

Pivot Table Analysis of Housing Conditions and Dampness Factors: Implications for Health and Well-being of Building Structure

¹Sonwane Dimpleben Prokashbai, ²Dr. Mujahid Faiyas Husain

^{1 & 2} SSBT College of Engineering and Technology, Jalgaon, Maharashtra

*Corresponding Author: dimple.sonwane1986@gmail.com

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Abstract

This research paper presents the findings of a survey conducted in Nashik, Maharashtra, aiming to assess housing conditions and indoor environmental factors and their implications for health and well-being. The survey collected feedback from 400 respondents and employed pivot table analysis to examine various aspects related to housing characteristics, maintenance history, structural integrity, indoor environmental factors, and their potential effects on occupants' health. The results shed light on the current housing conditions and provide valuable insights for policymakers, practitioners, and individuals seeking to improve housing quality and create healthier indoor environments.

Keywords: Housing conditions; Indoor environmental factors; Health implications; Well-being; Nashik, Maharashtra

1. Introduction

Housing conditions and indoor environmental factors play a crucial role in shaping the health and well-being of individuals and communities. The quality of housing and the indoor environment directly influence occupants' physical health, mental well-being, and overall quality of life [1]. Understanding the impact of these factors is essential for developing effective strategies to promote healthier living environments and improve public health outcomes. This research paper uses pivot table analysis to comprehensively analyze housing conditions and indoor environmental factors [2]. The study assesses various housing characteristics, maintenance history, structural integrity, and indoor environmental factors. By examining these factors, the study seeks to uncover their implications for health and well-being [3]. The survey was conducted in Nashik, Maharashtra, and gathered feedback from 400 respondents. The survey instrument included questions related to variables such as name, contact information, age, gender, profession, education, family structure, housing type, flooring, water tanks, number of floors, and other pertinent aspects. The questionnaire was designed to capture information about outdoor and indoor conditions, such as the age of the house, construction history, presence of dampness or leaks, condition of appliances, sunlight exposure, smoking habits, use of cleaning products, and presence of pets or indoor plants. Pivot table analysis was employed to analyze the collected data and derive meaningful insights. This analytical approach allows for cross-tabulating variables, facilitating the identification of correlations, trends, and patterns within the dataset. By leveraging pivot tables, the research aims to comprehensively understand the relationship between housing conditions, indoor environmental factors, and their potential implications for health and well-being.

The findings of this study are expected to provide valuable insights for policymakers, practitioners, and individuals seeking to improve housing conditions and create healthier indoor environments. The implications derived from the analysis will contribute to evidence-based decision-making processes and enable the development of targeted interventions to address housing-related health issues. Ultimately, the goal is to enhance the overall quality of life, promote well-being, and mitigate health risks associated with substandard housing conditions and unfavourable indoor environmental factors. In conclusion, this research sheds light on the critical role of housing conditions and indoor environmental factors in influencing health and well-being. By employing pivot table analysis, the study aims to assess these factors and their implications comprehensively.

2. Literature Review

The literature review highlights the substantial body of evidence demonstrating the significant impact of housing conditions on health outcomes. Substandard housing, characterized by inadequate ventilation, dampness, sanitation issues, and structural deficiencies, has been consistently associated with various adverse health effects [4]. Numerous studies have shown that individuals living in substandard housing are at an increased risk of respiratory diseases, allergies, asthma, and mental health problems found that housing conditions characterized by dampness and mould were associated with increased respiratory symptoms among occupants. Similarly, Howden-Chapman et al. (2007) demonstrated that housing improvement significantly reduced hospital admissions for respiratory infections in low-income communities [5]. In addition to housing conditions, indoor environmental factors have been identified as crucial determinants of health and well-being. Poor indoor air quality, resulting from factors such as insufficient ventilation, the presence of allergens or pollutants, and the use of tobacco products, can have detrimental effects on respiratory health, allergies, and lung function World Health Organization, (2010). For instance, the World Health Organization (2010) reported that exposure to indoor air pollutants, such as particulate matter and volatile organic compounds, contributes to the global burden of disease, particularly respiratory and cardiovascular conditions. Furthermore, Norbäck et al. (2013) found that exposure to indoor moulds and volatile organic compounds was associated with an increased risk of asthma and respiratory symptoms among children [6].

Moreover, the literature review emphasizes the presence of socioeconomic disparities in housing conditions. Lower-income households and marginalized communities are disproportionately affected by inadequate housing, including overcrowding, substandard construction, and limited access to basic amenities [7]. These disparities contribute to health inequalities, with individuals in disadvantaged housing situations experiencing higher rates of chronic diseases, mental health problems, and reduced overall well-being (Gee et al., 2008; Vize et al., 2021). For example, a study by Gee et al. (2008) revealed that racial and ethnic minority populations in the United States are more likely to live in substandard housing, contributing to health disparities among these groups [8].

Efforts to improve housing conditions and indoor environmental quality have involved various interventions and policy measures. Retrofitting initiatives, energy efficiency improvements,

and urban planning strategies have positively impacted housing conditions, indoor air quality, and residents' health outcomes conducted a systematic review and found that housing interventions, such as improved insulation and ventilation, improved respiratory health outcomes [9]. Additionally, policies targeting affordable housing, housing standards, and regulations can address housing-related health disparities and create healthier living environments for all. Berretta, Miriam et al (2021) examined the impact of housing policies on health and found that policies aimed at improving housing conditions were associated with reduced asthma-related hospitalizations and emergency department visits. Despite the existing research, research gaps still warrant further investigation [10]. The current study aims to contribute to the literature by utilizing pivot table analysis to comprehensively examine the relationship between housing conditions, indoor environmental factors, and their implications for health and well-being. By focusing on the specific context of Nashik, Maharashtra, the study seeks to provide localized insights and inform targeted interventions to improve housing quality, mitigate health risks, and promote overall well-being. By employing pivot table techniques, the study aims to uncover valuable insights and patterns within the collected data, enabling evidence-based decision-making processes for policymakers, practitioners, and individuals seeking to improve housing conditions and create healthier indoor environments.

In conclusion, the literature review underscores the critical role of housing conditions and indoor environmental factors in influencing health outcomes and well-being. The existing research highlights the detrimental effects of substandard housing conditions and poor indoor air quality on respiratory health, allergies, mental well-being, and overall quality of life. Addressing these issues through effective interventions and policies can help reduce health disparities and create healthier living environments for individuals and communities. The current study aims to contribute to this field of research by conducting a comprehensive analysis using pivot table techniques, generating valuable insights to inform evidence-based interventions and improve health outcomes related to housing conditions and indoor environmental factors.

3. Methodology

1. **Study Design:** The research employed a cross-sectional design to assess housing conditions and indoor environmental factors. A survey questionnaire was developed to collect data from the participants, focusing on various aspects related to housing characteristics, maintenance history, structural integrity, and indoor environmental factors. The survey was conducted in Nashik, Maharashtra, targeting a sample size of 400 respondents.
2. **Sampling:** A purposive sampling technique was utilized to select the participants. The sample included individuals residing in different housing types (rented, owned, living in parents' houses) and representing diverse demographic characteristics such as age, gender, profession, and education level. Efforts were made to ensure a representative sample by including respondents from various socioeconomic backgrounds.
3. **Data Collection:** The data collection process involved administering the questionnaire to the selected participants. The questionnaire consisted of multiple-choice and open-ended

questions covering various variables related to housing conditions and indoor environmental factors. The questions included inquiries about the number of people living in the house, age distribution, family income, housing type, flooring, water tanks, number of floors, maintenance history, and various indoor environmental factors.

4. **Data Analysis:** Pivot table analysis was employed to analyze the collected data. Pivot tables facilitate the tabulation and summarization of data by cross-tabulating variables, allowing for the identification of patterns, correlations, and trends within the dataset. The pivot table analysis enabled the exploration of relationships between housing conditions, indoor environmental factors, and their implications for health and well-being.
5. **Ethical Considerations:** Ethical guidelines were followed throughout the research process. Informed consent was obtained from all participants, ensuring their voluntary participation and confidentiality of their responses. The study adhered to ethical principles, maintaining the privacy and anonymity of the participants' personal information. Data were securely stored and used solely for research purposes.
6. **Limitations:** The study had specific rules that should be acknowledged. Firstly, the cross-sectional design limited the ability to establish causal relationships between housing conditions, indoor environmental factors, and health outcomes. Secondly, self-reporting bias might have influenced the accuracy of the responses provided by the participants. Additionally, the study was conducted in a specific geographical location (Nashik, Maharashtra), which may limit the generalizability of the findings to other regions.
7. **Data Interpretation and Reporting:** The data analysis findings were interpreted and reported comprehensively. The results were presented using descriptive statistics, tables, and charts to understand the housing conditions, indoor environmental factors, and their implications for health and well-being. Existing literature and research objectives guided the interpretation of the findings.

