Waluya The International Science Of Health Journal
Vol.5 No.1

ISSN: 2829-2278

WALUYA THE INTERNATIONAL SCIENCE OF HEALTH JOURNAL

Home Environmental Factors and the Incidence of Acute Respiratory Infections in Toddlers: A Case Study in the Tanggetada and Watubangga Community Health Centers

Yusuf Wawan Artist Sulaiman[1], Erwin Azizi Jayadipraja[2], Wa Ode Nova Noviyanti Rachman[2]

[1]Tanggetada Community Health Center, Kolaka Regency, Indonesia
[2]Mandala Waluya University, Indonesia
Correspondence: pkmtanggetada@gmail.com

ARTICLE INFO

Article history
Received : March 06th, 2026
Revised : March 19th, 2026
Accepted : March 30th, 2026

Keywords
Smoking Habit,
ARI.

ABSTRACT

Introduction: The initial survey conducted on 10 people in the Tanggetada Community Health Center Working Area stated that of the 10 people, 3 of their children suffered from ARI due to poor ventilation, exposure to cigarette smoke, and 3 people said the cause was dense housing and 3 people said their children had not been immunized. Based on this, the researcher wanted to examine the relationship between smoking habits in the home and cooking fuel with ARI in the Regional Technical Implementation Unit Working area of the Tanggetada Watubangga Community Health Center, Kolaka Regency, Southeast Sulawesi Province.

Method: This quantitative research, using a cross-sectional study approach, was conducted in the districts of Southeast Sulawesi Province. The population was 822 toddlers and the sample size was 90, determined using the Slovin formula.

Result: The chi square statistical test on smoking habits with a 95% confidence level ($\alpha = 0.05$) shows that the value indicates that the X^2count value = 7.813 > X^2table value = 3.841 and on Fuel with a 95% confidence level ($\alpha = 0.05$) shows that the value indicates that the X^2count value = 10.944 > X^2table value = 3.841, which means there is a relationship between cooking fuel and the incidence of ARI.

Conclusion: There is a weak relationship between smoking habits and fuel and the incidence of ARI in the working areas of Tanggetada Health Center and Watubangga Health Center.

Introduction

Acute respiratory tract infection (ARI) is a disease of the upper or lower respiratory tract, usually contagious and causes various diseases ranging from asymptomatic or from mild infections to serious and fatal diseases depending on the pathogen.[1]

According to the World Health Organization (WHO), in 2020, acute respiratory infections (ARI) were the leading cause of morbidity and

mortality from infectious diseases in developing countries. The annual mortality rate for ARI reached 4.25 million worldwide. According to WHO data, in 2020, there were an estimated 1,988 cases of ARI in children aged 1-5 years, with a prevalence of 42.91%.[2] Furthermore, in 2021, the number increased again to 2.372 million cases per year worldwide, with a prevalence of 49.11%. Then, in 2022, the number of cases of acute respiratory infections (ARI) in children aged 1-5 years is estimated to increase to 2,853 cases, with a prevalence of 52.11%.[3]

Pneumonia is the second leading cause of death in children in Indonesia, after diarrhea. Approximately 450,000 cases of pneumonia occur annually. Data show that the prevalence of pneumonia has increased to 2% from 1.8% in 2013.[4] Based on 2015, the number of pneumonia cases in Indonesia reached 554,650 people, then in 2016 the number of pneumonia cases in Indonesia increased to 568,146 people, in 2017 the number of deaths reached 43,764 people while in 2018 the number of pneumonia cases in Indonesia reached 478,078 people.[5] Furthermore, in Indonesia itself, there are also quite a high number of deaths caused by pneumonia, spread across all age groups. The high number of cases and deaths caused by pneumonia in Indonesia indicates that pneumonia detection and treatment in Indonesia require serious review.[6]

