

Knowledge Regarding Causes and Ill Effects of Household Air Pollution Among Residents of a Selected Community in Kozhikode (Kerala)

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Abstract

The present study was conducted to assess the knowledge regarding causes and ill effects of household air pollution among residents of selected community in Kozhikode (Kerala). The research design adopted was non-experimental descriptive survey type. The sample was selected using non-probability convenience sampling technique. The data were collected using semi structured questionnaire to assess the knowledge regarding causes and ill effects of household air pollution among residents. The data was tabulated and analysed by descriptive and inferential statistics. The study revealed that majority of the samples (50%) had average knowledge regarding causes and ill effects of household air pollution and 31.7 percent had good knowledge, 8.3 percent had excellent knowledge and 6 percent had poor knowledge. There was significant association with variables such as age and occupational state and no significant association with variables like gender, educational qualification, idea regarding household air pollution, respiratory illness due to household air pollution.

Key words: Household air pollution, Respiratory illness

Household air pollution from inefficient fuel combustion is one of the most important global environmental health risks today. A recent WHO report (2022) 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. Further, about 8 million people die every year globally because of air pollution. Among these, 4.3 million die because of air pollution from household sources and 3.7 million die because of ambient air pollution. Exposure to household air pollution caused over one million deaths 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 household air pollution was the fourth most important risk factor for mortality and morbidity in India (WHO, 2022).

Need of the Study

According to the Global Burden of Disease Report, household air pollution is the leading cause of disability-adjusted life years (DALYs) in Southeast Asia and the third leading cause of DALYs global-

ly (GBD, 2013). Until recently, air pollution from motor vehicles and industries was perceived as a bigger threat to human health. Household air pollution causes non-communicable diseases including stroke, ischaemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer. Close to half of deaths due to pneumonia among children under 5 years of age are caused by particulate matter (soot) inhaled from household air pollution. It is only now that we have started appreciating the significant adverse impacts of household air pollution on human health.

To better assess the health risks of household energy use as well as differentiated gender impacts from household energy practices, WHO is leading an effort with countries and surveying agencies (e.g. USAID's DHS, UNICEF's MICS, World Bank's LSMS) to enhance, harmonise and pilot questions for national censuses and surveys. The effort will ensure that surveys capture comprehensive information on all the fuels and technologies used in the home for cooking, heating and lighting, as well as other impacts like time lost to fuel collection disaggregated by sex. Considering these facts the investigators sought to assess the knowledge of residents of a selected community regarding household air pollution.

Review of Literature

A study submitted in Mahatma Gandhi University

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in Kottayam on 3 September 2019 on air pollution showed that particulate matter 10 and particulate matter 2.5, the key constituents of air pollution, were often over the limit, especially on-air pollution caused by household products and waste burning sites. The study also identified children between 2 and 10 years as the mostly affected section (The Hindu, 3 Sept 2019).

A Medline and Embase Data base search conducted by Laura L Jones et al in 2011 assessed the parental and household smoking and the increased risk of bronchitis, bronchiolitis and respiratory infections in infancy. It identified 60 samples suitable for meta analysis. In conclusion passive smoking in the family home was found as a major influence on the risk of lower respiratory infections and especially of bronchiolitis (Jones et al, 2011).

A cross-sectional study was conducted in Ningbo China in January 2015, to assess the knowledge and perceptions of air pollution in Ningbo, China. Personal information and questions pertaining to the knowledge, attitude and practices towards ambient air pollution and health were collected through structured questionnaire; and completed by 1604 respondents. The study concluded that there was relatively high knowledge, awareness, strong health protection consciousness and high enthusiasm for air pollution control among Ningbo residents (Singh et al, 2020).

Objectives

The objectives of the study were to:

- Check knowledge regarding causes and ill effects of household air pollution.
- Determine the association between knowledge of causes and ill effects of household air pollution with selected variables.

Hypothesis

H1 (Research hypothesis): There is significant association between knowledge score and selected demographic variables at 0.05 level of significance.

Methodology

Research approach: Quantitative approach was used in this research study. The research design adopted was descriptive survey research design. The study was conducted at Thalakkulathur Panchayath of district, Kozhikode in Kerala.

Sample: General public of selected community who met the inclusion criteria were included in study.

Sampling technique: Non-probability convenient sampling technique was used to select the subjects.

