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Mother's Knowledge and Attitude Associated with Acute Respiratory Infection Prevention in Under Two Children in Lewoleba, East Nusa Tenggara, Indonesia

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Abstract

Introduction: This study investigates the correlation between maternal knowledge and attitudes and their impact on preventing Acute Respiratory Infections (ARIs) in under two children in Lewoleba, East Nusa Tenggara, Indonesia. With a focus on this region with limited prior research, the study explores how a mother's understanding and approach toward ARI prevention measures may contribute to improved child health outcomes.

Methods: A cross-sectional study investigated the association between maternal knowledge and attitudes and their impact on preventing ARIs in children under two years old in Lewoleba, East Nusa Tenggara, Indonesia. The study administered structured questionnaires to gather data on maternal knowledge and attitude toward ARIs, behavior toward prevention, and demographic information. Data were analyzed using bivariate analysis to evaluate the association.

Results: Of 144 respondents, 81.3% showed high ARI knowledge, but only 54.9% had positive attitudes, and 53.2% exhibited good behaviors. The Chi-square test revealed a significant relationship between knowledge and attitude with ARI behavior (P<0.05) among mothers with children aged 0-24 months in Lewoleba Primary Health Centre, Nubatukan District, Lembata Regency. Specifically, mothers with high knowledge had a 2.31 prevalence ratio (PR) for good ARI-related behaviors compared to those with low ability. In contrast, those with positive attitudes had a 1.52 PR for such behaviors.

Conclusion: This study revealed a connection between mothers' knowledge and attitudes concerning ARI in children under two and their preventive actions. Despite a relative scarcity of good behaviors compared to strong knowledge and positive attitudes, the findings underscore that higher knowledge scores and more positive attitudes lead to significantly better behavioral outcomes.

Keywords: acute respiratory infections - attitude - behavior - knowledge - prevention.

INTRODUCTION

Acute Respiratory Infection (ARI) represents a significant global health concern, especially for children under the age of five. According to the World Health Organization (WHO), ARI is responsible for a substantial portion of global morbidity and mortality, with an estimated annual death toll exceeding 4 million people worldwide. This underscores the profound public health impact of this condition.[1] A comprehensive study conducted in rural North India, which involved a large cohort and examined 16,524 cases of ARI, revealed that the age group most susceptible to ARI-related hospitalization was boys aged 29 days to 1 year. Within this demographic, the hospitalization rate reached 82.2 cases per 1000 child-years. Considering the entire population of children under five, the overall hospitalization rate for ARI was 15.0 cases per 1000 child-years.[2] A more recent investigation conducted in Bangladesh demonstrates that 87.3% of individuals encountered at least one ARI episode within the initial two years of their lives. The highest occurrence of ARIs was observed at 330 infections per 100 infants per year, specifically between the ages of 2 and 4 months.[3]

In Indonesia, ARI, with a particular focus on pneumonia, is the second leading cause of death among infants and young children, following closely behind diarrhea.[4] This trend highlights the severity of ARI's impact on the nation's youngest population.[5] According to data from the Basic Health Research Report (*Riset Kesehatan Dasar/Riskesdas*) in 2013, East Nusa Tenggara (NTT) Province emerged as the region with the highest ARI prevalence in Indonesia, reaching 41.7%. This alarming statistic remained consistent with the 2007 *Riskesdas* findings, where NTT Province had already earned the unfortunate distinction of having the highest ARI prevalence nationwide. Notably, the age group most susceptible to ARI is the 1-4-year-olds bearing the brunt of this health challenge.[6]

Zooming in on Lembata Regency, one of the regencies within NTT Province, the 2013 *Riskesdas* data revealed an even higher ARI prevalence of 50.1%. This exceeds the provincial ARI prevalence, indicating a local health issue of considerable significance.[6] A closer examination through surveys conducted by the Lembata Central Statistics Agency (*Badan Pusat Statistik/BPS*) further underscores the magnitude of ARI in this region. Annually, ARI consistently features among the top 10 most prevalent diseases in the Lembata Regency. Data extracted from the Lewoleba Health Center profile reinforces the prominence of ARI as the most frequently occurring infectious disease, particularly among infants and under two children.

