

Criteria for sportswear preference of Turkish runners

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ABSTRACT – REZUMAT

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Nowadays, while the importance of doing sports for a healthy life is spreading all over the world, consumers expect some performance and functional properties from sports products. It is expected that the sportswear must be in harmony with the body, do not create discomfort and do not affect the performance. The comfort of sportswear is an important criterion that affects the performance and motivates the athlete. There are dynamic and fundamental changes in the preferences of sports people with the change in the context; type of sports, the geography they live in, season, climate, their cultural, demographic and anthropologic characteristics, etc. While offering sportswear products to the market, brands should pay attention not only to quality parameters, but also to these criteria.

This article aims to determine Turkish runners' sportswear preference criteria and expectations that are evaluated against past experiences and present desires. For the study, data were collected from 195 runners and statistically analyzed. With the data obtained from the questionnaires, the runner and running habits were analyzed, the perspective of sportswear shopping and purchasing preference criteria, sportswear size and fit issues, evaluation of the fabric properties, and the demands of the runners for sportswear were determined.

This research gives resourceful information for sportswear manufacturers and comfort researchers since the compiled consumer feedback from runners provide tools for product improvement to enhance utility.

Keywords: sportswear, runner, preference criteria, shopping behaviour

Criterii pentru alegerea îmbrăcămintei sport a sportivilor din Turcia

În prezent, importanța practicării sportului pentru o viață sănătoasă este cunoscută în toată lumea, iar consumatorii se așteaptă la anumite performanțe și caracteristici funcționale pentru produsele sport. Îmbrăcămintea sport ar trebui să fie în armonie cu purtătorul, să nu creeze disconfort și să nu influențeze negativ performanța. Confortul îmbrăcămintei sport este un criteriu important, care influențează performanța și motivează sportivul. Există schimbări dinamice și fundamentale în preferințele sportivilor în funcție de tipul de sport, mediul geografic în care trăiesc, sezonul, clima, caracteristicile lor culturale, demografice și antropologice etc. Atunci când brandurile oferă pe piață produse de îmbrăcămintă sport, ar trebui să acorde atenție nu numai parametrilor de calitate, ci și acestor criterii.

Acest articol își propune să stabilească criteriile și preferințele, în ceea ce privește îmbrăcămintea sport a sportivilor din Turcia, care sunt evaluate în funcție de experiențele anterioare și dorințele prezente. Pentru acest studiu, au fost colectate date de la 195 de sportivi și analizate statistic. Pe baza datelor obținute din chestionare, au fost analizate obiceiurile sportivilor și cele ale practicării sportului, fiind identificate perspectiva achiziției de îmbrăcămintă sport și criteriile preferențiale din procesul de cumpărare, dimensiunea îmbrăcămintei sport și problemele de corespondență dimensională, evaluarea proprietăților materialelor textile și cerințele sportivilor pentru îmbrăcămintă sport.

Această cercetare oferă informații utile pentru producătorii de îmbrăcămintă sport și pentru cercetătorii în materie de confort, întrucât feedback-ul de la utilizatorii sportivi oferă instrumente pentru îmbunătățirea produselor și extinderea domeniului de utilizare a acestora.

Cuvinte-cheie: îmbrăcămintă sport, sportiv, criterii de preferință, comportament de cumpărare

INTRODUCTION

Usually used in extreme physical and environmental performance conditions, along with the requirements of covering and “supporting” the active body, sportswear is about functionality, comfort and safety, with the specification developed and designed to provide a product that fits the athlete's performance needs [1, 2].

The functional performance of the sportswear is determined according to different conditions such as the physical structure and mechanical properties of the material, thermal and moisture regulating properties, as well as the athlete's body sizes and shapes,

physiological variations, comfort perception, sports type, environmental conditions and activity level [3–5].

Since the main purpose of sportswear design is function, fabrics and cuts are selected by taking performance characteristics into account [6]. The wear comfort of sportswear is an important quality criterion that affects efficiency, well-being and has considerable impact on the individual physical and cognitive performance [7, 8]. Besides thermal comfort, sensory skin-feel comfort, comfort due to fit, or the psychological comfort of clothing, external environments (physical, social and cultural) have great impact on the comfort status of the wearer [8, 9].

Some aspects to consider when designing sportswear for a particular sport can be listed as follows [4, 10–12].

Functional aspects:

- The protection/insulation/safety functions to protect wearers from air, water & adverse weather (wind, rain, snow, cold etc.);
- The comfort function which gives wear comfort (thermophysiological comfort, skin sensorial comfort, ergonomic comfort, and psychological comfort) to wearers;
- The exercise function, performance and movement needs (to improve athletic records positively and achieve athletes' goals).

Aesthetics aspects:

- Aesthetic appeal (subjective perception of clothing to the eye, hand, ear, and nose which contributes to the overall wellbeing of the wearer); from the sensitivity or aesthetic point of view, softness, surface texture, handle, lustre, colour variation and comfort in wear are important factors;
- High fashion ability;
- Appropriate fit.

