Public Health Perspectives Journal 6 (3) 2021 254-261

Public Health Perspectives Journal

http://journal.unnes.ac.id/sju/index.php/phpj

An Analysis Factors Affecting the Cases of Pneumonia in Toddlers at Public Health Center (Puskesmas) Pati I

Ulvarine Yuliniar✉, Yuni Wijayanti, Dyah Rini Indriyanti

Universitas Negeri Semarang, Indonesia

Article Info

Article History:
Accepted
23 May 2021
Approved
1 July 2021
Published
23 December 2021

Keywords:
age, breastfeeding, nutritional status, family income, family smoking habits, ventilation, and the incidence of pneumonia

Abstract

Pneumonia is an inflammatory condition of the lung primarily affecting the small air sacs known as alveoli. It is an Acute Respiratory Infection (ARI) that attacks the lung tissue which is characterized by coughing accompanied by rapid breathing or shortness of breath. Pneumonia often occurs and attacks the community, especially toddlers at Public Health Center (PUSKESMAS) Pati I in Pati Regency. There are many unknown factors of this disease. The purpose of this study was to analyze the intrinsic and extrinsic factors causing pneumonia in children under five years old at Publich Health Center (PUSKESMAS) Pati I. The research method used in this study was an analytical survey with a case control study design. The total sampling used was 35 toddlers. The sampling technique used was total sampling. Observations were made through direct observation and measurement of age, breastfeeding, nutritional status, family income, family smoking habits, ventilation, and the incidence of pneumonia in children under five years old or toddlers. The data in this study was analyzed by using Univariate, Bivariate and Multivariate analysis. The results showed that nutritional status (p=0.046), smoking habits (p=0.03) and ventilation (p=0.000) has an effect on the incidence of pneumonia. Meanwhile, age (p=0.398), breastfeeding (p=0.464), and family income (p=0.497) has no effect on the incidence of pneumonia. The most influential factor on the incidence of pneumonia in children under five years old or toddlers is home ventilation with an odds ratio of 40,866. Efforts to improve the health condition of toddlers with pneumonia at Public Health Center Pati I are carried out with Psychoeducation and Health Education activities.

✉Correspondent Address:
Kampus Unnes Jl Kelud Utara III, Semarang, 50237, Indonesia
E-mail: ulvarineyuliniar93@gmail.com

p-ISSN 2528-5998
e-ISSN 2540-7945

INTRODUCTION

Pneumonia is the single largest infectious cause of death in children worldwide. It is about 15% and and it is estimated that there were 922,000 cases of pneumonia occurred in children under five years old or toddlers in 2015. Pneumonia affects all ages in all regions, but it is most common in South Asia and sub-Saharan Africa. Populations that are susceptible to pneumonia are children aged less than 2 years, elderly people over 65 years and people who have health problems (malnutrition, immunological disorders). The estimates of pneumonia cases nationally are 3.55%, but the estimated number of cases in each province uses different numbers according to predetermined figures (Ministry of Health of the Republic of Indonesia, 2016).

The cases of pneumonia in Kenya, the state of East Africa, found the most cases of pneumonia in children and middle age (Onyango, et al, 2012). Another study found that boys (mean age 9 months) were admitted with severe pneumonia, 1041 (25%) were acutely malnourished (6.4%) had a positive HIV antibody test, and 364 (8.7%) died in hospital (Ngari et al*.,* 2017). The risk factors that increase the morbidity and mortality of pneumonia are divided into two major groups, namely intrinsic factors and extrinsic factors (Kasundriya et al., 2020).

Data obtained from the Health Profile of Central Java shows data on finding the incidence of pneumonia in 2015, from 1,408,716 toddlers as many as 52,842 (53.31%) had pneumonia. Pneumonia case data in Central Java shows that Pati Regency is the 7th area related to pneumonia cases and the fewest found and treated are 145 (4.4%) of the 3,296 estimated patients (Central Java Provincial Health Office, 2016).

