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THE RELATIONSHIP BETWEEN FAMILY RESILIENCE AND EFFORTS TO PREVENT ACUTE RESPIRATORY INFECTION (ARI) AMONG CHILDREN IN WETLANDS

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ABSTRACT
Children living in wetlands are particularly susceptible to Acute Respiratory Infections (ARI), and family resilience plays a vital role in safeguarding their health. This study explored the association between family resilience and families' efforts to prevent ARI in children aged 1–5 years. A quantitative descriptive correlational design was applied, involving 100 families in wetlands. Data were collected using the Family Resilience Assessment Scale (FRAS) and a validated ARI prevention questionnaire, both of which had been tested for validity and reliability. Data were analyzed using the Chi-square test. The findings revealed a significant relationship between family resilience and ARI prevention efforts ($p = 0.012$). Families with greater resilience were more consistent in maintaining hygiene, keeping their homes clean, and seeking timely medical care when respiratory symptoms appeared.

Keywords: acute respiratory infection; child health; family resilience; prevention behavior; wetlands

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INTRODUCTION

Acute Respiratory Infections (ARI) remain one of the leading causes of morbidity and mortality among children worldwide. According to the World Health Organization (2017), ARI accounts for more than three million deaths annually among children under five years old, with the majority occurring in developing countries. In Indonesia, data from the Ministry of Health of the Republic of Indonesia (2019) indicate that the prevalence of ARI among children under five exceeds 20% each year. This condition illustrates that ARI remains a significant public health concern requiring comprehensive management, particularly in areas with high environmental risk.

In wetland areas, the risk of ARI in children tends to be higher due to environmental conditions that frequently expose them to stagnant water and flooding. Floods can damage sanitation infrastructure, reduce clean water quality, and increase exposure to disease-causing agents. Damp and unhealthy household environments serve as key contributing factors to the occurrence of respiratory infections. Research conducted by Nurhayati et al. (2015) revealed that flooding directly affects the deterioration of sanitation systems and healthcare facilities, thereby worsening the quality of residential environments and increasing ARI incidence, particularly among children as a vulnerable group.

In such situations, family resilience plays a crucial role. Family resilience is defined as the ability of a family to adapt, recover, and maintain effective functioning when faced with stress or environmental changes. Resilient families can utilize available resources, sustain family functioning, and make appropriate decisions to protect the health of their members, including children. Hakim et al. (2023) highlighted that community resilience after flooding is strongly influenced by social support, personal strength, and adaptive capacity in responding to challenges, all of which help individuals and families manage stress and maintain emotional stability.

In addition to environmental and psychosocial factors, socioeconomic conditions and family knowledge also influence ARI prevention. Siahaineinia (2018) found that families with lower economic status face limitations in providing a healthy environment and accessing healthcare services. Rizkiah (2024) and Anggara et al. (2025) further noted that mothers' educational level and knowledge are closely related to ARI preventive behaviors; mothers with higher knowledge tend to maintain environmental hygiene and recognize early signs of illness more effectively. These findings suggest that strong family resilience, supported by socioeconomic stability and education, is key to successful ARI prevention.

Nevertheless, studies examining the relationship between family resilience and ARI prevention efforts among children in wetland areas remain scarce. Communities residing in wetlands possess unique social, economic, and environmental characteristics, which present specific challenges in maintaining family health. Therefore, this study aims to analyze the relationship between family resilience and ARI prevention efforts among families with children aged 1–5 years living in the wetlands of Pekanbaru City. The findings are expected to provide a comprehensive understanding of family resilience levels and ARI preventive behaviors, serving as a foundation for developing more effective and contextually relevant family-based community nursing interventions tailored to wetland communities.

METHOD

This study employed a quantitative correlational design to examine the relationship between family resilience and efforts to prevent Acute Respiratory Infections (ARI) in children. It was conducted among families with children aged 1–5 affected by flooding in the Siak River wetland area, Pekanbaru. The study population consisted of 380 children under five, based on data from the Umban Sari Community Health Center (Puskesmas). The sample comprised 100 children, determined using Slovin's formula (Sujarweni, 2014). The inclusion criteria were: (1) children who had experienced flooding, (2) residing in the working area of Puskesmas Karya Wanita, and (3) parents willing to participate as respondents by signing a written informed consent form.

