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Perceived Benefits and Utilization of Indoor Plants: A Study on Awareness Among Homemakers

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Abstract

Indoor plants have garnered increasing attention for their diverse benefits, including enhancement of indoor air quality and promotion of psychological well-being. This study aimed to assess the level of awareness among homemakers regarding the health, environmental, and psychological benefits of indoor plants. A descriptive research design was employed, with purposive sampling of homemakers in Vadodara city. Data were collected through a structured questionnaire covering demographic characteristics, knowledge of indoor plants, and perceptions of their benefits. Analytical tools such as frequency distribution, percentage analysis, and Chi-square tests were used to examine associations between demographic variables and awareness levels. The findings indicated that most respondents demonstrated substantial awareness of aesthetic and psychological benefits, including stress reduction and mood enhancement. However, awareness of health-related advantages, such as air purification and mitigation of respiratory issues, was comparatively moderate. Significant associations were observed between awareness levels and variables such as education, age, and exposure to information sources like social media and gardening platforms. The results highlight a knowledge gap in health and environmental aspects, emphasizing the need for targeted educational interventions. Community-based programs and awareness campaigns can play a crucial role in promoting informed practices, thereby enhancing indoor environmental quality and supporting sustainable living.

***Key words*:** Indoor plants, Homemakers, Awareness, Utilization, Health benefits

In recent decades, the quality of the indoor environment has become an important concern for human health and well-being. Rapid urbanization, increasing population density, and the growth of modern housing systems have reduced direct contact with natural environments. As a result, many people spend a large portion of their time inside homes and buildings. Indoor environmental quality therefore plays a critical role in shaping people's comfort, health, and overall well-being. One of the major concerns associated with indoor environments is indoor air pollution. Modern buildings are often designed to be energy efficient and airtight, which reduces natural ventilation and may lead to the accumulation of pollutants such as carbon dioxide (CO_2), particulate matter (PM), volatile organic compounds (VOCs), and formaldehyde (HCHO) [1-2]. These pollutants can cause several health problems, including respiratory issues, allergies, fatigue, headaches, and decreased productivity. In addition to physical health risks, poor indoor environments can also negatively affect mental well-being and emotional comfort.

In response to these challenges, researchers and designers have increasingly focused on nature-based solutions to improve indoor environmental quality. One such approach is the use of indoor plants, which are widely recognized for their environmental, psychological, and aesthetic benefits. Indoor plants are natural elements that can improve the quality of interior spaces by enhancing air quality, regulating humidity, and creating visually pleasing environments. Because of these benefits, indoor plants are often considered an important element of biophilic design, which aims to reconnect people with nature within built environments [3-4]. The concept of biophilia suggests that humans have an innate emotional connection with nature. According to this theory, people experience psychological comfort and improved well-being when they are exposed to natural elements such as plants, water, and landscapes [5]. Indoor plants are therefore considered one of the simplest and most accessible ways to bring nature into indoor spaces. By integrating plants into homes and buildings, it is possible to create healthier and more pleasant living environments.

Plants have the ability to absorb pollutants and release oxygen through the process of photosynthesis. They can also remove harmful substances from indoor air through a process known as phytoremediation, where pollutants are absorbed by plant leaves and roots [6]. Experimental research has shown that certain indoor plants can reduce concentrations of carbon dioxide, volatile organic compounds, particulate matter, and formaldehyde in indoor environments. In one study conducted in studio apartments, indoor plants combined with ventilation systems were able to significantly reduce levels of CO_2, VOCs, and particulate matter, thereby improving indoor air quality [6].

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In addition to improving air quality, indoor plants can also influence the thermal and microclimatic conditions of indoor spaces. Plants release moisture through transpiration, which helps regulate humidity levels and contributes to thermal comfort. Research has shown that the presence of potted plants in residential balconies and interior spaces can reduce indoor temperatures and create a more comfortable microclimate [7]. Such passive environmental improvements are particularly important in urban areas where green spaces are limited.

