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ANALYSING PEOPLE'S BEHAVIOUR TOWARDS INDOOR AIR QUALITY MANAGEMENT: A CASE STUDY IN KANDY, KURUNAGALA AND HAMBANTHOTA

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ABSTRACT

Indoor air quality (IAQ) management is crucial for ensuring a healthy and comfortable living environment. This study aimed to assess people's behaviours on IAQ management by investigating their awareness, attitudes, and practices. A questionnaire-based survey was conducted to gather data on IAQ-related habits and practices of individuals in Kurunagala-Abanpola, Kandy-Bothota, and Hamabnthtoa-Thangalle. The sample population was 156. The awareness of respondents regarding indoor air quality varied among the sampling locations. Awareness levels in Ambanpola, Bothtoa, and Thanagalle were 80%, 34.62%, and 82.14% respectively. Major sources of indoor air pollution also varied, with tobacco smoke usage (34.62%) and cooking emissions being predominant in Kandy-Bothota, while pollution associated with household cleaning products (32%) was identified as a major source in Kurunagala-Ambanpola. In contrast, cooking smoke (25%) and, cleaning products (21.43%) were identified as major indoor air pollutant sources in Hambanthtoa-Thangalle. In addition, outdoor activities such as the open burning of plastic waste, also impact indoor air quality. The majority of the respondents (42.31%) in the Kandy-Bothota region burned their plastic waste close to their dwellings, whereas the Kurunegala-Abanpola region had the lowest proportion, at 3.57%. The findings underscore varying levels of awareness among participants, largely attributed to a lack of information accessibility. The attitudes towards IAQ management were generally positive. However, the survey revealed that practical implementation of IAQ measures often fell short, indicating a gap between intention and behaviour.

Keywords: *Behaviours; Indoor Air Quality Management; Indoor Air Pollution; Indoor Air Quality.*

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1. INTRODUCTION

The quality of indoor air significantly impacts the health and well-being of individuals, since approximately 80-90% of their total time is spent in indoor environments (Kumar et al., 2022). The cumulative impact of both ambient air pollution and household air pollution accounts for 6.7 million premature deaths every year (World Health Organisation, 2022). Indoor air pollutants encompass a diverse range of elements, including particulate matter, biological agents (such as allergens, bacteria, mold, fungi, and spores), physical factors like temperature and electromagnetic fields, and over 400 distinct chemical compounds, predominantly volatile organic compounds (VOCs) and inorganic compounds (VICs Approximately one-third of the world's population, (nearly 2.4 billion people), depends on open fires or inefficient stoves fuelled by kerosene, biomass (including wood, animal dung, and crop waste), and coal for cooking, resulting in the production of detrimental household air pollution (World Health Organisation, 2022). Nearly 40% of all households, and a significant 90% of rural households in Low- and Middle-Income Countries (LMICs), primarily rely on biomass as their primary domestic energy source (Raju et al., 2020). Although over 80% of households in Sri Lanka have electricity access, the majority limit its usage primarily to lighting, predominantly influenced by cost considerations and cooking preferences (Chartier et al., 2017).

Traditional solid fuel burning methods, such as open fireplaces and unvented stoves, are inefficient and ineffective, more pollutants such as NO_2 and Carbon Monoxide (CO), as well as particulate matter, are emitted into the indoor environment (Zhang & Smith, 2003). Household pollutant concentrations can still rise in residences that do not rely on solid fuels, due to other prevalent heating and cooking methods (Raju et al., 2020). For instance, kerosene stoves and devices emit significant amounts of PM2.5, CO, NO_2, and SO_2 (Nandasena et al., 2013). Further to the authors, environmental tobacco smoke (ETS), commonly referred to as second-hand smoke (SHS) or passive smoke, is a combination of more than 4,000 chemicals, with more than 40 of them recognised as carcinogens in both vapour and particle phases. Vapor-phase numerous common household products such as personal care items, household cleaning products like finishes, rug and oven cleaners, paints, lacquers, paint strippers, pesticides, mosquito repellents, dry-cleaning fluids, building materials, and home furnishings can also be sources of indoor air pollutants (Nandasena et al., 2013). Further to the authors, very fine asbestos fibres can be released into the air when materials containing asbestos, such as roof sheets and insulation for heating systems, are utilised.

