

Original Research Article

Danger signs of acute respiratory tract infections in under-five children: awareness among mothers in the urban slums of Hyderabad, its relation to treatment seeking behaviour

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ABSTRACT

Background: Sustainable development goals (SDGs) proposes to all countries an aim to reduce under-five mortality to 25 per 1000 live births by 2030. Acute respiratory tract infections including pneumonia are the leading cause of death among the children less than five years in India. Identification of severe respiratory infections from non-severe forms necessitates that care-givers, especially mothers are aware of danger signs. An attempt is made to study the awareness of danger signs among the Mothers and see its relation to treatment seeking behaviour.

Methods: Community based cross-sectional survey was conducted involving 344 mothers of under-five children living in the urban slums of Hyderabad.

Results: The awareness of mothers about the danger signs of ARI is poor. Very few knew that fast breathing (11 percent), wheezing (4.7 percent), convulsions (1 percent), lethargy (1 percent) are major danger signs of ARI requiring urgent medical attention. A majority of mothers took the child with ARI to private hospital (42 percent) while few approached Govt. Hospital or dispensary (4.7 percent). Many mothers (77 percent) were aware that vaccination against diseases might protect the children against ARIs. The prevalence of acute respiratory infections among the children in the current study (59.3 percent) is much higher than previous studies elsewhere.

Conclusions: A very high proportion (44 percent) of the mothers were ignorant of any danger sign of ARI. The significant association between awareness and positive health care seeking behaviours, like consulting allopathic doctor or govt. hospital or private hospital establishes the evidence that awareness levels are the prerequisite for the positive health care behaviour.

Keywords: Danger signs, ARI, Awareness, Mothers, Pneumonia, Under fives

INTRODUCTION

Sustainable development goals (SDGs) proposes to all countries an aim to reduce U5MR (under-five mortality rate) to 25 per 1000 live births by 2030.¹ Currently, 79 countries have an under-five mortality rate above 25 which includes India with an U5MR of 48.² Acute respiratory tract infections including pneumonia are the leading cause of death among the children less than five

years of age in India (after perinatal conditions).^{3,4} More than 60% of these under 5 child deaths occurred in 5 states in India, which included Telangana (as part of erstwhile state of Andhra Pradesh).³

Acute respiratory infections (ARI) include infections of the respiratory tract both upper (URI) and lower (ALRI). Most respiratory viruses infect throughout the respiratory tract but do not necessarily always produce clinical

manifestation of ALRI. The progression from URI to ALRI occurs much more frequently in children of developing countries.⁵ ALRI is defined as any infection that affects the airways below the epiglottis and includes acute laryngitis, tracheitis, bronchitis and bronchiolitis and lung infections such as pneumonia, tuberculosis and empyema. Southeast Asia stands first in number for ARI incidence. SEAR countries together with sub-Saharan African countries account for more than 80% of all ARI incidences.⁶ In India, more than 4 lakh deaths every year are due to pneumonia accounting for 13%-16% of all deaths in the paediatric hospital admissions.^{7,8} Prevention efforts include many well-known child survival interventions, such as expanding vaccine coverage, promoting adequate nutrition and reducing indoor air pollution. But once a child develops pneumonia, a caregiver must recognise the symptoms and seek appropriate care immediately. Since a majority of severe pneumonia cases in children of the developing world are caused by bacterial pathogens, prompt treatment with a full course of effective antibiotics is a key to reducing pneumonia deaths. This approach is proven, affordable and relatively straightforward to implement.⁹ Identification of severe respiratory infections from non-severe forms necessitates that care-givers, especially mothers are aware of danger signs. An attempt is made to study the awareness of danger signs among the mothers and see its relation to Treatment seeking behaviour.

Aims and objectives

- To study the mothers' awareness of danger signs of acute respiratory infections in children.
- To study the association of awareness of danger signs with the treatment seeking behaviour.

METHODS

This is a community based cross-sectional study. Study population included mothers of under-five children living in the slums of Hyderabad.