Indoor plants also contribute significantly to psychological health and emotional well-being. Numerous studies have demonstrated that exposure to plants and greenery can reduce stress, improve mood, and enhance cognitive functioning. Natural elements are known to stimulate positive emotional responses and reduce feelings of fatigue and anxiety. According to research on indoor plant interaction, individuals who regularly care for houseplants often report higher levels of mental well-being and mindfulness compared to those who do not engage in such activities [8]. This suggests that indoor plants can play an important role in supporting mental health in everyday living environments. The psychological benefits of indoor plants can be explained through theories such as Stress Reduction Theory (SRT) and Attention Restoration Theory (ART). Stress Reduction Theory suggests that exposure to natural environments helps reduce physiological stress and promotes relaxation. Similarly, Attention Restoration Theory states that natural environments restore mental attention and improve cognitive performance [9]. These theories highlight the restorative effects of nature and emphasize the importance of integrating natural elements into built environments.

During periods of isolation, such as the COVID-19 pandemic, the importance of indoor plants became even more evident. A large questionnaire-based study conducted during the pandemic revealed that more than 60% of participants believed that indoor plants helped reduce anxiety and stress while staying at home [10]. Participants reported increased interest in indoor plants and more frequent interaction with them during lockdown periods. These findings indicate that indoor plants can provide emotional comfort and psychological support during stressful situations. Beyond health benefits, indoor plants also contribute to the aesthetic and functional quality of interior spaces. Plants enhance the visual appearance of rooms, create a sense of freshness, and improve overall interior design quality. In residential environments, indoor plants are often used as decorative elements that add color, texture, and natural beauty to interiors. Studies focusing on interior design perspectives highlight that indoor plants enhance perceptions of environmental quality and increase satisfaction with living spaces [11]. Furthermore, the use of indoor plants is closely linked with the broader concept of sustainable living and green design. As cities continue to expand and natural landscapes decrease, small-scale green elements within buildings become increasingly important. Indoor greenery, vertical gardens, and potted plants help restore connections with nature and contribute to healthier urban environments [12]. These green interventions support environmental sustainability while also improving the quality of daily life.

A review of literature provides an overview of the research and scholarly work previously conducted on a topic, offering insight into the existing knowledge base and guiding the methodology of the present study. It involves the systematic examination of journals, articles, books, research papers, and other credible sources relevant to the area of investigation. A comprehensive review of literature was undertaken in this study to understand prior work on indoor plants and their perceived benefits, which helped in planning and executing the present research effectively.

Recent studies highlight that indoor environmental quality has become a critical area of research due to the significant amount of time people spend indoors. Urban populations typically spend 80–90% of their daily lives inside buildings, making indoor environmental factors crucial for health, comfort, and productivity [9-10]. Indoor plants not only improve air quality but also influence indoor microclimates by releasing moisture through transpiration, thereby regulating humidity and creating a more comfortable environment. Research by Priya and Senthil [13] demonstrated that potted plants on residential balconies and interior spaces reduced indoor temperatures by approximately 3°C, improving thermal comfort in tropical urban homes. Similarly, green infrastructure solutions such as vertical gardens have been proposed to mitigate urban heat island effects and enhance environmental sustainability [12].

Beyond environmental benefits, indoor plants contribute significantly to psychological well-being. Ma [8] found that individuals who regularly cared for indoor plants reported higher levels of mindfulness and mental well-being, with positive correlations between plant quantity, care duration, and psychological health. Yan *et al*. [10] reported that during COVID-19 lockdowns, 61% of respondents experienced reduced anxiety through interactions with indoor plants. The psychological benefits align with environmental psychology theories, including Stress Reduction Theory and Attention Restoration Theory, which suggest that exposure to natural elements supports recovery from stress and mental fatigue [9]. The integration of natural elements in interior design has become increasingly popular under the concept of biophilic design. Moslehian *et al*. [3], Singh *et al*. [4] emphasized that indoor plants enhance visual appeal, improve perceptions of air quality, and provide sensory connections to nature, thereby promoting relaxation, well-being, and environmental satisfaction. Systematic reviews and experimental studies further indicate that indoor plants positively affect physiological and cognitive functions, such as lowering blood pressure, improving attention, and enhancing academic and work performance [1-2], [6].