Indoor air quality is influenced by a variety of factors, including behavioural factors, housing characteristics, environmental conditions, and indoor and outdoor pollution sources. The levels of indoor air pollutants can be influenced by the presence of outdoor air pollution arising from both human activities and natural occurrences, such as emissions from road traffic, wildfire smoke, and the resuspension of dust (Vardoulakis et al., 2020). Moreover, sources of pollutants and their emission rates undergo rapid changes over time (González-Martín et al., 2021). These sources include both constant contributors, such as building materials, adhesives, paints, and varnishes, as well as occasional ones like furniture, cleaning and disinfection products, cooking, personal care products, and even human metabolism (González-Martín et al., 2021). Additionally, the intrusion of outdoor pollutants is strongly dependent on human activities like road traffic and industrial processes (González-Martín et al., 2021). Lastly, indoor gas-phase reactions among various compounds present in indoor air can also lead to the formation of secondary pollutants (González-Martín et al., 2021). Multiple adverse respiratory health outcomes such as preterm birth, low birth weight, compromised lung function, childhood respiratory infections, an elevated risk of developing conditions like asthma, chronic obstructive pulmonary disease (COPD), lung cancer, and worsening of existing respiratory ailments have been linked to Household Air Pollution (HAP) in LMICs (Raju et al., 2020). This study aimed to assess indoor air quality awareness, perceptions, knowledge gaps, motivators and barriers, and attitudes toward management. It also examined the impact of health events, technology adoption, policy awareness, and the effectiveness of educational campaigns.

2. MATERIALS AND METHOD

2.1 STUDY AREA SELECTION

This study aimed to investigate the perception of the rural population towards indoor air quality. So, Bothota in the Kandy district, Tangalla in the Hambanthota district, and Ambanpola in the Kurunegala district were selected for this study (Refer to Figure 1).

Figure 1: Areal view of the study area (Google Earth)

The selection of Kandy, Kurunegala, and Hambantota for studying people's behaviour towards indoor air quality management is influenced by their diverse geographical and climatic conditions, different air quality challenges, and cultural and behavioural insights. Kandy, in the central highlands, has a cooler, humid climate. Kurunegala, in the North Western Province, has a temperate, relatively dry climate. Hambantota, in the southern coastal region, experiences a hot, arid climate. These locations also represent varied socioeconomic statuses and demographic profiles, allowing for a comprehensive understanding of indoor air quality management across different community settings. This selection ensures a thorough analysis of environmental, social, and economic contexts, leading to more generalisable findings. A questionnaire-based study was conducted to collect data on indoor air quality.

2.2 DATA COLLECTION

A population of 156 respondents was selected. 52 respondents were selected from each sampling location. The questionnaire consisted of 6 main sections with 68 questions, Section 1 - demographic information (Q1.1-1.7); Section 2 - awareness and knowledge about indoor air quality and Management (Q2.1-Q2.7); Section 3 - sources of indoor air pollution (Q3.1-3.30); Section 4 - potential health impacts (Q4.1-4.5); Section 5 - indoor air quality management practices (Q5.1-5.8) and Section 6 - future considerations (6.1-6.2). Section 3 identified various sources of indoor air pollution that the respondents might encounter. The survey was conducted both physically and virtually to accommodate different preferences and accessibility issues. The questionnaires were initially written in English and then translated into Sinhala to ensure better understanding and accurate responses from the participants. Data collection took place over two weeks in September 2023.

3. RESULTS AND DISCUSSION

3.1 DEMOGRAPHIC CHARACTERISTICS

Table 1 provides the demographic characteristics of the surveyed population across different areas.

