RESEARCH ARTICLE

ADVANCE RESEARCH JOURNAL OF SOCIAL SCIENCE

Volume 7 | Issue 1 | June, 2016 | 81-87 ■ e ISSN–2231–6418

DOI: 10.15740/HAS/ARJSS/7.1/81-87 Visit us : *www.researchjournal.co.in*

Practices adopted by rural and urban housewives to combat indoor pollution

■ D. Kaur*, M. Sidhu **and** S. Bal

Department of Family Resource Management, College of Home Science, Punjab Agricultural University, LUDHIANA (PUNJAB) INDIA

ARTICLE INFO :

Received : 28.03.2016
Revised : 14.04.2016
Accepted : 15.05.2016

KEY WORDS :

Air quality, Dust management, Ill effects, Indoor pollution

HOW TO CITE THIS ARTICLE :

Kaur, D., Sidhu, M. and Bal, S. (2016). Practices adopted by rural and urban housewives to combat indoor pollution. *Adv. Res. J. Soc. Sci.,* **7** (1) : 81-87, **DOI: 10.15740/HAS/ARJSS/7.1/81-87.**

*Author for correspondence

ABSTRACT

Indoor pollution consists of toxic gases, dust particles, suspended particulate matter (SPM) dust mites, fungus etc. that can harm the inmates' health. Indoor sources of toxic gases or particles can increase indoor pollutant levels much higher than those found outdoors. As there are many sources of indoor pollutants, and because people spend most of their time indoors, indoor exposures can be of high intensity and pose a significant risk to the health of the inmates. About 68.33 per cent homemakers perceived that due to indoor pollution, inmates can have headache, and 67.50 per cent respondents agreed that it can lead to irritation to throat. Minimum response was for Sick Building Syndrome and Tobacco Syndrome each as reported by 36.67 per cent respondents. Maximum number (81.67 %) of respondents was aware of the fact that one has to install ventilators for improvement of indoor air quality and it was followed by the 65.00 per cent respondents who knew that exhaust fans were also effective. Little more than half (58.33%) of respondents had the knowledge that using wire mesh on windows and doors can be very effective to control indoor pollution. Almost half of them (51.67%) agreed that they were aware of airing new furniture, rugs, mattresses etc, (50.00%) agreed that they were aware of indoor air getting polluted due to new paints or varnishes and these should be aired well. And (46.67%) agreed that they were aware of airing summer clothes before wearing them. Minimum awareness was reported by the respondents for 'airing out dry cleaned clothes', 'attending leaking taps' and 'not using artificial fragrances' as disclosed by 31.67, 34.17 and 39.17 per cent respondents respectively. It was also revealed in the study that urban respondents had higher awareness on these issues as compared to rural respondents.

INTRODUCTION

People may react differently to different pollutants, depending on factors such as age, pre-existing medical conditions, and individual sensitivity. Exposure to suspended particulate matter for a long time can lead to respiratory and cardiovascular diseases such as asthma, bronchitis, lung cancer and heart attacks. The Global burden of disease study for 2010, published in 2013, had reported that outdoor air pollution was the fifth-largest killer in India and around 620,000 early deaths occurred from air pollution-related diseases in 2010 (Anonymous, 2013).

The effects of inhaling suspended particulate matter that have been widely studied in humans and animals include asthma, lung cancer, cardiovascular disease,

respiratory diseases, premature delivery, birth defects, and premature death. The large number of deaths and other health problems associated with particulate pollution was first demonstrated in the early 1970s and has been reproduced many times.

The World Health Organization (WHO) estimated in 2005 that fine particulate in air causes about 3 per cent of mortality from cardiopulmonary disease, about 5 per cent of mortality from cancer of the trachea, bronchus, and lung, and about 1 per cent of mortality from acute respiratory infections in children under 5 years, worldwide. Short-term exposure at elevated concentrations can significantly contribute to heart disease. WHO further reported that traffic exhaust is the single most serious but preventable cause of heart attack in the general public.

