

A Study of Urban Kitchens Constructed by Delhi Development Authority

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Abstract—The kitchen has rightly been called the 'heart' of a home. It is also an important activity centre and a major work place. In the work, worker, workplace trilogy of ergonomics, it can be said that a suitably designed workplace- in this case the kitchen, will result in the work i.e of meal preparation, to be performed with ease resulting ultimately in comfort and better health of the worker i.e. the homemaker. The study of ergonomics also insists on designing workplaces keeping in mind the specific worker. Unfortunately, for most Indian homemakers this possibility is very remote. A majority of homemakers have to work in kitchens designed by builders or government agencies such as Delhi Development Authority who design kitchens for masses and not specifically for a particular homemaker.

A study was conducted on 510 kitchens built by Delhi Development Authority in the four zones of Delhi. In North Delhi and East Delhi 128 kitchens each and 127 from South and West Delhi each were studied. The kitchens were physically visited and information was collected regarding the size, shape, placement of counters, presence of sink, number of windows etc. in the kitchens. The homemakers were also interviewed and details regarding the changes made in the kitchen were noted. In the next phase, 50 kitchens were selected from the 510 kitchens. An in-depth study was done of these kitchens.

The findings of the study revealed the need for better designing of the urban Indian kitchen.

1. INTRODUCTION

The kitchen is one of the most important centre of family activity. It is not only a work centre but also a social centre, a family room as well as a focal point around which several activities such as cooking, washing utensils, cleaning, storing, maintenance of equipments and supplies etc. revolve[1].

Since a considerable amount of the homemakers time is spent working in the kitchen and variety of tasks are performed here, it becomes one of the most important work area for her. If the kitchen is such that it facilitates ease of work, then the fatigue incident to carrying on household duties becomes less and satisfaction increases. This is possible only when the kitchens are well planned. According to kitchen consultant Jay[2],

“Good planning is an essential ingredient to the efficiency of a kitchen.”

Unfortunately, this very vital component is missing in the Indian kitchens. In the urban areas, after the toilet and the bathroom, the kitchen is the most neglected room. The size of the kitchen is decided after the major portion has been designated for the drawing room and the bedroom [3]. Within the kitchen there is poor organisation of work area leading to undue expenditure of time and energy. According to a study conducted on the housing conditions in 163 rented and 248 self owned houses of middle income group families in urban and rural areas of Akola district, in the majority of cases, the kitchens were characterised by the presence of inadequate storage, storage beyond reach, unsatisfactory light and ventilation[4].

The present study was conducted to study the urban kitchens in the four zones of Delhi built by Delhi Development Authority.

2. METHODOLOGY

The study was conducted in 510 kitchens belonging to middle income group families living in flats built by Delhi Development Authority (DDA). A list of flats built under the Middle Income Group housing scheme in these four zones was taken from the Delhi Development Authority office and five colonies were selected at random from the list. The criterion for selection of these colonies was -

- Since there was a difference in the size of the flats built before 1980 and those built in subsequent years, it was decided to take only those falling in the latter category i.e. those built after 1980.
- The flats comprised of the following rooms (i) drawing cum dining room / drawing room and a lobby (ii) two bedrooms (iii) one bathroom (iv) one toilet (v) one kitchen (vi) open space in the front and at the back.

The colonies were selected by means of random sampling technique and were as follows -

- (i) Prasad Nagar (North Delhi) -128 kitchens
- (ii) Dilshad Garden (East Delhi)- 128 kitchens
- (iii) Mayapuri (West Delhi) - 127 kitchens

(iv) Sheikh Sarai and Munirka (South Delhi) - 127 kitchens.

The total sample size was 510.

An Interview schedule was constructed in order to get detailed information about the homemaker i.e. her age, education level, region of India to which she belonged, the type and size of her family, monthly family income, etc. as well as information regarding meal preparation such as activities performed in the kitchen, time of preparation of meals, their duration etc. There was also an observation table in which information regarding the kitchen were noted - size, shape, changes made etc.

The Interview schedule was field tested and subsequently modifications were made. The modified schedule was then used to collect data.