Table 1: Demographic information

Demographic features		Kandy (Bothota)	Kurunegala (Abanpola)	Hambanthota (Tangalle)
Gender	Female	62.75%	52.94%	59.62%
	Male	37.25%	47.06%	40.38%
Age	15-30	31.37%	70.59%	86.27%
	30-45	23.53%	33.33%	13.73%
	45-60	5.88%	7.84%	0%
	60-75	7.83%	0%	0%
Residence	Rent	58.82%	19.61%	5.88%
	Own	31.37%	68.63%	94.11%
	Other	29.41%	11.76%	0%
Highest education qualifications	Advanced level	35.29%	70.59%	49.02%
	Bachelor’s degree	17.65%	23.53%	45.1%
	Master’s degree	7.84%	0%	0%
	Doctorate	1.96%	0%	0%
	Other	52.94%	5.88%	5.88%
Where do you spend most of your time?	Home/boarding place	33.33%	60.78%	86.27%
	Workplace	23.53%	27.45%	9.08%
	Outdoor environment	33.33%	11.76%	3.92%

3.2 AWARENESS AND KNOWLEDGE

Kurunegala-Ambanpola showed the lowest level of awareness (11.76 %) of indoor air quality. In Bothota 34.62% of respondents expressed awareness of indoor air quality, and 15.38% admitted to a lack of awareness. In contrast, Hambanthota-Tangalle had a significantly higher awareness level, with 84.31% of respondents reporting awareness. In the Kurunegala-Ambanpola area, 29.41% of respondents had encountered health problems attributed to indoor air quality. In Kandy-Bothota (54.32%) of respondents reported health issues associated with indoor air quality, Tangalle exhibited a different pattern, with 23.53% of respondents indicating health issues. Kurunegala-Ambanpola indicated the highest level of awareness (90.2%) of indoor air pollutant sources. In Kandy-Bothota the situation contrasted with the lowest level of awareness of indoor air pollutant sources (17.08%). Respondents in Hambanthota-Tangalle exhibited a significant level (68.63%) of awareness of indoor air pollution. These findings provide valuable insights into the varying degrees of awareness and understanding of the significance of indoor air quality among different regions. The findings underscore the divergence in attitudes and apprehensions across the surveyed areas.

As shown in Figure 2, factors that were identified as potential influencers on indoor air quality varied across the surveyed areas.

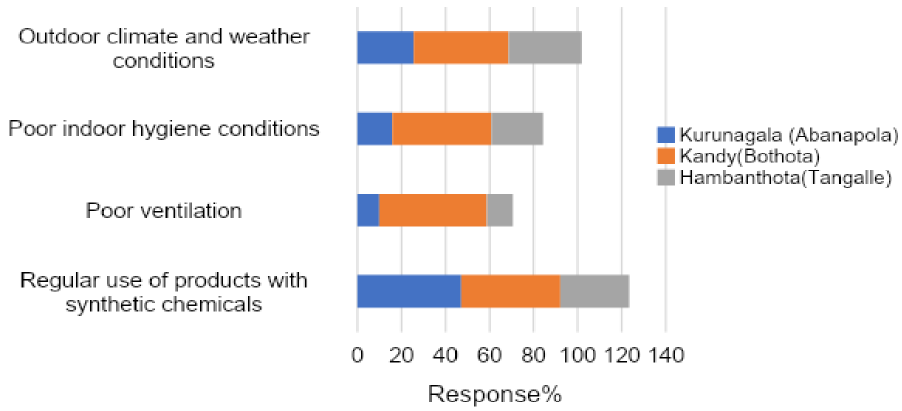

Figure 2: Factors affecting indoor air quality

In Ambanpola, 28% of respondents attributed the regular use of products containing synthetic chemicals as a factor affecting indoor air quality. Additionally, 12% identified poor ventilation, 24% cited poor indoor hygiene conditions, and 32% recognised outdoor climate and weather conditions as contributors to indoor air quality. In Bothota the figures showed a slightly different perspective, with 19.23% of respondents attributing synthetic chemical products, 19.23% acknowledging poor ventilation, 26.92% associating poor indoor hygienic conditions, and 38.46% pointing to outdoor climate and weather conditions as factors impacting indoor air quality.

In Hambanthota-Tangalle area, 35.71% associated synthetic chemicals, 14.29% acknowledged poor ventilation, 21.43% recognised poor indoor hygiene conditions, and 28.57% cited outdoor climate and weather conditions as factors affecting indoor air quality. These findings shed light on the multifaceted nature of factors perceived to impact indoor air quality, emphasising the importance of understanding regional variations in perceptions and awareness.

