International Journal of Science Culture and Sport
July 2014 : Special Issue 1
ISSN : 2148-1148
Doi : 10.14486/IJSCS127

SPORCU PERFORMANSINI ARTTIRMAYA YÖNELİK OLARAK YÜZÜCÜ GİYSİLERİNİN İNCELENMESİ ÜZERİNE BİR ARAŞTIRMA

Hacer ÖLÇER*, Serap DENGİN**
*Hitit University, Teaching Assistant, Vocational High School,
Department of Textiles, Clothing, Shoes and Leather, Çorum/TURKEY
**Gazi University, Research Assistant, Faculty of Art and Design,
Department of Fashion Design, Ankara/TURKEY
hacerolcer@hitit.edu.tr, serapdengin@gazi.edu.tr

Özet

Bu araştırmanın amacı, yüzücülerin, antrenman veya müsabakalarda kullandıkları yüzme giysilerine ilişkin yaşadıkları sorunları ve performanslarını arttırmaya yönelik olarak yüzme kıyafetlerinden beklentilerini ortaya koymaktır. Araştırmada betimsel yöntem kullanılmıştır. Veri toplama aracı olarak giysi konfor parametreleri ve yüzme kıyafetlerinin sahip olması gereken fonksiyonel tasarım özellikleri doğrultusunda anket geliştirilmiştir. Araştırmanın evrenini, Türkiye'de Çorum ilinde yüzme sporuyla ilgilenen kadın ve erkek yüzücüler oluşturmaktadır. Örneklemi ise, Çorum Gençlik Hizmetleri ve Spor İl Müdürlüğü bünyesinde hizmet veren Olimpik Kapalı Yüzme Havuzu üyelerinden araştırmaya gönüllü olarak katılan 50 yüzücüdür. Bulgular, Sosyal Bilimlerde İstatistik Paket Programı (SPSS)'nda analiz edilmiştir. Araştırma sonucunda; giysilerde yaşanan sorunların; çabuk deforme olması, hareketlerin kısıtlanması, kumaş dokusu ve dikiş özelliklerinin cildi rahatsız etmesi, giysilerden beklentilerin ise; dayanıklılık, hareket kolaylığı, vücuda uyum sağlama ve bakımının kolay olması olarak belirlenmiştir. Araştırma sonuçlarının, koşu sporunda sportif performansın artırılmasına ve sporcu sağlığının korunmasına yönelik olarak hem akademik hem de sektör bazında giysi konforu konusunda yapılacak araştırma ve geliştirme faaliyetlerine yol gösterici olacağı düşünülmektedir.

Anahtar Kelimeler: Yüzme, Sporcu Giysileri, Yüzücü Giysileri, Giysi Konforu

A RESEARCH ON EXAMINATION OF SWIMMER CLOTHING FOR INCREASING SPORTSMAN PERFORMANCE

Abstract

The purpose of this research is to present the problems of swimmers about swimming clothing in trainings or competitions and their expectations from swimming clothing for increasing their performance. Descriptive method was used in the research. Survey was developed as a data collection tool on clothing comfort parameters and functional design properties that swimming clothing should have. The universe of the research is composed of male and female swimmers interested in swimming sport in Turkey, in the province of Çorum. And the sample is composed of 50 swimmers who participate in the research voluntarily among the members of Olympic Indoor Swimming Pool serving in Çorum Provincial Directorate of Youth Services and Sports. The findings were analyzed in Statistics Package Program in Social Sciences (SPSS). As a result of the research; it was determined that the problems experienced with the clothing were quick deformation, restriction of movements, and the fact that fabric texture and sewing properties discomfort the skin and expectations from clothing were durability, ease of movement, to accord with the body and easy maintenance. It is considered that research results shall be a guide for research and development activities to be performed about clothing comfort on both academic and sector basis for increasing sportive performance in running sport and protection of sportsmen health.

