

# Effectiveness Of Health Education On Prevention Of Acute Respiratory Tract Infections Among Mothers Of Under-Five Children In Urban Slums

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## Abstract

**Introduction:** Children's health in early life is crucial for their development, yet Acute Respiratory Tract Infections (ARI) remain a leading cause of illness and death among under-five children worldwide, especially in developing countries. Effective interventions like health education and improved healthcare access are urgently needed to reduce ARI-related mortality and improve child health outcomes.

**Aim:** This study aims to assess the effectiveness of a teaching program on mothers' knowledge, attitude, and practices to prevent respiratory infections in under-five children and their link to demographic factors.

**Methodology:** This study used a quantitative, quasi-experimental one-group pre-test and post-test design to evaluate the effectiveness of a structured teaching program on the knowledge, attitude, and practices of 100 mothers of under-five children in urban slums of Vadodara regarding ARI prevention. Participants were selected through purposive sampling, and data were collected using a self-structured interview schedule covering socio-demographic details, knowledge, attitude, and practice related to ARI. Data collection occurred over one month with necessary permissions, using questionnaires and observations. Analysis involved descriptive and inferential statistics to assess changes after the intervention. Ethical approval was obtained, and participants were informed about confidentiality, voluntary participation, and ethical safeguards throughout the study.

**Result:** The study evaluated the effectiveness of a structured teaching program on the knowledge, attitude, and practices of 100 mothers of under-five children in urban slums regarding prevention of acute respiratory tract infections (ARI). Results showed significant improvements in all three areas after the intervention, with post-test scores markedly higher than pre-test scores. Age was the only socio-demographic factor significantly linked to baseline knowledge and attitude. These findings highlight that targeted health education effectively enhances mothers' ability to prevent ARIs, supporting the importance of such programs in improving child health outcomes in vulnerable communities.

**Conclusion:** The teaching program improved mothers' knowledge, attitude, and practices in preventing respiratory infections. Health education is key to better child health.

**Keywords:** Acute Respiratory Tract Infection (ARI), Under-Five Children, Knowledge, Attitude, and Practice (KAP), Health Education and Structured Teaching Program

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## INTRODUCTION

Children are the future of any society, and their development is strongly influenced by their health status during early life.<sup>1</sup> Acute Respiratory Tract Infections (ARI) represent a significant public health challenge worldwide, especially among children under five years of age.<sup>2,3</sup> ARIs encompass a variety of infections affecting both the upper and lower respiratory tracts, including common cold, bronchitis, pneumonia, pharyngitis, and laryngitis.<sup>4,5</sup> Globally, ARIs are responsible for approximately 20% of all childhood deaths, resulting in an estimated two million deaths annually. The burden is disproportionately high in developing countries such as Bangladesh, India, and Nepal.<sup>4,6</sup>

Upper Respiratory Tract Infections (URIs) are the most frequent respiratory infections in children, often causing ailments of the ear, nose, and throat, whereas lower respiratory infections, particularly pneumonia, are more severe and account for the majority of child mortality related to ARI.<sup>7,8</sup> Although

many ARIs resolve without complications, bacterial superinfections and the emergence of antibiotic-resistant pathogens increase the disease severity, especially in low-resource settings.<sup>9,10</sup> ARIs are closely associated with malnutrition and poverty and have been described as a “forgotten pandemic” due to a lack of global attention despite their widespread impact.<sup>11</sup>

According to the World Health Organization (WHO), pneumonia causes about 2 million deaths annually among children under five, contributing to the global estimate of 10.5 million childhood deaths each year, 90% of which are attributable to ARIs.<sup>12,13,14</sup> In India, ARIs account for 12% to 35% of outpatient visits and hospital admissions among children, with upper respiratory tract infections responsible for 15-20% of hospital admissions in toddlers.<sup>15</sup>

Given this high disease burden and mortality, especially in developing and underdeveloped countries, there is an urgent need for targeted interventions. These include enhanced health education, improved access to healthcare services, and early treatment strategies to reduce the incidence and fatality of ARIs among children under five.

