17	6	12.8
No Risk (>2500g)	39	83	41	87.2
Status of Exclusive Breastfeeding				
At Risk (no Exclusive breastfeeding until 6 month)	20	42.6	15	31.9
No risk (exclusive breastfeeding)	27	57.4	32	68.1
Status of Immunization				
At Risk (not completed)	9	19.1	14	54.7
Risk Free (completed)	38	80.9	33	45.3
Education level				
Basic	30	63.8	14	29.8
High/Advance	17	36.2	32	70.2
Smoking History in Family				
Smoking	33	70.2	22	46.8
Not Smoking	14	29.8	25	53.7
Asthma History in Family				
Yes	23	48.9	6	12.8
No	24	51.1	41	87.2
History of vitamin A supply				
Supplied	8	17	10	21.3
Not Supplied	39	83	37	78.7

Variabel	p-value	OR	95% CI	
			Lower	Upper
The age of under-five children	0.038*	2.616	1.134	6.033
Birth weight	0.772	1.402	0.446	4.408
Status of exclusive breastfeeding	0.393	1.580	0,680	3.671
Status of Immunization	0.337	0.558	0.214	1.456
Education Level	0.002*	4.160	1.755	9.860
Family Smoking History	0.036*	2.679	1.147	6.254
Family Asthma History	0.000*	6.549	2.338	18.344
History of vitamin A Supply	0.793	0.759.	0.270	2.132

relationship that is statistically significant between the age factors of the under-five children, mother's level of education, smoking history of children's family, asthma history in family with pneumonia incidence in under-five children at Sentolo 1 Public Health Centre in 2019.

Based on table 2, it can be seen that the analysis result using chi square test for the relationship of birth weight factors (p-value= 0.772), status of exclusive breastfeeding (p-value= 0.393), status of immunization (p-value = 0.337), and the provision of vitamin A (p-value = 0.793) with pneumonia incidence at Sentolo 1 Public Health Centre in 2019 shows that the relationship is not statistically significant since each of those factors has p-value >0.05.

After going through the chi-square test, then the logistic regression test then carried out which is a further development as a multivariate chi square. In the final analysis of the logistic regression test, the variables that influence the incidence of pneumonia in infants were included by entering a significant variable only (p-value <0.25), then statistically shown that the risk factors were significantly which associated with the incidence of pneumonia in infants age toddlers, mother's education level, family smoking history, parents' history of asthma. Furthermore, the four variables were analyzed by a Logistic Regression Test.

Table 3. Variable Logistic Regression Test Results

Variabel	B	Exp.(B)	Sig.	95% CI Lower	95% CI Upper
1 Age of Toddler	1.250	3.489	0.017	1.252	9.724
Mother's Education level	1.408	4.088	0.006	1.499	11.149
Smoking History	0.763	2.144	0.134	0.792	5.805
Parents' Asthma History	1.891	6.626	0.001	2.137	21.098
2 Age of Toddler	1.338	3.812	0.010	1.386	10.485
Mother's Education	1.477	4.378	0.003	1.625	11.791
Parents' Asthma History	1.900	6.683	0.001	2.137	20.892

Based on table 3, smoking history has p-value 0.134 (p-value> 0.05) so it must be carried out and obtained the final results in the next table as shown in the table above. Based on these results the most influential factor in the incidence of pneumonia in infants is a factor of parental asthma history with the highest OR of 6,683.

DISCUSSION

The data which acquired were analyzed through three types of tests. The test was univariate, bivariate with chi square test, and multivariate using logistic regression test. The following discussion is the results of this research.Toddlers who have a risky age (≤ 12 months) have 3,812 times the chance to experience pneumonia compared to toddlers who have a non-risk age (> 12 months) (Exp. (B) = 3,812). The results of this research are agreed with the results of research conducted by Hartati (2011) which explained that toddlers aged ≤ 12 months had a chance of 3.24 times to suffer from pneumonia compared to toddlers aged ≥ 12 months. Toddlers have defence mechanism body that still weak compared to adults, children aged 0-24 months are more susceptible to pneumonia than children over the age of 2 years. This is caused by imperfect immunity and relatively a narrow respiratory tract so that it has a high risk of diseases associated with immaturity of the central nervous system and lungs, including aspiration pneumonia because reflexes suck, swallow, and the imperfect cough and idiopathic respiratory disorder syndrome (hyaline membrane disease). Seeing this condition is very important to maintain the health of children aged ≤ 12 months by paying attention to the provision of appropriate nutrition and immunization to increase endurance so as to prevent children from infectious diseases.[21]

