Section: Community Medicine

Original Research Article

ASSESSMENT OF AWARENESS LEVELS REGARDING RECOGNITION OF DANGER SIGNS OF ACUTE RESPIRATORY INFECTIONS (ARIS) AMONG MOTHERS OF UNDER-FIVE CHILDREN IN THE FIELD PRACTICE AREA OF A PRIVATE MEDICAL COLLEGE IN UTTAR PRADESH

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ABSTRACT

Background: Pneumonia accounts for approximately 400,000 deaths annually in India and contributes to 13%–16% of all pediatric hospital mortality. Preventive strategies include well-established child survival measures such as expanding vaccination coverage, promoting proper nutrition, and reducing indoor air pollution. Alongside standard case management, it is crucial for caregivers—particularly mothers—to recognize warning signs that help differentiate between severe and non-severe respiratory infections. This study aims to assess the knowledge, attitudes, and practices of mothers of children under five years of age regarding acute respiratory infections and their associated warning signs.

Materials and Methods: This community-based cross-sectional study was conducted in both rural and urban field practice areas affiliated with a private medical college in Gajraula, Uttar Pradesh. A multistage random sampling technique was employed to obtain a representative sample of mothers. The sample size was calculated to be 600, based on an assumed prevalence of ARI-related knowledge among mothers of 50%, a 95% confidence level, an absolute error margin of 5%, and a design effect of 1.5. Data collection was carried out using a pre-tested, semi-structured questionnaire. Categorical variables were summarized using frequencies and proportions. The association between various independent variables and outcome measures was assessed using the Chi-square test.

Results: Among the 600 mothers who participated in the study, 79.6% demonstrated good knowledge, 77% exhibited a positive attitude and 68.6% followed appropriate practices which were related to the management of acute respiratory infections (ARI). A significant association was also found between good knowledge, attitude, and practices (KAP) and the mother's level of education as well as the socio-economic status of the family. The effectiveness of the health talks in improving maternal knowledge was evaluated using McNemar's test for paired categorical data. For all the questions, p-value was found to be <0.05, indicating a statistically significant improvement in knowledge following the intervention.

Conclusion: A good level of knowledge regarding acute respiratory infections (ARI), including awareness of its common symptoms such as cough, fever, and difficulty in breathing, as well as understanding the importance of early

recognition and appropriate management, was demonstrated. In addition, they showed a positive attitude toward essential aspects of home-based care, such as continuing breastfeeding and proper feeding during illness, adhering to prescribed treatment, and ensuring timely immunization of their children.
Keywords: Acute Respiratory Infections, Respiratory Tract Infections, Child, Preschool, Health Knowledge, Attitude, Practice.

INTRODUCTION

The health status of the under-five children plays a key role in shaping the future of any country including India. The widely accepted statement that "healthy children lay the foundation for a healthy nation" holds truth. As part of the Sustainable Development Goals (SDGs), all countries are urged to reduce under-five mortality to 25 per 1,000 live births by the year 2030.[1] However, as of now, 79 countries—including India—have under-five mortality rates exceeding this target, with India reporting an under-five mortality rate (U5MR) of 48 per 1,000 live births.[2]

A major contributor to the morbidity and mortality among under-five children is the burden of communicable diseases, with acute respiratory tract infections (ARIs), particularly pneumonia, being the leading cause.[3,4] In India, only pneumonia is responsible for over 4 lakhs deaths annually, accounting for approximately 13%–16% of all pediatric hospital admission deaths.[5,6] Multiple risk factors have been associated with the high incidence of ARIs in children including young age, low socio-economic status, poor maternal literacy, the presence of other under-five siblings, low birth weight, inadequate breastfeeding, malnutrition, and poor maternal sanitation and hygiene practices.[7]

Although preventive measures—such as increasing immunization coverage, promoting optimal nutrition, and reducing indoor air pollution—are well-established child survival interventions, the burden of ARIs remains significantly high. In addition to conventional case management, the early identification of severe versus non-severe respiratory infections requires that caregivers, especially mothers, are well-informed about key danger signs. Furthermore, addressing underlying social and environmental determinants—such as hygiene practices and breastfeeding promotion—offers cost-effective and culturally acceptable strategies in the Indian context.

