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RESEARCH ARTICLE

RISK FACTORS OF ACUTE RESPIRATORY INFECTION AMONG UNDER FIVE CHILDREN IN RURAL COMMUNITY OF NORTH DELHI

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Abstract

Introduction: Children are mankind's seeds for the future and God given gift or hope. They deserve the almost care from us. Children are as a clay material. Acute respiratory infection (ARI) is a serious public health issue especially in developing nations like India where the majority of people are impoverished, live in slums and exposed to deadly diseases. Children under the age of five are particularly vulnerable to infection at an early stage. So, for the maintenance of best healthy status of children and identification of risk factors of acute respiratory infection among under five children is essential.

Aim: To explore risk factors of acute respiratory infection among under five children in rural community of North Delhi region

Methodology: An exploratory research design was adopted for this study. A total 430 one to five years age of children were selected with the help of consecutive sampling technique in randomly selected villages of North Delhi region. Semi structured interview schedule was used for data collection.

Results: The prevalence of acute respiratory infection was 35% (150 out of 430 children). It was identified that preterm delivery, Low birth weight, birth order of children, overcrowding in the house, indoor smoking, smoky fuel used for cooking, house location near by dusty main road, open drainage system, Family history of respiratory infection leading to cause of occurrence of ARI among children.

Conclusion: Multivariate factors are responsible for acute respiratory infection among children which can be modified to prevent morbidity and mortality rate of under five children due to acute respiratory infection.

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Introduction:-

Children are seeds for future of the country. They are most precious part of nation in term of physical, mental, emotional development as a worthy citizen. The development of country is completely based on healthy citizen. Nutrition is vital for good health and to get protection from infection. The care of child starts from birth only.

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During first five years of child is period of recognition of physical growth, psychological development and acquiring of competence. In underdeveloped nations like India malnutrition, diarrhoea and respiratory illness are now more common among under five children.

Acute respiratory infections (ARIs) are still a major public health problem and they are well recognized as a major contributor to the greatest mortality and morbidity rates in children under the age of five. ARI is most common in young children particularly under the age of five and it diminishes with maturity. Children who belongs to poor economic status are malnourished and more prone to get respiratory infection. All over the world there is one-fifth of mortality rate among below five years of age is due to acute respiratory infection. Children under the age of five experience roughly 5 episodes of ARI every year on average resulting in about 238 million episodes. Approximately, 30-50 per cent of under five children suffering from ARI visiting health facilities and about 20-40 percent get admitted in hospital due to complication. According to hospital statistics from states with the highest mortality rates, ARI is responsible for up to 13% of inpatient fatalities in paediatric wards. The proportionate incidence of ARI related mortality is substantially greater in the community and many children die at home owing to a lack of basic facilities in rural and slum areas.

Acute respiratory infection is an illness that affects any region of the respiratory system including the paranasal sinus, middle ear and pleural cavity. It may produce respiratory tract inflammation everywhere from the nose to the alveoli with a broad variety of symptoms and indications. If upper respiratory infection is not treated, it extends to lower respiratory tract. Acute respiratory infection is communicable which can spread from infected child to another person. The episodes of ARI can be mild and lead to severe episodes. The recurrent episodes of ARI affect the growth and development of child.

Statement of the problem

A study to explore risk factors of acute respiratory infection among under five children in rural community of North Delhi

Objective of the study:-

1. To find out prevalence of acute respiratory infection among under five children
2. To explore risk factors of acute respiratory infection among under five children

Research Methodology:-

Study design:

Exploratory survey

Sample:

430 under five children were selected on the basis of sample size calculation

Setting and sampling technique:

This survey was conducted in Lampur and Singhola villages of randomly selected Narela subdivision in North Delhi region. A multi stage cluster random sampling technique was used to select villages from North Delhi region. Door to door survey was conducted in selected two villages and total 430 one to five years age of children were selected through consecutive sampling technique.

Data collection tool:

A Structured ARI screening tool was used to consider as a case of ARI among under five children to find out prevalence of ARI among under five children and semi structured interview schedule was used to collect data related to risk factors of acute respiratory infection among children and this tool included child's characteristics, environmental characteristics, History of morbidity in last six months and nutritional history of child during infancy period.

Ethical consideration:

A written informed consent was taken from mothers of children to be included in the study.

Data analysis and findings.

