

DOI: <https://doi.org/10.38027/iccaua2023en0136>

The Appropriateness of Standing kitchen in the Indian Context

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Abstract

Women used to sit and cook in traditional Indian kitchens, which had floor-mounted fuel stoves. After the invention of gas cylinders, there was a significant change in the cooking position, which went from sitting to standing. Since Indian women spend the most hours cooking in the kitchen in the entire world (MUKHERJEE, 2015), standing while cooking is uncomfortable and might have negative health effects. Additionally, it makes older women dependent on other people. The objectives of this study are to compare standing and sitting cooking techniques and to determine if a standing kitchen would be appropriate in an Indian setting. The paper employs secondary data analysis, first-hand observation, and focus group discussion as part of the methodology. The paper brings out a need to re-evaluate the design of Indian kitchens so that women of all ages can work independently and comfortably.

Keywords: Cooking styles; health issues; sitting kitchen; standing kitchen; Indian traditional kitchen.

1. Introduction

Traditional Indian kitchens were originally designed for utility, focusing on families coming together to cook and dine. Historically, women would sit on the floor and use open firewood stoves, considering it the most convenient posture at the time. However, with modern lifestyles and technological advancements, standing kitchens have emerged as the central hub of activity in contemporary homes. While standing kitchens offer their own advantages, it is important to consider their potential negative health impacts, especially for women who spend extended periods cooking in a standing posture especially during festivals, while entertaining guests or simply due to tradition etc. But with age they commonly experience health conditions such as knee and joint pain, which is exacerbated by the strain placed on their legs due to the weight of the upper body while cooking and find it difficult to stand for long hours especially during occasions.

With the increasing popularity of standing kitchens in India, it is crucial to examine their suitability in the Indian context and their specific negative health impacts. The objective of this research is to investigate the suitability of standing kitchens in the Indian context and explore their specific negative health impacts. The primary goal is to identify the gap between existing kitchens and the desired kitchen preferences of users. This will be achieved by understanding the characteristics of existing kitchens, analysing cooking time patterns during regular days and special occasions, assessing health issues associated with prolonged standing, examining the preferred cooking postures of users, and determining the preferred kitchen type for Indian. The scope focuses on analysing cooking postures at different occasions for residential kitchens only while excluding other factors like kitchen design, culture, ethnicity, appliances used, economic status, family size etc.

The results of this research clearly indicate a strong desire for kitchens that offer flexibility in cooking posture. Individuals prefer the ability to switch between standing and sitting positions based on their age, health conditions, and different occasions at home. By re-evaluating and redesigning kitchens to accommodate these preferences and provide flexible cooking postures, it is possible to mitigate the negative health impacts of standing kitchens, creating a more comfortable and healthier cooking environment.

The expected contribution of this research is to identify the gap between existing kitchens and user preferences based on culture, health, and age. It aims to provide insights into improving kitchen design for more comfortable postures and preventing health issues during long cooking hours. These findings will guide future studies and design interventions, promoting ergonomic and user-centric kitchen spaces.

The structure of this paper includes a review of the evolution of Indian kitchens, the time spent by Indians in the kitchen, and the associated health risks in the first chapter. The second chapter presents the research methodology, including sample surveys, questionnaires, data collection, and analysis. The third and fourth chapters discuss the results and highlight the main contributions of this paper.

1.1 Evolution of Indian kitchen

Over time, the evolution of the Indian kitchen has undergone significant changes (Table 1). In the past, traditional Indian kitchens were primarily utilitarian spaces, considered sacred for the family. Up until five decades ago, women would sit on the floor and cook on a "chulha" or fireplace, a practice still prevalent in Indian villages and certain urban areas with limited resources. This cooking method was influenced by the availability of open firewood stoves

built on the floor, making it convenient to sit while cooking. These kitchens also served as a gathering place for the family to bond over cooking and dining.

However, as people's lifestyles changed, so did the design and functionality of Indian kitchens. The introduction of modern amenities such as LPG stoves, gas cylinders, and induction cooktops marked a significant shift. The standing kitchen concept, where individuals cook while standing, gained popularity. Today, the kitchen has transformed into the central hub of activity in modern homes. It is a well-designed space equipped with the latest gadgets which facilitate cooking, bonding among family members, and even socializing with friends and relatives.

The architecture of old Indian kitchens was a reflection of the lifestyle of the people in those times. While the significance of traditional kitchens remains in the lives of people, their design and functionality have evolved to accommodate the changing needs and advancements in technology. The modern Indian kitchen emphasizes efficiency, convenience, and creating a space for family members to come together and engage in various activities beyond just cooking.

Time Period	Lifestyle/Technology Change	Resulting Kitchen Design
Before 1950	Smokey fuel + earthen hearths	Outdoor kitchen
1960-1970	LPG or clean smoke-free fuel	Kitchen moves indoors
1980-1990	Breaking up of joint families	Smaller standing kitchens
2000 onwards	More women joining the workforce	Modular kitchens

Table 1: Evolution of the great Indian kitchen: A timeline (Barari. (2021))

1.2 The time spent by Indians In the kitchen

In India, cooking and food preparation are primarily the responsibility of women, who spend a significant amount of time in the kitchen. A 2014 survey conducted by market research company GfK, on 27,000 people from 22 countries found that Indian women spend the twice the time cooking per week compared to women from other countries, with an average of 13.2 hours spent in the kitchen per week against the international average time of 6.5 hours per week (Figure 1). This is attributed to the diversity of Indian cuisine, reflecting the vast array of ingredients, cultures, and religions across the country. Additionally, cooking in India is often a daily practice, with at least three meals cooked per day, and there is a significant emphasis on preparing meals with care and attention to detail, especially during festivals and when hosting guests at home. Guests are often considered equivalent to gods in Indian culture, with the practice of "atithi devo bhava" means the guest is equivalent to God. Given the cultural significance of cooking and dining in India, it is crucial to consider the potential impact of standing kitchens on individuals, particularly women who are often responsible for the majority of cooking in Indian households.