The results of this research are in accordance with the research conducted by Regina (2013) explaining that there is no relationship between the history of LBW and the incidence of pneumonia in children under five with the results of p-value = 0.191 (> 0.005), and Rasyid (2013). Low birth with pneumonia incidence.[30,31] The results of this study indicate that birth weight has no relationship with the incidence of pneumonia because there

are other variables that greatly influence the incidence of pneumonia. So that there is no effect, toddlers who have a history of low birth weight will experience pneumonia, it is necessary to take a look at other histories associated with pneumonia in infants.

The results of this research are fit with Jayashree's research (2019) that there is no relationship between exclusive breastfeeding and the incidence of pneumonia in India. (p> 0.005) .[24] The results of this study are consistent with the research conducted by Frengki (2013) that there is no relationship between exclusive breastfeeding and the incidence of pneumonia in children under five in the work area of Global Mongolato Health Centre which produces a p-value = 0.604 (p- value => 0.05) .[32] The results of this study indicate that toddlers with exclusive breastfeeding have the same risk of developing pneumonia in children under five at Sentolo Health Center 1. So that there is no effect of toddlers who have a 6-month history of non-exclusive breastfeeding. When having pneumonia, it is necessary to look at other histories related to pneumonia in infants.

The results of this research are suitable with the research conducted by Regina (2013) explaining that there is no relationship between immunization status and the incidence of pneumonia in infants with p-value = 0.191 (> 0.005), and Sadenna's (2014) research that there is no relationship between giving complete basic immunization with recurrent pneumonia in infants at RanotamaWeru Health Center in Manado City with p-value = 0.333. The results of the Jayashree study (2019) show that the incidence of pneumonia in infants actually occurs in infants who have received complete immunization.[24] Toddlers who have received complete basic immunization are still at risk of developing pneumonia because there are also several factors that can affect the incidence of pneumonia, namely exposure to viruses, bacteria, under-five nutrition status, as well as maternal knowledge about diseases, disease prevention and health care methods that are still lacking. If knowledge about the causes of disease, treatment and prevention is good, parents will definitely can control the health of children, therefore pneumonia will not happen to children.[33]

The results of this study indicate that the proportion of children under five who has experience pneumonia is mostly in infants with mothers who have graduated from formal education at the level of primary education, compared to children under five whose mothers have passed formal education at the high level. Based on the results of bivariate and multivariate tests showed that the relationship of factors of maternal education level with the incidence of pneumonia in infants was statistically significant.

The results of this study are in accordance with the results of a study conducted by Aminasty (2017) explained that there is an influence between the education of mothers and the incidence of pneumonia. The education variable of the mother has OR 3.773, then the chance of pneumonia is 3.773 times greater in children under five who have mothers with primary / junior high school education compared to high school / PT.[5] The education a person is lived has an influence on increasing thinking ability. Someone who is more educated will be able to make more rational decisions, generally open to accepting changes or new things compared to individuals who are low educated. In the context of health, of course, if someone's education is good enough, the symptoms of the disease will be recognized earlier and encourage the person to look for preventive measures. [43]

The mother of a toddler who has a basic education level that is education taken ≤ 9 years tends to care for her toddler who is not so good, then her toddler is easily exposed to germs through the respiratory tract so that the ISPA continues to become pneumonia. The possibility that mothers with higher education will bring their children more treatment to health facilities, but mothers with low education will prefer their children to treat by themselves. Therefore, mothers of toddlers with a primary level of education are more at risk of having their children experiencing pneumonia.[5]

The multivariate test results showed that toddlers with families who smoked had a chance of 2,144 times to experience pneumonia compared with toddlers who had families who did not smoke in one place of residence. The results of this study support previous

studied that have been examined by Gothankar Research (2019) explaining that toddlers who have a family history of smoking have a higher risk than those who do not smoke. Cigarette smoke will reduce ciliary function, destroy ciliated epithelial cells that will be converted into squamous cells and reduce humoral or cellular immunity both locally and systemically.[24] Cigarette smoke and smoke from burning fuel to cook with high concentrations can damage the lung defense mechanism so that it will make it easier the onset of pneumonia.[10]

The results of the study showed that the relationship between the history of parents' asthma factors and the incidence of pneumonia in children under five in Sentolo 1 Public Health Center in 2019 was statistically significant. From the results of the multivariate test, p-value 0.001 (<0.05) was obtained. History of asthma in parents of toddlers has a value of OR = 6,592, this showed parents of toddlers (father / mother) who have a history of asthma has a chance of 6,592 times toddlers will experience pneumonia compared with toddlers, both parents do not have a history of asthma.

