

**Improving maternal knowledge of childhood acute respiratory
infections (ARIs) in BRAC villages, Bangladesh**

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Abstract

The contribution of community-based ARI control programme of BRAC in improving maternal knowledge of acute respiratory infections in children was assessed. Data came from a cross-sectional survey of 2,938 mothers of under 5 year-old children residing in 200 randomly selected villages in two regions of Bangladesh. Three aspects of maternal knowledge such as clinical symptoms, preventive practices and home remedies were considered. While the achievement in improving knowledge had remained modest in BRAC villages, findings revealed that the programme was able to create an enable environment for change among women. The ARI promotional activities were suggested to be sensitive to the belief of mothers and their ability to understand. The chapter concludes that the ARI intervention had significance in improving maternal knowledge and points to the need of addressing more relevant issues in its intervention strategy for better performance.

Introduction

Acute respiratory infection (ARI) is the leading cause of morbidity and mortality in infancy and childhood in most developing countries.¹⁻⁵ UNICEF and WHO highlighted to promote awareness about ARI among the caregivers at the community level.⁶ Educating caregivers to identify the symptoms and take necessary preventive measures was possible even in societies where traditional medical beliefs and practices were widespread.⁷ It was found that if only the fast breathing and chest in-drawing were timely recognised, most ARI deaths could be averted where appropriate services were available.⁸ As mothers were the main caregivers in most cases, the ARI control programme focused primarily on raising maternal knowledge and modifying their behaviour. Awareness among mothers regarding the symptoms of ARIs, however, had remained very poor in the developing countries.⁹⁻¹¹ Community-based intervention to reduce ARIs had been launched in many countries. Prior research suggested that such interventions had positive impact in health outcome.^{8,12-14}

Bangladesh is one of the countries with high ARI case fatality rate. Nearly 400 children die each day from ARIs in Bangladesh.¹⁵ BRAC, a non-government development organisation in Bangladesh, developed a simple approach to control acute respiratory infection (ARI) through its community health volunteers.¹⁶ The health volunteers disseminated information to mothers of young (<5 year-old) children to identify, prevent and treat ARIs at the household level. BRAC also involved village doctors and other local providers in its programme to promote the flow of supplementary information of ARIs in the community. Along with BRAC, other NGOs have also been promoting health information through various development forums. Only poor women were generally eligible to participate in such development forums where they received not only credit support and skill training but had the opportunity to discuss about health problems and sources of services.

BRAC has been providing community-based ARI control programme since 1992. An assessment of the mothers' ability to correctly diagnose ARIs and take preventive measures is important for the policy makers. The purpose of the present chapter is to assess the contribution of ARI control programme of BRAC in improving maternal knowledge of acute respiratory infections in children.

Materials and Methods

The study was carried out in the villages of five districts in northern and central regions of Bangladesh where BRAC had development interventions in health care, education and village forum-based income generating activities. The villages in three out of five districts were covered by the community-based

ARI control programme. The remaining two districts (one in each region) were selected from the adjacent districts where BRAC had all development interventions but no ARI programme. This made the study to be based upon an experimental design wherein the villages in the ARI districts (intervention) had both the community-based ARI control programme along with usual services of BRAC, while the villages in the non-ARI districts (comparison) had only usual services of BRAC.

In both the intervention and comparison villages, health services of BRAC were provided by the health volunteers. A sample of 200 health volunteers was selected at random from the defined geographical regions. Each volunteer provided services to 100-120 households. About 15 mothers (with <5 year-old child) were randomly selected from the households of each health volunteer. Thus, a total of 2,938 sample women in both the intervention and comparison villages were selected for this study.

As the study focused on maternal knowledge, the unit of analysis was 'woman having at least one <5 year-old child'. A test instrument was developed for the assessment of maternal knowledge comprising of 20 test items in three aspects of ARI, viz. clinical symptoms, preventive practices and home remedies. A woman was considered to have adequate knowledge if she could correctly explain at least 4 out of 8 test items of clinical symptoms without prompting. Similarly, accurate responses of at least 2 out of 6 items in both preventive practices and home remedies were considered adequate. Following this procedure, three dichotomous knowledge variables such as symptom, prevention and home remedies were created. The test instrument, along with an interview schedule covering the socio-economic characteristics, was used to collect information. The survey was conducted in January and February 1999.