Using the sample size formula for estimating prevalence, $\text{Sample Size} = Z^2 p (1-p) / d^2$, (where Z is standard normal variate =1.96; p is expected proportion and d=absolute error) the minimum sample size is calculated and rounded to 320 mothers at 95% CI and 10% error. This is based on known prevalence of awareness levels among mothers as 34% in the erstwhile state of Andhra Pradesh.¹⁰ There are 24 Anganwadi centres (AWC) serving nearly 3600 under five children in slums under the catchment of the Medical College. Using simple random sampling seven AWCs were selected. Fifty mothers from children of 7 AWCs were selected using simple random technique. Six of the interview schedules were excluded as the data was not complete. A total of three hundred and forty-four interview questionnaires were included in the study for further analysis.

International Institute for Population Sciences has developed a standardized questioner to assess the knowledge of danger signs along with various other

health parameters.¹¹ This is used to develop the questioner for the current survey and translated to Telugu. Mothers were interviewed at door step.

Data was entered into MS Excel Spreadsheet. Proportions were used to represent prevalence of ARIs, awareness levels among mothers and treatment seeking behaviour. Chi square was used to see the association between awareness about danger signs and treatment seeking behaviour. Chi Square Test was also used to see the association of prevalence of ARI with child's age, gender, religion, history of breast feeding and presence of other siblings in the family. Chi value, Odds Ratio and p value at 95% confidence level were derived using Epi Info™ Version 7.2.¹²

Informed oral consent was taken from all the mothers. The proposal was submitted to the Institutional Ethics Review Board and due clearance was obtained before starting the study. The data was collected between June and July 2016 and data analyzed in August-September 2016. At the end of the study, all the mothers involved were counselled on the danger signs of ARI and the importance of seeking early medical care in such situations.

RESULTS

Demographic variables of the mother and child (Table 1 and 2).

Most mothers were in the 20-25 years age group (49.6 percent). Eighty-seven percent of the mothers were literate. A majority (72 percent) of the study population are from below poverty line. Eighty-five percent of the women were house wives. Nearly three quarters of the study population were Hindus while the rest were Muslims. About 47 percent of the population belonged to Back ward social class. Muslims were classified under B.C social class as per norms of the state government.

Among the children, Infants were little higher in proportion (37 percent) than toddlers and under five children. Majority (51 percent) of the children were first born and nearly 70 per percent did not have siblings below 5 years age. A majority (84 percent) received exclusive Breast feeding.

Mothers gave a history of acute respiratory infections in 59 percent of the cases in the four weeks preceding the interview. Toddlers had a significantly higher percent of ARI case history (79 percent), followed by 2-5 Years age group (53 percent) and infants (46 percent) (p=0.001). Boys had a significantly higher prevalence of ARI (81 percent) as compared to girls (37 percent) (p=0.001). Hindus had a significantly higher prevalence of ARI (63 percent) compared to Muslims (48 percent) (p=0.01). Although exclusively breastfed children had a little higher prevalence than their counterpart, the difference was not statistically significant (60 vs. 50 percent). There was no major difference in the ARI prevalence rates in

those with and without siblings under five years (Table 3).

Table 1: Demographic characteristics of the mothers (original).

Variable	Number	Percentage (%)
Age (in years)		
<20	84	24.4
20- 25	171	49.6
>25	89	26.0
Education		
Illiterate	44	12.8
Primary	64	18.6
Secondary	108	31.4
Inter	72	20.9
Degree and above	56	16.3
Socio economic status		
Above poverty line	96	27.9
Below poverty line	248	72.1
Occupation		
House wife	291	84.5
Working Mother	8	2.4
House Maid	45	13.1
Religion		
Hindu	264	76.7
Muslim	80	23.3
Others	0	0.0
Social category		
ST	20	5.8
SC	96	27.9
BC	160	46.5
OC	68	19.8
Total	344	100.0

Table 2: Demographic characteristics of the child (original).

