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RELATIONSHIP BETWEEN PARENTAL SMOKING BEHAVIOR AND ACUTE RESPIRATORY INFECTION INCIDENCE IN TODDLERS

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Abstract

Acute Respiratory Infection (ARI) is a leading cause of toddler illness. One contributing factor is parental smoking behavior, which exposes toddlers to secondhand smoke and increases their risk of URTI. Over the past five years, Banten Province reported 194,684 cases of ARI. This study aimed to analyze the relationship between parental smoking behavior and ARI incidence in Banten Province. A cross-sectional design was employed, with a sample of 399 parents of toddlers aged one to five years. Data collection took place from January to April 2022 using a convenience sampling technique and a questionnaire. Data analysis was performed using chi-square tests. The results indicated a significant association between parental smoking and ARI incidence in toddlers (p = 0.001). Toddlers with smoking parents were found to be 14.39 times more likely to develop ARI compared to those with non-smoking parents. The study recommends that parents, as primary caregivers, play a crucial role in preventing ARI by refraining from smoking around children, in cars, or within the home.

Keywords : *Parental Smoking Behavior, Secondhand Smoke, Toddler, Upper Respiratory Tract Infection.*

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Introduction

Acute Respiratory Infection (ARI) is a leading cause of death among children under five years of age. ARI remains a significant health issue worldwide. It contributes to both morbidity and mortality from infectious diseases, with an annual incidence of 18.8 billion cases and 4 million deaths (WHO, 2015). Globally, acute respiratory infections are the seventh leading cause of environment-related deaths. These infections occur in all regions, including poor, developing, and developed countries such as sub-Saharan Africa, China, and Australia (WHO, 2017).

Toddlers are particularly vulnerable to ARI. In 2015, ARI was responsible for 5.9 million deaths among children under the age of five (WHO, 2017), making it the leading cause of child mortality worldwide. This issue is especially pronounced in sub-Saharan Africa, which accounts for an estimated 51% of ARI-related deaths (WHO, 2015). In Southeast Asia, Indonesia reported the highest number of ARI deaths, with 25,000 cases in 2015, followed by the Philippines, Myanmar, Vietnam, Laos, and Cambodia (WHO, 2017). In Indonesia, the ARI rate was 2.7% in 2013, up from 2.1% in 2012. Banten Province is among the ten provinces with the highest rates of acute respiratory infections in Indonesia (MOH Republic of Indonesia, 2018). The prevalence of ARI in children under five in Banten Province is 1.93%, exceeding the national prevalence of 1.85%. Over the

past five years, Banten Province reported 194,684 ARI cases, with 57,773 cases in 2016, 57,565 cases in 2017, 51,476 cases in 2018, 49,437 cases in 2019, and 22,927 cases in 2020. ARI cases have consistently ranked first among the ten most common diseases in Banten Province (Banten Provincial Health Office, 2020).

Risk factors for ARI include environmental, individual child, and behavioral factors. Environmental factors encompass exposure to cigarette smoke, high concentrations of cooking fuel smoke, inadequate home ventilation, and housing density. Individual child factors include age, low birth weight (LBW), nutritional status, and immune status. Behavioral factors involve the smoking behavior of family members around toddlers (Juwarni, 2012). Smoking is a health hazard, with cigarettes containing over 4,000 toxic elements, including tar, nicotine, and carbon monoxide (Nugroho, 2017). Indonesia ranks first in ASEAN for the highest number of smokers, with 50.68% of the population smoking. In 2015, there were approximately 72 million active smokers in Indonesia, with an annual increase of 17%. It is estimated that the number of smokers in Indonesia will rise to 96 million in the coming years (WHO, 2015). The habit of smoking inside the home exposes toddlers to secondhand smoke, making them passive smokers. This exposure can lead to various health issues in toddlers, including respiratory problems, digestive tract disorders, increased heart rate, and lung infections. Studies indicate that children with smoking parents are 7.83 times more likely to experience ARI compared to those with non-smoking parents (Juwarni, 2012). Additionally, research conducted in Australia highlights that while multiple factors contribute to ARI in toddlers, exposure to cigarette smoke is a significant risk factor (Walker et al., 2015).

Given the high prevalence of ARI in Banten Province and its status as a leading cause of death among toddlers, it is essential to conduct research analyzing the relationship between parental smoking behavior and the incidence of ARI in this population

Methods

The study employed a cross-sectional design and included a sample of 399 respondents, specifically parents of toddlers aged one to five years in Banten Province. Data collection took place from January to April 2022 using convenience sampling. A questionnaire was the primary data collection instrument, and chi-square tests were used to analyze the data.