The term 'Sick Building Syndrome' (SBS) is used when a large number of people occupying a particular building, develop symptoms associated with their presence in that building. Later on symptoms disappear. In most cases sick building syndrome occurs in office buildings, schools and apartment buildings.

Signs and symptoms of diagnosable illness are easy to identify and can be directed to specific airborne building contaminants. On another hand the cause(s) of symptoms in cases of SBS are often difficult to pin down and in many cases different factors may lead to the situation. So, once the causes are identified corrective measures must be taken to ensure that any adverse reaction inhibited and cause(s) are isolated to make the area safe for the student and school personal.

Hackshaw (1998) was of the view that tobacco smoke or second-hand-smoke is tobacco smoke which affects other people other than the 'active' smoker. Second-hand tobacco smoke includes both a gaseous and a particulate phase, with particular hazards arising from levels of carbon monoxide and very small particulates which get past the lung's natural defence. The only certain method to improve indoor air quality as regards second-hand smoke is the implementation of comprehensive smoke free laws. In this connection, homemaker can play a key role in controlling pollution to reasonably good extent and to combat the indoor pollution. So, the present study was therefore, conducted with the objective to examine the practices adopted at household level to combat the indoor pollution.

MATERIAL AND METHODS

The data for the present study was collected from 120 homemakers comprising of 60 rural and 60 urban, respondents. The respondents were selected randomly. Rural data was collected from randomly selected villages *i.e., Majara* and Phullanwal of Ludhiana 1 block of Ludhiana district. Similarly urban homemakers were randomly selected from *Jawahar Camp* and Canal Avenue of Ludhiana -D zone of Ludhiana. An interview schedule was prepared which sought information about the awareness of homemakers regarding Indoor pollution. The information was collected by personal interview method with open ended and pre-tested interview schedule. The data collected were coded and tabulated. For analyzing the data, simple averages, percentages, mean scores, t-test were used.

OBSERVATIONS AND ANALYSIS

The findings of the present study as well as relevant discussion have been presented under following heads :

Perceived ill effects of indoor pollution :

It can be seen in the Table 1 that maximum number of (68.33%) respondents reported headache due to

Table 1 : Perceived ill effects of indoor pollution on health of the respondents

Ill effects on health	Rural	Urban	Total
Headache	43 (71.67)	39 (65.00)	82 (68.33)
Irritation in throat	34 (56.67)	47 (78.33)	81 (67.50)
Allergic reaction	28 (46.67)	49 (81.67)	77 (64.17)
Hearing impairment	32 (53.33)	38 (63.33)	70 (58.33)
Asthma	24 (40.00)	43 (71.67)	67 (55.83)
Nausea	28(46.67)	38 (63.33)	66 (55.00)
Watery eyes	40 (66.67)	16 (26.67)	56 (46.67)
Sick building syndrome	20 (33.33)	24 (40.00)	44 (36.67)
Tobacco syndrome	15 (25.00)	29 (48.33)	44 (36.67)

*Multiple responses ** Figures in parentheses indicate percentage

degradation of indoor environment which was closely followed by 'irritation in throat'; a health problem perceived by 67.50 per cent respondents. More than half the number of respondents *i.e.*, 64.17 per cent agreed to have allergic reaction one time or the other in their life followed by 58.33 per cent respondents who reported of the hearing loss due to the higher level of noise produced than the recommended level *i.e.*, 40 dB (Grandjean, 1973). These results are in line with the findings of Nagi (1993) and Nagi (1997) who reported that noise level inside the homes due to kitchen appliances was much higher than the recommended level causing psychological and physiological effects. Almost 55 per cent respondents complained of asthma and nausea due to bad odours inside their houses. Least reported health problem was Tobacco Syndrome and Sick Building Syndrome as only 36.67 per cent each respondent were aware of these health issues arising due to indoor pollution. Less instances of Tobacco Syndrome can be attributed to the fact that people generally do not smoke in this part of the country; particularly the Sikh community. If less people were using cigarettes, *beedi* etc. lesser will be the Tobacco Syndrome. Sick Building Syndrome is a phenomenon with which the inhabitants are least aware of. This may be due to the reason that those spending their life time in sick buildings get accustomed to the syndrome and fail to report and consider any change in the surroundings. However, if a new comer or guest enters the buildings; he or she will feel Sick Building Syndrome immediately. Although, if the inhabitants move out of the house on vacations or for some commitment may also realize almost this type of syndrome; when they open the house after coming back. But there may be very few such instances in the sampled population; leading to lower reporting on Sick Building Syndrome.