The prevalence of acute respiratory infections (ARI) in Indonesia remains high, with data from the 2022 Basic Health Research showing 1,017,290 cases in Indonesia. Central Java ranks third, along with West Java and East Java, with 132,565 cases, or 13.03%. The prevalence of ARI in toddlers reached 93,620 cases, with 10,551, or 11.27%, occurring in Central Java. The provinces with the highest incidence of acute respiratory infections (ARI) in toddlers were East Java (93,620 cases, or 50.09%), Banten (87,763 cases, or 46.2%), and Lampung (81,843 cases, or 40.6%). The mortality rate due to acute respiratory infections in toddlers in 2022 was 0.12%, which is around 551 deaths from 468,172 cases of acute respiratory infections in toddlers and in 2023 it increased to 0.16%, which is around 498 deaths from 309,838 cases of acute respiratory infections in toddlers.[7]

Currently, cases of acute respiratory infections (ARI) in Southeast Sulawesi Province remain a serious health problem. The Southeast Sulawesi Provincial Health Office reported in 2022 that there has been no shift in disease patterns in the community, with infectious and communicable diseases still dominating the list of the top 10 diseases, both in terms of type and number of cases. For the past three years, ARI has been among the top 10 diseases in Southeast Sulawesi, with 56,738 cases (43.7%) in 2020, a further increase in 2021 to 67,099 cases (46.3%), and 73,731 cases (48.1%) in 2022.[8]

In general, there are three risk factors for ARI: environmental factors, individual child factors, and behavioral factors. Environmental factors include indoor air pollution, ventilation, and overcrowding. Individual child factors include age (6-12 months/toddlers), birth weight, nutritional status, vitamin A deficiency, and immunization status. Behavioral factors include preventive and treatment practices for ARI in infants, or the active role of the family/community in managing ARI.[9]

Acute Respiratory Infections can be influenced by various environmental factors such as environmental sanitation conditions, climate and also air pollution.[10] According to previous research, he stated that respiratory infections (ARI) can occur if a place or home lacks physical sanitation that meets healthy home standards. This is because environmental sanitation is closely linked to the incidence of infectious diseases.[11] Climate refers to the average or long-term weather conditions in an area.[12] Several infectious diseases, including acute respiratory infections (ARI), are significantly influenced by climate. When temperature, humidity, and wind speed decrease, this has the potential to increase and spread pathogens more widely.[13]

Environmental factors that influence acute respiratory infections from several studies are those related to cigarette smoke, such as smokers, indoor smoking, and exposure to passive smoking.[14] In addition, environmental factors related to housing, such as poor ventilation, overcrowding, use of cooking fuels, and indoor and outdoor air pollution, also contribute to ARI. Environmental risk factors can reduce lung function, making the respiratory tract more susceptible to infection by infectious agents.[15]

One of the factors influencing the risk of ARI is environmental factors. This environment

refers to indoor and outdoor air pollution, as well as home sanitation. Similarly, in the Tanggetada Community Health Center work area, indoor air pollution includes smoke from burning cooking fuels at high concentrations, cigarette smoke, house ventilation, and flooring types. Meanwhile, outdoor pollution includes combustion, transportation, and factory exhaust fumes. The home environment is closely related to the daily living space of toddlers. If the home environment, where the family gathers and takes shelter, is unhealthy due to bacterial or viral infections, it can lead to various illnesses in toddlers, one of which is ARI.[16] Home sanitation facilities also need to be monitored to prevent the occurrence of respiratory infections. These sanitation facilities include ventilation, temperature, humidity, flooring type, natural lighting, home construction, garbage disposal facilities, human waste disposal facilities, and water supply.[17]

Research result from Wulandari reported that there was a significant relationship between residential density (OR=2.030, RR=0.635, 95% CI: 0.673-6.128), ventilation (OR=0.814, RR=1.138, 95% CI: 0.280-2.369) and the incidence of ARI.[18] Another research found that there is a relationship between family smoking habits and the history of infant ARI with a p value of 0.017, and there is no relationship between nutritional status and the history of infant ARI with a p value of 0.512.[19]

Research result was found that the risk of toddlers getting ARI increased 5.5 times greater for those living in houses with a ventilation area of <10% of the floor area of the house, compared to toddlers living in houses with an area of >10% of the floor area of the house with a risk prevalence value of 5.965.[20] Research results shows a relationship between nutritional status and the incidence of acute respiratory infections in toddlers at the Tompaso Health Center, Minahasa Regency with a significance value of 0.003. This means that toddlers with malnutrition are at 3 times greater risk of contracting acute respiratory infections compared to toddlers with normal nutritional status.[21]

Based on the background above, the researcher wants to study further regarding the relationship between smoking habits in the home and cooking fuel with ARI in the Regional Technical Implementation Unit Working area of the Tanggetada Watubangga Community Health Center, Kolaka Regency, Southeast Sulawesi Province.

