

Original Research Article

Knowledge and practices regarding household air pollution in communities of slum areas of Sonipat district in Haryana

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ABSTRACT

Background: Each year globally, 3.8 million people die prematurely from illness attributable to the household air pollution. We assessed community knowledge and practices regarding household air pollution in slum areas of Sonipat district in Haryana.

Methods: A community-based cross-sectional study was conducted among 104 households in slum areas of Sonipat district. Data were collected using semi-structured questionnaire included socio-demographic profile, questions for knowledge and practice regarding indoor pollution. The data were coded and analysed using the software R, version 3.6.2.

Results: Of 104 household heads interviewed, 82.7 % were males and 17.3% were females. Most (69.2%) of the respondents were illiterate. More than half of the participants (53.8%) were labourer and rest were factory workers. Two third (75%) and more (79.8%) of the head households were aware that cooking fuel was harmful for the environment and smoke was harmful to the health respectively. Two third (75%) were not aware about Pradhan Mantri Ujjwala Yojana. Types of fuel used for cooking revealed that 71.2% and 21.1% of households used LPG and charcoal/firewood, respectively and (73.1%) of household cooked food inside the house.

Conclusions: The slum communities are aware of indoor air pollution and have knowledge regarding possible health effects. They are exposed to air pollution arising from cooking fuels. There is need for promoting awareness on exposure reductions in homes. The results of our study may help policymakers understand the need for strengthening supply of LPG under Pradhan Mantri Ujjwala Yojana.

Keywords: Awareness, Indoor air pollution, Practices, Slum

INTRODUCTION

Household air pollution (HAP) from inefficient fuel combustion is one of the most important global environmental health risks today. A recent WHO report estimated that around 3 billion people still cook using solid fuels (such as wood, crop wastes, charcoal, coal and dung) and kerosene in open fires and inefficient stoves.

Most of these people are poor, and live in low and middle-income countries. Each year, 3.8 million people

die prematurely from illness attributable to the household air pollution. Among these 3.8 million deaths, 27% are due to pneumonia, 18% from stroke, 27% from ischaemic heart disease, 20% from chronic obstructive pulmonary disease (COPD) and 8% from lung cancer.¹

It has been estimated that exposure to HAP caused over one million deaths per year in India in 2012 and the chronic cardiovascular and respiratory diseases and acute lung and respiratory infections in children were the main causes. The latest edition of the Global burden of disease

showed that HAP was the fourth most important risk factor for mortality and morbidity in India.²

People spend the majority of their time in indoors, at home, work, or school, in public buildings, and therefore, indoor environments contribute significantly to the total daily exposure.³ The indoor environment has been explored much less extensively than the outdoor atmosphere.

As little information is available about community knowledge and practices regarding indoor pollution in slum areas in India. This study was conducted to assess the community knowledge and practices regarding household air pollution in slum areas of Sonapat district in Haryana.

METHODS

This community-based cross-sectional study was conducted over a period of five months from April to August 2018 in two slum areas of Sonapat district having a health center staffed with one health officer, a pharmacist, a coordinator and two community mobilizers who were frequently visiting the areas for catering health services. There was no government health facility and no Medical Officer in the study area.

A total of 104 households were included in the study. All houses were covered except which were found locked and there were refusal or non-availability of adult member in the house at the time of visit. Before data collection, every respondent was explained about the objectives of the study and informed consent was obtained from all participants.

The necessary prior written permission was obtained from the Non-Government Organization (NGO) officer to carry out the study. The data was collected by interview method using a pretested, semi-structured questionnaire included socio-demographic profile and questions for knowledge and practice regarding indoor pollution.

Both community mobilizers were trained before filling the designed formats. They used to visit between 10 am to 3 pm daily except Sundays and holidays. The data were coded and analysed using the software R, version 3.6.2 and were presented in form of frequency and proportion.

RESULTS

Table 1 shows the sociodemographic characteristics of the study subjects. A total of 104 household heads were interviewed. Slightly more than four fifth 86 (82.7%) were males and rest 18 (17.3%) were females. Most of them 72 (69.2%) were illiterates, while only 12 (11.5%) had high school level and above education.

