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THE RELATIONSHIP BETWEEN MOTHERS' KNOWLEDGE AND EDUCATION LEVEL WITH THE MANAGEMENT OF ACUTE RESPIRATORY INFECTIONS (ARI) IN TODDLERS AT BARENG PUBLIC HEALTH CENTER, MALANG CITY

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Abstract

Acute Respiratory Infections (ARI) are considered a priority health issue. According to estimates by the World Health Organization (WHO), the incidence of ARI in toddlers in developing countries is 15% - 20% per year. The knowledge and education level of mothers play an important role in independently managing ARI at home, preventing the worsening of the condition. The purpose of this study is to identify the relationship between mothers' knowledge and education level with the management of ARI in toddlers at Bareng Public Health Center. This research design is correlational analytic with a cross-sectional approach. The sample consisted of 80 mothers who had toddlers with ARI and visited the Bareng Public Health Center in Malang City, selected using accidental sampling. Data analysis was performed using the Spearman Rank test and logistic regression test. The results of the Spearman Rank test showed a relationship between knowledge (p-value = 0.000) and education level (p-value = 0.002) of mothers and the management of ARI in toddlers. The logistic regression test results indicated a simultaneous relationship between mothers' knowledge and education level and the management of ARI in toddlers (significance value = 0.000). It was concluded that mothers' knowledge and education level affect how they manage ARI in toddlers at home, as an effort to prevent the condition from worsening. Therefore, it is expected that mothers increase their knowledge about ARI in toddlers.

Keywords: ARI, Education level, Knowledge, Management, Toddler

Introduction

Toddlers are children aged between 0 and 5 years. During this period, they experience growth and development that are not yet fully mature, including their immune system. Due to the immaturity of their immune system, toddlers are more vulnerable to infections, one of which is Acute Respiratory Infections (ARI) [1]. Acute Respiratory Infections (ARI) are one of the priority health issues because they affect a large portion of the population and can easily spread through direct contact with infected individuals. Most respiratory infections are mild, such as colds and coughs caused by viruses, and do not require antibiotic treatment [2]. Untreated Acute Respiratory Infections (ARI) can lead to prolonged illness and develop into severe ARI. This poses a risk of increasing mortality rates by 25% to 30% in infants and toddlers due to neglected ARI that does not receive proper treatment [3].

According to estimates from the World Health Organization (WHO), the incidence of ARI in developing countries reaches 15% - 20% per year among toddlers. In Indonesia, toddlers are estimated to experience ARI 3 to 6 times per year, meaning that on average, a toddler suffers from ARI 3 to 6 times a year [4].

According to the 2018 Basic Health Research (Riskesdas), the prevalence of ARI was 9.3%, with the highest incidence found in the 1–4 year age group (13.7%) [5]. Data from the Malang City Health

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Office in 2022 showed that there were 12,142 ARI cases reported, with 20.64% of them involving toddlers [6]. In 2023, from January to September, there were 10,624 ARI cases, with 18.18% involving toddlers. The highest number of ARI cases among toddlers in Malang City was at Bareng Public Health Center, with a total of 1,182 cases.

The high incidence of ARI in toddlers is partly due to a lack of maternal knowledge about the disease. Mothers with good knowledge of ARI can have a positive impact on their child's health, as they can reduce the risk of ARI and can independently manage ARI at home when their toddler is sick [1]. On the other hand, a lack of maternal knowledge about ARI can increase the risk of recurrent AR [7]. A person's knowledge is closely related to their level of education, with the expectation that individuals with higher education will have broader knowledge, resulting in milder cases of ARI in toddlers [8], [9].

As healthcare professionals, midwives play an important role in providing promotive, preventive, curative, and rehabilitative midwifery care, which is carried out in an integrated, comprehensive, and continuous manner, in accordance with Article 47 of Law No. 36 of 2009 on Health. One of the responsibilities is to provide healthcare services using the IMCI (Integrated Management of Childhood Illness) approach. Midwives are trained to actively and systematically apply the IMCI approach, which includes assessing symptoms, making classifications, determining appropriate actions and treatments according to the IMCI chart, as well as providing counseling and follow-up during the next visit [10].