Data at Public Health Center (PUSKESMAS) Pati I from January to September 2018 showed that there were 90 cases of pneumonia in toddlers. Based on the results of observations and interviews with 5 mothers whose children had pneumonia, it was found that the age of the affected children was still under five years old or in the toddler category, undernourished children, some were not given exclusive breastfeeding, were not immunized against measles and rarely given vitamin A. In addition, the condition of the living environment or surrounding area is a risk factor for the cases of pneumonia in Public Health Center Pati I, there are still many families of toddlers who smoke, their houses have poor ventilation, and even does not meet the requirements.

According to Yulendasari, (2019), there are some factors causing the cases of pneumonia, intrinsic factors include age, gender, nutritional status, low birth weight, immunization status, breastfeeding, and vitamin A administration. Extrinsic factors include residential density, air pollution, type of house, ventilation, humidity, location of the kitchen, type of fuel, the use of mosquito repellent, cigarette smoke, family income and maternal factors include mother's education, mother's age, and mother's knowledge.

According to research by Nikmah et al, (2015) intrinsic factors that cause pneumonia are exclusive breastfeeding and nutritional status, while extrinsic factors that cause pneumonia include floor type, floor conditions, and house ventilation. Based on the research of Sarmia and Suhartatik (2014), it was explained that the dominant factor causing pneumonia came from intrinsic factors such as nutritional status, complete immunization, and a history of LBW (Low birthweight is when a baby is born weighing less than 5 pounds, 8 ounces) with the incidence of pneumonia in toddlers.

According to research conducted by Wijaya & Herwanti (2014), it shows that toddlers who have families with smoking habits have 1,269 times the chance of experiencing pneumonia compared to toddlers who do not have families with smoking habits. Research conducted by Wardani, Winarsih & Sukini (2015) showed a relationship between exposure to cigarette smoke and the incidence of ARI (Accute Respiratory Infection) in toddlers.

Based on the formulation of the problem above, the objective of this study was: To analyze the factors affecting the cases of pneumonia in children under five years old or toddlers at Public Health Center (PUSKESMAS) Pati I in Pati Regency.

METHOD

This study was an analytical survey research with a case control study design to determine the factors affecting the cases of pneumonia in children

under five years old or toddles. This study applied a retrospective approach.

The population in this study was toddlers who were in the working area of the Public Health Center (PUSKESMAS) Pati I in Pati Regency. There were 35 toddlers in 2020 and the sample selection was carried out by using a total sampling technique. The data was analyzed by using Univariate Analysis, Bivariate Analysis. The data in this study was obtained from questionnaires, interviews and observations.

The variables of this study include independent variables and dependent variables. The independent variables in this study were breastfeeding, nutritional status, family income, family smoking habits, ventilation, and age. Meanwhile, the dependent variable in this study was the cases of pneumonia.

RESULTS AND DISCUSSION

This study was conducted at the Public Health Center (PUSKESMAS) Pati I in Pati Regency in 2020, with the aim of analyzing the intrinsic and extrinsic factors that cause pneumonia in toddlers at Public Health Center (PUSKESMAS) Pati I in Pati Regency.

Table 1. Univariate Analysis of Frequency Distribution Based on Characteristics of Respondents (Age).

Based on the research, obtained data about the age of the respondents as presented in table 1 below.

Table 1. Distribution of frequency and percentage of the age of respondents of toddlers (n=35)

Age	Frequency	Percentage
Risky (toddlers < months old)	28	22.9
Not risky (2 months – years)	527	77.1
Total	35	100

Table 2. Univariate Analysis of Respondents Distribution Based on Respondents Characteristics (Nutritional Status).

Based on the research, obtained data about the nutritional status of the respondents as presented in table 2 below.