Studies conducted in India also reinforce these findings. Priya and Senthil [13] highlighted the role of indoor plants in improving microclimates in urban homes, while Singh *et al*. [4] observed their contribution to aesthetics, air quality, and sustainable interior design. Research on specific plants, such as money plants [14], emphasized their air-purifying properties and ability to reduce stress and anxiety. Sharma *et al*. [1] also confirmed that indoor plants combined with ventilation effectively reduce indoor pollutants, promoting healthier living environments.

The existing literature clearly demonstrates that indoor plants offer multiple benefits, including improved indoor air quality, better thermal comfort, enhanced psychological well-being, and improved aesthetic quality of interior spaces. However, most studies focus on environmental performance or psychological outcomes in workplaces, healthcare facilities, or public spaces. There is limited research that examines awareness, perception, and practical utilization of indoor plants in residential settings, particularly among homemakers. Homemakers are key decision-makers in managing indoor environments and household decoration, yet their understanding of the benefits of indoor plants has not been widely studied.

Therefore, the present study aims to address this gap by investigating the perceived benefits and utilization of indoor

plants among homemakers. The study seeks to explore their level of awareness, attitudes, and practices related to indoor plants, which may contribute to improving residential environmental quality and promoting healthier living environments.

Aim of the study

The present study aims to assess the level of awareness among homemakers regarding the perceived benefits of indoor plants with reference to health, psychological well-being, and environmental impact.

Objectives of the study

1. To study the demographic profile of the selected homemakers in Vadodara city.
2. To identify the types of indoor plants available in the market of Vadodara city and to document their associated benefits.
3. To assess the level of awareness among homemakers regarding the benefits of indoor plants.
4. To examine the utilization patterns of indoor plants among homemakers in relation to their perceived benefits

Delimitation of the study

1. The present study was confined to selected homemakers residing in Vadodara city, Gujarat.

Hypotheses of the study

1. There is a significant association between the selected demographic variables (age, educational qualification, and family monthly income) of homemakers and their level of awareness regarding the benefits of indoor plants.
2. There is a significant relationship between the level of awareness of homemakers and their utilization pattern of indoor plants.

MATERIALS AND METHODS

The present study was undertaken to assess the level of awareness among homemakers regarding the benefits of indoor plants and to examine their utilization patterns. A descriptive research design was adopted for the study, as it aimed to systematically describe the existing level of awareness and practices without manipulating any variables. The study was conducted in Vadodara city, Gujarat. The locale was selected purposively, considering its urban residential setting and accessibility to the researcher.

Snowball sampling technique was employed for the selection of respondents, as the study specifically focused on homemakers who were available and willing to participate in the research. The final sample consisted of 120 homemakers, selected from different residential areas of Vadodara city. The study included both independent and dependent variables. The independent variables comprised selected demographic characteristics such as age, educational qualification, family income, type of family, and other relevant background information. The dependent variables included the level of awareness regarding the benefits of indoor plants and the utilization patterns of indoor plants among homemakers.

Data were collected using a structured interview schedule developed by the researcher in accordance with the objectives of the study. The tool consisted of sections covering demographic details, awareness regarding health, psychological and environmental benefits of indoor plants, and utilization practices. The schedule included close-ended and multiple-choice questions to facilitate systematic data collection. The tool was reviewed and validated through consultation with subject experts before final administration. During data collection, the purpose of the study was clearly explained, and the confidentiality of the information provided was assured to the respondents. The responses obtained were coded, tabulated, and analyzed and descriptive statistics such as frequency and percentage were used to interpret the data. Inferential statistics -Chi-square test was applied to determine the association between variables. The findings were presented in tabular form and interpreted in accordance with the objectives and hypotheses of the study.