Method

This quantitative research, using a cross-sectoral study approach, was conducted in the districts of Southeast Sulawesi Province. This is a case study at the Tanggetada and Watubangga Community Health Centers. This research will be conducted from August to September 2024. The study population is 822 toddlers and the sample size is 90, determined using the Slovin formula.

Result

Table 1 shows that of the 90 respondents studied, there are 48 respondents who have a smoking habit and there are 42 respondents who do not have a smoking habit. Furthermore, of the 48 respondents who have a smoking habit, there are 29 respondents (60.4%) who experienced acute respiratory infections and there are 19 respondents (39.6%) who did not experience acute respiratory infections. Then, of the 42 respondents who do not have a smoking habit, there are 13 respondents (31.0%) who experienced acute respiratory infections and there are 29 respondents (69.0%) who did not experience acute respiratory infections. The results of the chi square statistical test at a 95% confidence level ($\alpha = 0.05$) show that the value shows that the X^2count value = 7.813> X^2table value = 3.841, which means there is a relationship between smoking habits and the incidence of acute respiratory infections. The results of the relationship closeness test show a phi value = 0.295, which means there is a weak relationship between smoking habits and the incidence of acute respiratory infections in the Tanggetada Community Health Center and Watubangga Community Health Center Working Areas.

Table 2 shows that of the 90 respondents studied, there were 52 respondents for the cooking fuel variable with the Yes category and there were 38 respondents for the cooking fuel variable with the No category. Furthermore, of the 52 respondents

for the cooking fuel variable with the Yes category, there were 32 respondents (61.5%) who experienced acute respiratory infections and there were 20 respondents (38.5%) who did not experience acute respiratory infections. Then, of the 38 respondents for the cooking fuel variable with the No category, there were 10 respondents (26.3%) who experienced acute respiratory infections and there were 28 respondents (73.7%) who did not experience acute respiratory infections. The results of the chi square statistical test at a 95% confidence level ($\alpha = 0.05$) showed that the value showed that the X^2count value = 10.944> X^2table value = 3.841, which means there is a relationship between cooking fuel and the incidence of acute respiratory infections. The results of the correlation test showed a phi value of 0.349, which means there is a weak relationship between cooking fuel and the incidence of ARI in the working areas of Tanggetada Health Center and Watubangga Health Center.

Table 1.
The Relationship between Smoking Habits and the Incidence of ARI in the Working Areas of Tanggetada Health Center and Watubangga Health Center

Smoking Habit	ARI incidence				Total		Stastical Analysis
	Yes		No				
	n	%	n	%	n	%	
Yes	29	60.4	19	39.6	48	100.0	X^2count = 7.813
No	13	31.0	29	69.0	42	100.0	X^2table = 3.841
Total	42	46.7	48	53.3	90	100.0	phi = 0.295

Table 2.
The Relationship Between Cooking Fuel and the Incidence of Acute Respiratory Infections in the Working Areas of Tanggetada Community Health Center and Watubangga Community Health Center

Cooking Fuel	ARI incidence				Total		Stastical Analysis
	Yes		No				
	n	%	n	%	n	%	
Yes	32	61.5	20	38.5	52	100.0	X^2count = 10.944
No	10	26.3	28	73.7	38	100.0	X^2table = 3.841
Total	42	46.7	48	53.3	90	100.0	phi = 0.349

