

## Analysis on the association between the mothers' knowledge, attitude, practices and the incidence of acute respiratory infection in children under 5 years old in the rural Nam Dinh, Vietnam

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### ABSTRACT

**Background:** The knowledge, attitude and practices of mothers in caring for their children play an important role in prevention of acute respiratory infection.

**Objectives:** The study aimed to identify the association between the mothers' knowledge, attitude and practices in prevention and caring for children with acute respiratory infection and the incidence of acute respiratory infection in children under 5 years old in the rural Nam Dinh, Vietnam.

**Methods:** A descriptive cross-sectional study was conducted on 389 among mothers and their children under 5 years old with a simple random sampling technique in rural Nam Dinh, Vietnam from July 2020 to September 2021. Using logistic regression and Odds Ratio (OR) with definition level  $\alpha=0.05$  for analysis of variables

**Results:** Unsatisfactory KAP of mothers in prevention and caring for children with ARI accounted for high percentage. In addition, the incidence of ARI in children under 5 years old remained high at 47.0% (183/389 children). The study revealed the association between the mothers' attitude, practices and the incidence of ARI in their children. This difference was statistically significant with  $P < 0.05$ . Specifically, analysis results showed that mothers' practices are significantly related to the incidence of ARI in children with  $OR = 2.5$ ;  $95\%CI = 1.6-3.9$  and  $P < 0.001$ .

**Conclusion:** The mothers' knowledge, attitude and practices in prevention and caring for their children with ARI were low. In addition, the incidence of ARI in under-five children was high. There was an association between the mothers' attitude, practices and the incidence of ARI in children under 5 years old. Moreover, there was a significant association between the mothers' practices and the incidence of ARI in children

**Keywords:** Acute respiratory infection, Attitude, Knowledge, Mothers having children under 5 years old, Practices

## 1. Introduction

Acute respiratory infection (ARI) is a common syndrome in children (especially children under 5 years old) is leading cause of morbidity and mortality in the world [1]. Pneumonia is the leading cause of death in children [2]. Research showed that the rate of ARI in children under 5 years old was high at 60.8% of total participants with nearly 12.2% children having severe disease or severe pneumonia [3].

Mothers are the main caregivers for children under 5 years old and any deviations in the child's health are recognized first by the mother [4]. The management in prevention, caring for children with ARI depend not only on healthcare providers but also on the mothers' knowledge, attitude and practices (KAP) on ARI [5]. The study of *Vinod et al* revealed that mothers with the poor KAP had a higher incidence of ARI in their children [6]. However, the study only showed the association between the general KAP of mothers and the incidence of ARI in children. The study of *Wognin et al* showed that the high prevalence of ARI [7].

Associations of socio-demographic factors with the occurrence of respiratory diseases including the history of coughing in children. On the other hand, the association between

the KAP of mothers about ARI and the incidence of ARI in their children was not assessed in the study [7]. Therefore, this association is necessary to be explored which plays an important role in making recommendations and solutions to improve the knowledge, attitude and practices for mothers as well as reducing the incidence of ARI in children under 5 years old. This contributes to reducing the burden on family and society.

## 2. Methods

### 2.1 Study Area

A cross-sectional study was conducted on mothers and their children under 5 years old in the rural Nam Dinh, Vietnam from July 2020 to September 2021. This rural area has 21 villages in 2 communes of Vu Ban district, Nam Dinh province, Vietnam.

### 2.2 Study Design

A cross-sectional study was conducted using simple random sampling on 389 mothers and their children under 5 years old.

### 2.3 Sample Size and Sampling

A simple random sampling technique was adopted for this study. Excel software was applied to randomly select research subjects, ensuring that the minimum sample size

according to the calculated formula and ensuring the selection criteria.

According to the study of *Tazinya Alexis et al*, the overall prevalence of ARI was 54.7% [8]. Thus, using this prevalence with an allowable error of 5% at a confidence level of 95%, the sample size was estimated to be 381. In fact, the researcher collected 389 mothers paired with their children within three months. Mothers and their children were willing to participate in the study. They were living in the rural areas of Vu Ban district, Nam Dinh province in Vietnam in the period of survey.