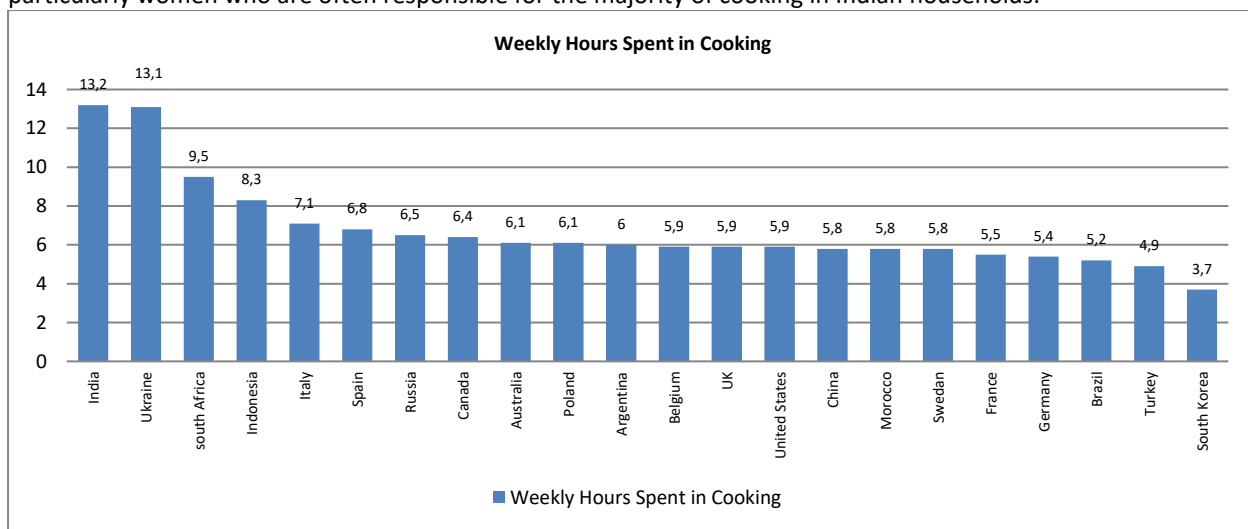


Figure 1: Hours Spent Cooking per week among consumer worldwide (GfK, 2014)

1.3 Problem faced due to standing and cooking for long hours

The issue of prolonged standing and cooking poses a significant health risk for Indian urban women. Engaged in daily household activities from morning till night, these women spend considerable time standing in the kitchen, performing tasks like cooking, dishwashing, and other chores. Unfortunately, this extended standing puts excessive strain on the lower back and ankles, resulting in lower back pain, leg and feet pain, and circulatory disorders. These continuous standing positions can lead to various physiological and musculoskeletal disorders, causing varying

degrees of muscle pain in the lower and upper limbs. In contrast, traditional rural practices involve sitting postures for household work, which can strain the muscles of the back, stomach, and hips when prolonged. Such postures are not suitable for extended periods of work, particularly for women with age-related conditions like arthritis. To mitigate the associated risks, it is crucial to avoid postures like squatting, sitting cross-legged, and standing for prolonged hours during cooking (Ratn, 2023; Ali, 2021).

2. Material and Methods

A comprehensive questionnaire-based survey was conducted across India from March to April 2023 to assess the suitability of standing kitchens in the Indian context. The questionnaire (see Annexure-1) was developed based on primary observations, personal experiences, and discussions with individuals. It was administered online and in-person to a large group of participants, resulting in a total of 268 responses, including 247 females and 21 males (see Figure 2). The survey sample consisted of Indian nationals who engage in cooking within their homes, primarily focusing on the urban population where standing kitchens are commonly used, regardless of gender. It is worth noting that the majority of respondents were female, reflecting the prevailing cultural norms in India where cooking is primarily considered a duty for women (Sharma, 2021).

The survey participants encompassed a wide range of age groups, with the highest number falling within the 45-54 age range (95 participants). Substantial participation was also observed from the 35-44 age range (62 participants), followed by the 25-34 age range (50 participants) and the 18-24 age range (33 participants). The 55-64 age range had the lowest number of participants (15), with only 13 participants aged 65 or older.

The questionnaire consisted of 28 questions, including 12 multiple-choice questions, 3 open-ended questions, and one linear scale question. The remaining 12 questions utilized checkboxes, allowing respondents to select multiple options. The initial questions aimed to gather user profiles, while subsequent questions explored the type of existing kitchen, activities performed in the kitchen, duration of daily cooking, fatigue experienced during cooking on different occasions, advantages and disadvantages of standing and sitting kitchens, potential health hazards associated with standing kitchens, and mitigation strategies. Focus group discussions were also conducted to gain further insights into the problem. The collected data was analysed using Microsoft Word and Excel, with the generation of graphs for analysis.