Discussion

The Relationship Between Smoking Habits and the Incidence of ARI

Smoking is a habit that can provide pleasure for smokers, but on the other hand, it can have negative impacts on smokers themselves and those around them. Smoking is a problem that is still difficult to solve so it is a special concern for the government, especially health workers to be more active in dealing with this problem, and efforts to minimize the impact of smoking. The presence of one or more smokers in the house will increase the risk of family members suffering from illnesses, such as respiratory disorders, worsening asthma and aggravating angina pectoris. It can also increase the risk of getting an acute respiratory infection, especially in toddlers because the body structure is not yet perfect or mature where the internal structure of the ear and throat continues to shorten and straighten, and the lymphoid tissue of the tonsils and adenoids continues to increase. As a result, otitis media, tonsillitis, and respiratory tract infections often occur.[22]

Based on the results of the study, it shows that out of 90 respondents studied, 48 respondents had a smoking habit and 42 respondents did not have a smoking habit. Furthermore, of the 48 respondents who had a smoking habit, 29 respondents (60.4%) experienced acute respiratory

infections and 19 respondents (39.6%) did not experience ARI. The existence of respondents who had a smoking habit but did not experience ARI was due to the respondents smoking outside the house, either on the terrace of the house, or in the garden around their house so that exposure to cigarette smoke was not reached by people inside the house.[23] This is in line with the theory, smoking indoors can negatively impact family members, especially toddlers. Cigarette smoke can leave chemicals or residue on clothing, ceilings, sofas, curtains, and other areas of the home. If smoking outdoors or passive smoking is exposed to secondhand smoke, the smoke can stick to clothing or skin. If smoking indoors, residue can stick to curtains, sofas, ceilings, and even children's toys.[24]

Then, of the 42 respondents who did not have a smoking habit, there were 13 respondents (31.0%) who experienced ARI and there were 29 respondents (69.0%) who did not experience ARI. The presence of respondents who did not smoke but experienced ARI was caused by another factor, namely the use of mosquito repellent coils where the mosquito repellent if used for a long time has a very large risk of ARI because exposure to smoke from mosquito coils for a long time is very dangerous for toddlers. This is in line with the theory that says that the use of mosquito coils is very dangerous for humans because it contains active ingredients that are included in the organ phosphate and carbamate groups. The active ingredient of organ phosphate is Dichorvos or Dichlorovynil dimethyl phosphate (DDVP) and the active ingredient of carbamate is propuxur which is a type of insecticide that is as an insect killer. Other chemical compounds contained in mosquito coils besides propuxur and dichlorvos are pyrethroid, tranflutri, and dellatherine.[25]

The act of smoking by the smoker is known as passive smoking and active smoking. Passive smoking is when someone accidentally inhales someone else's cigarette smoke, while active smoking is when someone smokes. Parents' smoking habits at home make toddlers passive smokers, constantly exposed to cigarette smoke. Homes where parents smoke have a 7.83-fold increased risk of respiratory infections (ARI) compared to homes where parents don't smoke. Meanwhile, the number of smokers in a family is quite high.[26]

Based on the results of the chi square statistical test at a 95% confidence level ($\alpha = 0.05$) shows that the value shows that the X^2count value = 7.813> X^2table value = 3.841, which means there is a relationship between smoking habits and the incidence of ARI. The results of the relationship closeness test show a phi value = 0.295, which means there is a weak relationship between smoking habits and the incidence of ARI in the Tanggetada Health Center and Watubangga Health Center Working Areas.

Passive smoking has a greater negative impact than active smoking. When a smoker burns a cigarette and inhales it, the smoke inhaled by the smoker is called primary smoke, and the smoke that comes out of the tip of the cigarette (the burning part) is called sidestream smoke. This sidestream smoke has been shown to contain more tobacco combustion products than primary smoke.[27]

The home environment is influenced by the condition of windows, particularly in terms of exposure to cigarette smoke. Some toddlers are exposed to cigarette smoke because windows are not opened when family members are smoking. Furthermore, ashtrays used for smoking are not kept out of reach of toddlers. Most family members also fail to wash their hands after smoking and do not change their clothes after smoking and carrying their toddlers, even though most family members are aware that smoking can put toddlers at risk of developing respiratory infections.

