Abstract

"Ageing refers to the regular changes that occur in mature, genetically representative organisms living under representative environmental conditions as they advance in chronological age."

The world over, there has been a rapid increase in the number of elderly people, commonly called as people in the "Third Age", first and second being child and adulthood. In India, the "aged" population (60 years and older) is the second largest in the world. It is estimated that the proportion of elderly people will increase from 7.7% (76 million), in 2001 to about 11% (142 million) in 2020. With this demographic change and increase in the proportion of the elderly, societies in developed and developing countries will have to learn how to deal with a new set of health challenges and needs.

Age is characterized by the following changes: (a) reduced elasticity in almost all tissues of the body, which leads, among other things, to an increasing restriction of movement in legs and arms; (b) reduced ability of the brain to react to situations, slowing-down of all the directive functions, and loss of alertness; (c) reduction in mental activity, which shows itself mainly in loss of memory and reduced awareness of what is going on.

Physiological decline with increasing age renders the daily activities at home more difficult. Ageing emphasizes problems in the environment, since people have to face the difficulties of body decadence.

The elderly dealing with changed capacity, reduced ability and increased needs require the same accommodations and compensations in late life that they found in earlier years. Homes must provide solutions that address their distinctions in capacity, ability and needs for daily living to be carried out comfortably .

Therefore, home ergonomics is becoming very important amongst home scientist, ergonomists, industrialists, builders and interior designers.

Ergonomics is the study of human characteristics for the appropriate design of the living and working environment. While performing the daily living activities elderly people deal with storage units frequently in the different areas such as kitchen and bedroom of their home. Sometimes storages lack functionality and fabrication and are not up-to the needs of elderly due to which they face problems.

With the faulty design of storage system, even normal person without primary anatomical or physiological defects develop degenerative tissue changes and functional defects on the musculo-skeletal system resulting in decreased output with maximum input.

Therefore, in order to accommodate the elderly as viable and productive members of house it becomes necessary to consider their capabilities, limitations, needs and requirements for designing and modifying storage units for them.

Many people blame the ageing process for problems they encounter with daily activities, when instead quite often it is the design of the home itself that creates unnecessary disabilities. Even though there are more people over the age of 60 than there are under 25 years of age, the design of today's homes, including the products contained in them, is still based on the anthropometry of young healthy adults. Builders and manufacturers do not take into account age related conditions such as limited range of reach or reduced mobility when creating a home or household product. Consequently, most dwellings are hostile to the physical and sensory changes that older adults encounter as they live well into their 8th, or 9th or 10th decade.

In everyday life people frequently come in contact with storage units and elder people due to several causes as discussed earlier face problems while using storage units as they are not up-to their needs therefore, retrofitting the existing storage units and developing new guidelines for designing storage units for older adults is became necessary.

This justifies that designing of storage units requires standards based on anthropometric data of the third agers'. But there is inadequate information regarding this aspect for Indian elder women of various regions. There is a strongly felt need for such valuable information; hence it becomes necessary to study the anthropometric parameters of large section of elder women to provide a complete picture of diversity in size, shape, need and requirements of elder women than younger women which could be used as a reference data in planning ergonomically appropriate storage units. So the present study was planned to study the existing storage units in selected areas of the house and the problems experienced as well as the satisfaction felt by the women in the third age so that modifications can be suggested for the storage designs which are most appropriate for the third agers.

Descriptive research design was used for present investigation. The study was carried out in Ghaziabad district. The purposive sampling design was used to select the elder women. The women of 60-70 years of age, living alone or with spouse, able to carry out daily living activities in kitchen and bedroom and living in their own house were selected as sample for the present study. The total sample consisted of 85 elder women.