Keywords: Swimming, Sportsman Clothing, Swimmer Clothing, Clothing Comfort

1. Introduction

Today it is known that many factors in physical, physiological and psychological terms are effective on the athletic performance of sportsmen. Athletic performance is the integrity of the efforts paid for success during fulfillment of any athletic task to be performed and it is quite complex (Bayraktar and Kurtoğlu, 2004). Factors affecting performance are basically divided into two namely internal and external factors. Internal factors are such factors which already exist in humans, which are partially hereditary, which may be subjected to modification in time and the chance of which being effected externally is limited. These include age, sex, and genetic, anatomic structure, psychological balance (Bayraktar and Kurtoğlu, 2009: 16). Those which are not originated from the structure of human body and which indirectly affect sportive performance are external factors. These include temperature, climate, material (instruments), nutrition, ergogenic assistance, trainer, rest interval and the like (Bayraktar and Kurtoğlu, 2011: 302). It is also possible to say that the clothing used by sportsmen are included in material (instruments) under external factors. Yücesir et.al. (2011: 159) also define sportsmen's clothing and shoes as assistants that contribute to performance of sportsmen (ergogenic assistance) under the title of mechanical and biomechanical assistants.

Sports activities are divided into much diversified branches. It is considered by researchers to be useful to use clothing developed specially for each sports branch in order to support performance of sportsmen. And since comfort of swimmer clothing is discussed in this study; merely swimming sports styles and swimmer clothing are emphasized. Although swimming is team sport, individual sport or a training type with physical and psychological properties it is developed, it is a sport branch that develops physical characteristics of the individual including flexibility, strength, tenacity at highest level. There are four different swimming styles in different positions and movements in trainings and competitions. These are Butterfly Stroke, Back Glide, Breast Stroke, Crawl (free) styles (Anonymous 1). Back glide swimming style is in supine position and other techniques are in facedown, horizontal or almost horizontal positions. The four techniques have different characteristics with respect to body position, foot stroke, arm pulling, position of head, breathing and coordination.

In order the user to move fast and easily it is very significant in sport clothing that the clothing has properties of being able to accord with body movements in anatomic terms and not preventing movement. This is true for swimming sport which requires high level of activity as well. Swimmer clothing is composed of swimming hat, swimmer glasses and swimming suit. This clothing covers a broad surface in the body and takes the shape of the body and thus affects physical activity. Knitted fabrics containing spandex fiber are generally preferable in this clothing due to their ability of elasticity and fitting with the body. Another advantage of formfitting swimmer clothing in addition to movement comfort is its positive effect on aerodynamic (interaction with air) performance (Oğlakçıoğlu, İlleez, Erdoğan, Marmaralı and Güner, 2013). Furthermore it is possible in this type of clothing to provide positive effect on the performance of the swimmer through decreasing surface friction property. All those properties mentioned are related to clothing comfort and affect performance indirectly.

Clothing comfort is basically the individual's not being affected by clothing in physical, psychological and physiological terms, feeling himself/herself comfortable and consequently increasing in his/her comfort (Öner and Okur, 2011: 21). Here physical comfort namely body movement comfort is the ability of any textile product to allow the person who

wears it to move properly and its property of fitting with the body and not making pressure on the body (Li, 2001: 2). And thermo-physiological (thermal) comfort is a thermal situation which contains transfer of temperature and moisture through the fabric and which arises from the interaction between the skin and textile surface (Toprakkaya, 1999: 403). Finally psychological comfort is subjective perceptions that contribute to the total comfort of the person who wears it and it is related to elements including color, style, form, fashion. It is usually named as aesthetic comfort (Li, 2001: 2; Güney, 2008: 15; Vural, Çoruh and Çileroğlu, 2011: 805).Comfort perception is a complex process covering numerous stimulants which come from the clothing and external environmental conditions, which go to the brain through nervous ways and analyzed there (Güneşoğlu, 2005) and which is vulnerable to personal perceptions. A significant point considered in comfort perception of users is that the body and clothing are in continuous interaction. Physiological properties including skin temperature, perspiration rate and moisture value on the skin surface change during movement; those effects lead to mechanical and thermal warnings. Resistance or harmony of the clothing against those warnings determines comfort perception of the user (Güneşoğlu, 2005). The feeling of discomfort toward any of those factors physically, physiologically and psychologically may eliminate comfort (Kaplan and Okur 2005).