Some desirable characteristic of functional sportswear are identified as follows [4, 10, 13, 14]:

- Maintain a comfortable microclimate (temperature & humidity in the skin sensor zone);
- Optimum heat;
- Moisture regulation;
- Good absorption of moisture & ability to transmit moisture vapour (fast drying & vapour permeability);
- Good air permeability;
- Low water absorption of the layer of clothing just positioned to the skin;
- Good extensibility without restriction mobility;
- Dimensional stability even when wet;
- Durability;
- Easy care;
- Lightweight (low intrinsic weight, not impairing physical performance);
- Coolness effect;
- Pleasant to skin, soft, non-abrasive and nonchafing;
- Water repellent & dirt repellent;
- Thermal absorptivity;
- UV resistance;
- Absence of unpleasant odour (perspiration);
- Compatibility with skin;
- Good fit stability & give relaxation without fatigue;
- Smart and functional design;
- Higher Drapability & graceful luster.

In running sport, due to extremely high sweat rate, moisture transmission is the most important requirement for microclimatic condition. The sensorial comfort of sportswear is also crucial as it prevents from skin abrasion, chafing, and skin injury. In high-speed games, ergonomic comfort that affects air entrainment is also a vital requirement [11]. Because considerable movement of body parts occurs during running, sportswear must have sufficient degree of mobility so that runner can move freely [13].

Runner sportswear must be proper fit for move and balance well on active body. It has to provide proper ease and set so the interaction of gravity and frictional properties of the fabric do not displace the garment [5]. Sportswear fabrics and cuts are carefully chosen to enhance the silhouette [6]. Besides protection against climate extremes like wind, rain, and snow, ultraviolet (UV) rays also become an important functional requirement for runners spending long hours at outdoor [11].

LITERATURE REVIEW

There have been many studies and researches in the literature regarding comfort parameters of sportswear products. However, there are few researches that investigate consumer satisfaction in depth and whether the products that meet the comfort parameters in theory are sufficient for the runners. Studies on sports wear aimed at developing and improving the comfort and performance of the athlete were carried out in different areas such as fabric characteristics of the running clothes, model/design features and consumer evaluations.

In one of the studies in the literature on the fabric properties of running clothes and their effects on comfort and performance, the researchers investigated the influence of sportswear fabric properties on the physiological responses and performance of athletes in sports conditions. They found a statistically significant effect on physiological responses and performance parameters of athletes for the different types of sportswear tested [7]. In another study, the physiological and psychological responses of athletes who wear t-shirts with different fabrics during and after high-intensity sports in hot and humid environments investigated, the results obtained were evaluated according to the fabric properties [15]. In a study, the effects of functional t-shirts with different fiber composition on thermoregulation and wearing comfort during an average intensity treadmill walking in well-trained runners were investigated and also sweat loss, heart rate, and subjective comfort perception were determined [16].

In one of the studies on the design of innovative runner clothes in the literature, the researchers realized a new running t-shirt prototype and compared it with the standard one. Effectiveness of prototype has been evaluated in terms of ergonomics and comfort with subjective ratings expressed by the participants [17].

In a study on smart textile and a smart jersey design for athletes, researchers focused on the wearable technology and implemented some of the technologies together to propose an idea of smart jersey which will help the athletes to maintain their health. Researchers identified the issues faced by the athletes in relation to their health while they were in active mode and proposed wearable skin sensors for respiratory, muscle strain, hydration level of body, body temperature regulation [18]. Participant design sessions were held in a study in which runners were

involved in developing innovative product concepts. The aim of the study was to develop and test a base layer concept that helped thermal comfort while running in cold weather. This research, in which the design session, concept voting and wear trials were conducted, aimed to understand the runner's needs correctly and clearly [19].

In the literature, in one of the studies on the perception and evaluation of sportswear and runner clothing, clothing fit and perceived fitness level was investigated, and the effect of clothing fit on the perceptions of running performance was examined. It was determined that the participants believed the positive effects of tight-fitting clothing on their performances and self-confidence [20]. In another study, consumers' purchase intention for green sportswear was examined by investigating the effects of their expectation, perception, subjective norm, perceived behavior control, and attitude on purchasing green sportswear [21]. Another study aimed to determine the key factors influencing the US consumers' intent to purchase activewear for casual use [22]. In another study that examined the perception of activewear of women consumers, drawing upon brand association theory and the functional, expressive, and aesthetic model, the researchers identified important attributes of activewear brands and how attributes led to benefits pursued by female activewear consumers. They revealed three product-related attributes (functional design, colour, and size and fit) and two non-product-related attributes (price and model imagery) influenced the fulfillment of four benefits (mood enhancement, exercise facilitation, healthy and active lifestyle, and physical fit body image) [23]. In the research in which running clothes were evaluated by users, the problems encountered within the scope of thermal, sensual, physical and aesthetic factors and the features contributed to the performance were tried to be determined. Researchers have determined that athletes most pay attention to physical comfort and lightness in their jogging suits and define those two features as features that affect performance most [24].