Variable	Number	Percentage (%)
Age (in years)		
< 1 (Infant)	127	36.8
1-2 (Toddler)	116	33.8
2-5 (Nursery)	101	29.4
Sex		
Male	176	51.2
Female	168	48.8
Birth rank		
First	176	51.2
Second	124	36
≥Third	44	12.8
Siblings below 5 years of		
Yes	104	30.2
No	240	69.8
Exclusive breast		
Present	288	83.7
Absent	56	16.3
Total	344	100.0

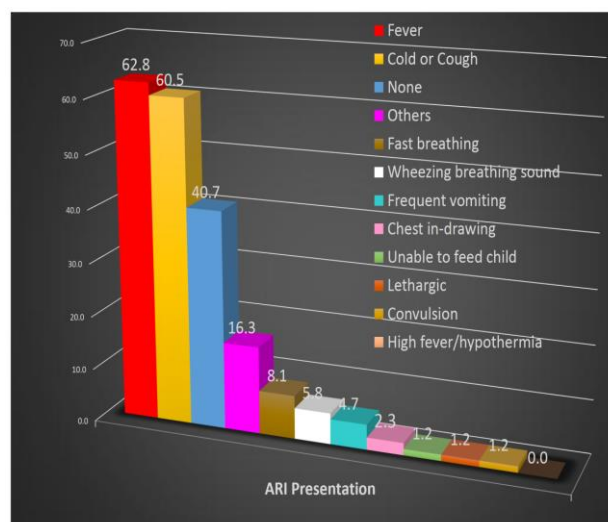


Figure 1: ARI Presentation in children (n=204 children).

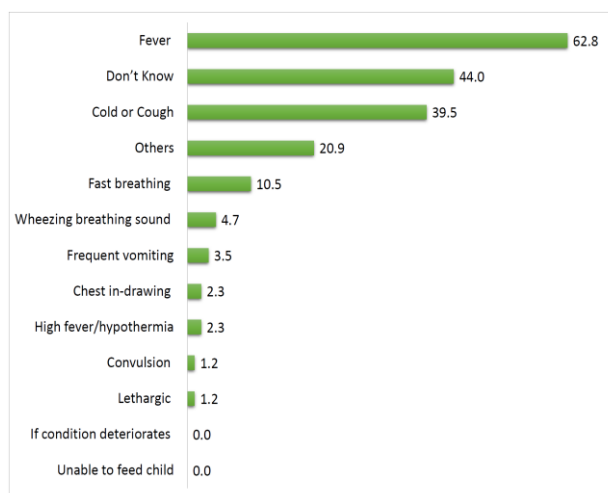


Figure 2: Awareness of danger signs of ARI among mothers (n=344 mothers).

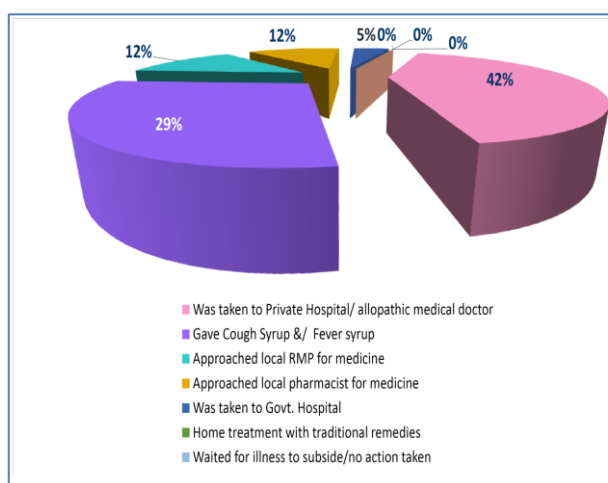


Figure 3: Health seeking behavior among mothers of under-fives with ARI (n=204 children).

Table 3: Prevalence of ARI and its relation to child's characteristics (original).

Group	N	ARI present	ARI absent	Prevalence	Odds ratio	Chi square	P value
Age (years)							
<1 (Infant)	127	58	69	45.8	0.4	30.44	0.001
1-2 (Toddler)	116	92	24	79.1			
2-5 (Nursery)	101	54	47	53.4			
Sex							
Male	176	142	34	80.7	7.14	68.25	0.001
Female	168	62	106	36.9			
Religion							
Hindu	264	166	98	62.9	1.87	6.01	0.01
Muslim	80	38	42	47.5			
Exclusively Breastfed							
Yes	288	173	115	60.1	1.21	0.43	0.51
No	56	31	25	55.4			
Siblings <5 years							
Yes	104	61	43	58.7	0.96	0.02	0.87
No	240	143	97	59.6			
Total	344	204	140	59.3	na	na	na

Table 4: Association between awareness and health care seeking behavior (original).

