

Risk factors causing Acute Respiratory Infection (ARI) in toddlers in Indonesia: A literature review

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Abstract

Acute Respiratory Tract Infection (ARTI) is a respiratory tract disease that can lead to various illnesses, ranging from asymptomatic conditions to fatal ones. In Indonesia, the mortality rate caused by pneumonia ranks second with a total of 217 cases. Generally, the risk factors for ARTI occurrence include individual factors, environmental factors, and behavioral factors. The aim of this study is to identify the risk factors that contribute to the occurrence of ARTI in toddlers in Indonesia. The research method utilized is a literature review, which involves searching for research articles from the electronic database Google Scholar using keywords such as ARTI, smoking habits, risk factors, and toddlers. The research findings indicate that the main risk factors for ARTI occurrence are smoking habits (5 articles), indoor air humidity (2 articles), nutritional status (2 articles), and immunization status (2 articles). From the research findings, it can be concluded that the occurrence of ARTI is caused by risk factors such as smoking habits among family members, indoor air humidity, nutritional status, and immunization status in toddlers. Prevention of ARTI can be achieved by improving nutritional status and ensuring complete immunization for toddlers.

Keywords: ARTI; Smoking Habits; Risk Factors; Toddlers

1. Introduction

Depending on the etiological microorganisms, environmental variables, and individual characteristics, acute respiratory tract infection (ARTI) is a respiratory tract disease that can cause a variety of illnesses, ranging from asymptomatic or moderate infections to severe and deadly diseases [1]. Irianto explained that acute respiratory tract infection (ARTI) is one of the diseases that causes mortality in infants and ranks first as the leading cause of illness in toddlers. Early prevention can reduce the mortality rate caused by ARTI [2].

The World Health Organization (WHO) estimates that 13 million toddlers worldwide pass away from acute respiratory tract infections (ARTI) each year, with poorer nations accounting for the majority of these deaths. According to the WHO, the prevalence of ARTI among toddlers in underdeveloped nations with death rates exceeding 40 per 1000 live births is between 15% and 20% yearly [3]. According to the data from the Indonesian health profile in 2021, it is known that the mortality rate caused by pneumonia ranks second with a total of 217 cases. In addition, the cases of pneumonia found over an 11-year period have been quite fluctuating, with the highest number of cases recorded in 2016, reaching 65.3% [4].

Age, gender, nutritional condition, and vaccination status are some of the host-related intrinsic variables that contribute to the high prevalence of ARTI. On the other hand, environmental variables, like as overpopulation, air pollution, exposure to cigarette smoke, as well as maternal behavioral issues, might be risk factors for the development of ARTI in toddlers. [5,6].

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Based on the background outlined above, the objective of this research is to identify the risk factors that contribute to the occurrence of ARTI in toddlers in Indonesia.

2. Material and methods

This research is classified as a qualitative study utilizing the literature review method and employing a descriptive analysis approach. The data used in this study were sourced from scientific articles from national journals, obtained from the Google Scholar database using keywords such as "ARTI," "smoking habits," "risk factors," and "toddlers." The inclusion criteria for this research were scientific articles published within the last 10 years (2013-2023). The collected data will be analyzed, and conclusions will be drawn based on the analysis.

3. Results and discussion

Based on the collected and analyzed articles, the findings are presented as follows:

Table 1 List of Articles

No.	Author	Method	Result
1	Sofia [7]	Cross sectional	The amount of indoor humidity, family members' indoor smoking habits, and indoor use of mosquito repellent coils are all risk factors for the development of acute respiratory infections (ARIs) in toddlers.
2	Aprilia et al. [8]	Cross sectional	The prevalence of Acute Respiratory Infections (ARIs) among toddlers in Pulau Jambu village in 2019 is significantly correlated with parental smoking habit, with a p-value of 0.001.
3	Rahayaningrum and Nur [9]	Cross sectional	Acute Respiratory Infections (ARIs) in toddlers are significantly correlated with nutritional status and vaccination status.
4	Fadila and Siyam [10]	Case control	In Kertosari Village, risk factors for acute respiratory infections (ARI) in toddlers include mother employment status, family smoking habits, exposure to dust, exclusive breastfeeding, child nutritional status, child vaccination status, and zinc supplement use.
5	Siska [2]	Cross sectional	There is a significant relationship between smoking behavior and cases of Acute Respiratory Infections (ARIs) in toddlers at Bukit Sangkal Palembang Health Center.
6	Syam and Ronny [11]	Case control	Temperature, humidity, and lighting are risk factors that contribute to the occurrence of Acute Respiratory Infections (ARIs) in toddlers.
7	Wardani et al. [12]	Cross sectional	In Pucung Rejo Village, Magelang Regency, there is a connection between exposure to cigarette smoke and the prevalence of acute respiratory infections (ARIs) in toddlers.
8	Aryani et al. [13]	Cross sectional	At the Helvetia Health Center, there is a correlation between toddlers getting acute respiratory infections (ARIs) and family members who smoke indoors.