In conclusion, the methodology section outlines the study design, sampling approach, data collection procedures, analysis techniques, ethical considerations, and research limitations. Using pivot table analysis allowed a comprehensive exploration of housing conditions and indoor environmental factors. By addressing ethical concerns and ensuring data validity and reliability, the study aimed to generate reliable and meaningful insights into the relationship between housing conditions, indoor environmental factors, and their implications for health and well-being.

4. Results and Discussion

This research paper investigates the demographic profile, housing characteristics, family income and financial status, maintenance and construction history, structural integrity and dampness, and indoor environmental factors that impact the living conditions of households. The study examines the distribution of respondents based on age, gender, profession, education, and family structure. It also analyses housing type, size, flooring type, and the presence of elderly and young children. Furthermore, the research explores family income

classification, maintenance history, and the age of the house. It investigates structural integrity, dampness, and the presence of cracks. Additionally, the study assesses various indoor environmental factors such as the age of appliances, lighting, smoking habits, carpet usage, cooking stoves, presence of furniture, pets, indoor plants, and use of non-stick cookware. The findings of this research will provide valuable insights into the living conditions and environmental aspects of households, contributing to a better understanding of the factors that influence the quality of life in residential settings.

4.1. Demographic Profile

The survey results conducted in Nashik City for building audit and indoor air quality assessment reveal the distribution of respondents across different age groups. Among the respondents, 356 individuals (representing 71.2%) fall within the age range of 15-25. The age group of 26-35 constitutes 56 respondents, accounting for 11.2% of the total. Additionally, there are 16 respondents (3.2%) aged between 36 and 45, while eight individuals (1.6%) are above the age of 56. Lastly, the age group of 46-55 comprises six respondents, representing 1.2% of the total. These percentages provide an overview of the age distribution among the surveyed population and serve as a basis for further analysis of the building audit and indoor air quality assessment in Nashik City.

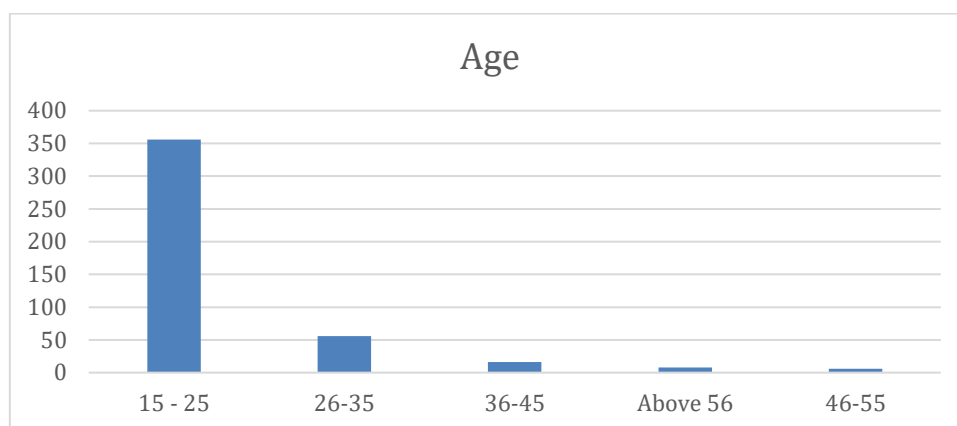


Figure 1: Distribution of Respondents by Age Group

The survey results indicate a relatively higher representation of males (56.1%) compared to females (43.9%) among the respondents. This suggests that there might be a gender imbalance in terms of participation in the survey. Further analysis could explore the potential reasons behind this gender disparity and its implications for the building audit and indoor air quality assessment in Nashik City.

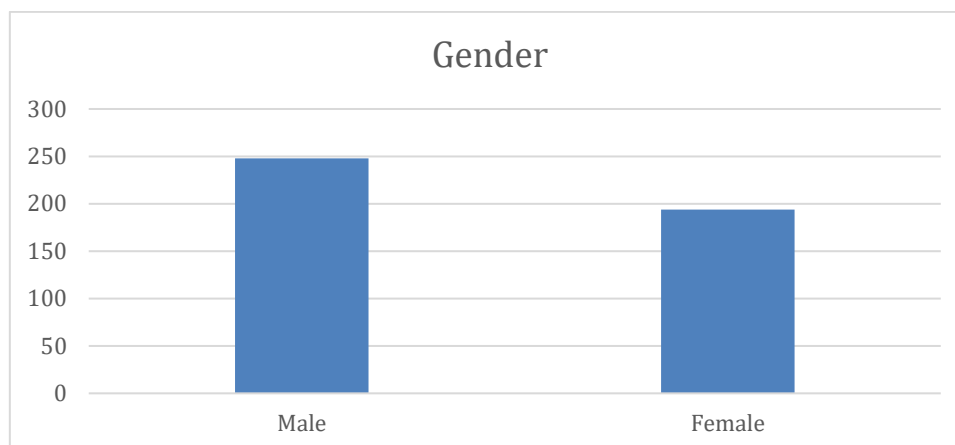


Figure 2: Distribution of Respondents by Gender

This figure displays the distribution of respondents in the survey conducted for building audit and indoor air quality assessment in Nashik City, categorized by their professions. The respondents include students, working professionals, individuals engaged in business, retirees, and homemakers (homemakers/husbands). Interpretation: The survey results reveal that most respondents (324 individuals, 72.7%) identified as students. Working professionals accounted for 92 respondents (20.6%) in the survey. A smaller number of respondents indicated their profession as a business (18 individuals, 4%), while retirees and homemakers (homemakers/husbands) were represented by 6 individuals (1.3%) and 2 individuals (0.4%), respectively.

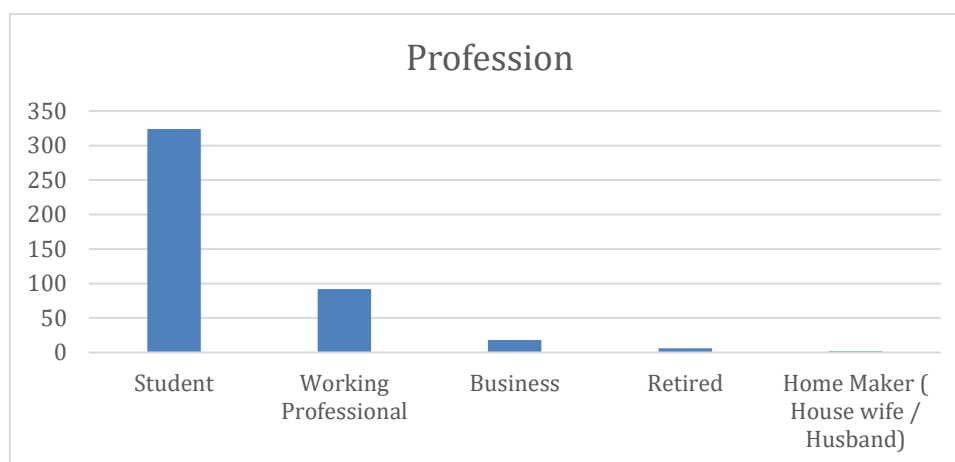


Figure 3: Distribution of Respondents by Profession

The survey results indicate that among the respondents, the highest number of individuals (314, representing 70.5%) reported having an Under Graduate level of education. Post Graduate-level education was reported by 70 respondents (15.7%), while Professional Diploma was indicated by 26 respondents (5.8%). A smaller proportion of respondents (32 individuals, 7.2%) reported their education level as High School. These findings suggest that a significant portion of the respondents in the survey have an Under Graduate education, followed by Post Graduate and Professional Diploma levels. The lower representation of individuals with a High School education may have implications for the building audit and indoor air quality

assessment in Nashik City. Further analysis can explore the relationship between education levels and the perceptions or behaviours related to building conditions and indoor air quality.