Therefore, the present study aims to evaluate the knowledge, attitude and practices of mothers of under-five children regarding acute respiratory infections and their associated warning signs.

MATERIALS AND METHODS

This community-based cross-sectional study was conducted in both rural and urban field practice areas affiliated with a private medical college in Gajraula, Uttar Pradesh. A multistage random sampling design was adopted to obtain a representative sample of mothers.

At first, a list of all the Anganwadi Centres (AWCs) in the planned study area was compiled. These AWCs were then stratified into rural and urban zones. From each zone, ten AWCs were randomly selected. After this stage, a list of all eligible children under five years of age and their mothers from the selected AWCs was prepared. Using a systematic random sampling technique, the required number of participants was drawn from this list.

The sample size was calculated based on the following assumptions

1. Estimated prevalence of ARI-related knowledge among mothers: 50%
2. Confidence level: 95%
3. Absolute margin of error: 5%
4. Design effect: 1.5

Using these parameters, the final sample size was determined to be 600 mothers, with an equal distribution of 300 participants from rural and urban areas.

Data were collected using a pre-tested, semi-structured questionnaire. The questionnaire was validated through a pilot study prior to its use. Trained health workers from the Urban Health Training Centre (UHTC) and Rural Health Training Centre (RHTC), under the guidance of the Department of Community Medicine, VIMS, Gajraula, facilitated the data collection process. The questionnaire captured information on socio-demographic characteristics, as well as the knowledge, attitude and practices (KAP) of mothers regarding acute respiratory infections (ARI) in under-five children.

All data were entered into Microsoft Excel and analyzed using SPSS version 26. Gaps in maternal knowledge were identified, and subsequently, structured health talks were conducted at the respective Anganwadi Centres. Following a two-week washout period, the same set of knowledge-based questions was re-administered to assess improvements. The change in maternal knowledge before and after the intervention was evaluated accordingly.

RESULTS

Socio-Demographic Profile

In the present study, a total of 600 mothers were enrolled. 50% of them were from rural and 50% were from urban areas. Majority of participants belonged to joint family and hindu religion. More than one third participants (39.3%) belonged to lower middle

class socio-economic status followed by middle class (28.7%) and upper middle class (18%) according to modified B.G. Prasad classification. Around 30.7% mothers were educated till primary school and 24% were illiterate. Only 19.3% mothers were graduate and 2.7% were post graduate. Majority (90.7%) mothers in this study were homemakers. Two third participants had two children followed by 12% who had single child only.[Table 1]

Knowledge, attitude and practices regarding ARIs-

There were 8 questions to assess knowledge of mothers regarding ARIs, danger signs and management. Each correct response was given a score of 1 and score of 0 for incorrect response. A score of >_5 and <5 was considered as having good and poor knowledge respectively. Knowledge regarding aggravating factors and danger signs was 24% and 56% respectively. Overall, 79.6% mothers had good knowledge of ARIs.[Table 2]. Attitude of the mothers was regarded as positive and negative based on their approach towards ARIs and their management assessed by 9 questions. Mothers having a positive attitude were found to be 77%.[Table 3]. Practices of mothers were assessed by 8 questions. Again, a score of >_5 and <5 was considered as having good and poor practices respectively. 68.6% mothers were following good practices of ARI management. Only 15.3% mothers were counting no. of breaths during an episode of ARI.[Table 4].

Statistically significant association was observed between socio-economic status (p<0.00001) and education of mother (p-0.0000) with KAP regarding ARI. Statistically significant association was observed between religion and practices of mothers (p-0.002). Statistically significant association was also observed between attitude of mothers and no. of children (p-0.012).[Table 5]. Knowledge of mothers was assessed after delivering health talk by using the same questionnaire. The change in their level of knowledge was assessed by Mc Nemar's test for paired categorical data. P value for all the questions was <0.05 indicating a significant change in the knowledge of mothers.