The data was entered in to master sheet and descriptive and inferential statistics analysis was done with the help of SPSS

Objective 1:

To find out prevalence of Acute respiratory infection among under five children

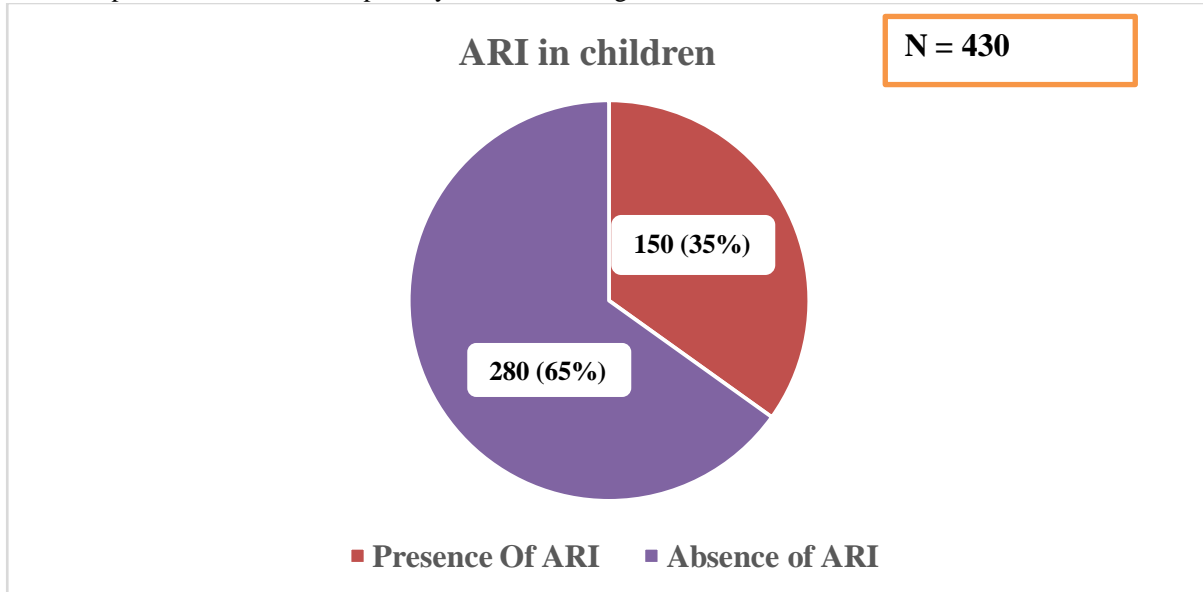


Figure no1:- Pie diagram showing overall prevalence of ARI in Under five children.

Figure no 1 show that out of 430 under five children, 150 had symptoms of acute respiratory infection at the time of data collection. The overall Prevalence rate of ARI was found 35%.

Objective 2: To explore risk factors of acute respiratory infection among Under five children

The Risk factors were assessed by using semi structured interview questionnaire through interview schedule. Frequency and percentage distribution of risk factors was computed in to four components which includes Child's characteristics, Environmental characteristics, history of illness in last 6 months and nutritional history during infancy period.

Table no 1:- Distribution of study sample based on risk factors of ARIN =430.

S.no	Factors	Yes	No
		n (%)	n (%)
I. Child's Characteristics			
1.	Preterm birth of child	111 (25.81)	319 (74.18)
2	Low Birth weight	130 (30.23)	300 (69.76)
3	First birth order of child	119 (27.67)	311 (72.32)
4	Completely immunized as per age	420 (97.67)	10 (02.32)
II. Environmental characteristics			
1	Inadequate ventilation status of house	85 (19.76)	345 (80.23)
2	Overcrowding in house	152 (35.34)	278 (64.65)
3	Indoor smoking	164 (38.13)	266 (61.86)
4	Smoky Fuel used for cooking	32 (07.44)	398 (92.55)
5	Kuccha House	32 (07.44)	398 (92.55)
6	House located near to dusty main road	147 (34.18)	283 (65.81)
7	Presence of factory nearby house	00 (00.00)	430 (100)
8	Sources of safe drinking water	430 (100)	00 (00.00)
9	Open drainage system	295 (68.60)	135 (31.39)
10	Open Waste disposal	120 (27.90)	310 (72.09)