The role of parents, especially mothers, in caring for toddlers with ARI is crucial. Mothers need to understand several aspects of ARI, including its definition, causes, symptoms, complications, treatment, and prevention of ARI in toddlers [2],[11]. Based on this, the researcher is interested in conducting a study on "The Relationship Between Mothers' Knowledge and Education Level with the Management of Acute Respiratory Infections (ARI) in Toddlers at Bareng Public Health Center, Malang City",

Method

This study used a correlational analytic research with a cross-sectional approach. The variables used were mothers' knowledge and education level as the independent variables, while the management of ARI in toddlers was the dependent variable. The research is located at the Bareng Public Health Center in Malang City. The research was conducted in May - June 2024.

The study population consisted of mothers with toddlers suffering from ARI who visited Bareng Public Health Center in Malang City from January to September 2023, with an average of 101 people per month. The sample used consisted of 80 people, selected using the accidental sampling technique. Data collection process was carried out using a questionnaire created by the researcher, which had undergone validity and reliability testing. The data analysis for this study was performed using the Spearman Rank test and Logistic Regression test. Then the data was analyzed using a computerized program, SPSS Windows version 17. This research has passed the ethical clearance with number.

Results

Table 1. Distribution of General Characteristics of Respondents (n=80)

Characteristics	Frequency	%
Age		
< 20 years	5	6.3
20-35 years	60	75.0
> 35 years	15	18.8
Occupation		
Housewife	58	72.5
Trader	11	13.8
Civil Servant/Military/Police	2	2.5
Entrepreneur	9	11.3

Source: Primary Data, 2024

Based on Table 1, it is known that almost all respondents were aged 20–35 years, with 60 respondents (75.0%), and the majority were housewives, with 58 respondents (72.5%).

Tabel 2. Distributions of Spesific Characteristics of Respondents (n=80)

Characteristics	Frequency	%
Knowledge		
Poor	12	15.0
Fair	24	30.0
Good	44	55.0
Education Level		
Basic Education (Elementary/Junior High)	21	26.3
Secondary Education (High School/Vocational)	45	56.3
Higher Education (Diploma/Bachelor's/Master's/PhD)	14	17.5
ARI Management		
Poor	16	20.0
Good	64	80.0

Source: Primary Data, 2024

Based on Table 2, it was found that the majority of mothers had good knowledge, with 44 respondents (55.0%), and most were at the secondary education level (High School/Vocational), with 41 respondents (51.2%). Almost all ARI management in toddlers was good, with 64 respondents (80.0%).

Table 3. The Relationship Between Mothers' Knowledge and ARI Management in Toddlers at Bareng Public Health Center

Knowledge	ARI Management				*f*	*p-value*
	Poor		Good			
	f	%	*F*	%		
Poor	10	83.3	2	16.7	12	0.000
Fair	5	20.8	19	79.2	24	
Good	1	2.3	43	97.7	44	

Source: Primary Data, 2024

Based on Table 3, it was found that out of 44 respondents with good knowledge, almost all had good ARI management (97.7%). Out of 24 respondents with fair knowledge, the majority had good

ARI management (79.2%). Meanwhile, of the 12 respondents with poor knowledge, only a small portion had good ARI management in toddlers (16.7%).

The results of the Spearman Rank correlation test showed a significance value (p-value) of 0.000, where the p-value < 0.05, and the Correlation Coefficient was 0.607.

Table 4. The Relationship Between Mothers' Education Level and ARI Management in Toddlers at Bareng Public Health Center

Education Level	ARI Management				*f*	*p-value*
	Poor		Good			
	f	%	*f*	%		
Primary Education	8	38.1	13	61.9	21	0.002
Secondary Education	8	17.8	37	82.2	45	
Higher Education	0	0.0	14	100	14	

Source: Primary Data, 2024

Based on Table 4, it was found that out of 21 respondents with a primary education level, the majority had good ARI management in toddlers (61.9%). Out of 45 respondents with a secondary education level, almost all had good ARI management in toddlers (82.2%). Additionally, all 14 respondents with a higher education level had good ARI management in toddlers (100.0%).

The results of the Spearman Rank correlation test showed a significance value (p-value) of 0.002, where the p-value < 0.05, and the Correlation Coefficient was 0.315.

Table 5. The Relationship Between Mothers' Knowledge and Education Level with ARI Management in Toddlers at Bareng Public Health Center

		Chi-Square	Df	Sig.
Step 1	Step	37.185	2	.000
	Block	37.185	2	.000
	Model	37.185	2	.000

Source: Primary Data, 2024

The results of the F hypothesis test in the Omnibus Test of Model Coefficients in Table 5 showed a significance value of 0.000 < 0.05, meaning that the hypothesis is accepted. This indicates that there is a simultaneous relationship between mothers' knowledge and education level with ARI management in toddlers at Bareng Public Health Center, Malang City.