The complexity of the ARI challenge faced in Lembata Regency extends beyond its epidemiological dimensions. It delves into knowledge, attitudes, and behaviors within the local community, particularly among mothers and caregivers. Numerous research studies have underscored the pivotal role of maternal knowledge and attitudes in influencing behaviors related to ARI, ranging from preventive measures to prompt recognition and management of the condition.[7-9] Given the high prevalence of ARI in Lembata Regency and the absence of comprehensive research examining the facets of knowledge, attitudes, and behaviors concerning ARI in this region, researchers are drawn to explore and elucidate the relationship between maternal knowledge and attitudes and their consequent impact on preventive behaviors related to ARI among under two children.

METHODS

Research Design and Location

This study adopts a cross-sectional design, incorporating a quantitative analytical observational approach. The research endeavor transpired in December 2018 within the delineated boundaries of ten carefully selected urban and rural areas in Lembata. These areas fall within the purview of the Lewoleba Health Center, situated in the Nubatukan District of Lembata Regency, East Nusa Tenggara Province, Indonesia. This

research and location choice made to ensure a comprehensive understanding of the pertinent issues. All procedures in this study was approved by local institutional committee with clearance number #13/11/KEP-FKUAJ/2018.

Research Subjects

The focal subjects of this study encompassed mothers who are nurturing toddlers within the age bracket of 0 to 24 months. Importantly, these mothers are residents within the jurisdiction of the Lewoleba Health Center. These subjects were selected through a randomized sampling method. Notably, while striving for inclusiveness, specific individuals were consciously excluded from the study. This exclusion was primarily based on their voluntary refusal to participate or due to inherent communication difficulties that could have impeded the research process.

The sample size was determined using the single population proportion formula. Upon incorporating an anticipated 20% oversampling contingency for unforeseen occurrences, the ultimate total sample size reached 144. The selection of study participants employed a computer-generated simple random sampling method, relying on their medical registration numbers in Lewoleba Primary Health Center. Sampling occurred daily, with children chosen from a randomized list of numbers specific to each day.

Research Instrument and Variables

The foundation of this research lies in the data collected through interviews. An ARI questionnaire about knowledge, perception, and behaviour was employed to ensure the integrity of the data. This questionnaire consists of four sections: the first part contains questions about maternal demographics, and the second part contains statements about knowledge of ARI, totalling 18 statements. The third part contains statements about attitudes toward ARI consisting of 13 statements, and finally, the fourth part contains statements about behaviours related to ARI comprising 11 statements. High knowledge is defined if the total score is ≥85% of the maximum total score, while low knowledge is if the total score is <85% of the maximum total score. Meanwhile, attitudes and behaviours are based on the cut-off value calculation (average if the data is normally distributed and median if the data is skewed). It is worth noting that this questionnaire underwent validation and reliability testing, which showed an alpha Cronbach of 0.83.

The demographic questionnaire consists of questions about age (in years), educational level (primary, junior high, senior high, and bachelor/diploma), working statuses (working/not working), and expenses per month. The monthly expenses were divided by the minimum wage applied in Lewoleba, IDR 922,000 or approximately 60 USD per month. The response was categorized as either less than minimum wage or equal/more than minimum wage.

Statistical Analysis

The analysis encompassed univariate and bivariate components, facilitated by chi-square test. The venerable statistical analysis tool, SPSS version 22.00 [IBM, Corp], was utilized in this study. Continuous data underwent analysis through the independent t-test when the data exhibited a normal distribution, while the Mann–Whitney U test was employed for skewed data. Mean and standard deviation (SD) were calculated. For qualitative variables, the chi-square test was used, and results were presented as frequency and proportion. A prevalence ratio (PR) was used in this study to measure the risk or prediction of adopting favorable behavior. PR is used in a cross-sectional study to explore relationships between exposures and outcomes without requiring follow-up over time.