Table 2. Distribution of frequency and percentage of the nutritional status of respondents toddlers (n=35)

Nutritional status	Frequency	Percentage
Good	12	34.3
Average	21	60
Poor	2	5,7
Total	35	100

Table 3. Univariate Analysis of Frequency Distribution Based on Characteristics of Respondents (Breastfeeding).

Based on the research, obtained data about respondents' breastfeeding as presented in table 3 below.

Table 3. Distribution of frequency and percentage of breastfeeding in respondents toddlers (n=35)

Breastfeeding	Frequency	Percentage
Not Exclusive	19	54.3
Exclusive	16	45.7
Total	35	100

Table 4. Univariate Analysis of Frequency Distribution Based on Characteristics of Respondents (Family Income).

Based on the research, obtained data about family income as presented in table 4 below.

Table 4. Distribution of frequency and percentage of family income of respondents toddlers (n=35).

Income	Frequency	Percentage
High	11	31.4
Low	24	68.6
Total	35	100

Table 5. Univariate Analysis of Frequency Distribution Based on Respondents Characteristics (Smoking Habits).

Based on the research, obtained data about smoking habits as presented in table 5 below.

Table 5. Distribution of frequency and percentage of of smoking habit respondents (n=35).

Smoking Habit	Frequency	Percentage
Smoking	24	68.6
Not smoking	11	31.4
Total	35	100

Table 6. Univariate Analysis of Frequency Distribution Based on Characteristics of Respondents (Ventilation).

Based on the research, obtained data about ventilation as presented in table 6 below.

Table 6. Distribution of frequency and percentage of household ventilation of respondent toddlers (n=35).

Ventilation	Frequency	Percentage
Adequate	22	62.9
Not adequate	13	37.1
Total	35	100

Table 7 Univariate Analysis of Frequency Distribution Based on Characteristics of Respondents (Occurrence of Pneumonia).

Based on the research, obtained data about the cases of pneumonia as presented in table 7 below.

Table 7. Distribution of frequency and percentage of the cases of pneumonia in toddlers (n=35).

Cases of Pneumonia	Frequency	Percentage
Suffering from pneumonia	22	62.9
Not suffering from Pneumonia	13	37.1
Total	35	100

Table 8. Bivariate Analysis of Frequency Distribution Based on the Cases of Pneumonia at Public Health Center Pati I in Pati Regency.

Correlation between variables	Correlation coefficient	p value	Interpretation
Age – Cases of pneumonia in toddlers	- 0.145	0.398	Ho accepted
Nutritional status - Cases of pneumonia in toddlers	- 0.335	0.046	Ho rejected
Breastfeeding - Cases of pneumonia in toddlers	0.125	0.464	Ho accepted
Family income- Cases of pneumonia in toddlers	0.116	0.497	Ho accepted
Smoking habit - Cases of pneumonia in toddlers	0.371	0.03	Ho rejected
Ventilation - Cases of pneumonia in toddlers	- 0.691	0.000	Ho rejected

Based on the results of the study, obtained data on the effect of independent variables (age, nutritional status, breastfeeding, family income, family smoking habits, and home ventilation on the dependent variable (the cases of pneumonia in toddlers) as presented in table 8 below.

As presented in table 8 above, the results of the Kendall'stau bivariate correlation test show a significant value (p value) for the relationship between the six variables is 0.398; 0.046; 0.064; 0398; 0.497; 0.03 and 0.000 <0.05, it can be concluded that Ho is rejected or Ha is accepted, which means that there is a significant relationship between nutritional status, smoking habits of toddler's families, and home ventilation of toddlers with the cases of pneumonia in toddlers.

The results of Kendall'stau analysis for testing the research hypothesis show the value of sig. 0.398 > 0.05 which means Ho is accepted, and Ha is rejected. This means that there is no significant relationship between age and the cases of

pneumonia in toddlers. This happened since there are other variables which are intrinsic and extrinsic factors of the host (toddlers) instead of age that can allow pneumonia if the exposure frequency (response dose) is greater.

