



## Determinants of Incident Risk of Acute Respiratory Infection in Infants in Populated City

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### Abstract

**Introduction:** Acute Respiratory Infection (ARI) was a major cause of morbidity and mortality in infants. ARI was always ranked first of the 10 most diseases in Indonesia. To be able to overcome the spread of ARI, it was necessary to know the risk factors for ARI. The purpose of this study was to analyze the relationship of predisposing factors (education, family income, knowledge, and attitudes), supporting factors (use of health care facilities, ventilation, presence of smokers in the house), driving factors (the role of health workers) with the risk of ARI events recurrent pneumonia in infants. **Methods:** This type of research was descriptive analysis with a cross-sectional approach. Data collection was done by questionnaire. The population was parents of children under five in the working area. This study used purposive sampling, with a sample of 100 respondents. Data analysis was done by univariate, bivariate with chi-square test and odds ratio. **Results:** The results showed that the incidence of recurrent Non Pneumonia ARI in toddlers had a significant relationship with knowledge (p-value = 0.017; OR = 0.27), attitude (p-value = 0.003; OR = 0.27), use of health care facilities ( p-value = 0.371; OR = 0.58), ventilation (p-value = 0.028; OR = 0.29), smokers in the house (p-value = 0,000; OR = 7.56), the role of health workers (p-value = 0,000; OR = 0.17). **Conclusion:** Recommendations need further research to develop a model of prevention of recurrent Non-Pneumonia ARI in infants according to the risk factors of the incident found so that it can.

**Keywords:** *Acute Respiratory Infection, Infants, Risk factor.*

### Introduction

Acute Respiratory Infection (ARI) is a major cause of morbidity and mortality in infants, an estimated 13 million children under five in the world die every year. ARI that is not handled properly can cause pneumonia or even death. Cough and cold diseases such as rhinitis, pharyngitis, tonsillitis and other upper respiratory infections are classified as non-pneumonia [1].

According to WHO,  $\pm$  13 million children under the age of the world die every year and most of these deaths occur in developing countries and ARI is one of the main causes of death by killing  $\pm$  4 million children under five every year [2]. The highest characteristics of the population with ARI occurred in the age group 1-4 years which amounted to 25.8% [3]. Cough episodes, colds in infants in Indonesia are estimated to be 3-6 times per year [4]. Most research in developing countries shows that in various countries every year 20-

30% of infants and under-five deaths are due to acute respiratory infections (ARI). ISPA is always ranked first of the 10 most diseases in Indonesia. To be able to cope with the spread of ARI, knowledge of ISPA risk factors is needed. It is expected that after the known risk factors for recurrent non-pneumonia ARI events in children under five are expected to provide appropriate interventions by the underlying risk factors.

Ministry of Health explained some efforts to prevent the recurrence of NP-ARI include immunization of measles and pertussis, child nutrition improvement including the promotion of breast feeding, improving health for pregnant women to prevent low birth weight (LBW), reducing in-house or out-door populations, reducing population density, improving home ventilation, and improving health hygiene. Mothers already know about prevention, but not all of them can implement them.

The objectives of this study were: 1) To identify the relationship of predisposing factors (maternal age, maternal education, family income, maternal knowledge, maternal attitudes) with the risk of recurrent non-pneumonia ARI in infants in the working area; 2) Identifying the relationship of enabling factors (use of health services, accessibility of health resources) with the risk of recurrent non-pneumonia ARI events in infants; 3) Identify the driving factors or reinforcing factors (support of health workers, family support) with the risk of recurrent non-pneumonia ARI in infants.

## Method

The research design that will be carried out is cross-sectional. The number of samples in this study was 100 respondents who were following the inclusion and exclusion criteria determined by the researcher. This study uses purposive sampling which means determining the sample according to the research objectives. This research was conducted in the working area of The Public Health Center. Independent variables consist of: 1) predisposing factors (mother's age, mother's education, family income, mother's knowledge, mother's attitude), supporting

factors or enabling factors (use of health services and accessibility of health resources), and reinforcing factors (support staff family health and support). The dependent variable was the incidence of recurrent non-pneumonia ARI in infants. Data analysis was done by univariate, bivariate with the chi-square test, and multivariate with multiple logistic regression.