The results of this study support the previous studies that have been examined by Aminasty (2017) showed that there is a relationship between the history of asthma and the incidence of pneumonia in the Regional General Hospital (RSUD) City of Padangsidimpuan in 2017.[5]The results of the study showed that the history of immunization factors with the incidence of pneumonia in infants in Sentolo 1 Public Health Center did not reach statistical significance. The results of this study are appropriate with the research conducted by Aminasty (2017) explaining that there is no relationship between the history of giving vitamin A and the incidence of pneumonia in infants with p-value = 0.825 (> 0.005), and Hartati (2011) studied that there is no relationship between history of giving vitamin A with the incidence of pneumonia in infants with p-value = 0.285. The results of this study indicate that the history of giving vitamin A has no relationship with the incidence of pneumonia, because there are other variables that greatly influence the incidence of pneumonia, namely the age of children at risk, low maternal education level, family smoking history, and a history of parents' asthma. Despite of the results of this study showed no significant relationship, it should be noted that the proportion of children under five who get vitamin A and suffer from pneumonia is still higher. This needs to be studied further by health workers how vitamin A is given. Giving vitamin A which is carried out together with immunization will cause an increase in specific antibody titers and appear to remain in a high enough value.[1,27]

CONCLUSION

There was a statistically significant relationship between the age factor of the toddler, the last education of the mother, family smoking history, and a history of asthma in the elderly with the incidence of pneumonia. The most influential factor in the incidence of pneumonia in children under five at Sentolo 1 Public Health Center in 2019 is a factor in the history of parents' asthma.

SUGGESTION

Improving health promotion to improve clean and healthy lifestyle, especially reducing smoking / not smoking at all in the home to prevent pneumonia so that families can pay more attention to pneumonia risk factors. Improve monitoring and early detection of pneumonia risk factors, namely in infants with risky toddlers, mothers of children under five with basic education, family smoking history and especially in toddlers with parents of children under five who have a history of asthma so that they can be caught early and get immediate treatment.

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PAPER EVALUATION SHEET

No.   :   07

Paper Title   : Factors affecting pneumonia among children under five

A. Evaluation objects:

		Yes	No
1	Is the paper content original?	√	
2	Does the paper title represent its content?	√	
3	Does the abstract reflect the paper content?	√	
4	Do the keywords indicate the scope of the research?	√	
5	Is the research methodology or the approach of the problem solving clearly described?		√
6	Do the data presentation and interpretation valid and reasonable?	√	
7	Do the use of tables and figures help to clarify the explanation?	√	
8	Have the discussion and/or analysis been relevant with the results of the study?	√	
9	Are the references used relevant?	√	

		Very Good	Good	Fair	Poor
10	Contribution to science?		√		
11	Originality?			√	
12	Systematic?		√		
13	Language?		√		
14	Writing accuracy?			√	

B. Reviewer Decision (select one)

1	Accept Submission	
2	Revision Required	√
3	Resubmit for Review	
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C. Comment about the paper.