The results of this study are in line with research conducted by Ameliani' Matul Fajrianti on the Influence of Knowledge, Use of Mosquito Coils and Cooking Fuel on the Incidence of ARI in Toddlers in Rejuno Village, Karangjati, Ngawi, which states that smoking habits are related to the incidence of ARI with a P-Value of 0.291, then research conducted by Siprianus Salmon Seda on the Relationship between Smoking Behavior of Closest Persons and the Incidence of ARI in Toddlers Treated at Cempaka Health Center, Banjarmasin, which states that there is a relationship between smoking behavior and the incidence of ARI in toddlers treated at Cempaka Health Center, Banjarmasi, with a P-Value of 0.004, which is smaller than the significance level of 0.05.

For this reason, it is hoped that the public will not smoke inside the house so that people in the house do not become passive smokers which can cause various diseases, one of which is ARI in toddlers.

The Relationship Between Cooking Fuel and the Incidence of ARI

Using cooking fuels like firewood can contribute to the incidence of respiratory infections (ARI). Lack of adequate ventilation in the kitchen can lead to poor air exchange. This allows the resulting smoke to collect inside the home and be inhaled by babies, children, and other family members.[28]

Based on the Minister of Health Regulation No. 1077 concerning monitoring indoor air quality, it is stated that cooking fuels that cause pollution, such as firewood, charcoal, rice husks, and coal briquettes, are included in the category of not meeting indoor air quality requirements. Meanwhile, cooking fuels that do not cause pollution, such as electricity, LPG, and kerosene, are included in the category of meeting indoor air quality requirements.[29] In rural areas, many people still use firewood for cooking, and many still use mosquito coils as repellent. A possible solution is to provide public education.[30]

Based on the results of the study, it shows that of the 90 respondents studied, there were 52 respondents for the cooking fuel variable with the Yes category and there were 38 respondents for the cooking fuel variable with the No category. Furthermore, of the 52 respondents for the cooking fuel variable with the Yes category, there were 32 respondents (61.5%) who experienced ARI and there were 20 respondents (38.5%) who did not experience ARI. The existence of respondents who used cooking fuel but experienced ARI was due to the respondents' home kitchens being equipped with a lot of ventilation so that the smoke produced from the cooking fuel did not remain in the kitchen which if left behind could result in ARI.

Then, from 38 respondents for the cooking fuel variable with the category No, there were 10 respondents (26.3%) who experienced ARI and there were 28 respondents (73.7%) who did not experience ARI. The existence of respondents who did not use cooking fuel but experienced ISPA was due to other factors, namely the absence of exclusive breastfeeding in respondents so that the risk of ARI was greater than in children who were given exclusive breastfeeding.

Biomass is a fuel commonly used by rural communities. Firewood is typically used because the Kampar region still has abundant forests for wood production, so people use it for cooking. Firewood is also readily available and inexpensive. However, the use of fuel in the home kitchen is a contributing factor to respiratory infections due to inhalation of smoke exposure by family members from the burning fuel. Several types of biomass fuels are commonly used by the community, including kerosene, firewood, and LPG, which is distributed by the government.[31]

The results of the chi square statistical test at a 95% confidence level ($\alpha = 0.05$) show that the value indicates that the X^2count value = 10.944> X^2table value = 3.841, which means there is a relationship between cooking fuel and the incidence of ARI The results of the relationship closeness test show a phi value = 0.349, which means there is a weak relationship between cooking fuel and the incidence of ARI in the Tanggetada Community Health Center and Watubangga Community Health Center Working Areas.

In rural areas, many people still use firewood for cooking, and many still use mosquito coils as repellent. Possible solutions include providing public education and counseling. Use natural mosquito repellents like lavender plants or electronic mosquito coils. Telon oil and mosquito nets can also be used to avoid using mosquito coils.[25] In rural communities, many homes still lack chimneys, ventilation, or windows that meet standards. Therefore, adequate ventilation and windows should be provided to allow for proper air circulation. A chimney in every kitchen allows smoke to escape directly.[32]

The results of this study are in line with the research conducted by Elmalia Saputri on the Relationship between Room Occupancy Density and Type of Cooking Fuel with the Incidence of ARI in Toddlers in Pulau Rambai Village, Kampa Health Center Regional Technical Implementation Unit Work Area in 2023 which stated that there was a significant relationship between the type of cooking fuel and the incidence of ARI in toddlers with a p value = 0.004. Then this study is not in line with the research conducted by Vedjia Medhyna which stated that the results of the

statistical test obtained a p value = 0.633, so it can be concluded that there is no significant relationship between cooking fuel and the incidence of ARI.