## Results

The predisposing factors of respondents in this study consisted of age, education, family income, knowledge, and attitude. The following was the frequency distribution of the respondent's answers for predisposing factor variables. The statistical test used a different chi-square proportion test, to explain the relationship between the dependent and independent variables with a significance limit of 0.005, which means that if the p-value value 0.05 then the relationship between the dependent and independent variables was not significant, but if p-value <0,05 means. In addition to testing the level of significance it can be seen also the OR value (odds ratio), if OR <1 means protective OR = 1 means that there was no risk while OR > 1 means having a risk.

**Table 1: Distribution of Respondents by Knowledge on The Risk of ARI Non-Pneumonia in Toddlers**

| Variables                     | ARI | Non-ARI | Total | P-Value | Odds Ratio (95%CI) |
|-------------------------------|-----|---------|-------|---------|--------------------|
| Knowledge                     |     |         |       | 0.017   | 0.27               |
| Good                          | 34  | 23      | 57    |         |                    |
| Poor                          | 36  | 7       | 43    |         |                    |
| Highest Education             |     |         |       | 0.071   | 4.26               |
| High school                   | 58  | 23      | 81    |         |                    |
| Collage                       | 12  | 7       | 19    |         |                    |
| Income                        |     |         |       | 0.071   | 2.59               |
| < Rp 1.924.000                | 29  | 32      | 61    |         |                    |
| > Rp 1.924.000                | 11  | 28      | 39    |         |                    |
| Attitude                      |     |         |       | 0.03    | 0.19               |
| Positive                      | 23  | 34      | 57    |         |                    |
| Negative                      | 27  | 16      | 43    |         |                    |
| Use of health care center     |     |         |       | 0.371   | 0.58               |
| Good                          | 31  | 44      | 75    |         |                    |
| Poor                          | 19  | 6       | 25    |         |                    |
| Ventilation                   |     |         |       | 0.028   | 0.29               |
| There is                      | 26  | 34      | 60    |         |                    |
| There is no                   | 24  | 16      | 40    |         |                    |
| Smokers in the house          |     |         |       | 0.000   | 7.56               |
| There is                      | 32  | 18      | 50    |         |                    |
| There is no                   | 18  | 32      | 50    |         |                    |
| The role of the health worker |     |         |       | 0.000   | 0.17               |
| Good                          | 21  | 45      | 66    |         |                    |
| Poor                          | 29  | 15      | 34    |         |                    |

Based on table 1, knowledge variables based on the results of statistical tests obtained p =

0.006 means (<0.05) it can be concluded that there was a significant relationship between

mothers of children under five who have less knowledge with the incidence of ARI. With an OR value of 0.27 (95% CI) this means that for less knowledgeable parents, their toddlers have a risk of 0.27 times greater risk of ARI than parents who have good knowledge. Educational variables based on the results of statistical tests obtained  $p = 0.071$  means ( $> 0.05$ ) it can be concluded that there was no significant relationship between parents of children under five who have high school education and education of college. Family income variables with the incidence of Non-Pneumonia ARI in Toddlers based on statistical test results obtained  $p = 0.071$  means ( $> 0.05$ ) it can be concluded that there was no significant relationship between families who have income  $<Rp\ 1,924,000$  and income  $>1,924,000$  with the incidence Non-pneumonia ARI in infants.

Attitude variables based on the results of statistical tests obtained  $p=0.003$  means ( $<0.05$ ) it can be concluded that there was a significant relationship between family attitudes that have a negative attitude to the incidence of ARI. With an OR value of 0.19 (95% CI) this means that in families with negative attitudes, their toddlers have a risk of 0.19 times greater risk of ARI than mothers who have a positive attitude towards the prevention of Non-Pneumonia ARI.