#### **2.4 Data Collection**

Vu Ban district like other parts of Nam Dinh province has 4 seasons in a year. Data were collected from October 2020 to December 2020. This period is winter which the dry season is characterized by cool, dry and winds with temperatures ranging between 10°C and 25°C. So, the characteristic of climate able to effect on ARI disease in children. In Vietnam, this period with the COVID-19 pandemic began to appear in the early stage. The government closely monitored cases with tests being checked regularly when there were suspected cases.

There were no recorded cases of COVID-19 in children at this time of the study.

Mothers were invited to participate in this study and then, the research members in Nam Dinh University of Nursing who are the paediatric doctors and nurses or healthcare workers at the commune health station guides mothers to fill out the survey to evaluate the knowledge, attitude and practices of mothers in prevention and caring for their children with ARI in about 20 minutes. The paediatric doctors and nurses or healthcare workers completed the checklists by observing mothers' practices about 15 minutes with hypothetical situation on their children at mothers' home or at the commune health station. After that, the face-to-face interview with mothers and examination for their children at home or the commune health station. The incidence of ARI in children was identified by examination and follow-up during the period of survey time from October 2020 to December 2020.

#### **2.5 Data Analysis**

A structured questionnaire was used to collect clinical, socio-demographic data in children under 5 years old. Diagnosis of ARI was based on the revised WHO guidelines [9, 10]. Case definition for ARI was based on the

Integrated Management of Childhood Illnesses (IMCI) classification for children presenting with cough or difficulty breathing: Mild ARI (no pneumonia), Moderate ARI (pneumonia) and Severe ARI (severe pneumonia) [11].

The questionnaire about the knowledge, attitude, practices in prevention and caring for children with ARI was based on the WHO guidelines [10]. The questionnaire contains 34 items, including 8 items about the demographic characteristics of mothers and 26 items to assess the knowledge (8 items), attitude (10 items), and practices (8 items). The questionnaire was validated by 5 paediatric experts with CVI = 0.98. And then, the questionnaire was tested for structural validity and reliability by testing on 130 mothers with children under 5 years old in rural areas in Vietnam (these 130 mothers didn't participate in the later survey). The result of reliability with Cronbach's Alpha value was greater than 0.70 for the total scale of the knowledge, attitude and practices. Evaluating the structural validity of the questionnaire by analysing the exploratory factor (EFA) with the KMO coefficient (Kaiser-Meyer-Olkin) was greater than 0.5. Therefore, this questionnaire meets the standard to apply for this study. The 70%

threshold was established based on the literature review and findings from study of *Saeed and Awadalla* in 2020 [12]. Thus, we take the cutoff point at 70% in this our study.

The knowledge about the ARI disease including 2 main contents: Signs and symptoms; Prevention and caring for children with acute respiratory infections including 2 main contents: Nutrition and nasal hygiene for children. This section includes 8 multiple-choice questions. The different levels of knowledge are categorized as follows: The total score of 8 questions with 37 correct answer choices was 37 points. Mothers with a total knowledge score of  $\geq 26$  points ( $\geq 70\%$  of the total score) were classified as the satisfactory knowledge and vice versa, mothers with a knowledge score of  $< 26$  points ( $< 70\%$  of the total score) were considered the unsatisfactory knowledge.

The attitude of mothers about ARI including 3 main contents: Mother's attitude about the disease, care, and prevention of ARI. This section includes 10 items using a five-point Likert scale with answers in 5 levels corresponding to the score 1, 2, 3, 4, 5: Strongly disagree, disagree, neutral, agree, strongly agree. The items score was added to calculate the total scores, where a higher score indicates a better attitude. The total

score of the attitude divides by 10 (items). The satisfactory level of attitude from 4 – 5 points (the answer: strongly agree, agree). In contradiction, the unsatisfactory level of attitude was less than 4 points (the answer: strongly disagree, neutral, disagree).