RESULTS AND DISCUSSION

Section I: *Demographic profile of the respondents*

This section presents a detailed description of the socio-demographic characteristics of the respondents selected for the study. The findings reveal that half of the respondents (50%) belonged to the age group of 40–59 years, indicating that the majority were middle-aged adults. Nearly 45% were in the younger age group of 20–39 years, while only 5% were in the age group of 60–69 years. This distribution suggests that most respondents were in an active stage of life. In terms of educational qualification, the findings indicate that a substantial majority (70%) of respondents were graduates, while 20% had completed their education up to the higher secondary level. The remaining 10% belonged to other educational categories. This reflects a relatively high educational status among the respondents. Based on family monthly income, data show that 45% of respondents belonged to the middle-income group (₹30,001–₹50,000), while 35% reported a family income above ₹50,000. About 20% fell under the lower income category (up to ₹30,000). Similarly, personal monthly income shows that half of the respondents (50%) reported earning up to ₹20,000 per month. 30% earned between ₹20,001–₹40,000, while 20% earned above ₹40,000. Regarding marital status, 65% of respondents were unmarried, while 35% were married. In terms of employment status, 50% of the respondents were self-employed, indicating economic engagement and entrepreneurial involvement. 30% of the respondents were full-time homemakers, while 10% each were part-time workers and full-time employees. This distribution demonstrates that a considerable proportion of respondents were economically active, alongside those primarily engaged in household responsibilities. With respect to family structure, 60% of respondents belonged to nuclear families, whereas 40% were from joint families. This suggests that most respondents lived in smaller family units, were household decisions, including environmental choices, may be taken independently. Concerning the type of residence, 45% of the respondents resided in apartments or flats, followed by 35% living in independent houses, 15% lived in villas, and 5% in bungalows. This residential pattern reflects an urban context, where limited access to outdoor green spaces may increase the importance of indoor plants as an alternative means of incorporating greenery into the living environment. This finding aligns with Fonseca *et al.* [12], who emphasized the role of indoor greenery in enhancing environmental quality in urban residential spaces.

Section II: *Available indoor plants in the market of Vadodara and their benefits*

The findings reveal that 90% of respondents reported having indoor plants in their homes, while only 10% indicated that they did not maintain any indoor plants. This reflects a high

level of acceptance and adoption of indoor plants among households in Vadodara city. The present study documented a total of 48 indoor plant species and varieties, which were systematically categorized based on their functional attributes, including air-purifying ability, ornamental value, flowering characteristics, and medicinal importance. The air-purifying plant category comprised ten species, namely *Epipremnum aureum* (Money Plant), *Sansevieria trifasciata* (Snake Plant), *Spathiphyllum* spp. (Peace Lily), *Philodendron* spp., *Zamioculcas zamiifolia* (Zanzibar Gem), Dracaena fragrans, *Dracaena deremensis* (Dracaena Victoria), *Dracaena surculosa* (Gold Dust Dracaena), *Dieffenbachia seguine*, and *Aglaonema* spp. These plants are widely recognized for their efficiency in improving indoor air quality (Fig 1).

Money plant (*Epipremnum aureum*) | Snake plant (*Sansevieria trifasciata*) | Peace lily (*Spathiphyllum* spp.) | Philodendron *Philodendron* spp | Zanzibar gem (*Zamioculcas zamiifolia*)

Dracaena fragrans (*Dracaena fragrans*) | Dracaena Victoria (*Dracaena deremensis*) | Gold Dust Dracaena (*Dracaena surculose*) | Dieffenbachia (*Dieffenbachia seguine*) | Aglaonema (*Aglaonema spp.*)

Fig 1 Air purifying indoor plants available in the market

Monstera (*Monstera deliciosa*) | Calathea ornata (*Calathea ornata*) | Calathea 'Dottie' (*Calathea roseopicta*) | Nerve Plant (*Fittonia albivenis*) | Pink Veined Fittonia (*Fittonia albivenis*)

Alocasia (*Alocasia odora*) | Asparagus Fern (*Asparagus setaceus*) | Stromanthe (*Stromanthe sanguinea*) | Cryptanthus (*Cryptanthus zonatus*) | Philodendron xanadu (*Philodendron xanadu*)

Fig 2 Decorative foliage indoor plants available in the market

The decorative foliage plants included *Monstera deliciosa*, *Calathea ornata*, *Calathea roseopicta* ('Dottie'), *Fittonia albivenis* (Nerve Plant), *Fittonia albivenis* (Pink Veined Fittonia), *Alocasia odora*, *Asparagus setaceus* (Asparagus Fern), *Stromanthe sanguinea*, *Cryptanthus zonatus*, and *Philodendron xanadu*. These species are primarily valued for their attractive foliage, colour patterns, and suitability for indoor decoration (Fig 2).

