

REZUMAT – ABSTRACT

Impactul formelor corpului feminine asupra creării tiparelor

Îmbrăcămintea potrivită este unul dintre cei mai importanți factori care determină comportamentul cumpărătorilor și confortul mișcării corpului.

Acest studiu își propune să examineze efectele diferitelor forme de corp feminin asupra modelului de îmbrăcăminte. În acest scop, au fost prelevate și clasificate în funcție de forma și dimensiunile corpului măsurătorile corpului a 231 de femei cu vârsta cuprinsă între 18 și 25 de ani. Impactul formelor corpului a fost investigat pe modelul de bază de îmbrăcăminte cu standard de ajustare pregătit în sistemul de creare a tiparelor Müller & Sohn.

Modelele de bază ale rochiilor de damă ajustate pe corp cu măsura 36 și cu formă a corpului dreptunghiulară și tip pară au fost ajustate, iar aceste ajustări au fost comparate. În timp ce ajustările de model s-au efectuat în funcție de forma corpului dreptunghiulară și de cea tip pară, modificările necesare au fost făcute pe întreaga înălțime, circumferința sânilor, talie, șold și partea frontală și au fost efectuate măsurători de lungime medie în partea din față și spate.

Cuvinte-cheie: potrivirea îmbrăcămintei, ajustări ale modelului, forme ale corpului, confortul mișcării corpului

Impacts of female body shapes on patternmaking

Clothing fit is one of the most important factors that affect consumers' purchasing behaviour and body movement comfort.

This study aims to examine the effects of different female body shapes on clothing pattern design. For this purpose, body measurements of 231 women aged between 18 and 25 were taken and classified according to body shapes and sizes. Then the impacts of body shapes were investigated on basic dress pattern drawing with standard dart prepared in Müller&Sohn patternmaking system.

Darted basic dress patterns of women who had a body size of 36 and piled up in pear and rectangle body shapes were adjusted, and these adjustments were compared. While pattern adjustments were carried out according to the rectangle and pear body shape, necessary changes were made on the full height, the girths of breasts, waist, hip and front, back and front average length measurements.

Keywords: fitting, pattern adjustments, body shapes, body movement comfort

INTRODUCTION

Clothing fit is one of the most important factors that affect consumers' purchasing behaviour and body movement comfort. In order for a garment fitting to the body, the patterns must be compatible with the body sizes and shapes of the person. Fabrication clothing that can fit the body is one of the most important competitive advantages for companies that manufacture by using mass production-based measurements.

A lot of research is present in the international literature on patternmaking of different body types, body sizes, and garment groups. Some of the studies conducted can be summarized as follows.

Connell et al. (2003) noted that body-type analysis is theoretically the basis of body size measurement. In their work, the researchers examined the body types of women in America [1].

Schofield et al. (2006) published a study, which explored fitting pants of 176 women aged 55 and older to be able to see the relation between sizing, body and pattern shape in clothes. According to the results of the study, body shapes have been presented as subgroups and the personalized productions were

recommended as a solution to the problem of clothing fit to the body [2].

Cho et al. (2006) stated that consumers demand personal clothing and variety in their study. The researchers emphasized that not only body sizes but also body shapes must be taken into account during the preparation of the patterns of personal clothes [3]. In their study, Connell et al. (2006) developed a new tool called the Body Shape Assessment Scale (BSAS) ©, which analyses female body shapes and explained how it works [4].

Lee et al. (2007) compared the body shapes of American and Korean women by race and age in their study. The study found that the largest shape category was the rectangle shape in both countries, but the distribution within each shape category for Korean women was different from that of USA women. More body shape categories were found in the USA women than in Korean women. They pointed out that body shape is one of the main factors in clothing fit and clothing comfort [5].

In their study, Shin et al. (2007) revealed that ethnic groups had different fit problems and significant body shape differences [6].

Faust and Carrier (2009) suggested that body shapes should be added to the clothing labels as well as body sizes, and they made experiments in this direction. The researchers indicated that labels did not inform the consumers adequately and that the consumers had fitting problems with the clothes [7]. Çileroğlu (2010), examined the size distribution of Turkish women between the ages of 18–50, identified their body shapes and analyse the relation between their body measurements and body shapes in terms of the ready-to-wear industry. Results showed that, 37% of Turkish women had hourglass, 31% had triangle, 19% had rectangle and 13% had an inverted triangle body shape [8].

Manuel et al. (2010) categorized the body shapes of African-American women in their study and examined how these body shapes affected women's clothing preferences [9].