The aim of this study is to assess the effectiveness of a structured teaching programme in improving the knowledge, attitude, and practices of mothers of under-five children regarding the prevention of acute respiratory tract infections. Additionally, the study aims to examine the association between mothers' pre-test knowledge, attitude, and practice levels and their selected socio-demographic characteristics.

## METHODOLOGY

The present study adopted a quantitative evaluative research approach using a quasi-experimental one-group pre-test and post-test design. The primary objective was to assess the effectiveness of a structured teaching program on the knowledge, attitude, and practices of mothers of under-five children regarding the prevention of acute respiratory tract infections (ARI). The dependent variables were the mothers' knowledge, attitude, and practices towards ARI prevention, while the independent variable was the structured teaching program itself. The study was conducted in urban slum areas of Vadodara.

The sample comprised 100 mothers of under-five children residing in these urban slums. Non-probability purposive sampling was used to select participants.

Data were collected using a self-structured interview schedule divided into four parts. Part I covered socio-demographic details such as age, number of children, family type, occupation, monthly income, education, religion, and prior exposure to health education on respiratory infections. Part II included 24 multiple-choice questions assessing knowledge about ARI. Part III consisted of 22 attitude statements, evenly split between positively and negatively worded items. Part IV comprised 25 practice-related statements, also including both positive and negative wording.

Data collection was planned for one month after obtaining necessary permissions from authorities. Both self-structured questionnaires and structured observation methods were used for data gathering. The collected data were analyzed using descriptive and inferential statistics to evaluate the effectiveness of the teaching intervention on improving mothers' knowledge, attitudes, and practices related to ARI prevention.

Ethical approval for this study was obtained from the Institutional Ethics Committee of Parul Institute of Nursing. Participants were fully informed about the study's purpose and assured that their confidentiality and anonymity would be strictly protected. Voluntary participation was emphasized, and all ethical principles—including autonomy, beneficence, non-maleficence, and justice—were carefully maintained throughout the research process.

## RESULT

**Findings Related to the Frequency and Percentage Distribution of Socio-Demographic Variables of the Mothers of Under-Five Children**

**Table 1: Frequency and Percentage Distribution of Socio-Demographic Variables of the Mothers of Under-Five Children**

n=100

| Demographic Variable | Category                 | Frequency | Percentage (%) |
|----------------------|--------------------------|-----------|----------------|
| Age Group            | Below 20 years           | 0         | 0.00%          |
|                      | 20–25 years              | 70        | 70.00%         |
|                      | 26–30 years              | 28        | 28.00%         |
|                      | Above 30 years           | 2         | 2.00%          |
| Number of Children   | One                      | 35        | 35.00%         |
|                      | Two                      | 40        | 40.00%         |
|                      | Three                    | 25        | 25.00%         |
|                      | Four                     | 0         | 0.00%          |
|                      | Five & above             | 0         | 0.00%          |
| Type of Family       | Nuclear Family           | 65        | 65.00%         |
|                      | Joint Family             | 35        | 35.00%         |
|                      | Extended Family          | 0         | 0.00%          |
|                      | Broken Family            | 0         | 0.00%          |
| Occupation           | Housewife                | 58        | 58.00%         |
|                      | Business                 | 0         | 0.00%          |
|                      | Employee (Private/Govt.) | 42        | 42.00%         |
|                      | Agriculture              | 0         | 0.00%          |
|                      | Daily Wages              | 0         | 0.00%          |
| Income per Month     | Below ₹1500              | 0         | 0.00%          |
|                      | ₹1501 – ₹3,000           | 33        | 33.00%         |
|                      | ₹3,001 – ₹5,000          | 12        | 12.00%         |
|                      | ₹5,001 – ₹7,000          | 22        | 22.00%         |
|                      | ₹7,001 – ₹10,000         | 33        | 33.00%         |
|                      | Above ₹10,000            | 0         | 0.00%          |