1. Add the research purpose in the introduction
2. Make conclusion from the others study in the introduction
3. Complete the research method by explaning the statistic analysis
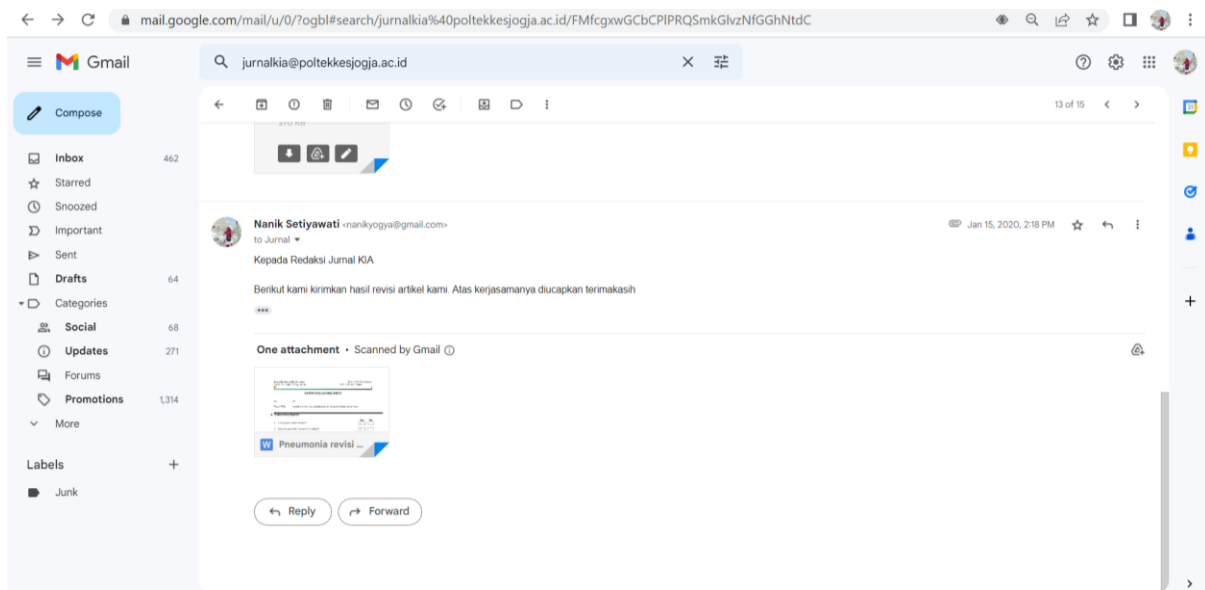
D. Note to the editors

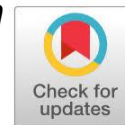1. Please, examine the sentences and phrases structure in the discussion section.

Signature of reviewer:

(………………………..)

3. BUKTI REVISI HASIL REVIEW PERTAMA : 15 JANUARI 2020

Factors affecting pneumonia among children under five in sentolo 1 public health center kulon progo 2019

ABSTRACT

Background : Prevalence of pneumonia among children under five in Indonesia reach to 20%, in Daerah Istimewa Yogyakarta 39,61% and in Sentolo 1 Public Health Center has increased from 170 pneumonia toddlers (2017) to 224 toddlers of pneumonia (2019). Pneumonia affects the deaths of infants and toddlers.**Purpose :** This study was to find out the factors that influence the incidence of pneumonia in infants. **Methods :** Analytical observational researched with case control design used secondary data from medical records from January to December 2019 and primary data from direct interviews. The subject of this study were 94 toddlers in Sentolo1 Public Health Center with a purposive random sampling technique. Data analysis used chi-square test followed by logistic regression. **Results :** The results showed that pneumonia was most prevalent among children under five with risky toddlers (66.0%), history of non-risk birth weight (83.0%), toddlers who received exclusive breastfeeding (57.4%), toddlers who had received complete basic immunization (80.9%), mothers of children under five with basic education (63.8%), toddlers who had a family history of smoking (70.2%), parents (father / mother) of toddlers who had a history of asthma (51, 1%), and toddlers who had received vitamin A (83.0%). Factors related to pneumonia in children under five were the age factor of the toddler (p-value: 0.038; 95% CI: 1.134-6.033), the last education of the mother (p-value: 0.002; 95% CI: 1.755-9,860), family smoking history (p-value: 0.036; 95% CI: 1,147-6,254), and a history of parent's asthma (p-value: 0,000; 95% CI: 2,338-18,344).

Conclusion : Age of toddler, mother's education level, family smoking history and history of parental asthma were factors that influence the incidence of pneumonia in infants. The history of parent's asthma was the most influential factor.

