THE 90th TEXTILE INSTITUTE WORLD CONFERENCE
Textiles: Inseparable from the human environment
25-28 April 2016
Poznan, Poland

BASIC PATTERN DESIGN FOR CARE DEPENDENT ELDERLY

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ABSTRACT

This study presents the first results of a PhD in textile engineering aiming to understand the clothes needs of the female elderly who are under the care of professionals or relatives. The initial body measurements of the elderly with and over 65 and the way they will impact in the basic pattern design are presented. A new concept of clothing is proposed, based in the shape and proportions of their bodies, considering their anatomic positions and their needs and limitations during the task of dressing/undressing and seeking the comfort of the user with the handling of the caregiver.
The most common profile of these women corresponds to individuals that spend a great part of their day in a sitting position, in wheelchairs or in a conventional seat. After an ergonomic analysis, with the use of specific measurements, it was possible to perform a basic pattern design for this target population, which will after be used in the production of the appropriate clothing prototypes, respecting their needs. 78 measurements of elderly women in a sitting position were obtained, 46 in two institutions in the city of Guimaraes (Portugal) and 32 in two institutions in the city of Teresina (Brazil). 8 body measurements were considered to build an average measurements table from pre-established criteria for the construction of the clothing prototypes.

Keywords: body measurements, dependent elderly, clothing comfort, basic pattern design

INTRODUCTION

Discussing the aging of the population contributes to dissolve preconceptions of a natural process of the individual's life cycle. Reaching old age has its problems and difficulties, as has its benefits and compensations based on the wisdom and experience gained. Today, with the population changes, the profile of the elderly have, in one way, improved, result of the technological advances in health care, improving socio-economic conditions, the partial control of preventable diseases by immunization, and the awareness to change eating habits and incentive to a more active life with increasing physical activity. With the

increasing of life expectancy, concurrently there has been an increase of people with more independence reaching old age.

World Health Organization (WHO) (2010), prepared a policy report that aims to contribute to allow people reaching old age in the best possible state of health, for a sustainable economic and social development. According to the report, it has been recognized for more than 30 years that Health for All would contribute both to a better quality of life but also to global peace and security. The report aims providing the population an healthy aging and to maintain maximum functional capacity, as long as possible, it means giving value to the autonomy or self-determination and the preservation of mental and physical independence of the elderly. Both physical and mental illness can lead to dependence and therefore to the loss of functional capacity. It is the role of health policies to contribute to more people reaching advanced ages with the best possible health. Active and healthy aging is the main objective at the moment, requiring attention in the process of support to the elderly (WHO, 2010).

In the process of aging, addiction is one of the distressing challenges as any other phenomenon in this stage of life, the loss of mental and physical functioning is seen in the foreground, as the consequence of decay and deterioration. So, despite all the care and habits change, as the person gets older is more vulnerable, more susceptible to various non-communicable diseases, including some more common as urinary incontinence, memory loss, depression and loss of immobility, as well as more vulnerable to certain diseases and communicable lesions, especially in the elderly segment with 80 years or more. (United Nations, 2013; WHO, 2007; BRAZIL, 2007; Batista et al., 2008).

It is clear, that besides the lack of research dealing with the subject, there is still a need for adaptable products to the physical conditions in which they find themselves. A person in the dependency profile has difficulties in finding clothes when they don't fit in the standard size clothing (Bergenheim, 1986). Investments are directed to the production of clothing for people with body size within the said standard "normal" and outlined. Examples of legitimate confirmation are the existing fitting rooms in public stores, developed only for people without major restrictions of movement.

In the elderly category, there are many outstanding problems that hinder the task of finding appropriate clothing. There are individuals with deformities who have a problem of balance and clothing does not harmonize nor moulds to their new silhouette. Forced by the circumstances are often forced to choose their clothing with a larger or smaller size, depending on their body dimension and deformation (Meinander; Minna, 2002).