Variables using health service facilities based on the results of statistical tests obtained  $p = 0.371$  means ( $> 0.05$ ) it can be concluded that there was no significant relationship between the use of health care facilities and the incidence of ARI. The results of the study on variable ventilation of toddler rooms, data obtained that in the group of mothers who were not affected by ARI, 34 (40%) among them had room ventilation that met health requirements, and a group of mothers who had ARI was 24 (70%) who did not have

ventilation that meets health requirements ( $<10\%$  of floor area). The results of statistical tests show  $p$ -value of 0.028 ( $<0.05$ ) and OR = 0.29 (95% CI), which means that there was a significant relationship between ventilation of toddlers' rooms with ARI incidence in infants, and in under-five families who do not have room ventilation that meet health requirements have an ARI risk of 0.29 times than ventilated family groups toddler rooms that meet health requirements. Variables of the presence of smokers in the house based on the results of statistical tests obtained  $p = 0,000$  means ( $<0.05$ ).

It can be concluded that there was a significant relationship between the presence of smokers in the house with the incidence of Non-Pneumonia ARI. With an OR value of 7.56 (95% CI) this means that for families who have family members who smoke inside the house, their toddlers have 7-8 times greater risk of ARI Non-Pneumonia than families without smokers in the house.

Variables of the role of health workers based on the results of statistical tests obtained  $p = 0,000$  means ( $<0.05$ ) it can be concluded that there was a significant relationship between the presence of smokers in the home with the incidence of Non-Pneumonia ARI. With the value of OR = 0.17 (95% CI), this means that the role of health workers who are lacking in the prevention of ARI Non-Pneumonia has a risk of 0.17 times greater for infants affected by ARI Non-Pneumonia.

### Multivariate Analysis

Variables that met the requirements of bivariate analysis were included in the multivariate analysis. From the results of multivariate analysis with logistic regression, the resulting  $p$ -value for each variable is produced.

**Table 2: Multivariate Analysis Variables of Knowledge, Attitudes, Use of Health Service Facilities, Ventilation, Existing Smokers in the House, Role of Officers Against Risk Factors for Repeated Non-Pneumonia ARI Events in Toddlers**

| Variable                      | Exp (B) | Wald  | 95% CI        | P-Value |
|-------------------------------|---------|-------|---------------|---------|
| Knowledge                     | .323    | 4.057 | .107-.970     | .044    |
| Attitude                      | .245    | 2.045 | .036-1.684    | .153    |
| Ventilation                   | .421    | 1.001 | .077-2.291    | .317    |
| Smokers in the house          | 27.573  | 9.502 | 3.347-227.178 | .002    |
| Use of health care facilities | .757    | .328  | .292-1.961    | .567    |
| The role of health worker     | .295    | 6.910 | .119-.733     | .009    |

To see the variables that have the greatest influence on the risk of recurrent Non-Pneumonia ARI events in infants can be seen from the value of Exponen B on a significant variable. In the results of the analysis above, the greatest Exponent B value is the presence of smokers in the house, so that it can be interpreted that smoking in the home is the dominant factor that influences the risk of ARI Non-Pneumonia in children under five

## Discussions

Predisposing factors are internal factors that exist in individuals, families, groups or communities that make it easier for individuals to behave manifested in knowledge, attitudes, beliefs, values and so on. Besides predisposing factors, there are also driving factors and forming factors that influence a person's behavior. Mother's characteristics directly influence a mother's behavior [5].

Predisposing factors (predisposing factors) include knowledge, attitudes, values, beliefs, confidence, individual characteristics (such as age, education, employment, income) [6]. The results of the chi-square analysis showed that the indicator of predisposing factors obtained the value of p-value that is knowledge and attitude. While for age, education and invalid income form predisposing factors.

Knowledge is the result of human sensing, or the result of knowing someone about objects through their senses (eyes, nose, ears, etc.) [7]. The module as a guide to increase mother self-efficacy in preventing recurrence of non-pneumonia ARI. Self-efficacy will be influenced by the training and health education received by mothers [5]. This study showed that most respondents had a positive attitude. Based on FGD, the habit was the most difficult cause to change attitude [8].