RESULTS

The characteristics of the respondents are summarized in Table 1. The results show that the mean age of mothers with under two children is 30.11±6.85 years, with the youngest being 17 years old and the oldest 52 years old. The education level of mothers is predominantly high school graduates or equivalent (40.3%),

Table 1. Respondent's Characteristics

Characteristics	Frequency (n)	%	X±SD	Min-Max
Age [years]	144	100	30.11±6.85	17-52
Education level				
Primary school	22	15.30		
Junior high	27	18.80		
Senior high	58	40.30		
Bachelor/Master Degree	37	25.70		
Working Statuses				
Working	26	18.10		
Not Working	118	81.90		
Expenses				
≥ minimum wage	63	43.80		
Less than minimum wage	81	56.30		

followed by bachelor's degree or equivalent (25.7%). This figure indicates that mothers in Lembata have a relatively high level of education. Most mothers are unemployed (81.9%) and have a monthly income below the minimum wage (56.3%).

Based on the distribution of knowledge, attitudes, and behavior scores related to ARI, the research results show that out of 144 respondents, the majority have a high level of knowledge about ARI (81.3%). However, in terms of attitudes and behaviors, positive attitudes are exhibited by 54.9% of respondents, while good behaviors are displayed by only 53.2% (Table 2).

Table 2. ARI's Knowledge, Attitude and Behaviour Characteristics

Variable	Freq. (n)	%	Scores		
			X±SD	Minimum	Maximum
Knowledge	144	100			
High	117	81.30	16.67±1.51	10	18
Low	27	18.80			
Attitude	144	100			
Positive	79	54.90	42.17±4.36	32	52
Negative	65	45.10			
Behaviour	144	100			
Good	77	53.50	34.63±3.76	25	44
Bad	67	46.50			

The Chi-square test results indicate a significant relationship between knowledge and attitudes with ARI behaviour (P<0.05) among mothers with children aged 0-24

months in the working area of Lewoleba Primary Health Centre, Nubatukan District, Lembata Regency. This relationship is depicted as follows: mothers with a high level of knowledge have a prevalence ratio (PR) of 2.31 for developing good ARI-related behaviours compared to those with low knowledge. Meanwhile, in terms of attitudes, mothers with a positive attitude have a PR of 1.52 for developing good ARI-related behaviour.

Table 3. Association Between Knowledge and Attitude with ARI-Related Behavior

| Variable | Behavior | | | | P | PR* (95% CI) |
| | Good | | Bad | | | |
	n	%	n	%		
Knowledge						
High	70	59.80	47	40.20	0.003	2.31 (1.19-4.44)
Low	7	25.90	20	74.10		
Attitude						
Positive	50	63.30	29	36.70	0.015	1.52 (1.09-2.12)
Negative	27	41.50	38	58.50		

*PR=Prevalence Ratio

DISCUSSION

In this study, we found that there is a significant association between a mother's knowledge and her preventive behaviors regarding ARI (p=0.003) in Lewoleba. This finding aligns with the studies conducted by Teddy et al. and Pudjiastuti et al., which concluded that a statistically significant relationship exists between a mother's knowledge level and her preventive behaviors related to ARI (p-value < 0.05).[10,11] Additionally, this research is corroborated by Rahim's study, which found a connection between a mother's knowledge of pneumonia prevention and her actual practices in preventing pneumonia (p-value = 0.017). Andrianto's study also emphasizes the relationship between knowledge and the practice of initial ARI management in toddlers at the Sambirejo Health Center in Sragen. It elucidates that mothers with a high level of knowledge about initial ARI management are likelier to apply this knowledge in behaviors when aiding their children if they experience ARI.[12] This is further supported by Sarimin et al.'s research, which posits that good maternal health behavior is influenced by a mother's education level and her knowledge about ARI. This knowledge equips mothers to readily receive health information from various sources and effectively apply it in their daily lives.[13,14]