Health care behaviour	Two danger sign awareness				Total
	Present	Percent	Absent	Percent	
Positive	59	62.1	36	37.9	95
Negative	52	47.7	57	52.3	109
Total	111	54.4	93	45.6	204

(Odds Ratio=1.79; Chi Square=4.24; p=0.03. Positive Health Care Behaviour=Consulted Govt. Hospital /Private Hospital/ allopathic doctor; Negative Health Care Behaviour=Gave Cough Syrup &/ Fever syrup or Approached local pharmacist or Approached local RMP. Two Danger sign awareness=Fever and Cold or Cough).

ARI Presentation in children and awareness of Danger signs among mothers (Figure 1 and 2).

Among those who had history of ARI (n=204), Fever was the commonest presentation (63 percent) followed by Cold and Cough (61 percent). While none had a history of danger signs like high fever or hypothermia very few had fast breathing (8 percent) wheezing (6 percent) or chest-in-drawing (2 percent).

A high percent of the total study population (n=344) knew that Fever (63 percent) is a major danger sign of ARI. Very few mothers knew that fast breathing (11 percent), wheezing (4.7 percent), convulsions (1 percent), lethargy (1 percent) are major danger signs of ARI requiring urgent medical attention. Inability to take feeds is hardly known to anybody as another major danger sign of ARI. Even chest in-drawing which is a very important sign often educated by health care providers is hardly known to mothers. Overall 44 percent of the mothers were ignorant of any danger sign of ARI.

A majority of mothers took the child with ARI to Private Hospital/ allopathic medical doctor (42 percent) while few approached Govt. Hospital or dispensary (4.7

percent). Nearly 29 percent mothers tried to manage the child with cough syrup or fever syrup (29 percent). While a few approached Local RMP or pharmacist seeking medication (12 percent each). No one approached local quack, traditional healers or tried traditional remedies.

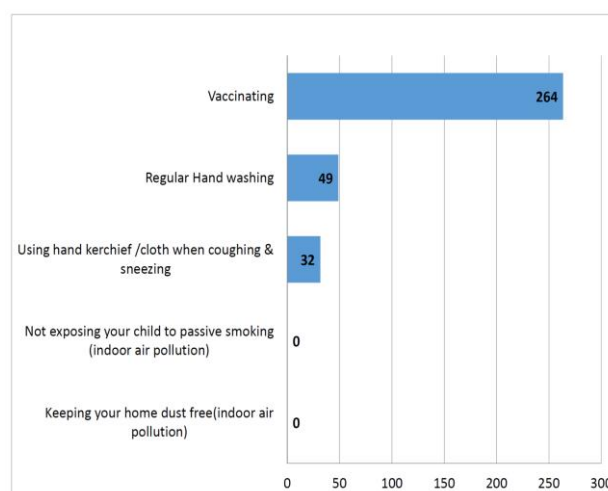


Figure 4: Awareness regarding prevention of spread of ARIs (n=344 mothers).

When the mothers were assessed for knowledge regarding the prevention of ARIs, most felt that vaccinations will prevent ARI (77 percent). Hand washing as a means of prevention of ARI was known to 14 percent of mothers. Cough etiquette was known to 9 percent mothers as another mode of prevention of ARIs. None were aware of role of indoor air pollution by dust or passive smoke in the control of ARIs.

Association between awareness and health care seeking behavior was assessed. A significantly higher proportion (62 percent) of the mothers with awareness of at least two danger signs approached the appropriate health care provider ($p=0.03$). This includes an allopathic doctor or govt. hospital or private hospital (Table 4).

DISCUSSION

The literacy rate among the mothers in the study population (87 percent) is much better than the adult literacy rate of India (74 percent) and close to Female youth Literacy Rate (87.26 percent).^{13,14} The fact that in spite of good literacy levels majority are below poverty line may reflect the multiple factors that determine the ability to lead a socially and economically productive life in Indian scenario. The exclusive breast feeding rate (84 percent) is much higher than the country average (46.4 percent).¹⁵ This factor, apart from the smaller family norms go well with the higher literacy rates among women.