Factors that influence knowledge according to [9] include education, information, social culture and economy, environment, experience, and age. Factors that play a role in the formation of perceptions are knowledge, affective, personality and culture that someone has that comes from the reality that exists in their environment [10]. Behavior cognition was a significant relationship between education levels pregnancy history and the number of children with self-efficacy [11].

Another factor that influences is education parental education indicator, which had the most common distribution, was that of senior high school [12]. Mother's education level is related to information processing, understanding and rational thinking [13]. Almost all respondents who have toddlers who do not experience Non-Pneumonia ARI have good knowledge.

Knowledge will influence one's perceptions and beliefs to prevent recurrent non-pneumonia ARI in toddlers. The results of discussions conducted with respondents showed that respondents who were knowledgeable about non-pneumonia ARI based on their experience, both their own experiences or other people's experiences.

Knowledge of toddlers about good recurrent non-pneumonia ARI can improve the perception of toddlers in the prevention of recurrent non-pneumonia ARI. Peer group support (family support) had a significant effect on treatment adherence in taking medication also [14]. Age is a person's maturity level, the more a person ages, the more they age. This is because the knowledge that he gets is not only from the environment, the level of education, but their experience faces the reality of life that leads to maturation of mind [15].

The age of respondents in this study is not supportive of forming predisposing factors. This is because some respondents are in a young age range so the variation is very minimal. Education is a conscious effort to develop personality and abilities inside and outside the school and last a lifetime [16]. Respondents' education in this study did not support forming predisposing factors. This is because the respondent's education is homogeneous. The study showed that education has a significant influence on improving the parent's knowledge [17].

The family income in this study is also invalid in forming predisposing factors. Difficult to change habits associated with the prevention of recurrent non-pneumonia ARI, namely the smoking habit of family members in the house, the use of masks for family members who are experiencing ARI. Positive attitudes of respondents to the prevention of recurrent non-pneumonia ARI will reduce the risk of recurrent non-pneumonia ARI in infants.

Enabling factors are manifested in the physical environment, available or unavailability of health facilities or facilities. Supporting factors include the use of health services, the environment, accessibility of health resources, government regulations, health skills [18].

In this study, the researchers took three indicators on supporting factors, namely accessibility to health services, ventilation in toddler rooms, and the presence of smokers in the house. The results of the statistical analysis show that there is a significant relationship between the variables of enabling factors and the risk of recurrent Non-Pneumatic ARI in infants. The use of health services greatly affects the severity of ARI.

In some developing countries, the use of health facilities is good. The factors associated with health services are family and reference groups. The reference group is all groups that have a direct or indirect influence on a person's attitude and behavior. The results of [19] show that the variables related to the utilization of health services are age and health care insurance [20]. Study shows family support and exposure to information related to the use of health services.

The results of Anggraheni's research (2012) show that medical costs influence decision making to choose health services. There is a relationship between the use of health services and public perceptions of health [21]. The use of health services shows almost all respondents are of good value. The choice of use of health care facilities is due to compatibility or can also be due to cost factors. Mothers who choose to bring toddlers to private health services feel because there is no change when taken to the public health center. There are also because they usually do treatment in private health services. Besides them to the public health center because they are free of charge.

Good use of health services will improve the main constructs of perceived (the main construction of perception) in the prevention of recurrent non-pneumonia ARI. The results were obtained, toddlers who were not sick with ARI, most of whom lived in homes that had ventilation that met the requirements, and only a portion of children under five who were affected by ARI lived in homes whose ventures did not meet the requirements.

Based on the results of the bivariate analysis, that there was a significant relationship between ownership of ventilation with the incidence of Non-Pneumonia ARI in infants, and toddlers who live in ventilated homes that do not meet the requirements have a

greater chance of ARI occurring. Ventilation is the place where the air comes in and out of the room/house, so that the air quality in the house remains stable. The results of this study are in line with [22] which states that there is a significant relationship between ventilation and the incidence of ARI in infants.

