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Deepening Analysis on Factors Related to the Mothers' Practices and Acute Respiratory Infection Disease in Children Under 5 Years Old in the Rural Area, Vietnam

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ABSTRACT

Objective: The study aimed at identify some factors related to practices of mothers and acute respiratory infection disease in children under 5 years old in rural area, Vietnam.

Material and methods: A cross-sectional study was conducted on among 194 mothers and their children under 5 years old in the rural area of Vu Ban District, Nam Dinh province, Vietnam from October 2020 to June 2021. The questionnaire includes 16 items and 3 technique checklists was used which was comprised of sociodemographic factors and information about practices of mothers in prevention and caring for children with acute respiratory infection. The questionnaire and diagnosis of acute respiratory infection (ARI) was based on the revised WHO guidelines. Then the data was collected, analyzed and entered into the SPSS 25.0 program. Using Chi-Square statistics and the odds ratio OR with 95% CI confidence to analyze and determine the relation factors between the two variables in the study.

Results: Unsatisfactory practices of mothers in prevention and caring for children with ARI accounted for high percentage (61.9%). In addition, the incidence of ARI in children under 5 years old was 43.8% (85/194 children). There were some relationships between the mothers' education level, receiving counseling information, number of children, the incidence of ARI in children and mothers' practices about ARI. The difference was statistically significant with $p < 0.05$. There were some relationships between the mothers' education level, receiving counseling information about ARI, mothers' practical skills in caring and the incidence of ARI in their children. The difference was statistically significant with $p < 0.01$.

Conclusions: The practices of mothers in prevention and caring for their children with ARI were low. The study revealed that some factors related to practices of mothers and ARI disease in children under 5 years old.

KEYWORDS: Acute respiratory infection (ARI), mothers, children under 5 years old, practices, prevention and caring, the incidence.

ARTICLE DETAILS

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INTRODUCTION

Acute respiratory infection (ARI) is a common syndrome in children, especially children under 5 years old who leading position in morbidity and mortality in the world [1], [2]. In particular, pneumonia is the leading cause of death in children [3]. The management, prevention, and caring for children with acute respiratory infections depend not only on healthcare providers but also on the practices of mothers in prevention and caring for their children with ARI. The practices of mothers in caring for their children play an important role in prevention. Mothers are the caregivers of their children and thus their practices could be used as a preventive measure for the disease [4]. A previous revealed that mothers with the poor practices showed a higher incidence of ARI in their children (28.9%). The incidence was measured at 24.78% for mothers with a fair practices and 20.83% for mothers with a good practices [5]. Therefore, the research aim to identify some factors to

practices of mothers about ARI plays an important role in making recommendations and solutions to improve practices for mothers as well as reducing the incidence of ARI in children under 5 years old. This contribute to reduce the burnden on family and society.

Aim of the study

The study aimed at identify some factors related to practices of mothers in caring and acute respiratory infection disease in children under 5 years old in the rural area, Vietnam in 2020-2021.

Research Questions

1. What are the practices of mothers in prevention and caring for children with acute respiratory infection in the rural area, Vietnam?
2. How is the proportion of ARI disease in children under 5 years old in the rural area, Vietnam?
3. What are the factors related to practices of mothers and acute respiratory infection disease in children under 5 years old in the rural area, Vietnam?

Research subject

Mothers and their children under 5 years old in the rural area, Vietnam.

METHODS

Research setting

A cross-sectional survey conducted in the rural area of Vietnam. There are 8 villages in commune of Vu Ban district, Nam Dinh provice, Vietnam. It was estimated that about 248 times of children were hospitalized for treatment of acute respiratory infections at Vu Ban district hospital in the first 9 months of 2020. In addition, the people's ability to access health services as well as information about health care remain low. Therefore, this rural area of Viet Nam was selected for this study.

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 of time 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. All mothers and their children under 5 years old in the rural selected in the community. Mothers were invited to participate in this study and then, the research members in Nam Dinh University of Nursing who are the padiatric doctors and nurses or healthcare workers at the commune health station guides mothers to fill out the survey to evaluate the practices of mothers in caring for their children with ARI in about 10 minutes. After that, assessing mothers' practical skills in caring for children by using a checklist in 15 minutes. Next to, 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.

Sample

The sample size was calculated using the following formula

$$n = Z^2_{(1-\alpha/2)} \frac{p(1-p)}{d^2}$$

With $Z^2_{(1-\alpha/2)}$: 1.96 (95% confidence level); d= 0.05 (5% error); p = 0.55 (According to the research of Tazinya and et al in 2018, the incidence of ARI was 54.7%) [6].