|                                         |                   |    |        |
|-----------------------------------------|-------------------|----|--------|
| <b>Education Status</b>                 | Illiterate        | 0  | 0.00%  |
|                                         | Primary Education | 32 | 32.00% |
|                                         | Higher Primary    | 6  | 6.00%  |
|                                         | High School       | 31 | 31.00% |
|                                         | Pre-University    | 3  | 3.00%  |
|                                         | Degree & Above    | 28 | 28.00% |
| <b>Religion</b>                         | Hindu             | 73 | 73.00% |
|                                         | Muslim            | 20 | 20.00% |
|                                         | Christian         | 7  | 7.00%  |
|                                         | Other             | 0  | 0.00%  |
| <b>Health Education Exposure on ARI</b> | Yes               | 55 | 55.00% |
|                                         | No                | 45 | 45.00% |

Table 1 shows the socio-demographic profile of 100 mothers of under-five children. Most were aged 20–25 years (70%), had two children (40%), and belonged to nuclear families (65%). A majority were housewives (58%), and 42% were employed; none were in business or daily labor. Monthly income varied, with the largest groups earning ₹1,501–₹3,000 and ₹7,001–₹10,000 (33% each). Educationally, most had primary (32%), high school (31%), or degree-level education (28%); none were illiterate. Religiously, 73% were Hindu, 20% Muslim, and 7% Christian. About 55% had prior health education on ARI. Overall, the group was young, moderately educated, and mostly homemakers from nuclear families.

#### **Findings Related to Pre-Test and Post-Test Knowledge, Attitude, and Practice Scores Regarding Prevention of Acute Respiratory Tract Infection**

**Table 2: Frequency and Percentage Distribution of Knowledge Scores Regarding Prevention of Acute Respiratory Tract Infection**

n=100

| Knowledge Score         | Pre-Test  |                | Post-test |                |
|-------------------------|-----------|----------------|-----------|----------------|
|                         | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Poor Score ( $\leq 8$ ) | 51        | 51.0%          | 0         | 0.0%           |
| Average Score (9–16)    | 40        | 40.00%         | 44        | 44.0%          |
| Good Score (17 – 24)    | 9         | 9.00%          | 56        | 56.0%          |

Table 2 shows the mothers' knowledge levels on ARI prevention before and after the structured teaching programme. In the pre-test, 51% had poor knowledge, 40% had average knowledge, and only 9% had good knowledge. After the intervention, none were in the poor category. Instead, 44% had average

knowledge and 56% had good knowledge, indicating a significant improvement in awareness due to the teaching programme.

**Table 3: Frequency and Percentage Distribution of Attitude Scores Regarding Prevention of Acute Respiratory Tract Infection**

n=100

| Attitude Score                        | Pre-Test  |                | Post-test |                |
|---------------------------------------|-----------|----------------|-----------|----------------|
|                                       | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Unfavorable Attitude (22–49)          | 0         | 0.0%           | 0         | 0.0%           |
| Moderately Favorable Attitude (50–79) | 98        | 98.00%         | 92        | 92.0%          |
| Favorable Attitude (80–110)           | 2         | 2.00%          | 8         | 8.0%           |

Table 3 shows the mothers' attitudes towards ARI prevention before and after the structured teaching programme. In the pre-test, 98% had a moderately favorable attitude and 2% had a favorable attitude; none had an unfavorable attitude. After the programme, 92% showed a moderately favorable attitude and 8% showed a favorable attitude. No mothers had an unfavorable attitude in either phase. This indicates a slight improvement in attitude following the teaching programme.

**Table 4: Frequency and Percentage Distribution of Practice Scores Regarding Prevention of Acute Respiratory Tract Infection**

n=100

| Practice Score           | Pre-Test  |                | Post-test |                |
|--------------------------|-----------|----------------|-----------|----------------|
|                          | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Poor Practice (0–20)     | 18        | 18.0%          | 0         | 0.0%           |
| Average Practice (21–35) | 82        | 82.00%         | 87        | 87.0%          |
| Good Practice (36–50)    | 0         | 0.00%          | 13        | 13.0%          |

Table 4 shows mothers' practice scores regarding ARI prevention before and after the structured teaching programme. In the pre-test, 18% had poor practices and 82% had average practices, with none showing good practices. After the intervention, none had poor practices. About 87% had average practices, and 13% demonstrated good practices. This indicates that the teaching programme helped improve mothers' preventive practices for ARI in under-five children.