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INTRODUCTION

Under-five is an age group that is prone to malnutrition and prone to disease. Under-Five children must get protection to prevent disease. The disease can cause growth and development to be disrupted or even cause death.[1]The incidence of pneumonia in children under five in Indonesia in 2016 increased by 65.27% from the

previous year 63.45%.[6] The causes of the under-five children's death include infection, diarrhea, and malnutrition.[2] One of the highest causes of death due to infectious diseases in the under-five children is pneumonia.[3] Pneumonia is still the most dangerous disease that causes under-five children death and also many elderly people in the world. According to World Health Organization (WHO) in 2013, the majority of the under-five mortality is caused by pneumonia.[4] In 2015 UNICEF mentioned that the main causes of under-five mortality are; pneumonia, diarrhea, malaria, and malnutrition.[5] According to the WHO in 2013, from 8,8 million children deaths in the world, 1,6 million were due to pneumonia. More than 98% of pneumonia deaths in children occur in developing countries.[4] Pneumonia is a major public health problem in Indonesia.[6]

Pneumonia is one of the causes of 4 million deaths in infants. According to the Directorate General of Disease Control and Environmental Health, pneumonia cases in under-five children are estimated at between 10-20% per year. The incidence of pneumonia in children under-five in Indonesia in 2016 increased by 65.27% from the previous year 63.45%.6 Even though the eradication of Acute Respiratory Infection (ARI) was emphasized and focused on the prevention of under-five children pneumonia.[7] The full basic and routine immunization, and also the supply of vitamin A has also been carried out in all health services to prevent pneumonia.[8]

According to DIY Health profile year 2017, the incidence of pneumonia in toddlers in Yogyakarta is 39.61%. The number of cases of pneumonia in the highest DIY toddler is in KulonProgo Regency which is 52,17%.[8] Whereas the complete basic immunization coverage in KulonProgo has exceeded the target set and the highest coverage in DIY amounted to 99.3%, coverage The giving of breast milk (ASI) exclusively in KulonProgo Regency also occupy the second highest in DIY and the percentage of clean and healthy living behavior (PHBS) in KulonProgo Regency from 2013-2017 has always increased by 8.50%, as well as the coverage The administration of vitamin A in the KabupatanKulonProgo has reached 100%.[8] Some of these things can affect the prevention of diseases so that it increases the degree of health. The number of infants experiencing pneumonia in KulonProgo Regency in 2018 is most widely found in Sentolo Puskesmas.[1,9]

Risk factors that increase morbidity and mortality incidence of pneumonia are divided into two major groups of Instrinsik and extrinsic factors. Instrinsik factors include age, gender, nutritional status, low birth weight, immunization status, BREAST feeding, and vitamin A administration. Extrinsic factors covering housing density, air pollution, home type, ventilation, humidity, kitchen layout, Types of fuel, mosquito repellent, cigarette smoke, family income and the mother factor of good education, maternal age, and maternal knowledge.[5,10]

The results of the Aminasty study (2017) under the title "Factors related to Genesis Pneumonia in infants at the District General Hospital (RSUD) of Padangsidimpuan", based on the results of the logistic regression test indicate the presence of birth weight 4 times more influential, granting of BREASTFEEDING 5 times more influential, and asthma 5 times more influential with the incidence of pneumonia in infants, while there is no link between the administration of vitamin A with the incidence of pneumonia in the District General Hospital (RSUD) of Padangsimpuan City.[5]

The results of the research of Wijaya (2014) under the title "Relations of Smoking habit, immunization with the incidence of Pneumonia in children in PuskesmasPabuaranTumpengTangerang City". The study used a research method of analytic surveys with cross sectional approaches. Data is analyzed using ChiSquare test. The research conclusion shows that there is a significant link between the immunization status with the incidence of pneumonia in infants, where infants with incomplete immunization status have an opportunity have pneumonia 0.790 times compared with a complete immunisation status.[11]

The results of the study by Hidayat (2014) with the title of the factors associated with the incidence of pneumonia in infants in the area of Mojogedang II Health Center, Karanganyar Regency. The sample in this study amounted to 33 toddlers in the case group and 33 under-fives in the control group. The method of data collection was carried out by observational and interview. The statistical test used is the Chi-square test and as an alternative Fisher's Exact Test with a significance level of 95%. The results of the study explained that the factors associated with the incidence of pneumonia in infants were exclusive breastfeeding , use of firewood , the presence of smokers. While the factors not related to pneumonia were DPT immunization, measles immunization, nutritional status, low birth weight, Vitamin A.[12]

