AJHS
Asian Journal of Home Science
Volume **10** | Issue 2 | December, 2015 | 371-374

DOI: 10.15740/HAS/AJHS/10.2/371-374
e ISSN-0976-8351 ■ Visit us: *www.researchjournal.co.in*

Research Paper

A study of ergonomic approach to kitchen work centers

■ SWATI ASHOK MAHAJAN **AND** S.L. PATWARDHAN

Received: 23.07.2015; **Revised:** 29.10.2015; **Accepted:** 07.11.2015

■ **ABSTRACT :** Work place is an important dimension that expedite the activity and exerts minimum stress on the workers. Therefore work space must get considerable attention in the designing of the layout. considering the importance of kitchen platform, there is need to design kitchen and ergonomically evaluation of kitchen. A data on 200 sample of existing kitchen were randomly selected belonging to nuclear families. The data obtained was useful for designing a kitchen which gives comfort while working and reduced energy expenditure. The study was carried out through interview schedule methods and questionnaire filled; Anthropometrical observations are recorded by using measuring tape etc. The data collected were tabulated and suitable statistical tools like, frequency, average, percentage were used for analysis of data. In standing type of kitchens as the worker maintains the standing posture while working. Home maker can move quickly from washing to preparation to cooking area, so the home maker saving their time and energy. It is observed that "L-Shaped" kitchen counters were most common (57.00%) of respondents were more comfort for their work. The result of present study will be used to understand and improve work, worker and work place relationship to have healthy and safety of the home makers. This will help to minimize physical and energy cost of home makers to improve work efficiency and also to reduce heart beat of home makers.

■ **KEY WORDS:** Ergonomics, Kitchen work centre, Anthropometric measurements

■ **HOW TO CITE THIS PAPER :** Mahajan, Swati Ashok and Patwardhan, S.L. (2015). A study of ergonomic approach to kitchen work centers. *Asian J. Home Sci.*, **10** (2) : 371-374.

See end of the paper for authors' affiliations

SWATI ASHOK MAHAJAN
Department of Home Science, Smt. Dankunwar Mahila Mahavidyalaya, JALNA (M.S.) INDIA
Email : pswatimahajan@gmail.com

Ergonomic comfort in the kitchen can be achieved through appropriate design layout, comprehension of dimensional parameters and an appraisal of equipment efficiency for use of women. Women have to work harder and their optimum efficiency can not be achieved mainly because work place are not ideally designed. Hence to obtain maximum efficiency in work with least cost to the body. There should be an ideal relationship between work, worker and workplace (Braton, 1992).

Work place is an important dimension that expedite the activity and exerts minimum stress on the workers. It is adequate as per the anthropometric measurements of the worker (Kaur, 1986). The work place or work area especially kitchen should be adequately designed and properly arranged in order to reduce the physical, psychological and temporal cost of the home maker. The planning of the kitchen area in the house needs to be considered important place to facilitate to carry out all activity by reducing the effects of fatigue and accidents in the kitchen.

In recent years there has been a trend of more and

more women getting employed outside the home, in addition to their traditional domestic work, to share the financial burden of the family and also to gainfully utilize their professional expertise (Varghesse *et al.*, 1994). Indian kitchen neither changed as per the demand of women, that is why there is need for change in design of kitchen to fulfill need and wants of the homemaker.

Improper plan of kitchen area *i.e.*, work surface, storage space, dimensions of kitchen platform, distance in work centres, shape and size of the kitchen cause discomfort, become fatigue, muscular pain, bend in body posture and increasing work cost, whereas proper planned kitchen area minimizes stress, fatigue, reduced muscular pain. Therefore work space must get considerable attention in the designing of the layout (Charles, 1976). considering the importance of kitchen platform, there is need to design kitchen and ergonomically evaluation of kitchen.

Objectives :

– To study the size and shape of existing kitchen of selected women.

– To examine the existing work area of selected home makers.

■ RESEARCH METHODS

Present study was conducted in Jalna district of Maharashtra, to study the existing kitchen and to find out problem faced by women while working on kitchen platform and to find out loopholes in designing of kitchen platform. A data on 200 sample of existing kitchen were randomly selected belonging to nuclear families. The data obtained was useful for designing a kitchen which gives comfort while working and reduced energy expenditure. The study was carried out through interview schedule methods and the structured questionnaire were consist of two parts, 1. General information of the home makers (socio-economic status). 2. work area *i.e.*, kitchen type, kitchen size, dimension of working platform were analyzed. Data for the present study were collected through personal interview method. Anthropometrical observations are recorded by using measuring tape etc. The data collected were tabulated and suitable statistical tools like, frequency, average, percentage were used for analysis of data.

■ RESEARCH FINDINGS AND DISCUSSION

The experimental findings from the present study was presented and discussed in the following sub headings.

General information of the respondents :

It is clear from the Table 1 that 79.50 per cent of the respondents were have the family size of 2-4 members, whereas 20.50 per cent of the respondents belonging to big size family (5-6). 49 per cent of the respondents were belonging to the age group of 25-35 years. 42.50 per cent respondents were belonging to the income group of Rs.20,001 to 40,000/month. It is interesting to note that 70.50 per cent respondents were having education up to H.Sc. The dimension or size of the kitchen details were presented in Table 2.

