ONLINE ISSN 2069-7430
ISSN-L 1841-4737
PRO LIGNO
www.proligno.ro
Vol. 13 N° 4 2017
pp. 466-470

CRITICAL POINTS IN THE CONSTRUCTION OF AGED PEOPLE FURNITURE

Vasiliki KAMPERIDOU
Aristotle University of Thessaloniki, Faculty of Forestry and Natural Environment
Laboratory of Wood Products and Furniture Technology
Address: 54124, Thessaloniki, Greece
Tel: 0030 2310 631046, Fax: 0030 2310 998947, E-mail: vkamperi@for.auth.gr

Abstract:
Even though the economic crisis has influenced the shopping behavior of all people, elderly between 65 and 69 still consume and spend more money on furniture than younger people. Despite of this, furniture manufacturers seem to lack knowledge about the diverse needs of aged people, referring to furniture, mainly because of a poor communication between furniture industry and its end-users. In this study an attempt to approach and categorize the requirements and needs of aged people using furniture in their everyday life is implemented. The study used approximately 100 interviews with elderly people that were carried out on a continual process that lasted around 1.5 years in several furniture stores of Thessaloniki (North Greece), gathering data and information in a frame of conversations, trying to reach a deeper understanding of their habits, needs and requirements related to furniture. The results, were also correlated to corresponding literature, and revealed common wishes and needs for furniture that provide comfort, safety, functionality, pleasure and independence, since furniture could help elderly people continue to be active and self autonomous.

Key words: *design; elderly; ergonomics; furniture; stability.*

INTRODUCTION

Low birth rates and higher life expectancy increase the average age of Europe. Aged people (65 years or over) will likely account for an increasing share of the total population, for 28.7% of the EU population by 2080, compared to 18.2% in 2013 (Eurostat 2013). Within the EE, the proportion of people aged 65 and over in the total population increased by 3.7% during the analysis period to reach 17.4%.

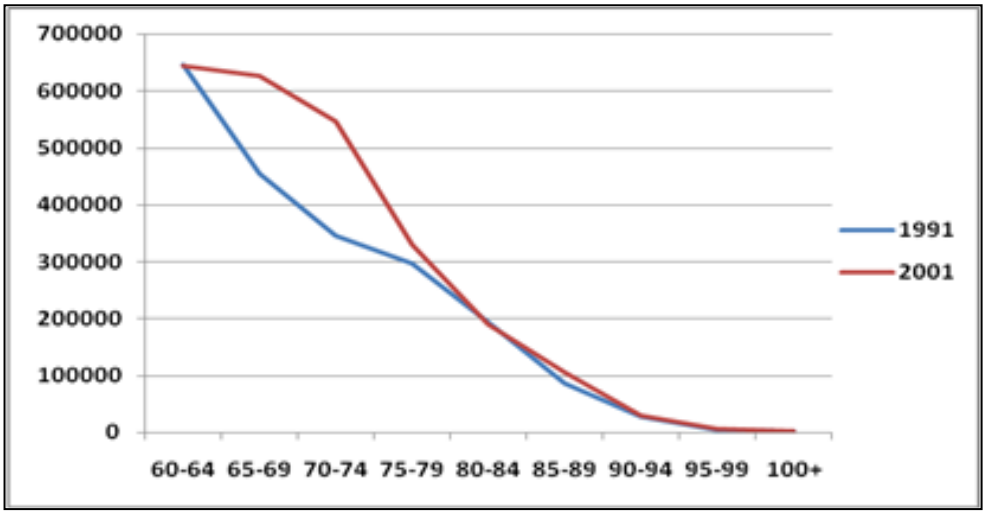

Fig. 1.
Population of aged people in Greece in the years 1991 and 2001.

Similarly, in Greece the average age has increased rapidly in recent decades starting from 28.9 in 1965 to 41.7 in 2010 (Eurostat 2013) (Fig.1). As the number of senior citizens increases, the number of people with disabilities also increases (Hrovatin 2012). This fact imposes the obligation on furniture designers to search for solutions that would at the same time combine elegance, comfort and safety requirements. These complex design methods that create furniture products physically and psychologically adapted to the user's needs base on ergonomics (Klos et al. 2014). People of third age live longer, are healthy and active longer and have different expectations on living conditions, than in any previous age (Jonsson 2013).

Even though the economic crisis has influenced the shopping behavior of all people, elderly between 65 and 69 still consume and spend more money on furniture than younger people. Despite of this, furniture

manufacturers seem to lack knowledge about the diverse needs of aged people, referring to furniture, mainly because of a poor communication between furniture industry and its end-users (Jonsson 2013).