Toddlers who live in ventilated homes that do not meet the requirements have a risk of suffering from ARI-pneumonia 23,889 times greater [23]. Ventilation has a function as a means of circulation of fresh air into the house and dirty air out of the house. Houses that are not equipped with ventilation facilities will cause the supply of fresh air in the house to be very minimal. Adequacy of fresh air in this house is very much needed for life for its inhabitants, because the insufficient supply of air will affect the physiological functions of the respiratory equipment for its inhabitants, especially for infants and toddlers.

Houses that do not have adequate ventilation will cause health problems because O<sub>2</sub> levels decrease, CO<sub>2</sub> levels rise, Humidity rises, Rooms become smelly, Microorganisms multiply. The area of permanent ventilation is at least 5% of the floor area when added with incidental ventilation holes such as windows and doors of 5%.

Based on the results of the study, it was found that the proportion of infants who were not ARI and not at home with smokers was 73.3%, whereas, for children under five who were ARIs, almost all lived at home with smokers. The results of research conducted based on bivariate analysis with chi-square showed that there was a significant relationship between the presence of smokers in the home and the incidence of ARI in infants.

And toddlers who live in homes with smokers have a greater chance of getting ARI than living in a home where there are no smokers. Smoking is known to interfere with the effectiveness of some respiration defense mechanisms. Cigarette smoke products are known to stimulate mucus production and reduce ciliary movement. So that there is the stimulation of thick mucus stimulation and trapping of particles or microorganisms in the airway, which can reduce air movement and increase the risk of microorganism growth.

Infants and toddlers who are exposed to cigarette smoke before and after birth show an increase in ARI rates, compared to infants and toddlers from parents who are not smokers. The output of urine containing nicotine metabolites increases dramatically in children of parents of smokers compared to children of parents who are not smokers. Some nicotine metabolites are carcinogens and irritate the lungs.

The results of this study are by the results of Mudehir's research and Irianto, which both state that there is a significant relationship between cigarette smoke in the home and the incidence of ARI in infants. Reinforcing factors are factors that reinforce behavior that manifests in the attitudes and behavior of health workers, peers, parents, who are community behavior reference groups [24].

The driving factor consists of family, peers, teachers, coworkers, health workers, traditional leaders, decision-makers [25]. The results of discussions with parents of toddlers showed that there was a significant relationship between the variables of enabling factors and the risk of non-pneumonia ARI. The driving factor examined in this study is the role of health workers. Research shows that there is a relationship between the role of health workers and behavior change [26].

The results of the study showed that there was a significant relationship between maternal perceptions of the role of officers and the prevention behavior of pneumonia [27]. The role of health workers is partly in the good category. This can be seen from the education about prevention of non-pneumonia ARI, frequency of education and implementation of education.

The implementation of counseling was delegated to village midwives. ISPA reporting is obtained from village midwives, medical centers in Public Health Center, and MCH rooms (Maternal Health) [28]. The efforts that have been made so that pneumonia does not occur is to provide education when doing treatment [29]. Based on the results of discussions with parents of toddlers and the public health center the

alignment between existing programs and the implementation in the community is needed or in the field [16]. So, it is expected that toddlers can get the right information from health workers about the prevention of recurrent non-pneumonia ARI in toddlers [30]. The role of a good health worker will reduce the risk of recurrent non-pneumonia ARI in infants [31]. Parents have an important role in meeting the basic needs of the child by stimulation, emotion and physical. With the fulfillment of the basic needs of the infant, the quality of life of infants will increase [32].

Adaptive responses from parents that can be done to children during medical treatment include meeting the child's psychological and physical needs. Looking for information related to illnesses suffered by children is an essential thing that can be done by parents [33].

## Conclusion

Based on the results of the research and discussion described in the previous chapter, it can be concluded as follows: Predisposing factors (good knowledge, positive attitude in parents) will reduce the risk of recurrent Non-Pneumonia ARI in infants; The reinforcing factor (the presence of ventilation in the toddler's room and the absence of smokers in the toddler's house) will reduce the risk of recurrent Non-Pneumonia ARI in infants; The enabling factor (good health worker support) will reduce the risk of recurrent Non-Pneumonia ARI in infants;

The dominant factor that greatly influences the risk of recurrent Non-Pneumonia ARI in infants is the presence of smokers in the home. Suggestions for health workers: Parents need to be provided with easy-to-understand health education about ARI and prevention of recurrent non-pneumonia ARI; Parents need to be given health education about ARI and prevention of recurrent non-pneumonia ARI as a knowledge base to provide support to parents of children under five; Parents need to be made a peer group to share information about experiences in an effort to prevent recurrent non-pneumonia ARI.