The data for the present study were collected through interview and observation and by taking measurements. Relevant questions were framed regarding the background information of the respondents like age, education, marital status etc. Information regarding health of the respondents viz: A: Functional Capacity (Activities performed by the respondents); B: General health status as perceived by the respondents; C: Status of organs as perceived by the respondents; D: Disease profile of the respondents; E: Problems related to movement of various body parts; F: Body Trouble Experienced by Respondents. Record sheet for collecting information regarding anthropometric measurements of the respondents. Record sheet for collecting information regarding existing storage units in selected areas of house viz. kitchen and bedroom. Scales were

framed to assess the Extent of problems with existing storage units in kitchen and bedroom viz: (A): Physiological problems faced by the respondents; (B): Problems regarding physical characteristics of the storage units; (C): Problems faced by the respondents while using storage units; (D): Ovako Working posture Analyzing System (OWAS) was used to assess the posture adopted by respondents while using storage units. Satisfaction scale was developed to assess the level of satisfaction of the respondents regarding existing storage units in kitchen and bedroom.

Descriptive and relational statistics were used for the present study.

Out of 85 elder women from Ghaziabad city, more respondents were widow (43.5 per cent) than others and in the age group of 60-65 years (75.3 per cent). Around 32 per cent respondents were higher secondary/Intermediate pass and 40 per cent were living with their spouse. It was found that majority of the respondents were non-employed in the past (71.8 per cent) as well as in the present (90.6 per cent). The family's mean monthly income was found to be Rs.13,035.29. The various sources of personal income of the respondents were pension, present employment, investment/savings/retirement benefits and allowances given by children. All the respondents possessed their own house. Little less than 70 per cent respondents lived in independent house and around 30 per cent lived flat.

On the basis of the activities performed by the respondents in kitchen and bedroom it was concluded that respondents had moderate functional capacity.

It was found that more than fifty per cent respondents perceived their health fair enough, whereas very few respondents stated that they had poor health status.

Maximum respondents used spectacles (50.6 per cent), had normal hearing power (57.6 per cent), normal taste for different food (54.1 per cent), could smell normally (82.4 per cent), walk normally without any support (95.3 per cent) and had good sensation power (100 per cent).

Further result of the study shows that maximum number of respondents (87.05 per cent) was suffering from mild health problems.

More than fifty percent (56.47 per cent) of respondents had low problems in movement of body parts; while around 43 per cent respondents fell in the category of moderate problems.

Majority (67.05 percent) of respondents were having least body trouble whereas; a wide majority of respondents did not face any problem in carrying out normal activities due to trouble in body. Due to less health problems the respondents could carry out daily living activities normally as well as were able to use storage units of the selected areas of the house.

The average normal standing height of the elder women was found to be 156.5 cm. The percentile values were calculated as 5^{th} percentile i.e. 147.5 cm, 50^{th} percentile i.e. 154.8 cm. and 95^{th} percentile i.e. 165 cm. Little difference was observed in the averages of eyelevel height (143.3 cm), shoulder height (131.4 cm) and elbow height (99.6 cm). Sizable differences among the sample were noticed for other standing heights namely abdominal extension height, waist height, buttock extension height, knuckle height and dactylion height.

The depths and breadths measurements include arm span, span akimbo, maximum body breadth, relaxed and maximum body depth, relaxed. A high difference was found in their averages. Similarly great differences were observed in circumference measurements. The mean chest circumference was found to be 93.3 cm. which was 100.5 cm. for circumference of hip at gluteal extension. Variation was also seen in other circumference measurements namely abdominal extension, waist and wrist.

The mean vertical upward arm reach from floor (197.2 cm) was found to much lower than maximum vertical arm reach, body raised on toe (203.6 cm) but higher than comfortable vertical upward grasp reach from floor (190.2 cm).

Upper position length, upper position height and lower position length, lower position height both in standing and leaning position shows differences in their averages.

Mean maximum horizontal reach and minimum horizontal reach in sitting position was found to be 61.5 cm and 34.07 cm respectively.

Miscellaneous measurements include Inner arm length, Total arm length, Fore arm length, Hand length, Finger length and Elbow width which shows sizable differences among the sample.

The mean dimensions i.e. length, breadth and depth of kitchen of the respondents were found to be 328.24 cms, 321.94 cms and 321.76 cms, respectively whereas, the mean dimensions i.e. length, breadth and depth of bedroom of the respondents were found to be 420.65 cms, 391 cms and 321.76 cms, respectively.