In the next phase 50 kitchens were selected - 12 each from North and West Delhi and 13 from South and East Delhi. An in-depth study was done of these kitchens.

The collected data was analysed and conclusions drawn.

3. RESULTS

The major findings of the study are as given below -

3.1 Size

The area of the kitchens of Munirka and Mayapuri flats were the largest i.e. 6 sq.mts. The Prasad Nagar and Dilshad Garden flats had the smallest kitchens of size 4.45 sq.mts.

3.2. Placement of counter within the kitchen.

The arrangement of the counter in the kitchen would, in a way determine the shape of the kitchen. This means, that although the physical shape of the kitchen would be square or rectangular, it is the arrangement of the counter that will further determine whether the kitchen is one wall, two wall, L shape, U shape or Island type. The present study further found that in fact it was the placement of counter along with the arrangement of storage cupboards on the walls which together determined the actual 'shape' of the kitchen. For e.g. in a kitchen where the counters along two continuous walls formed an L shape, a utensil stand might be placed on the third wall which does not have a counter beneath. In such a case, the shape of the kitchen becomes L as far as the arrangement of counters is concerned but an incomplete U when the arrangement of storage units are also taken into consideration. Overall, it can be considered as U shape kitchen rather than L shape since the L shape will form a section of the U shape.

The kitchens in Prasad Nagar were of two types. In the New Prasad Nagar, the placement of counter was L shape but in Old Prasad Nagar it was against a single wall. The kitchens in Dilshad Garden, Mayapuri and Sheikh Sarai also had L shape counter. In Munirka, the kitchens had the counter in the shape of U.

The in-depth study of the kitchens revealed that out of the total of 50 kitchens, modifications were done only in 4 kitchens.

Thus, there were five kitchens in which the counter was originally running along one wall only and this shape had been retained by four respondents. One respondent had changed it to U shape counter.

There were 34 kitchens which had L shape placement of counter and this shape had been retained by 31 respondents. Two respondents had changed it to two wall (counters on two opposite walls as opposed to counters on two continuous walls in L shape) and one had changed it to U shape. Thus, majority of the respondents had not modified the shape of the counter. The space provided by the counters was probably sufficient and therefore the families did not change it. It is also important to note that none of the kitchens which were U shaped had been altered in any way. This indicates that as compared to the other shapes, the U shape was probably the most suitable shape of the counter.

However, in terms of the overall shape of the kitchen, the concept discussed earlier, changes were seen in the kitchens. In the original plan of the kitchens, in addition to the counter there were slabs above and below the counter which the respondents had later either covered to form cupboards or were left open to form shelves. In addition to these in built cupboard/shelves, some additional units, which were mainly for the purpose of storage, had also been placed in most of the kitchens in order to meet the storage needs of the family. Thus, the placement of these additional units changed the overall plan of the kitchens. There were 39 kitchens which had an overall shape of L and these had been changed to U shape by 21 respondents, extended U by 14, two wall by one respondent and the most common overall shape of the kitchen i.e. L shape had been retained only by three respondents. The original U shape had been retained by one respondent and 11 had converted it into an extended U shape. Thus, additional storage units were placed on walls which did not have counters against them. As reported earlier, most of the respondents had not changed the shape of the counter. This means that as far as performing operations was concerned, the space was found to be sufficient and therefore not increased in any way. But for storage more units were required which were then placed on three or more walls thereby resulting in U or extended U shape of the kitchen. Shrestha [5], in the study of kitchen related activities performed by 114 homemakers residing in selected university staff quarters of the Maharaja Sayajirao University of Baroda also reported that all the respondents had augmented their existing storage facilities with either portable cupboards, racks, wall cabinets or fixed ones.

In the present study, it was found that a wide variety of operations were performed in the kitchen and an even larger variety of items / ingredients were needed for performing those operations. Since the size of the kitchen was not very large, each and every area within the kitchen had to be

utilised. Thus, when the space is limited, it is the maximum utilisation of the space to meet the needs of the family that becomes important rather than saving in time and energy of the homemaker which in any case would probably be less because of the small size of the kitchen.