11	Pets in house	137 (31.86)	293 (68.13)
III History of illness in last six months			
1	History of any illness in child other than ARI	57 (13.25)	373 (86.74)
2	Family history of respiratory infection	23 (05.34)	407 (94.65)
IV Nutritional history during infancy period			
1	Received Pre-lacteal feed	109 (25.34)	321 (74.65)
2	Received First Breast milk (Colostrum)	430 (100)	00 (00.00)
3	Exclusive Breast-feeding practices	356 (82.79)	74 (17.20)
4	Bottle feeding	134 (31.16)	296 (68.83)
5	Weaning initiated after 6 months	270 (62.79)	160 (37.20)

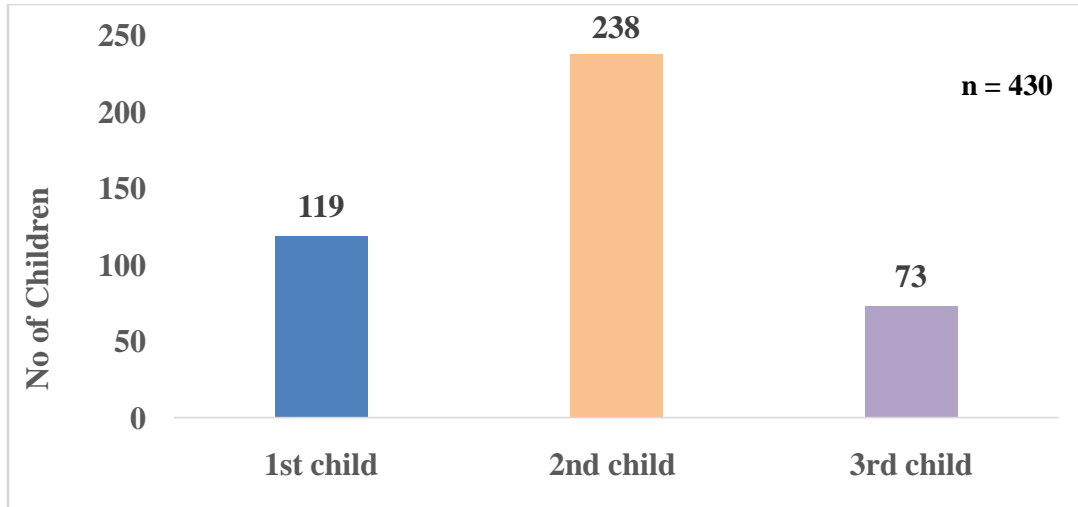


Fig no 2:- Bar diagram representing frequency distribution of birth order of child.

Figure no 2 depicts that Out of 430 Majority 238 (55.34 %) of children were Second born child in the family.

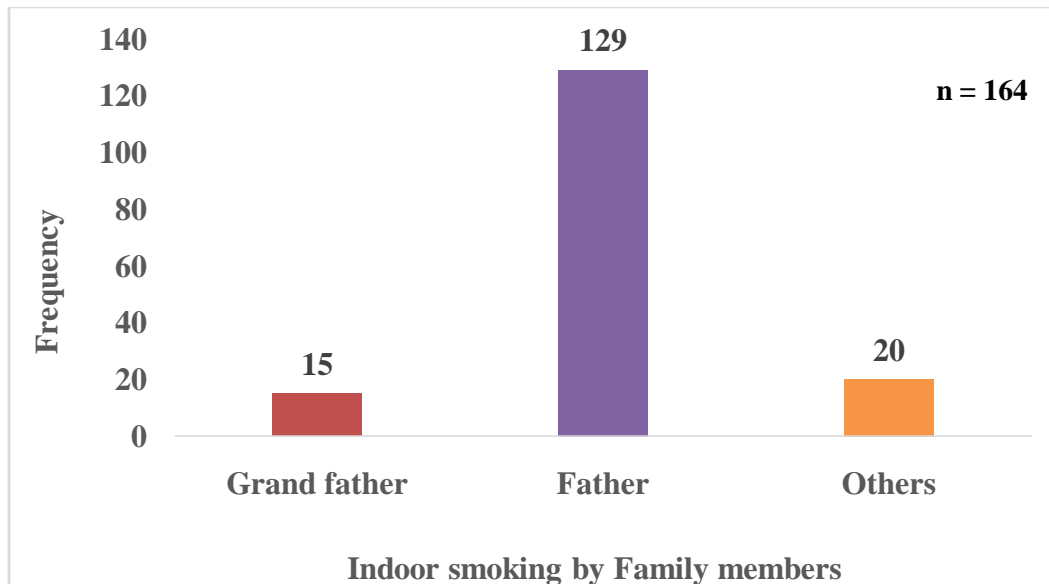


Fig no 3:- Bar diagram representing frequency distribution based on indoor smoking by family members.