The results of this study are in line with the research conducted by Oktaviani and Maesaroh (2017) entitled *Factors Associated with Pneumonia Incidence in Toddlers at Teluknaga District Health Center, Tangerang Regency*. The results showed that there was no relationship between age and the incidence of pneumonia in toddlers with statistical test results p = 0.572 or p>0.05.

The results of the research above are inversely proportional to the concept of disease epidemiology proposed by Prabawa and Azinar, (2017) which states that age is an indicator of a risk factor for a disease. And one of the risk factors for pneumonia in toddlers is toddlers less than 2 years old. Although this study shows that there is no relationship between age and the incidence of pneumonia, health care interventions for children aged 12 months should continue to be improved to reduce the susceptibility to various pneumonia diseases.

The results for testing the research hypothesis show the value of sig. 0.046 < 0.05 which means Ho is rejected, and Ha is accepted. This means that there is a significant relationship between nutritional status and the cases of pneumonia in toddlers in the working area of Public Health Center (PUSKESMAS) Pati I in Pati Regency. This result is in line with the research conducted by (Sugihartono et al., 2012) which found that children with malnutrition had a risk of pneumonia by 3.1 times compared to children who had good nutrition.

In contrast to the research by (Rigustia et al, 2019) which found that toddlers with good nutritional status had a higher incidence of pneumonia than toddlers with poor nutritional status, the level of energy and protein consumption were direct factors that affected the nutritional status of toddlers.

According to researchers, nutritional status is a very important health indicator for toddlers. Good nutritional intake will provide a good immune system against various diseases including pneumonia in toddlers.

From the results of Kendall'stau analysis for testing the research hypothesis, it shows the value of sig. 0.464 > 0.05 which means Ho is accepted, and Ha is rejected. This means that there is no significant relationship between breastfeeding and the cases of pneumonia in toddlers. The result of this study is similar to the research conducted by (Kulsum et al., 2019) entitled *Pneumonia Incidence in Toddlers and the History of Breastfeeding at the UPT Health Center of Japan Kudus*, the results of the Chi-square test showed that the p value = 0.091> 0.05 then Ho was accepted. Therefore, it can be concluded that there is no effect between exclusive breastfeeding and the incidence of pneumonia in toddlers.

The results of the research above are inversely proportional to the research conducted by (Aldriana, 2015). From the data analysis conducted by using the chi square test between exclusive breastfeeding and pneumonia, the results obtained p value of 0.0001, from this value it can be seen that p value < 0.05 which means that there is a significant relationship between exclusive breastfeeding and pneumonia in toddlers in the working area of Rambah Samo Health Center 1 in 2014. From the results of this analysis also obtained an OR value = 14,778, which means that toddlers who do not receive exclusive breastfeeding have a 14 times greater chance of suffering from pneumonia, thus, it can be concluded that there is a relationship between nutritional status and the incidence of pneumonia in toddlers.

Exclusive breastfeeding is one of the way to improve infant health (Ichsan et al, 2015).

Because breast milk contains nutrients that are balanced for the baby's needs, in an easily digestible form, and with high biological availability (Atabik, 2014).

The state of nutritional health depends on the level of consumption of nutrients found in daily food (Rahim, 2014).

However, in this study, breastfeeding had no significant effect on the cases of pneumonia in toddlers.

According to the researcher, there are other factors that can cause pneumonia such as nutritional status, where poor nutritional status can cause the immune system of toddlers to be susceptible to diseases such as infections, since the better the

nutritional status, the better the immune system will be.

The results of Kendall'stau analysis for testing the research hypothesis show the value of sig. 0.497 > 0.05 which means Ho is accepted, and Ha is rejected. This means that there is no significant relationship between family income and the cases of pneumonia in toddlers in the working area of Public Health Center (PUSKESMAS) Pati I in Pati Regency.