Discussion

Mothers' Knowledge

The results of the study conducted on 80 respondents showed that 44 respondents (55.0%) had high knowledge, 24 respondents (30.0%) had fair knowledge, and 12 respondents (15.0%) had low knowledge.

Knowledge is the result of awareness that originates from the human sensory process of certain objects, occurring through the five senses-sight, hearing, smell, taste, and touch. The majority of human knowledge is acquired through the eyes and ears [12]. Knowledge can encourage someone to seek further information about something they consider important and to understand it more deeply. Each person's knowledge is often different, depending on their perspective or point of view on a particular subject [8].

According to some respondents, information about ARI in toddlers is generally obtained only through counseling from healthcare workers during monthly posyandu (integrated health post)

activities. The respondents' knowledge in this case is classified as non-scientific knowledge, which includes information acquired from lectures, radio, television, or personal experiences in the past [13].

In this study, nearly all respondents were mothers aged 20 to 35 years, with a total of 60 respondents (75.5%). This age range is considered ideal for performing caregiving and nurturing roles optimally [14]. This is supported by the notion that as a person ages, their ability to understand and think critically develops, leading to improved knowledge acquisition [15]. Age also affects a person's ability to acquire information, both directly and indirectly, thereby increasing their experience and maturity in thinking [14].

In addition to age, another factor that affects knowledge is the mother's occupation. In this study, the majority of respondents were housewives, with 58 respondents (72.5%). Housewives generally have more time to seek information about ARI in toddlers [16]. The more information they obtain, the higher their level of knowledge about ARI in toddlers will be.

Mothers' Education Level

The results of the study conducted on 80 respondents showed that 45 respondents (56.3%) had a secondary education level, 21 respondents (26.3%) had a primary education level, and 14 respondents (17.5%) had a higher education level.

Education is the process of developing fundamental abilities both intellectually and emotionally to understand the environment and interact with others [8]. Education is a systematic effort made by individuals to transform knowledge and social values, shape character, and personality, as well as to teach skills and creativity [17]. A person's level of education determines their mindset and perspective; additionally, education level is also part of work experience [18],[19].

The level of education can affect a mother's knowledge, as higher education makes it easier for her to receive and understand input and opinions from others [7]. This is because a person's ability to accept and comprehend information is determined by their level of education. This aligns with the theory proposed by Notoatmodjo in his book, which states that education level affects a person's knowledge, leading to positive behavioral changes [12].

ARI Management

The results of the study conducted on 80 respondents showed that nearly all had good ARI management, with 64 respondents (80.0%) demonstrating effective management, while 16 respondents (20.0%) had poor management of ARI.

Effective management of ARI in toddlers by mothers can accelerate the recovery of the child. This is because ARI in toddlers is generally classified as a mild illness, which does not lead to side effects that could endanger the child's safety.

Management of ARI at the family level can affect the progression of the illness from mild to more severe [20],[21]. Parents often perceive coughs and colds as harmless ailments. However, these conditions can worsen if the toddler's immunity decreases and if they are not treated promptly. Mothers need to be aware of the early signs of ARI in toddlers and understand when to provide treatment or seek help and referral within the healthcare system [20].

According to the researcher, inappropriate management of ARI can have negative effects on toddlers, such as disrupting their daily activities. Disruption of activities can lead to delays in children's motor development due to a lack of stimulation in their motor nerves, affecting both gross and fine motor skills.

The Relationship Between Mothers' Knowledge and ARI Management in Toddlers at Bareng Public Health Center, Malang City

Based on the results of the Spearman Rank correlation test, a significance value (p-value) of 0.000 was obtained, which is < 0.05. Thus, it can be concluded that there is a relationship between mothers' knowledge and ARI management in toddlers at Bareng Public Health Center, Malang City. The Correlation Coefficient value was 0.607, indicating a strong level of correlation.

Respondents who applied good ARI management practices did this because they had good knowledge about managing ARI in toddlers. This statement aligns with Notoatmodjo's view, which states that a person's behavior is affected by the extent of their knowledge about what they are doing [12]. A person's behavior tends to follow their knowledge. An action or behavior will be enduring or long-lasting, and may eventually become a habit if it is based on adequate knowledge [22]. Therefore, parents' knowledge about ARI is key to improving children's health quality [23].