The corrected sample is 194 mothers and their children. Hence the researcher collected in 3 months was 194 mothers and their children as the sample size to conduct this research

Sampling technique

The purposive sampling technique used to select the samples based on inclusion and exclusion criteria

Sampling criteria

Mothers and their children who fulfill the following criteria:

Inclusion criteria

Mothers who:
Have children under 5 years old
Were present in the selected community
Were willing to participate in the study
Were living in a rural area from October 2020 to December 2020.

Exclusion criteria

Mothers are unable to write or communicate.
Children are in the emergency situation

MEASUREMENTS

The questionnaire about practices in prevention and caring for children with ARI was based on the WHO [7], the technical checklist for measuring temperature and applying warm compresses to reduce fever for children was developed by the research team based on the Ministry of Health guidelines [8], [9]. The technique of flapping-vibration checklist was based on the National Children's Hospital guidelines in Vietnam [10]. The questionnaire was validated by 5 pediatric 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 Viet Nam (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. Evaluating the structural validity of the questionnaire by analyzing the exploratory factor (EFA) with the KMO coefficient (Kaiser-Meyer-Olkin) was greater than 0.5. The score of similarity between 5 investigators on 3 technical checklists was 0.97. In which, the technique of temperature measurement, warm compress and flapping-

vibration technique had consensus scores of 0.98, 0.97; 0.97 respectively. Therefore, this questionnaire enough standards used in this study.

The questionnaire contains 16 items, including 8 items about the general information characteristics of mothers and 8 items to assess practices of mothers in the prevention and caring for children with ARI. Practices of mothers including 4 main contents: Practice taking children to go to the doctor, giving them water to drink, relieving cough, cleaning the nose; About prevention of ARI including 4 main contents: Avoid to cigarette smoke, dust and animal hair, breastfeed, vaccinated fully according to regulations. This section includes 8 multiple-choice questions and 3 checklists with 28 steps. The different levels of practice are categorized as follows:

Satisfactory practices ≥ 70%

Unsatisfactory practices < 70%

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 [7], [11]. 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) [12].

Research ethics

This study was approved by the Ethical Review Committee of Nam Dinh University of Nursing (no.2359/GCN-HĐĐD), 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.

Statistical analysis

All variables entered into the regression models were coded or transformed into categorical measurements. Collected data were coded and tabulated using a personal computer. Using an SPSS 25.0 program for Windows. The chi square test was used to evaluate significance of associations with mothers' practices and the incidence of ARI in children which were coded as categorical variables.

RESULTS

Table 1. **Socio-demographic characteristics of mothers** (N = 194)

Socio-demographic characteristics	**Frequencies (N)**	**Percentages (%)**
Age		
≤ 25 years	36	18.6
26-35 years	123	**63.4**
36-45 years	33	17.0
> 45 years	2	1.0
Educational level		
Middle school or below	48	24.7
High school	88	**45.4**
Diploma/Bachelor/Postgraduate	58	29.9
Occupation		
Civil servants	25	12.9
Worker	111	**57.2**
Farmer	10	5.2
Housework	32	16,5
Others	16	8,2
Number of children		
1 child	32	16.5
≥ 2 children	162	**83,5**

Table 1 showed that the majority of mothers have the age group from 26 to 35, accounting for 63.4% and the high percentage of mother having education level was high school, accounting for 45.4%. Mothers mainly have 2 or more children at 83.5%.

Table 2. Characteristics of counseling information of mothers

Characteristics		**Frequencies** (N)	**Percentage** (%)
Receiving counseling information	Yes	110	56.7
	No	84	43.3
Source of information	Media /books	81	41.8
	Friends/ relatives	35	18.0
	Health providers	51	26.3
	Others	1	0.5
Desired source of information	Media /books	48	24.7
	Friends/ relatives	8	4.1
	Health workers	134	69.1
	Others	4	2.1

The majority of mothers received counseling information about ARI. However, the percentage of mothers who have not received instructions and counseling was high, accounting for 43.3%. The media/books were a popular source of information that mothers received with 41.8%, followed by the counseling from health workers accounted for 26.3%. However, 69.1% mothers desired to receive counseling information from health workers

Table 3. Acute respiratory infections in children under 5 years old *(N = 194)*

Contents		**Frequencies (N)**	**Percentages (%)**
Children with ARI	Yes	85	**43.8**
	No	109	56.2
Classification	Upper ARI	76	**39.2**
	Lower ARI	24	12.4
Upper ARI	1 time	55	**28.4**
	2 times	16	8.2
	≥ 3 times	5	2.6
	Total	76	**39.2**
Lower ARI	1 time	19	9.8
	2 times	4	2.1
	3 times	1	0.5
	Total	24	12.4

The incidence of ARI by follow-up was 43.8% (85/194 children). The proportion of upper ARI was 39.2% (76/194 children) and the lower ARI was 12.4% (24/194).

