

An educational intervention for improving knowledge, attitude and practice of mothers on indoor air pollution and acute respiratory infections

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A community-based intervention study was conducted in North Okkalapa Township during July 2002 to September 2003 with the aim of assessing the effectiveness of intervention to improve maternal knowledge, attitude and practice (KAP) on indoor air pollution and acute respiratory infections (ARI). Intervention included health education of mothers through the use of Information, Education and Communication (IEC) materials. A total of 669 mothers, 331 from the intervention and 338 from the control areas, participated in the study. At post intervention assessment conducted 6 months after intervention, maternal knowledge on cause of ARI and attitude towards indoor air pollution and ill health were significantly improved in the intervention area. Their practice on use of scented stick in the living room also diminished compared to control area. Our results indicate that with relatively inexpensive methods and simple interventions, KAP of mothers on indoor air pollution and ARI can be improved.

INTRODUCTION

Acute lower respiratory infection (ARI) is the single most important cause of mortality in children aged under 5 years, accounting for around 2 million deaths annually in this age group [1]. The severity and fatality of ARI is much greater in the developing nations and amongst socially and economically deprived groups in the developed countries [2].

Agents of respiratory diseases are mainly transmitted through the air. Crowding, domestic smoke and inadequate ventilation are significant risk factors for ARI [3]. Approximately half the world population and up to 90% of rural households in developing countries still rely on unprocessed biomass fuels in the form of wood, dung and crop residues [4]. As a result there

are high levels of indoor air pollution, to which women, especially those responsible for cooking, and their young children, are most heavily exposed. Various studies in developing countries have reported on the association between exposure to indoor air pollution and acute lower respiratory infections [3, 5, 6, 7]. It is also responsible for upper respiratory infections and middle ear infections [8].

Such consequences can be controlled only if the prevailing knowledge, attitude and practice (KAP) of the community could be improved. So this study was conducted with the following objectives:

1. To assess the effectiveness of an educational intervention for improving KAP of mothers on indoor air pollution and ARI ;

2. To reinforce the avoidance of practices enhancing indoor air pollution in the study area.

MATERIALS AND METHODS

Study area and population

A community-based interventional study was carried out in North Okkalapa Township, a peri-urban township of Yangon during July 2002 to September 2003. Two wards with similar geographic and socio-economic conditions were selected, one as a test (intervention) and the other as a control area. The location of the control area was about two miles away from intervention area so as to eliminate the contamination effect of health education.

All households with at least one under-five child were enumerated from each ward. Only one family was randomly selected if the household consisted of more than one family. The respondent was the mother or caretaker of under-five children and a total of 669 participants, 331 from intervention and 338 from control area, were recruited for the baseline study. Some families migrated out during the study period. Thus, 223 mothers from the intervention area and 254 from the control area were available for follow up at post intervention assessment.

Methodology

Before the field survey, training on systematic filling up of the proforma was given to interviewers. After having informed consent, data was collected by face to face interview using pre-tested structured questionnaire to obtain base line data on KAP of mothers on indoor air pollution and ARI in both areas.

Thereafter, three sessions of Focus Group Discussions (FGD) were conducted on mothers of the intervention area for the development and choice of Information, Education and Communication (IEC)

material. Thirty-one mothers of under-five children participated in these sessions. Their age range was 19-50 years and the majority (19) fell within (26-35) year age group. More than half of respondents (18) were primary school level. Only 3 mothers attended a university/ college. Regarding their occupation, majority (21) were dependent and few were unskilled labour. Choice of IEC material, its format, content and distribution were discussed during FGD sessions. All respondents participated in the discussions actively and shared the ideas, experiences and suggestions. The facts discussed individually and collectively by the respondents were counted down in details. Based on their opinion, wall posters and pamphlets were chosen as IEC materials for health education. Illustrated wall posters containing messages to highlight the danger of indoor air pollution were placed at strategic locations in the market place and other parts of the intervention area. Pamphlets containing messages on causes and prevention of ARI with special emphasis on avoidance of indoor air pollution were also distributed to the households. In the control area, no special interventions were instituted except for the routine measures for ARI treatment and control like child immunisation.