Dwi's research (2016) with the title "The Analysis of Multiple Linear Regression In Determining The Effect Of Low Birth Weight Infants (LBW) And Non-Exclusive Breastfeeding Occurrence Pneumonia Toward In East Java Province In 2016". Based on the results using multiple linear regression analysis, obtained significant values of each variable, namely Low Birth Weight (LBW) (0.010) and non-exclusive ASI (0.014) and also the coefficient of determination is 0.295 or 29.5%. So that there is a significant influence between Low Birth Weight Babies (LBW) and breastfeeding (ASI) Exclusive to the occurrence of pneumonia.[13]

Based on the results of previous studies there are results that are inconsistent with the factors that affect pneumonia. So this research was conducted aiming to find out the most influential factor with the incidence of pneumonia in toddlers

METHOD

This study was an observational analytic study with case-control design. The sampling technique used in this study was simple random sampling. The number of samples in this study were 94 people. Respondents in this study were under-five children who conducted medical examinations at Sentolo 1 Public Health Center in 2019. Data collection is carried out from 12-15 March 2019. This research was conducted with an analytic observational research or analytic survey. Degree of confidence in this study using 95%

RESULT

The following is a factors proportion of age, birth weight, the status of exclusive breastfeeding, the status of full basic immunization, mother's education level, smoking history in family, asthma history in family, and history of supplying of vitamin A in the under-five children at Sentolo 1 Public Health Center in 2019.

Table 1. Characteristics Respondent

Variable	Case N= 47		Control N= 47	
	n	%	N	%
Age of Children				
At Risk (<1 years)	31	66	20	42.6
No Risk (> 1years)	16	34	27	57.4
Birth Weight				
At Risk (<2500g)	8	17	6	12.8
No Risk (>2500g)	39	83	41	87.2
Status of Exclusive Breastfeeding				
At Risk (no Exclusive breastfeeding until 6 month)	20	42.6	15	31.9
No risk (exclusive breastfeeding)	27	57.4	32	68.1
Status of Immunization				
At Risk (not completed)	9	19.1	14	54.7
Risk Free (completed)	38	80.9	33	45.3
Education level				
Basic	30	63.8	14	29.8
High/Advance	17	36.2	32	70.2
Smoking History in Family				
Smoking	33	70.2	22	46.8
Not Smoking	14	29.8	25	53.7
Asthma History in Family				
Yes	23	48.9	6	12.8
No	24	51.1	41	87.2
History of vitamin A supply				
Supplied	8	17	10	21.3
Not Supplied	39	83	37	78.7

Table 2. The Variable Relation with Pneumonia Incidence In Under-Five Children

Variabel	p-value	OR	95% CI	
			Lower	Upper
The age of under-five children	0.038*	2.616	1.134	6.033
Birth weight	0.772	1.402	0.446	4.408
Status of exclusive breastfeeding	0.393	1.580	0,680	3.671
Status of Immunization	0.337	0.558	0.214	1.456

Education Level	0.002*	4.160	1.755	9.860
Family Smoking History	0.036*	2.679	1.147	6.254
Family Asthma History	0.000*	6.549	2.338	18.344
History of vitamin A Supply	0.793	0.759.	0.270	2.132

Notes: * significant p-value <0.05

Analysis with the chi-square test for the relationship of several factors with the incidence of pneumonia in children under five at Sentolo 1 Public Health Center in 2019 shows that the age variable of the under-five children (p-value = 0.038), under-five children mother's education level (p-value = 0.002), family smoking history (p-value = 0.036), and family asthma history (p-value = 0.000) has p-value <0.05. This shows that there is a relationship that is statistically significant between the age factors of the under-five children, mother's level of education, smoking history of children's family, asthma history in family with pneumonia incidence in under-five children at Sentolo 1 Public Health Centre in 2019.

The analysis result using chi square test for the relationship of birth weight factors (p-value= 0.772), status of exclusive breastfeeding (p-value= 0.393), status of immunization (p-value = 0.337), and the provision of vitamin A (p-value = 0.793) with pneumonia incidence at Sentolo 1 Public Health Centre in 2019 shows that the relationship is not statistically significant since each of those factors has p-value >0.05.

After going through the chi-square test, then the logistic regression test then carried out which is a further development as a multivariate chi square. In the final analysis of the logistic regression test, the variables that influence the incidence of pneumonia in infants were included by entering a significant variable only (p-value <0.25), then statistically shown that the risk factors were significantly which associated with the incidence of pneumonia in infants age toddlers, mother's education level, family smoking history, parents' history of asthma. Furthermore, the four variables were analyzed by a Logistic Regression Test.