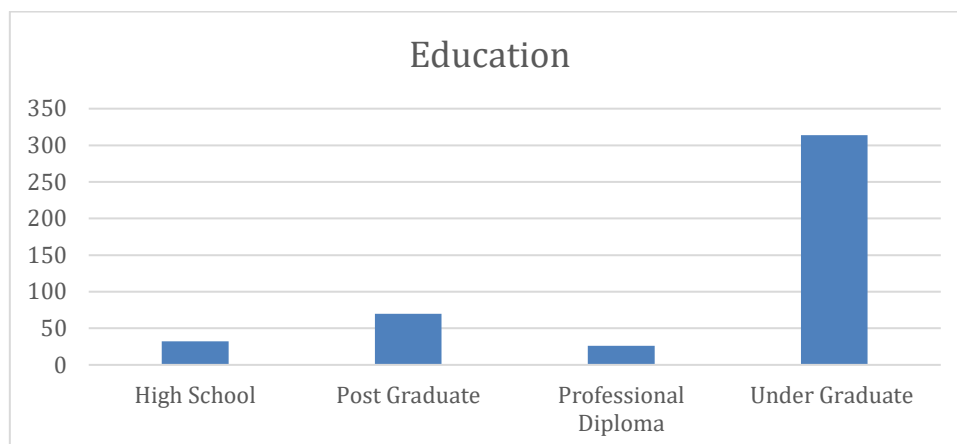


Figure 4: Distribution of Respondents by Education

The survey results reveal that the most significant proportion of respondents (144 individuals, 32.4%) reported being part of a Joint Family, which includes living with parents or in-laws. The Nuclear Family category consisted of husband and wife, with or without kids, accounting for 136 respondents (30.6%). Single individuals represented 122 respondents (27.4%) in the survey. The Two People only category, which includes individual people or roommates, had 28 respondents (6.3%). Smaller proportions of respondents reported living with specific family structures, such as 5 people only, With my Parents, grandmother and brother, 3 members in the family, and Hostel, each represented by 2 to 6 individuals.

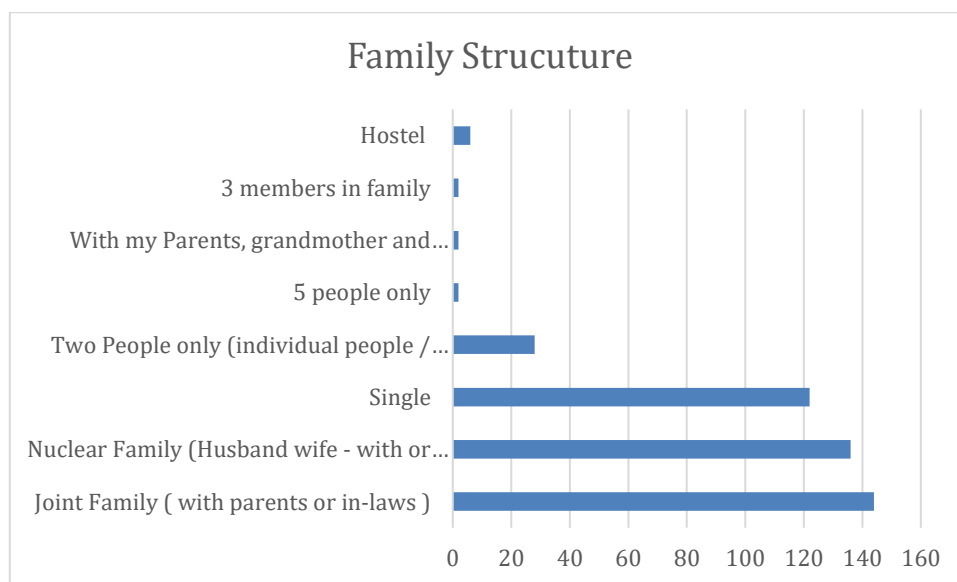


Figure 5: Distribution of Respondents by Family Structure

The survey results indicate that most respondents (228 individuals, 51.1%) reported living in houses with 3 to 4 people. The category of 5 to 6 people living in the house was indicated by 116 respondents (26%), while 56 respondents (12.5%) reported living in houses with 6 or more

people. A smaller proportion of respondents (42 individuals, 9.4%) reported living in houses with 1 to 2 people.

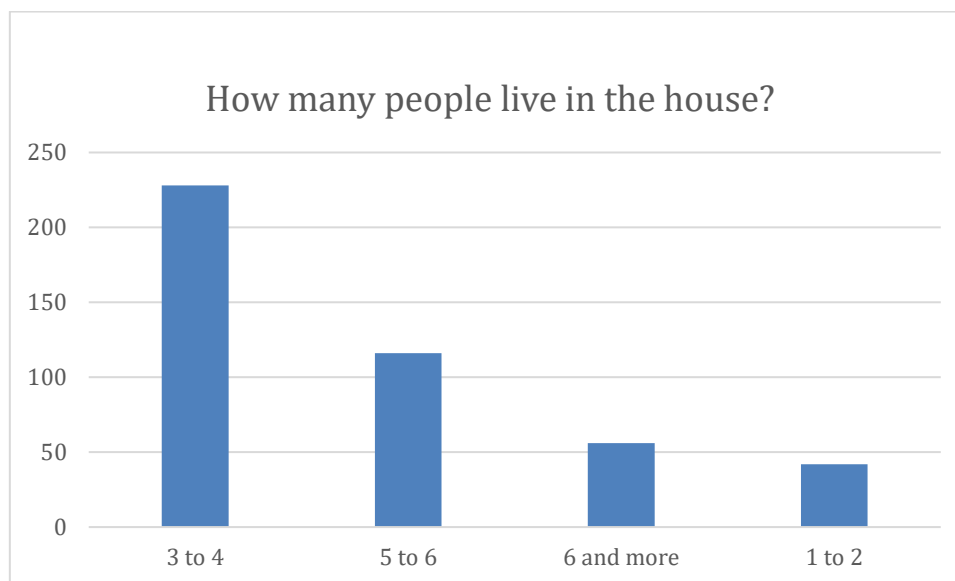


Figure 6: Distribution of Respondents by Number of People Living in the House

The demographic section of this research paper provides a comprehensive overview of the survey respondents' characteristics. The survey was conducted in Nashik City, and the findings reveal important insights into the demographic profile of the participants. Most respondents fall within the age range of 15-25, representing a significant portion of the sample population. In terms of gender, the survey captured a higher number of male participants compared to females. The distribution of respondents based on profession shows a substantial representation of students, followed by working professionals. In terms of education, a significant proportion of respondents reported having an Under Graduate level of education. Additionally, the survey collected information on family structure, revealing the prevalence of Joint Families and Nuclear Families. Understanding the demographic profile of the surveyed population is essential for analyzing the subsequent sections of the research paper and understanding the factors that influence building conditions and indoor air quality in Nashik City.

4.2. Housing Characteristics

A. Distribution of respondents based on housing type, size, and flooring type.

This figure presents the distribution of respondents in the survey conducted for building audit and indoor air quality assessment in Nashik City, categorized by their housing types. The housing type categories include Own, Living in Parents' house, Rent, and Hostel. The survey results reveal that many respondents (198 individuals, 44.4%) reported owning their houses. The category of Living in Parents' houses was indicated by 174 respondents (38.9%), while 68 respondents (15.2%) reported living in rented accommodations. A smaller proportion of respondents (2 individuals, 0.4%) indicated residing in hostels.

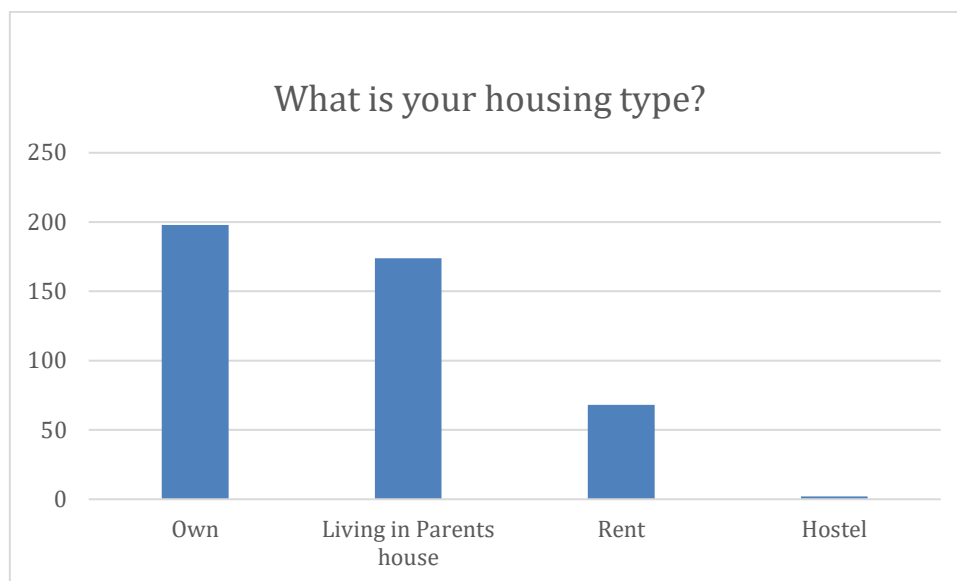


Figure 7: Distribution of Respondents by Housing Type

The survey results in Nashik City provide valuable insights into the distribution of housing types among the respondents. Most respondents (46.8%) reported living in flats, making it the most prevalent housing type. Bungalows were the second most common housing type, representing 34.6% of the respondents. Chawls, a type of multi-family housing, accounted for 5.2% of the respondents. A smaller proportion of respondents reported living in Mati cha ghar (clay houses) (1.6%) and houses with bamboo roofs (0.4%). These percentages highlight the diversity in housing types within the surveyed population. The dominance of flats and bungalows suggests a prevalence of urban or suburban residential areas, while the presence of chawls, clay houses, and houses with bamboo roofs signifies the existence of traditional or rural housing structures in the city. These findings contribute to a better understanding of the housing landscape in Nashik City, which is essential for assessing building conditions and indoor air quality within different types of residential settings.