Respondent recruitment was conducted in coordination with the health center and community health cadres in the Puskesmas Karya Wanita working area, who contacted families meeting the inclusion criteria. The study received ethical approval from the Faculty of Nursing Ethics Committee, Universitas Riau Number: 3755/UN19.5.1.8/KEPK.FKp/2025. Before completing the questionnaires, respondents were provided with detailed explanations of the study's objectives and benefits. Only those who provided written consent were included in the study. Respondents were not asked to write their names to ensure confidentiality, and all personal data was securely protected.

The research instruments consisted of a Family Resilience questionnaire and a Child ARI Prevention questionnaire. The Family Resilience questionnaire used the Indonesian version of the Family Resilience Assessment Scale (FRAS), originally developed by Sixbey (2005) in Development of the Family Resilience Assessment Scale to Identify Family Resilience Constructs (University of Florida). The Indonesian version has been previously tested for validity and reliability in Indonesia by Ahmad et al. (2023), demonstrating excellent internal consistency with a Cronbach's alpha of 0.966. The instrument uses a Likert-type scale, with higher total scores indicating higher levels of family resilience.The Child ARI Prevention questionnaire was developed by the researchers and underwent validity and reliability testing prior to data collection. The validity analysis demonstrated item-total correlation coefficients ranging from 0.486 to 0.642, indicating that all items were valid. Reliability testing yielded a Cronbach's alpha coefficient of 0.752, reflecting acceptable internal consistency. Univariate analysis was presented as frequency distributions and percentages. In contrast, bivariate analysis was conducted using the Chi-square test to determine the relationship between family resilience and ARI prevention efforts in children.

RESULT

A total of 100 respondents participated in this study. The majority of parents had completed senior high school education (62%), followed by higher education (15%), junior high school (16%), and elementary school (7%). Nearly half of the respondents were unemployed (45%), while the remaining worked as traders (32%), civil servants (11%), private employees (5%), laborers (3%), and retirees (4%). Most respondents reported a monthly family income above minimum wage (79%), indicating that most came from low-income families. Most families reported that their children had experienced acute respiratory infections (ARI) (77%), followed by diarrhea (21%) and skin diseases (2%). Regarding healthcare utilization, the majority of respondents sought care at community health centers (66%), while the remainder went to pharmacies (34%) (Table 1).

Table 1.
Respondent Characteristics (n = 100)

Characteristics	f (%)
Parents' Education	
Elementary School	7 (7)
Junior High School	16 (16)
Senior High School	62 (62)
Higher Education (University/College)	15 (15)
Occupation	
Unemployed	45 (45)
Trader	32 (32)
Civil Servant	11 (11)
Private Employee	5 (5)
Laborer	3 (3)
Retired	4 (4)
Family Income	
Minimum wage	79 (79)
Above minimum wage	21 (21)
Family Illnesses	
Acute Respiratory Infections (ARI)	77 (77)
Diarrhea	21 (21)
Skin Diseases	2 (2)
Healthcare Facility	
Community Health Center (Puskesmas)	66 (66)
Pharmacy	34 (66)

Table 2.
Frequency Distribution of Characteristics Based on the Relationship between Family Resilience and Prevention Efforts for ISPA in Toddlers

Family Resilience	ARI Prevention Efforts										P value
	Very Good		Good		Poor		Very Poor		Total		
	f	%	f	%	f	%	f	%	f	%	
High	13	20,6	39	61,9	6	9,5	5	8	63	63	0,012
Moderate	5	13,5	14	37,8	10	27	8	21,7	37	37	

The analysis of the relationship between family resilience and efforts to prevent ARI in young children revealed a statistically significant association. Families with high resilience tended to implement better ARI prevention efforts than those with moderate resilience. The Chi-square test indicated a p-value of 0.012, suggesting a significant relationship between family resilience and ARI prevention efforts in children under five (Table 2).