OBJECTIVE

The objective of this study is to increase knowledge and awareness about the ways in which elderly people act on, are influenced by, reflect on and utilize furniture in their home environment the current years and specifically, aim is the communication and bringing of end-user opinion and experiences into sight, in order to improve the conditions of furniture design, intended for old people and their housing environment conditions in home. This human centered approach expect to inspire the world of designers and manufacturers to generate new design practices, that will hopefully contribute in developing furniture solutions that suit the specific needs of the elderly and improve their sense of coherence according to their own abilities, skills and experiences, maintaining a sense of dignity and independence.

MATERIAL, METHOD, EQUIPMENT

In this study an attempt to clarify and record the requirements and needs of elderly people using furniture in their everyday life is implemented. A number of around 100 interviews with elderly people was carried out on a continual process that lasted around 1.5 years in several furniture stores of Thessaloniki city (Greece). Data and information were gathered in the frame of conversation about their upcoming shopping process and experience, where their attitude about furniture choices and solutions, their interests, needs, expectations, concerns and reflections related to furniture were discussed, trying to reach a deeper understanding of their requirements, under a relaxed atmosphere without forcing people to complete specific questionnaires. Some of the participants were already aware and had a clear idea of their requirements, needs or problems related to furniture products and it was easy to analyze them, while sometimes elderly people have the problems and needs confusedly on their minds and posing additional questions is necessary to clarify their attitudes. Of course, through this process one could record only the thoughts and expectations that they have at the moment of conversation according to their experiences, but yet they had not realized the possibility of using and enjoying new improved furniture products and solutions, that is the reason why further discussion with several hypothetical questions were carried out. Their attitudes and recorded data were correlated to previous works of literature.

Aged people often do not seem so willing to spend their time, completing questionnaires, unlike developing a conversation, mainly due to their need to communicate and share their experiences. 90% of the participants were between the age of 60 and 70, while only 10% of them were between 70 and 75. An attempt was made to include in the same percentage both genders, singles as well as couples of elderly and people coming from diverse social and economical backgrounds. Processing of the recorded information was implemented and the most significant concerns and requirements of the aged participants that were drawn from this process are summarized hereupon.

RESULTS AND DISCUSSION

According to the results of processing of the data and information coming from the research process of this work and the record of results of previous researches, an attempt was made to categorize the needs, concerns and expectations of aged people, resulting in the following main categories of furniture usability aspects.

Dimensions

A frequent problem seem to be a mismatch between the elderly body dimensions and their furniture. The chairs and beds are often too high or deep and tables are often high for the elderly, presenting a negative effect on the sitting posture of the elderly especially while reading or writing. Chairs and sofas should be chosen according to the size of the person. Taller people require generally deeper seats, while smaller persons need shallower seats. Dining/coffee tables should also be of appropriate height for the user. Cabinets and wardrobes should be chosen after considering accurately the variable storage space needs. Storage requires also low physical effort in using as well as having ergonomic dimensions for the elderly. Important is also the relation between the dimensions of the house and rooms, compared to furniture dimensions, because this affects the interior free space left to the Elderly to move freely and the possibility of maneuvering the furniture units. A possible solution would be the furniture to be in some way height-adjustable. The dimensionally adequacy call for the attention of furniture designers and manufacturers to take into account the sizes and dimensions of aged people bodies and home interior spaces.

Cleaning and Hygiene

Elderly people are more susceptible to infection and diseases, necessitating greater care to achieve hygienic conditions within the house (Hrovatin 2012). Additionally, they spend a great deal of time indoors,

due to social and financial reasons. Therefore, following the basic hygienic standards is crucial to their health condition and particular care needs to be taken in the design of kitchen furniture, where food is prepared, as well as furniture where they prefer to seat, sleep or spend much time, as well as furniture of bathroom. Generally, conversations with elderly people showed that they require of properties that make furniture easier to clean, such as flat surfaces, non-porous, resistant materials to scratches, smooth and without joints or seams, simplicity of design in order to have access during the cleaning process to the whole furniture and the opportunity for the user to clean the floor beneath the furniture and reach there with a vacuum cleaner easily. The upholstery should provide the capability to be cleaned easily and to be frequently removable and washable and all the upholstery materials should be impenetrable to prevent surface soiling. Waterproof seat cover materials could be used for the protection of the seat cushion from soiling and make the seat easily cleanable but these materials normally have poor breathability properties, which makes them uncomfortable to sit on and increases the risk of pressure sores (Meinander and Varheenmaa 2002).

Transfer

Furniture is required to be easy to move and not too big and bulky. They should be easy to get in and out of the room and probably the house. Also, they could be movable with the help of wheels, which is an easier way and do not damage the floors (Jonsson 2013). Materials such as solid wood or lightweight honeycomb panels may be used in furniture construction, in order to ensure easy transfer.