Therefore, the public is encouraged to use natural mosquito repellents, such as lavender plants, or use electronic mosquito coils. They can also use telon oil and mosquito nets to avoid using mosquito coils.

Conclusion

There is a weak correlation between smoking habits and fuel consumption and the incidence of acute respiratory infections (ARI) in the working areas of the Tanggetada and Watubangga Community Health Centers. It is hoped that the Kolaka Regency Health Office will monitor factors that can lead to ARTI to ensure more appropriate policies are taken.

Reference

1. Rusady, YP & Zulaikha, LI The Relationship Between Exclusive Breastfeeding and the Incidence of ARI in Toddlers Aged 7-24 Months at the Lemper Village Health Post, Padewawu Community Health Center Working Area.*J. Joubhas*2, 138–147 (2022).
2. Rai, R. & Tripathi, V. An overview of breast cancer epidemiology, risk factors, classification, genetics, diagnosis and treatment.*Vantage J. Themat. Anal.*4, 45–67 (2023).
3. Organization, WH*Global Patient Safety Action Plan 2021-2030: Towards Eliminating Avoidable Harm in Health Care*. (World Health Organization, 2021).
4. Sari, MP & Cahyati, WH Trends in Pneumonia in Toddlers in Semarang City 2012-2018.*HIGEIA (Journal of Public Heal. Res. Dev.*3, 407–416 (2019).
5. Dewi, AR Classification of chest x-ray images using contrast limited adaptive histogram equalization and convolutional neural network (case study: pneumonia).*JIPI (Journal of Science, Research, and Informed Learning)*.(2021).
6. Safitri, A., Prisca, N., Salsabila, S., Fauzi, H. & Ariyanto, J. Child Deaths Due to Pneumonia: A Literature Review on the Role of Early Detection and Medical Intervention.*Galen. J. Medicine and Health. Mhs. Malikussaleh*4, 55–67 (2025).
7. Nuhan, HG & Listyarini, OR Health Education Using Leaflet MediaThe Influence of Mothers' Knowledge Level on Pneumonia in Toddlers at the Children's Polyclinic of Bhayangkara Hospital, Level I, Indonesian National Police Health Center, East Jakarta. J. Health Science. 16, 395–402 (2024).
8. Southeast Sulawesi, provincial health office 2021. Profile of the Southeast Sulawesi Provincial Health Office in 2021. dinkesProv sultra (2021).
9. Zolanda, A., Raharjo, M. & Setiani, O. Risk factors for acute respiratory infections in toddlers in Indonesia.*Link*17, 73–80 (2021).
10. Dewi, CF & Sardin, EU The Relationship Between Indoor Environmental Sanitation and the Incidence of ISPA in Toddlers in Perang Hamlet, Cireng Village, Manggarai Regency in 2018.*J. Health Insight.*3, (2018).
11. Hariyanto, SS Optimizing the Role of Integrated Health Posts (Posyandu) in Reducing Stunting in Randegan Village, Kebasen District, Banyumas Regency.*UIN Prof. KH Saifuddin Zuhri Purwokerto*(2023).
12. Suhadi, S., Mabruroh, F., Wiyanto, A. & Ikra, I. Analysis of climate change phenomena on extreme rainfall.*Opt. J. Educator. Phys.*7, 94–100 (2023).
13. Ashar, YK & SKM, MKM*Environmentally Based Disease Management*. (Cipta Media Nusantara, 2022).
14. Hidayanti, R. & Darwel, D. Relationship Between Home Environment And Acute Respiratory Tract Infection In Toddlers In Padang City.*Tower of Science J. Researcher. and Study. Ilm.*14, (2020).
15. Garmini, R. & Purwana, R. Indoor air pollution on acute respiratory infections in toddlers at the Sukawinatan TPA, Palembang.*J. Health. Environment. Indonesia.*19, 1 (2020).