3.3 INDOOR AIR POLLUTION SOURCES

The data provided in Figure 3, as reported by the respondents, reveals the sources of indoor air pollution across different areas.

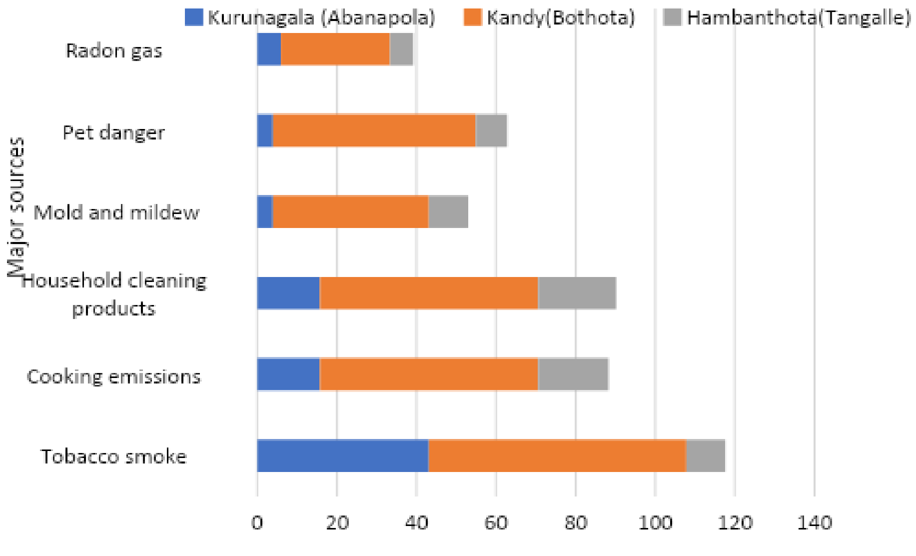

Figure 3: Major sources of indoor air pollution according to the responded population

Notably, the Kandy-Bothota area exhibits a higher prevalence of tobacco smoke usage, accounting for 34.62% of respondents, and it also records the highest percentage of cooking emissions. Interestingly, an equal number of respondents, approximately 8% identified, pet dander, mold, and mildew as sources of indoor air pollution. In Kurunagala-Ambanpola, pollution associated with household cleaning products (32%) can be identified as the major source of indoor air pollution. In contrast, cooking smoke (25%) and cleaning products (21.43%) were identified as major indoor air pollutant sources. Furthermore, most respondents (53.85%) in the Kandy-Bothota area used biogas for cooking while Kurunegala-Ambanpola reports a substantial 84% usage of LPG gas, and Hambanthota-Tangalle records 82.14% usage of LPG gas (Refer to Figure 4).

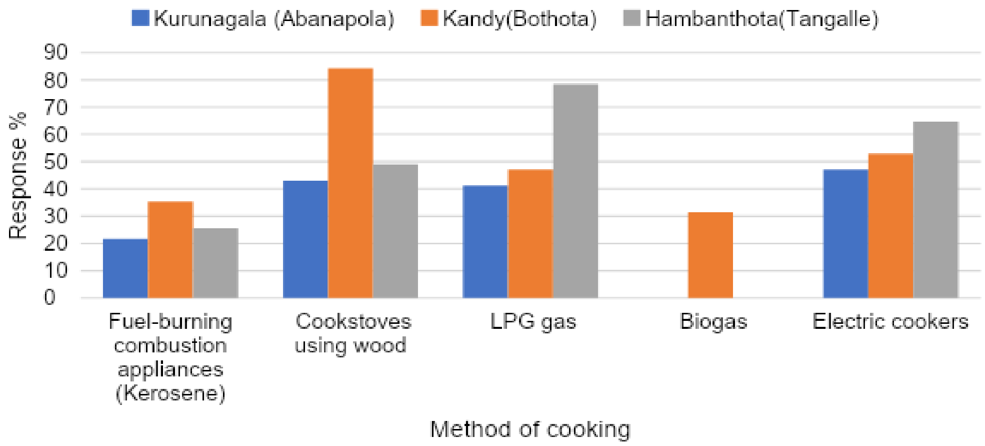

Figure 4: Methods of cooking foods of the respondent population

When cooking with traditional solid fuels over open flames or in traditional cooking stoves, exposure lower-income individuals can lead to ambient concentrations exceeding ten times the allowed EPA level in a 24-hour period (150µg/m^3) (Duflo et al., 2008). In comparison to burning solid fuels, burning gaseous fuels in basic machines results in a greatly reduced pollution emission. This comprises carcinogens such as benzene, 1,3-