The knowledge and methodology developed in clothing comforts research can be applied in a number of ways to conduct consumer research by utilizing the research techniques developed to understand what consumers want and need, and to identify a market gap for new product development [12].

STUDY OBJECTIVES

This research aims to contribute to the knowledge and experience required for effective design in running clothes. The study was carried out on Turkish runners in order to have similarity in the consumer characteristics. Conducting the research on a certain population is important in terms of both the reliability of the data and the use of the findings in marketing techniques appropriate to the consumer profile.

Current study provides feedback on Turkish runners' perspectives, demands and expectations regarding

sportswear. The specific objectives of the research include the following:

- to understand runners' sportswear shopping behaviors
- to determine shopping reasons and the effective criteria for purchasing,
- to determine the expected and important criteria in running sportswear fabrics,
- to understand main fit issues (for example, in which parts of the body the runner sports clothes cause size and fit problems).

METHOD

This study contains data from 195 runners, who are members of running communities in Istanbul, Ankara and Izmir provinces, in Turkey. A questionnaire was applied to the runners and the obtained data were evaluated statistically.

The questionnaire was prepared in the light of the information obtained from the literature research, and was developed through interviews with coaches and runners actively involved in running sports. The questions in the first section include the demographic characteristics of the participants, information about their commitment to running (the number of years as a regular runner) and running frequency per week, in order to understand their running habits. The questions in the second section are about runners' running clothes shopping and purchasing behaviors, most preferred fabric properties in sportswear, fit issues with the running sportswear, optional feature preference in running sportswear.

In order to determine the reliability of the scale used in the research, the results of Cronbach Alpha (α) statistics were examined. The result of the Cronbach Alpha (α) statistics is 0.871. According to this result, a high degree of reliability and internal consistency was provided for the data collection scale used in the study. Descriptive statistics of gender, age, body type and monthly income are shown in frequency and percentage. In addition to frequencies, total score was obtained for some questions by giving points (between 1 and 5; 1 is the lowest and 5 the highest value). Total scores were calculated by multiplying the scores given by the participants with the frequencies. Total scores were calculated for the questions about runner sportswear shopping reasons, criteria effective in shopping, and evaluation of fabric properties, (evaluations are given in mentioned questions in result and discussion section with its figures). Pearson Chi-square test was used to evaluate the relationship between the frequency of upper & lower body garments shopping and age, monthly income, and body type. Kruskal-Wallis test was used to evaluate the effect of age, monthly income and body type on shopping reasons. Mann-Whitney U test was used to evaluate the effect of gender on the criteria effective in shopping. Kruskal-Wallis test was used to evaluate the effect of age, monthly income and body type on the criteria effective in shopping. In case of determining the effect among these, the results of binary

comparison were examined. The Pearson chi-square test was used to evaluate the relationship between the optional feature preference (about fabric quality, color alternative, design and pattern/cut) and gender, age, monthly income, and body type. In cases where the relationship between the groups is determined, the results of the binary comparison are examined. IBM SPSS Statistics 22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) and MS-Excel 2007 programs were used for statistical analysis and calculations. Statistical evaluations were made by taking Type-I error level $\alpha = 0.05$.

ANALYSIS AND RESULTS

Questionnaire results consist of items under two main categories. The first category concerns analyzing runners and their running habits. The second category provides a perspective about running sportswear shopping and purchasing preference criteria, fit issues with the running sportswear, fabric characteristics evaluation and runners' optional feature preference demands.

Runners and running habits

Demographic information of participants is shown in table 1. In addition to the demographic information of the runners participating in the survey, information on body types was obtained. In accordance with the scope of the research, the effects of demographic features, body types, and sports habits on the reasons of shopping and purchasing behavior of the runners were investigated.

According to the frequency results of body types; It was determined that 28 people (14.4%) had ectomorphic body type (characterized as skinny, weak, with small muscles, and usually tall), 59 people (30.3%) had endomorphic body type (characterized as fat, usually short, rounded stocky body and having difficulty losing weight) and 108 people (55.3%) had mesomorphic body type (characterized as hard, muscular, and as having good posture, well-defined muscles, large bones, and a torso that tapers to a well-defined waist). The table 2 shows body type distribution by gender.

In order to understand their running habits, participants were asked about the number of years as a regular runner. It was determined that 117 runners (60%) were doing less than 3 years, 78 runners

Table 1

DEMOGRAPHIC INFORMATION		
Gender	Number	Frequency (%)
Male	85	43.6
Female	110	56.4
Total	195	100
Age	Number	Frequency (%)
19-29	26	13.3
30-39	104	54.4
40-50	65	33.3
Total	195	100
Income (monthly)	Number	Frequency (%)
Low (< 2500TL)	69	35.4
Middle (2501-10000TL)	94	48.2
High (>10000 TL)	32	16.4
Total	195	100

(40%) were doing sports for 3 years and longer. According to the data obtained on the frequency of running sports, it was concluded that 129 people (66.2%) were doing sports twice a week at most, while 66 people (33.8%) were doing sports at least 3 times a week.