Various types of storage units were found in kitchen {Such as Free-standing storage unit, built-in (upto 6/7 feet) storage unit, built-in wall cabinet, wall mounted cabinet, base cabinet, wall mounted rack, other rack, loft and open shelves} and bedroom {Such as free-standing storage unit, built-in floor to ceiling, built-in (upto 6/7 feet) storage unit, chest of drawers, wall storage unit, base storage unit and box bed} of the respondents. The storage units vary in their age, number and material. Much variation was seen in illumination level of natural and artificial light inside storage units of kitchen and bedroom. It was found that respondents were using storage units to moderate extent in kitchen and bedroom.

The storage units found in kitchen and bedroom of the respondents vary in their dimensions i.e total height, total width and total depth and also the shelves'/drawers' height, width and depth.

It was found that the elder women felt moderate pain while using storage units in kitchen but further comparison of figures revealed that more pain/discomfort was felt by the respondents while using Loft, other rack, wall mounted cabinet, and built-in open shelves. The worst affected body parts were

neck, one or both hips/thighs/buttocks, one or both knees and one or both legs/ankle/feet.

Similarly the elder women felt moderate pain while using storage units in bedroom but on comparing the figures it was found that more pain/discomfort was felt by the respondents while using built-in floor to ceiling and box bed. The worst affected body parts were neck, one or both hips/thighs/buttocks, one or both knees and one or both legs/ankle/feet.

The problems related to physical characteristics were sub-categorized into (i) space availability, (ii) inner features and (iii) outer features of the storage units in kitchen and bedroom.

It was concluded that the problems related to space availability was experienced by respondents to a more extent in kitchen. However, the total weighted mean score was found high (1.30/2.00) for the problems related to height, depth and distance between shelves and drawers, under inner features of the storage units.

However, it was found that the problems related to space availability was experienced by the respondents to a more extent in bedroom also. Whereas, the total weighted mean scores were found high (1.25 /2.00) for the miscellaneous problems under inner features and outer features of the storage units.

The problems were further categorized into three parts viz. (i) problems while storing articles on top shelf (2) problems while storing articles on lower shelf and (3) other problems while storing articles in storage units.

It was revealed that the problems under the section of "other problems while using storage units" were faced by respondent to moderate extent whereas; the problems under the other two sub-sections were experienced to low extent in kitchen.

However in bedroom, the respondents faced moderate problems under the section of "problems while storing articles on lower shelf" while the problems were on the lower extent for the problems under the other two sub-sections.

Majority of the respondents requires corrective measures as soon as possible while using lower shelves of the storage units found in kitchen and bedroom..

It was revealed that majority of the respondents were moderately satisfied with their existing storage units in kitchen (71.8 per cent) and bedroom (68.2 per cent).

Coefficient of Correlation indicated that there was no significant relationship between age and extent of problems with existing storage units and level of satisfaction of the respondents with existing storage units.

Coefficient of Correlation indicated that there was a significant relationship between problems in movement of body parts and physiological problems faced by the respondents while using storage units in kitchen and bedroom. Relationship was also significant between problems in movement of body parts and level of satisfaction with existing storage units in kitchen.

The results of correlation of coefficient indicated that the relationship between anthropometric variables (Normal standing height, Vertical upward arm reach and total arm length) was non significant in relation to extent of problems felt by the respondents with existing storage units in kitchen but the relationship was significant between vertical upward arm reach and physiological problems faced by the respondents while using storage units in bedroom.

Significant relationship was found between various problems faced by the respondents and level of natural and artificial light inside various storage units in kitchen and bedroom. Relationship was also found significant between various problems faced by the respondents and extent of using various storage units in kitchen and bedroom.

Relationship was also found significant between level of satisfaction of the respondents and level of natural and artificial light inside various storage units in kitchen and bedroom. Significant relationship was also found between level of

satisfaction of the respondents and extent of using various storage units in kitchen and bedroom.

Coefficient of Correlation indicated that there was significant relationship between various problem felt by the respondents and total dimensions of various storage units in kitchen and bedroom. Relationship was also found significant between level of satisfaction and total dimensions of various storage units in kitchen and bedroom.

Result of correlation of coefficient shows that there was non significant relationship between the various problems felt by the respondents and level of satisfaction of the respondents with existing storage units in kitchen but the relationship was found significant between various problems felt by the respondents and level of satisfaction of the respondents with existing storage units in bedroom