The prevalence of acute respiratory infections among the children in the current study (59.3 percent) is much higher than previous studies. The study in urban slums of Gokulpuri, New Delhi reported a prevalence of 14.6 percent ARI in the under-fives.¹⁶ In a national cross-sectional household survey the authors reported 14.8% and 17.67% of fever and cough respectively.¹⁷ A study was conducted in rural Wardha where the overall prevalence of acute morbidity was 59.9 percent in the below three year age group.¹⁸ In a secondary data analysis of DLHS 4, ARI was reported in 3.4 percent children in Telangana State and 6.4 percent in the state of Andhra Pradesh.¹⁰ The reasons for such wide divergences may include the variations in the operational definitions used, viz the current study included 4 weeks history while most other studies included 2 weeks. This apart, the variations in the age group studied and seasonality of the ARIs and time of interviews can influence the prevalence rates. However other determinants like indoor air pollution, overcrowding, presence of nala (open drainage stream) in the vicinity (Shaikpet Nala is a known for the open drainage stream) could also contribute a local microbiome for a higher prevalence of ARIs.

A significantly higher percent of ARI case history in the Toddlers (79 percent), compared to 2-5 years age group (53 percent) and infants (46 percent) could be a reflection of the transient nature of immunity between the maternally acquired and community acquired immunity.

Similarly, boys having significantly higher prevalence of ARI (81 percent) as compared to girls (37 percent) could be due to behavior of playing and mingling with more children. Cultural and behavioral factors may explain differences in the ARI prevalence among religions and social classes.

Among those who had history of ARI, fever was the commonest presentation followed by cold and cough which is similar to other studies. The awareness of mothers about the danger signs is poor as very few knew that fast breathing (11 percent), wheezing (4.7 percent), convulsions (1 percent), lethargy (1 percent) are major danger signs of ARI requiring urgent medical attention. The overall awareness levels of 66 percent is above that of the State of Telangana (64 percent) or Andhra Pradesh (56 percent).¹⁰ However they are much lower than the levels found in Delhi slums (80 percent).¹⁶

A majority of mothers took the child with ARI to private hospital/ allopathic medical doctor (42 percent) while few approached Govt. Hospital or dispensary (4.7 percent). This behaviour too is similar to previous studies not only across India but also the studies done in Egypt.¹⁹ Even the DLHS data reflected similar trend in the states of Andhra Pradesh and Telangana.²⁰ The practice of self medication (by the mother to the child) with cough/fever syrup either already available or brought directly from pharmacy is very high. This might be because of limitations in the affordability, accessibility and acceptability, the very tenets of primary health care.

The fact that many mothers (77 percent) felt that vaccination against diseases might protect the children against ARIs is a very positive factor as this reflects the penetrance of health propaganda and education the governments engage to run the National health programs. Unless such high awareness and health demand is generated sustainability of health programs become difficult.

The significant association between awareness and positive health care seeking behavior, like consulting allopathic doctor or govt. hospital or private hospital establishes the evidence that awareness levels are the prerequisite for the positive health care behaviour which again is the prerequisite to appropriate management of ARI, there by contributing to the sustainable developmental goal of reducing the under-five mortality rate. Previous studies demonstrated a positive correlation between Awareness levels among mothers about danger signs of ARI in children and treatment seeking behavior and a negative correlation with seeking government health centers.²¹ The current study concurs with these studies.

CONCLUSION

The higher literacy rates among the mothers in the study population of urban slums of Hyderabad need to be

exploited for raising the awareness levels regarding danger signs of ARIs. Further epidemiological and environmental studies may be needed for identifying the determinants of high ARI prevalence rate in Hyderabad Slums. Significant variations in the ARI prevalence rates in different age groups, genders and social status were observed reflecting the social and biological determinants of ARIs. Absolute ignorance about important danger signs like inability to take feeds and chest in-drawing raises concern over the awareness levels. The health seeking behavior is also poor with many mothers soughting to self-medication or approaching the un-qualified practitioners. It also reinforces the need to re-institute faith in government Primary Health Centers by upholding the principles of primary health care, by providing affordable health care which is accessible and acceptable to the people with their full participation. While the mothers' faith in vaccination is worth an applaud, further efforts will be needed to drill the importance of Hand washing, Cough etiquette and the role of indoor air pollution by dust or passive smoke in the control of ARIs. The study generates evidence of association between awareness levels and positive health seeking behavior. Which again is the prerequisite to appropriate management of ARI, there by contributing to the sustainable developmental goal of reducing the under-five mortality rate.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee, AIMSRS, Hyderabad

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