Runners' sportswear shopping behaviours

The frequency of shopping of participants was examined for upper and lower body sportswear. In the related question, the option of "less frequent" for the purchase of 3 or less sportswear per year, and "very frequent" for the purchase of 4 or more garments is offered. The results of data analysis are shown in the table 3.

The relationship between the frequency of shopping for upper and lower body garments, gender, age, monthly income and body type was examined by Pearson's chi-square test. The analysis results of the variables that have significant relationship with the frequency of shopping are shown in tables 4 and 5. It was found that the frequency of upper body sportswear shopping was significantly related to the frequency of running ($\chi^2=7.937$; $p=0.005$) and monthly income ($\chi^2=23.166$; $p<0.001$).

Table 2

BODY TYPE DISTRIBUTION ACCORDING TO THE GENDER							
Gender	Ectomorphic		Endomorphic		Mesomorphic		Total
	Number	Frequency (%)	Number	Frequency (%)	Number	Frequency (%)	
Male	15	17.6	30	35.3	40	47.1	85
Female	13	11.8	29	26.4	68	61.8	110
Total	28	14.4	59	30.3	108	55.3	195

Table 3

SHOPPING FREQUENCY				
Product type	Less frequent		Very frequent	
	Number	Frequency (%)	Number	Frequency (%)
Upper body sportswear	110	56.4	85	43.6
Lower body sportswear	118	60.5	77	39.5

Table 4

THE RELATIONSHIP OF UPPER BODY SPORTSWEAR SHOPPING FREQUENCY WITH THE RUNNING FREQUENCY AND INCOME								
Shopping frequency	Running frequency						Test statistics	
	twice a week at most		at least 3 times a week		χ^2	p		
	n	%	n	%				
Less frequent	82	63.6	28	42.4	7.937	0.005		
Very frequent	47	36.4	38	57.6				
Shopping frequency	Income (monthly)						Test statistics	
	Low		Middle		High			
	n	%	n	%	n	%		
Less frequent	54	78.3	38	40	18	56	23.166	<0.001
Very frequent	15	21.7	56	60	14	44		

Table 5

THE RELATIONSHIP OF LOWER BODY SPORTSWEAR SHOPPING FREQUENCY WITH THE FREQUENCY OF RUNNING, INCOME, AND BODY TYPE								
Shopping frequency	Running frequency						Test statistics	
	twice a week at most		at least 3 times a week		χ^2	p		
	n	%	n	%				
Less frequent	88	68.2	30	45.5	9.468	0.002		
Very frequent	41	31.8	36	54.5				
Shopping frequency	Income (monthly)						Test statistics	
	Low		Middle		High			
	n	%	n	%	n	%		
Less frequent	52	75.4	51	54	15	47	10.399	0.006
Very frequent	17	24.6	43	46	17	53		
Shopping frequency	Body type						Test statistics	
	Ectomorphic		Endomorphic		Mesomorphic			
	n	%	n	%	n	%		
Less frequent	18	64.3	43	73	57	53	6.648	0.036
Very frequent	10	35.7	16	27	51	47		

It has been determined that gender, age and body types do not have a significant relationship with the frequency of shopping in upper body garments. It was found that the frequency of lower body sportswear shopping was significantly related to the frequency of running ($\chi^2=9.468$; $p=0.002$), monthly income

functionality criteria than runners between the ages of 40 and 50 ($p=0.009$).

It was concluded that monthly income status had an effect on the functionality ($\chi^2=9.109$; $p=0.011$), unpleasant odour ($\chi^2=8.548$; $p=0.014$), size and fit issues ($\chi^2=12.127$; $p=0.002$), deformation ($\chi^2=7.103$;

($\chi^2=10.399$; $p=0.006$), and body type ($\chi^2=6.648$; $p=0.036$). It has been determined that gender and age do not have a significant relationship with the frequency of shopping in lower body garments.

In addition to shopping frequencies, participants were asked to evaluate the reasons for shopping by scoring 1 to 5 points. Total scores were calculated by multiplying the frequencies by the scores given by the participants.

Considering the 195 participants, the total score would range from 195 (least effective criterion) to 975 (most effective criterion). The reasons for shopping were shown in figure 1.

The effect of age, monthly income and body type on the reasons for shopping was investigated with the Kruskal-Wallis test. The analysis results of the groups that have significant relationship with the shopping reasons are shown in table 6.

It was determined that gender had no effect on the reasons for shopping.