Access

Old people appreciate products that are accessible from many diverse users. Easily maneuverable levers and controls facilitate use by people with reduced tactile sense or no sense of touch in hand. The placement of furniture and parts of it must not challenge or frustrate old people suffering from reduced ability to stretch and reach (Jonsson 2013). Additionally, as everyone requires enough storage space, as well as elderly people, this storage should be easily accessible. For instance, under the bed storage might not be a good idea because it involves bending, or manipulating the bed. Dressers with drawers that glide out easily could be a good choice.

Stability and Safety (preventing falls and accidents)

For old people that have slower reactions and grasp reflexes, sharp edges and corners of furniture may pose great risks. Furniture should be stable, offer grip supports and be difficult to overturn in order to reduce the risk of falling. Potential hazards could be inadequate lighting, loose rugs, unstable furniture. It is dangerous to use doors with unmarked glass, handles not identifiable, and furniture that are the same color as the wall or have sharp corners, jutting bases etc. (Pinto et al. 1997). Necessary seem to be for elderly people the existence of sliding doors with long horizontal handles, kitchen base cabinets on easy-to-roll castors and an appropriate way of placement of the furniture in house. Research has shown that adapting living space to the needs of the elderly could reduce the risk of injury by 30% - 50% (Hrovatin 2012).

In kitchen there should be provisions of continuous knee space beneath the countertop, the cooktop, and the sink. Due to balance disturbances of the elderly there is the necessity of rounding the worktops, replacing traditional doors with a vertical axis of rotation with sliding doors or doors opening in the vertical plane, as well as using recessed handles or push-opener mechanisms. The cabinet width of 600 or 1000mm were proposed as ideal in previous researches, with sides at the angle of 85º. The fronts could be equipped with handle strips. Cabinet lightning could be fitted with a movement detector. The cabinets could have fittings elevating the front in vertical position (Klos et al. 2014). Shelves and appliances should be in right height, worktops should be regularly arranged, cleaning inside the corners or shelves under the cupboards should be easy. A carefully planned arrangement of kitchen elements ensures the safe working with the minimum required motion (Hrovatin 2012).

Seats are required to be firm in order to help the elderly not to sink into the furniture making it difficult to get up. Chair armrests should be sturdy, in order to help the elderly to get out of the seat and strong enough to handle the weight of the person, because elderly are not always strong enough to lift their bodies. Suitable for aged people could be also chairs with electric mechanisms that look similar to a recliner but in fact tilt forward, helping them get out and stand. Upholstery should not let the body slip down the sofa and fabric upholstery is better to be preferred instead of polished leather or vinyl. The bottom of the legs of furniture should be non-slip, so that the item does not move when the elderly are trying to get out of it. High tables and chairs seem to be better as people can get in and out of them easily. Round tables or tables with rounded edges are preferred by them because they minimize injuries. Shelves or bookcases should be secured to the wall or fastened with safety straps to prevent tip over. Shelves should not be overburdened.

Signage with big clear icons appeared to be important for aged people, since it helps them recognize the different surfaces, warns them about edges, corners, dangers (Leung et al. 2012). Seats should be of a

color that contrasts to the surrounding area, also should be in the range of 450mm to 475mm high and a recommended width of 500mm with firmly padded seats incorporating rounded front edges.

Flexibility

Elderly seem to require a large range of adjustable tables and chairs, because there are several body sizes and movements. Lift chairs are an option for anyone who has difficulty getting in and out of a seated position. Chairs should generally allow changing sitting positions in an easy way, because constrained sitting is bad for health, contributes to chronic disorders, muscle pain, impaired circulation (Jonsson 2013). Beds should allow raising and lowering of each end separately and appropriate mattress that provides needed support. Products should be smart, easy to use and not complicated, since aging people do not become more flexible with time.

Health - Ergonomics

Ergonomics optimizes performance and productivity, reducing the risks of injury, discomfort and disease (Pinto et al. 1997). When materials and mattresses conform to specific anthropometrical and physiological-hygienic conditions, furniture can satisfy human needs in rest and sleep and help the body to recover. The shape, color, texture and their constructional parts play an important role in furniture use. Supine position contributes in releasing of the body weight and to a more intensive resting phase. A complete and maximal relaxation of muscles occurs only when optimal matching of the form of the upholstered furniture and the shape of the user's figure is possible allowing the natural shape and course of the line of the spinal column. Beds for example should correspond to dimensions of user, ensure proper alignment of the body during sleep (shape of the spine column and other body parts), ensure even load of the body upon the lying surface, ensure air-permeability, thermal conductivity, moisture permeability, correspond to different body weights and meet hygienic/health standards (Smardzewski et al. 2005).