Beginning 6 months after initiation of intervention, post intervention assessment was started in both areas. The same questionnaire used in base line data collection was administered to mothers of under-five children to record their KAP regarding indoor air pollution and ARI.

Statistical methods

Data analysis was performed with SPSS Version 10.0 software. Statistical comparisons of categorical variables were made with use of chi-square statistics. Differences were considered significant if $p < 0.05$.

Ethical consideration

This study was approved by the Medical Ethics Committee of the Department of

RESULTS

Comparability of the intervention and control areas in the baseline period

Table 1. Baseline socio-demographic variables of the intervention and control areas

| Variables | Intervention area n=331 | Control area n=338 | p-value |
|---|----------------------------|-----------------------|---------|
| <i>Age groups of mothers</i> | | | |
| ≤25 years | 70(21.1%) | 69(20.3%) | >0.1 |
| 26-35 years | 169(51.1%) | 180(53.3%) | |
| 36-45 years | 62(18.7%) | 60(17.8%) | |
| ≥46 years | 39(9.1%) | 29(8.6%) | |
| <i>Education of mothers</i> | | | |
| No formal education | 9(2.7%) | 9(2.7%) | >0.05 |
| Primary school | 53(16.0%) | 66(19.5%) | |
| Middle school | 120(36.3%) | 112(33.1%) | |
| High school | 100(30.4%) | 109(32.2%) | |
| College | 49(14.8%) | 42(12.4%) | |
| <i>Occupation of mothers</i> | | | |
| Own business | 8(2.4%) | 6(1.8%) | >0.05 |
| Unskilled labour | 47(14.2%) | 39(11.5%) | |
| Government employee | 18(5.4%) | 19(5.6%) | |
| Employee at private business | 12(3.6%) | 7(2.1%) | |
| Dependent | 246(74.3%) | 267(79.0%) | |
| <i>Family income per month (Kyats)</i> | | | |
| ≤10,000 | 82(24.9%) | 85(25.1%) | >0.1 |
| 11,000-20,000 | 133(40.4%) | 150(44.4%) | |
| ≥21,000 | 114(34.7%) | 103(30.5%) | |
| <i>Number (%) of houses constructed with bamboo</i> | | | |
| Median number of room per house (interquartile range) | 2(1-3) | 2(2-3) | |
| Median number of window per house (interquartile range) | 3(1-5) | 3(1-4) | |
| Median number of persons in the household (interquartile range) | 6(5-9) | 7(5-9) | |

Table 1 shows the comparative demographic and socioeconomic profiles of the 331 intervention families and 338 control families in the baseline period. They are comparable with respect to important characteristics such as age of the mothers, education, occupation and family income. The only difference was in the type of house construction. Maternal knowledge on indoor air pollution and ARI was also similar (Table 2).

Table 2. Knowledge of mothers on indoor air pollution and ARI at baseline period

| Knowledge | Intervention area n=331 | Control area n=338 | p-value |
|--|----------------------------|-----------------------|---------|
| Knows what ARI is | 261 (78.9%) | 274 (81.3%) | >0.1 |
| Knows cause of ARI | 241 (73.0%) | 254 (75.6%) | >0.1 |
| Knows relationship of smoking and respiratory infections | 291 (87.9%) | 291 (87.9%) | >0.5 |
| Knows relationship of passive smoking and ARI | 270 (81.6%) | 291 (87.1%) | >0.1 |

Table 3. Maternal practices enhancing indoor air pollution at baseline period

| Practice | Intervention area n=331 | Control area n=338 | p-value |
|--|----------------------------|-----------------------|---------|
| <i>Cooking place</i> | | | |
| In the living room | 134(40.5%) | 155(45.9%) | >0.05 |
| Kitchen outside the house | 138(41.7%) | 132(39.1%) | |
| 59(18.8%) | 51(15.1%) | | |
| <i>Type of fuel for cooking</i> | | | |
| No smoke forming* | 15(4.5%) | 26(7.7%) | >0.05 |
| Smoke forming** | 316(95.5%) | 312(92.3%) | |
| <i>Use of scent stick</i> | 253(75.3%) | 211(63.7%) | <0.001 |
| <i>Use of mosquito coil</i> | 277(82.4%) | 236(71.3%) | <0.01 |
| <i>Use of fume to drive out mosquitoes</i> | 163(50.6%) | 160(48.8%) | >0.1 |

*No smoke forming = Electric/gas

**Smoke forming = Wool/coal/kerosene

Regarding their attitudes, 279 (84.3%) respondents from intervention and 299 (89.5%) from control areas agreed that

indoor air pollution can cause ill health ($p = >0.1$). Moreover, 290 (87.6%) and 295 (88.1%) from intervention and control areas respectively agreed indoor air pollution and ARI were preventable ($p = >0.5$). The differences were not statistically significant between the two areas.