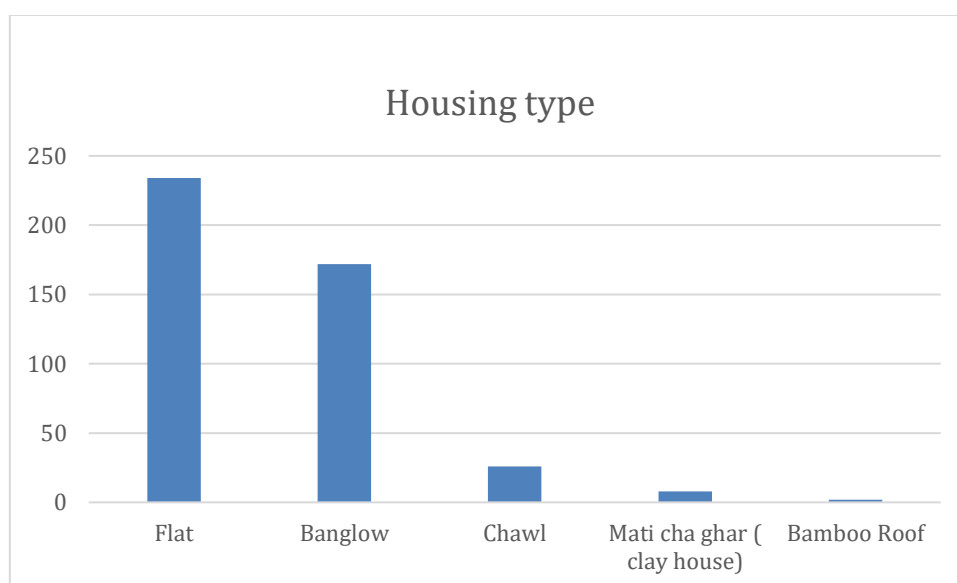


Figure 8: Distribution of Respondents by Housing Type

4.3. Maintenance and Construction History

The survey results regarding the age of houses among the respondents in Nashik City provide essential insights into the distribution of housing age groups. Among the participants, 42.6% reported their houses as 10 or older, while 22% indicated houses aged 5 to 10. Additionally, 15.3% reported living in houses under 5 years old. A significant portion of respondents (14.9%) stated that they did not know the age of their houses, with a further breakdown of 12.3% unsure whether their houses were old or new. These findings demonstrate the variety in the age of houses within the surveyed population and indicate the need for further investigation into the impact of house age on building conditions and indoor air quality.

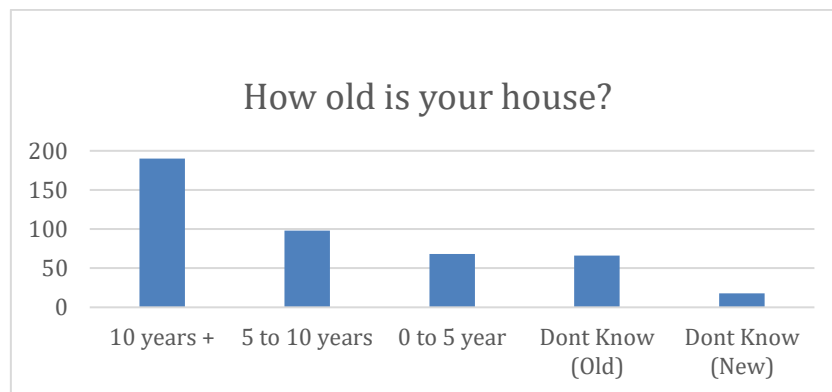


Figure 9: Distribution of Respondents by House Age

The survey results on the duration of residence in Nashik City provide insights into the length of time respondents have lived in their current houses. Most respondents (37.1%) reported living in their houses for 10 years or more, indicating long-term residency. A significant portion (28.7%) stated a duration of residence between 0 to 5 years, suggesting relatively newer occupants. 19.8% reported residing in their houses for 5 to 10 years, indicating a moderate duration of residency. A smaller proportion of respondents (7.0%) stated that they did not know the years they had lived in their houses, with a further breakdown of 6.5% unsure if their homes were old or new. These findings highlight the diverse duration of residence among the surveyed population and emphasize the importance of considering the impact of the length of occupancy on building conditions and indoor air quality.

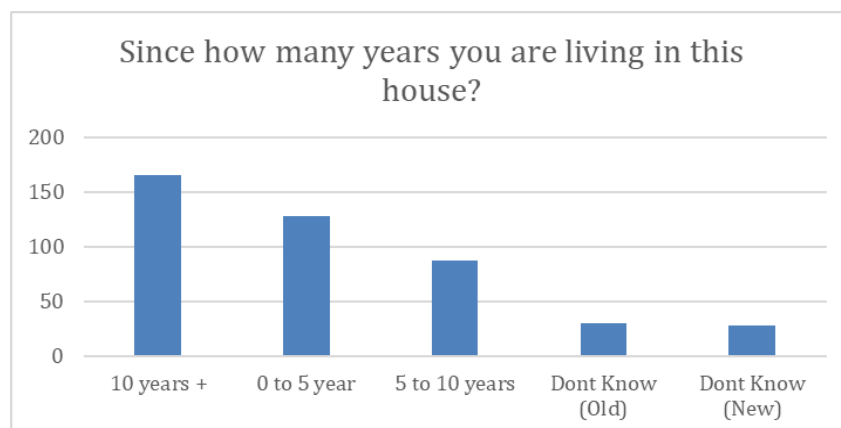


Figure 10: Distribution of Respondents by Years of Residence in the Current House

The survey results regarding the duration since the last construction activity in respondents' houses provide valuable insights into the maintenance and renovation patterns in Nashik City. Most respondents (35.3%) reported doing construction work in their houses within the last 0 to 5 years, indicating relatively recent renovations. A considerable proportion (18.7%) stated they did not know when the previous construction occurred, while 16.5% reported a construction duration between 5 to 10 years ago. Additionally, 14.3% mentioned having construction work done in their houses more than 10 years ago, suggesting long intervals between renovations. A smaller proportion (13.5%) indicated uncertainty regarding whether recent construction had taken place. These findings highlight the need for regular maintenance and construction activities in residential buildings to ensure the integrity and safety of the structures.

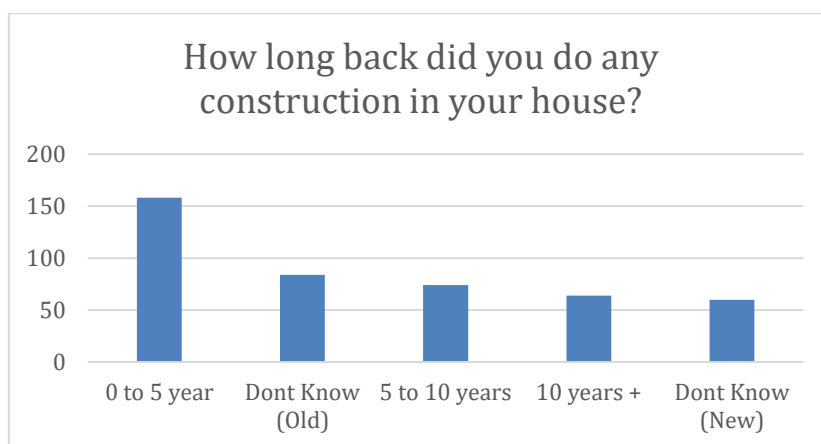


Figure 11: Distribution of Respondents by Duration since Last Construction in the House

The survey results regarding the duration since the last internal painting of respondents' houses provide insights into the maintenance and aesthetic upkeep of residential properties in Nashik City. Most respondents (54.2%) reported having painted the interiors of their houses within the last 0 to 5 years, indicating relatively recent paintwork. A smaller proportion (15.1%) stated they did not know when the last internal painting occurred. Additionally, 14.2% mentioned a duration of 5 to 10 years since the previous painting, while 9.9% reported a painting duration of more than 10 years ago. A small percentage (6.6%) indicated uncertainty regarding whether a recent painting had been done. These findings emphasize the importance of regular painting maintenance to preserve the appearance and condition of interior spaces.