More than half 56 (53.8%) of the respondents were laborers and rest 48 (46.2%) were engaged as factory

workers. Majority, 67 (64.4%) were with monthly income ranging from 5000 to 10000 and only 24 subjects (23.1%) were with income above 10000 per month. Most of the houses were pucca (80%), whereas (20%) were kutcha. Majority of houses (88%) were having electricity supply and about (12%) were using kerosene oil lamps or candles for lighting purpose.

Table 1: Characteristics of the respondents (n=104).

Characteristics	Frequency	Percentage
Sex of head of family		
Male	86	82.7
Female	18	17.3
Education of head of family		
Illiterate	72	69.2
Primary	6	5.8
Mid school	14	13.5
High school and above	12	11.5
Occupation of head of family		
Factory worker	48	46.2
Laborer	56	53.8
Total family income in Rs per month		
< 5000	13	12.5
5000-10000	67	64.4
> 10000	24	23.1
Type of house		
Pucca	83	79.8
Kutcha	21	20.2
Electricity supply		
Yes	92	88.5
No	12	11.5
Total family member in household (n=572)		
Children below 5 years	74	12.9
Elder persons 60 years and above	38	6.6
Females in the family	300	52.4
Total pregnant women	11	1.9

Table 2: Knowledge of the participants towards indoor air pollution (n=104).

Variables	No.	Percentage
Cooking fuel is harmful for the environment		
Yes	78	75.0
No	26	25.0
Smoke is harmful to the health		
Yes	83	79.8
No	21	20.2
Health hazards*		
TB	61	58.6
Asthma	22	21.1
COPD	12	11.5
Allergy	11	10.6
Aware about Pradhan Mantri Ujjwala Yojana		
Yes	26	25.0
No	78	75.0

In Table 2, findings show the knowledge of respondents regarding indoor air pollution. Two third (75%) and more than two third (79.8%) of the household heads were aware that cooking fuel was harmful for the environment and smoke was harmful to the health respectively.

Maximum 61 (58.6%) responses reported by the respondents were for tuberculosis as health hazard of air pollution. Another health hazards mentioned by the participants were Asthma (21.1%), COPD (11.5%) and allergy (10.6%). Two third (75%) were not aware about Pradhan Mantri Ujjwala Yojana.

Table 3: Practices among study subjects (n=104).

Variables	No.	Percentage
Type of fuel		
LPG	74	71.2
Firewood/Dung/Kerosene stoves	22	21.1
LPG and Firewood/Dung/Kerosene stoves	8	7.7
Place of cooking		
Inside house	76	73.1
Outside house	28	26.9
Practices to reduce indoor pollution while cooking		
Using chimneys	04	3.8
Opening doors	22	21.1
Switching on fans	16	15.4
None	62	59.6

The preventive practices of the study subjects are presented in Table 3. Types of fuel used for cooking revealed that 74 (71.2%) and 22 (21.1%) of households used LPG and charcoal/firewood, respectively as the main cooking fuel while rest 7.7% used both. About two third (73.1%) of household cooked food inside the house. Common preventive practices for controlling indoor air pollution were using chimney (3.8%), opening doors (21.1%) and switching of fans (15.4%).

DISCUSSION

Presently, HAP has become a major public health concern in India and in the world. Among the study population of 104 household heads, more than four fifth (82.7%) were male. This might be because the male-headed household is the norm in India, a pattern consistent with traditional family structures and dominant roles of male gender in the society, and their perceived relative economic importance.

In the present study, among the study subjects, 69.2% were illiterates, 53.8% were laborers and 46.2% were factory workers and 64.4% were with monthly income ranging from 5000 to 10000. This might be due to the differences in education, occupation and economic aspects of slum and non-slum areas. In our study, we assessed the awareness of the study participants regarding indoor air pollution and found that 75% and 79.8% of the

respondents aware that cooking fuel was harmful for the environment and smoke was harmful to the health respectively.

In a community based cross-sectional study conducted in rural Mangalore, it was found that most (80.8%) of the study population were aware of the health risks posed by the smoke from burning firewood.⁴ In a study conducted in rural Bangladesh, it was found that majority (85%) of the household women had good awareness regarding the harmful effects of burning firewood.⁵

In our study, we found that 58.6% responses reported by the participants were for tuberculosis as health hazard of air pollution and another health hazards mentioned by the participants were Asthma (21.1%), COPD (11.5%) and allergy (10.6%).