Practices followed for the abatement of indoor pollution :

Prime responsibility of care givers in any family remains universally same *i.e.*, providing safe and comfortable shelter, nutritious and ample food and socially acceptable clothing. Ensuring safe housing environment, generally, is mistaken by warding off from elements of nature (rain, heat, cold and storms); anti theft strategies and taking care of fire hazard, electrocution, earthquake, flood and making interiors accident free. Unfortunately most people remain unaware of the indoor elements also responsible for degrading the environment and adding to pollution. The present investigation, which first looks into awareness level of sampled population, also investigates steps taken by them to keep interiors of their homes pollution free. Table 2-4 unfolds information pertaining to such practices.

Ventilation and air quality management practices adopted to combat indoor pollution :

Ventilating is the process of "changing" or replacing

Table 2 : Ventilation and air quality related prevalent practices followed by respondents to combat indoor pollution

Practices	Awareness of practices			Use of practices			Frequency of use			
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	t-value	Total
Provision of adequate ventilation										
Install ventilators	45 (75.00)	53 (88.33)	98 (81.67)	40 (66.17)	50 (83.33)	90 (75.00)	2.78	2.81	0.09	2.80
Exhaust fans	25 (41.67)	53 (88.33)	78 (65.00)	18 (30.00)	53 (88.33)	71 (59.17)	2.71	2.80	0.22	2.76
Dust free AC ducts	12 (20.00)	40 (66.67)	52 (43.33)	8 (13.33)	30 (50.00)	38 (31.17)	2.73	2.75	0.03	2.74
Proper air circulation	18 (30.00)	37 (61.67)	55 (45.83)	15 (25.00)	33 (55.00)	48 (40.00)	2.66	2.77	0.89	2.72
Use fans for air circulation	18 (30.00)	45 (75.00)	63 (52.50)	12 (20.00)	38 (63.33)	50 (41.67)	2.58	2.75	1.72	2.67
Open windows frequently	21 (35.00)	40 (66.67)	61 (50.83)	18 (30.00)	35 (58.33)	53 (44.17)	2.67	2.67	0.00	2.67
Regularly clean wire meshes	23 (38.33)	46 (76.67)	69 (57.50)	19 (31.67)	40 (66.17)	59 (49.17)	2.48	2.61	1.53	2.55
Improving quality of indoor air										
No wood/charcoal burning indoors	16 (26.67)	35 (58.33)	51 (42.50)	18 (30.00)	15 (25.00)	33 (27.50)	2.83	2.83	0.00	2.83
No indoor smoking	25 (41.67)	42 (70.00)	67 (55.83)	20 (33.33)	35 (58.33)	55 (45.83)	2.80	2.87	0.64	2.84
Use air fresheners	12 (20.00)	35 (58.33)	47 (39.17)	7 (11.67)	29 (48.33)	36 (30.00)	2.45	2.46	0.01	2.46
Use indoor plants and natural fresheners	13 (21.67)	46 (76.67)	49 (40.83)	6 (10.00)	35 (58.33)	41 (34.17)	2.39	2.42	0.09	2.41

Multiple responses # 3 point Scale: Always=3, Sometimes= 2, Rarely=1
Figures in parentheses indicate percentages.

air in any space, to provide high indoor air quality *i.e.*, to control temperature, replenish oxygen, or remove moisture, odours, smoke, heat, dust, airborne bacteria, and carbon dioxide. Ventilation is used to remove unpleasant smells and excessive moisture, introduce outside air, to keep circulating the air inside the building, and to prevent stagnation of the interior air.

Ventilation includes both the exchange of air to the outside as well as circulation of air within the building. It is one of the most important factors for maintaining acceptable indoor air quality in buildings. Methods for ventilating a building may be divided into mechanical / forced and natural ventilation.