It can, therefore be said that in consideration of the storage needs of the middle income group families, the kitchen should be so designed that there are as many storage areas as is possible in order to meet the extensive storage needs of the middle income group family.

3.3. Presence and Placement of important kitchen equipments

In order to be able to prepare a meal, a homemaker requires a source of heat for cooking and supply of water. In addition to these basic requirements, an arrangement for washing utensils, a suitable place for storing perishables, utensils etc. and some labour saving devices for performing the heavy task of grinding and mixing would enable her to work with ease. To that extent, an urban kitchen should have a gas range, a sink (a platform sink and/or floor sink), refrigerator and a mixer. Therefore, while designing a suitable urban kitchen, space has to be provided for placement of gas stove, a sink, space for placement of refrigerator and place for storing and using electric mixer.

As reported earlier, there was suitable counter space for the placement of gas stove.

In the present study, it was found that the sink was present in almost all (99%) kitchens. It had been installed at the time of building of the flat. However, in the case of 5 respondents (5 out of 510 kitchens), after the sink broke it was not replaced and they were using the floor sink only. The material of the original sink was ceramic and this had been retained by only 39.8% of the respondents. The other respondents had replaced the original ceramic with sink made from other materials. Thus, marble sink were found in 44.60% kitchens, steel in 14% and a very small percentage i.e. 1.6% had granite sink. The ceramic sink is no doubt cheap as compared to sink of other material. However, keeping in consideration the longer life and durability of the steel sink along with its advantages of being easy to clean and maintain, it would be ideal if the planners at the time of construction of the flat would install a steel sink.

Another placement of water tap in the Indian kitchen is the floor sink (i.e. an arrangement for water at a level close the floor where work can be performed only in sitting posture). Since most of the kitchens are now being designed so as to enable a worker to work while standing, a floor sink might not suit such an arrangement. But the present study revealed that 58.6% of the respondents were using the floor sink for filling water for storing, washing utensils etc. Also, especially in the case of flats on the upper floors, because of low water pressure during summers, water does not always reach the sink but only comes in the floor sink. Under such circumstances, all water

requirements were being fulfilled by the floor sink. A floor sink is thus a necessity and should be installed in all high rise buildings.

As far as providing space for refrigerator was concerned, due to lack of space in the kitchen 95.5% homemakers had to place the refrigerator outside the kitchen. During the in depth study of the kitchens it was found that 30% of trips made during meal preparation to the refrigerator are from the range followed by sink (26%). Similarly, 33% of trips made from the refrigerator were to the range and 25% to the sink. This shows that it is important for the range, sink and refrigerator to be close to each other if the energy expenditure of the homemaker has to be reduced. It is an important factor to be considered by the kitchen designers and planners.

Another important finding of the study was related to the storage and use of electric mixer. The study revealed that 494 out of 510 homemakers had an electric mixer but only 87% of these were using the mixer in the kitchen and 76.3% were also storing it in the kitchen. Thus, almost 24% were not able to store the mixer in the kitchen itself. About 19% were storing the mixer in the dining room or lobby and 4% were storing it even in the bedroom. (Interestingly, 10.9% were even operating the mixer in the dining or lobby area.) This increases the load of the worker who has to perform additional task of first bringing the mixer from another room to the kitchen and then replacing it after performing the work. Therefore, it is important to provide adequate storage space and electric points for electrical equipments in the kitchen.

The present study also revealed the need for better storage facilities in the kitchen for other materials too. It was found that although the majority of the respondents were storing all the raw ingredients in the kitchen itself, atleast 9% were using other areas as well. The rooms or areas used were storeroom (5.5%), bedroom (2.1%) and drawing room and other areas (1%).

3.4. Presence of windows

A sufficiently large window is a must in kitchen for effective light and ventilation. A window allows fresh air and natural light to enter the kitchen. It also allows fumes and hot air to leave the kitchen, thus enabling a worker to perform the task more comfortably. However, except for the flats in East Delhi, which had two windows, all the other flats had only one window.