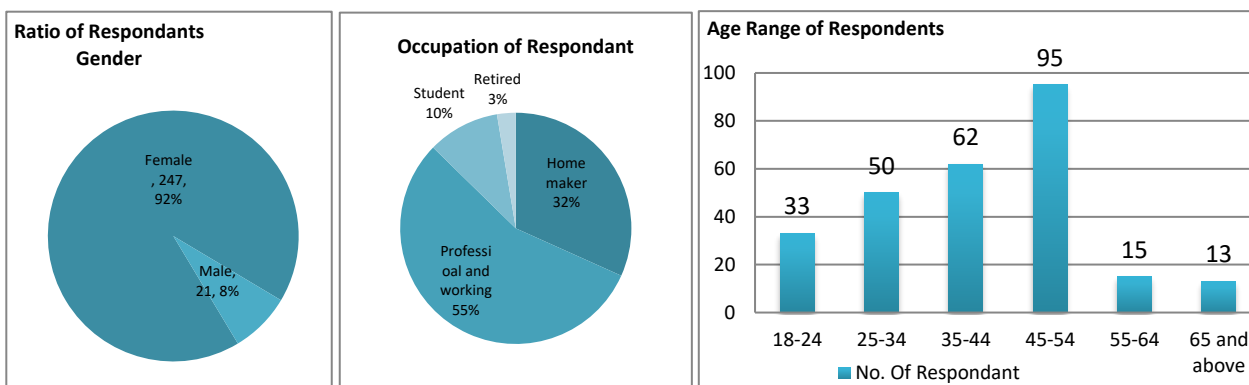


Figure 2: The Respondents Profile (Developed by Author)

3. Results and discussions

The survey responses result has been classified into four main categories to gain a comprehensive understanding of the existing kitchen and activities, cooking time in the kitchen and associated fatigue, health issues related to standing, and respondent preferences for kitchen type and cooking posture. This categorization allows for a structured analysis of the data and provides valuable insights into each aspect of the study.

3.1 Understanding Existing Kitchen and activities

This study aims to examine and analyse the existing kitchen through different variables including the type of kitchen, equipment used, and activities performed. The survey conducted seeks to provide insights into the current state of kitchens, laying the groundwork for future research and potential improvements in kitchen design.

3.1.1 Type of Existing Kitchen

The data collected from the 268 respondents revealed that the majority of them (260) have a standing kitchen, while only a small percentage (8) have a sitting type of kitchen. Interestingly, out of the 8 respondents with a sitting kitchen, 2 were students, 3 were young professionals, and 3 were homemakers, and all of them preferred to have a standing kitchen. This indicates a preference for the standing kitchen among the surveyed population (Figure 3).

It is also noteworthy that the standing kitchen is prevalent in urban areas, which could be attributed to the adoption of modern cooking methods and the availability of various cooking equipment.

3.1.2 Equipment’s used in the Kitchen

The survey data shows that gas stoves are the most commonly used cooking equipment in Indian households, with 251 respondents reporting its use. Among them, 201 respondents used only a gas stove, while 29 respondents used a combination of gas stove and induction cooktop. A small group of respondents also reported using a gas stove with an electric stove and microwave. The second most popular cooking medium was induction, with 51 respondents using it. However, only 11 respondents reported using induction as their sole cooking equipment, while others used it in combination with other cooking equipment (Figure 3).

These findings illustrate the prevalence of gas stoves and the growing popularity of induction cooktops as part of the kitchen equipment landscape in Indian households

3.1.3 Activities Performed in Kitchen

The data suggests that cooking and food preparation are the primary functions of the kitchen for the majority of respondents. This is supported by the fact that the highest number of respondents reported cooking as the main activity performed in the kitchen. Other important functions of the kitchen include chopping, washing utensils, and storing food and utensils, indicating that the space is utilized for not only cooking but also food storage and preparation. While socializing in the kitchen was reported by a smaller number of respondents, serving meals was reported by a moderate number, suggesting that the kitchen is used not only for food preparation but also for dining. Overall, the data emphasizes the multifunctional nature of the kitchen space based on the experiences and habits of the survey respondents.