16. Jayanti, DI, Ashar, T. & Aulia, D. The influence of the home environment on ARI in toddlers in the working area of the Tanjung Haloban Health Center, Labuhan Batu Regency in 2017.*JUMANTIK (Journal of Science, Research, and Health)*3, 63–77 (2018).
17. Kinanti, M. Description Of Patients With Acute Respiratory Tract Infection (ARI) In The Working Area Of The Natar Public Health Center, Lampung Regencysouth 2024. at (2024).
18. Fatriansari, A. The influence of health education on toddler pneumonia prevention behavior.*J. Health. J. Ilm. Multi Sci.*13, 1–5 (2023).
19. Syahrir, S., Ibrahim, IA, Syarfaini, S., Kurniati, Y. & Halimatussa'diyyah, H. The relationship between LBW, family smoking habits, and nutritional status with the history of ISPA in infants in Ballaparang Village. (2021).
20. Waliyyuddin, R., Fahdhienie, F. & Arivin, VN Risk factors of the physical environment of the house on the incidence of ISPA in toddlers in Darul Imarah Aceh Besar.*Public Media. Health Promotion. Indonesia.*7, 1695–1703 (2024).
21. Silalahi, ML, Siahaan, TM, Mairanda, S. & Wira, M. The Relationship between Nutritional Status and the Incidence of Acute ISPA in Toddlers Aged 0-11 Months in North Sumatra in 2018.*SEHATMAS J. Science. Health. Society.*2, 296–301 (2023).
22. Wong, DL Clinical guidelines for pediatric nursing.*Jakarta Egc*(2003).
23. Ningsih, S., Usmia, S., Nur, NA, Bohari, NH & Kamaruddin, M. Description of Smoking Habits of Family Members with the Incidence of Acute Respiratory Tract Infections (ARI) in Toddlers in the Working Area of the Ponre Health Center, Gantarang District, Bulukumba Regency.*Med. Alkhairaat J. Researcher. Medicine and Health.*2, 30–36 (2020).
24. Seda, SS, Trihandini, B. & Permana, LI The relationship between smoking behavior of close relatives and the incidence of ISPA in toddlers who received treatment at the Cempaka Banjarmasin Community Health Center.*J. Insa Sanctuary Nursing.*6, 105–111 (2021).
25. Fajrianti, AN, Widiarini, R. & Wibowo, PA The Influence of Knowledge and Use of Mosquito Coils on the Incidence of Acute Respiratory Syndrome (ARI) in Toddlers in Rejuno Village.*J. Delima Harapan*9, 189–197 (2022).
26. Subagya, AR*Active Smokers and Passive Smokers*. (Earth of Literature, 2023).
27. Sari, DP, SKM, MKM & Hafidati Khoirunisa, Skm*differences In Cholesterol Levels Between Active Smokers And Passive Smokers*. (PT Arr Rad Pratama, 2024).
28. FEBBIA, C. Physical Environmental Factors In The Home Related To The Incidence Of Ari In Toddlers In The Working Area Of The Kedaton Inpatient Community Health Center In Bandar Lampung City In 2020. at (2021).
29. Ministry of Health. Ministry of Health of the Republic of Indonesia.*Ministry of Health of the Republic of Indonesia*1, (2019).
30. Ningsih, DS*et al.*Innovation in Utilizing Local Resources of Lemongrass Leaves to Become Anti-Mosquito Spray in Kebun Kelapa Village, Secanggang. J. Community Service. Economics and Business Digit. 1, 303–311 (2024).
31. Romeo, P., Setyobudi, A. & Nau, YA Dissemination of information on the use of alternative fuels to replace firewood for salt cookers in Oebelo Village, Central Kupang District, Kupang Regency.*Indonesia. J. Community Dedication*3, 88–93 (2025).
32. Ministry of Health of the Republic of Indonesia.*Indonesian Health Profile 2018 Ministry of Health of the Republic of Indonesia*. Health Statistics (Jakarta, 2018).