The analysis begins with a profile of the sample women. Three maternal knowledge variables along with each item were compared between the intervention and comparison villages. The association of socio-economic factors of women with ARI knowledge variables was also discussed. Finally, the net effects of ARI control programme on maternal knowledge variables were estimated.

Since the study followed a cross-sectional approach, the results might have generated biased estimates of the contribution of ARI programme in improving maternal knowledge. To minimise the possibility of selection bias, multivariate analyses have been used to control the effects of confounding factors. The logit model was used because the dependent variables were made dichotomous.¹⁷⁻¹⁸

Results

Table 1 provides the socio-demographic profile of the sample women of both the intervention and comparison villages. Mean age and the proportion of <30 year old mothers indicate that women were

relatively older in the intervention than comparison villages. Regarding education, women of intervention villages scored poorly than comparison villages as both the mean years of schooling and literacy rate were lower among the women in the intervention than comparison villages. The proportion of primary graduates was, however, slightly higher in the comparison than intervention villages. Amount of land was considered a good indicator of socio-economic status because agriculture was the main economic activity in the study settings. Data indicate that women had less land in the intervention than comparison villages. Likewise the proportion of landless was higher in the intervention than comparison villages although the concentration of land (>200 decimals) was lower in the comparison than the intervention villages. Nearly the same proportion of husbands of sample women was involved in selling manual labour between the two study groups.

Table 1
Socio-demographic characteristics of the sample women by the study villages

Background variables	Study village	
	Intervention	Comparison
Mean age	28.9	26.7
% age <30 years	60.2	77.2
Mean years of schooling	1.43	1.96
% literate	26.5	43.0
% Primary +	9.4	10.7
Mean land (in decimal)	72.8	95.0
% landless	52.0	43.3
% land more than 200 d	12.9	10.5
% husband labour	57.5	55.9
% forum member	31.0	37.4
% exposed to media	27.0	28.7
N	1,591	1,347

NGO-led credit and development forums for the poor women were generally available in most villages in Bangladesh. Data show that about 31% women in the intervention villages took the opportunity to become members of such forum compared to only 37.4% in the comparison villages. The rural women in Bangladesh were not generally very exposed to information beyond their villages. The

print media was inappropriate for largely illiterate community. Radio and television were available in villages although only a small proportion of women had access to the electronic media. Table 1 shows that access to radio or television was slightly lower among women in the intervention than comparison villages.

Maternal knowledge about the clinical symptoms, preventive practices and the home remedies of ARIs was compared between the study villages (Table 2). Regarding the awareness of the clinical symptoms, the mothers were asked, 'How do you know that a child has ARI? Tell us the some signs and symptoms of ARI that you know of.' While the presence of cough and common cold were the most frequently cited symptoms, others such as fast breathing, chest in-drawing, noisy breathing and fever were better known indicators of ARI in both study groups. Such other symptoms as convulsion, shrunken eyes or inability to drink by the child were not known to most women. At the aggregate level, when all 8 items were considered, about a third of all women was able to correctly explain at least 4 symptoms. When compared, women appeared to be significantly more aware in the intervention than comparison villages both at the aggregate level as well as in identifying breathing difficulties and chest in-drawing ($P<0.01$).

Only a small proportion of mothers had knowledge about the preventive measures of ARI in children (Table 2). Personal hygiene was cited by a large proportion of women in both groups. Very few women recognised that exposure to such unsafe environment as dust or smoke could cause cough and fever. The awareness of child immunisation as a preventive measure of ARI was insignificant.¹⁰ Adequate diet, breast-feeding during infancy and giving vitamin A were also known to a very small proportion of women. Overall, 30.7% women were aware of at least 2 items of preventive measures in the intervention compared to only 15.8% in the comparison villages ($P<0.01$).

Regarding home remedies during minor ARIs, rural mothers tended to keep the sick children in warm environment and provide them warm fluids for drinking. Feeding lemon juice, honey, etc. was also practiced.¹² Such other remedies as cleaning noses,¹² frequent breast-feeding and washing head in case of high fever were also known among a smaller proportion of mothers. At the aggregate, women were significantly more aware in the intervention than comparison villages.