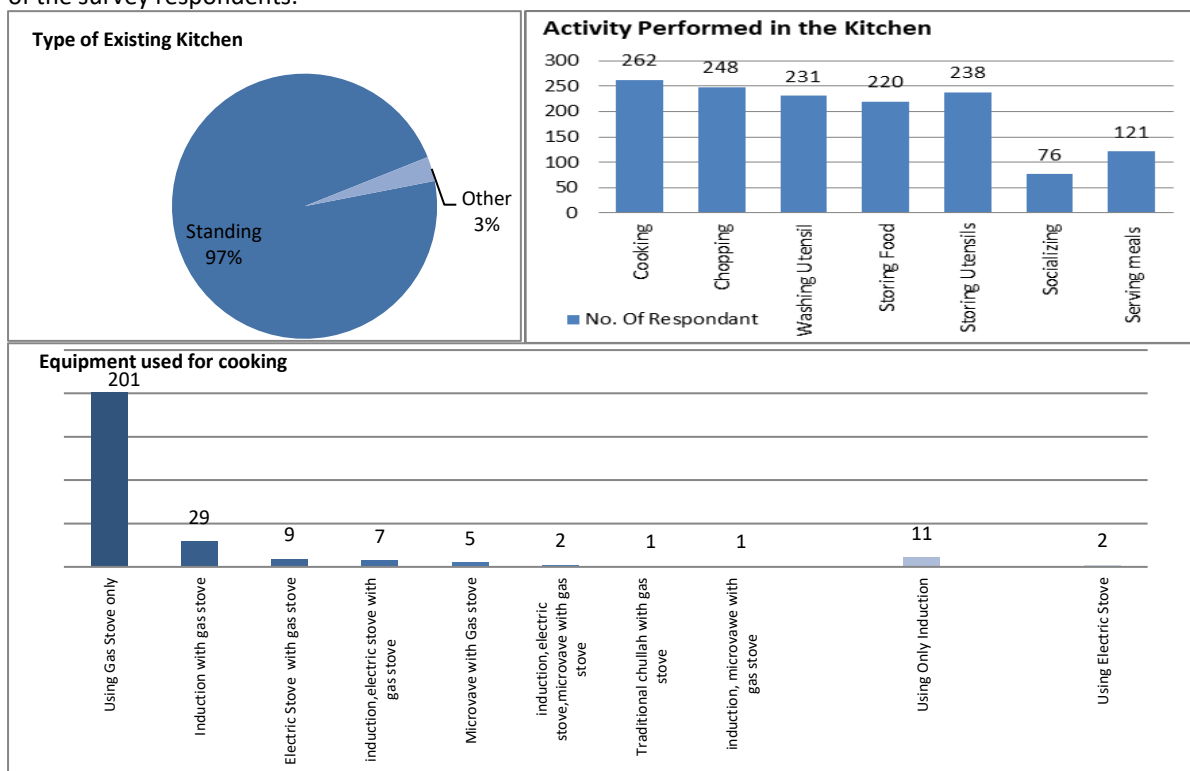


Figure 3: Understanding Existing Kitchen and activities (Developed by Author)

3.2 Cooking Time and Its Relationship with Tiredness at Different Occasions

This survey study aims to explore the duration of cooking activities on a daily basis and during various occasions, while examining the correlation between time spent and fatigue. Variables such as cooking frequency, cooking time, and fatigue experienced during different occasions are analysed. Additionally, the study delves into the time respondents spend in the kitchen during festivals, weekends, and when hosting guests. In India, the cultural practice of celebrating festivals and entertaining guests with a variety of cuisines often leads to a significant increase in cooking time during different occasions.

3.2.1 Weekly Cooking Frequency

The findings indicate that daily cooking is a widespread practice, with a majority of 196 respondents cooking every day. However, only a small percentage of 25 report cooking rarely, and 51% of them are in the age group of 18-24 and 25-34. For the age group 35-64, 85.2% cook daily, with the percentage reaching 100% for the age group of 55-64. However, for older people above 65, the frequency of cooking decreases to 61.5% (Figure 4). This may be attributed to age-related health issues. The results highlight an inverse relationship between age and frequency of cooking upto the age of 64, with younger age groups cooking less frequently and older age groups cooking more frequently.

3.2.2 Time spent in the Kitchen during Regular Days and Special Occasion

The majority of respondents spend 1-2 hours (33.21%) or 2-4 hours (34.70%) in cooking daily. Fewer respondents reported spending less than 30 minutes (5.97%) or 30-60 minutes (26.12%). No respondents indicated spending more than 4 hours. However, during special occasions and when guests are over, the time spent cooking increased significantly. For instance, only 17 respondents (6.3%) spent less than 30 minutes to 1 hour, while 17.5% of respondents cooked for 1-2 hours. A majority of respondents (53%) spent between 2-4 hours cooking, with 21.6% spending more than 4 hours (Figure 4). The findings suggest that people put more effort and time into cooking during special events and when they have guests. The figure further demonstrates that the tiredness level during festivals and when guests are around is high, leading to exhaustion and irritability. This sometimes results in a lack of interest in organizing social gatherings and celebrating festivals, due to exertion and fatigue.

3.2.3 Tiredness Due to Standing and Cooking

The results of the survey indicate that a significant proportion of the participants (162 out of 268) reported feeling fatigued while cooking for guests, which was the highest number of respondents who reported tiredness. This is unsurprising, as cooking for guests usually requires more time, effort, and energy than daily cooking routines. Moreover, a considerable number of respondents (129 out of 268) reported experiencing fatigue while cooking during festivals, which may be due to the need to prepare large quantities of food (Figure 4). On the other hand, a smaller number of participants (48 out of 268) reported feeling tired during their daily cooking routines, and even fewer (54 out of 268) felt tired on weekends. Among those who felt tired daily, 52% (24 participants) were cooking for more than 2 hours per day, indicating a direct association between tiredness and the duration of standing. Additionally, when considering age, it is observed that tiredness is experienced across all age groups, with a higher prevalence among those aged 45 and above.