The flowering ornamental plants recorded in the study were *Rosa* spp. (Rose), *Gerbera jamesonii* (Gerbera Daisy), *Petunia hybrida*, *Euphorbia pulcherrima* (Poinsettia), *Ixora coccinea*, and *Pentas lanceolata* (Egyptian Star Cluster), which contribute significantly to aesthetic enhancement through their colourful blooms (Fig 3). These species not only enhance visual appeal but also play an important role in improving the overall ambiance and psychological well-being of the surrounding.

Rose (*Rosa* spp.) | Gerbera Daisy (*Gerbera jamesonii*) | Petunia (*Petunia hybrida*) | Poinsettia (*Euphorbia pulcherrima*) | *Ixora* (*Ixora coccinea*) | Egyptian Star Cluster (*Pentas lanceolata*)

Fig 3 Flowering ornamental plants available in the market

Phalaenopsis Orchid (*Phalaenopsis amabilis*) | Phalaenopsis Orchid (*Phalaenopsis orchid*) | Dendrobium Orchid (*Dendrobium* spp.) | Dendrobium Orchid (*Dendrobium masarangense*)

Fig 4 Orchid indoor plants available in the market

The orchid category included *Phalaenopsis amabilis*, *Phalaenopsis schilleriana*, *Dendrobium* spp., and *Dendrobium masarangense*, which are widely appreciated for their long-lasting and attractive flowers (Fig 4).

The succulent and cactus group consisted of *Echeveria desmetiana*, *Echeveria lilacina*, *Haworthiopsis attenuata* (Zebra Haworthia), *Crassula ovata* (Jade Plant), *Pachypodium eburneum*, *Gymnocalycium mihanovichii* (Moon Cactus), *Opuntia microdasys* (Bunny Ear Cactus), and *Cereus tetragonus* (Fairytale Cactus). These plants are preferred for their low maintenance requirements and adaptability to indoor conditions (Fig 5-6).

Echeveria (*Echeveria desmetiana*) | Echeveria (*Echeveria lilacina*) | Zebra Haworthia (*Haworthiopsis attenuata*) | Jade Plant (*Crassula ovata*) | Pachypodium (*Pachypodium eburneum*)

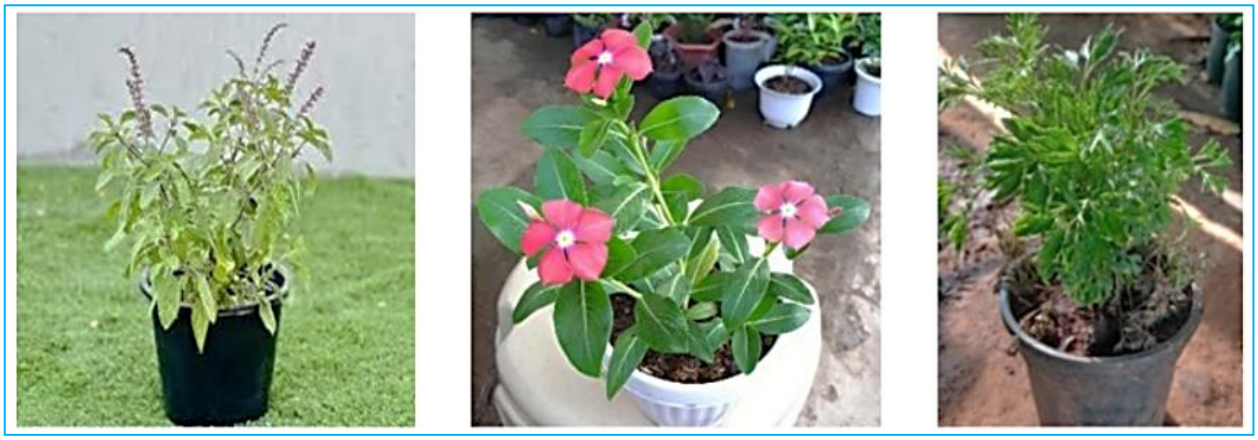
Fig 5 Succulent indoor plants available in the market