Vuruşkan and Bulgun (2011) asserted that the methods used currently to determine the female body shapes generally depended on subjective and visual decision-making approaches. In their work, they developed a numerical method to identify the female body shape [10].

Mason et al. (2012) investigated and classified the body shapes of Kenyan women [11].

Özeren (2012) stated that the competitive conditions in the market today cause the enterprises to make a difference and to produce personal products especially for ready-to-wear industry. People's bodies are different, so clothing production should be done according to body sizes and body shapes. In this study, a basic body pattern drawing without darts was developed according to triangle and hourglass female body shapes. At the end of the study it was suggested that the developed pattern drawing system could be used for both body shapes [12].

Vuruşkan and Bulgun (2013) assessed garment fitting between made-to-measure garments and standard body garments by taking the most common female body shapes as an example. The researchers emphasized the importance of personalized production for oversize bodies and non-standard body shapes [13].

Tama and Öndoğan (2014) prepared patterns in Contec, Metric, Müller&Sohn and Basic Block pattern-making systems in order to evaluate the fit of the basic skirt pattern and compared them with clothing programs. Patterns were designed with the help of the CAD system and body sizes as well as different body shapes (hourglass, triangle, rectangle) were considered. Based on the results of the study, the researchers stated that different patternmaking systems were more successful in designing the pattern of each body shape [14].

The Contec Pattern Making system is suitable for computer applications and hand drawing. Dress patterns can be easily prepared using very few assistant lines in Metric system. The basic measurements are taken from the body directly and auxiliary measurements are calculated in Müller&Sohn System. Patterns

are drawn by the combination of simple blocks in The Basic Blocks System [14].

Petrak et al. (2015) examined the effects of male body posture and shape on clothing design and garment fit. In the scope of the study, 50 male subjects were scanned with 3D body scanning system. At the end of the study, the researchers developed a new parametric garment pattern design by considering body dimensions, posture and shape [15].

Eryazıcı and Çoruh (2015) examined the dress preferences of working women according to body shapes. They detected that women's dress styles did not show any difference according to their body shapes [16].

If clothing pattern is prepared suitable for the body, clothing does not restrict body movements and also adapt itself to these movements [17].

In the light of the literature review and the advancements that occur in the sector, it can be stated that it is insufficient to consider only body sizes in pattern-making, and that body shapes should also be taken into account. In this study, the impacts of different female body shapes on the dress pattern design were investigated.

MATERIALS AND METHODS

Within the scope of the study, firstly basic body measurements (full height, chest, waist and hip girths) were obtained by tape measure from 231 women aged between 18 and 25 in Turkey. They wore their underwear while measuring. Then, auxiliary measures (armhole and hip depth, back and front length, back neckline, chest drop, back, armhole and front girth) were calculated by using "Body Size Calculator" [18]. The positions of the front and back body measurements are displayed in figure 1 and the explanations are presented in table 1.

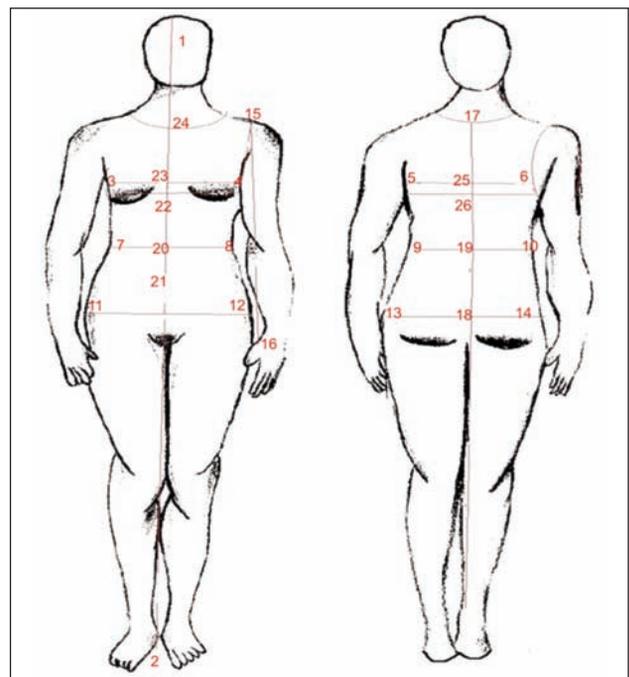


Fig. 1. Women's body measurements parts

Table 1

Basic measurements	Line	Auxiliary measurements	Line	Auxiliary measurements	Line
Full length	1–2	Armhole depth	17–26	Front length I	24–21
Breasts girth	3–4 & 5–6	Back neckline	17	Front length II	20–24
Waist girth	7–8 & 9–10	Hip drop	17–18	Back girth	5–6
Hip size	11–12 & 13–14	Breasts drop I	22–24	Armhole width	3–5/4–6
Sleeve length	15–16	Breasts drop II	23–24	Front girth Back length	3–4 17–19