Practices of mothers in caring for children with ARI including main contents: Practice taking children to go to the doctor, giving them water to drink, relieving cough, cleaning the nose, practical skills in caring; About prevention of ARI including main contents: Avoid to cigarette smoke, dust and animal hair, breastfeed, vaccinated fully according to regulations. The different levels of practices are categorized as follows: Mothers who achieve  $\geq 70\%$  of the total score ( $\geq 27$  points) were classified as the satisfactory practices and vice versa, mothers were considered as the unsatisfactory practices.

**Statistical analysis:** All variables entered the logistic regression models were coded or transformed into categorical measurements. Collected data were coded and tabulated using a personal computer. The data was collected, analysed and entered into the SPSS 25.0 program. Using logistic regression and Odds Ratio (OR) with definition level  $\alpha=0.05$  to analyze and determine the association between mothers’ knowledge, attitude, practices and the incidence of ARI in children which were coded as categorical variables

### 3. Results

Table 1 shows that most mothers have the age group from 26 to 35, accounting for 62.5% and the highest percentage of mothers having education level was high school, accounting for 48.1%. Mothers mainly have 2 children and over (80.7%), the highest proportion of mothers’ occupation was workers (62.5%).

Table 1: Socio-demographic characteristics of mothers (n = 389)

Socio-demographic characteristics	Frequencies (n)	Percentages (%)
<b>Age</b>		
≤ 25 years	91	23.4
26-35 years	243	62.5
36-45 years	52	13.3
> 45 years	3	0.8
<b>Educational level</b>		
Middle school or below	87	22.4
High school	187	48.1
Diploma/Bachelor/Postgraduate	115	29.5
<b>Occupation</b>		
Civil servants	45	11.6
Worker	243	62.5
Farmer	18	4.6
Housework	45	11.6

Socio-demographic characteristics	Frequencies (n)	Percentages (%)
Others	38	9.7
<b>Number of children</b>		
1 child	75	19.3
≥ 2 children	314	80.7

Table 2 describes the general characteristics of children under 5 years old. The age group from 12 months to under 5 years old was 66.3%. Male children were 54.2% more than female children (45.8%). Children are the

first child (28.8%), children with birth weight less than 2500g (3.9%). Most of the children with BMI classification were normal (68.9%).

Table 2: General characteristics of children (n = 389)

Variables	Number (n)	Percentage (%)
<b>Age</b>		
Under 2 months	22	5.7
From 2 - <12 months	109	28.0
From 12 months – <5 years	258	66.3
<b>Gender</b>		
Male	211	54.2
Female	178	45.8
<b>The first child</b>		
Yes	112	28.8
No	277	71.2
<b>Birth weight</b>		
< 2500g	15	3.9
≥ 2500g	374	96.1
<b>BMI classification</b>		
Malnutrition	38	9.8
Normal	268	68.9
Overweight/ obesity	83	21.3

**The incidence of acute respiratory infection in under five children**

Table 3 describes the study investigated from the period from October to December 2020 to assess the incidence of ARI at the rural areas

was 47% (183/389 children). The rate of upper respiratory tract infection was 42.7% (166/389 children). The rate of lower acute respiratory tract infection was 11.8% (46/389 children).

Table 3: The incidence of acute respiratory infection in under five children (n= 389)

Variables	Number (n)	Percentage (%)
<b>Children with ARI</b>		
No	183	47.0
Yes	206	53.0
<b>Respiratory Tract Infection</b>		
Upper	166	42.7
Lower	46	11.8

**The mothers’ knowledge, attitude and practices about acute respiratory infection**

Table 4 illustrates that the mothers' knowledge, attitude and practices in prevention and caring for children with ARI

at rural Nam Dinh in Vietnam remained low. The percentage of mothers who had unsatisfactory knowledge, attitude and practices were high at 83.5%, 36.5% and 68.1%, respectively

Table 4: The mothers’ knowledge, attitude and practices about acute respiratory infection (n=389)

Variables	Satisfactory		Unsatisfactory	
	n	%	n	%
<b>Knowledge</b>	64	16.5	325	83.5
<b>Attitude</b>	247	63.5	142	36.5
<b>Practices</b>	124	31.9	265	68.1

**The association between the knowledge, attitude and practices of mothers and the incidence of ARI in children**

Table 5 describes the association between the knowledge, attitude and practices of mothers and the incidence of ARI in children. Analysis results showed that mothers' practices had significant association with the incidence of ARI in children with OR= 2.46

(95%CI= 1.6-3.9, P< 0.001). Mothers with satisfactory attitude and practices had lower rates of ARI in their children than children of mothers with unsatisfactory attitude and practices. However, the results revealed that there was no association between mothers' knowledge about ARI and the incidence of ARI in their children.