DISCUSSION

The results of this study indicate a significant relationship between family resilience and efforts to prevent Acute Respiratory Infections (ARI) in children living in wetland areas ($p = 0.012$). Families with high resilience levels were more consistent in implementing preventive measures, such as maintaining household hygiene, ensuring adequate ventilation, and promptly seeking medical care when children exhibited respiratory symptoms. These findings suggest that family resilience is crucial for coping with psychological or economic stressors and plays a direct role in safeguarding child health through clean and healthy living behaviors.

Walsh (2003) explains that family resilience is the capacity to withstand adversity and bounce back with renewed strength and resources after encountering challenges. In the context of ARI prevention, resilient families can adapt to environmental pressures such as flooding, high humidity, or air pollution. They develop adaptive strategies, including maintaining environmental cleanliness, improving household ventilation, and managing emotional stress. This demonstrates that highly resilient families can maintain family functioning while consistently practicing health-promoting behaviors despite ecological pressures. This study aligns with the findings of Rakhmani et al. (2020), who reported that internal family dynamics, including communication, social support, and the division of roles among family members, influence family behaviors in preventing ARI. Families with effective communication, strong social support, and flexible role distribution among parents and other members could better recognize early signs of ARI and implement preventive measures. Conversely, families experiencing high stress or economic limitations tended to be less effective in prevention, reflecting low resilience capacity and an increased risk of ARI in children.

In addition to psychosocial factors, household environmental conditions play a critical role in ARI prevention. Kua and Lee (2021) demonstrated that interventions such as improving ventilation, enhancing sanitation, and controlling indoor humidity can reduce the incidence of respiratory infections by up to 28%. Families with high resilience in wetland areas generally adapt better to such risks by maintaining clean homes, ensuring proper air circulation, and securing access to clean water. The findings are further supported by Ruffles et al. (2023), who identified household humidity, exposure to tobacco smoke, and air pollution as significant contributors to respiratory infections and wheezing in children. In high-humidity wetland environments, resilient families often implement measures such as improving ventilation, sun-drying bedding, and preventing damp walls. These actions represent objective environmental load management, which helps reduce ARI risk in children.

Additionally, the study corresponds with Fahdiyani, Raksanagara, and Sukandar (2016), who reported that household crowding is significantly associated with ARI incidence in young children. Children living in crowded homes have nearly three times the risk of developing respiratory infections compared to those in more spacious environments. This underscores that ARI prevention depends not only on individual behavior but also on objective household environmental conditions. In this context, the family's ability to adapt and manage ecological risks reflects practical family resilience.

According to Yang et al. (2023), family resilience is the capacity of the family system as a whole to adapt, cope with stress, and restore functioning after a crisis. This resilience emerges from interactions among family members and interrelated social support. Based on the family resilience model developed by Walsh (2016), resilience is built through shared belief systems, flexible organizational patterns, and positive family communication. These three components enable families to adapt to environmental pressures and protect child health, including preventing respiratory illnesses like ARI.

In summary, family resilience reflects psychological endurance and the family's capacity to manage available resources to maintain a healthy household environment. Resilient families are more likely to demonstrate adaptive behaviors when facing challenging environmental conditions, including

those in coastal or wetland areas (Yulianita et al., 2023). Therefore, strengthening family resilience through health education, community support, and empowerment programs is a critical strategy to reduce ARI incidence among children in vulnerable regions.

CONCLUSION

This study indicates that family resilience is significantly associated with efforts to prevent Acute Respiratory Infections (ARI) in children aged 1–5 years living in wetland areas ($p = 0.012$). Resilient families consistently maintain household hygiene, ensure adequate ventilation, manage environmental risks, and seek timely medical care. Strengthening family resilience through health education and community support is an important strategy to reduce ARI risk and promote healthy living behaviors among children in vulnerable environments.

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