Moon Cactus
(*Gymnocalycium mihanovichii*)

Bunny Ear Cactus
(*Opuntia microdasys*)

Fairytale Cactus
(*Cereus tetragonus*)

Fig 6 Cactus indoor plants available in the market



Tulsi
(*Ocimum sanctum*)

Periwinkle
(*Catharanthus roseus*)

Mint Aralia
(*Polyscias fruticosa*)

Fig 7 Medicinal indoor plants available in the market

The medicinal plants identified were *Ocimum sanctum* (Tulsi), *Catharanthus roseus* (Periwinkle), and *Polyscias fruticosa* (Mint Aralia), which are known for their therapeutic and traditional significance (Fig 7).

The palm category included *Chamaedorea elegans* (Parlor Palm) and *Dypsis lutescens* (Areca Palm), which are commonly used in interior landscaping (Fig 8).

In addition, the ornamental plant group comprised *Polyscias guilfoylei* (Aralia Black and Geranium Aralia), *Dracaena sanderiana* (Lucky Bamboo), *Thuja occidentalis*, and *Cheilanthes* spp., which enhance the decorative value of indoor spaces.

Parlor Palm
(*Chamaedorea elegans*)

Areca Palm
(*Dypsis lutescens*)

Fig 8 Palm indoor plants available in the market

Section III: *Awareness of indoor plants among the respondents*

The findings reveal that 65% of respondents were aware of the health benefits of indoor plants, while 35% were not aware. High awareness was observed for plants such as Snake Plant (80%), Money Plant (90%), Tulsi (75%), Jade Plant (70%), Bunny Ear Cactus (75%), and Zebra Haworthia (75%). Moderate awareness (40%–60%) was seen for Monstera, Rose, Peace Lily, Lucky Bamboo, Orchids, Parlor Palm, and several others. However, certain plants such as Philodendron Xanadu Golden (10%), Geranium Aralia (10%), and Pachypodium (15%) showed very low awareness among respondents. These findings indicate that commonly available and easy-to-maintain plants have higher recognition, whereas exotic or less frequently marketed plants have lower awareness levels.

A majority of respondents (65%) were aware of the health benefits of indoor plants, such as air purification and stress reduction. However, 35% were not aware of these benefits. This indicates moderate to high awareness among homemakers regarding the positive impact of indoor plants on health and well-being. The primary reason for keeping indoor plants was aesthetic purpose (35%). Health benefits and hobby/interest were each reported by 30% of respondents. Only 5% kept indoor plants for cultural or religious significance. However, despite this awareness, aesthetic purpose was reported as the primary reason for keeping indoor plants (35%), followed by health benefits and hobby. This indicates that although respondents are aware of functional benefits, their behavior is more influenced by aesthetic considerations. This finding aligns with Singh *et al*. [4], who reported that aesthetic

appeal is a major factor driving the use of indoor plants in residential spaces.

Section IV: *Utilization pattern of indoor plants by the respondents*

The study examined the utilization pattern of indoor plants among respondents, focusing on ownership, plant types, sources, care practices, and associated challenges. Analysis revealed that indoor plant ownership was widespread, with 90% of respondents reporting at least one plant in their homes. Regarding the number of plants maintained, 30% owned 6–10 plants, 25% had 1–5 plants, 20% maintained 11–15 plants, and 15% possessed more than 15 plants. This demonstrates that indoor plant ownership typically involves multiple varieties, reflecting a growing interest in indoor gardening. In terms of plant types, flowering plants were the most commonly reported (40%), followed by herbs and medicinal plants (25%), foliage plants (20%), and succulents and cacti (15%). These preferences indicate that respondents value both the aesthetic appeal and functional benefits of indoor plants, consistent with Singh *et al*. [4], who observed that indoor plants serve both decorative and practical purposes in residential interiors.