When the effects were determined between the reasons and groups, the results of the binary comparison were examined. It was concluded that age groups had an effect on the discomfort ($\chi^2=7.598$; $p=0.022$) and functionality criteria ($\chi^2=10.626$; $p=0.005$). Runners between the ages of 19 and 29 gave lower scores for the discomfort criterion than runners between the ages of 40 and 50 ($p=0.023$). Runners between the ages of 19 and 29 gave relatively lower scores for functionality criteria than runners between the ages of 30 and 39 ($p=0.005$). Likewise, runners between the ages of 19 and 29 scored relatively lower for func-

THE EFFECT OF AGE, MONTHLY INCOME AND BODY TYPE ON SHOPPING REASONS					
Shopping reasons	Age			Test statistics	
	19–29	30–39	40–50	χ^2	p
	Mean±S.D.	Mean±S.D.	Mean±S.D.		
Discomfort of current sportswear	2.19±1.30	2.68±1.44	3.08±1.43	7.598	0.022
The functionality of current sportswear is insufficient	2.27±1.25	3.13±1.34	3.12±1.14	10.626	0.005
Shopping reasons	Monthly income			Test statistics	
	Low	Middle	High	χ^2	p
	Mean±S.D.	Mean±S.D.	Mean±S.D.		
The functionality of current sportswear is insufficient	2.96±1.48	3.23±1.24	2.50±0.76	9.109	0.011
Unpleasant odour of current sportswear	2.99±1.67	2.62±1.51	1.97±1.33	8.548	0.014
Size and fit issues of current sportswear	2.16±1.43	2.43±1.24	1.56±0.80	12.127	0.002
Dimensional deformation of current sportswear	2.64±1.47	2.39±1.39	1.78±0.91	7.103	0.029
Follow the fashion	2.93±1.47	3.83±1.14	3.53±1.24	15.758	<0.001
Shopping reasons	Body type			Test statistics	
	Ectomorphic	Endomorphic	Mesomorphic	χ^2	p
	Mean±S.D.	Mean±S.D.	Mean±S.D.		
Size and fit issues of current sportswear	1.46±0.79	2.58±1.43	2.17±1.23	14.374	0.001
Follow the fashion	2.57±1.32	3.47±1.38	3.69±1.24	14.309	0.001

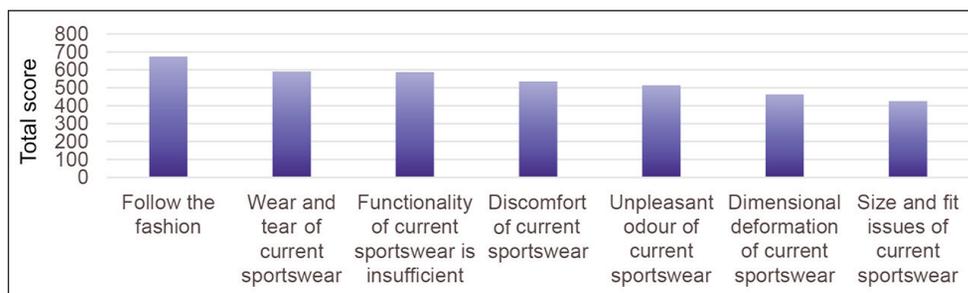


Fig. 1. Runners' sportswear shopping reasons

$p=0.029$), and fashion ($\chi^2=15.758$; $p<0.001$) criteria. Those with high monthly income scored relatively higher for functionality criterion than those with middle monthly income ($p=0.009$), with relatively higher scores for unpleasant odour than those with low monthly income ($p=0.010$). Likewise, those with higher monthly income scored relatively higher for fit and size issue than those with middle monthly income ($p=0.002$), and relatively higher scores for deformation than those with low monthly income ($p=0.009$). The scores of those with middle monthly income had relatively higher values for fashion criterion than those with low monthly income ($p<0.001$). It was concluded that body types had an effect on the criteria of size and fit issue ($\chi^2=14.374$; $p=0.001$) and fashion ($\chi^2=14.309$; $p=0.001$). It was determined that for the size and fit issues, those with ectomorphic body type gave a lower ($p<0.001$) score compared to those with endomorphic body type and

relatively lower ($p=0.018$) than those with mesomorphic body type. It was concluded that those with ectomorphic body type for fashion criterion had relatively lower scores compared to those with endomorphic body type ($p=0.011$) and

likewise lower than those with mesomorphic body type ($p<0.001$).

The most problematic body parts that have size and fit issues in runner sportswear were investigated. It was found that most upper body problems were neck area ($f: 58$; %29.7), abdomen ($f: 44$; %22.6) and arm ($f:38$; %19.5), upper body length ($f:33$; %16.9). The most problems with lower body were the crotch area ($f:46$; %23.6), leg ($f:41$; %21) and waist ($f:25$; %12.8). The body parts with size and fit problems were shown in figure 2.

Participants were asked about the level of importance of the parameters that were effective in the purchase decision. Participants evaluated the effective parameters in purchasing decision by scoring 1 to 5 points (calculation of the total scores are explained in method section). The total score would range from 195 (least effective parameter) to 975 (most effective

parameter). When the total score was calculated for parameters according to the preferences of all participants, comfort was considered the most important parameter, which was followed by performance, fabric quality, functionality, design, price, brand and fashion, respectively. The effective parameters in purchasing decision were shown in figure 3.