butadiene, and polycyclic aromatic hydrocarbons, as well as CO, particulate matter (PM), and volatile organic chemicals that irritate the eyes (such as aldehydes) (Zhang & Smith, 2003).

Additionally, the concentration of pollutants is influenced by kitchen attributes such as ventilation, the existence of a chimney, and the design of the stove (Nandasena et al., 2013). Sri Lanka predominantly employs two types of stoves: traditional stoves and improved cook stoves, exemplified by the "Anagi" stove (Nandasena et al., 2013). Traditional stoves, crafted by users from locally sourced materials like the "three stone stove", have been a fixture in households for generations. In contrast, Anagi stoves are commercially produced lightweight clay units capable of accommodating one or two cooking utensils simultaneously (Nandasena et al., 2013).

According to a study conducted by Phillips et al (2016), indoor PM2.5 concentrations typically exceeded personal concentrations, especially when the stove lacked a chimney, trapping smoke inside the structure. For instance, an Anagi stove used without a chimney yielded an indoor PM2.5 concentration of 222 $\mu g/m^3$. Women who utilised Anagi stoves with chimneys in cooking areas integrated with their homes had the lowest personal exposures, measuring 47 $\mu g/m^3$. In contrast, those who relied on traditional stoves without chimneys in separate structures faced the highest PM2.5 concentrations, reaching 216 $\mu g/m^3$(Phillips et al., 2016). Approximately 50% of the respondents in both Kurunagala (Abanpola) and Kandy (Bothota) use polythene to initiate the flame in their wooden furnaces. 27.47% of respondents in Hambanthota-Tangalle use polythene to initiate the flame in their furnaces. Solvents, microplastics, and hazardous gases are released into the air during the burning of polythene in cooking stoves (Handley, 2022). These findings shed light on the diverse sources of indoor air pollution in various regions, highlighting the need for targeted interventions and awareness campaigns to address these concerns. The prevalence of indoor air pollution sources, beyond the primary ones, is detailed in Table 2.

Table 2: Other sources of indoor air pollution

Source		**Percentage of the responded population**		
		Kurunagala (Abanapola)	**Kandy (Bothota)**	**Hambanthota (Tangalle)**
Wooden furniture		76.47	66.67	62.75
Wall paintings		17.65	47.06	49.02
Disinfection agents		15.69	58.82	13.73
Air fresheners		49.02	54.90	50.98
Personal care products	Perfumes	76.47	62.75	82.35
	Nail polish removers	39.22	45.10	39.22
	Nail polish	45.10	37.25	39.22
	Hair sprays	9.80	56.86	23.53
	Deodorants	47.06	60.78	72.55

Most respondents across all three locations reported having wooden furniture in their households. In Bothota-Kandy and Tangalle-Hambanthota, 47.06% and 49.02% of respondents, respectively, reported having wall paintings in their homes, whereas only

17.65% of respondents in Abanpola-Kurunagala reported the same. Bothota-Kandy recorded the highest use of disinfection agents at 58.82%, while Tangalle-Hambanthota had the lowest at 13.73%. Approximately 50% of respondents in all three locations use air fresheners. Additionally, the use of personal care products such as perfumes, nail polish, nail polish removers, hair sprays, and deodorants was more prevalent among respondents in Bothota-Kandy than in the other two locations.

Awareness of respondents regarding the indoor air pollution associated with personal care products varied from 60.78% (Kurunegala-Abanpola), 58.82% (Kandy-Bothota), and 33.33% (Hambanthota-Tangalle) respectively. Awareness of respondents regarding the indoor air pollution associated with the use of grilling machines under poor ventilation conditions varied from 80.39% (Kurunegala-Abanpola), 56.86% (Kandy-Bothota)- and 35.29% (Hambanthota-Tangalle) respectively.