The present study revealed that 18.4% respondents were using areas other than the kitchen for performing activities related to meal preparation due to poor lighting and ventilation in the kitchen. The use of any other area increases the time and energy expenditure of the homemaker since utensils, ingredients etc. have to be collected from one workplace and taken to another workplace which might not really be suited for that particular activity. In addition to this, time will be wasted in cleaning as well. However, the most important point here is that working in a poorly planned and unorganised

kitchen can result in serious accidents. According to National Safety Council, the kitchen is the most dangerous room in the home accounting for 1,150,000 accidents per year, 26% of all falls and burns in the home and 12% of all fatalities [6].

Unfortunately, lighting whether natural or artificial, is not proper in Indian Kitchens. Luthra, in her study on the amount of illumination required for performing certain activities in the kitchen, found that in none of the homes that she studied was there any task lighting for different work centres in the kitchen. The amount of light available for work during night was inadequate in all the kitchens.[7].Therefore, more provision for light - both natural and artificial should be made in the kitchen.

3.5 Use of areas other than kitchen for meal preparation

It has already been reported earlier that some respondents were using places other than the kitchen for storage of items needed in the kitchen. Similarly, it was found that many respondents were using areas other than the kitchen for performing activities related to meal preparation.

It was found that only 24.6% respondents were performing all the activities related to meal preparation solely in the kitchen, whereas the majority of the respondents i.e. 75.4% were using other areas as well. The dining table placed in the lobby was being used by 65% respondents.(Interestingly, although 65% were using the dining table for performing activities related to meal preparation, only 49.6% were using it for eating meals).

The reasons given for the use of other areas for performing activities related to meal preparation such as cutting vegetables, picking and cleaning rice and pulses etc. indicate the need for better kitchen design. About 22% of the homemakers felt the need to perform at least some part of the meal preparation activity while sitting. Since the kitchens were not designed for enabling the homemaker to sit comfortably while working, areas other than the kitchen had to be used. It has been reported earlier that 18.4% respondents were using other areas due to poor lighting and ventilation in the kitchen. Another reason which was given by 18.2% respondents was that they wanted to watch the television while performing some activities related to meal preparation. This highlights the need to not isolate the kitchen and place it in the secluded portion of the house but to place it in such a way that the homemaker is able to participate in other activities too.

4. CONCLUSION

The present study highlights the need for the better designing of urban Indian Kitchens.

There is no doubt that space in urban areas is facing a major crunch. The houses and flats are becoming smaller leading subsequently to decrease in the kitchen size. But it is important to note that a large variety of activities are performed in the kitchen by the homemaker and the

performance of these activities will be greatly affected if the size is reduced.

It can also be seen that although an L shape arrangement of counter might be appropriate for performing most operations (in any case it might not be possible to have U shape arrangement of counter in small sized kitchens), a large number of storage units need to be provided. The overall shape of the kitchen, after keeping into consideration both the placement of counter and storage units should be U or extended U (or G).

A number of electrical equipments are now being used in modern urban kitchens and therefore there should be sufficient number of electrical outlets. There should also be well designed storage units for storing the large electrical equipments and their accessories.

A refrigerator is an important element of range, sink and refrigerator triangle. Ideally, there should be a well marked out space with appropriate electrical outlets within the kitchen.If that is not possible, then there should be adequate space for refrigerator near the kitchen.

A sink is also an important appliance and should be of a material that is long lasting and easy to clean. A floor sink is also a must in an urban indian kitchen especially in multi storey buildings.

There should also be some provision for the homemaker to be able to perform selected activities in the kitchen while sitting. This can be made possible by having a stool or a high chair which can be pushed beneath the counter when it is not being used. When the homemaker wants to use it, the stool or chair can be pulled out and the homemaker can sit comfortably with her legs positioned under the counter. In such a case, no doubt, one will have to compromise with storage space but the comfort of the homemaker and the necessity of her maintaining a good body posture while working are just as important.

Every kitchen should have adequate provision for lighting and ventilation - both natural and artificial.In addition to having artificial general lighting, task lighting should also be provided.

5. ACKNOWLEDGEMENTS

This work could not have been possible without the support of 510 homemakers.

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