Table 5: The association between the knowledge, attitude, practices of mothers and the incidence of ARI in their children under five years old

Variables	Children with ARI				Odds ratio	95% CI	P-value
	Yes		No				
	n	%	n	%			
<b>Knowledge</b>							0.16
Unsatisfactory	158	48.6	167	51.4	1		
Satisfactory	25	39.1	39	60.9	1.5	0.9-2.6	
<b>Attitude</b>							0.003
Unsatisfactory	81	57.0	61	43.0	1		
Satisfactory	102	41.3	145	58.7	1.9	1.2-2.9	
<b>Practices</b>							< 0.001
Unsatisfactory	143	54.0	122	46.0	1		
Satisfactory	40	32.3	84	67.7	2.5	1.6-3.9	

**4. Discussion**

The incidence of ARI in children under 5 years old was high. This result was aligned

the study of *Tazinya Alexis et al* in 2018, the prevalence of ARI in under-five children was 54.7% [8]. This result proposed a need to

reduce the incidence of ARI in children under 5 years old. In addition, our study indicated the rate of upper respiratory tract infection was 42.7% which was higher than the study of *Shivaprakash N.C et al* where the rate was 30.3% [13] but in line with other studies [3, 8]. In our study, the rate of LRTI in the rural areas was 11.8%. This is one of the most important findings as pneumonia is a leading cause of death in children [2]. Therefore, this makes suggestions for further research to have nursing intervention in order to improve ARI disease of children. On the other hand, the reality of mothers' knowledge, attitude and practices in prevention and caring for children with ARI at rural areas in Vietnam was remain low. The percentage of mothers who had unsatisfactory knowledge, attitude and practices were high at 83.5%, 36.5% and 68.1%, respectively. This result was also consistent with the study of *Mutalik and Raje* in 2017, which assessed the knowledge, attitude and practices of mothers in rural areas of Maharashtra [14]. Research showed that mothers' KAP about ARI was very low. Mothers with poor practices about ARI were 68.9%. The number of mothers with poor knowledge, attitude and practices accounted for a high percentage (71.6%). In addition, the research conducted in 2020 evaluated the KAP among mothers of under- five children

about acute lower respiratory tract infection with the similar results such as 25.7% mothers had a good knowledge, 48.7% mothers had a good attitude about the disease 25.7% mothers a good practice [15]. The percentage of mothers had less knowledge in prevention of ARI before doing health education was 93.8% [16].

Our study illustrated mothers' practices had significant association with the incidence of ARI in children. Mothers with unsatisfactory practices have a 2.5 times higher proportion of ARI in their children than children of mothers with satisfactory practices about prevention and caring for children. Thus, mothers' practices play an important role in reducing the incidence of ARI in children under 5 years old. The research of *Mutalik A and Raje V. V* showed that mothers' practices have a significant influence on the disease status and survival in children [14]. However, our study showed that mothers' practices were low with 68.1% mothers had unsatisfactory practices. This result was consistent with the study of *Gamtessa et al* revealed that a significant proportion of the mothers had poor practice about ARI (57.2%) [17]. This suggested an urgent need to improve the practice of mothers about ARI. Furthermore, mothers are the primary

caregivers for children in society. Majority of mothers had fair awareness regarding childhood ARI. It is necessary to put more effort into educating these mothers about the importance of early detection and seeking appropriate health care for ARI in their children.

