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# IMMUNIZATION STATUS AND OCCURENCE OF ACUTE RESPIRATORY INFECTION IN UNDER FIVE CHILDREN

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## ABSTRACT

**Background:** Pneumonia is the leading cause of morbidity and mortality in children below five years of age. Immunization against certain diseases like measles, diphtheria, pertusis, and with BCG may protect the child against LRI. **Objectives:** To study the prevalence of ARI among under five children residing in the urban slum and the effect of immunization on the occurrence of ARI in the study population. **Method:** Cross Sectional observational study carried out in the urban slum, Raichur. **Results:** Out of 451 children enrolled in the study, 75 children had ARI at the time of survey; hence the prevalence rate is 16.6%. Completely immunized children were 67.4% and 32.6% were partially immunized.

**Conclusion:** A significantly higher prevalence was found for age. Partially immunized children had higher prevalence. Improving the immunization status will help to reduce the burden of ARI.

Keywords: Acute respiratory infections; Under Five Children; Completely Immunized; Partially Immunized.

### 1. INTRODUCTION

One of the most significant contributions of the medical fraternity to mankind is the advent of the vaccines. Immunization is one of the most cost effective interventions for disease prevention known to man and it plays significant role in the reduction of morbidity and mortality due to infectious diseases, especially in developing countries. It was the experience with the small pox eradication programme that showed the world the importance of immunization. In May 1974, the World Health Organization (WHO) launched its "Expanded Programme on Immunization" (EPI) against six, most common, vaccine preventable diseases which include diphtheria, pertusis, tetanus, tuberculosis, poliomyelitis and measles [1].

Vaccine is an immune-biological substance designed to produce specific protection against specific diseases. It stimulates the production of protective antibody and other immune mechanisms.

Pneumonia in children is a major concern in developing countries, because almost all childhood related deaths occur in these countries. In India an estimated 0.4 million pneumonia deaths occur annually, which is highest among all countries in the world. Childhood pneumonia has been identified as the major "forgotten killer of children" by the UNICEF & WHO [2].

The five most important causes of under five mortality are ARI (19% of total death in under fives),

diarrhoea (17%), malaria (8%), measles (4%), HIV/AIDS (3%), neonatal conditions (37%) and injuries (3%) [3].

In India, ARI accounts for a morbidity burden of 12.1% prevalence rate and 2.5 episodes per child per year and an estimated one million deaths in under fives [4].

It has been reported that the problem of ARI in urban slum areas is more compared to rural areas [5].

The incidence of ARIs in children aged less than 5 years is estimated to be 0.29 and 0.05 episodes per child per year in developing and industrialized countries, respectively, which translates into 151 million and 5 million new episodes each year, respectively. Most cases occur in India (43 million), China (21 million), Pakistan (10 million), Bangladesh, Indonesia and Nigeria (56 million each). Pneumonia is responsible for about 21% of all deaths in children aged less than 5 years, leading to estimate that of every 1000 children born alive, 12-20 die from pneumonia before their fifth birthday [6].

#### 2. METHODOLOGY

This community based cross sectional study was carried out in an urban slum of Raichur. The study population comprised of children under five who were permanent residents of the slum. Sample size was calculated using the formula n=z2pq/e2 (total population of slum 10000, under five children constitutes 14% of population and prevalence rate of ARI is 12% with allowable error25% of proportions, e=3). The total sample size was 451. The study subjects were enrolled for the study using systematic random sampling method. The consent was taken from the immediate care taker of the child. Using the interview technique and clinical examination, information was collected from the mothers or immediate care taker in a predesigned and pre tested semi structured questionnaire.

### 2.1. Statistics

Statistical methods such as proportions and Chi-square test were used. The statistical software Epi Info Version-3.5.1 was used for the analysis of data.

#### Parameter used to define the immunization status

**Completely immunized:** If the child has received all vaccinations due for his/her age according to national immunization schedule.

**Partially immunized:** Child has missed even a single dose of vaccination due for his/ her age.

**Unimmunized:** If the child has not received even a single dose of any vaccine.

#### 3. RESULTS AND DISCUSSION

Table-1: Distribution of children according to age group

Age (in months)	Frequency	Percentage
1-12	69	15.3
13-24	86	19.1
25-36	101	22.4
37-48	94	20.8
49-60	101	22.4
Total	451	100

The above table shows that, mean age of children (in months) is  $32.60 \pm 16.60$ . Majority of the children fall under the age group of 25-36 (22.4%) and 49-60 (22.4%) months, followed by (20.8 %) in 37-48 months, whereas least number of children fall under the age group of 1-12 months (15.3%).

Table-2: Distribution of children according to Immunization status

Immunization status	No	Percentage
Complete	304	67.4
Partial	138	31.6
Non immunized	9	2.0
Total	451	100

We can infer from above table that, out of 451 children, 67.4% were completely immunized and 32.6% were partially immunized and 2% were non immunized.

Table-3: Distribution of children according to immunization status and occurrence of ARI

Immunization	ARI present	ARI absent	Total	
status	No (%)	No (%)	No (%)	
Complete	11 (14.7)	293 (77.9)	304 (67.4)	
Partial	57 (76.0)	81 (21.5)	138 (30.6)	
Non immunized	7 (9.3)	2 (0.5)	9 (2.0)	
Total	75 (100)	376 (100)	451 (100)	
$y^2 = 115.00 df = 2.0 \leq 0.0001$				

 $\chi^2 = 115.09$ , d.f. = 2, p < 0.0001

Children who are partially immunized have more prevalence of ARI (76%) compared to completely immunized (14.7%) and non immunized children (9.3%). There is highly significant association between immunization status and occurrence of ARI (p<0.0001).

Inadequate immunization was significantly associated with a high number of ARI episodes (RR=2.76), in Mitra NK study (1997) [7].

Study by Broor S et al, [8] Savitha MR [9], have shown that complete immunization has protective role in preventing the risk of ARI, this is because immunization against measles and pertussis may prevent infections that can lead to pneumonia as a complication, and also probably because mothers utilizing immunization services are better aware of health care facilities and probably seek early consultations for illness in their children, which probably avoids severe illness.

#### 4. CONCLUSIONS AND RECOMMENDATIONS

It was evident from our study that, there is lack of information and motivation that has consequently led to a large number of children dropping out from the immunization schedule. Emphasis should be given to strengthening of IEC (information, education and communication) activities at the primary level. Partially and non immunized children are more prone to get the infectious diseases.

Community health education programme needs to be conducted with regard to the risk factors of ARI. These programmes should educate the families regarding respiratory illness, proper immunization practices. Primary immunization coverage should be strengthened.

Efforts should be made to improve the literacy status of both parents especially mothers by encouraging them to avail adult literacy programme conducted by government.

Health education should be given to mothers regarding hygiene practices, better child care and appropriate utilization of health services.

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