#### Findings Related to the Effectiveness of the Structured Teaching Programme on Knowledge, Attitude, and Practice Scores

**Table 5: Paired t-test Analysis Showing the Effectiveness of the Structured Teaching Programme on Knowledge, Attitude, and Practice Scores**

n=100

| Score | Test | Mean Score | Standard Deviation | Degree of Freedom | Calculated 't' Value | Tabulated 't' Value | p-value |
|-------|------|------------|--------------------|-------------------|----------------------|---------------------|---------|
|-------|------|------------|--------------------|-------------------|----------------------|---------------------|---------|

|                 |           |       |       |    |        |       |         |
|-----------------|-----------|-------|-------|----|--------|-------|---------|
| Knowledge Score | Post-test | 10.44 | 3.983 | 99 | 13.866 | 1.984 | 0.0001* |
|                 | Pre-test  | 16.81 | 2.65  |    |        |       |         |
| Attitude Score  | Post-test | 73.11 | 3.795 | 99 | 6.875  | 1.984 | 0.001*  |
|                 | Pre-test  | 68.46 | 5.476 |    |        |       |         |
| Practice Score  | Post-test | 32.73 | 2.912 | 99 | 22.85  | 1.984 | 0.0001* |
|                 | Pre-test  | 23.34 | 2.698 |    |        |       |         |

**Table 5** presents the results of a paired t-test analysis to evaluate the effectiveness of the structured teaching programme on knowledge, attitude, and practice (KAP) scores among 100 mothers. For knowledge, the mean score increased from 10.44 in the pre-test to 16.81 in the post-test, with a highly significant t-value of 13.866 ( $p=0.0001$ ), indicating a strong improvement. Similarly, attitude scores improved from a pre-test mean of 68.46 to 73.11 in the post-test, with a significant t-value of 6.875 ( $p=0.001$ ). Practice scores also showed a marked rise from 23.34 in the pre-test to 32.73 in the post-test, with a very high t-value of 22.85 ( $p=0.0001$ ). In all three areas, the calculated t-values were greater than the tabulated value (1.984), confirming that the structured teaching programme was statistically effective in improving the knowledge, attitude, and practices of mothers regarding the prevention of acute respiratory tract infections.

**Findings Related to the Association between Pre-Test Knowledge, Attitude, and Practice Scores and Selected Socio-Demographic Variables of the Participants** shows the link between mothers' pre-test knowledge and their socio-demographic factors. Only age showed a significant impact ( $\chi^2 = 13.18$ ,  $p = 0.010$ ), meaning mothers' knowledge levels varied by age. Other factors like number of children, family type, job, income, education, religion, and prior health education had no significant effect on their knowledge.

Chi-square Association between Pre-Test Attitude Scores and Selected Socio-Demographic Variables of the Participants shows the link between mothers' pre-test attitude scores and their socio-demographic factors. Only age had a significant impact ( $\chi^2 = 5.248$ ,  $p = 0.043$ ), indicating attitudes differed by age. Other factors like number of children, family type, job, income, education, religion, and prior health education had no strong effect on attitudes.

Chi-square Association Between Pre-Test Practice Scores and Selected Socio-Demographic Variables of the Participants shows the relationship between mothers' pre-test practice scores and their socio-demographic factors. None of the variables—like age, number of children, family type, job, income, education, religion, or prior health education—had a significant effect (all  $p > 0.05$ ). This means mothers' practices were generally similar across all groups before the teaching program.