The current study demonstrated the association between certain social factors and the awareness of childhood ARI among mothers of children under the age of five. This association has the potential to aid in the prevention of morbidity and mortality caused by ARI in these young children. Additional measures can be taken to enhance the knowledge of these mothers concerning the significance of timely identification and seeking appropriate healthcare for ARI in their children [18]. The previous study revealed that more than half of the parents had poor knowledge and bad practice of self-medication without consulted physician and negative attitude toward physician rather than home remedies and dispenser. Thus, it is concluded that several health preventive and promotive educational programs should be arranged for mothers, give training to community health care worker to improve their knowledge and decrease ARI in children [19]. There is a need to improve the

awareness of parents through health education and to improve health insurance policy. Health education should target parents with low socio-economic status in general [20]. The study determined that the association between the mothers' attitude and practices about ARI which was in line with other study [6]. The mothers' KAP in caring for children is a key in prevention of ARI to reduce the morbidity and mortality due to it among children [5]. It is necessary to provided more extensive health education programs with diverse communication methods and support for mothers including educational intervention programs [21] to improve their KAP about ARI. Additionally, disease control programs should focus on the diagnosis, treatment and prevention of ARI in children could also be beneficial [8]. There are multiple factors that are barriers in reducing the risks of ARI which needs policies implementation to support the health of children in the communities as well as social support structures [7, 22].

This, study has certain limitations that need to be addressed. Firstly, only rural Nam Dinh was used for data collection, so these findings may not be generalizable to all rural Vietnam or to rural areas in other countries. Second, our study did not include some potential

factors like vaccination status, household environment and access to healthcare as these may influence ARI incidence and severity. Therefore, future research needs to include these variables and large rural areas to evaluate the generalizability of the results of this study.

## 5. Conclusion

Our study illustrated the association between mothers' attitude and practices regarding ARI and the incidence of ARI in their children under five years of age. Moreover, the mothers' practices had a significant association with the incidence of ARI in children. Especially, health education needs to be focused on practices in caring for children with ARI. It is necessary to have the interventional programs to improve the mothers' knowledge, attitude and practices about ARI for mothers having children under 5 years old.

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## Author contributions

TLT: Conceptualization, data curation, formal analysis, methodology, writing original draft, writing review and editing.

HTD: Conceptualization, methodology, supervision, writing original draft, writing review and editing. HTN: Conceptualization, methodology, supervision, writing original draft, writing review and editing. TTTN: Conceptualization, supervision, writing review and editing.

## Declaration

### Ethics approval and consent to participate

This study was approved by the Ethical Review Committee of Nam Dinh University of Nursing (no.2359/GCN-HDDD), and permission for data collection from the authorities of the community. Participants were informed verbally and in writing about the study's aim and their role. All participants reviewed and signed the study informed consent form as their agreement to participate. Research respondents participated voluntarily and were free to withdraw from the study without consequence.