Sportive activities used in the history as a means for individuals' gaining and developing self-confidence were commercialized under sponsorship of global companies in time in addition to physical activity character and they became competitions. Through sportive activities, competition in social and cultural form in national or international arena was supported, sportive activities were diversified and made common and this increased significance of success of sportsmen for the success of clubs and countries. In order to achieve this success, it is necessary to perform sport healthily and in high performance. Today boundaries of scientific knowledge that would provide these are broadened as well (Bayraktar and Kurtoğlu, 2009: 16). On the basis of those information, the fundamental purpose of this research which discusses swimmer clothing comfort is to determine the problems that swimmers face with regard to the clothing they use in trainings or competitions, to detect the properties they seek in swimming clothing as a supportive element in increasing performance. Furthermore it makes suggestions on the basis of the results obtained for both sportsmen and sport clothing producers. It is considered that research results shall contribute to similar researches and researchers working on a similar subject.

2. Material and Method

This study is descriptive with respect to the way followed for achieving the purpose. In the research general surveillance method realized on the entire universe or a group of samples to be taken from it was used in order to make a general judgment on a universe composed of numerous elements (Karasar, 2008: 79).

Materials of the research is composed of information obtained through books, journals, theses related to the issue and browsing performed via the internet and the findings reached through statistical analyses of the data collected through the survey.

The universe of the research is male and female swimmers interested in swimming sport in the province of Çorum in Turkey. And the sample is composed of 50 swimmers who were reached between the dates of 14.04.2014-25.04.2014 who participate in the research

voluntarily among the members of Olympic Indoor Swimming Pool serving in Çorum Provincial Directorate of Youth Services and Sports.

It is considered that clothing preferred by professional sportsmen have higher comfort property compared to those used by amateur sportsmen because as a result of the surveillances performed, it is found out that comfort demand has increased in recent years and particularly those special high performance sport clothing with high price offered by branded sport clothing producers to the consumers are mostly preferred by professional sportsmen. This is also supported by academicians and trainers whose opinions were received prior to the research. For this reason the research was limited to amateur swimmers and professional swimmers were excluded.

Survey that was created by researchers by receiving the opinions of specialists for the purpose of collecting research data was used. Form is composed of 3 sections and 15 questions 3 of which are demographic properties, 7 of which are open ended and 8 of which are expressed. The questions in the first section contain demographic properties of participants, questions in the second section contain swimming style of participants, period of being interested in swimming, level of interest, type of clothing they use, status of following technologic design swimming sport clothing, following ways and reasons for use, degree of significance of properties of clothing used in sport for users. And the questions in the third section contain properties that increase performance in swimming clothing, problems experienced with clothing and clothing expectations. The effects of properties of swimming clothing on the performance of participants and problems they face with the clothing were measured with quartet likert type questions graded as always, frequently, sometimes and never and the properties (expectations) that the clothing used in running sport were measured with trio likert type questions graded as I agree, I partially agree and I do not agree.

For the purpose of determining reliability of the scale used in the research Cronbach Alpha (α) statics was used. The criteria based on in assessment of Cronbach Alpha Coefficient is $0.80 \leq \alpha < 1.00$ which is highly reliable (Özdamar, 2002: 61). The result of Cronbach Alpha (α) statics performed is 0.858. According to this result high reliability was provided for data collection criterion used in the research.

The findings obtained from the survey after the process of data collection is completed were analyzed in 16,0 version of SPSS program, frequency and percent distribution values according to the type of data obtained were presented in the tables.

3. Findings and Comment

Demographic characteristics of the swimmers who participate in the research and general information about their interest in swimming sport are presented in tables 1 and 2.