Table 3. Variable Logistic Regression Test Results

Variabel	B	Exp.(B)	Sig.	95% CI	
				Lower	*Upper*
1 Age of Toddler	1.250	3.489	0.017	1.252	9.724
Mother's Education level	1.408	4.088	0.006	1.499	11.149
Smoking History	0.763	2.144	0.134	0.792	5.805
Parents' Asthma History	1.891	6.626	0.001	2.137	21.098
2 Age of Toddler	1.338	3.812	0.010	1.386	10.485
Mother's Education	1.477	4.378	0.003	1.625	11.791
Parents' Asthma History	1.900	6.683	0.001	2.137	20.892

Smoking history has p-value 0.134 (p-value> 0.05) so it must be carried out and obtained the final results in the next table as shown in the table above. Based on these results the most influential factor in the incidence of pneumonia in infants is a factor of parental asthma history with the highest OR of 6,683.

DISCUSSION

The data which acquired were analyzed through three types of tests. The test was univariate, bivariate with chi square test, and multivariate using logistic regression test. The following discussion is the results of this research.Toddlers who have a risky age (≤ 12 months) have 3,812 times the chance to experience pneumonia compared to toddlers who have a non-risk age (> 12 months) (Exp. (B) = 3,812). The results of this research are agreed with the results of research conducted by Hartati (2011) which explained that toddlers aged ≤ 12 months had a chance of 3.24 times to suffer from pneumonia

compared to toddlers aged ≥ 12 months. Toddlers have defence mechanism body that still weak compared to adults, children aged 0-24 months are more susceptible to pneumonia than children over the age of 2 years. This is caused by imperfect immunity and relatively a narrow respiratory tract so that it has a high risk of diseases associated with immaturity of the central nervous system and lungs, including aspiration pneumonia because reflexes suck, swallow, and the imperfect cough and idiopathic respiratory disorder syndrome (hyaline membrane disease). Seeing this condition is very important to maintain the health of children aged ≤ 12 months by paying attention to the provision of appropriate nutrition and immunization to increase endurance so as to prevent children from infectious diseases.[21]

The results of this research are in accordance with the research conducted by Regina (2013) explaining that there is no relationship between the history of LBW and the incidence of pneumonia in children under five with the results of p-value = 0.191 (> 0.005), and Rasyid (2013). Low birth with pneumonia incidence.[30,31] The results of this study indicate that birth weight has no relationship with the incidence of pneumonia because there are other variables that greatly influence the incidence of pneumonia. So that there is no effect, toddlers who have a history of low birth weight will experience pneumonia, it is necessary to take a look at other histories associated with pneumonia in infants.

Jayashree's research (2019) reported that there is no relationship between exclusive breastfeeding and the incidence of pneumonia in India. (p> 0.005) .[24] The results of this study are consistent with the research conducted by Frengki (2013) that there is no relationship between exclusive breastfeeding and the incidence of pneumonia in children under five in the work area of Global Mongolato Health Centre which produces a p-value = 0.604 (p- value => 0.05) .32 The results of this study indicate that toddlers with exclusive breastfeeding have the same risk of developing pneumonia in children under five at Sentolo Health Center 1. So that there is no effect of toddlers who have a 6-month history of non-exclusive breastfeeding. When having pneumonia, it is necessary to look at other histories related to pneumonia in infants.

Regina (2013) explaining that there is no relationship between immunization status and the incidence of pneumonia in infants with p-value = 0.191 (> 0.005), and Sadenna's (2014) research that there is no relationship between giving complete basic immunization with recurrent pneumonia in infants at RanotamaWeru Health Center in Manado City with p-value = 0.333. The results of the Jayashree study (2019) show that the incidence of pneumonia in infants actually occurs in infants who have received complete immunization.[24] Toddlers who have received complete basic immunization are still at risk of developing pneumonia because there are also several factors that can affect the incidence of pneumonia, namely exposure to viruses, bacteria, under-five nutrition status, as well as maternal knowledge about diseases, disease prevention and health care methods that are still lacking. If knowledge about the causes of disease, treatment and prevention is good, parents will definitely can control the health of children, therefore pneumonia will not happen to children.[33]

The results of this study indicate that the proportion of children under five who has experience pneumonia is mostly in infants with mothers who have graduated from formal education at the level of primary education, compared to children under five whose mothers have passed formal education at the high level. Based on the results of bivariate and multivariate tests showed that the relationship of factors of maternal education level with the incidence of pneumonia in infants was statistically significant.