Majorities of the maternal practices were also identical except the use of scent stick and mosquito coils in their living room or bed room that were significantly higher in the intervention area (Table 3).

Comparison of knowledge, attitude and practice of mothers after the intervention

Table 4 compares the maternal knowledge in the study areas after educational intervention. Knowledge on cause of ARI was significantly higher in the intervention area.

Table 4. Knowledge of mothers on Indoor air pollution and ARI at post intervention assessment

| Knowledge | Intervention area n=223 | Control area n=254 | p-value |
|--|----------------------------|-----------------------|---------|
| Knows what ARI is | 154 (69.1%) | 174 (68.5%) | >0.5 |
| Knows cause of ARI | 182 (81.6%) | 184 (72.4%) | <0.05 |
| Knows relationship of smoking and respiratory infections | 210 (94.2%) | 232 (91.3%) | >0.1 |
| Knows relationship of passive smoking and ARI | 186 (83.4%) | 215 (84.6%) | >0.1 |

When acquired about their attitudes, 205 (92.3%) mothers in the intervention area agreed that indoor air pollution could cause ill health compared to 181 (85.0%) in the control area. The difference was statistically significant ($p < 0.01$). But no significant difference was found as 203 (91.1%) respondents in the former and 228 (89.8%) in the latter area agreed that indoor air pollution and ARI were preventable ($p = >0.1$).

Regarding the maternal practices, the use of scent stick in the living room was significantly less in the test area than in the control area at post intervention assessment. Other practices enhancing indoor air pollution did not differ significantly in both areas (Table 5).

Table 5. Maternal practices enhancing indoor air pollution at post intervention assessment

| Practice | Intervention area n=223 | Control area n=254 | p-value |
|---|----------------------------|-----------------------|---------|
| <i>Cooking place</i> | | | |
| In the living room | 74(33.5%) | 84(32.9%) | >0.1 |
| Kitchen | 96(42.7%) | 122(47.8%) | |
| Outside the house | 53(23.9%) | 48(19.2%) | |
| <i>Type of fuel for cooking*</i> | | | |
| No smoke forming | 47(21.2%) | 73(28.6%) | >0.05 |
| Smoke forming | 175(78.8%) | 181(71.4%) | |
| <i>Use of scent stick</i> | 134(60.4%) | 186(72.9%) | <0.01 |
| <i>Use of mosquito coil</i> | 144(64.9%) | 178(69.8%) | >0.1 |
| <i>Use of fume drive out mosquitoes</i> | 136(61.3%) | 149(59.1%) | >0.1 |

*Same as defined under Table 3

DISCUSSION

After the health education, maternal knowledge on cause of ARI was found to be higher in the intervention area as was their attitude towards indoor air pollution and ill health. In addition, practice of mothers on use of scent stick in their living room was significantly less compared to the control area.

Since the trial used a concurrent control, to access whether the differences were real and due to the intervention two study areas should be comparable at the baseline. Although the maternal practices on use of scent stick and mosquito coils were different between intervention and control area at the baseline period, they were found to be higher in the intervention area. Thus, the less use of scent stick in this area after intervention may reflect the real improvement attributable to

effectiveness of intervention. The use of mosquito coils in the bed room was decreased relatively to baseline in both groups but the difference was not significant at post intervention assessment.

While no specific attempt was made to monitor for "spillover" of the educational message from intervention to control communities, the distance between the two areas (about 2 miles) separating the communities made such an occurrence unlikely. Moreover, such contamination would have lessened the measured impact of the intervention and would have constituted a major concern only if the study had failed to find an effect.

Our results suggest that simple health educational intervention with relatively inexpensive methods can improve the KAP of mothers on indoor air pollution and ARI.

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