"Mechanical" or "forced" ventilation is used to control indoor air quality. Excess humidity, odours, and contaminants can often be controlled via dilution or replacement with outside air. However, in humid climates much energy is required to remove excess moisture from air especially from inside the homes.

Ventilation increases the energy needed for heating or cooling, however, heat recovery ventilation can be used to mitigate the energy consumption. This involves heat exchange between incoming and outgoing air. Energy recovery ventilation additionally includes exchange of humidity.

Kitchens and bathrooms typically have mechanical exhaust to control odours and sometimes humidity. Kitchens have additional problems to deal with such as smoke and grease. Factors in the design of such systems include the flow rate *i.e.*, a function of the fan speed and exhaust vent size and noise level. Ceiling fans and wall/ table/pedestal fans circulate air within a room for the purpose of reducing the perceived temperature because of evaporation of perspiration on the skin of the occupants.

The term "air quality" means the state of the air around us. Good air quality refers to clean, clear, unpolluted air. Clean air is essential not just for humans, but wildlife, vegetation, water and soil. Poor air quality is a result of a number of factors, including emissions from various sources, both natural and "human-caused." Poor air quality occurs when concentration of pollutants reach high enough to endanger human health and/or the environment. Our everyday choices, such as driving cars and burning wood, can have a significant impact on air quality.

Information was gathered to know the prevalent practices adopted by the respondents related to ventilation and air quality. It can be seen in Table 2 that maximum number (81.67%) of respondents were aware of the fact that one has to install ventilators for improvement of indoor air quality. Sixty five per cent respondents also knew that exhaust fans is a mechanical means to get rid of hot air and cooking fumes which are generally produced when the cooking is in progress. Little more than half *i.e.*, 57.50 per cent respondents had the knowledge that by regular cleaning of wire meshes, air exchange (both interior and exterior) can be achieved more effectively. Almost half of the selected respondents (52.50% and 50.83%) agreed that they were aware of using fans for air circulation and opening of windows more frequently was significant in abating indoor pollution. Minimum awareness among the management practices was for 'dust free AC ducts' and 'proper air circulation' as disclosed by 43.33 per cent and 45.83 per cent respondents, respectively. It was also revealed in the table that urban respondents had higher awareness of all the listed practices as compared to rural respondents.

As regard the use of these practices, it can be seen from the table that, the practice was more by those

Table 3: Prevalent dust management practices adopted by respondents to combat indoor pollution

Dust management practices	Awareness of use			Use of practices			Frequency of use			
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	t-value	Total
Use foot mat at the entrance door	35 (58.33)	45 (75.00)	80 (66.67)	30 (50.00)	40 (66.17)	70 (58.33)	2.69	2.69	0.00	2.69
Wash oily and dirty items in hot water	38 (63.33)	44 (73.33)	82 (63.33)	35 (58.33)	42 (70.00)	77 (64.17)	2.68	2.65	0.09	2.67
Cleaning hidden dirt frequently	35 (58.33)	42 (70.00)	77 (64.17)	30 (50.00)	38 (63.33)	68 (56.67)	2.45	2.69	1.89	2.57
Use of vacuum cleaner	15 (25.00)	35 (58.33)	50 (41.67)	7 (11.67)	28 (46.67)	35 (29.17)	2.51	2.61	1.13	2.56
Use micro fibre mop	13 (21.67)	45 (75.00)	58 (48.33)	7 (11.67)	35 (58.33)	42 (35.00)	2.39	2.60	2.54*	2.50
Dusting of rugs/carpet/ bedding/sofa	15 (25.00)	28 (46.67)	43 (35.83)	13 (21.67)	20 (33.33)	33 (27.50)	2.38	2.60	2.61**	2.49

Multiple responses
Figures in parentheses indicate percentages.
3 point Scale: Always= 3, Sometimes= 2, Rarely=1
* and ** indicate significance of values at P=0.05 and 0.01, respectively

respondents where the awareness level was high. Three fourth of respondents (75.00%) installed ventilators in their home, followed by 59.17 per cent respondents who also had exhaust fans for improving indoor air quality. Almost half of them (49.17%) were regularly cleaning wire meshes of their doors and windows, followed by 44.17 per cent respondents who opened windows regularly for proper air circulation. Minimum response was for practice of 'keeping AC ducts dust free' as reported by 31.17 per cent respondents. This may be due to the fact that they either had window model AC's or did not posses AC at all.