Table 1: Socio-demographic profile of participating mothers

Profile of participating mothers (N=600)		Frequency	
Type of family	Nuclear	252	42%
	Joint	348	58%
Religion	Hindu	340	56.7%
	Muslim	248	41.3%
	Sikh	12	2.0%
Socio economic status (Modified BG Prasad scale)	I	60	10.0%
	II	108	18.0%
	III	172	28.7%
	IV	236	39.3%
	V	24	4.0%
Mother's Education	Illiterate	144	24.0%
	Primary school	184	30.7%
	Middle school	84	14.0%
	Senior secondary school	56	9.3%
	Graduate	116	19.3%
	Postgraduate	16	2.7%
Mother's Occupation	Home maker	544	90.7%
	Farmer	20	3.3%
	Labourer	12	2.0%
	Army/Police	8	1.3%
	Teacher & other service	16	2.7%
No. of children	1	72	12.0%
	2	396	66.0%
	3	48	8.0%
	4	60	10.0%
	5	24	4.0%

Table 2: Knowledge of participants regarding ARI

Knowledge	Correct answer		Incorrect answer	
What is ARI?	396	66%	204	34%
Symptoms of ARI	390	65%	210	35%
Incidence of ARI is increased in which season?	432	72%	168	28%
Aggravating factors of ARI.	144	24%	456	76%
Danger signs of ARI.	336	56%	264	44%
Do you know ARI spreads from one child to another?	312	52%	288	48%
What should be done in case of ARI?	528	88%	72	12%
Do you know about home management of ARI?	480	80%	120	20%

Table 3: Attitude of participants regarding ARI

Attitude	Agree (%)		Don't Know (%)		Disagree (%)	
Do child with cold and cough needs care?	510	85%	60	10%	30	5%
Breaths should be counted if child has cough and fever.	120	20%	390	65%	90	15%
Fast breathing in child needs urgent medical care.	420	70%	150	25%	30	5%
During cough and fever, extra fluids need to be given and breastfeeding should be continued.	360	60%	60	10%	180	30%
During cough and fever, child should be fed continuously and diet should be increased during recovery.	450	75%	90	15%	60	10%
Cleaning blocked nose help to feed better.	468	78%	72	12%	60	10%
Cleaning houses of dust/smoke reduce risk of ARI in children.	372	62%	108	18%	120	20%
Well fed children have low ARI risk.	528	88%	42	7%	30	5%
Vaccination reduces risk of ARI.	552	92%	30	5%	18	3%

Table 4: Practices of participants regarding ARI

Practices during ARI in child	Correct practices		Incorrect practices	
Did you watch for breathing counts in child?	92	15.3%	508	84.7%
Did you watch for danger signs in child?	338	56.3%	262	43.7%
Did you give extra fluids/breastfeed during cough and cold?	520	86.7%	80	13.3%
Did you take child with fever and cough to RMP immediately ?	430	71.7%	170	28.3%
Did you give antibiotics during fever and cough?	380	63.3%	220	36.7%
What home remedies you used to relieve cough?	480	80.0%	120	20.0%
Do you clean your house of dust regularly?	550	91.7%	50	8.3%
Do you vaccinate your child on time?	560	93.3%	40	6.7%

Table 5: Association between various variables and knowledge, attitude and practices of participants