## References

1. Kemenkes (2012) "Pedoman Pengendalian Infeksi Saluran Pernafasan Akut. Jakarta: Kementerian Kesehatan Republik Indonesia."
2. WHO (2007) Buku Pedoman Pencegahan dan Pengendalian, Infeksi Saluran Pernafasan Akut (ISPA) Yang Cenderung

- Menjadi Epidemi dan Pandemi di Fasilitas Pelayanan Kesehatan, Pedoman Interim WHO.
3. Riskesdas (2013) "Populasi Penderita Permasalahan Pernafasan,"
  4. FJ Kunoli (2013) Pengantar komunikasi kesehatan untuk mahasiswa institusi kesehatan.
  5. Y Afiyati, B Keliat, I Ruwaida, I Rachmawati, N Agustini (2016) "Peningkatkan Kualitas Hidup Pasien Kanker Dengan Implementasi Perawatan Kesehatan Psikoseksual," *J. NERS.*, 11 (1):7.
  6. HC Koyra, T Chinasho (2019) "Treatment Adherence and Factors Affecting among Adult Asthmatic Patients at Soddo Christian General Hospital, Southern Ethiopia .,"
  7. S Justice, JRD Espiritu, A Program (2018) "Supine Sleep during Polysomnography and the Diagnosis of Ob - structive Sleep Apnea," 1-7.
  8. EZ Zatihulwani, T Sukartini, I Krisnana (2017) "Development of Model on Mothers Self-Efficacy in Preventing Recurrence of Non-Pneumonia Acute Respiratory Infection among Toddlers," *J. Ners*, 12 (2): 171.
  9. I Nirmala (2018) "Promosi Kesehatan," .
  10. T Bacak, S Ozdogan, SG Gulec, E Ozmen (2019) "A Rare Cause of Respiratory Distress in Infants : Double Aortic. Arch.," 6-8.
  11. R Susilaningrum, S Utami, N Nursalam, RD Tristiana (2018) "Analysis of factors related to behavior cognition and effects on pregnant women in maternal and child health (Mch) handbook utilisation," *Indian J. Public Heal. Res. Dev.*, 9 (11): 492-497.
  12. EW Wuryanningsih, EH Kurniyawan, EC Aisyah (2019) "Correlation Between Emotional Peer Support and Cyberbullying Behaviour in Senior High School Students," *J. Ners.*, 14 (2): 205-209.
  13. I Krisnana, R Azizah, T Kusumaningrum, EMM Has (2019) "Feeding patterns of children with stunting based on WHO (world health organization) determinant factors of behaviours approach," *Indian J. Public Heal. Res. Dev.*, 10 (8): 2756-2761.
  14. U Hasanah, M Makhfudli, L Ni'Mah, F Efendi, GE Aurizki (2018) "Peer Group Support on the Treatment Adherence of Pulmonary Tuberculosis Patients," in 4th International Conference on Tropical and Coastal Region Eco Development, ICTCRED, 2019, 246: 1.
  15. M Maoua et al (2018) "Occupational Rhinitis and Asthma in the Textile Sector of the Central Region of Tunisia," 1-7.
  16. JV Santeliz (2020) "Tropical Pulmonary Eosinophilia: An Epidemiological and Clinical Review,".
  17. SN Aini, S Mulatsih, PS Lasmani (2015) "The Effect of Education on Parents 'Speak Up' Knowledge Regarding Patients Safety in Hospital," *Nhk 技研*, 151: 10-17.
  18. C Schwebel et al (2013) "Safety of intrahospital transport in ventilated critically III patients: A multicenter cohort study," *Crit. Care Med.*, 41 (8): 1919-1928.