Several studies have shown similar results, indicating a significant relationship between mothers' knowledge and ARI management in toddlers [7],[24],[25]. Good ARI management is most commonly found among respondents with good knowledge. This statement aligns with Notoatmodjo's assertion that knowledge about health influences a person's behavior as a result of the health education received. With this knowledge, effective care efforts arise to prevent the recurrence of ARI in toddlers [12],[24].

The Relationship Between Mothers' Education Level and ARI Management in Toddlers at Bareng Public Health Center, Malang City

Based on the results of the Spearman Rank correlation test, a significance value (p-value) of 0.002 was obtained, which is < 0.05. Thus, it can be concluded that there is a relationship between mothers' education level and ARI management in toddlers at Bareng Public Health Center, Malang City. The Correlation Coefficient value was 0.315, indicating a moderate level of correlation.

Education is the process of change within individuals related to achieving health goals for both individuals and communities [16]. The level of education has a significant impact on a person's attitudes and behaviors; the higher a person's level of education, the more mature the actions they take [26],[27]. A mother's education affects her knowledge, particularly regarding the management she undertakes in response to ARI occurrences in her child.

Several studies have shown similar results indicating a relationship between mothers' education level and the management of ARI in toddlers [24],[28]. Education serves as an experience that develops a person's abilities and personality quality [24]. Education can increase the tendency to take preventive actions by raising awareness of the importance of health check-ups and motivating individuals to engage in them [29]. Additionally, a higher education level can help mothers expand their knowledge, remind them of the importance of health, and enhance their motivation to behave better [30].

According to the researcher, mothers with a secondary education level (High School/Vocational) are considered capable of understanding information about ARI in toddlers well. This knowledge includes proper home management techniques, which are acquired through various sources of health education, such as counseling, health books, and information from health center staff or community health workers during posyandu (integrated health post) activities.

The Relationship Between Mothers' Knowledge and Education Level with ARI Management in Toddlers at Bareng Public Health Center, Malang City

Based on the hypothesis test (F-test), a significance value of 0.000 was obtained, which is < 0.05. It can therefore be concluded that there is a simultaneous relationship between mothers' knowledge and education level with ARI management in toddlers at Bareng Public Health Center, Malang City.

A person's knowledge involves the ability to assess, explain, and understand various matters, as well as technical skills in solving life problems that have not yet been addressed systematically and

methodically [2]. A mother's knowledge regarding her child's health is often related to her educational background, occupation, access to healthcare facilities, frequency of visits to health centers, and parents' awareness of the importance of maintaining family health [16].

The research results showed that many respondents had fair or even poor knowledge but were still able to manage ARI well. This may be because most respondents had a secondary education level (High School/Vocational), which affects the level of knowledge they possess, making it somewhat limited. However, their experience in caring for sick children and the counseling provided by healthcare workers or community health workers during posyandu activities helped them manage ARI in toddlers effectively.

This research also showed that some respondents with poor knowledge were unable to manage ARI effectively. The lack of knowledge among mothers about ARI in toddlers is often due to limited information or their unwillingness to enhance their knowledge from available sources. If mothers are unaware of the signs, symptoms, management, and prevention methods of ARI in toddlers, it can lead to recurring ARI infections in their children [31].

According to the researcher, knowledge plays an important role in shaping a person's attitudes and behavior. The results of this study showed a relationship between mothers' knowledge and ARI management, meaning that the respondents have paid attention to the information they received and tend to act based on that information, resulting in positive behavior as expected [7]. A person's level of education is closely related to their level of knowledge; the higher a person's education level, the greater their knowledge is expected to be. This is because higher education is directly related to experiences that can broaden a person's knowledge [28],[32].

A high level of education and good knowledge of ARI in toddlers can enhance a mother's ability to manage and prevent the illness, thereby reducing the risk of ARI in toddlers. Consequently, the morbidity and mortality rates due to ARI in toddlers are expected to decrease [33].

Conclusion

Based on the results of the research conducted on the relationship between mothers' knowledge and education level with ARI management in toddlers at Bareng Public Health Center, Malang City, it can be concluded that there is a relationship between mothers' knowledge and ARI management in toddlers (p-value = 0.000), a relationship between mothers' education level and ARI management in toddlers (p-value = 0.002), and a simultaneous relationship between mothers' knowledge and education level with ARI management in toddlers at Bareng Public Health Center, Malang City (significance value = 0.000). Based on these findings, it is expected that parents, especially mothers, will continue to increase their knowledge about ARI in toddlers, particularly regarding how to manage it independently at home. Additionally, it is recommended that the Public Health Center plans health education programs, especially concerning ARI in toddlers.

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