Category (N=600)	Knowledge		Attitude		Practices		p value
	Good (N=478)	Poor (N=122)	Positive (N=462)	Negative (N=138)	Good (N=412)	Poor (N=188)	
Type of family							Knowledge-0.13677 Attitude-0.171312 Practices-0.194311
Nuclear	208	44	201	51	200	52	
Joint	270	78	261	87	212	136	
Religion							
Hindu	280	60	261	79	253	87	Knowledge-0.14259 Attitude-0.27498 Practices-0.002378
Muslim	188	60	194	54	152	96	
Sikh	10	2	7	5	7	5	
Socio economic status(Modified BG Prasad scale)							
I	38	22	38	12	30	30	Knowledge-<0.00001 Attitude-<0.00001 Practices-<0.00001
II	70	38	55	53	41	67	
III	144	28	140	32	132	40	
IV	206	30	209	27	190	46	
V	20	4	20	4	19	5	
Mother's education							
Illiterate	93	51	88	56	78	66	Knowledge-0.0000 Attitude-0.0000 Practices-0.0000
Primary	154	30	149	35	119	65	
Middle	62	22	60	24	58	26	
Senior secondary	50	6	48	8	46	10	
Graduate	105	11	104	12	99	17	
Postgraduate	14	2	13	3	12	4	
Mother's occupation							
Home maker	442	102	426	118	381	163	Knowledge-0.04971 Attitude-0.19340 Practices-0.60639
Farmer	12	8	13	7	13	7	
Labourer	8	4	7	5	8	4	
Army/Police	5	3	5	3	6	2	
Teacher & other service	11	5	11	5	14	2	
No. of children							
1	54	18	52	20	58	14	Knowledge-0.06798 Attitude-0.012706 Practices-0.17365
2	320	76	321	75	270	126	
3	36	12	30	18	31	17	
4	52	8	43	17	38	22	
5	16	8	16	8	15	9	

DISCUSSION

This study was conducted among 600 mothers with rural and urban background. It was found that 80% mothers had good knowledge of ARIs and their management. Knowledge regarding symptoms about ARI was as follows- breathlessness-2%, cough- 24%, fever with cough- 30%, fever- 6%, cough, fever and throat pain- 2%, cough, fever and weakness- 6%, don't know- 30%. Knowledge of identification of danger signs (52%) was as follows- breathlessness - 46%; dizziness and loss of consciousness-4% and high fever-6%. Knowledge of home management of ARIs was found to be as- oil massage- 32%, vicks massage-34%, sponging- 10%, kadha (ginger, turmeric , honey etc.)-6% and steam inhalation-4%. In a study conducted by Challa S et al, knowledge of symptoms and danger signs was found to be as- fever- 62.8%, cough- 40%, fast breathing-10.5%, wheezing- 4%, convulsions-1% and lethargy- 1%. Overall knowledge of danger signs was found to be poor.[8] In a study conducted by Gyawali M et al, it was found that 89.5% mothers had satisfactory knowledge of ARIs and 60.4% mothers followed correct management practices. A significant association between knowledge and education of mothers was established ($p<0.05$).[9] In our study significant association among KAP with education of mother and socio economic status was established. In a study conducted by Siddique A et al, 55% mothers had good knowledge and 71% mothers had positive attitude and both were significantly associated with socio-economic status of family.[10]

In our study, around 10% mothers recognized exposure to cold as an aggravating factor for ARI in children followed by smoke-8%, no/incomplete vaccination- 4% and poverty- 2%. 10% mothers gave cough syrup and 4% gave paracetamol and cough syrup as self medication to their child during an episode of ARI. Around 42% participants had a smoker in their family. In a study conducted by Siddique A et al, 10% mothers used paracetamol and ibuprofen as self medication due to their lower potential of risk while 6% mothers gave home remedies.[10]

CONCLUSION

In every society, mothers are primary caregivers to a child. Educated mothers were more aware of health related illnesses and were able to identify danger signs of ARI in their children. Socio economic status of family influence the health seeking behavior among mothers. Hence, educating mothers regarding ARIs – symptoms, danger signs and management should be a key strategy. Also, elderly women and fathers should be educated on ARIs as they influence health seeking behavior of mothers.

Limitations: Feeding practices during illness are not detailed in this study. Also, the severity, medical management and outcome of ARI episodes were not assessed.

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