Table 1. Demographic Characteristics of Participant

Characteristics		**% (f)**
Gender	Female	34% (17)
	Male	**66% (33)**
	Total	100 (50)
Age	15-18	**56% (28)**
	19-24	20% (10)
	25-30	10% (5)
	31-36	10% (5)
	37-40	4% (2)
	Total	100 (50)
Education Level	High School	**44% (22)**
	Associate degree	26% (13)
	Bachelor's degree	30% (15)
	Total	100 (50)

n=50

Table 2. General Information about Interest of Participants in Swimming Sport

General Informations		**% (f)**
Swimming style	Crawl	14% (7)
	Back Glide	10% (5)
	Butterfly Stroke	12% (6)
	Breast Stroke	8% (4)
	Mixed	**56% (28)**
	Total	100% (50)
Period of being interested in swimming sport	0-3 years	24% (12)
	4-7 years	**58% (29)**
	8-11 years	8% (4)
	12-15 years	8% (4)
	16-19 years	2% (1)
	Total	100% (50)
Period of performing weekly sport	1 day	6% (3)
	2 days	2% (1)
	3 days	18% (9)
	4 days	**44% (22)**
	5 days	12% (6)
	6 days	14% (7)
	7 days	4% (2)
	Total	100% (50)

n=50

The findings obtained as a result of research executed for the purpose of determining the problems that swimmers face with swimming clothing they use in training or competitions and detecting the characteristics they seek.

Table 3. Level of Interest of Participants in Swimming Sport

Level	**% (f)**
I'm a swimmer in different styles in clubs.	**64% (32)**
I participate in various competitions but I swim with an individual license.	8% (4)
I have no club / individual license. I swim in free times.	28% (14)
Total	100% (50)

n=50

When Table 3 where levels of interest of participants in swimming sport are indicated; it is found out that 64% of participants are members of a club and swim in different styles, 28% participate in various competitions with individual license without being a member of any club and 8% swim in free times without being a member of any club and having no individual license.

Table 4. Statuses of Participants to Follow Technologic Design Swimming Clothing

Following status	**% (f)**
Follows	**98% (49)**
Does not follow	2% (1)
Total	100% (50)

n=50

When Table 4 is examined; it is found out that participants of a high percentage follow technologic design swimming clothing.

Table 5. Ways of Participants to Follow Technologic Design Swimming Clothing

Alternatives	**Always**	**Sometimes**	**Never**
	% (f)	**% (f)**	**% (f)**
Internet	**60% (30)**	36% (18)	---
TV	18% (9)	**5%0 (25)**	30% (15)
Newspaper / Journal	16% (8)	**4%2 (21)**	40% (20)
Scientific studies	8% (4)	12% (6)	**78% (39)**
Trainer's recommendation	**60% (30)**	28% (14)	10% (5)
Manufacturer company	26% (13)	**48% (24)**	24% (12)

n=50

When Table 5 where the ways of participants to follow technologic design swimming clothing are given is examined; it is found out that swimmers mostly follow the said clothing

through the internet and trainer recommendation, sometimes through television and they do not use newspapers or journals, scientific studies related to the subject as tools of following.

Table 6. Reasons for Participants' to Prefer Technologic Design Swimming Clothing

Reasons for use	% (f)
Considering that they increase performance	**62% (31)**
Being interested in	20% (10)
Trainer / Club suggestion	18% (9)
Total	100% (50)

n=50

When Table 6 is examined; it is found out that; the first reason for participants' to prefer technologic design swimming clothing is that they think this affects their performance during swimming, the second one is their personal interest and the third is the suggestions of the club which they are members of or the trainers they work with.

Table 7. Degrees of Importance of Various Characteristics in Swimming Clothing for Participants

Alternatives	Important	Partially Important	Not Important
	% (f)	% (f)	% (f)
Brand	40% (80)	20% (10)	---
Model	10% (5)	90% (45)	---
Comfort	**94% (47)**	3% (6)	---
Price	40% (80)	8% (16)	4% (2)
Color	66% (33)	20% (10)	14% (7)
Being light	92% (46)	8% (4)	---
Flexibility	90% (45)	8% (4)	2% (1)
Sewing quality	80% (41)	18% (9)	---
Functionality	84% (42)	16% (8)	---
Durability	90% (45)	5% (10)	---
Suitability for the body	92% (46)	8% (4)	---
Low moisture absorption	72% (36)	28%(14)	---
Decreasing friction resistance	**94% (47)**	6% (3)	
Air permeability	74% (37)	26% (13)	
Drying fast	86% (43)	12% (6)	2% (1)
Heat isolation	68% (34)	32% (16)	
Heat flow	72% (36)	26% (13)	2% (1)

n=50

When Table 7 is examined, listing the degrees of significance of various properties in swimming clothing, it is found out that comfort and increasing friction resistance are the most significant property and being light, fitting with the body, durability, elasticity, fast drying, functionality and sewing quality are significant for the participants. Listing the degrees of significance, it is found out that brand, price and color properties are in lower ranks.