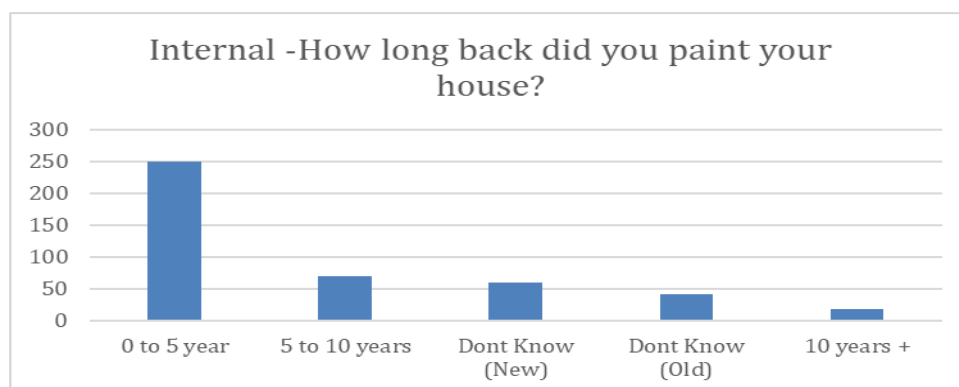


Figure 12: Distribution of Respondents by Duration Since Last Internal Painting of the House

The survey results regarding the duration since the last external painting of respondents' houses/buildings provide insights into the maintenance and visual appeal of the external facades in Nashik City. Among the respondents, 43.5% reported having painted the exteriors of their houses/buildings within the last 0 to 5 years, indicating relatively recent paintwork. A portion of the respondents (16.5%) stated that they did not know when the last external painting occurred, while 13.5% mentioned uncertainty regarding whether a recent painting had been done. Additionally, 13% reported a painting duration of 5 to 10 years, and 6.5% indicated a painting duration of more than 10 years ago. These findings emphasize the significance of regular external painting maintenance to enhance the aesthetics and protect the exterior surfaces of residential buildings.

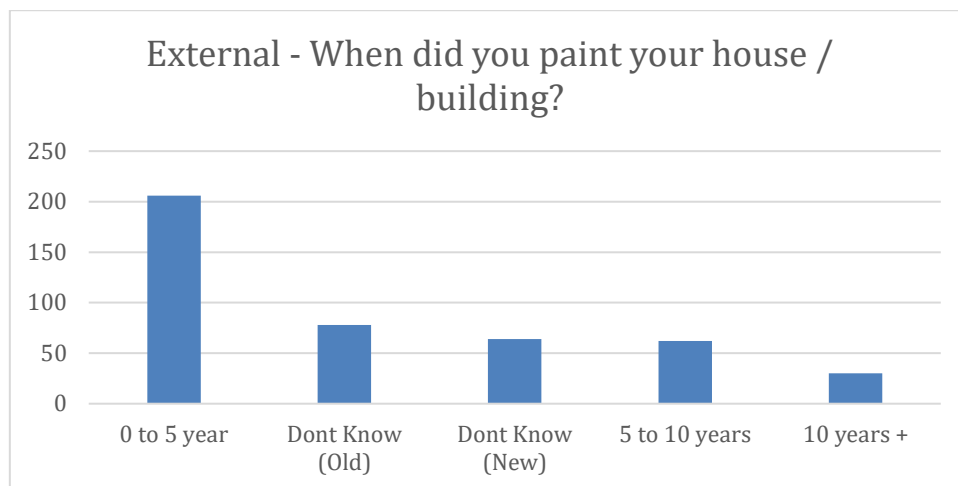


Figure 13: Distribution of Respondents by Duration since Last External Painting of the House/Building.

The survey results regarding the duration since the last painting of iron grills and doors with enamel paints in respondents' houses provide insights into the maintenance and preservation of these components in Nashik City. Most respondents (48.9%) reported having painted their iron grills and doors with enamel paints within the last 0 to 5 years, indicating relatively recent paintwork. A smaller proportion (17.4%) stated they did not know when the last painting occurred. Additionally, 15.5% mentioned a duration of 5 to 10 years since the last painting, while 14.5% reported a painting duration of more than 10 years ago. A small percentage (4.3%) indicated uncertainty regarding whether a recent painting had been done. These findings highlight the importance of regular painting maintenance for iron grills and doors to protect against rust and maintain their visual appeal.

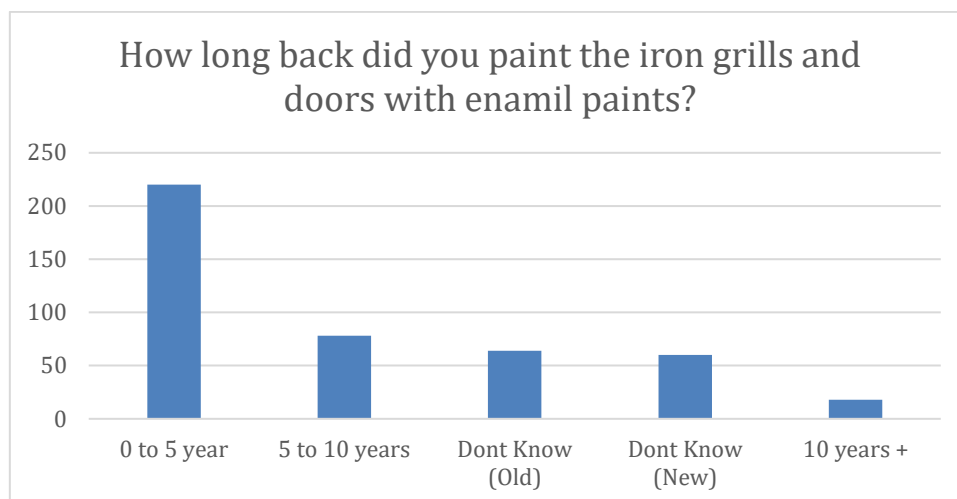


Figure 14: Distribution of Respondents by Duration since Last Painting of Iron Grills and Doors with Enamel Paints.

The results of the survey on the age of water pipes in respondents' houses provide insights into the longevity and potential maintenance needs of the water supply system in Nashik City. Among the respondents, 29.6% reported having water pipes that were 0 to 5 years old, indicating relatively newer installations. A significant portion (23.7%) said their water pipes were over 10 years old, suggesting the potential for ageing infrastructure. Additionally, 21.9% mentioned a duration of 5 to 10 years since the installation of their water pipes. Some respondents (13%) reported not knowing the age of their water pipes, with a further breakdown of 10.2% unsure if their water pipes were old or new. These findings highlight the importance of regularly inspecting and maintaining water supply systems to ensure their efficiency and reliability.