Local nurseries were the most preferred source of indoor plants (40%), followed by online stores (35%), while 25% of respondents obtained plants through friends or family. Plant-wise utilization showed that low-maintenance and widely recognized species such as snake plant (80%), money plant (75%), bunny ear cactus (65%), *Cryptanthus zonatus* (65%), *Echeveria lilacina* (65%), lucky bamboo (60%), and jade plant (55%) were most frequently used. Moderate utilization was observed for Monstera, Rose, Orchids, Parlor Palm, Ixora, and Calathea varieties. In contrast, Philodendron Xanadu Golden (10%), Dendrobium Orchids (10%), Pin-stripe Calathea (10%), and Thuja (5%) were used less frequently, despite some awareness among respondents. These patterns suggest that practical considerations, including ease of maintenance, adaptability, and availability, strongly influence utilization, supporting the findings of Priya and Senthil [13].

Regarding care and maintenance, 45% of respondents reported that family members primarily tended to indoor plants, 30% personally managed plant care, 20% employed a gardener or helper, and 5% indicated that plants were maintained naturally without supervision. Weekly care was most common (45%), followed by daily care (35%), occasional care (15%), and rare attention (5%). Nearly 65% of respondents had gifted indoor plants to others, reflecting growing acceptance of eco-friendly gifting practices, while 35% had not engaged in gifting.

Despite high ownership and awareness, a significant proportion of respondents (70%) reported facing difficulties in maintaining indoor plants. Among the challenges, lack of time (30%) and other unspecified issues (30%) were most prevalent, followed by insufficient knowledge of plant care (25%) and watering problems (15%). These findings highlight a gap between awareness and effective utilization, consistent with Ma [8], who emphasized that time constraints and limited knowledge act as barriers to proper plant care. Overall, the results indicate that while indoor plant awareness and ownership are relatively high, practical factors such as maintenance requirements, adaptability, and available time significantly influence actual utilization patterns in residential settings.

Section V: *Testing of hypotheses*

H_{01}: There is no significant association between the selected demographic variables (age, educational qualification, and family monthly income) of homemakers and their level of awareness regarding the benefits of indoor plants.

The data in (Table 1) shows that the calculated χ^2 value (4.56) for age was less than the table value (5.99), indicating that the association between age and awareness is not significant at the 0.05 level. Therefore, the null hypothesis is accepted. This suggests that age does not significantly influence the level of awareness regarding indoor plants among homemakers. Again, the calculated χ^2 value (6.17) for educational qualification exceeds the table value (5.99), indicating a significant association at the 0.05 level. Therefore, the null hypothesis is rejected. This result demonstrates that educational qualification has a significant association with awareness regarding the benefits of indoor plants. These findings align with Singh *et al*. [4], who reported that higher educational attainment contributes to greater environmental awareness and adoption of indoor greenery practices. For monthly family income, the calculated χ^2 value (6.02) exceeds the table value (5.99), indicating a significant difference in utilization patterns with respect to family income [15]. Hence, the null hypothesis is rejected. This suggests that family income significantly influences the way homemakers utilize indoor plants, with higher-income groups showing greater engagement and maintenance capability.

Table 1 Chi-square text showing the association between age, educational qualification, and family monthly income of homemakers and their level of awareness

Variable 1	Variable 2	χ^2 Value	df	p-value	Level of significance
Age		4.56	2	0.102	N.S.
Educational qualification	Level of awareness	6.17	2	0.046	0.05*
Family monthly income		6.02	2	0.049	0.05*

df = Degree of Freedom, *Level of Significance = 0.05 level, N.S. = Not significant

H_{02}: There is no significant relationship between the level of awareness of homemakers and their utilization pattern of indoor plants.

The results presented in (Table 2) clearly demonstrate a statistically significant association between the level of awareness and the utilization patterns of indoor plants among homemakers. The calculated chi-square (χ^2) value of 13.19 substantially exceeds the critical table value of 3.84 at 1 degree of freedom and 0.05 level of significance. This large deviation indicates that the observed distribution is not due to random chance. Furthermore, the very low p-value (0.0003), which is far below the conventional threshold of 0.05, provides strong evidence against the null hypothesis. Consequently, the null hypothesis stating that there is no relationship between awareness and utilization is rejected.

