

# SOCIO-CULTURAL AND ENVIRONMENTAL RISK FACTORS OF A.R.I. IN UNDER – FIVE CHILDREN

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## Abstract

**Background:** Acute Respiratory Infections are one of the leading and common causes of morbidity and mortality in human throughout the world affecting young infants, small children/under five children, elderly and person with impaired respiratory tract reserves. The incidence and prevalence of ARIs are a great burden in low- and middle-income countries in comparison to high income countries. According to WHO, the annual number of ARI-related deaths in children less than five years old (excluding death caused by measles, pertussis and neonatal deaths) was about 2.1 million i.e., about 20% of all childhood deaths. **Materials and Methods:** A cross sectional descriptive under analytical of observational study in the Department of Community Medicine, Nalanda Medical College, Patna, Bihar. This study was conducted on a total of 100 under five children. The study month duration was One year from November 2021 to October 2022. Simple random sampling technique was applied for the selection of the sample of the study. Only the people willing to participate and who were present during the study were included in the study. Only one respondent was taken from each household. Mothers having fewer than five children were selected using systematic random sampling. Informed consent was obtained from the parents. Ethical committee clearance was obtained before the study. **Result:** The total study population was 100. The respondents were mothers of children under the age of 5. The majority of the study population belonged to the age group of 36-48 months (37%). Sex wise distribution was almost equal male (49.5%) and female (50.5%). Respondents included five different castes following different religion. Most of them were Munda (30.5%) and least were Dalit (15%). Highest number of people was following Hindu religion (70.5%). Most of the respondent had nuclear family (58%). **Conclusion:** The prevalence of ARI was seen high in children in winter season (16%) but was not statistically proven. Also no statistically significant association was found between other demographic variable such as age, gender, religion, caste, type of family, and others.

## INTRODUCTION

Acute Respiratory Infections are one of the leading and common causes of morbidity and mortality in human throughout the world affecting young infants, small children/under five children, elderly and person with impaired respiratory tract reserves.<sup>[1,2]</sup> The incidence and prevalence of ARIs are a great burden in low- and middle-income countries in comparison to high income countries. According to WHO, the annual number of ARI-related deaths in children less than five years old (excluding death caused by measles, pertussis and neonatal deaths) was about 2.1 million i.e., about 20% of all childhood deaths. Each year about 10.8 million children die due to ARI. Estimates indicate

that in 2022, 1.9 million children died because of ARI, 70% of them in Africa and Southeast Asia.<sup>[3]</sup> The incidence of ARI stands first in Southeast Asia causing more than 80% of all the incidences along with Sub-Saharan African countries.<sup>[4]</sup> ARI is responsible to cause death of about 28,000 children in Nepal each year.<sup>[5]</sup> Nepal is diversified in socio-cultural, geographical and economical and many other aspects have so there are many factors that are associated with ARI and these factors vary from one country to another.

Acute Respiratory Infection (ARI) continues to be the leading cause of acute illness worldwide and remain the most important cause of infant and young children mortality.<sup>[1,4]</sup> ARI in young children is responsible for an estimated 3.9 million deaths

every year worldwide. It is reported that Bangladesh, India, Indonesia and Nepal together account for 40% of the global ARI mortality. ARI deaths about 90% are due to pneumonia which is usually bacterial in origin. The incidence of pneumonia in developed countries may be as low as 3-4%, whereas in developing countries range between 20-30%. The difference is due to high prevalence of malnutrition, low birth weight and indoor air pollution in developing countries.<sup>[5,6]</sup> ARI is a serious threat to infant and child survival in India. Hospital records from states with high infant mortality rates show that up to 13% of the inpatient deaths in paediatric ward are due to ARI.<sup>[7]</sup> Whereas, outpatient attendance attributing to ARI is as high as 20-40% of all outpatients and 12-35% of in-patients.<sup>[8]</sup> It has been reported that there are links between environmental risk factors (such as overcrowding, outdoor air pollution, and indoor pollution) and risk factors in the child (such as breastfeeding, low birth weight, malnutrition, and vitamin A deficiency) with ARI.<sup>[9,10]</sup> In India, most of the population is integrated in rural area and therefore there is a need to have knowledge of these risk factors related to acquisition of ARI, as it will help in its prevention, through community health education. This study was done to know the risk factors in the routine habitat of the Indian rural setup leading to ARI.

#### Aim and Objective

The objective of the study was to assess the prevalence and identify the determinants of Acute Respiratory Tract Infections under five children.

## MATERIALS AND METHODS

A cross sectional descriptive under analytical of observational study in the Department of Community Medicine, Nalanda Medical College,

Patna, Bihar. Was conducted on a total of 100 under five children. The study month duration was One year from November 2021 to October 2022. Simple random sampling technique was applied for the selection of the sample of the study. Only the people willing to participate and who were present during the study were included in the study. Those youth who refused to participate and were absent during the study were not included in the study. Only one respondent was taken from each household. Mothers having fewer than five children were selected using systematic random sampling. Informed consent was obtained from the parents. Ethical committee clearance was obtained before the study.

## RESULTS

The total study population was 100. The respondents were mothers of children under the age of 5. The majority of the study population belonged to the age group of 36-48 months (37%). Sex wise distribution was almost equal male (49.5%) and female (50.5%). Respondents included five different castes following different religion. Most of them were Munda (30.5%) and least were Dalit (15%). Highest number of people was following Hindu religion (70.5%). Most of the respondent had nuclear family (58%). In comparison to educational status of father, highest percentage of population had received Higher secondary education (6%) in the category of children who had ARI and the highest percentage of population received primary education in the category of children had no ARI, similarly in case of mother's education status similar status was seen. 80% of the family had father as the head and most of them were farmers (33%). Main source of income was generated equally by agriculture and job (both 30.5%) followed by other profession.