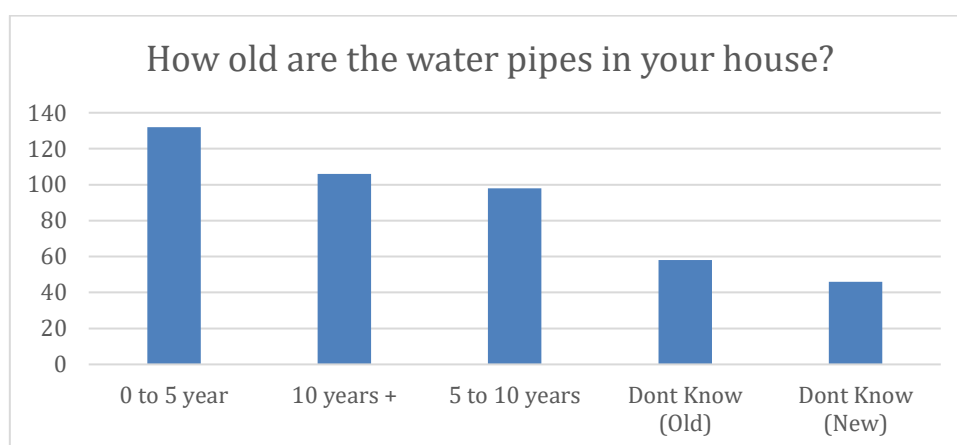


Figure 15: Distribution of Respondents by the Age of Water Pipes in the House

The survey results regarding the frequency of water tank cleaning among the respondents provide insights into the maintenance practices and hygiene standards related to water storage in Nashik City. Most respondents (65.3%) reported getting their water tanks cleaned within the last 0 to 5 years, indicating a relatively regular cleaning schedule. A smaller proportion (15.4%) stated they did not know when the previous cleaning occurred, while 8.6% mentioned

uncertainty regarding whether recent cleaning had been done. Additionally, 3.4% reported a cleaning duration of 5 to 10 years, and 1.7% indicated a cleaning duration of more than 10 years ago. These findings highlight the importance of regular water tank cleaning to ensure the quality and safety of stored water, as well as the need for increased awareness and adherence to proper maintenance practices.

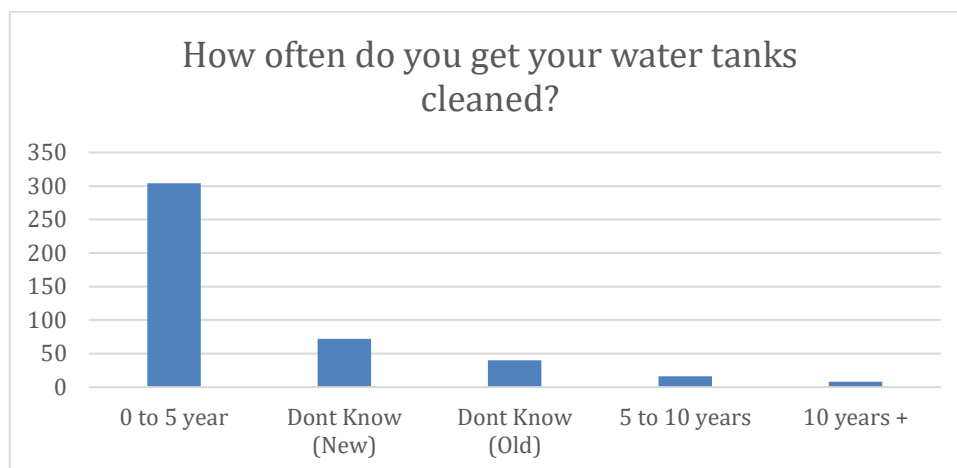


Figure 16: Distribution of Respondents by Frequency of Water Tank Cleaning

The survey results regarding the frequency of septic tank cleaning among the respondents shed light on the maintenance practices related to sewage systems in Nashik City. Among the participants, 45.2% reported getting their septic tanks cleaned within the last 0 to 5 years, indicating a relatively regular cleaning schedule. A significant proportion (17.6%) stated they did not know when the last cleaning occurred, while 11.7% mentioned uncertainty regarding whether recent cleaning had been done. Additionally, 7.6% reported a cleaning duration of 5 to 10 years, and 4% indicated a cleaning duration of more than 10 years ago. These findings highlight the importance of regular septic tank cleaning to prevent blockages, maintain proper functioning, and avoid potential health and environmental issues associated with inadequate sewage management.

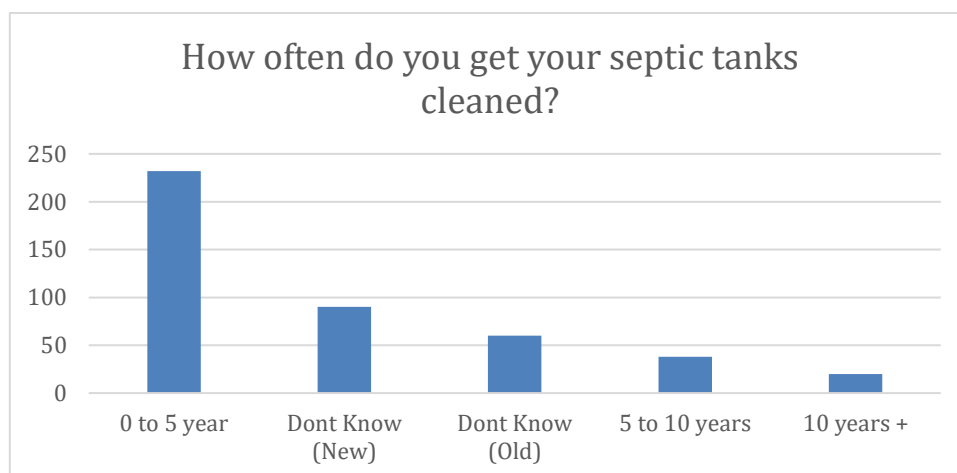


Figure 17: Distribution of Respondents by Frequency of Septic Tank Cleaning

The survey results on the timing of structural audits for buildings or bungalows among the respondents provide insights into the maintenance and safety measures taken in Nashik City. Among the participants, 31.2% reported conducting a structural audit within the last 0 to 5 years, indicating relatively recent assessments. A significant portion (26.7%) stated they did not know when the last audit occurred, while 21.8% mentioned uncertainty regarding whether an audit had been conducted. Additionally, 6.3% reported an audit duration of 5 to 10 years, and 5.9% indicated an audit duration of more than 10 years ago. These findings highlight the importance of regular structural audits to ensure the structural integrity of buildings and bungalows, particularly considering the potential risks associated with inadequate maintenance and ageing structures.

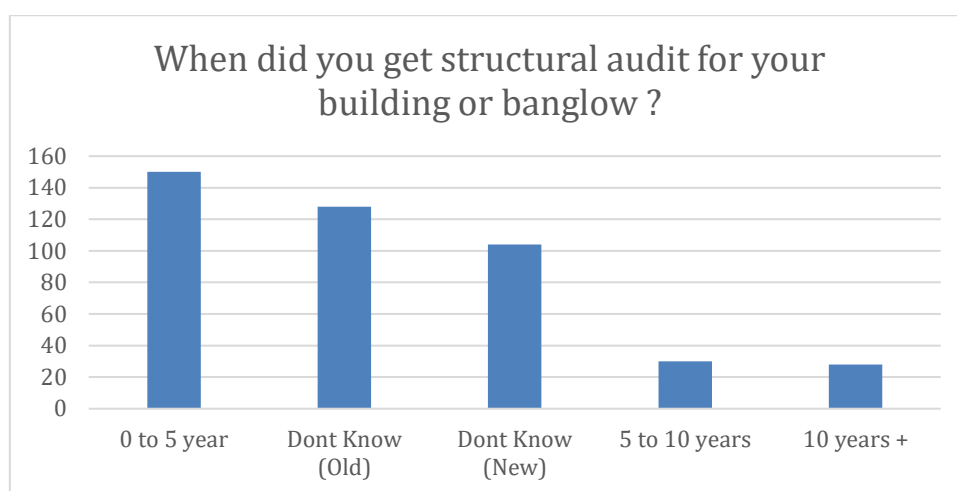


Figure 18: Distribution of Respondents by Timing of Structural Audit for Buildings or Bungalows.

The survey results regarding the timing of waterproofing for buildings among the respondents provide insights into the maintenance practices to prevent water damage and ensure structural integrity in Nashik City. Among the participants, 37.6% reported having conducted waterproofing within the last 0 to 5 years, indicating relatively recent protection measures. A significant portion (17.6%) stated they did not know when the last waterproofing occurred, while 14.4% mentioned uncertainty regarding whether waterproofing had been done. Additionally, 10.4% reported a waterproofing duration of 5 to 10 years, and 8% indicated a waterproofing duration of more than 10 years ago. These findings highlight the importance of regular waterproofing to safeguard buildings against water infiltration, dampness, and potential structural issues.