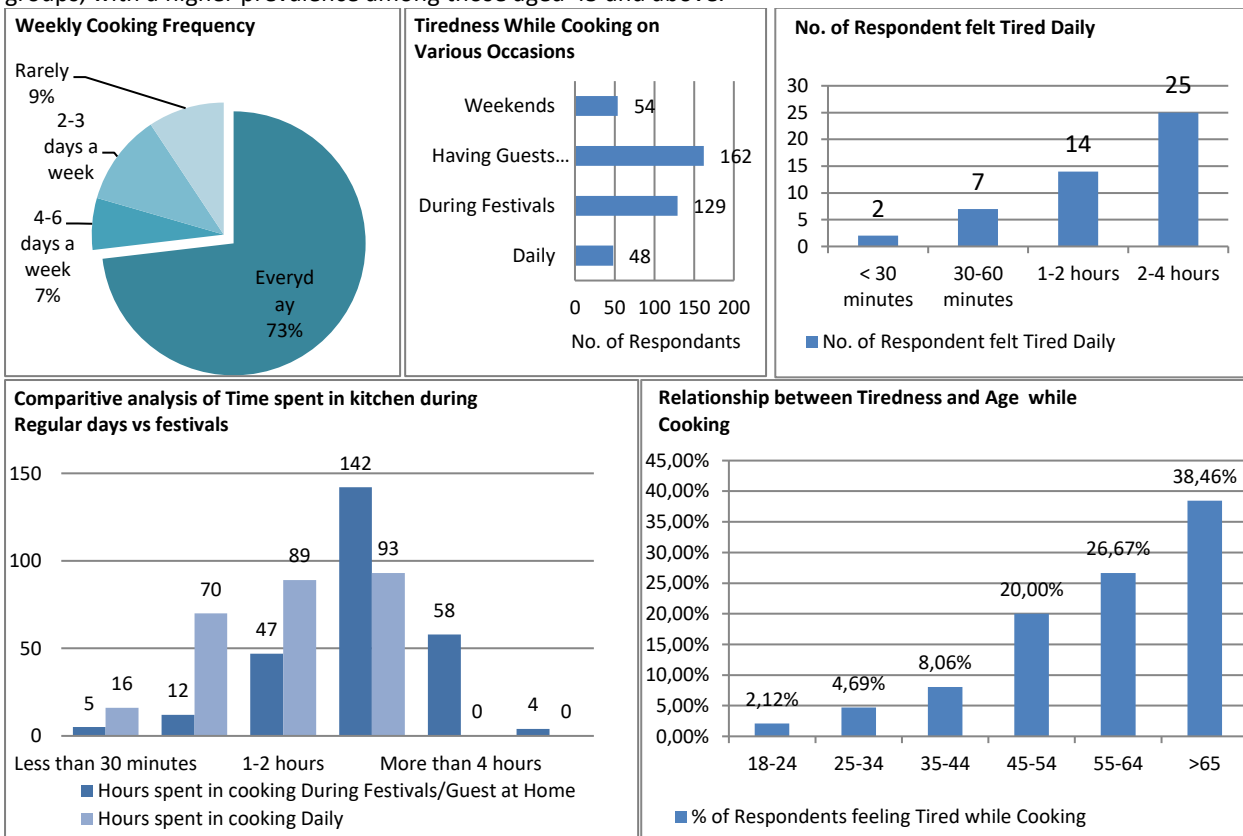


Figure 4: Cooking Time and Tiredness Level at Different Occasions (Developed by Author)

3.3 Health Problems Associated with Standing and Cooking

This study investigates the health effects of prolonged standing and cooking, analysing variables such as the number of participants experiencing health issues, the types of health problems encountered, and management strategies. The findings provide valuable insights into effective measures for mitigating health issues related to standing and cooking in the kitchen environment.

3.3.1 Health Problem Related to Standing Cooking

The survey revealed that 49.1% of respondents reported health problems related to standing and cooking, while 51.1% did not. Interestingly, a majority of respondents (206 out of 268) recognized the potential health risks of extended standing and cooking, while a smaller group (50 out of 268) did not believe it could lead to health issues. When examining the data by age groups, younger individuals (18-24 years) had the lowest occurrence of health problems (27.27%), while older age groups experienced higher rates. Among those aged 25-34, 38% reported problems, and the majority of the 35-44 age groups (54.83%) faced difficulties. The 45-54 age groups had an almost equal split (50.53%) of respondents reporting problems, while the 55-64 age groups had a significant proportion (66.67%) experiencing health issues. The highest risk was observed among those over 65, with 84.62% reporting health problems (Figure 5).

The most commonly reported health problems included leg pain, back pain, fatigue, knee pain, and foot pain. Joint pain and occasional discomfort were also mentioned but less frequently. Notably, 50 respondents did not experience any health problems. These findings emphasize the prevalence of health issues during standing and cooking, particularly for extended periods. Age emerged as a significant factor, with older individuals facing a higher risk. The identified health problems can guide awareness and the implementation of measures to mitigate risks associated with standing and cooking activities.