The results of this study are in accordance with the results of a study conducted by Aminasty (2017) explained that there is an influence between the education of mothers and the incidence of pneumonia. The education variable of the mother has OR 3.773, then the chance of pneumonia is 3.773 times greater in children under five who have mothers with primary / junior high school education compared to high school / PT.[5] The education a person is lived has an influence on increasing thinking ability. Someone who

is more educated will be able to make more rational decisions, generally open to accepting changes or new things compared to individuals who are low educated. In the context of health, of course, if someone's education is good enough, the symptoms of the disease will be recognized earlier and encourage the person to look for preventive measures. [43]

The mother of a toddler who has a basic education level that is education taken ≤ 9 years tends to care for her toddler who is not so good, then her toddler is easily exposed to germs through the respiratory tract so that the ISPA continues to become pneumonia. The possibility that mothers with higher education will bring their children more treatment to health facilities, but mothers with low education will prefer their children to treat by themselves. Therefore, mothers of toddlers with a primary level of education are more at risk of having their children experiencing pneumonia.[5]

The multivariate test results showed that toddlers with families who smoked had a chance of 2,144 times to experience pneumonia compared with toddlers who had families who did not smoke in one place of residence. The results of this study support previous studied that have been examined by Gothankar Research (2019) explaining that toddlers who have a family history of smoking have a higher risk than those who do not smoke. Cigarette smoke will reduce ciliary function, destroy ciliated epithelial cells that will be converted into squamous cells and reduce humoral or cellular immunity both locally and systemically.[24] Cigarette smoke and smoke from burning fuel to cook with high concentrations can damage the lung defense mechanism so that it will make it easier the onset of pneumonia.[10]

The results of the study showed that the relationship between the history of parents' asthma factors and the incidence of pneumonia in children under five in Sentolo 1 Public Health Center in 2019 was statistically significant. From the results of the multivariate test, p-value 0.001 (<0.05) was obtained. History of asthma in parents of toddlers has a value of OR = 6,592, this showed parents of toddlers (father / mother) who have a history of asthma has a chance of 6,592 times toddlers will experience pneumonia compared with toddlers, both parents do not have a history of asthma.

The results of this study support the previous studies that have been examined by Aminasty (2017) showed that there is a relationship between the history of asthma and the incidence of pneumonia in the Regional General Hospital (RSUD) City of Padangsidimpuan in 2017.[5]The results of the study showed that the history of immunization factors with the incidence of pneumonia in infants in Sentolo 1 Public Health Center did not reach statistical significance. The results of this study are appropriate with the research conducted by Aminasty (2017) explaining that there is no relationship between the history of giving vitamin A and the incidence of pneumonia in infants with p-value = 0.825 (> 0.005), and Hartati (2011) studied that there is no relationship between history of giving vitamin A with the incidence of pneumonia in infants with p-value = 0.285. The results of this study indicate that the history of giving vitamin A has no relationship with the incidence of pneumonia, because there are other variables that greatly influence the incidence of pneumonia, namely the age of children at risk, low maternal education level, family smoking history, and a history of parents' asthma. Despite of the results of this study showed no significant relationship, it should be noted that the proportion of children under five who get vitamin A and suffer from pneumonia is still higher. This needs to be studied further by health workers how vitamin A is given. Giving vitamin A which is carried out together with immunization will cause an increase in specific antibody titers and appear to remain in a high enough value.[1,27]

CONCLUSION

There was a statistically significant relationship between the age factor of the toddler, the last education of the mother, family smoking history, and a history of asthma in the elderly with the incidence of pneumonia. The most influential factor in the incidence

of pneumonia in children under five at Sentolo 1 Public Health Center in 2019 is a factor in the history of parents' asthma.

SUGGESTION

Improving health promotion to improve clean and healthy lifestyle, especially reducing smoking / not smoking at all in the home to prevent pneumonia so that families can pay more attention to pneumonia risk factors. Improve monitoring and early detection of pneumonia risk factors, namely in infants with risky toddlers, mothers of children under five with basic education, family smoking history and especially in toddlers with parents of children under five who have a history of asthma so that they can be caught early and get immediate treatment.

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