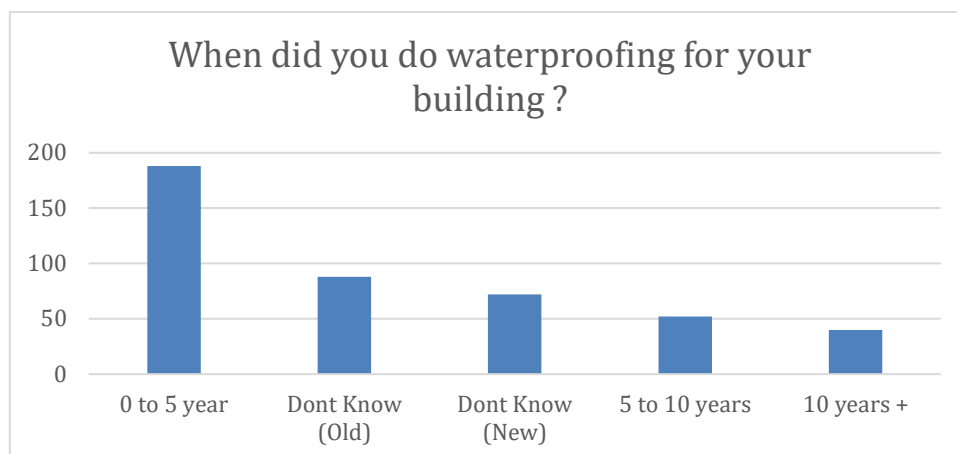


Figure 19: Distribution of Respondents by Timing of Waterproofing for Buildings

5.5 Structural Integrity and Dampness

The survey results on the presence of rainy season leakages in walls among the respondents provide insights into the waterproofing effectiveness and vulnerability of buildings in Nashik City. Among the participants, 56.8% reported no rainy season leakages, indicating relatively dry and well-maintained walls during the rainy season. However, a considerable portion (20.2%) reported experiencing leakages, suggesting potential waterproofing issues or inadequate maintenance. Additionally, 23% mentioned uncertainty regarding leakages, indicating a need for further investigation or assessment. These findings underscore the importance of proper waterproofing measures and timely maintenance to prevent water ingress and protect the structural integrity of buildings.

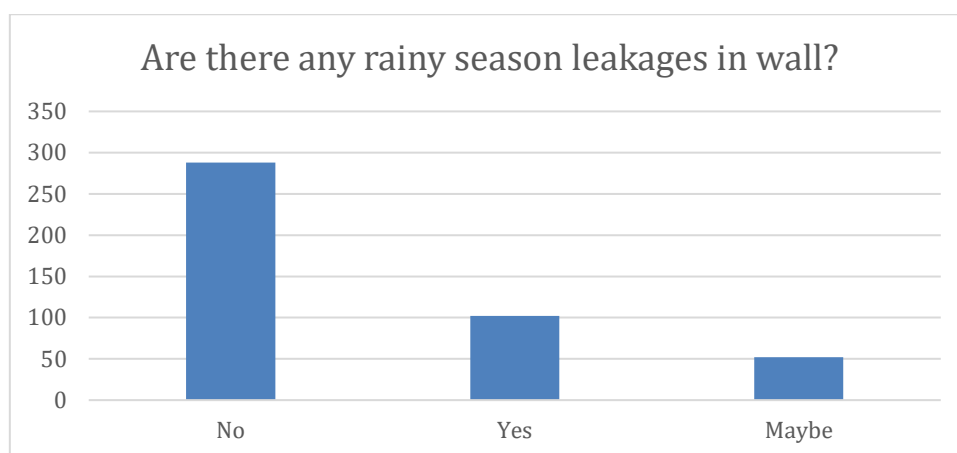


Figure 20: Distribution of Respondents by Presence of Rainy Season Leakages in Walls.

The survey results on the presence of internal dampness among the respondents shed light on the indoor moisture levels and potential issues related to humidity and water infiltration in Nashik City. Among the participants, 54.9% reported no internal dampness, indicating relatively dry indoor environments. However, a significant proportion (21.3%) reported experiencing internal dampness, suggesting the presence of moisture-related problems such as condensation or leaks. Additionally, 23.8% mentioned uncertainty regarding dampness,

indicating the need for further investigation or assessment. These findings highlight the importance of proper ventilation, moisture control, and timely repairs to mitigate the risks associated with internal dampness and maintain a healthy living environment.

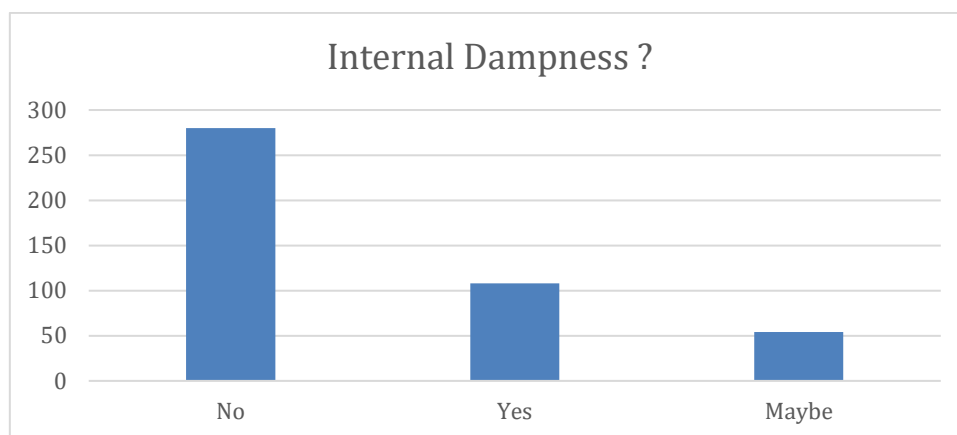


Figure 21: Distribution of Respondents by Presence of Internal Dampness

The survey results on the presence of external dampness among the respondents provide insights into the susceptibility of buildings to moisture ingress and potential structural issues in Nashik City. Among the participants, 57.8% reported no signs of external dampness, indicating relatively dry exterior surfaces. However, a notable proportion (17%) reported experiencing external moisture, suggesting the presence of water infiltration or inadequate waterproofing measures. Additionally, 25.2% mentioned uncertainty regarding dampness, indicating the need for further investigation or assessment. These findings underscore the importance of proper building maintenance, including effective waterproofing and regular inspections, to prevent external dampness and safeguard the integrity of buildings.

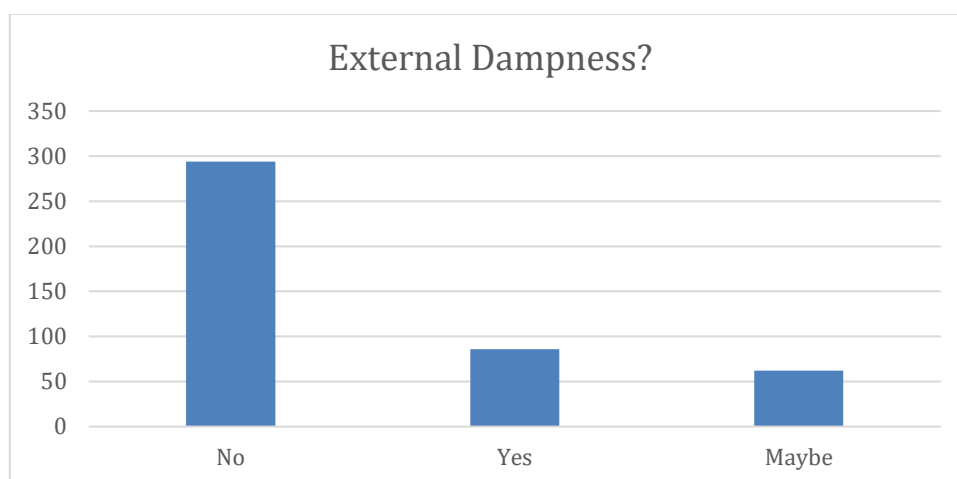


Figure 22: Distribution of Respondents by Presence of External Dampness

The survey results on the presence of cracks in walls from the inside among the respondents provide insights into the structural condition and potential vulnerabilities of buildings in Nashik City. Among the participants, 51.8% reported no cracks in their walls, indicating relatively stable and well-maintained structures. However, a significant proportion (21.2%) said the

presence of cracks suggesting potential structural issues or settling. Additionally, 26.9% mentioned uncertainty regarding the presence of cracks, indicating the need for further investigation or assessment. These findings emphasize the importance of regular structural inspections and timely repairs to address any cracks and ensure the safety and stability of buildings.