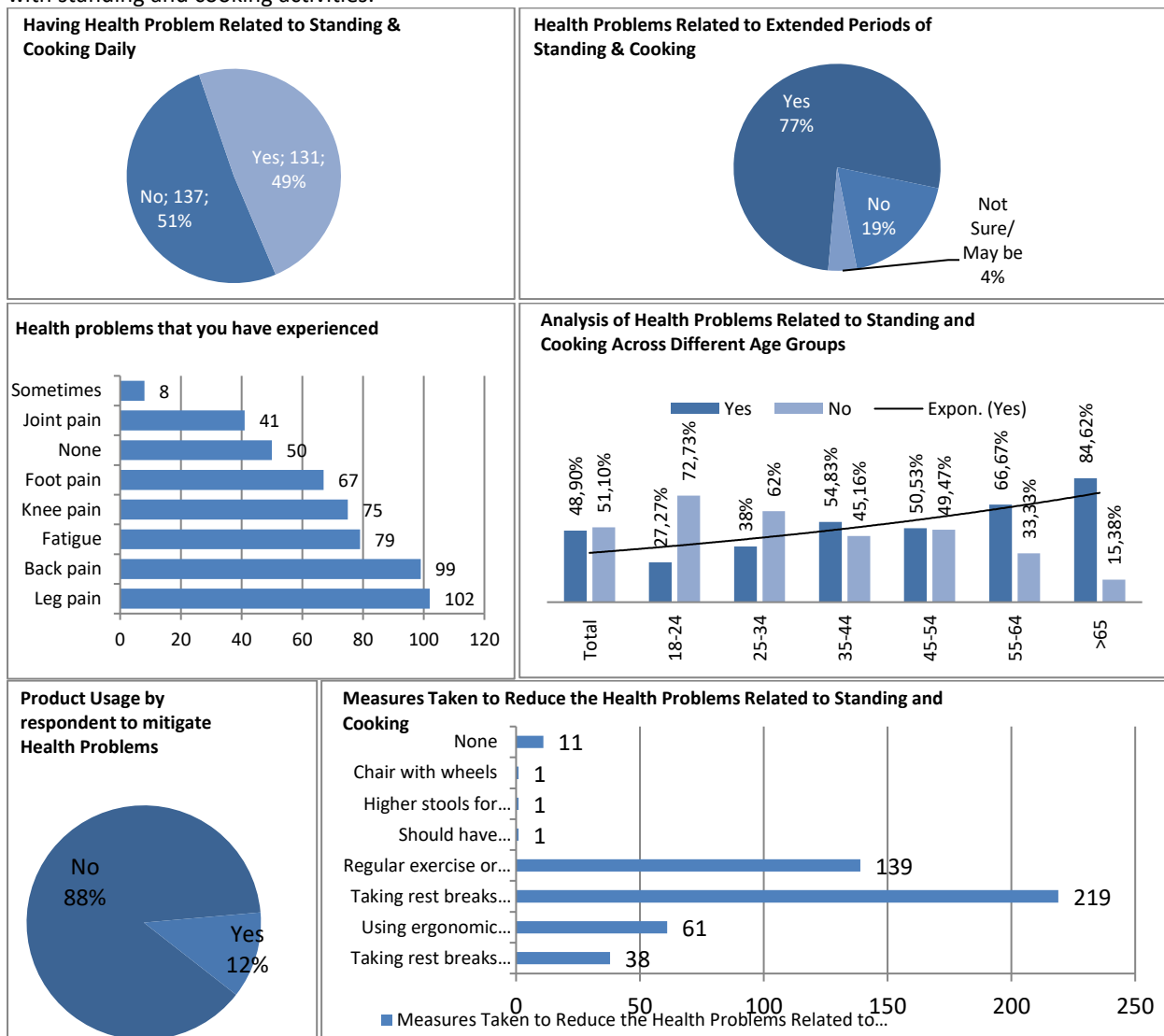


Figure 5: Health Problem Related to Standing and Cooking

3.3.2 Product Usage suggested by Participant for Mitigating Related Health Problems

Based on the responses given, it seems that the majority of respondents have not used any specific products or equipment to alleviate physical discomfort while cooking. However, some have mentioned taking rest breaks, using ergonomic equipment, using anti-fatigue mats, or using chairs or stools to sit while cooking. One respondent mentioned the use of Millet for health benefits related to weight loss, thyroid, and diabetes. It is clear that some respondents are aware of the importance of physical comfort while cooking and are taking steps to address discomfort (Figure 5).

3.3.3 Advantages and Disadvantages of Standing Kitchen

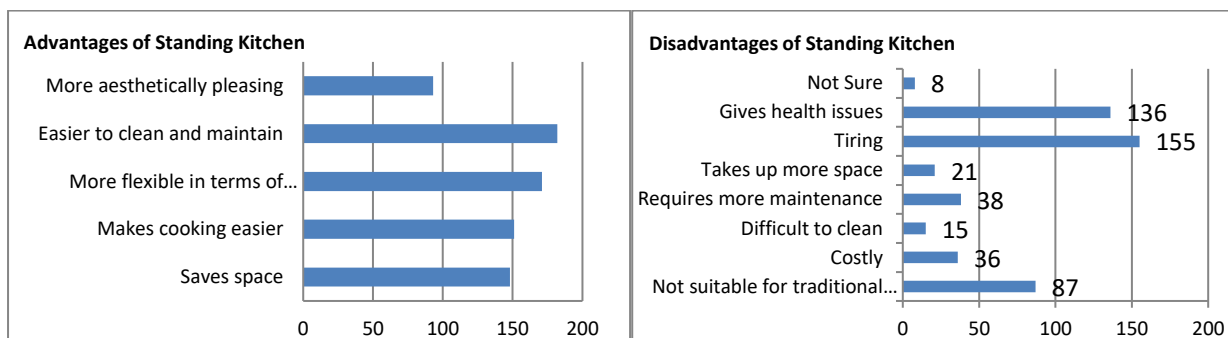


Figure 6: Advantages and Disadvantages of Standing Kitchen

The majority of respondents perceive several advantages of a standing kitchen over a traditional sitting kitchen, including flexibility in layout, easier cleaning and maintenance, and improved cooking convenience. Aesthetics and space-saving are not significant factors for respondents. However, there are concerns about the physical toll of standing for long hours, unsuitability for traditional cooking practices, and potential reliance on others for assistance. Cost, maintenance, and cleaning challenges were also mentioned. It is important to consider these drawbacks and individual needs when designing and choosing a kitchen setup (Figure 6)

3.4 Respondent Preferences for Kitchen Type and Cooking Posture

This survey study examines the influence of kitchen type and posture on user comfort in Indian households, with a focus on variables such as the type of preferred kitchen type, posture preference based on situation and activity.