Table 2
Maternal knowledge about the clinical symptoms, preventive practices and home remedies of acute respiratory infections by study villages

Knowledge	Study village		<i>P</i>
	Intervention	Comparison	
Clinical symptoms			
Cough and cold	68.4	48.6	<0.01
Fast breathing	53.2	38.6	<0.01
Chest in-drawing	53.5	30.6	<0.01
Noisy breathing	28.5	17.3	<0.01
Fever	34.4	29.4	<0.01
Not able to drink	1.2	0.8	NS
Convulsion	5.0	2.2	<0.01
Shrunken eye	0.6	1.2	<0.10
<i>Symptom (4+ items)</i>	<i>34.4</i>	<i>15.8</i>	<i><0.01</i>
Preventive practices			
Personal hygiene	40.3	25.5	<0.01
Safe environment	14.9	10.2	<0.01
Immunization	1.6	0.8	<0.05
Vitamin A supplement	2.5	2.2	NS
Breast-feeding	1.4	0.7	<0.05
Proper diet	2.8	6.0	<0.01
<i>Prevention (2+ items)</i>	<i>30.7</i>	<i>15.8</i>	<i><0.01</i>
Home remedies			
Warm environment	31.4	7.4	<0.01
Provide warm fluid	21.1	20.4	NS
Giving lemon juice and honey	17.3	4.8	<0.01
Cleaning nose	5.2	2.3	<0.01
Frequent breast-feeding	3.0	1.2	<0.01
Wash head if high temperature	2.4	2.2	NS
<i>Home remedies (2+ items)</i>	<i>30.5</i>	<i>12.5</i>	<i><0.01</i>

NS=not significant.

Maternal knowledge about ARI varied by socio-economic factors (Table 3). Exposure to electronic media significantly raised ($P<0.01$) the knowledge of ARIs among women ($P<0.01$). Participation of women in NGO-led development forums provided them opportunities to become more aware about the symptom of illnesses ($P<0.01$) and preventive measures ($P<0.01$) than comparable non-participants. Home remedies were probably not discussed much in the forums as no significant

difference was. The knowledge about clinical symptoms and home remedies appeared to increase with age of women although the awareness of preventive measures was much higher among the younger than older women indicating that the young mothers were more concerned about personal hygiene and environmental safety than others. As expected, education of women had positive and statistically significant association with the three aspects of knowledge of ARI in the study villages.

Table 3
Selected women factors associated with the knowledge of symptoms, preventive practices and home remedies of acute respiratory infections

Factors	n	Symptom		Prevention		Home remedies	
		%	P	%	P	%	P
Media			<0.01		<0.01		<0.01
Not exposed	2114	23.4		18.1		19.2	
Occasional	553	30.9		35.3		26.0	
Frequent	260	35.0		47.3		39.2	
Development forum			<0.01		<0.01		NS
Not attended	1238	21.9		22.4		21.1	
Attended	958	27.1		23.6		22.7	
Not eligible	618	29.6		30.3		22.3	
Age of women			<0.01		<0.05		<0.01
< 25	717	19.7		25.1		17.4	
25 - 34	1271	25.3		24.9		21.7	
35 - 39	598	29.6		23.7		26.6	
35 +	338	34.0		17.2		26.0	
Education			<0.05		<0.01		<0.01
No school	1937	24.9		20.5		20.6	
1 - 5 y	706	25.6		26.8		24.1	
6 + y	294	32.3		38.8		28.6	
Land			<0.05		<0.05		<0.01
Landless	1411	27.0		23.3		24.5	
1 - 199 dec	1180	23.3		22.8		18.8	
200 + dec	347	30.0		29.7		24.5	
Occupation of husband			<0.05		<0.05		NS
Labourer	1399	26.1		23.6		23.0	
Agriculture	984	23.4		22.1		20.9	
Service/business	548	29.7		28.1		22.6	

NS=not significant.