Frequency of following these practices was seen on three point quantum scale using always, often and rarely for the statements. It can be observed from Table 2 that most frequently followed indoor pollution abatement practice by the way of providing adequate ventilation was installing ventilator by the respondents (mean score 2.80). Trend was followed by use of exhaust fans, use of dust free AC ducts, and proper air circulation by the respondents (mean scores 2.76, 2.74 and 2.72, respectively for these practices). Least frequently followed practice (by the respondents) was 'regular cleaning of wire meshes (of windows, doors and ventilators) with mean score 2.55, a little more followed the practice of opening windows frequently and use of fans for air circulation (mean score 2.67 each). It can also be concluded that urban respondents took lead in using ventilation related management practices and their frequency of use was also higher as compared to their rural counterparts.

The difference between the rural and urban respondents regarding provision of adequate ventilation was found to be statistically non-significant.

As far as management practice related to improving quality of indoor air was concerned it was noted from the Table 2 that maximum respondents (55.83%) knew that by banning and discouraging indoor smoking, can be helpful in reduction of indoor air pollution, followed by 42.50 per cent respondents who also knew that if they do not burn wood/charcoal indoors, they will be able to improve air quality in their interiors. However, minimum number of respondents (about 40%) was aware that use of air fresheners, indoor plants and natural fresheners can also effectively improve indoor air quality. Awareness of these practices was seen to be more in case of urban respondents as compared to rural respondents. It can also be noted from the table that maximum number of (45.83%) respondents were not smoking inside their houses and even did not allow smoking by their guests inside the home. This may be due to the fact that neither any of the family members smoked, nor they had such

Table 4 : Prevalent miscellaneous practices adopted by respondents to combat indoor pollution

Practices	Awareness of use			Use of practices			Frequency of use			
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	t-value	Total
Keep kitchen and bathroom dry	40 (66.67)	42 (70.00)	82 (68.33)	35 (58.33)	40 (66.67)	75 (62.50)	2.71	2.78	0.13	2.75
Never have leaking taps unattended	16 (26.67)	25 (41.67)	41 (34.17)	7 (11.67)	18 (30.00)	25 (20.83)	2.26	2.62	2.48*	2.44
Use drain covers	15 (25.00)	60 (100.00)	75 (62.50)	10 (16.67)	48 (80.00)	58 (48.33)	2.63	2.67	0.07	2.65
Use wire mesh on windows and doors	27 (45.00)	43 (71.67)	70 (58.33)	22 (36.67)	38 (63.33)	60 (50.00)	2.53	2.60	0.21	2.57
Airing woolen clothes	37 (61.67)	40 (66.67)	77 (64.17)	35 (58.33)	37 (61.67)	72 (60.00)	2.62	2.78	1.34	2.70
Airing quilts/blanket	35 (58.33)	44 (73.33)	79 (65.83)	35 (58.33)	42 (70.00)	77 (64.17)	2.61	2.72	1.29	2.67
Air new furniture, rugs, mattresses etc.	27 (45.00)	35(58.33)	62 (51.67)	15 (25.00)	22 (36.67)	37 (30.83)	2.59	2.68	0.92	2.64
Air new paints/varnishes	27 (45.00)	37 (61.67)	60 (50.00)	17 (28.33)	21 (35.00)	38 (31.67)	2.43	2.74	2.37*	2.59
Air summer clothes before wearing	25 (41.67)	31 (51.67)	56 (46.67)	15 (25.00)	24 (40.00)	39 (32.50)	2.46	2.66	1.89	2.56
Air out dry cleaned clothes	15 (25.00)	20 (33.33)	38 (31.67)	9 (15.00)	15 (25.00)	24 (20.00)	2.36	2.46	0.79	2.41
Don't use artificial fragrances	12 (20.00)	35 (58.33)	47 (39.17)	8 (13.33)	27 (45.00)	35 (29.17)	2.20	2.37	1.07	2.29