Figure no 3 shows that out of 430 Families of 164 children used to do indoor smoking. Among them, majority 129 (78.54%) of father do smoking inside the house which leads to risk factor of acute respiratory infection.

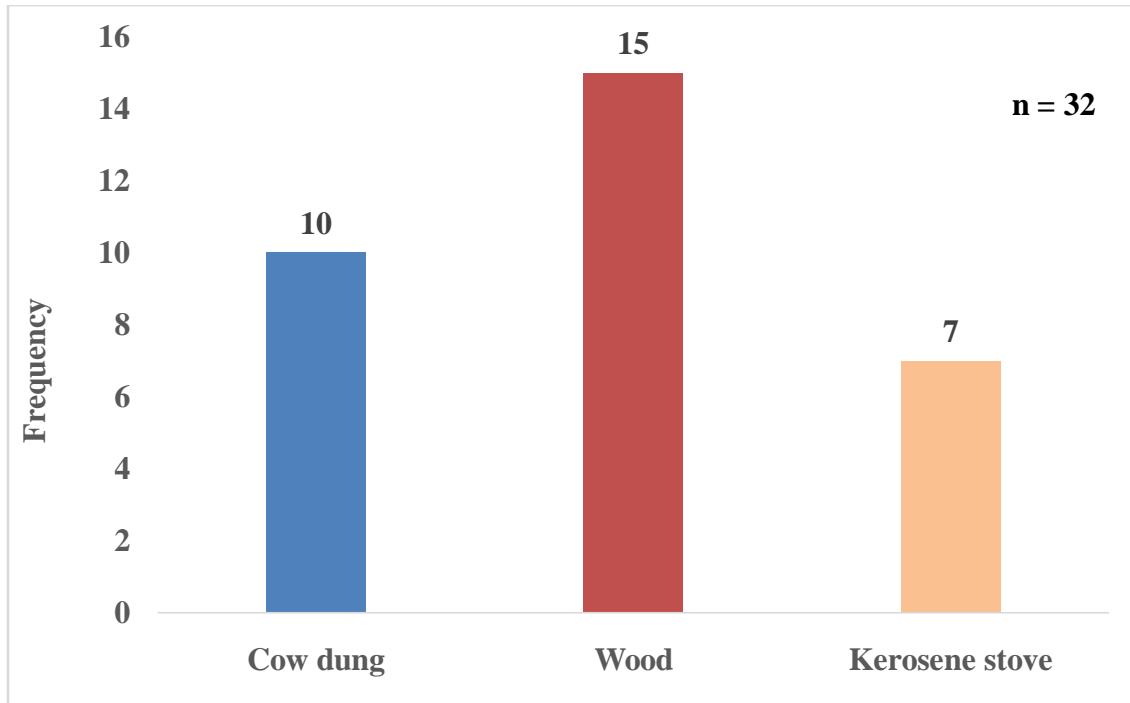


Fig no 4:- Bar diagram representing frequency distribution based on smoky fuel used for cooking. Fig no 4 depicts that 32 (7.44%) families were using smoky fuel for cooking.