In this study the sample consisted of 60 residents who were residing at Thalakkulathur Panchayath, Kozhikode.

Inclusion Criteria

- Residents of selected Panchayath.
- All men and women of age above 18 years.
- Those who understood English and Malayalam.

Exclusion Criteria

- Adults who have any cognitive impairment.

Data collection tool: In the study two tools were developed in order to identify the knowledge regarding causes and ill effects of household air pollution among people living in rural area. Structured questionnaire for socio demographic profile and semi structured questionnaire to assess the knowledge regarding the causes and ill effects of household air pollution.

Content validity: The constructed tool was given to eight experts from the field of nursing.

Reliability of tools: The reliability coefficient of knowledge test was calculated using Pearson's formula. It was found $r=0.7$ indicating that the tool is reliable.

Pilot study: The data collection was tried out on 6 subjects and was found to be feasible. No modification was done after pilot study.

Written permission was obtained from the scientific committee, administrative section and from the Panchayath prior to data collection. Approval from the institutional ethical committee was taken. Informed written consent was obtained from all subjects. Confidentiality of information was maintained. The participants were adequately informed of the purpose of the study. There was no risk involved as it was questionnaire-based study.

Analysis and interpretation of data: Analysis and interpretation was done according to the objectives. Data analysis was done by descriptive and inferential statistics

Results

Frequency and percentage distribution based on demographic data

Out of 60 subjects, 33.3 percent belonged to the age group of 40 to 49-years, 28.3 percent belonged to 30 to 39 years and 21.7 percent belonged to greater than 60 years and 16.7 percent belonged to 18 to 29 years. In this study 73.3 percent of the subjects were female and 26.7 percent male. Majority of the samples educated up to under graduate level (33.3%), primary education (30%),

Table 1: Frequency and percentage distribution of knowledge regarding causes and ill effects of household air pollution (n=60)

Sl. No.	Score	Frequency	Percentage	Knowledge level
1	25-30	5	8.3	Excellent
2	20-24	19	31.7	Good
3	15-19	30	50	Average
4	<15	6	10	Poor

26.7 percent were educated up to higher secondary, 8.3 percent were post graduates and rest (1.7%) were in the group of 'others'. Majority of the samples (61.7%) were from nuclear family and 38.3 percent were from joint family. As for marital status, 81.7 percent were married and 13.3 percent were unmarried; 5 percent were widowed. Out of 60 subjects, 33.3 percent were unemployed and 30 percent were on daily wages; about 8.3 percent were government employees, 13.3 percent were private employees and rest of them (5%) were in the category of about 'others'.

Knowledge of general public regarding causes and ill effects of household air pollution

Data in Table 1 revealed that majority of the subjects (50%) had average knowledge regarding the causes and ill effects of household air pollution, 31.7 percent of subjects had good knowledge, 10 percent of subjects had poor knowledge and only 8.3 percent had excellent knowledge.

Association between knowledge of general public regarding causes and ill effects of household air pollution

Table 2 shows that chi-square value obtained for age and occupational state were greater than table value, so there is a significant association between knowledge and occupational state with selected demographic variable. For variables like gender, educational qualification, idea regarding air pollution, respiratory illness due to household air pollution was less than table value, so there is no significant association between knowledge and

selected demographic variable.

Discussion

In this study half (50%) of general public had average knowledge, 31.7 percent had good knowledge, 8.3 percent had excellent and 10 percent had poor knowledge regarding the causes and ill effects of household air pollution. The findings of the present study is correlated by the result of a study done in Sonipat district, Haryana regarding knowledge and practices related to household air pollution in communities of slum areas and found that 75 percent and more 79.8 percent of the head households were aware that cooking fuel was harmful for the environment, and smoke was harmful to the health, respectively (Singh et al, 2020).

The findings of the present study are in line with another study done at Ningbo China regarding the knowledge of causes and ill effects of house hold air pollution on health, which showed that the awareness rate was 64.59 percent. Most of the residents have taken protective measures indoors during haze weather. Also, 48.50 percent have worn face masks when going outside; the most frequently type of face masks selected were cotton (39.85%) or gauze face masks (36.24%) (Qian et al, 2016).

