



**Assessing Indoor Air Pollution Exposures and Acute Respiratory  
Infection in Children Under 5 in Urban Slum Areas of Gandhidham City:  
A Community-Based Study**

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# Introduction

- As ARI is a major determinant of child mortality, understanding its etiological factors is necessary. This study aims to find the prevalence of ARI in children under 5 years of age in households using solid fuel combustion as well as the association between indoor pollution and the prevalence of ARI.
- The use of inefficient and solid fuels within the home produces household air pollution, which is composed of a variety of health-damaging pollutants, including small particulates that can enter the bloodstream and deeply infiltrate the lungs
- Children under five exposed to polluted air due to the combustion of unprocessed biomass fuel are most vulnerable to health hazards. They are more affected than adults as they inhale large amounts of polluted air compared to their body size due to increased minute ventilation as they are more active

# Research Question

- Is there an association between exposure to indoor air pollution from burning firewood for cooking and the incidence of acute respiratory infection in children under 5 years old living in the slums of Gandhidham City?

# Objectives

- To determine the prevalence of Acute respiratory infection in children under 5 years of age in households using solid fuel combustion in Gandhidham city.
- To determine the association between indoor air pollution and prevalence of Acute respiratory infection in children under the age of 5.

# Methodology

- **Study Type** :- Community-based cross-sectional study
- **Study Area** :- Public Health
- **Duration Of The Study** :- 8 Weeks.
- **Sample Size** :- 100
- **Sample Techniques** :- Convenient Sampling.
- **Data Collection** :- Primary Data Collection.
- **Data Analysis** :- The collected data was analyzed using software such as SPSS

# Result/Findings

## Socio-demographic details of Children

| Demographic Details                    | N=100 | %   |
|----------------------------------------|-------|-----|
| <b>Sex of Children</b>                 |       |     |
| Female                                 | 49    | 49% |
| Male                                   | 51    | 51% |
| <b>Age of Primary Caregiver</b>        |       |     |
| <24                                    | 53    | 53% |
| >24                                    | 47    | 47% |
| <b>Occupation of Primary Caregiver</b> |       |     |
| Skilled Employee                       | 18    | 18% |
| Unskilled Employee                     | 10    | 10% |
| Self Employed                          | 18    | 18% |
| Housewife                              | 54    | 54% |
| <b>Maternal Education</b>              |       |     |
| <6 <sup>th</sup> std                   | 47    | 47% |
| >6 <sup>th</sup> std                   | 51    | 51% |

## Household Environmental Factor

| Variables        |         | N=100 | %   |
|------------------|---------|-------|-----|
| Type of Fuel     | Clean   | 83    | 83% |
|                  | Unclean | 15    | 15% |
| Overcrowding     | Yes     | 66    | 66% |
|                  | No      | 33    | 33% |
| Ventilation      | Yes     | 5     | 5%  |
|                  | No      | 91    | 91% |
| Parental Smoking | Yes     | 3     | 3%  |
|                  | No      | 97    | 97% |

- The mothers' mean age was 24.25 years ( $\pm$ SD 6.37), while the children's mean age was 2.38 years ( $\pm$ SD 1.36).
- Most of the houses in the study area were overcrowded and the majority of the households used clean fuels for cooking. Most of the children who had ARIs were exposed to parental smoking.
- The overall prevalence of the ARI is 46.7%. Most of the mothers were literate and their educational status was not associated with the prevalence of ARI.
- Overcrowding has existed in 43% of the households. A majority, i.e., 91% of the households were inadequately ventilated. The prevalence of indoor smoking was 3%. Out of the total households, 15% used unclean fuel.
- The use of unclean fuel and parental smoking is significantly associated with the higher prevalence of ARIs. Inadequate ventilation did have a positive association with ARI.

# Conclusion

- The findings of this study also affirm that Acute Respiratory Infections (ARI) are common among under-five children; weighted prevalence rate for ARI was 46.7%, which is consistent with the previous studies. Like other studies, poor ventilation and smoke from unclean fuels are identified as ARI risk factors. This study is among the few that did not find a relationship between maternal education and an increased risk of ARI . There was also no significant sex difference in the prevalence of ARI.

# Suggestions

- Parental smoking is significantly associated with a higher prevalence of ARIs. Implementing smoking cessation programs and educating parents about the harmful effects of secondhand smoke on children could mitigate this issue.
- Although most households used clean fuels, 15% still used unclean fuels, which is associated with higher ARI prevalence. Providing subsidies or incentives for cleaner fuel options can help reduce the reliance on unclean fuels.
- Overcrowding was found in 43% of the households. Implementing policies that support larger living spaces or limiting the number of occupants per household could help reduce the spread of ARIs.
- Since 91% of the households are inadequately ventilated, improving ventilation can significantly reduce the prevalence of ARIs. This can be achieved by educating households on the importance of proper ventilation and encouraging them to use windows and ventilation systems

Thank  
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