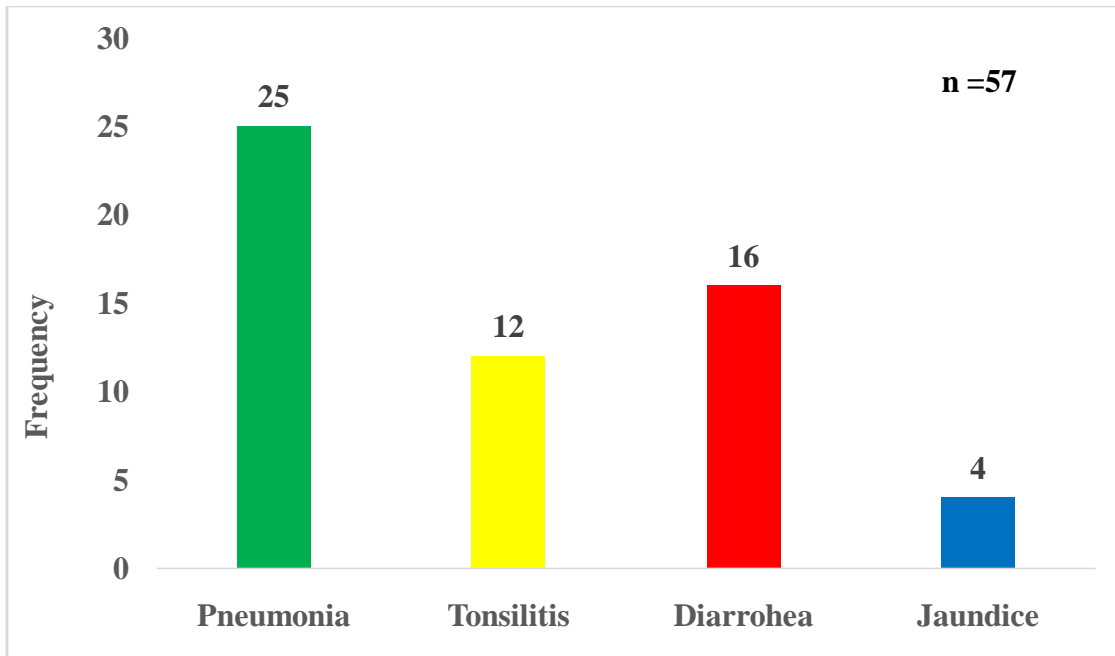


Fig no 5:- Bar diagram representing frequency-based distribution of History of any other illness in child in last six months. Fig no 5 shows that 57 (13.35%) children were having presence of other illness in last six month at the time of base line assessment. Among them, majority 25 (43.85%) of them were suffered from pneumonia disease

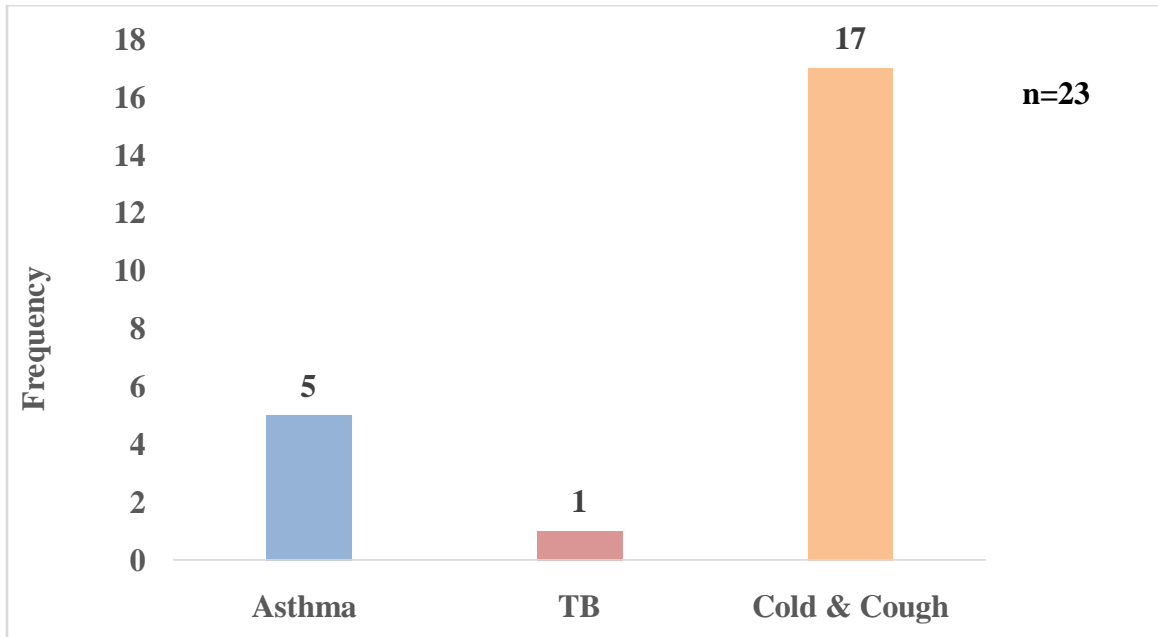


Fig no 6:- Bar diagram representing frequency distribution of family history of respiratory infection. Fig no 6 shows that 23 (4%) families were having history of respiratory infection. Among them, majority 17 (73.19%) of families had history of cold and cough in last six months.