The effect of gender on the parameters that affect the purchasing decision was examined with the Mann-Whitney U test and the existence of age, monthly income and body type effect on the parameters were examined by Kruskal-Wallis test.

When the effects were determined between the effective parameters and the groups, the results of binary comparison were examined. Analysis of the effect of gender, age, monthly income and body type on the parameters that affect the purchasing decision is shown in table 7.

It has been determined that the effect of gender on fabric quality ($z = -3.297$; $p = 0.001$) and functionality ($z = -3.532$; $p < 0.001$) parameters is important. It was determined that women's evaluation scores were

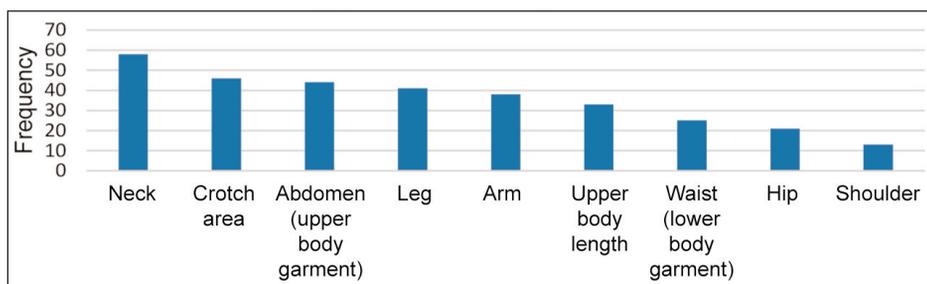


Fig. 2. Size and fit problems for running sportswear considering body parts

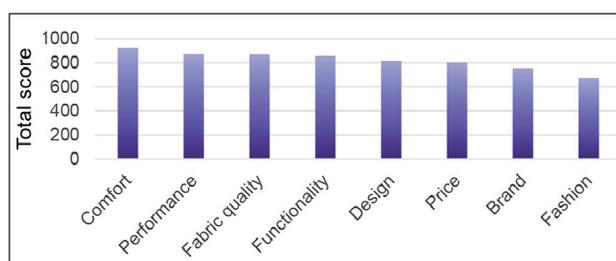


Fig. 3. The effective parameters in purchasing decision

higher than those of men for fabric quality and functionality criteria.

It has been determined that the effect of monthly income on brand, fabric quality, fashion, functionality, performance and comfort parameters is important. According to the binary comparison results:

Table 7

EVALUATION OF THE EFFECT OF GENDER, AGE, MONTHLY INCOME AND BODY TYPE ON THE PARAMETERS THAT AFFECT THE PURCHASING DECISION					
Effective parameters	Gender			Test statistics	
	Male	Female		χ^2	p
	Mean±S.D.	Mean±S.D.			
Fabric Quality	4.29±0.81	4.61±0.67		-3.297	0.001
Functionality	4.14±1.15	4.61±0.84		-3.532	<0.001
Effective parameters	Monthly income			Test statistics	
	Low	Middle	High	χ^2	p
	Mean±S.D.	Mean±S.D.	Mean±S.D.		
Brand	4.01±1.17	3.97±0.99	3.38±1.29	6.99	0.03
Fabric Quality	4.62±0.71	4.46±0.62	4.19±1.06	8.071	0.018
Fashion	3.07±1.45	3.81±1.02	3.19±1.28	12.803	0.002
Functionality	4.52±0.96	4.53±0.85	3.78±1.29	17.163	<0.001
Performance	4.55±0.87	4.55±0.85	4.09±0.93	13.887	0.001
Comfort	4.86±0.46	4.73±0.71	4.63±0.55	7.783	0.02
Effective parameters	Body type			Test statistics	
	Ectomorphic	Endomorphic	Mesomorphic	χ^2	p
	Mean±S.D.	Mean±S.D.	Mean±S.D.		
Price	4.32±0.95	4.44±0.77	3.91±0.99	13.992	0.001
Functionality	4.29±1.36	4.08±1.18	4.61±0.72	8.344	0.015
Performance	4.75±0.80	4.32±1.01	4.49±0.82	6.375	0.041
Comfort	4.96±0.19	4.59±0.87	4.80±0.47	6.525	0.038

- The effect on the brand; those with high monthly income scored higher than those with low monthly income ($p=0.028$).
- The effect on the fabric quality; those with high monthly income scored higher than those with low monthly income ($p=0.036$).
- The effect on the fashion; those with middle monthly income scored higher than those with low monthly income ($p=0.003$).
- The effect on the functionality parameter; those with high monthly income scored higher than those with middle monthly income ($p=0.001$) and those with low monthly income ($p<0.001$).
- The effect on the performance; those with high monthly income scored higher than those with middle monthly income ($p=0,002$) and those with low monthly income ($p=0.002$).
- The effect on the comfort; those with high monthly income scored higher than those with low monthly income ($p=0.001$).