This finding suggests that awareness plays a decisive role in shaping the behavior of homemakers with respect to indoor plant usage. Individuals with higher awareness levels are more likely to understand the aesthetic, environmental, and health benefits of indoor plants, such as improved air quality, psychological well-being, and enhanced home ambience. As a

result, they tend to incorporate indoor plants more actively into their living spaces. Conversely, lower awareness may limit adoption due to lack of knowledge about plant care, benefits, or suitability. The statistically significant association also aligns with previous studies [16-17], which emphasize that knowledge dissemination and awareness campaigns can directly influence pro-environmental practices within households. These findings highlight the importance of educational interventions, extension programs, and media outreach in promoting indoor plant utilization. Increasing awareness could thus serve as a key strategy for enhancing sustainable household practices and improving overall quality of life.

Table 2 Chi-square text showing the association between awareness and utilization patterns among homemakers

Variable 1	Variable 2	χ^2 Value	df	p-value	Level of significance
Level of awareness	Utilization pattern of indoor plants	13.19	1	0.0003	0.05*

df = Degree of Freedom, *Level of Significance = 0.05 level

CONCLUSION

The present study revealed several key insights regarding the awareness and utilization of indoor plants among homemakers in urban households. Demographically, the majority of respondents were female and belonged to the age group of 40–59 years. Most were graduates and part of the middle-income group, with a significant proportion residing in nuclear families and apartments, reflecting contemporary urban lifestyles. Findings indicated a high level of acceptance of indoor plants, with most respondents maintaining multiple plants in their homes. Flowering plants were the most preferred, followed by herbs and foliage varieties, while local nurseries were the primary source of acquisition. Awareness regarding the benefits of indoor plants was moderate to high, particularly for commonly available species, whereas lesser-known or exotic plants were associated with lower awareness levels. Although respondents recognized health-related benefits such as air purification and stress reduction, aesthetic considerations emerged as the primary motivation for keeping indoor plants. The utilization pattern demonstrated that respondents actively used indoor plants, particularly low-maintenance varieties. However, some plants exhibited lower utilization despite reasonable awareness, highlighting a gap between knowledge and practice. Care and maintenance were primarily undertaken by family members or the respondents themselves, with weekly attention being the most common. Challenges reported included lack of time, limited knowledge about plant care, and watering issues, which constrained effective utilization. Additionally, a majority of respondents had used indoor plants for gifting, reflecting growing eco-friendly and sustainable practices. Hypothesis testing revealed significant associations between demographic variables and awareness levels, with educational qualification positively influencing understanding of the environmental and health benefits of indoor plants. Family income was found to affect utilization patterns, with higher-income respondents demonstrating greater engagement and maintenance capabilities. A strong and significant relationship was also observed between awareness and utilization, indicating that higher awareness contributes to more effective use of indoor plants. Consequently, all hypotheses formulated for the study were accepted. Overall, the study concludes that indoor plants have become an integral part of urban households, with homemakers demonstrating a positive attitude and moderate to high awareness of their benefits. Nevertheless, practical considerations such as ease of maintenance and aesthetic appeal largely guide utilization, rather than comprehensive knowledge of functional benefits. Addressing the observed gap between awareness and actual use through education and practical guidance on plant care can enhance the adoption of indoor plants, thereby improving indoor environmental quality, psychological well-being, and overall household sustainability.

Recommendations

Based on the findings of the study, the following recommendations were suggested:

1. Awareness programmes and workshops should be conducted to educate homemakers about the health, psychological, and environmental benefits of indoor plants.
2. Training on plant care and maintenance practices should be provided to reduce difficulties faced by respondents.
3. Promotion of low-maintenance and air-purifying plants should be encouraged.
4. Government and local authorities can support urban greenery initiatives by promoting indoor gardening.
5. Online platforms and nurseries should provide proper guidance and information about plant care.

Suggestions for further research

1. Similar studies can be conducted with a larger sample size and locale.
2. Comparative studies between rural and urban households can be undertaken.
3. Future research can focus on the impact of indoor plants on mental health and productivity.
4. Experimental studies can be conducted to measure actual improvement in indoor air quality.

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