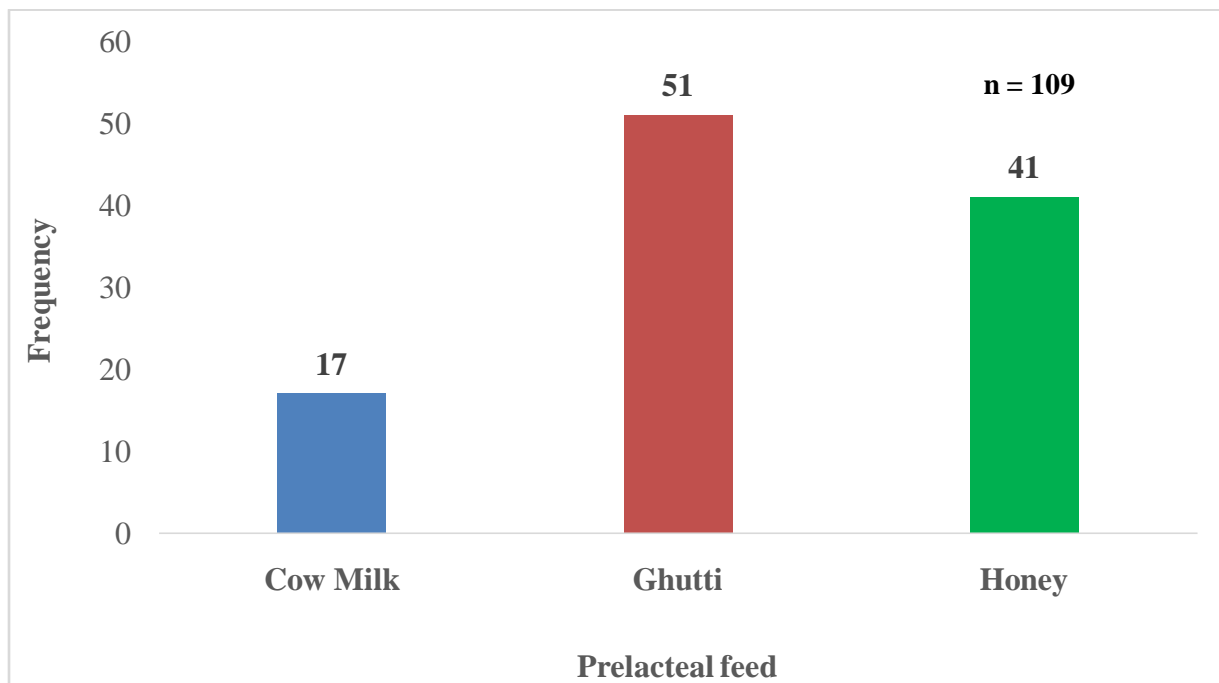


Fig no 7:- Bar diagram representing frequency-based distribution of prelacteal feed. Fig no 7 illustrated that out of 430, 109 children had prelacteal feed within 3 days of birth and majority 51 (50%) of them had Ghutti provided by their family member before initiating first breastfeeding

Odds ratio between risk factors and acute respiratory infection status of child

In order to explore the significant risk factors odds ratio between Presence of ARI and risk factors was computed and is described in below mentioned table 2.

Table no2:- Odds ratio between risk factors and acute respiratory infection status of childrenN=430.

S.no	Factors	Absence of ARI (n)	Presence of ARI (n)	Unadjusted Odds Ratio (95%CI) (Lower-Upper)	p value
I. Child's Characteristics					
1.	Preterm birth of child				
	Yes	98	13	5.675 (3.054-10.544)	<0.001*
	No	182	150	1 (ref)	
2.	Low Birth weight				
	Yes	98	32	1.986 (1.252-3.150)	0.004*
	No	182	118	1 (ref)	
3.	First birth order of child				
	Yes	94	25	1 (ref)	<0.001*
	No	186	125	2.57 (1.539-4.149)	
4	Completely immunized as per age				
	Yes	270	150	1 (ref)	0.999
	No	10	00	1.556 (1.449-1.670)	
II. Environmental characteristics					
1.	Inadequate ventilation status of house				
	Yes	57	28	0.898 (0.543-1.485)	0.675
	No	223	122	1 (ref)	
2.	Overcrowding in the house				
	Yes	90	62	1.487 (0.987-2.242)	0.048*
	No	190	88	1 (ref)	
3.	Indoor smoking				
	Yes	128	36	0.375 (0.241-0.584)	<0.001*
	No	152	114	1 (ref)	
4.	Smoky Fuel used for cooking				
	Yes	27	05	3.095 (1.66-8.212)	0.023*
	No	253	145	1 (ref)	
5.	Kuchha House				
	Yes	18	14	0.667 (0.322-1.383)	0.277
	No	262	136	1 (ref)	
6.	House Located nearby dusty main road				
	Yes	119	28	0.311 (0.193-0.499)	<0.001*
	No	161	122	1 (ref)	
7.	Open drainage system				
	Yes	221	74	3.487 (2.502-5.914)	<0.001*