It has been determined that the effect of body type on functionality ($\chi^2=8.344$; $p=0.015$), price ($\chi^2=13.992$; $p=0.001$), performance ($\chi^2=6.375$; $p=0.041$) and comfort ($\chi^2=6.525$; $p=0.038$) parameters is important. The evaluation scores for the price parameter of those with body type mesomorphic have relatively higher values than individuals with endomorphic body type ($p=0.001$). For the functionality parameter those with mesomorphic body type had relatively higher values than individuals with endomorphic body type ($p=0.012$). Those with endomorphic body-type had relatively higher scores for performance parameter compared to individuals with ectomorphic body types ($p=0.036$) and relatively higher scores for comfort parameter ($p=0.033$). Participants evaluated the fabric properties they preferred in sportswear fabrics by giving a score of 1–5 (calculation of the total scores are explained in method section). Considering that 195 participants, the total score would range from 195 (least preferred property) to 975 (most preferred property). When the total scores for the fabric properties were examined, it was determined that the air perme-

ability was the most important feature, followed by flexibility, fast drying, dimensional stability, durability, heat and moisture regulation, soft and pleasant touch, waterproofness. Evaluation results were shown in figure 4.

In order to understand the specific demands of the runners on the quality, color, design and model/cut of the sportswear, the participants were asked if they would like to have options for the mentioned features of the sportswear if customized production was made. Optional feature preference in running sportswear evaluation is shown in table 8.

The relationship between the demand for optional features in sportswear products and gender, age, monthly income and body type was examined by Pearson chi-square test. Test results are shown in table 9. The relationship between the fabric quality options request and gender ($\chi^2=16.684$; $p<0.001$) and age ($\chi^2=14.593$; $p=0.001$) was found to be significant.

It was found that the relationship between the color options request and gender ($\chi^2=4.561$; $p=0.033$), age ($\chi^2=7.155$; $p=0.028$) and monthly income ($\chi^2=20.080$; $p<0.001$) is significant. It was concluded design options request were not significant in relation to gender, age, monthly income, and body type. It has been found that the relationship between

Table 8

OPTIONAL FEATURE PREFERENCE IN SPORTSWEAR				
Optional feature	No		Yes	
	Number	Frequency (%)	Number	Frequency (%)
Model/Cut	60	30.8	135	69.2
Fabric Quality	65	33.3	130	66.7
Design	74	37.9	121	62.1
Colour	107	54.9	88	45.1