Incense materials have been employed for centuries in Asia for ceremonial and indoor fragrance purposes. However, many individuals remain unaware of the potential indoor air quality issues associated with incense smoke (Verma et al., 2016). The burning of incense can lead to a slow and incomplete combustion process, resulting in the emission of dense smoke, which in turn contributes to indoor air pollution concerns (Verma et al., 2016). The use of incense sticks was also high in the Kurunagala-Amanpola area compared to the remaining areas. Most of the respondents (65%) in Kurunagala-Amanpola burned incense sticks daily while the lowest daily burning (25%) was recorded in the Kandy-Bothota area (Refer to Figure 5).

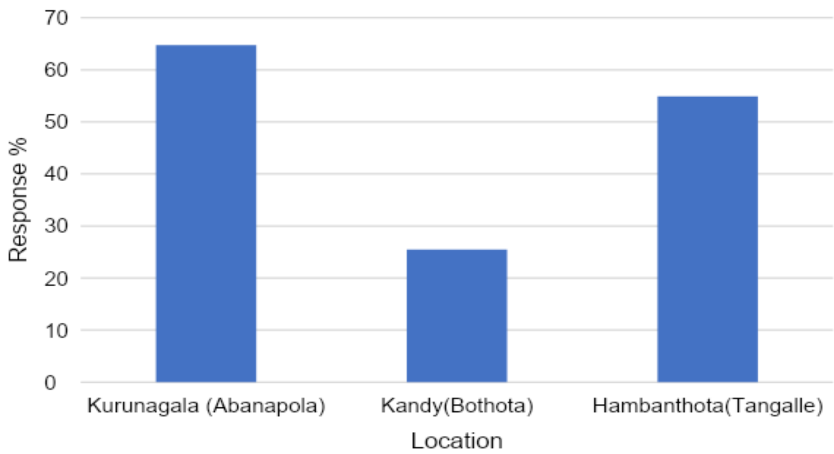

Figure 5: Daily use of incense sticks of the respondent population

Awareness of respondents regarding the indoor air pollution associated with burning incense sticks can act as indoor air pollution varied 60.78% (Kurunegala-Abanpola), 31.37% (Kandy-Bothota)- and 88.24% (Hambanthota-Tangalle) respectively. Mosquito coils are commonly used in Asia to repel mosquitoes (Verma et al., 2016). These coils typically contain pyrethrin insecticides, which play a crucial role in their effectiveness but pyrethrins have low chronic toxicity for humans (Verma et al., 2016). However, the combustion of the remaining materials in mosquito coils generates significant amounts of particulate matter (Verma et al., 2016). The toxicological effects of inhaling mosquito coil smoke can lead to health issues such as asthma, lung cancer, and persistent wheezing in children (Verma et al., 2016). In contrast, Kandy-Bothota exhibits a higher prevalence at 58.82%, while Hambantota-Tangalle and Kurunegala-Ambanpola record the lowest percentages at 23.53% and 25.49%, respectively. The highest daily burning of mosquito coils was recorded in Kandy-Bothota at 27.45%, while the lowest was recorded in Kurunegala-Ambanpola at 3.92%, as shown in Figure 6.