Table 4. **The score of mothers' practical skills about ARI**

Content	$\overline{X}$±SD	**Min**	**Max**
The temperature measurement technique	6.3 ± 1.97	1	10
The warm compress technique	5.8 ± 1.86	0	9
The flapping-vibration technique	2.1 ± 2.38	0	9
Total	14.3 ± 5.2	1	28

The practical skill about temperature measurement achieved the highest score: 6.3 ± 1.97. The flapping-vibration technique had the lowest average score with 2.1 ± 2.38.

Table 5. **The score of mothers' practices about ARI**

Contents	$\overline{X}$±SD	**Min**	**Max**
Practice about caring for children	2.3 ± 1.57	0	6
Practice about prevention of ARI	3.5 ± 0.8	0	4
Practical skills	14.3 ± 5.2	1	28
Total	20.1 ± 6.1	7	36

Practice about caring for children achieved the lowest score: 2.3 ± 1.57. The total score of mothers' practices about ARI was 20.1 ± 6.1.

Table 6. Socio-demographic factors associated with practices of mothers

Factors	Practice				Odds ratios	95% CI	p value
	Unsatisfactory		Satisfactory				
	N	%	N	%			
Age group							
≤ 25 years old	31	86.1	5	13.9	0.9	0.3-2.7	0.18
≥ 26 years old	135	85.4	23	14.6			
Educational level							
Middle school or below High school and over	46 120	95.8 82.2	02 26	4.2 17.8	4.98	1.14-21.84	**0.02**
Occupation							
Civil servants	21	84	4	16	1.15	0.36-3.6	0.8
Others	145	85.8	24	14.2			
Number of children							
1 child	23	71.9	09	28.1	2.95	1.19-7.3	**0.016**
≥ 2 children	143	88.3	19	11.7			
Receiving counseling information							
Yes	87	78.4	24	21.6	0.18	0.06-0.55	**0.001**
No	79	95.2	04		4.8		

Table 6 showed that no relationship between mothers'age group, occupation and mothers' practice about ARI with p >0.05. There was a relationship between education level, receiving counseling information, number of children and mothers' practice about ARI. The difference was statistically significant with p < 0.05

Table 7. The relationship between the incidence of ARI and practical skills of mothers

Children with ARI		Practical skills				Odds ratios	95% CI	p value
		Unsatisfactory		Satisfactory				
		N	%	N	%			
Diagnose	Yes	51	92.7	4	7.3	2.9	0.97-8.8	0.04
	No	113	81.3	26	18.7			
Follow up	Yes	77	90.6	8	9.4	2.4	1.02-5.8	0.04
	No	87	79.8	22	20.2			
Upper ARI	Yes	70	92.1	6	7.9	2.97	1.2-7.7	**0.019**
	No	94	97.7	24	20.3			

There was a relationship between the incidence of ARI in children and mothers' practical skills in caring. Mothers with unsatisfactory practical skills, their children have a 2.9 times higher rate of ARI by diagnosis and 2.4 times higher by follow-up compared to children of mothers with satisfactory practical skills. The rate of Upper ARI in children of mothers with unsatisfactory practice skills was 2.97 times higher than children of mothers with satisfactory practical skills. The difference was statistically significant with p < 0.05.

Table 8. The relationship between the incidence of ARI and practices of mothers

Children with ARI		Practice				Odds ratios	95% CI	p value
		Unsatisfactory		Satisfactory				
		n	%	n	%			
Diagnose	Yes	52	94.5	3	5.5	3.8	1.1-13.2	0.025
	No	114	82	25	18			
Follow up	Yes	79	92.9	6	7.1	3.3	1.3-8.6	0.01
	No	87	79.8	22	20.2			

Upper ARI	Yes	72	94.7	4	5.3	4.6	1.5-13.8	**0.004**
	No	94	97.7	24	20.3			

There was a relationship between the incidence of ARI in children and mothers' practices. Children of mothers with unsatisfactory practice had a 3.8 times higher rate of ARI by diagnose and 3.3 times higher by follow up than children of mothers with satisfactory practice. Similarly, children of mothers with unsatisfactory practices had 4.6 times higher rate of upper respiratory tract infection than children of mothers with satisfactory practice. The difference was statistically significant with $p < 0.05$.