Based on the 8 articles presented in Table 1, the discussion will now focus on identifying the factors that contribute to the cases of Acute Respiratory Infections (ARIs) in toddlers in Indonesia.

The behavior of family members' smoking habits is identified as the main risk factor for causing Acute Respiratory Infections (ARIs) in toddlers in Indonesia. According to the study by Aryani et al. [13], It was discovered that 66 children (71.7%) had ARIs as a result of having family members who smoke. Another study showed that toddlers with active smoking parents experienced ARIs in 28 cases (81.4%) [8]. Toddlers with family members who actively smoke are at a risk of experiencing ARIs 17.143 times higher compared to toddlers whose family members do not smoke actively [2]. Harmful gases in cigarette smoke lead to the development of chronic bronchitis and a decrease in lung pumping capacity due to the accumulation of mucus, dust, and bacteria that cannot be expelled, resulting in the rupture of air sacs [12].

One environmental factor, namely indoor air humidity, also serves as a risk factor for the cases of Acute Respiratory Infections (ARIs) in toddlers. This finding is supported by the study conducted by Syam and Ronny [11] The statistical test results indicate a p-value of 0.00 (<0.05) with an odds ratio (OR) of 0.145 and a 95% confidence interval (CI) of 0.060-0.353, which signifies that indoor air humidity is a significant risk factor. Another study revealed that inadequate indoor air humidity levels led to the cases of Acute Respiratory Infections (ARIs) in 45 toddlers (85.7%). Keman elucidates that poor air quality, characterized by the presence of pollutants causing irritation, can adversely affect individual health, including the cases of Acute Respiratory Infections (ARIs) [7].

Based on the results of Siyam and Fadila's research [10], It is revealed that compared to children with adequate nutrition, those who are malnourished have a 2.32 times higher chance of developing acute respiratory infections (ARIs). This study is consistent with the research conducted on toddlers at Lubuk Buaya Health Center, they claimed there was a causal link between poor nutrition and the cases of ARI. From the same study, it is also known that among toddlers with malnutrition, 37 toddlers (90.2%) experienced Acute Respiratory Infections (ARIs). Heriana explains that the decreased appetite in toddlers leads to malnutrition, which in turn weakens their immune system. This condition makes toddlers more susceptible to chronic ARIs with longer durations of illness [14]. Preventive measures that parents can take include providing proper nutrition to toddlers with the goal of improving their nutritional status. Although it does not directly provide immune protection against Acute Respiratory Infections (ARIs), toddlers with good nutritional status will reduce the risk factors for cases of ARIs and other infectious diseases [9].

According to the study conducted by Rahyaningrum and Nur [9], it is explained that the number of cases of Acute Respiratory Infections (ARIs) in toddlers and vaccination status are significantly correlated. From the study, it was found that toddlers who did not receive complete immunization and experienced ARIs accounted for 78.2%. This is also consistent with other studies that state that toddlers who have not received complete immunization are at a 3.68 times higher risk of developing Acute Respiratory Infections (ARIs) compared to toddlers who have received complete and timely immunization [10]. The low coverage of immunization in toddlers is caused by parents' fear due to the fever experienced by toddlers after immunization [9]. The administration of immunization in toddlers is aimed at stimulating the development of their immune system. Complete basic immunization is carried out to prevent diseases such as tuberculosis, hepatitis B, tetanus toxoid, pertussis, influenza type B, and measles. Immunization is a proven cost-effective preventive measure and the best way to prevent young children from being affected by diseases [15].

4. Conclusion

According to the research's findings, there are a number of intrinsic and extrinsic variables that contribute to the occurrence of acute respiratory infections (ARIs) among toddlers in Indonesia. Nutritional status and vaccination status are intrinsic variables that put kids at risk for ARIs. Family members' smoking habits and the humidity of indoor air are two external variables that influence the development of acute respiratory infections (ARIs). By guaranteeing full basic vaccination to strengthen the toddlers' immune systems and ensuring enough food intake to improve nutritional status, acute respiratory infections (ARIs) can be prevented in toddlers.

Compliance with ethical standards

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