Table 2

Breasts girth	Size no.
Between 80 and 83 cm	34
Between 84 and 87 cm	36
Between 88 and 91 cm	38
Between 92 and 95 cm	40
Between 96 and 99 cm	42
Between 100 and 103 cm	44
Between 104 and 109 cm	46
Between 110 and 115 cm	48
Between 116 and 121 cm	50
Between 122 and 127 cm	52
Between 128 and 133 cm	54

The body sizes of the women were determined according to the Müller&Sohn pattern making system by using data in table 2.

After establishing body size, women were classified according to body shapes. These shapes have been classified using geometric figures, rods, lines or fruit forms in the literature.

In this study, Rosen's classification was used. Rosen (2005) named the seven groups representing female body shapes as proportioned, rectangle, pear, apple, hourglass, diamond, and round [19].

While female body shapes are classified:

- Pear body type; women whose chest girth is at least 8 cm less than their hip girth;
- Apple body type; women whose chest girth is at least 9 cm more than their hip girth;
- Rectangle body type; women who have a difference of 7 cm or less between their chest and hip girths;
- Hourglass body type; women whose chest girth is at least 37 cm larger than their waist girth [20, 21, 22, 23].

Finally, the impacts of body shapes on pattern drawing were investigated on basic body pattern drawing with standard darts prepared in Müller&Sohn pattern-making system, pattern adjustments were made and these adjustments were compared. These adjustments were made with the help of the data obtained by calculating the arithmetic mean of the basic and auxiliary body measurements of 36-size women with pear and rectangle body shapes where piling up was determined.

In this study, in order for the dress pattern drawings to be done, first 36-body size, darted basic body pattern with standard posture and expansion drawings were made. Later on, based on the measurements obtained, adjustments were made on the 36-body-size, darted basic dress pattern drawings according to pear and rectangle body shapes.

FINDINGS

Table 3 illustrates the distribution of the women by body shape and size.

Table 3

Body size	Body shapes (n)			
	Pear	Apple	Rectangle	Total
34	10	0	11	21
36	31	0	28	59
38	8	1	22	31
40	10	1	18	29
42	14	1	7	22
44	1	5	12	18
46	7	0	8	15
48	8	3	11	22
50	1	4	4	9
52	0	0	3	3
54	0	0	2	2
Total	90	15	126	231

According to the data obtained from 231 women it was determined that 90 women had pear, 126 women had rectangle and 15 women had apple body shape.

A total of 31 out of 90 women with pear and 28 out of 126 women with rectangle body shape were of 36-body size. It was revealed that the piling up in both body shapes was in 36-body size.

A comparison of the differences in 36-sized female body measurements according to rectangle and pear body shapes is displayed in table 4.

Figures 2 and 3 show pattern adjustments applied according to the rectangle and pear body shapes according to Müller&Sohn pattern making system.

CONCLUSION

Existing patternmaking systems mostly take into account body measurements of the standard body shape and posture. Within the scope of this study, the

Body shape with 36-Size Standard Posture		36-Size Rectangle Body Shape		36-Size Pear Body Shape	
Measurements		Measurements	Differences	Measurements	Differences
Full height	160 cm	162 cm	2 cm lengthened	163 cm	3 cm lengthened
Chest girth	84 cm	86 cm	2 cm enlarged	85 cm	1 cm enlarged
Waist girth	68 cm	67 cm	1 cm taken in	69 cm	1 cm enlarged
Hip girth	90 cm	89 cm	2 cm taken in	96 cm	6 cm enlarged
Armhole depth	19 cm	19 cm	No difference	19 cm	No difference
Back length	40 cm	41 cm	1 cm lengthened	41 cm	1 cm lengthened
Hip depth	60 cm	60 cm	No difference	60 cm	No difference
Back neckline	6 cm	6 cm	No difference	6 cm	No difference
Breast depth I	31 cm	31 cm	No difference	31 cm	No difference
Breast depth II	25 cm	25 cm	No difference	25 cm	No difference
Front length I	44 cm	44 cm	No difference	44 cm	No difference
Front length II	50 cm	50 cm	No difference	51 cm	1 cm lengthened
Back girth	16 cm	16 cm	No difference	16 cm	No difference
Armhole width	9 cm	9 cm	No difference	9 cm	No difference
Front girth	17 cm	18 cm	1 cm enlarged	17.5 cm	0.5 cm enlarged