The ease of ingress and egress of seating furniture depends on its dimensions, the position of the armrests, whether the user is able to put the feet in the space underneath the seat pan and the angle of the backrest. Head and neck rests promote an experience of comfort. Soft seat pans should be thick enough for the user not to feel the hard surface underneath it and the compression of the material should be similar to that of human tissue, even make recommendations regarding optimal load distribution for different regions of the body. The need for warmth and cooling increases because the ability of old people to regulate their body temperatures changes. Inflexible sitting positions constitute risk factors causing neck problems, shoulder problems and back problems (Jonsson 2013). Recliners can be useful for seniors. They are often used for sleeping at night because of medical conditions that cause breathing difficulties or when legs need to be elevated for better circulation. Footstool sometimes are necessary for rest of legs and also allows changing one's sitting position. Some furniture enable the performance of specific activities in addition to their appliances usages, for example support to holds up a book when reading, transporting objects or sitting during other activities (Jonsson 2013). Steel chairs are too cold and hard for the elderly (Leung et al. 2012). Pillows, for beds, chairs or sofas can add comfort, as the user can arrange them for additional support. Elderly people with highly sensitive skin should avoid clothing with hard seams and sharp wrinkles and choose materials that feel pleasant. Upholstery should provide thermal comfort and transmission of moisture from the skin, also have good mechanical durability (surface smoothness, protruding coarse fibres, friction, elasticity, abrasion and tear resistance) and should not generate allergic reactions. Wool, raw silk, rubber and monomers containing polyamide should be avoided (Meinander and Varheenmaa 2002).

Durability and Maintainability

Furniture should withstand wear and tear, cleaning and washing, demand a minimum of cleaning, such as surfaces that hide dust (Jonsson 2013). Wood was mentioned as a preferred material, because it is believed to be a strong, durable material that is associated with quality and high aesthetics. Furniture should be stable and durable, with high elasticity, with strong and tight joints and assembled with fittings or adhesives of high quality. Among others, elderly face problems with disassembled joints in chairs, sofas and low quality of hinges in cabinets.

Approaching the identity – Attractive appearance

As it was revealed, furniture can be significant for the elderly because reflect a sense of home and inspire a familiarity. The elderly require coherence between existing furniture in their homes and the new. Furniture could reflect independence, relaxation, safety, joy, could be modern, timeless and people in the design process could be closely involved in creation of knowledge on elderly people's attitudes giving feedback to the design (Jonsson 2013). They prefer furniture to have style that has a relaxing impact on the body and mind that helps people calm down, alleviate the symptoms of stress. They prefer warm pastel

colors that increase optimism and influence positively the activity of human body (Fabisiak and Hrovatin 2014).

CONCLUSIONS

The results showed that furniture of aged people should be comfortable, ergonomic, practical, durable, easy to clean, of suitable dimensions, harmonious and should suit the individual, environment, usage and the human body, in order to support and enrich old people for as long period of their lives as possible. They need their homes to reflect their own identities and personalities, to promote independence and also to contribute towards creating the greatest feeling of dignity, sense-making and freedom possible, which is of great significance to quality of life and well-being. In order for this to be possible, designers should be closely involved in the process of generating knowledge concerning the needs of old people, which ought to extend to attitudes that may be inherent in the design of furniture and a holistic view on humans and their diverse needs and expectations.

REFERENCES

Eurostat (2013) Population structure and ageing. (http://ec.europa.eu).

Hrovatin J, Širok K, Jevšnik S, Oblak L, Berginc J (2012) Adaptability of Kitchen Furniture for Elderly People in Terms of Safety. Drv. Indust. 63(2):113-120.

Jonsson O (2013) Furniture for later life-design based on older people's experiences of furniture in three housing forms. Doct. Diss., Lund University, 2013.

Fabisiak B, Hrovatin J (2014) Preferences of Polish and Slovenian seniors concerning kitchen interior design. Annals of Warsaw University of Life Sciences – SGGW. Forestry and wood technology. No 86 (2014):92-97.

Kłos R, Fabisiak B, Kaczmarek M (2014) Analysis of Human Needs in Kitchen Design for People with Visual Impairment. Drv Industrija 65(1):43-50.

Leung M, Yu S, Chong A, Jiao L (2012) Facility management for the Elderly in Public and subsidized housing – A focus group investigation. Property and Facility Management Division, Hong Kong Institute of Surveyors. Res. Proj. 2009-10.

Meinander H, Varheenmaa M (2002) Clothing and textiles for disabled and elderly people. Espoo 2002. VTT Tiedotteita – Research Notes 2143. 57 p. + app. 4 p.

Pinto MR, De Medici S, Zlotnicki A, Bianchi A, Van Sant C, Napou C (1997) Reduced visual acuity in elderly people: the role of ergonomics and gerontechnology. Age and Ageing 1997; 26:339-344.

Smardzewski J, Matwiej Ł, Grbac I (2005) Anthropo-technical models in testing mattress, EJPAU 8(3):38.