### Competing interests

None

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## References

- [1] Bhavsar S, Sarkar A. Assessment of common childhood diseases in 1-5 yr age group children and determination of knowledge, health care practices & health seeking behavior of parents in Jamnagar district. *Global Journal for Research Analysis*. 2017.
- [2] Honglei H, Readon CI, Evelyn G, et al. Discovery and Validation of Biomarkers to Guide Clinical Management of Pneumonia in African Children. *Oxford Journals*. 2014;58(12):1707-15.
- [3] Ghimire P, Gachhadar R, Piya N, et al. Prevalence and factors associated with acute respiratory infection among under-five children in selected tertiary hospitals of Kathmandu Valley. *PLOS ONE*. 2022;17(4):e0265933.
- [4] Gyawali M, Rama P, Safala M, et al. Knowledge on acute respiratory infection among Mothers of under five year children of Bhaktapur District, Nepal. *International Journal of Scientific and Research Publications*. 2016;6(02):85-9.
- [5] Alluqmani MF, Aloufi AA, Abdulwahab AM, AlShathri AA, AlShehri MS, Hawsawi SI, et al. Knowledge, attitude and practice of mothers on acute respiratory infection in children under five years in Saudi Arabia, 2017. *The Egyptian Journal of Hospital Medicine*. 2017;69(2):1959-63.
- [6] Ramani VK, Pattankar J, Puttahonnappa SK. Acute Respiratory Infections among Under-Five Age Group Children at Urban Slums of Gulbarga City: A Longitudinal Study. *Journal of clinical and diagnostic research : JCDR*. 2016;10(5):Lc08-13.
- [7] Wognin AS, Konan LL, Laure Essis EM. Associated Factors of Respiratory Diseases in Community Settings in Attécoubé Lagoon, Côte d'Ivoire, January-February 2022. *International Journal of Health & Medical Research*. 2023;2(11):414-23.
- [8] Tazinya A, Gregory EH, Lawrence TM. Risk factors for acute respiratory infections in children under five years attending the Bamenda Regional Hospital in Cameroon. *BMC Pulmonary Medicine*. 2018;18(7).
- [9] Maria-Regina AC, Cristiana MNC, Ferrero F, Fátima MA, Simon NC. Adding fever to WHO criteria for diagnosing pneumonia enhances the ability to identify pneumonia cases among wheezing children. *Archives of Disease in Childhood*. 2011;96:58-61.
- [10] WHO. Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. Geneva: World Health Organization; 2014.
- [11] Patwari AK, Raina N. Integrated Management of Childhood Illness (IMCI): a robust strategy. *The Indian Journal of Pediatrics*. 2002;69(1):41-8.
- [12] Saeed EAM, Awadalla H. Knowledge, Attitude, and Practice among Mothers of Under-Five Children about Acute Lower Respiratory Tract Infections a Locality in Khartoum Urban Area, Sudan. *Journal of Environmental Science and Public Health*. 2020;4(4):455-68.
- [13] Shivaprakash NC, Kuty DN. Magnitude of acute respiratory infections in 6 months - 6 years in a Rural hospital BG Nagara: a cross sectional study. *International Journal of Pediatric Research*. 2017;4(3):226-32.
- [14] Mutalik A, Raje VV. Study to assess the knowledge, attitude, and practice about acute respiratory infections among school going children and their parents in rural Maharashtra. *International Journal of Medical Science and Public Health*. 2017;6(11):1584-7.
- [15] Saeed EAM, Awadalla H. Knowledge, Attitude, and Practice among Mothers of Under-Five Children about Acute Lower Respiratory Tract Infections in a Locality in Khartoum Urban Area, Sudan. *Journal of Environmental Science and Public Health*. 2020;4(4):455-68.
- [16] Tunny IS, Soamole I, Wibowo SA, et al. Effect of Health Education on Mothers' Knowledge in the Prevention of Acute Respiratory Infection in Toddlers in Waimital Village, Maluku. *Jurnal Ners*. 2020;15(Special issue 02):188-92.
- [17] Gamtessa LC, Seid SS. The Knowledge and Practice of Mothers Caring for their Children with Acute Respiratory Infection among those attending the Under-Five Unit at Bedele Hospital, Southwest Ethiopia. *Clinics in Mother and Child Health*. 2021;18(7):1-4.
- [18] Koranath RA, Nair A. Awareness and healthcare seeking behavior regarding acute respiratory infections among mothers of under five children in rural Tamil Nadu: A hospital based cross sectional study. *Journal of Current Research in Scientific Medicine*. 2024;10(1):55-61.

- [19] Khan K, Nazar G, Ullah S. Knowledge Attitudes, and Practices of Parents on Acute Respiratory Tract Infection in Children Under Five Years: A Cross Section Study. *Journal of Development and Social Sciences*. 2022;3(2):474-84.
- [20] Shtayyat KF, Abu-Baker NN. Knowledge, Attitude, and Practice toward Antibiotic use with Acute Respiratory Infection among Parents of Children under Five Years. *The Open Nursing Journal*. 2023;17:e187443462305100.
- [21] Bhatti ZI, Nawaz K, Ali M, et al. Effectiveness of Educational Interventions on Knowledge Towards Prevention of Acute Respiratory Tract Infection among the Mothers of Under Five Year Children. *PJMHS*. 2020;14(3):672-4.
- [22] Chand V, Masoud M. Perception of mothers about Acute Respiratory Infections (ARIs) and risk factors affecting children Under 5 Years (U5Ys) in Fiji. *Journal of Pediatric Nursing*. 2022;65:44-54.

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