**Table 1: Prevalence of ARI.**

	Frequency	Percent
Children who had ARI	21	21%
Healthy children (no ARI)	79	79%
Total	100	100

**Table 2: Type of house and ARI.**

Type of house	Children who had ARI	No ARI	Chi-square	P value
mud and stone made roofed with strew/hay	2(2%)	7(7%)	9.105	0.025
mud and stone made roofed with tin	7(7%)	43(43%)		0.025
brick and cement made with tin roof	5(5%)	9(9%)		0.025
RCC building	6(6%)	20(20%)		0.025
Total	21(21%)	79(79%)	---	---

**Table 3: Presence of moisture and cold in surrounding or room and ARI.**

Presence of moisture and cold in surrounding or room	Children who had ARI	No ARI	Chi-square	P value
Yes	8(8%)	47(47%)	6.243	0.015
No	13(13%)	32(32%)		0.015
	21(21%)	79(79%)	-----	----

**Table 4: Educational status of father and ARI**

Educational status	Children who had ARI	No ARI	Chi-square	P value
Illiterate	1(1%)	1(1%)		0.003

Literate (non-formal education)	1(1%)	7(7%)	14.305	0.003
primary education (1-5)	3(3%)	21(21%)		0.003
lower secondary education (6-8)	4(4%)	16(16%)		0.003
secondary education (9-10)	4(4%)	17(17%)		0.003
higher secondary education (11-12)	6(6%)	7(7%)		0.003
postgraduate/ degree/others	2(2%)	10(10%)		0.003
Total	21(21%)	79(79%)	----	---

**Table 5: Crowding and ARI.**

	Children who had ARI		No ARI	Chi-square	Chi-square
Own house	No crowding	7(7%)	43(43%)	6.243	0.006
	Crowding	6(6%)	20(20%)		0.006
Rented house	No crowding	5(5%)	9(9%)	2.205	0.033
	Crowding	2(2%)	7(7%)		0.033
Total		21(21%)	79(79%)	---	---

The highest number of family (45%) had monthly income of 10000-20000. Most of the respondents had two children (48%). The greater numbers were living in houses made up of mud and stone with tin roof 7(7%) in the category of children who had ARI and 43(43%) in the category of children who had no ARI. Almost all were living in their own house, 13 children (13%) in the category of children who had ARI, 63 children (63%) in the category who had no ARI and few were living in rented house around 7 children (7%) in the category of children who had ARI and 16 children (16%) in the category of children who had no ARI. Most of the people had separate kitchen (60%) and 65.5% were using LPG as the main fuel for cooking. According to the present study, more episodes of ARI were seen during winter season (70%). Most of the respondents were exposed to dust, smoke, or other pollutants (53%). The houses were not well ventilated and 8(8%) population had moisture and cold in their room. Majority of the children (63.5%) under age five were breastfed for more than two years. 96% of the children were given the supplementation of vitamin A. The table provides information about the prevalence of ARI in children under age five. Out of the total sample, 21(21%) of the children had ARI whereas 79(79%) of the children had no ARI [Table 1].

From the above table it is clearly evident that there is a significant association between type of house and prevalence of ARI ( $p<0.05$ ) [Table 2]. There is significance association between presence of moisture and cold in surrounding or room in prevalence of ARI [Table 3]. It is clearly seen that educational status of father is associated with prevalence of ARI [Table 4]. The table clearly show that there is significant association between crowding and ARI [Table 5].

## DISCUSSION

Out of total 100 sample population, 21 children (21%) were having ARI and 79 children (79%) had no ARI.<sup>[11]</sup> in Gujarat, India which found the prevalence to be 22% and the study in Tamilnadu, South India with the ARI prevalence of 27%.<sup>[7,12]</sup> According to the data of 21 children (21%) who had

ARI shows almost similar result to the studies mentioned above. This depicts that the prevalence of ARI in developing countries are on similar scale. The present study found significant association between educational status, crowding, type of house and presence of moisture and cold around the room with ARI. According to present study data we cannot assure that presence of moisture in room or cold room is the major cause of ARI. The findings revealed some sociodemographic and environmental factors as the determinants of ARI in developing countries and particularly in Scheduled tribe and Scheduled caste. This study showed that the prevalence of ARI was high in children living in crowded condition.

The study found a significant association between prevalence of ARI and crowding in own house ( $p=0.006$ ) and in rented house ( $p=0.033$ ). Comparable association was also seen between occurrence of ARI and overcrowding ( $p<0.001$ ). There was also a statistically significant association between the prevalence of ARI and type of housing ( $p=0.025$ ).

The present study also found a significant association between presence of moisture and cold in room and prevalence of ARI ( $p=0.015$ ). The finding is comparable with the finding of the study done in India, wherein the results show that there was association between dampness and occurrence of ARI ( $p<0.001$ ) in India.<sup>[12]</sup>

## CONCLUSION

However, no statistically significant association was found in the present study between LBW, status of breast feeding, supplements of vitamin A and ARI. It is clearly seen that educational status of father is associated with prevalence of ARI [Table 4]. The findings are similar with the study.<sup>[13,14]</sup> High prevalence was seen in children whose parents were smoking but was not statistically proven. This finding is similar to the study. Also no statistical association was found between use of cooking fuel and ARI and the finding is comparable with the study done by Bhaale et al.<sup>[10]</sup> The prevalence of ARI was seen high in children in winter season (16%) but was not statistically proven. Also no

statistically significant association was found between other demographic variable such as age, gender, religion, caste, type of family, and others.<sup>[15,16]</sup>

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