Table 9. The relationship between the incidence of ARI and characteritic of mothers

Characteritic of mothers	**Children with ARI**				Odds ratios	95% CI	p value
	Yes		No				
	n	%	N	%			
Educational level							
High school or below	31	23	104	77	0.4	0.2-0.8	0.01
Diploma/ Bachelor/ Postgraduate	24	40.7	35	59.3			
Receiving counseling information							
Yes	38	34.2	73	65.8	0.4	0.2-0.7	**0.002**
No	47	56.6	36	43.4			

There was a relationship between the mother's education level and the incidence of ARI in children. The difference was statistically significant with $p < 0.05$. Mothers have a high education level with diploma/ bachelor or over, their children have a 0.4 times lower rate of ARIs than children of mothers have education level with high school or below. In addition, there was a relationship between the mother's characteristics about receiving counseling information and the incidence of ARI in children. The difference was statistically significant with $p < 0.05$. Mothers who received information about ARI, their children had a 0.4 times lower rate of ARI than children of mothers who did not receive counseling information.

DISCUSSION

The percentage of mothers who have not received counseling information about ARI was high at 43.3%. The media/books were popular source of information that mothers received with 41.8%, the counseling information from health workers accounted for 26.3%. However, 69.1% mothers who desired to receive counseling information from health workers. According to the study of Gombojav N and et al (2009) [13], it showed that children with ARI have slow access to health services and caregivers have limited support. Therefore, it is necessary to promote communication - health education to caregivers of newborns in the management of ARI. A cross-sectional descriptive study on 132 mothers with children under 5 years old in Nepal in 2014 on knowledge and practice about the management of ARI [14], the results showed that most mothers had information about the disease (93%). The sources of information from health workers accounted for 30%. The lack of knowledge about the danger signs of the disease has prompted a proposal for a community-based education programs for mothers about ARI. The results in the table 3 showed that the incidence of ARI in children under 5 years old was high at 43.8% (85/194 children). The proportion of upper respiratory tract infection was 39.2% (76/194). Children classified as pneumonia by examination were 4.1%. The total number of upper respiratory tract infections in children was 76 times/194 children. There was one time upper respiratory tract infection at 28.4%. Those results were lower than the study of Tazinya Alexis and et al in 2018, the incidence of ARI in children under 5 years old was 54.7 (280/512 children). The proportion of pneumonia was 22.3% (112/512) [6]. The reality of mothers' practices in prevention and caring for children with ARI in rural areas was remain low. The percentage of mothers who had satisfactory practice was high at 85.6%. This result was also consistent with the study of Mutalik A and Raje V. V in 2017, which assessed the knowledge, attitudes and practices of mothers in rural areas of Maharashtra [15]. Research showed that mothers' knowledge, attitudes and practices about ARI were very low. Mothers with poor practice about ARI were 68.9%. The number of mothers with poor knowledge, attitude and practice accounted for a high percentage (71.6%). Furthermore, mothers are the primary caregivers for children in society, so mothers' practices have a significant influence on the disease status and survival in children. Therefore, it is necessary to improve mothers' practices on ARI. Research revealed that there was a relationship between education level, receiving counseling information and mothers' practice about ARI. The difference was statistically significant with $p < 0.05$. This result was

similar to the study of author Sherene G. E in 2009 in New Delhi [16]. Research showed that there were relationships between education level, receiving counseling information, desired source of information, number of children and mothers' practice about ARI. The difference was statistically significant, with $p < 0.05$. This result revealed the impact of counseling information about ARI on mothers' practices in prevention and caring for sick children. In addition, the study determined a relationship between the receiving counseling information of mothers and the incidence of ARI in children. The difference was statistically significant with $p < 0.01$. Mothers who received information about the disease, caring and prevention of ARI, their children had a 0.4 times lower proportion of ARI than children of mothers who did not receive counseling information. Therefore, it is necessary to have more extensive health education programs with diverse communication methods and support for mothers in prevention and caring for children at home in order to improve the children's health and reduce the incidence of ARI in children under 5 years old. According to the results in table 9, there was a relationship between the mother's education level of mothers and the incidence of ARI in children. The difference was statistically significant with $p < 0.05$. Mothers with a high level of education from intermediate or over, their children have a 0.4 times lower proportion of ARI than mothers with middle school/ high school or below**.** This result was consistent with the study of Tazinya Alexis and et al in 2018, mothers with low education level was a risk factor associated with ARI in children. The research suggested that disease control programs should focus on the diagnosis, treatment and prevention of ARI in children [6].

CONCLUSIONS

The study showed that some factors related to the mothers' practices about ARI such as: The mothers' educational level, number of their children, receiving counseling information and the incidence of ARI in children. The difference was statistically significant with $p < 0.05$. Some factors related to the incidence of ARI in children under 5 years old such as: The mother's characteristics of receiving counseling information about ARI, educational level, mothers' practical skills in caring and mothers' practices about ARI. The difference was statistically significant with $p < 0.01$.

RECOMMENDATION

Health workers need to strengthen counseling and health education for mothers about prevention and caring for children with ARI. It is necessary to focus on practical skills in caring for children. Especially, the guidelines about the technique of flapping-vibration for mothers having children under 5 years old at home.

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