Thus, it is important to have the basic knowledge on how to adapt the combination model with the many changes of the body shape of the person. On this subject, among the few relevant research available, Hernandez (2002) conducted a study about standard construction for single figures based on changes in the body - large disfigurements - using equipment, software and methods of patterns adaptation, making it possible to identify variations in order to make the process faster. In the survey, Hernandez refers some authors who had earlier initiatives on public works developed for "non-standard" people. Gamwell, in 1966, presented a research which states that an individual with disability does not want to appear different from the others in his social group, regardless of age, gender or financial situation; Rosemblad-Wallin, in 1977, with a clothing development project for seniors, setting changes and techniques to facilitate dressing; Benktzon, in 1993, presented a study designing clothing to meet the needs of women with osteoporosis; and

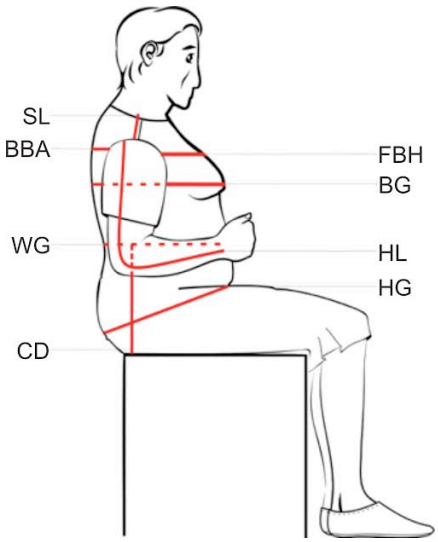
Thoren, in 1994, examined the manufacturing of individualized clothing for people with physical disabilities and abnormal body proportions, warning that the importance of clothing is an individual experience for disabled or disfigured individuals.

MATERIALS AND EXPERIMENTAL METHODS

Direct contact with the target group of this research allowed observing the various bodies' shapes, assessing their geometric appearances. Despite also finding longitudinal bodies, it can be said that the predominating shapes are more rounded, oval style, with a concentration of fat in the abdomen and hips. As a person ages a change in the body gradually occurs, such as a prevalence of fat mass, loss of height, change in weight, change in skin texture, muscle loss and bone (Baumgartner et al., 1991; Chumlea et al. 1989, cited by Oliveira, 2013)

Considering that the subjects are people over age in a dependency condition, remaining a large part of their time in a sitting or lying position, 78 volunteers were measured in a sitting position, 46 from two institutions in the city of Guimaraes, in Portugal and 32 from two institutions in the city of Teresina, in Brazil.

The points of the body that would be required to collect the 8 key measurements for pattern design were identified. The measurements were obtained in the positions the elderly were found: casually dressed, sitting in different types of chairs, either in a wheelchair or other types of chair. The 8 selected measurements of the body were: waist girth, bust girth, hip girth, front bust arc, back bust arc, shoulder length, harm length and crotch depth, as shown in Figure 1. All measurements were obtained with a flexible measuring tape.



Symbol Key

- Waist Girth (WG)
- Bust Girth (BG)
- Hip Girth (HG)
- Front Bust Arc (FBH) - (armhole to armhole)
- Back Bust Arc (BBA) - (armhole to armhole)
- Shoulder Length (SL)
- Harm Length - (HL)
- Crotch Depth (CD)

Figure 1 - Body measurements obtained from each participant.

RESULTS

The development of the measurements table to be used in the initial pattern design process of the proposed clothing was done using the collected measurements of the 78

participants. For this purpose, it was considered applying experimentation methods, deciding ranges of values that corresponded to larger differences between sizes. It was necessary to define a methodology that led to find an interval value to more acceptable determination of the size scales.

The measurements table used in the design of the basic patterns was obtained from the average of all measurements found, later used in the preparation of the garment prototypes. Thus, some experiments were carried out, starting from a possible range and size scale, so the samples would be within the acceptable results according to the predetermined criteria choices.

In order to identify the most suitable mean measurements all trials and determine the needed sizes, 5 trials were done using the mean values of the measurements table of the 46 participants from Guimaraes (Portugal). In the first two trials the Waist Girth (WG) was used as the measurement reference and in the other three trials was used the Hip Girth (HG).

During the procedure the design of the basic patterns was done using the Cavalheiro e Silva (2004) methodology. The basic patterns block was composed by 6 basic patterns using the standard measurements from the methodology and the proposed measurements from this study. In Figure 2, it is possible to observe the basic patterns for the skirt, body and pants. The standard pattern design is represented in blue, whilst the proposed patterns design for a better adjustment to the physics complexion of the elderly in a sitting position, is represented in red.