*Multiple responses
Figures in parentheses indicate percentages.
3 point Scale: Always= 3, Sometimes= 2, Rarely=1
* indicate significance of value at P=0.05

visitors. Punjab being a state, where smoking is considered highly objectionable habit and otherwise also smoking in public areas has been banned by the government; this practice was actually successful. Uses of indoor plants, natural fresheners, and artificial air fresheners were also followed by 34.17 and 30.00 per cent respondents respectively. Least followed practice was: avoiding wood or charcoal burning indoors. These practices were more prevalent in urban families except for 'use of fuel' for which more rural respondents agreed to.

It can be seen in the Table 2 that the most frequently followed practices was 'no wood/charcoal burning' (mean score 2.83) as disclosed by both urban and rural respondents and also 'no indoor smoking' (mean score 2.84), use of air fresheners (mean score 2.46) and use of indoor plants and natural fresheners (mean score 2.41). These practices were followed more frequently by urban respondents as compared to their rural counterparts.

The difference between the rural and urban respondents regarding provision of adequate ventilation was found to be statistically non-significant.

Dust management practices adopted to combat indoor pollution :

Information was gathered to know the awareness of the respondents regarding prevalent dust management practices. It can be seen in Table 3 that maximum number of (66.67%) respondents were aware that one must keep foot mat at the entrance. Large number of respondents (64.17%) also had the knowledge that by cleaning hidden dirt frequently (both interior and exterior) indoor pollution can be curtailed. A little more than a half (63.33%) of the respondents had the knowledge that one has to wash oily and dirty items in hot water. Almost half of them (48.33%) further agreed that they were aware that use of micro fibre mop more frequently in abating indoor pollution. Minimum awareness was for 'dusting of rugs/carpet/ bedding/sofa' and 'use vacuum cleaner' as disclosed by 35.83 per cent and 41.67 per cent respondents, respectively. It was also revealed in the table that urban respondents had higher awareness (of all listed practices) as compared to their rural respondents.

It can be observed from Table 3 that, those who were more aware also used the practice more. Less than three fourth of respondents (64.17%) washed oily and dirty items in hot water in their home, followed by 58.33 per cent respondents who were found using foot mat at the entrance for improving indoor quality. Almost half of them (56.67%) were in practice of cleaning hidden dirt frequently (of their wall hangings), followed by 35.00 per cent respondents who were using micro fibre mop. Minimum followed practices were 'dusting of rugs, carpet, bedding, sofa' as reported by (27.50%) respondents and 'use vacuum cleaner' as revealed by (29.17%) respondents.

It can also be observed from Table 3 that most frequently followed indoor pollution abatement practice was by the use of foot mat at the entrance (mean score 2.69) followed by washing of oily and dirty items in hot water, cleaning hidden dirt frequently and use vacuum cleaner (mean scores 2.67, 2.57 and 2.56, respectively). Least frequently followed practice was 'using micro fibre mop with mean score 2.50, followed by practice of dusting of rugs, carpet, bedding, sofa etc' (mean score 2.49). It can also be concluded that urban respondents took lead in using ventilation related management practices and their frequency of use was also higher as compared to their rural counterparts.

The difference between the rural and urban respondents regarding dust management practices *i.e.*, use of fiber mop and dusting of rugs, carpets, bedding, sofa was found statistically significant at 5 per cent and 1 per cent level of significance, respectively. As regards for other mentioned dust management practices difference was found to be statistically non-significant.