3.4.1 The type of Kitchen Preferred by The Respondent

The survey findings revealed that a majority of respondents (197 out of 268) prefer a flexible kitchen that allows for both standing and sitting postures while cooking, rather than a kitchen that is solely designed for standing or sitting. Hybrid kitchens, equipped with adjustable platforms that can be set to different heights, provide the flexibility to switch between standing and sitting positions as desired. This indicates that respondents value the ability to adjust their posture during cooking based on personal preference or levels of fatigue. Overall, the results emphasize the significance of incorporating posture flexibility in kitchen design and indicate the necessity for adjustable countertops and seating options in the kitchen.

3.4.2 Need for Flexibility of Posture while cooking in the Kitchen

Based on the given data, it can be concluded that the majority of respondents (226 out of 268) agree that their kitchen should be flexible enough to allow both standing and sitting postures while cooking. This accounts for approximately 84.33% of the total respondents. Only a small percentage of respondents (11.94%) disagreed with this statement, while 3.73% were unsure (Figure 7).

These results indicate that there is a clear preference among respondents for the ability to switch between standing and sitting postures while cooking, depending on their preference or fatigue levels. This highlights the importance of kitchen designs that accommodate this preference, such as hybrid kitchens with adjustable platforms or seating options.

3.4.3 Occasions Influencing Sitting and Cooking Preferences

Based on the provided data, it is evident that a majority of respondents find it more convenient to sit and cook during festivals (100) and when guests are at home (75). Additionally, 86 respondents prefer sitting while cooking on a daily basis. However, during weekends, only 46 respondents find it more convenient to sit and cook. It is worth noting that a small number of respondents (30) reported never finding it more convenient to sit and cook (Figure 7).

Additionally, it is important to acknowledge that some respondents expressed concerns about standing for long hours while cooking, as it can lead to health problems. Preferences vary among respondents, with some preferring sitting but not on the floor, while others find a combination of sitting during preparation and standing while cooking to be more convenient. Overall, the data suggests that sitting while cooking is a preferred posture for many respondents, particularly during specific occasions and on a daily basis.

Furthermore, the data indicates that occasions play a role in determining whether respondents choose to sit or stand while cooking. The majority of respondents prefer standing while cooking in most situations, except during festivals where sitting is the most preferred posture. Daily cooking has a relatively higher proportion of respondents who prefer sitting while cooking, followed by cooking for guests at home. Weekends have the fewest respondents who prefer sitting while cooking.

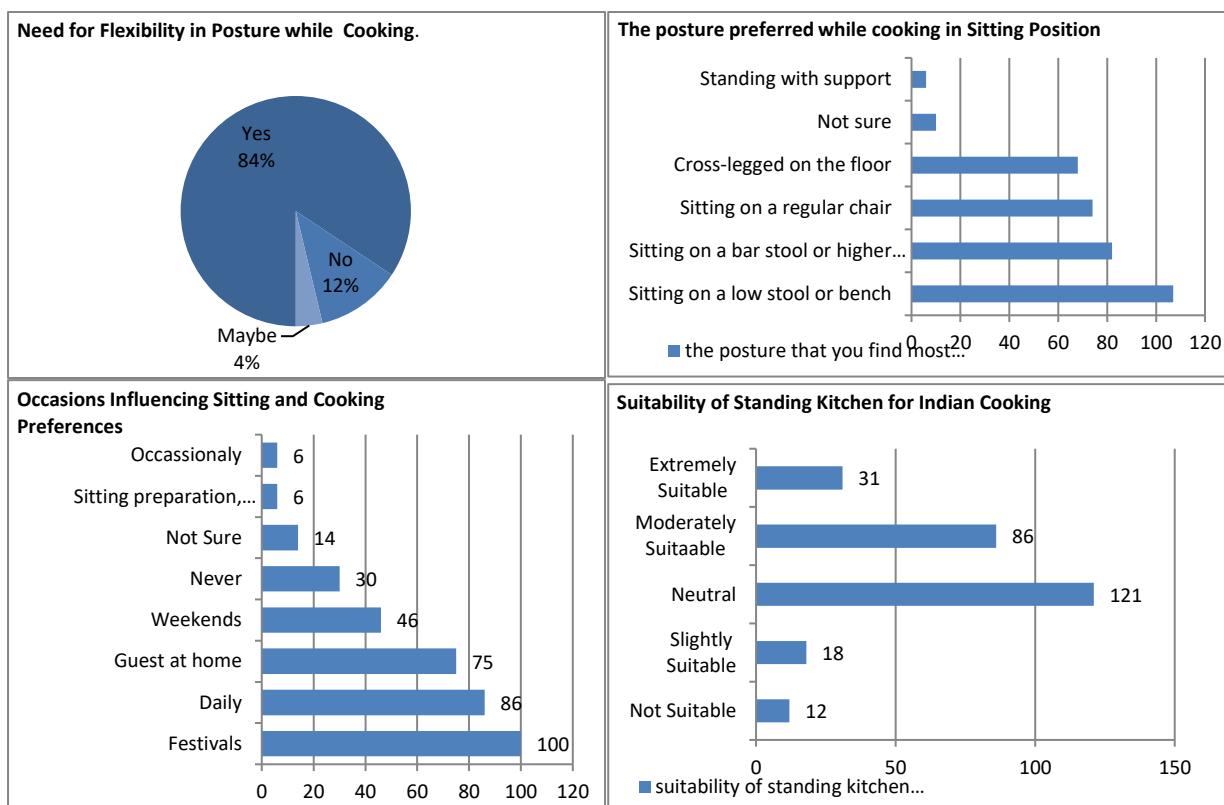
3.4.4 The Posture Preferred while Cooking in Sitting Position