Socio-economic status indicators such as land ownership and occupation of husbands had important bearing upon the knowledge level among rural women. Women of landless households were more aware in all three aspects of ARIs than the women having some land (<2 acres) although the awareness level in land categories was highest among women with larger (2> acres) land owners. This unexpected pattern of association was also apparent in occupation categories as well. The knowledge level of all three aspects of ARI was higher among the wives of labourers than farmers. Emergence of such new pattern of association was probably caused by the participation of a large proportion of landless and poor women in the development forums through which they had received additional information of health care than others.

Table 4
Multivariate analysis of selected women factors associated with the knowledge of clinical symptoms, preventive practices and home remedies controlling for land and the occupation of husband

Variable	Symptom		Prevention		Home remedies	
	Odds ratio	P	Odds ratio	P	Odds ratio	P
Intervention (rc=comparison)	2.74	0.000	3.02	0.000	3.24	0.000
Media (rc=not exposed)						
Occasional	1.49	0.001	2.23	0.000	1.49	0.001
Frequent	1.71	0.004	3.39	0.000	2.85	0.000
Development forum (rc=not attended)						
Attended	1.42	0.001	1.17	0.120	1.22	0.082
Not eligible	1.46	0.002	1.27	0.077	1.11	0.796
Age of women	1.04	0.000	0.98	0.058	1.02	0.017
Education (rc=none)						
1 – 5 y	1.24	0.049	1.42	0.004	1.53	0.001
6 + y	1.42	0.047	1.76	0.001	1.57	0.018
Constant	--3.16		--1.58		--2.86	
Chi square	195.08		276.57		221.80	
P-value	000.0		000.0		000.0	

We have seen so far that rural women in the study villages received ARI-related information directly from three sources such as ARI prevention programme, electronic media and development forums. The net effects of ARI programme in raising knowledge level controlling for the other factors

are presented in Table 4. Clearly, ARI control programme (intervention) played a significant role in raising the knowledge of clinical symptoms, preventive measures and home remedies when the effects of media exposure, the participation in development forum and other socio-demographic factors were controlled ($P<0.01$). Data also suggest that both the media exposure and forum participation had the potential to significantly improve the level of maternal knowledge. Similarly, age and education also appeared to play a positive influence in raising maternal knowledge of ARIs.

Discussion

The effects of ARI control programme in raising knowledge among the mothers of under five children were assessed in this research. One feature of this programme has been the presence of the NGO-led development forums through which the poor rural women were able to receive health education in addition to credit support and skill training. The electronic media such as radio and television had also been playing a significant role in disseminating health information although the accessibility to such media had remained very limited in rural women. Given the presence of multiple sources of health knowledge, the study examined the ARI intervention – maternal knowledge linkage. Findings suggest that the community-based intervention, if carefully designed and implemented, can make a difference in raising the knowledge of rural women.

The improvement in maternal knowledge of childhood ARIs was modest in BRAC villages. Results of the study indicate that the programme had difficulties in producing desired outcomes in some respects. Although the health volunteers had regular contacts with the mothers, most of them were not able to recognise early signs of ARIs to seek prompt care for their children. Besides, the programme efforts in raising knowledge seemed to concentrate in identifying few clinical symptoms. For example, the fast breathing and chest in-drawing were better known than other important symptoms. Even in BRAC villages, the mothers were not adequately aware of some important preventive measures. Despite very high child immunisation coverage in Bangladesh, most mothers had little knowledge of what EPI could do for their children. Although the prevalence of ARIs was very high in Bangladesh, only few mothers had a clear sense of home remedies.

The acceptance of ARI knowledge varied widely by socio-demographic factors. The women involved in development forum and exposed to media had additional opportunities to know more about ARI and its prevention. Education and socio-economic position of women had also important bearing upon the acceptability of ARI information. The promotional activities, therefore, should not only be

targeted to poor and illiterate mothers but the messages should be sensitive to their beliefs and ability to understand.¹⁹⁻²⁰

While the achievement in raising awareness was modest, the ARI control programme was able to create an enable environment for change among women that justified the need of the continuation of such programme. The chapter concludes that the ARI intervention at the grassroots level had significance in improving maternal knowledge and points to the need of addressing more relevant issues in its intervention strategy for better performance.

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