Table 8. Characteristics that Increase Performance in Swimming Clotting for Participants

Characteristics	Always	Frequently	Sometimes	Never
	% (f)	% (f)	% (f)	% (f)
Being elastic	78% (39)	18% (9)	2% (1)	2% (1)
Being light	90% (45)	6% (3)	2% (1)	2% (1)
Low moisture absorption	48% (24)	30% (15)	20% (10)	2% (1)
Increasing friction resistance	**94% (47)**	2% (1)	4% (2)	---
Having heat isolation character	60% (30)	24% (12)	16% (8)	---
Having air permeability	74% (37)	16% (8)	10% (5)	---
Fitting with the body	92% (46)	2% (1)	6% (3)	---
Not restricting movements	**94% (47)**	2% (1)	---	---

n=50

When Table 8 is examined; it is found out that properties of decreasing friction resistance and not restricting movements of swimming clothing are such properties that always improve performance. According to Table 8, fitting of swimming clothing with the body, being light and elasticity are other properties considered by the participants to affect their performance.

Table 9. Problems Experienced by Participants with Swimming Clothing

Characteristics	Always	Frequently	Sometimes	Never
	(f)%	(f)%	(f)%	(f)%
Being deformed quickly	**58% (29)**	20% (10)	16%(8)	6% (3)
Fabric texture discomforting the skin	28% (14)	24% (12)	38% (19)	10% (5)
Sewing properties discomforting the skin	30% (15)	22% (11)	36% (18)	12% (6)
Having no air permeability character	28%(14)	18% (9)	34% (17)	20%(10)
Having heat rise due to friction	28% (14)	30% (15)	28% (14)	14% (7)
Having heat keeping character	18% (9)	22% (11)	36% (18)	24%(12)
Discomforting by model characteristics	38% (19)	30% (15)	10% (5)	22%(11)
Restricting movements	36% (18)	24% (12)	18% (9)	22%(11)

n=50

When Table 9 where problems experienced by participants with swimming clothing is examined; it is found out that the problem that swimmers face most frequently is fast deformation of the clothing. And others are model properties (details), restricting movements, sewing properties and fabric texture discomforting the skin.

In order to obtain high clothing comfort, sewing types have significant effect for sensual comfort. It was supported by the research performed by Oğlakçıoğlu et.al. (2013) that sewing types are significant for comfort. In this research where the effect of sewing processes applied in cycler clothing on thermal comfort properties are examined, thermal comfort parameters of four fabric structures used in cycler clothing before and after being sewn were tested. As a result of the research, it was detected that comfort properties of clothing are not only depended on fabric properties but they were affected significantly by sewing parameters and comfort properties after sewing should be taken into consideration as well in product design.

Table 10. Expectations of Participants from Swimming Clothing

Expressions	**I agree**	**I partially agree**	**I do not agree**
	(f)%	**(f)%**	**(f)%**
It should have low moisture absorption.	70% (35)	20% (10)	10% (5)
It should have air permeability.	70%(35)	24% (12)	6% (3)
It should be able to breathe.	80% (40)	18% (9)	2% (1)
It should have property of keeping heat.	72% (36)	26% (13)	2% (1)
Its fabrics texture should be soft.	80% (40)	20% (10)	---
It should dry fast.	80% (41)	18% (9)	---
It should be durable.	**90%(45)**	10% (5)	---
Its maintenance should be easy.	88% (44)	10% (5)	2% (1)
Model characteristics should be suitable for swimming.	84% (42)	16% (8)	---
Sewing characteristics should suitable for the activity.	84% (42)	16% (8)	---
It should provide movement ease.	**90%(45)**	10% (5)	---
It should be fitting with the body.	88% (44)	12% (6)	---

n=50

When Table 10 is examined; expectations of participants from swimming clothing are respectively the properties of the clothing being durable during usage, fitting with the body, providing movement ease, its maintenance being easy, model and sewing properties being in conformity with the activity, drying fast, being able to breathe, fabrics being soft, having property of heat keeping, having properties of air permeability and low moisture absorption.