The data reveals that respondents have varied preferences for their most comfortable cooking posture in the kitchen. The majority (107) prefer sitting on a low stool or bench, followed by sitting on a bar stool or higher chair (82), sitting on a regular chair (74), and cross-legged on the floor (68). A small number of respondents (10) were unsure, while a few (6) preferred standing with support (Figure 7). These findings emphasize the importance of providing a range of seating options to accommodate individual comfort and enhance the overall cooking experience.

3.4.5 Suitability of Standing Kitchen in Indian Context

The data reveals varying opinions on the suitability of a standing kitchen for Indian cooking. A significant number of respondents (121) hold a neutral stance, while a considerable number (86) find it moderately suitable. A smaller proportion of respondents find a standing kitchen either slightly suitable (18) or extremely suitable (31). However, there are also respondents (12) who consider a standing kitchen not suitable for Indian cooking (Figure 7). These findings highlight the diverse perspectives on the matter, suggesting the importance of considering individual preferences and cooking practices when designing kitchens for Indian cooking.

The data further suggests that the suitability of a standing kitchen in the Indian context can be correlated with respondents' preferences for flexibility in the kitchen. It is observed that while many respondents prefer a standing kitchen, they also express the need for flexibility based on different situations. For instance, during festivals or when guests are at home, respondents may prefer to sit and cook. This highlights the importance of incorporating flexibility in kitchen design to accommodate varying preferences and situations.



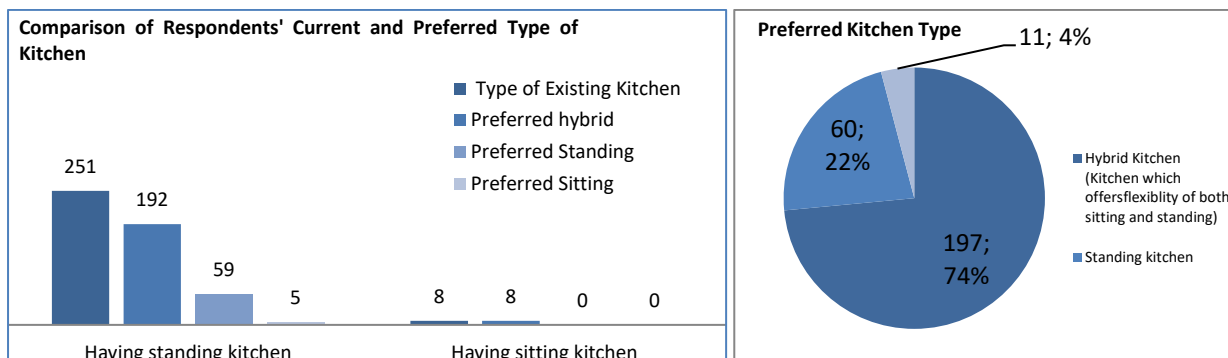


Figure 7: Respondent Preferences for Kitchen Type and Cooking Posture

4. Conclusions

In conclusion, the research findings highlight the substantial amount of time dedicated by women in India to cooking, particularly during special occasions. This prolonged standing contributes to various health issues and cooking-related stress. While standing kitchens are preferred for their flexibility and efficiency on regular days, longer cooking periods necessitate a preference for sitting postures. Additionally, the elaborateness of Indian cuisine and its cultural significance in religious rituals, festivals, and celebrations further emphasize the need for kitchen designs that accommodate diverse user needs.

The research also reveals a shift away from traditional floor-level cooking practices, with a preference for raised kitchens. However, the existing kitchen designs do not adequately cater to user comfort, well-being, and flexibility requirements. The findings also indicate a direct association between tiredness and age and the time spent in the kitchen. Therefore, considering age-related trends in fatigue while cooking is crucial. This underscores the need for kitchen design to create more comfortable and user-friendly environments, especially for older individuals who may face challenges due to fatigue.

The research highlights a noticeable gap between the current kitchen design and user preferences, indicating the necessity for additional research that considers factors such as age, health conditions, and cultural considerations. This will guide the redesign of modular standing kitchens in India, taking into account user needs and promoting a healthier and more comfortable cooking experience.

Collaboration among stakeholders, including users, designers, and manufacturers, is crucial in re-examining and redesigning kitchens. The aim is to create a modular standing kitchen that offers flexibility in different postures, addresses user comfort, mitigates health issues, and provides older women with the independence to cook and dine without prolonged standing. By prioritizing the well-being and preferences of users, a more user-centric and accommodating kitchen design can be achieved, enhancing the overall cooking experience in India.

Overall, the research emphasizes the importance of considering user preferences, improving kitchen design, and preventing health issues during cooking in India. By identifying user needs and implementing design interventions, it is possible to create a more comfortable and healthier cooking process that enhances the overall well-being of individuals.

Acknowledgements

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. I am grateful to my family and friends for their valuable support in reaching out to a wide range of respondents across the country.

Conflict of Interests

The authors declare no conflict of interest.

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