However, the findings of our study contradict with the one conducted in Accra, Ghana by Odonkor & Mahani (2020) to assess the knowledge, attitudes and perception of air pollution and its effect on health where the majority (70.1%) had adequate knowledge regarding causes and ill effects of household air pollution, others (29.9%) had inadequate knowledge.

Recommendations

- Similar study can be carried out in a large sample from multiple settings selected randomly thereby allowing findings to be generalised.

- A follow-up study can be done to find out the effectiveness of a leaflet on knowledge regarding the causes and ill effects of household air pollution.

- A similar study can be conducted to assess the knowledge regarding causes and ill effects of ambient air pollution.

Nursing Implications

Nursing practice

Household air pollution is a major problem so it is the responsibility of

Table 2: Chi-square test on association between the level of knowledge of general public and selected demographic variables (n=60)

Sl. No.	Variable	χ^2	df	Table value	Inference of χ^2
1	Age	8.54	9	8.49	Significant
2	Gender	0.77	3	24.45	Not significant
3	Educational qualification	14.92	12	21.03	Not significant
4	Idea regarding household air pollution	4.31	3	7.82	Not significant
5	Respiratory illness due to household air pollution	7.538	3	7.82	Not significant
6	Occupational state	24.45	12	21.03	Significant

Level of significant at 0.05 level.

the nurse to assess the knowledge, clarify doubts and give education to the community who have exposure with household air pollution regarding the prevention of household air pollution.

Nursing education

Staff development programmes and in-service education programmes should be organised to update the knowledge of nurses and community health workers regarding current trends and screening programmes so that they have an effective role in prevention of household air pollution.

Nursing administration

The nurse administrator should mobilise adequate resources and facilities for conducting and evaluating such programmes. Continuing education opportunities will enable the nurse to update their knowledge and acquire specific skills in early detection of illnesses caused by household air pollution and demonstrate high quality care in assisting persons affected with such illnesses to modify their living status.

Nursing research

The present study might open up new avenues for exploring many other issues in this area. Clinical nurses should take an initiative and conduct research on knowledge regarding causes and ill effects of household air pollution in the rural setting.

Conclusion

The present study assessed the knowledge regarding causes and ill effects of household air pollution among general public in a selected community. It was found that half of the subjects had average knowledge regarding the causes and ill effects of household air pollution. As a nurse it is our responsibility to assess the knowledge, clarify

doubts and give education to the community regarding the prevention of household air pollution. Education programmes should be organised to improve the knowledge of public regarding prevention of household air pollution.

References

1. Apte K, Salvi, S. Household air pollution and its effects on health. *F1000 Research* 2016; 5, 2593, Available from: <https://doi.org/10.12688/f1000research.7552.1>
2. Household Air Pollution and Health (nd). WHO. Int. Retrieved February 12, 2022, Available from: <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health>
3. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A Systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2015; 385 (9963): 117-71. Available from :[https://doi.org/10.1016/S0140-6736\(14\)61682-2](https://doi.org/10.1016/S0140-6736(14)61682-2)
4. Staff Reporter. Kottayam among 5 highly air-polluted districts. *The Hindu* 3 Sept 2019. <https://www.thehindu.com/news/national/kerala/kottayam-among-5-highly-air-polluted-districts/article29325684.eceK>
5. Jones LL, Hashim A, McKeever T, Cook D G, Britton J, Leonardi-Bee J. Parental and household smoking and the increased risk of bronchitis, bronchiolitis and other lower respiratory infections in infancy: Systematic review and meta-analysis. *Respiratory Research* 2011; 12(1): 5. <https://doi.org/10.1186/1465-9921-12-5>
6. Singh K, Singh M, Jha SK, et al. Knowledge and practices regarding household air pollution in communities of slum areas of Sonapat district in Haryana. *International Journal of Community Medicine and Public Health* 2020; 7(12): 4974. <https://doi.org/10.18203/2394-6040.ijcmph20205172>
7. Qian X, Xu G, Li L, Shen Y, He T, Liang Y, et al 2016. Knowledge and perceptions of air pollution in Ningbo, China. *BMC Public Health* 2016; 16(1): 1138. <https://doi.org/10.1186/s12889-016-3788-0>
8. Odonkor ST, Mahami T. Knowledge, attitudes, and perceptions of air pollution in Accra, Ghana: A critical survey. *Journal of Environmental and Public Health* 2020; 3657161. <https://doi.org/10.1155/2020/3657161>

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