Most of the respondents have low family income or Rp. 1,891,000, - while high family income is above Rp. 1,891,000.

Based on the research above, the frequency distribution of research respondents based on the characteristics of family income was 11 respondents with high family income (31.4%), and 24 respondents (68.6%) respondents with low family income.

The results of this study are not in line with the research from Mentari (2020), that the results of the bivariate analysis of family income levels obtained p value = 0.026 (p < 0.05) with a PR value of 1.443 (95% CI: 1.040 - 2.003), therefore, it can be concluded that there is a relationship between family income level and the parenting of stunting toddlers in a case study at Public Health Center Bandar I.

Statistical test results show that family income is not a factor that affects the cases of pneumonia in toddlers which is not in accordance with Green's theory.

It is possible since health services are increasingly affordable for the community, especially primary health services that can be obtained free of charge or cross-subsidized through BPJS.

The results of Kendall'stau analysis for testing the research hypothesis show the value of sig. 0.03 < 0.05 which means that Ho is rejected, and Ha is accepted. It can be concluded that there is a significant relationship between smoking habits and the cases of pneumonia in toddlers.

The results of this study are in line with the research conducted by Leonardus & Anggraeni, (2019) that the incidence of pneumonia in toddlers who have family members who smoke are 31 people with a presentation of 81.6%. The incidence of pneumonia in toddlers who do not have smoking family members is 0 with a percentage of 0.00%. From the results of the chi square statistical test, it was obtained that the P value was equal to 0.000 or p value <0.05, which means that there is a relationship between the presence of smoking family members and the incidence of pneumonia in toddlers who are treated at Lewoleba Hospital, East Nusa Tenggara. Thus, it can be concluded that there is a relationship between the presence of smoking family members with the incidence of pneumonia in toddlers.

The results of the study above are inversely proportional to the research by Dewiningsih (2018), that exposure to cigarette smoke in the house has a p-value= 0.654 (p>0.05). Indoor air pollution and from combustible materials have usually been determined to increase the risk of pneumonia in children by about 80% and the presence of poor ventilation in the home has also contributed to a higher pneumonia risk in children (Kasundriya et al, 2020). Thus, it can be concluded that there is no relationship between exposure to cigarette smoke in the house and the incidence of pneumonia for toddlers aged 12-59 months in the area of Public Health Center Kedungmundu.

According to the researcher, the presence of smoking family members has an impact on toddlers. Cigarette smoke which contains various pollutant substances can be inhaled by toddlers can cause respiratory infections such as pneumonia. Cigarette smoke contains particles such as polycyclic hydrocarbons, carbon monoxide, nicotine, nitrogen oxides and acrolein which can cause damage to the ciliated epithelium, reduce mucociliary clearance and suppress phagocytic activity and bactericidal effects, thereby disrupting the lung defense system.

Parents are expected not to be close to toddlers when smoking since cigarette smoke can cause pneumonia in toddlers. Smoking activities are mainly carried out by the head of the family, such as the toddler's own father, grandfather, and uncle.

Based on the research data, it shows that there is a relationship between home ventilation and the cases of pneumonia in toddlers in the working area of Public Health Center (PUSKESMAS) Pati I in Pati regency. It can be seen from the bivariate analysis obtained p = 0.000. These results mean that home ventilation has a

relationship with the cases of pneumonia in toddlers.

The result of this analysis is similar to the result of the research by Padmanobo (2012) which states that home ventilation is a risk factor for the incidence of pneumonia in children under five with an OR of 2.21.

This is supported by the research conducted by Yudiastuti (2015) in Denpasar City in 2015 that sunlight serves to kill pathogenic bacteria that live in the house, such as streptococcus pneumoniae bacteria which can survive for several days in ordinary hatchery and die in direct sunlight.

Based on the results of this study, through the bivariate test, obtained 3 significant variables from the factors that influence the cases of pneumonia in toddlers, namely nutritional status, smoking habits, and ventilation.