In contrast, in a study in slums of Kenya, cough/cold, difficulties in breathing, headache and eye problems were the most common health risks mentioned by the respondents related to air pollution.⁶ This difference in awareness of health risk could be explained by the difference in the education level and occupation of the participants.

In the present study, it was found that 71.2% and 21.1% of households used LPG and charcoal/firewood, respectively and 7.7% used both. In a study conducted in rural Mangalore, the study population using firewood and both firewood and LPG were comparatively more (34%) and (41.3%) respectively, while only 25% were using LPG for their cooking needs.⁴

In other study conducted in northeast India, firewood and charcoal users were (45%), LPG users were only 20% and people using both firewood and LPG were 35%.⁷ Some people are unable to procure the cylinder and prefer firewood for their cooking purposes. Two third of the study subjects were not aware about Pradhan Mantri Ujjwala Yojana and this could be the reason for using charcoal/firewood among the participants. About two third (73.1%) of household cooked food inside the house. Similar findings were seen in different studies conducted in India, where 67 to 73% of the study population cooked indoors.^{8,9}

Common preventive practices for controlling indoor air pollution were using opening doors (21.1%), switching of fans (15.4%) and using chimney (3.8%). Some studies indicated that without adequate ventilation, installing a chimney may not necessarily solve air pollution problems.^{10,11}

Limitations

The present study was carried out in two slum areas only with small sample size so the results cannot be extrapolated to other areas. Practice of smoking for indoor air pollution was not assessed in our study.

CONCLUSION

The slum communities are aware of indoor air pollution and have knowledge regarding possible health effects. They are exposed to air pollution arising from cooking fuels. There is need for promoting awareness on exposure reductions in homes. The results of our study may help policymakers understand the need for strengthening supply of LPG under Pradhan Mantri Ujjwala Yojana.

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REFERENCES

1. World Health Organization. Household air pollution and health. Geneva: World Health Organization. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/household-air-pollution-and-health>. Accessed on 01 August 2020.
2. World Health Organization, Opportunities for transition to clean household energy: application of the Household Energy Assessment Rapid Tool (HEART) in India, 2018.
3. Leonarte FV, Ballester F, Tenías J. Sources of indoor air pollution and respiratory health in preschool children. J Environ Public Health. 2009;2009:1-19.
4. Alex P, Kiran KG, Baisil S, Shameena AU, Badiger S. Assessment of awareness and attitude of rural women towards ill-effects of indoor air pollution and their perception regarding alternate cooking fuel usage in Mangalore. Int J Community Med Public Health. 2018;5:4092-7.
5. Banik KB. Female perceptions of health hazards associated with indoor air pollution in Bangladesh. Int J Sociol Anthropol. 2010;2(9):206-12.
6. Egondi T, Kyobutungi C, Ng N, Muindi K, Oti S, Vijver SV, et al. Community perceptions of air pollution and related health risks in Nairobi slums. Int J Environ Res Public Health. 2013;10(10):4851-68.
7. Po J, FitzGerald J, Carlsten C. Respiratory disease associated with solid biomass fuel exposure in rural women and children: systematic review and meta-analysis. Thorax. 2011;66(3):232-9.
8. Balakrishnan K, Sankar S, Parikh J, Padmavati R, Srividya K, Venugopal V, et al. Daily average exposures to respirable particulate matter from combustion of biomass fuels in rural households of southern India. Environment Health Perspect. 2002;110(11):1069-75.
9. Dutta A, Ray RM, Banerjee A. Systematic inflammatory changes and increased oxidative stress in rural Indian women cooking with biomass fuels. Toxicol Appl Pharm. 2012;261:255-62.
10. Xiao Q, Saikawa E, Yokelson RJ, Chen P, Li C, Kang S. Indoor air pollution from burning yak dung as a household fuel in Tibet. Atmospheric Environ. 2015;102:406-12.
11. Pollard. A cross-sectional study of determinants of indoor environmental exposures in households with and without chronic exposure to biomass fuel smoke. Environmen Health. 2014;13:21.

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