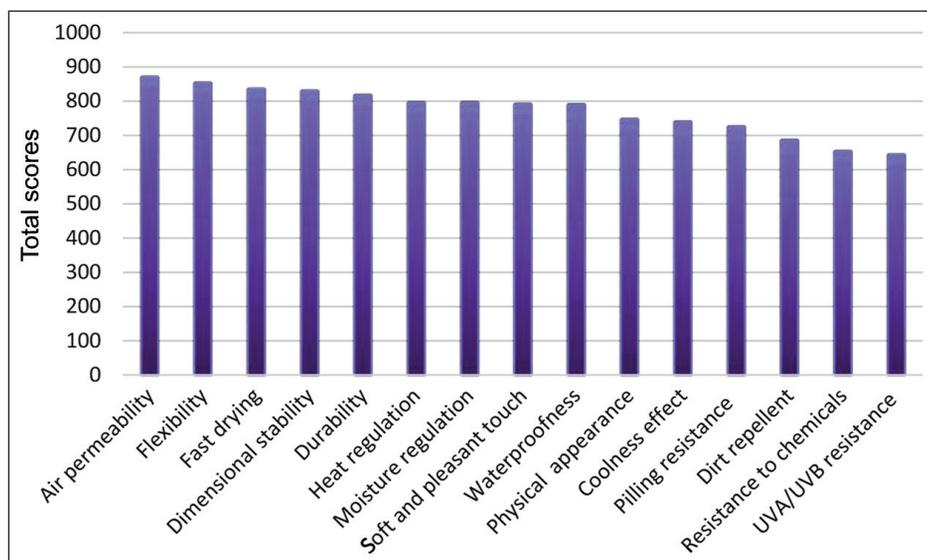


Fig. 4. Most preferred fabric properties in sportswear

THE RELATIONSHIP BETWEEN OPTIONAL FEATURE PREFERENCE IN SPORTSWEAR AND GENDER, AGE, AND MONTHLY INCOME									
FABRIC QUALITY OPTION REQUEST	Answer	Gender				Test statistics			
		Male		Female		χ^2	p		
	n	%	n	%	16.684			<0.001	
	No	15	17.6	50		45.5			
	Yes	70	82.4	60	54.5				
	COLOUR OPTION REQUEST	Answer	Age				Test statistics		
19-29			30-39		40-50		χ^2	p	
n		%	n	%	n	%			14.593
No		17	65.4	27	26	21	32.3		
Yes		9	34.6	77	74	44	67.7		
MODEL/CUT OPTION REQUEST		Answer	Gender				Test statistics		
	Male		Female		χ^2	p			
	n	%	n	%			4.561	0.033	
	No	54	63.5	53	48.2				
	Yes	31	36.5	57	51.8				
	FABRIC QUALITY OPTION REQUEST	Answer	Age				Test statistics		
			19-29		30-39		40-50		χ^2
		n	%	n	%	n	%	7.155	
		No	8	30.8	62	59.6	37		56.9
	Yes	18	69.2	42	40.4	28	43.1		
COLOUR OPTION REQUEST	Answer	Income (monthly)				Test statistics			
		Low		Middle		High		χ^2	p
	n	%	n	%	n	%	20.08		
	No	23	33.3	62	66	22		68.8	
Yes	46	66.7	32	34	10	31.2			
MODEL/CUT OPTION REQUEST	Answer	Gender				Test statistics			
		Male		Female		χ^2	p		
	n	%	n	%	6.027			0.014	
	No	34	40	26		23.6			
Yes	51	60	84	76.4					

model/cut options request and gender is significant ($\chi^2=6.027$; $p=0.014$).

DISCUSSION

This article aims to determine sportswear preference criteria and expectations that are evaluated against past experiences and present desires. The analysis of quantitative data obtained from the questionnaires answered by the runners themselves shed light on issues related to the runner sportswear preference criteria.

Regarding the shopping habits; of the runners participating in the survey, 43.6% of them frequently shop for upper body sportswear and 39.5% of them frequently shop for lower-body sportswear. It has been determined that as the frequency of running and monthly income increases, the frequency of shopping of upper and lower clothing increases and those with mesomorphic body type shop more frequently.

Fashion, wear and tear, and performance are the leading reasons for shopping. Gender has no effect on the reasons for shopping. As the age of the athletes participating in the survey increases, the score given by the participants to discomfort and functionality criteria increases. As the income level increases, the scores given by the runners for functionality, unpleasant odour, deformation and fashion criteria also increase. It was determined that those with endomorphic body type gave higher scores to fit and fashion criteria.

When the fitted body parts and body problems related to sportswear were examined, it was determined that these parts were collar, crotch, abdomen, leg, upper body length and waist according to the frequency order.

Regarding the purchase decisions of the runners, comfort, performance, fabric quality, functionality and design are determined to be important in the purchase decision. The fashion, which takes the first

place in the reasons for shopping draws attention as the least effective parameter in the decision to purchase. It has been determined that the effect of gender on fabric quality and functionality parameters is important. Women's evaluation scores were higher than men's for fabric quality and functionality criteria. The effect of monthly income on brand, fabric quality, fashion, functionality, performance and comfort parameters are important. As the monthly income level increases, the scores given for these parameters increase. Those who are mesomorphic have higher scores for price and functionality parameters, while those who are endomorphic have higher scores for performance and comfort parameters.

According to the ranking of the most preferred fabric properties in sportswear; air permeability was considered as the most important property, which was followed by flexibility, fast drying, dimensional stability, durability, heat and moisture regulation, soft and pleasant touch, waterproof.

The participants stated that they would like to have model/cut, fabric quality and design options in sportswear products. 82.4% of male participants and 54.5% of women want to have fabric quality options. 74% of participants in the 30-39 age group want to have fabric quality options. 51.8% of women, 69.2% of participants between the ages of 18-29, and 66.7% of participants with low salaries wanted to have colour option. 76.4% of women asked for the model/cut option to be offered. Here, the results draw attention to the importance of customization. Customer requests and suggestions should be taken into consideration with the aim of eliminating size and fit issues, meeting quality expectations as well as increasing the level of satisfaction.

CONCLUSIONS

In the light of the information obtained from the literature, it can be said that there are dynamic and fundamental changes in athletes' preferences along with contextual changes; type of sport, geography, season, climate, cultural, demographic and anthropological characteristics etc. While offering sportswear products to the market, brands should pay attention not only to quality parameters, but also to these criteria.

This research gives resourceful information for sportswear brands and comfort researchers, as the compiled consumer feedbacks from runners provide tools for product improvement to enhance utility. Because it will be more efficient for the brands to offer sportswear products to the market by paying attention not only to the quality parameters, but also to the criteria preferred by the athletes and consumer feedback.

When designing sportswear, manufacturers should consider criteria such as customer profile, demographic and anthropological features, sports habits, and shopping behaviors.

The finding of this research obtained from Turkish runners should be evaluated by the manufacturers producing for Turkish market in terms of demographic, anthropological, cultural and geographical features. The data obtained from this study drew attention to the criteria effective in shopping and purchasing, as well as to customer demands and expectations.

This study can be developed and conducted with different populations and international comparison can be made. Thus, important feedback is provided for effective and efficient marketing and sales techniques for sportswear brands.

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