Based on the research data, it shows that there is a relationship between home ventilation and the cases of pneumonia in toddlers in the working area of Public Health Center (PUSKESMAS) Pati I in Pati Regency. It can be seen from the bivariate analysis obtained p = 0.000. These results mean that home ventilation has a relationship with the cases of pneumonia in toddlers.

The results of the multivariate logistic regression analysis showed that the nutritional status variable had no significant effect on the incidence of pneumonia in toddlers with a probability value of 0.246 > 0.05. The other two variables, namely smoking habits and home ventilation have a significant effect on the incidence of pneumonia as evidenced by the probability value < 0.05.

CONCLUSION

Toddler age, exclusive breastfeeding and family income have no effect on the cases of pneumonia in toddlers at Public Health Center (PUSKESMAS) Pati I in Pati Regency. Meanwhile, the nutritional status of toddlers, family smoking habits, and home ventilation of toddlers affect the cases of pneumonia in toddlers at Public Health Center (PUSKESMAS) Pati I in Pati Regency. The most influential factor on the cases of pneumonia in toddlers at Public Health Center (PUSKESMAS) Pati I in Pati Regency is the ventilation of the house.

REFERENCES

Aldriana, N. (2015). Faktor-Faktor Yang Berhubungan Dengan Pneumonia Pada Balita Di Wilayah Kerja Puskesmas Rambah Samo 1 Tahun 2014. *Jurnal Maternity and Neonatal*, 1(6), 262-266.

Atabik, A. (2014). Faktor Ibu Yang Berhubungan Dengan Praktik Pemberian Asi Eksklusif Di Wilayah Kerja Puskesmas Pamotan. *Unnes Journal of Public Health*, 3(1), 1–9.

Dewiningsih, U. (2018). Faktor Lingkungan dan Perilaku Kejadian Pneumonia Balita Usia 12-59 Bulan. *Higeia Journal Of Public Health*, 2(3), 453- 464.

Dinas Kesehatan Kota Semarang, (2016). Profil Dinas Kesehatan Kota Semarang. Semarang: Dinas Kesehatan Kota Semarang.

Ichsan, B., Salimo, H., & Soebijanto, H.A.A. (2015). Keefektifan Program Kelompok Pendukung Ibu Dalam Mengubah Perilaku Ibu Menyusui. *Jurnal Kesehatan Masyarakat*, 10(2), 186–194.

Kasundriya, S. K., Dhaneria, M., Mathur, A., & Pathak, A. (2020). Incidence and risk factors for severe pneumonia in children hospitalized with Pneumonia in Ujjain, India. *International Journal of Environmental Research and Public Health*, 17(13), 1–16.

Kementerian Kesehatan Republik Indonesia. (2016). Profil Kesehatan Indonesia Tahun 2015. Jakarta: Kementerian Kesehatan Republik Indonesia.

Kulsum, U., Astuti, D., & Wigati, A. (2019). Kejadian Pneumonia Pada Balita Dan Riwayat Pemberian Asi Di Upt Puskesmas Jepang Kudus. *Jurnal Ilmu Keperawatan Dan Kebidanan*, 10(1), 130-135.

Leonardus, I., & Anggraeni, L.D. (2019). Faktor – Faktor Yang Berhubungan Dengan Kejadian Pneumonia Pada Balita Di RSUD

Lewoleba. *Jurnal Keperawatan Global*, 4(1), 12–24.

Mentari, T. S. (2020). Pola Asuh Balita Stunting Usia 24-59 Bulan. *Higeia Journal of Public Health Research and Development*, 4(4), 610–620.

Ngari, M. M., Fegan, G., Mwangome, M.K., Ngama, M.J., Mturi, N., Scott, J.A.G., Bauni, E., Nokes, D.J., & Berkley, J.A. (2017). Mortality after Inpatient Treatment for Severe Pneumonia in Children: a Cohort Study. *Pediatric and Perinatal Epidemiology,* 31(3), 233–242.