Miscellaneous practices adopted to combat indoor pollution :

Information was gathered to know the awareness of the respondents of other non-listed miscellaneous indoor pollution abatement practices. It can be seen in Table 4 that majority of the respondents (68.33%) were aware of keeping kitchens and bathrooms dry, immediately after the use, is the best option. One third (65.83%) respondents knew of airing quilts, blankets etc., for indoor air freshness and 64.17 per cent respondents were aware of airing the woolen clothes and further 62.50 per cent respondents had the knowledge of covered drain for reducing indoor pollution. Little more than half (58.33%) respondents were aware of using wire mesh on windows and doors, with which air quality can be improved more effectively. Almost half of the selected respondents (51.67%) were aware of airing new furniture, rugs, mattresses etc., 50.00 per cent respondents agreed that

they were aware of airing new paints and varnishes and further 46.67 per cent respondents agreed that they were aware of airing summer clothes before wearing to abate indoor pollution. Minimum awareness was for 'airing out dry cleaned clothes', 'attending leaking taps' and 'not to use artificial fragrances' are the effective ways to bring down indoor pollution as divulged by 31.67, 34.17 and 39.17 per cent respondents, respectively. It was also revealed in the table that urban respondents were having higher awareness of these practices as compared to their rural respondents.

As reported the use of practices mentioned in Table 4 that those respondents, who were more aware of a particular practice; use it more. Little less than three fourth of the respondents (62.50%) kept their kitchens and bathrooms dry and (64.17%) respondents knew of airing of quilts, blankets etc. Sixty per cent respondents further knew of airing woolen clothes and 48.33 per cent respondents were aware of using covered drain. Fifty per cent respondents were found using wire mesh on windows and doors followed by 30.83 per cent respondents who too had a practice to air new furniture, rugs, mattresses etc. Almost one third (31.67%) respondents knew of airing new paints and varnishes and 32.50 per cent had the knowledge about airing summer clothes before wearing to control or minimize indoor pollution. Minimum used practices were 'airing out dry cleaned clothes', 'attending leaking taps' and 'not to use artificial fragrances' as disclosed by 20.00, 20.83 and 29.17 per cent respondents, respectively.

It can be also be observed from Table 4 that most frequently followed indoor pollution abatement practice by the respondents was to keep the kitchens and bathrooms dry (mean score 2.75) followed by airing woolen clothes, airing quilts, blankets, use covered drain, airing new furniture, rugs, mattresses and air new paints and varnishes, with mean scores 2.70, 2.67, 2.65, 2.64 and 2.59, respectively. Least frequently followed practice was 'use wire mesh on windows and doors' with mean score 2.57, followed by practice of 'airing summer clothes before wearing' (mean score 2.56), 'not leaving leaking taps unattended' with mean score 2.44, 'airing out dry cleaned clothes' with mean score 2.41 and 'not to use artificial fragrances' with mean score 2.29. It can also be concluded that urban respondents took the lead in using management practices and their frequency of use was also much higher as compared to their rural counterparts. The difference between rural and urban homemakers for practices like unattended leaking pipes and airing new paints was statistically significant at 5 per cent level of significance and other mentioned practices were found to be statistically non-significant.

Conclusion :

Based on the findings of the study, it can be concluded that only some of the respondents from both the categories were aware about the different causes of indoor environment pollution. Although some respondents were taking some conscious steps to alleviate the impact of indoor pollution, yet very few of them were actually following many practices regularly for improving the indoor pollution.

REFERENCES

Grandjean, E. (1973). *Ergonomics of the home*. pp. 141-150. Taylor and Francis, LONDON, UNITED KINGDOM.

Hackshaw, A.K. (1998). Lung cancer and passive smoking. *Stat. Methods Med. Res.*, **7** : 119-136.

Nagi, G.K. (1993). Domestic noise pollution and its effect on inhabitants of Ludhiana district. M.Sc. Thesis, Punjab Agricultural University, Ludhiana, PUNJAB (INDIA).

Nagi, G.K. (1997). Noise pollution and its effect on inhabitants of Ludhiana district. Ph.D. Thesis, Punjab Agricultural University, Ludhiana, PUNJAB (INDIA).

WEBLIOGRAPHY

Anonymous (2013). Health effects of air pollution in Bangkok. Retrieved on 08-09-2014. *http://en.wikipedia.org/wiki/Particulates#cite_note-58.*