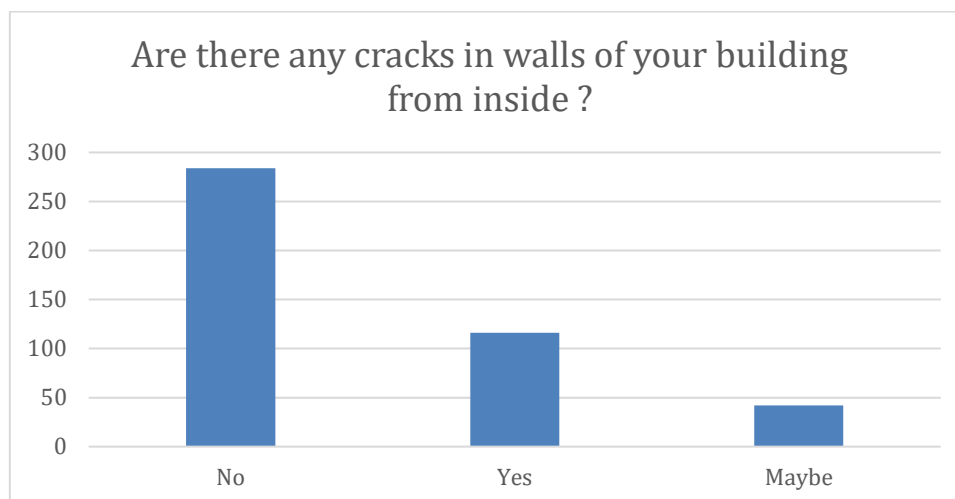


Figure 23: Distribution of Respondents by Presence of Cracks in Walls from Inside.

The survey results on the presence of cracks in walls from the outside among the respondents provide insights into the external structural condition and potential vulnerabilities of buildings in Nashik City. Among the participants, 49.6% reported no cracks visible from the outside, indicating relatively intact and well-maintained exteriors. However, a significant proportion (20.2%) reported the presence of visible cracks, suggesting potential structural issues or external damage. Additionally, 30.2% mentioned uncertainty regarding the presence of cracks, indicating the need for further investigation or assessment. These findings underscore the importance of regular visual inspections and timely repairs to address any cracks in external walls, ensuring building stability and aesthetic appeal.

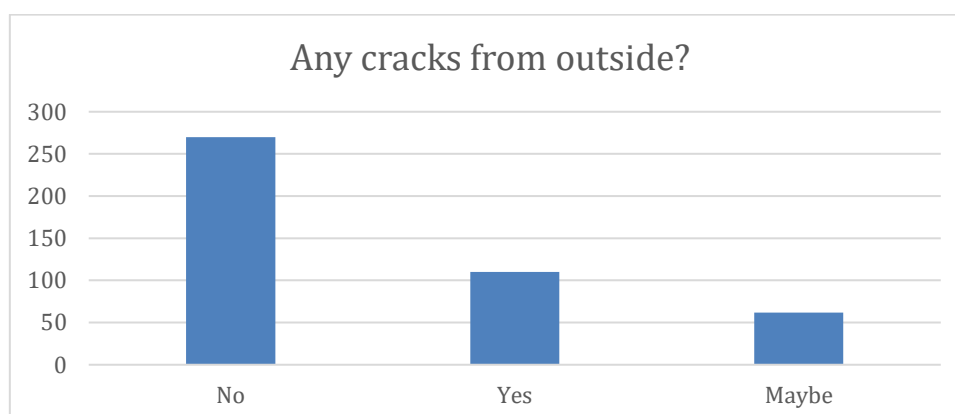


Figure 24: Distribution of Respondents by Presence of Cracks in Walls from Outside.

The survey results on the presence of cracks between walls and doors/windows among the respondents provide insights into potential structural issues and gaps in building integrity in

Nashik City. Among the participants, 56.6% reported no cracks between walls and doors/windows, indicating relatively stable and well-fitted structures. However, a notable proportion (16.2%) said the presence of cracks, suggesting possible misalignments or settling that could compromise the integrity of the building envelope. Additionally, 27.2% mentioned uncertainty regarding the presence of cracks, highlighting the need for further investigation or assessment. These findings emphasize the importance of regular inspections and appropriate repairs to ensure proper sealing and functionality of doors/windows, contributing to the overall structural integrity of buildings.

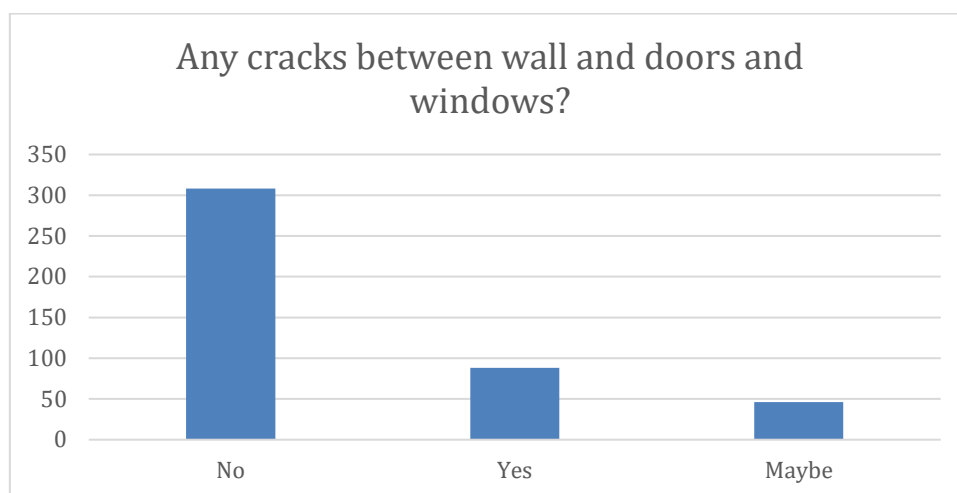


Figure 25: Distribution of Respondents by Presence of Cracks between Wall and Doors/Windows.

The survey conducted in Nashik City aimed to assess the structural conditions and related factors affecting buildings. The demographic profile of the respondents revealed a diverse range of participants in terms of age, gender, profession, education, and family structure. The housing characteristics highlighted the distribution of respondents based on housing type, size, and flooring type, along with the number of people living in the house and the presence of elderly and young children. The family income and financial status section provided insights into the classification of respondents based on income type and distribution across different income brackets. The maintenance and construction history section analyzed the age of the house, duration of residence, frequency of construction, and various maintenance activities performed. The results showed that a significant percentage of respondents were living in flats and owned their houses. The age of the houses varied, with a considerable number being more than 10 years old. The frequency of construction, internal and external painting, water tank, and septic tank cleaning varied among the respondents. Some respondents had carried out structural audits and waterproofing, while others were uncertain about the status. The duration since water pipes and furniture were installed also varied among the participants.

Based on the survey results, it is evident that a significant number of buildings in Nashik City exhibit signs of structural issues. The presence of internal and external cracks in walls, doors, and windows indicates potential vulnerabilities. This could be attributed to factors such as the age of the houses, irregular maintenance practices, and inadequate construction quality. The

high percentage of respondents reporting rainy season leakages, and internal and external dampness, suggests the need for improved waterproofing measures and timely repairs. These issues can lead to long-term damage, including mould growth, decay of building materials, and compromised structural integrity. Overall, the survey results highlight the importance of regular maintenance, timely repairs, and proactive measures to ensure the structural integrity and indoor air quality of buildings in Nashik City. Building owners and residents should be encouraged to conduct periodic inspections, address maintenance issues promptly, and invest in sustainable construction practices to enhance the longevity and safety of their structures.

5. Conclusion

The pivot table analysis of housing conditions and indoor environmental factors in Nashik, Maharashtra, has revealed significant findings with implications for health and well-being. The study found that many respondents live in houses with suboptimal conditions, such as inadequate maintenance, dampness issues, and structural deficiencies. These factors can contribute to various health problems, including respiratory issues, allergies, and poor mental well-being. Furthermore, the analysis highlighted the importance of addressing indoor environmental factors, such as lighting, ventilation, and the presence of pollutants. The study identified areas for improvement, including the need for better maintenance practices, regular cleaning of water and septic tanks, and addressing issues related to dampness and structural integrity. The findings emphasize the need for holistic housing and indoor environmental management approaches. Strategies should focus on enhancing housing conditions, promoting regular maintenance, and implementing measures to improve indoor air quality. Additionally, raising awareness among residents about the potential health impacts of substandard housing conditions and providing guidance on preventive measures is crucial. The research underscores the critical role of housing conditions and indoor environmental factors in shaping the health and well-being of individuals and communities. The results provide valuable insights for policymakers, housing authorities, and residents in designing and implementing interventions to improve housing quality, mitigate health risks, and create healthier indoor environments. By addressing these issues, we can contribute to enhancing the overall quality of life and well-being of residents in Nashik and beyond.

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