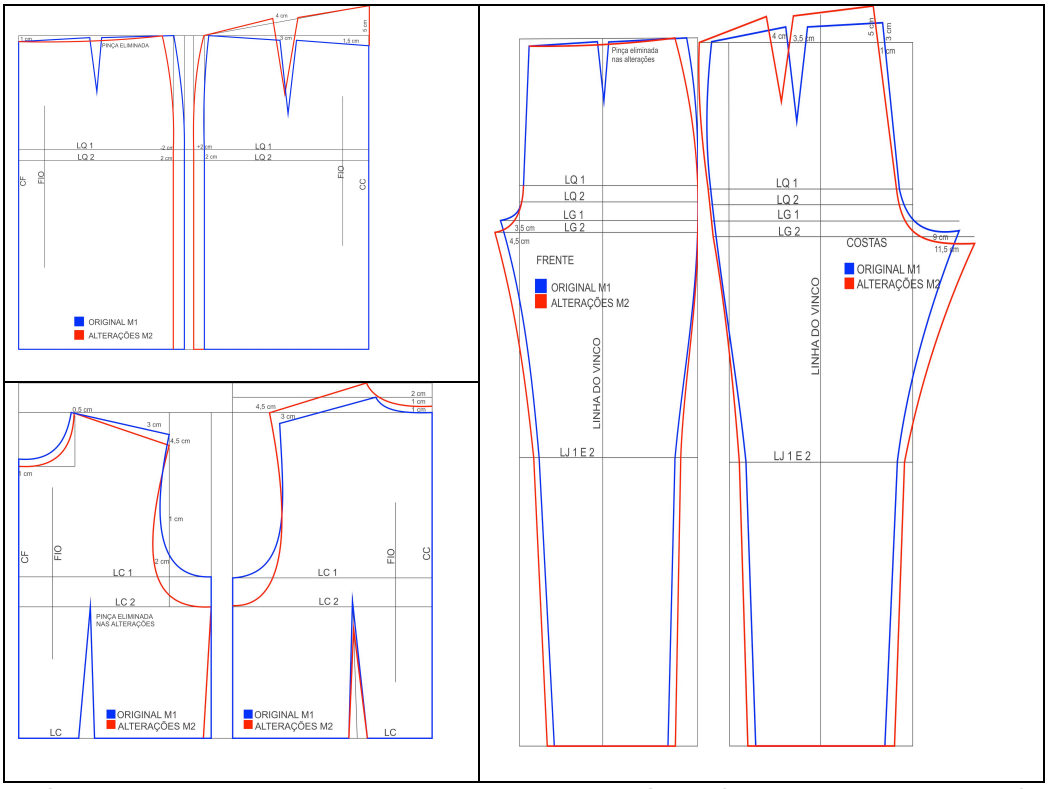


Figure 2: Standard and proposed basic patterns block - Skirt (front and back); Body (front and back); Pants (front and back).

The most relevant differences between the two blocks of patterns are:

- SKIRT - Width reduction in the front with the same enlargement in the back; Increased center back.
- BODY - Addition in the back shoulder; Increased armhole.
- PANTS - Increased height of the center back; Increased crotch depth.

CONCLUSIONS

Based on the theories and lessons learned during the development of the blocks of basic patterns of the different types, it was possible to produce flat patterns using fundamental measurements. Flat pattern design is a common method in the garment industry, where fashion designers and experienced pattern designers use their own methodologies, formulas and dimensions, creating lines and curves during the development of each pattern of a specific style. However, several trial methods were executed to obtain clothes that would serve a larger number of body types and styles.

The path for the production of garments follows a proposed methodology for product development. Garments are considered a second skin and garment production should be compared to an architectural project, which involves the planning of product transformation, based on knowledge, using specific methods and techniques for their preparation. For the users satisfaction about the clothing, considering their ergonomic functions, the architectural design of clothes must be designed according to specific human differentiations from the perception of their body shape and measurements. Anthropometric data is imperative for an accurate design. Thus, the development of the proposed clothing, as a usable product, in addition to the ergonomics and anthropometry contributions, it should consider the complex movements of the wearer and more meticulously, the movements of the caregivers, because they are the ones performing the procedures of dressing and undressing the user.

The contribution of ergonomics follows the entire route, being relevant during the phase of awareness and participation when the product is evaluated, the user and caregiver are able to identify problems, ergonomic or any other, which were not detected in any of the previous phases.

Every professional, at the moment of preparation of a product, has the responsibility to ensure the full interaction of the product with the user. It is important to use new reviews, even in the early stage of the process, re-evaluating the design, with the intention of finding the correct answers to the human dimensions (Panero, Zelnik, 2002). The responsibility becomes greater when the product has a more direct contact with the user, as it is the case of the clothing used by the elderly remaining most of their time sitting or lying down.

ACKNOWLEDGMENTS

This work is financed by FEDER funds through the Competitive Factors Operational Program (COMPETE) and by national funds through FCT - Portuguese Foundation for Science and Technology under the project UID/CTM/000264 and CSF/CAPEs.

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