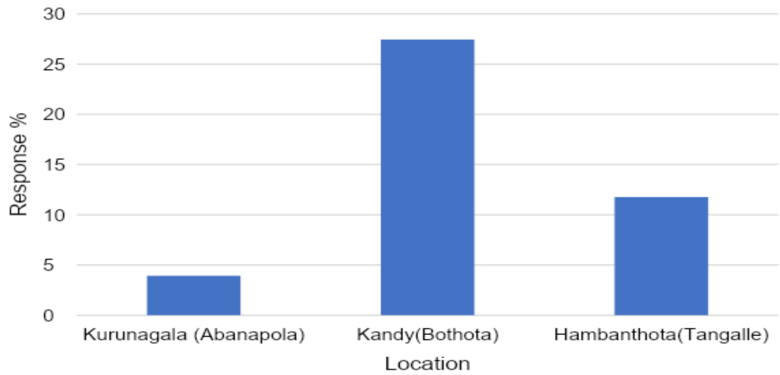

Figure 6: Daily use of mosquito coils of the respondent population

No respondents in Kurunagala-Amanpola observed tobacco smoking inside their houses. In contrast, Kandy-Bothota exhibited the highest percentage (52.94%) of tobacco smoking inside their house. Few respondents (5.88%) observed tobacco smoking inside their house in Hambantota-Tangalle. In addition to sources in the indoor environment, outdoor air pollution also influences indoor air quality. For instance, outdoor activities such as the open burning of plastic waste also impact indoor air quality. Most of the respondents (56.81%) in the Kandy-Bothota region burned their plastic waste close to their dwellings. 7.84% of respondents burnt plastic waste at a very short distance to their house in Kurunagala-Bothota In contrast, the Hambanthota-Tangalle region, has the lowest proportion, at 3.92%. In, Kandy-Bothota, respiratory problems have been reported in 35.29% of residents due to the open burning of plastics. 27.45% of respondents in Kurunagala-Abanpola reported respiratory illness related to the open burning of plastics. In contrast, Hambanthota-Tangalle displays the majority 43.14% with relation to health difficulties. Appropriate ventilation techniques are being used to lessen the amount of contaminated air coming from Tangalle, which accounts for 41.18% of the total, Bothota for 60.78%, and Ambanpola for 64.71%. Roofs were covered with asbestos in houses of 66.67%, 68.63%, and 50.98% of respondents in Kurunagala (Abanpola), Kandy (Bothota), and Hambanthota (Tangalle) respectively. 68.63%, 64.71%, and 41.18% of respondents were aware of the harmful health impacts of asbestos sheets in Kurunagala (Abanpola), Kandy (Bothota), and Hambanthota (Tangalle) respectively. 72.55%, 60.78%, and 40.06% of respondents replace the damaged asbestos on their roofs in Kurunagala (Abanpola), Kandy (Bothota), and Hambanthota (Tangalle).

3.4 POTENTIAL HEALTH IMPACTS

The survey results also provided a comprehensive overview of respondents' awareness of health risks associated with indoor air pollution in various areas. In Ambanpola, 78.43% of respondents acknowledged their awareness of these potential health risks, while 19.61% were not cognizant of the health issues related to indoor air pollution. 52.95% and 37.25% of respondents exhibited awareness of these potential health risks in Kandy-Bothota and Hambanthota-Tangalle respectively. Interestingly, in the Bothota village of Kandy, a substantial 69.23% of respondents reported facing health risks due to indoor air pollution. Conversely, in the Hambanthota-Tangalle area, only 28.57% of respondents acknowledged these risks. Second, hand smoke, a notable source of indoor air pollution, also exhibited variations in awareness across areas. In Ambanpola 72% of respondents reported their awareness of secondhand smoke, while Kandy-Bothota had a lower awareness rate of 19.23%. Tangalle demonstrated a high level of awareness at 78.57%. In terms of allergies or sensitivities exacerbated by indoor air quality, respondents in Ambanpola (32%), Bothota (46.15%), and Hambanthota-Tangalle (32.14%) reported their awareness of this situation. These allergies commonly manifest as skin rashes, pollen allergies, and pet dander sensitivities.

Furthermore, the survey revealed the prevalence of health issues associated with poor indoor air quality. Kurunegala-Ambanpola reported that 60% of respondents had experienced health problems, primarily respiratory issues. Bothota displayed the highest rate at 92.31%. The long-term health effects of indoor air pollution, including respiratory disorders, cancers, and allergies, were recognised by 100% of respondents in Kurunegala-Ambanpola. In Kandy-Bothota 34.62% were aware of these risks, while Tangalle reported lower awareness rates of 92.86%, respectively. These differences in awareness levels can be attributed to varying levels of education and information dissemination about indoor air quality, highlighting the need for increased public awareness and concern for health issues related to indoor air pollution.