4. Conclusions and Suggestions

As a result of this study for the purpose of determining the problems that swimmers face with swimming clothing and detecting the properties that they expect from clothing to have;

– It has been detected that a high percentage of swimmers follow technologic design swimming clothing, and preferred trainer or club suggestions and the internet at the same rate as a means of following. And they expressed that the preferred this

clothing since they consider that this clothing affects their performances positively.

– The properties that the swimmers pay the highest significance with respect to comfort properties in swimming clothing are comfort and decreasing friction resistance. And other properties that they pay significance are being light, fitting to the body, elasticity and durability. According to survey results the properties discriminative for the consumers including brand, color, price in normal clothing are not very significant in swimming clothing.

– According to the swimmers who participate in the research properties that increase performance in swimming clothing are respectively decreasing friction resistance, not restricting movements, fitting with the body and being light.

– The problems that swimmers experience most frequently with swimming clothing are respectively being deformed quickly, restricting movements, fabric texture and sewing properties discomforting the skin.

– And the properties that swimmers expect from swimming garments are respectively; durability, movement ease, fitting to the body and easy maintenance.

It was suggested by scientific studies that the real purpose of clothing used during sport is facilitating the activity and protecting sportsman health. Suggestions developed according to research results;

- Swimming clothings should be manufactured from fabrics having properties of fabric which compel movement of the swimmer in swimming sport and which make the sportsmen feel friction, water resistance and weight less.
- Model and sewing properties should be paid attention to pertain to the sport of swimming.
- In order the swimmer not to feel any restriction caused by the clothing under the water the clothing should cover the body of the swimmer properly and be fitting to the body of the swimmer with elasticity properties.
- Details that will facilitate activity, increase performance and give the swimming clothing model property may be examined and researched.

REFERENCES

Bayraktar B, Kurtoğlu M (2009). Performance in Sports, Effective Factors, Assessment and Increasing. Clinical Development, 22 (1), 16-24.

Bayraktar B, Kurtoğlu M (2011). Performance in Sports and Methods of Increasing Performance. Atasü T, Yücesir İ, Bayraktar B (Ed.). Doping and Methods of Increasing Performance in Football (p. 301-328). Ankara: Ajansmat Printing House.

Güneşoğlu S (2005). Researching Comfort Properties of Sportive Purpose Clothing. Doctorate Thesis, Uludağ University, Bursa.

Güney F Ü (2008). Examination of Internal Comfort in Protective Clothing. Unpublished Master Thesis, Süleyman Demirel University, Isparta.

Karasar N (2008). Scientific Research Methods. Ankara: Nobel Publications.

Li Y (2001). The Science of Clothing Comfort. Textile Progress, 31 (1-2), 1-135.

Oğlakçıoğlu N, İlleez A A, Erdoğan Ç, Marmaralı A, Güner M (2013). Effect of Sewing Process on Thermal Comfort Properties in Cycler Clothing. Textiles and Engineer, 20 (90), 32-41.

Öner E, Okur A (2011), "Material, Production Technology and Thermal Comfort Effects of Fabric Structure", The Journal of Textiles and Engineer, 80, 20-29.

Özdamar K (2002). Statistical Data Analysis with Package Programs. Eskisehir: Kaan Book Store.

Toprakkaya D (1999). Clothing comfort in thermo-physiological terms. Textiles and Engineer, 9 (5), 403-407.

Vural T, Çoruh E, Çileroğlu B (2011). Developments for Clothing Comfort in turkey. 17th National Ergonomics Congress, Eskisehir (14-16 October), 802-809.

Yücesir İ, Güner R, Atasü T (2011). Ergogenic Assistance and Ergogenic Nutrition in Sports. Atasü T, Yücesir İ, Bayraktar B (Ed.). Doping and Methods of Increasing Performance in Football (p. 157-189). Ankara: Ajansmat Printing House.