  19. Devon L Polascheck, [https://books.google.co.id/books?id=ekaHDwAAQBAJ&pg=PA127&lpg=PA127&dq=logan%27s+study+\(2015\)+health+service&source=bl&ots=94ITC3KKFU&sig=ACfU3U2LWcgxuzfDAv5bnOi6LwMnvsn6Mg&hl=id&sa=X&ved=2ahUKEwiewOe5tPjnAhUVjuYKHcY-B28Q6AEwBHoECAsQAQ#v=onepage&q=logan's](https://books.google.co.id/books?id=ekaHDwAAQBAJ&pg=PA127&lpg=PA127&dq=logan%27s+study+(2015)+health+service&source=bl&ots=94ITC3KKFU&sig=ACfU3U2LWcgxuzfDAv5bnOi6LwMnvsn6Mg&hl=id&sa=X&ved=2ahUKEwiewOe5tPjnAhUVjuYKHcY-B28Q6AEwBHoECAsQAQ#v=onepage&q=logan's). 2019.
  20. H Nurzaini (2018) "Faktor-Faktor Penggunaan Pelayanan Kesehatan Bagi Bayi Gejala Diare Di Kota Depok," *E-Journal Widya Kesehat. dan Lingkung.*, 1 (2): 96-101.
  21. L Rachmawati IF Sholihah (2019) "the Correlation Between Demand Factors and Health Care Service Utilization By Contribution Beneficiary Patients," *J. Adm. Kesehat. Indones.*, 7 (2): 185.
  22. AC Dewi (2012) "Hubungan Kondisi Lingkungan Fisik Rumah dengan Kejadian ISPA pada Balita di Wilayah Kerja PUSKESMAS Gayamsari Kota Semarang," *J. Kesehat. Masy.*, 1 (2): 852-860.
  23. WR Nurjazuli (2009) "Faktor Risiko Dominan Kejadian Pneumonia Pada Balita," *J. Respilogi Indones.*
  24. J Sesti, S Quintiliani, C Minerowicz, D Garg (2020) "Vaping Associated Lung Illness : A Case Series,".
  25. F Zengin, V Suleymanova, MR Sonsöz, M Erelel (2019) "Acute Liver Injury : Due to a Rare Case Accompanied by Cardiac and Pulmonary Complications," 6-9.
  26. RE Malosh, ET Martin, JR Ortiz, AS Monto (2017) "The risk of lower respiratory tract infection following influenza virus infection : A systematic and narrative review," *Vaccine*.
  27. B Dhir, R Kumar (2019) "Steroid Induced Psychosis in a Rare Case of Bronchiolitis Obliter - ans Organizing Pneumonia," 4-7.

28. BA Kareem (2020) "Paediatric Empyema Thoracis: Roles and Outcomes of Surgical Intervention in Advanced Disease," 6-11.
29. V Omiwole, S Ali, J Ali (2019) "Age and Incidence of Pharyngeal Candidiasis in Patients Undergo - ing Bronchoscopy," 1-5.
30. P Pahwa, K Amin, C Karunanayake, S Abonyi (2019) "Prevalence and Associated Risk Factors of Chronic Bronchitis among Aboriginal Children and Adolescents in Canada-Results from 2012 Aboriginal Peoples Survey," 1-13.
31. B Chip, B Microarray (2019) "Determination of Epidermal Growth Factor Receptor (EGFR), KRAS and BRAF Mutation in Non Small Cell Lung Cancers Using," 6-13.
32. PD Rachmawati, R Ranuh, Y Arief (2016) "Model Pengembangan Perilaku Ibu Dalam Pemenuhan Kebutuhan Asah, Asih Dan Asuh Anak Leukemia," J. Ners, 11 (1): 63.
33. EN Hermalinda, Yeni Rustina (2015) "Pengalaman Orang Tua dalam Penggunaan Pengobatan Alternatif pada Anak yang Menderita Kanker di Jakarta," J. Ners., 10: 61-73.