3.5 INDOOR AIR QUALITY MANAGEMENT PRACTICES

The preceding section delves into the measures adopted by respondents to mitigate indoor air pollution. Notably, in Kurunegala-Ambanpola, most respondents, accounting for 76%, reported the regular practice of ventilating their indoor spaces. This emphasises the significance of maintaining proper airflow as an effective method to combat indoor air pollution. Furthermore, 58.82%, 54.90%, and 41.17% of respondents have taken steps to reduce indoor air pollution from cooking or heating in Abanpola, Bothota, and Hambanthota respectively. 54.91%, 50.98%, and 50.98% of respondents use exhaust fans in their kitchens in Abanpola, Bothota, and Hambanthota. 62.75%, 50.98%, and 43.14% of respondents utilise chimneys to escape the polluted air in Abanpola, Bothota, and Hambanthota, respectively.

Table 3: Air quality management practices

Measures	Percentage of the responded population		
	Kandy (Bothota)	Kurunegala (Ambanpola)	Hambanthota (Tangalle)
Regular ventilating	58.82%	88.24%	70.59%
Air purifiers and filters	23.53%	7.84%	27.45%
Removing or reducing sources	60.78%	72.55%	47.06%
Natural cleaning product	47.18%	72.55%	54.90%
Control of dust and allergens-Mop hard floor	54.90%	92.16%	19.61%
Control of dust and allergens Dust and vacuum	39.22%	54.90%	92.16%
House plant to improve indoor air quality	52.94%	72.55%	52.94%
Modification to enhance indoor air quality (Sealing gaps, VOC product)	15.68%	15.68%	39.22%
Follow any guidelines or recommendations	74.51%	62.75%	33.33%

In contrast, a noteworthy observation was made in the Hambantota-Tangalle area, where 100% of respondents reported the practice of mopping hard floors. This underscores the simplicity and feasibility of employing methods such as floor cleaning and regular ventilation as part of daily routines to enhance indoor air quality. These practices, being relatively easy to implement, have the potential to mitigate the negative impacts of indoor air pollution. Encouraging the adoption of such daily practices can serve as an essential step toward improving indoor air quality and minimising its detrimental effects on health and well-being.

3.6 FUTURE CONSIDERATIONS

As previously noted, the interplay between outdoor air quality and indoor air quality is a complex issue with varying levels of recognition among respondents. In Abanpola-Kurunegala, 7.82% of respondents perceive outdoor air quality as a major factor influencing indoor air quality, compared to 50.98% in Bothota-Kandy and 3.92% in Tangalle-Hambanthota. This highlights the need for enhanced awareness and education regarding the interconnectedness of these two environmental factors. Furthermore, 19.61% of respondents in Abanpola-Kurunegala, 35.29% in Bothota-Kandy, and 17.65% in Tangalle-Hambanthota have received guidance or information on indoor air quality management from local authorities or health organisations. This underscores the necessity to implement strategies to increase awareness of indoor air quality among rural communities. Interestingly, the majority of respondents (60%) across all three locations sought information from academic institutions rather than relying on government agencies as their primary source of knowledge. This trend suggests a higher degree of trust in academic institutions and underscores their importance in disseminating information and raising awareness about air quality issues, both indoors and outdoors. Consequently, academic institutions have the potential to play a key role in educating the public and promoting measures to enhance air quality.

4. CONCLUSIONS

This study underscores the critical role of IAQ management in fostering healthy living environments. Through an examination of behaviours, awareness, attitudes, and practices related to IAQ among residents of Kurunagala-Abanpola, Kandy-Bothota, and Hambanthota-Thangalle, significant regional disparities have been uncovered. Awareness levels of IAQ varied widely, with Kurunagala-Abanpola and Hambanthota-Thangalle demonstrating high awareness (80% and 82.14%, respectively), while Kandy-Bothota exhibited notably lower awareness (34.62%). Despite generally positive attitudes towards IAQ management across all regions, there remains a notable gap between awareness and practical implementation of effective measures. The findings highlight this crucial gap, primarily attributable to limited access to information and resources. Thus, there is an urgent need to develop and implement targeted strategies aimed at bridging this divide, enhancing IAQ management practices, and promoting sustained behavioural changes. Addressing these disparities and fostering improved IAQ practices holds the potential to significantly enhance the health and comfort of rural communities.

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