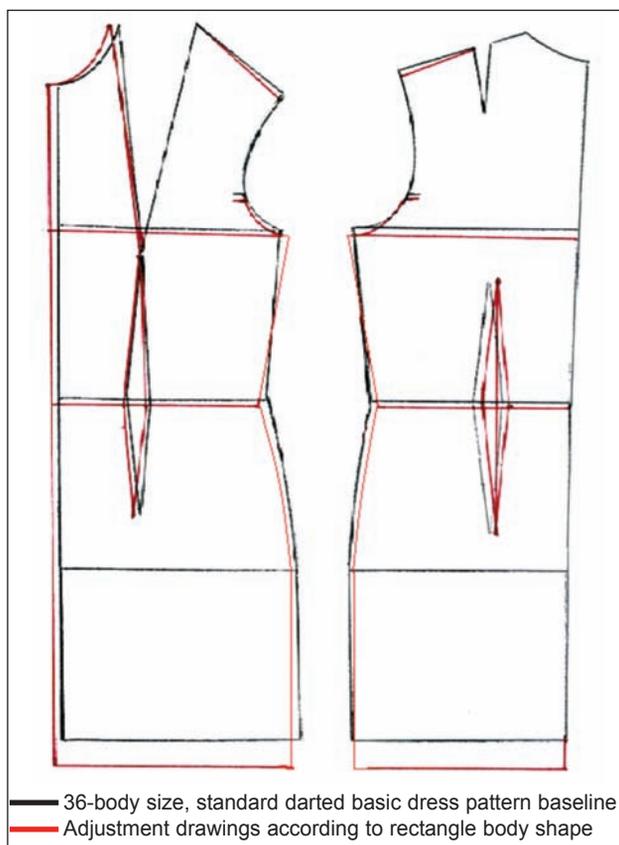


Fig. 2. 36-body size, darted basic dress pattern adjustments according to the rectangle body

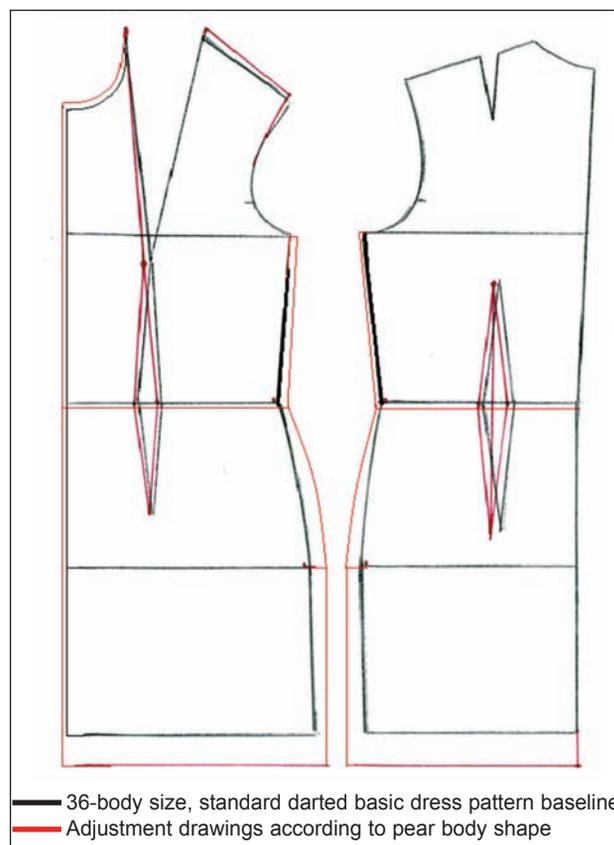


Fig. 3. 36-body size, darted basic dress pattern adjustments according to the pear body shape

effects of different female body shapes on the patternmaking were examined and the patternmaking stages of different body shapes were compared. While pattern adjustments were carried out according to the rectangle body shape; necessary changes were made on the full height, breasts, waist, front and hip girths, back average length measurements.

When pattern adjustments were carried out according to the pear body shape; necessary changes were made on the full height, breasts, waist and hip girth, back average length and front average length measurements.

When pattern adjustments were carried out according to the rectangle and pear body shapes, it was

revealed that there were no changes in hollow forearm depth, hip drop, back neckline, breasts drop 1, breasts drop 2, front average length 2, back girth, and hollow forearm girth, and no adjustments were made.

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