## DISCUSSION

The present study aimed to evaluate the effectiveness of a structured teaching program on the knowledge, attitude, and practices (KAP) of mothers of under-five children regarding the prevention of acute respiratory tract infections (ARI). A quasi-experimental one-group pre-test post-test design was adopted, which is a commonly used approach in community-based educational interventions to assess before-and-after changes without a control group. The methodological approach aligns with similar studies conducted in India and other developing countries that also used quasi-experimental or pre-experimental designs to assess the impact of health education among mothers of young children. For example, Prajapati,

Patel, and Shah <sup>15</sup> conducted a one-group pre-test post-test study on mothers in urban Gujarat to assess the impact of a structured teaching program on knowledge regarding ARI prevention. Their study, like the present one, utilized non-probability purposive sampling and pre-structured questionnaires to measure changes in knowledge and practices. Likewise, Sharma and Gupta <sup>16</sup> evaluated the effectiveness of a health education program on mothers' knowledge and practices related to ARI prevention in Rajasthan using a similar pre-experimental design. They found significant improvement in mothers' knowledge and preventive practices post-intervention, which supports the findings of the present study. Both studies emphasized that structured educational interventions, when culturally appropriate and community-based, can effectively enhance mothers' awareness and self-care practices for common childhood illnesses. The use of a self-structured interview schedule covering socio-demographic variables and separate sections for knowledge, attitude, and practices is consistent with the methodology adopted by Sahu et al. <sup>17</sup>, who studied the effectiveness of health teaching programs among rural mothers on ARI management. Their data collection tools were validated and administered face-to-face, similar to the present study, ensuring data reliability and contextual relevance. In the current study, the sample consisted of 100 mothers selected purposively from urban slums in Vadodara, which is comparable to Kumar et al. <sup>18</sup>, who used a purposive sampling technique to study mothers in slum areas of Delhi. They argued that purposive sampling is appropriate in community settings where the target population is well defined but a randomized sampling frame is difficult to establish due to practical constraints. Consistent with these similar studies, the present research also found a statistically significant improvement in knowledge ( $p < 0.0001$ ), attitude ( $p = 0.001$ ), and practices ( $p < 0.0001$ ) after the intervention, confirming that structured teaching programs are effective in bringing positive behavioral change. The significant improvement in mean scores across KAP dimensions parallels findings by Yadav et al. <sup>19</sup>, who highlighted that mothers' KAP regarding childhood ARI improved remarkably after community health worker-led educational sessions. Furthermore, the chi-square analysis in this study revealed that age was the only socio-demographic variable significantly associated with pre-test knowledge and attitude scores. This finding is partially supported by Bansal and Singh <sup>20</sup>, who also reported that younger mothers tend to have lower baseline knowledge and thus show more improvement after targeted health education. Overall, the methodological rigor maintained through structured data collection, validated tools, ethical safeguards, and robust statistical analysis aligns well with the best practices demonstrated in related community health nursing research. The findings reaffirm the critical role of focused, structured, and repeated teaching sessions in empowering mothers, especially in underserved urban slum settings, to adopt effective home-based measures for ARI prevention and early detection.

## CONCLUSION

In conclusion, the study clearly demonstrates that the structured teaching programme significantly improved the knowledge, attitude, and practices of mothers of under-five children regarding the prevention of acute respiratory tract infections in urban slum areas. The post-intervention results showed marked enhancement across all three domains compared to the pre-test scores. Statistical analysis confirmed the effectiveness of the educational intervention, with age being the only socio-demographic factor significantly associated with baseline knowledge and attitude. These findings highlight the crucial role of targeted health education in empowering mothers to adopt better preventive measures, ultimately contributing to improved child health outcomes in vulnerable populations. Continued efforts to provide such educational programmes are essential for sustaining and further advancing community health.

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**Conflict of Interest:** The authors declare that there are no actual or potential conflicts of interest associated with this research study.

**Ethical Consideration:** Ethical approval for the study was obtained from the Institutional Ethics Committee of Parul Institute of Nursing (PIEC), Vadodara, Gujarat. Participants were fully informed about the purpose and procedures of the study, and written informed consent was obtained from each before data collection.

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