The researcher obtained ethical approval from the Research Ethics Committee, Faculty of Nursing Universitas Pelita Harapan. The instruments used were designed to provide respondents with information about the study's purpose, their rights, and instructions for completing the questionnaire. This information was presented on the first page of the research form via Google Forms. The questionnaire was then distributed via social media platforms such as WhatsApp, Instagram, and Facebook. Prospective respondents who agreed to participate were instructed to review the informed consent page before proceeding to the research questions. Once the sample target of 399 respondents was achieved, the researcher processed the data using advanced computerized methods, ensuring the study's technological rigor

Result and Discussion

Table 1. Characteristics of parents

Variable	Frequency (n)	Percentage (%)
Age		
20-30	248	62,2
31-40	147	36,8
>40	4	1
Education		
Junior high school	14	3,5
Senior high school	286	71,7
University	98	24,6
Occupation		
Government employees	36	9,1
Self-employed	106	26,6
Housewife	163	40,9
Pegawai swasta	93	23,3
Private employee	1	0,3

Table 1 shows that most parents are aged 20-30 years (62.2%), have a high school education (71.7%), and are housewives (40.9%).

Table 2. Parental smoking behavior

Parental smoking behavior	Frequency (n)	Percentage (%)
Yes	385	96,5

No	14	3,5

Table 2 shows that the majority of respondents are smokers, with 96.5% reporting smoking.

Table 3. ARI incidence

ARI incidence	Frequency (n)	Percentage (%)
Yes	370	92,7
No	29	7,3

Table 3 shows that the majority of toddlers experienced ARI, accounting for 92.7% of the cases.

Table 4. Bivariate Analysis

Smoking	Yes		No		Quantity		OR (95% CI)	p-value
Yes	362	94.3	22	5.7	384	96.2	14,398	0.001
No	8	53.3	7	46.7	15	37	(4,78-43,33)	

Table 4 shows that parental smoking behavior is significantly related to the incidence of ARI in toddlers (p-value = 0.001). Toddlers with smoking parents have a 14.39 times greater risk of experiencing ARI compared to those with non-smoking parents.

Discussion

ARI is a disease caused by viruses or bacteria that typically lasts 14 days or more. Common symptoms include difficulty breathing, coughing, sore throat, fever, runny

nose, and earache (Wardana, 2020). ARI is a prevalent respiratory tract disease, especially among toddlers, and is a significant cause of morbidity and mortality, particularly in poor and developing countries (Irianto et al., 2021). It is one of the leading causes of death globally and significantly affects the quality of life, particularly in toddlers, as measured by disability-adjusted life years (Zulkifli et al., 2019). Various factors, including environmental conditions, influence ARI. Key environmental factors contributing to ARI include the physical condition and density of housing, air pollution from sources such as cigarette smoke, household smoke, burning waste, transportation exhaust, industrial emissions, and forest fires (Langbein, 2018).

Several factors can increase the risk of ARI, including environmental factors such as air pollution and exposure to cigarette smoke. Smoking habits of family members, especially those who smoke inside the home, can have detrimental effects on family members, particularly toddlers (Suguna et al., 2020). Cigarettes contain over 4,000 chemical elements, 200 of which are harmful to health (WHO, 2019). Residual chemicals from cigarette smoke can cling to clothes, furniture, curtains, and other surfaces, potentially leading to respiratory infections like ARI in toddlers (Glantz & Bareham, 2018). Furthermore, the hazardous materials and toxins in cigarettes not only affect smokers but also pose health risks to non-smokers, including babies, toddlers, and mothers, who are exposed as passive smokers. The habit of smoking in the home can increase the risk of ARI in toddlers by 2.2 times (Jean-Daniel, 2016).

The results of this study explain that toddlers whose parents smoke at home are 14.39 times more at risk of experiencing ARI compared to toddlers with parents who do not smoke. This study is in line with research conducted in the Sidomulyo Health Center work area, which shows that there is a relationship between smoking behavior and the incidence of ARI in toddlers (Seda et al., 2021). In addition, research conducted in India found that the worse the respondent's smoking behavior, the higher the incidence of ARI. Another study conducted in Parepare showed that there was a significant relationship between parental smoking behavior at home and the incidence of ARI in children (Hengky et al., 2022). Another study conducted in Banjarbaru showed that parental smoking behavior at home was 3.935 times more at risk of suffering from ARI than those who smoked at home (Seda et al., 2021). Research in New York found that there is a relationship between smoking behavior in parents and the incidence of ARI, where in infants and 38 children passive smokers can experience respiratory health problems, one of which is respiratory infection (New York State Department of Health, 2018).

This is supported by research conducted in the United States on children aged 3-11 years who have serum cotinine concentrations (nicotine breakers) that are more than twice as high as adults who do not smoke. This indicates that children who do not live with smokers are also at risk of being affected by the adverse effects of cigarette smoke (Benowitz et al. 2019). However, there is still much to learn about the full extent of these risks and the most effective strategies for prevention. It can be concluded that parental

smoking behavior can increase the risk of toddlers getting ARI, but further research is needed to fully understand and address this issue.

Conclusion

This study, conducted with 399 respondents in Banten Province, reveals significant insights into the relationship between parental smoking behavior and the incidence of ARI in toddlers. Most respondents were 20-30 years old, worked as housewives, and had a high school education. A striking 96.5% of respondents had family members who smoked, and 92.7% of toddlers were reported to have ARI. The analysis showed a significant association between parental smoking behavior and the increased risk of ARI in toddlers (p-value = 0.001). These findings highlight the critical impact of parental smoking on the respiratory health of young children and underscore the need for targeted interventions to reduce smoking in households to improve child health outcomes.

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