Nikmah, A., Rahardjo, S.S., & Qadrijati, I. (2015). Indoor Smoke Exposure and Other Risk Factors of Pneumonia among Children Under Five in Karanganyar, Central Java. *Journal of Epidemiology and Public Health*, 3(1), 25–40.

Oktaviani, I., & Maesaroh, S. (2017). Faktor Faktor Yang Berhubungan Dengan Kejadian Pneumonia Pada Balita di Puskesmas Kecamatan Teluknaga Kabupaten Tangerang. *Jurnal Komunikasi Kesehatan*, 18(01), 29-44.

Onyango, D., Kikuvi, G., Amukoye, E., & Omolo, J. (2012). Risk factors of severe pneumonia among children aged 2-59 months in western Kenya: A case control study. *Pan African Medical Journal*, 13(01)*,* 1–13.

Padmanobo, H., Setiani, O., & Joko, T. (2012). Hubungan Faktor-Faktor Lingkungan Fisik Rumah dengan Kejadian Pneumonia pada Balita di Wilayah Kerja Puskesmas Jatibarang Kabupaten Brebes. *Jurnal Kesehatan Lingkungan Indonesia,* 11(2), 194-198.

Prabawa, H. E., & Azinar, M. (2017). Faktor - Faktor Yang Berhubungan Dengan Praktik Penemuan Pneumonia Balita Oleh Bidan. *Unnes Journal of Public Health*, 6(3), 149-154.

Rahim, F. K. (2014). Faktor Risiko Underweight Balita Umur 7-59 Bulan. *Jurnal Kesehatan Masyarakat*, 9(2), 115-121.

Rigustia, R., Zeffira, L., & Vani, A.T. (2019). Faktor Risiko yang Berhubungan dengan Kejadian Pneumonia pada Balita di Puskesmas Ikur Kota Kota Padang. *Health & Medical Journal,* 1(1), 22-29.

Sarmia, & Suhartatik. (2014). Determinan Kejadian Pneumonia Pada Balita Di RSUD Labuang Baji Makassar 2013. *Journal Of Pediatric Nursing*, 1(1), 047-052.

Sugihartono., Rahmatullah, P., & Nurjazuli. (2012). Analisis Faktor Resiko Kejadian Pneumonia ada Balita Di Wilayah Kerja Puskesmas Sidorejo Kota Pagar Alam. *Jurnal Kesehatan Lingkungan*, 11(1), 14412-4939.

Wardani, N. K., Winarsih, S., & Sukini, T. (2015). Hubungan Antara Paparan Asap Rokok Dengan Kejadian ISPA Pada Balita di Desa Pucung Rejo Kabupaten Magelang Tahun 2014. *Jurnal Kebidanan*, 5(10), 30-37.

Wijaya, I. G.K., & Herwanti, B. (2014). Hubungan Kebiasaan Merokok, Imunisasi Dengan Kejadian Penyakit Pneumonia Pada Balita Di Puskesmas Pabuaran Tumpeng Kota Tangerang. *Forum Ilmiah*, 11(3), 375-385.

Yudiastuti, N. K.E., Sawitri, A.A.S., & Wirawan, D.N. (2015). Durasi Pemberian ASI Eksklusif, Lingkungan Fisik Dan Kondisi Rumah Sebagai Faktor Resiko Pneumonia Pada Balita Di Puskesmas II Denpasar Selatan. *Public Health And Preventive Medicine Archive*, 3(2), 92-98.

Yulendasari, R., Novikasari, L., & Warina, E. (2019). Pengetahuan Ibu Sebelum Dan Sesudah Dilakukan Pendidikan Kesehatan Tentang Penyakit Pneumonia Pada Balita. *Jurnal Kebidanan*, 5(3), 243-251.