	No	59	76	1 (ref)	
8.	Open waste disposal				
	Yes	82	38	1.221 (0.779-1.912)	0.384
	No	198	112	1 (ref)	
9.	Pets inside the house				
	Yes	91	46	0.919 (0.599-1.409)	0.697
	No	189	104	1 (ref)	
III. History of illness in last six months					
1.	History of any illness in child other than ARI				
	Yes	42	15	0.630 (0.337-1.178)	0.148
	No	238	135	1 (ref)	
2.	Family history of respiratory infection				
	Yes	03	20	8.762 (2.456-31.260)	<0.001*
	No	277	130	1 (ref)	
IV. Nutritional history during infancy period					
3.	Prelacteal Feed				
	Yes	77	32	0.700 (0.436-1.123)	0.140
	No	203	118	1 (ref)	
4.	Exclusive Breast-feeding practices				
	Yes	234	121	1 (ref)	0.450
	No	46	29	0.820 (0.491-1.371)	
5.	Use of Bottle feeding				
	Yes	91	43	0.809 (0.541-1.287)	0.342
	No	189	107	1 (ref)	

OR> 1 Increased risk of ARI, OR= 1 No risk, OR< 1 Decreased risk of ARI, * p< 0.05= significant

The data depicted in the Table 2 above shows chi square and odds computed between risk factors and presence of ARI. The bivariate logistic regression analysis found that Children were born preterm have 5.675 times [95% CI (3.054, 10.544), p=<0.001*] higher risk for having ARI, child born with low birth weight were 1.98 times [95% CI (1.252, 3.150), p=0.004] at higher risk of getting ARI, child who born after first child predisposes to acquire ARI to child by twice times [95% CI (1.539, 4.149), p=<0.001*]. Environmental factors like overcrowding house were noted to have 1.48 times [95% CI (0.987, 2.242), p=0.04] risk to develop ARI in children, Children who were having indoor smoking by their family member were 0.375 times risk for [95% CI (0.241,0.584), p=<0.001*] developing ARI. Families who were using smoky fuel for cooking inside house had 3.09 times [95% CI (1.66,8.212), p=<0.001*] more risk of developing of ARI in their children.

Children were found to be at more risk of developing ARI by 0.311 times [95% CI (0.193,0.499),p=<0.001*] whose houses were located nearby dusty main road. Having an open drain system around house was noted to have 3.487 times higher risk for ARI [95% CI (2.502,5.914), p=<0.001*] among children. It was noted to have 8.76 times more [95% CI (2.456-31.260), p=<0.001*] risk of ARI in children whose family members having any history of respiratory illness. Hence, all these factors were found to be independently contributing for developing risk of ARI among under five children.

Table no 3:- Description of level of Environmental condition of family.N= 430

S.no	Level of environmental condition	Frequency (n)	Percentage (%)
1	Poor	09	02.9
2	Fair	237	55.1
3	Good	184	42.7

Table no 3 depicted that Majority 237 (55.1%) of the family of under five children were having fair and 184 (42.7%) good environmental condition. Very few 09 (2.9%) had poor environmental condition.

Conclusion:-

The overall prevalence of acute respiratory infection was 35% which signifies it is a health concern. The risk factors of acute respiratory infection identified among under five children were preterm birth of child, low birth weight baby, first ordinal position in the house, overcrowding in the house, Indoor smoking, use of unclean fuel, house located nearby road, open drainage system in the house and family history of ARI.

Recommendation:-

1. Exploratory study can be done on risk factors and prevalence of acute respiratory infection in different population of country
2. Comparative study can be done on risk factors and prevalence of acute respiratory infection in urban and rural community

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