According to Lawrence Green, as cited in Notoatmodjo's book, an individual's health behavior is shaped by three factors:

predisposing, enabling, and reinforcing. Knowledge is a pivotal component of predisposing factors, implying that knowledge can influence a person's health behavior positively or negatively. In essence, individuals with a high level of knowledge tend to exhibit healthier behaviors, while those with lower knowledge levels may exhibit less favorable health behaviors. Asih et al.'s study in the Sawahjoho Village, Semarang, further supports this notion. It highlights the impact of health education on a mother's knowledge and skills in caring for toddlers with ARI at home (p-value = 0.000). The research reveals a significant improvement in the knowledge and skills of mothers in handling ARI after receiving health education. Mothers with sound knowledge tend to be more objective and open-minded when making decisions and taking actions that lead to positive behaviors.[15] However, several factors can pose challenges to this connection. Socioeconomic status plays a significant role, as mothers from disadvantaged backgrounds may have limited access to quality healthcare information and services, making it harder to implement preventive measures effectively. Cultural beliefs and practices can also impact this relationship, with some cultural norms affecting healthcare-seeking behaviors or adherence to preventive procedures. In this study, most mothers have relatively higher education and spend more than minimum wage than any other districts in east Indonesia, which may affect the significant relationship.[16,17]

This study also shows a significant correlation between a mother's attitudes and her preventive behaviors regarding ARI (p=0.015). This finding is consistent with the research conducted by Taarelluan and Putra et al., both of which concluded a relationship between attitudes and ARI prevention practices (p-value <0.05).[18,19] It is important to note that while a positive attitude in mothers does not guarantee that their children will not experience ARI, attitudes can be influenced by various factors, including personal experiences, mass media exposure, and the influence of significant others in their social environment. This resonates with Priyoto's assertion that attitude change is driven by two factors: internal factors within an individual, which involve selectivity in receiving and processing external influences, and external factors, which encompass social interactions outside one's immediate circle.[20]

The research findings also align with the studies conducted by Octaviani et al., which found a relationship between attitudes and practices in handling ARI in toddlers (p-value < 0.05).[21] Additionally, Gobel's research supports this connection, asserting that a family's positive attitude is directly proportional to their effective caregiving behaviors in managing ARI in toddlers.[22,23] Attitude

represents a mental mechanism that evaluates, shapes perspectives, colors emotions, and significantly influences our behavioral tendencies towards ourselves, other individuals, or the challenges we face.[20]

The study observed that despite a high level of knowledge and positive attitudes towards preventing ARI, the incidence of ARI in Lembata remained high. This paradox can be attributed to several factors. Firstly, even though good behavior is a dominant characteristic, about 40% of the ARI preventive behavior of the mother is still bad and might have affected the ARI incidence so far. Secondly, other factors may have contributed to ARIs in Lembata. One significant factor is the lack of discipline in managing household waste. This often leads to burning waste in temporary shelters around residents' houses, a practice community leaders oversee. The situation significantly increases the risk of ARIs among toddlers and infants under two years old and even teenagers, adults, and the elderly. Thirdly, environmental factors are beyond their control, even if the child's mothers or primary caregivers have diligently followed ARI prevention measures. This includes potential exposure to ARIs from other household members or visitors who may not be as cautious in their behavior. Furthermore, it's worth noting that the nutritional status of the individuals in the study was not assessed.

Nutritional status can play a crucial role in immunity to viral exposure, and its influence was not accounted for in this study.

This study, however, still depicted essential characteristics of mother knowledge, attitude, and preventive behavior towards ARI in Lembata that have never been studied. The study results may motivate the locals and their leaders to always provide ARI education and health promotion to lower the ARI's incidence over time.

CONCLUSION

ARI is still the most relevant infectious disease that has an impact on child mortality and morbidity throughout the world. In low-resource settings, the challenges faced are more significant. This study found that mothers' knowledge and attitudes towards ARI in under two children were related to their prevention behavior. Although good behavior is relatively lacking compared with high knowledge and attitudes, the association emphasizes that a higher knowledge score and more positive attitudes will produce significantly favorable behavioral outcomes. Higher education and socio-economic status may play a role in this connection, highlighting the need for local governments to pay greater attention to improving overall well-being.

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CONFLICT OF INTEREST

Author(s) stated there are no conflict of interest in the study and publishing this article.

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