Table 1 : Personal information of the respondents

Sr. No.	Personal information	Frequency number (n=200)	Percentage (%)
1.	**Type of the family**		
	Nuclear family	200	100
	Joint family	Nil	Nil
2.	**Size of the family**		
	2-4	159	79.50
	5-6	41	20.50
3.	**Age (years)**		
	25-35	98	49.00
	36-45	75	37.50
	46-55	27	13.50
4.	**Income per month in Rs.**		
	up to Rs 20,000	78	39.00
	20,001 to 40,000	85	42.50
	40,001 and above	37	18.50
5	**Educational qualifications**		
	up to H.Sc.	141	70.50
	Graduation	40	20.00
	Post graduation	19	09.50

It was observed from Table 2 that majority of the (60.00% of the kitchens) were having the area of 9.29 to 13.93 sq.mts, followed by 26.5 per cent of the kitchens were having small size of the kitchen ranging from 4.64

Table 2 : Size of the kitchen.

Sr. No.	Size of the kitchen	Frequency	Percentage
1.	4.64 to 9.28 sq.mts	53	26.50
2.	9.29 to 13.93 sq.mts	120	60.00
3.	13.94 to 18.58 sq.mts	27	13.50

sq.mts to 9.28 sqm. Similar results 8.00 sq.mts to 15.00 sq.mts of total area of kitchen was recommended by Grandjean (1973).

In standing type of kitchens as the worker maintains the standing posture while working, Home maker can move quickly from washing to preparation to cooking area, so the home maker saving their time and energy. The observations recorded about the type of kitchen are presented in Table 3.

Table 3 : Type of the kitchen.

Sr. No.	Shape of the kitchen	Frequency	Percentage (%)
1.	One wall	74	37.00
2.	Two wall	Nil	Nil
3.	L-shape	114	57.00
4.	U-Shape	09	4.50
5.	Broken shaped	03	1.50
6.	Island shaped	Nil	Nil

The room and interior character should itself dictate the design of an efficient kitchen layout (Conran, 1986). From the Table 3. It is observed that "L-Shaped" kitchen counters were most common (57.00%) of respondents were more comfort for their work. Similar observations were also reported by Mittal (1971); Grandjean (1988) and Sumangala (1995). According to their finding, L-shaped kitchen management is the best as it is found to be the most efficient for performing kitchen work. Where as Two walled and Island shaped kitchens were not observed in the present study.

Kitchen work triangle :

Work triangle is the distance travelled by home maker in kitchen while working with Freeze, sink and Cooking. The idea of "Kitchen work triangle" was formulated at the school of Architechture of the University of Illinois at Urbana-Champaign founded in 1944. Whereas Grandjean (1973) declared that maximum of 7.0 mts for small and medium size kitchens and 8.00 mts for large kitchens. The observations recorded from the present study were presented in Table 4.

The data presented in Table 4 indicates that minimum work traingle 2.75 mts and maximum 7.51 mts distance has to be travelled by selected home makers. The present findings were also similar according to Grandjean (1973). These three centres *i.e.*, cooking, freeze and sink are required to be closer to each other so that the home maker can do minimum travel at these centres.

Table 4 : Work triangle

Sr. No.	Cooking – Freeze (mts)	Cooking-Sink(mts)	Freeze-Sink(mts)	Work Triangle
1	1.19	0.33	1.23	2.75
2	1.99	0.62	2.09	4.70
3	3.14	1.06	3.31	7.51

Conclusion :

To ensure enhanced work efficiency of home makers kitchen design has to be developed on the basis of Ergonomic principle and Anthropometric measurements of home maker. The result of present study will be used to understand and improve work, worker and work place relationship to have healthy and safety of the home makers. This will help to minimize physical and energy cost of home makers to improve work efficiency and also to reduce heart beat of home makers.

Authors' affiliations:
S.L. PATWARDHAN, Koleshwar College, AMBAJOGAI (M.S.) INDIA

■ REFERENCES

Bhatt, Hema and Sidhu,M.K.(2011). An ergonomic assessment of activities done by female workers at kitchen workstation. *Asian J. Home Sci.*, **6** (1) : 22-25.

Bhatt, Hema and Sidhu,M.K.(2012). Survey of the ergonomic aspects of kitchen workstation. *Asian J. Home Sci.*,**7** (1) :83-87.

Braton, N.J. (1992). Occupational causes of disorders in the upper limb. *British Medical J.*, **34** : 309-311.

Charles, E.E.ed.(1976). Food service management.(2nd Ed.) Caheners Books International inc, New York.pp14-19.

Conran, T. (1986). *The kitchen Book*. Mitchell Beazley publishers Limited, London, UNITED KINGDOM.

Grandjean, E.(1973). *Ergonomics of the home*. pp.141-150. Taylor and Francis, London, UNITED KINGDOM.

Grandjean, E.(1988). *Fitting the task to the man*. (4th Ed),pp.35-36. Taylor and Francis, London, UNITED KINGDOM.

Jindal, U., Bakshi, R. and Dhaliwal, R.K. (2005). A study of existing kitchen conditions of rural households in moga district of Punjab state. *J. Dairying Foods & H.S.*, **24** (3/4): 211-215.

Mittal, M. (1971). Development of guides for setting up storage cabinets at the serving and cleaning. M.Sc.Thesis, Haryana Agricultural University, Hissar, HARYANA(INDIA).

Sandhu, P., Malik, M. and Kaur, H. (2007). Analysis of gap between existing and formulated kitchen work counters in selected households of Ludhiana city. *J. Dairying Foods & H.S,* **26**(1):42-47.

Sumangala, P.R.(1995). Developments of standards based on anthropometric measurements and their implications in the designing of kitchen and storage. Ph.D.Thesis, M.S. University, Baroda, GUJARAT (INDIA).

Times of India (2013). Ergonomic comfort in kitchen design. Oct 25.

Verghese, M.A.,Saha, P.N., Bhatnagar, A. and Narayane, G.G. (1994). An acceptable workload for Indian workers. *Ergonomics,* **22** : 1059-1071.