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Research of the coordination abilities in rhythmic gymnastics

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Abstract

The research is aimed at studying some components of coordination abilities – coordination in rhythm and agility among 72 students from Coach Department of the NSA "Vassil Levski" in Sofia. Four tests were used to assess the coordination in rhythm (Frontal feet and hands hitting against a wall, Feet and hands hitting (in a corner), Jumps in four squares, Cross jumps in four squares) and two tests for assessment of agility (Sideward running 10x5 meters, "T" test). The results from the tests – Jumps in four squares and Cross jumps in four squares – correlate to a great extend with the gymnasts (.707**) and moderately with the athletes practicing other kinds of sports. The results from the tests for agility correlate with gymnasts to a great extent (.702**), and moderately with the athletes practicing other kinds of sports 684**). The coefficients of correlation with the tests for agility do not show any dependence on the tests for coordination in rhythm with both groups of subjects.

Keywords: Coordination, rhythmic gymnastics, other sports

INTRODUCTION

The contemporary rhythmic gymnastics is a complicated coordination sport. Its mastery is displayed through learning the exercises and the ability to convey not only the general nature of the movements but also their details.

In the gymnasts' routines, according to the requirements of the code of rules of FIG, the number of actions performed in unexpected situations is significantly increased and the gymnasts are supposed to show resourcefulness, fast reaction, and concentration. When performing with apparatuses (rope, hoop, ball, clubs, and ribbon), the gymnasts have to switch over their attention, their spatial, time and dynamic accuracy of movements and their biomechanical rationality (Gantcheva, 2017).

The coordination abilities in gymnastics are known to be an automatic flow of specific processes for management and diversity of the movement (Hadjiev et al., 2011). Authors distinguish the following five components of coordination abilities, which can be fully applied in rhythmic gymnastics:

- Ability for reaction;
- Rhythmical ability;
- Balance ability;
- Ability for spatial awareness;
- Kinesthetic ability for differentiation.

Bompa (2006) believes that coordination is a complex motor ability necessary for the perfect execution of the exercises and routines. In this case, rhythmical abilities are defined as an ability to coordinate and determine the level of perfect connection of the motor characteristics, which in turn are determined by factors such as age, transition level of acquired motor abilities, the choice of kind of sport, sports experience, etc.

Most often, authors determine the manifestation of coordination abilities according to different factors and recommend their taking into consideration as early as the stage of the children's selection for a particular sport and the assessment of their motor-coordination abilities (Dimitrova, 2015). The abilities for correct analysis of the movements, the activity of the motor analyzer, and the complexity of motor tasks are key components of the manifestation of the coordination abilities in rhythmic gymnastics (Hafe, 2016). The level of development of other physical abilities (speed abilities, dynamic power, flexibility, etc.), the diversity of the motor skills and habits, are considered to be important prerequisites for the successful performance in a certain motor activity (Jastrjembskaja and Titov, 1999).

In rhythmic gymnastics special attention is paid to the balance abilities since they are one of the main parts of coordination abilities and also because they are a specific motor ability and a technical requirement for the exercises and routines (Macovei, 2006). The author views balance in three directions: as a specific motor ability, as a technical group of body exercises, as a criterion for evaluation of the execution of balances, jumps, and spins.
Other authors (Karpenko, 2003) present coordination in rhythmic gymnastics in close relation to agility, and namely to the abilities of fast learning of new movements and readjusting one's motor activity according to the requirements of the changing environment.
There is one major trend in the competitive programs of the gymnasts – execution of complex motor activities of the body together with exercises with apparatuses. Due to the necessity of using exercises from different structure groups (steps, waves, balances, spins, jumps, acrobatic and pre-acrobatic

exercises), requiring higher level of development of balance abilities, as well as rhythmical abilities related to the performance with musical accompaniment, sports physical preparation emphasizes on the perfection of the different components of coordination abilities. These qualities are known to facilitate to the greatest extent the quality performance of the competitive program (Viner-Usmanova, 2003).

METHOD

The research was done among 72 female first- and second-year students – 35 of them with major "Rhythmic gymnastics" and 37 – with different majors at the Coach Department (athletics, wrestling, tennis, basketball, etc.).

In order to fulfill the aim of the research we used tests recommended by Damjanovska et al. (2013) and tried out in rhythmic gymnastics (Damjanovska et al., 2015):

1. Four tests for assessment of coordination in rhythm were used and the results were recorded in number of cycles made in 20 sec.:
    - Frontal feet and hands hitting against a wall,
    - Feet and hands hitting (in a corner),
    - Jumps in four squares,
    - Cross jumps in four squares.
2. Two tests for agility were used and the results were given an account of during the execution:
    - Sideward running 10x5 meters,
    - „T"- test.

Each test was executed three times. We allowed for a short elaboration of the movements in the beginning. However, we did not let the subjects learn them well. The results from all tests were recorded in a preliminarily prepared individual form for each participant in the research. In the end, the best achievement was highlighted.

Math-statistical methods:

Correlation analysis

Mean, SD and d – for statistical significance of the differences.

RESULTS

In order to establish the statistically significant relations between the variables for coordination in rhythm and agility we used a correlation analysis.

The results and the growth are shown in table 1. The coefficients of correlation between the results from the applied tests are shown in Tables 2 and 3.

Table 1. Results of the two groups – gymnastics and other sports

Test	group	N	Mean	SD	d	Z (U)	Sig.
Frontal feet and hands hitting against a wall	gymnastics	35	10.2	3.16	5.79	6.673	0.000
	other sports	37	4.41	2.047			
Jumps in four squares	gymnastics	35	7.23	1.896	0.34	0.953	0.341
	other sports	37	6.89	1.696			
Cross jumps in four squares	gymnastics	35	7.09	2.092	0.66	1.161	0.246
	other sports	37	6.43	2.544			
Feet and hands hitting (in a corner)	gymnastics	35	10.6	3.031	2.36	2.806	0.005
	other sports	37	8.24	3.345			
ILINOIS	gymnastics	35	22.32	2.29	1.587922	2.563	0.01
	other sports	37	20.73	2.11			
t_6	gymnastics	35	14.28	1.06	-0.10573	0.868	0.386
	other sports	37	14.39	1.29			

Table 2. Correlation analysis between the indexes of coordination in rhythm and agility – gymnastics

Female gymnasts	Frontal feet and hands hitting against a wall	Jumps in four squares	Cross jumps in four squares	Feet and hands hitting (in a corner)	ILINOIS	t_6
Frontal feet and hands hitting against a wall	1					
Jumps in four squares	0.267	1				
Cross jumps in four squares	0.175	.707**	1			
Feet and hands hitting (in a corner)	.423*	.441**	.465**	1		
ILINOIS	0.315	-0.109	-0.108	0.08	1	
t_6	.378*	-0.021	-0.172	0.22	.702**	1

Table 3. Correlation analysis between the indexes of coordination in rhythm and agility – other sports

Female athletes – other sports	Frontal feet and hands hitting against a wall	Jumps in four squares	Cross jumps in four squares	Feet and hands hitting (in a corner)	ILINOIS	t_6
Frontal feet and hands hitting against a wall	1					
Jumps in four squares	-0,139	1				
Cross jumps in four squares	,563**	,468**	1			
Feet and hands hitting (in a corner)	0,306	,401*	,500**	1		
ILINOIS	-0,004	-0,007	0,166	-0,165	1	
t_6	0,058	0,08	0,105	0,033	,684**	1

DISCUSSION

The mean values of the results show the gymnasts' tendency to perform better in coordination in rhythm tests. There are more significant differences in the tests where the movements are executed

simultaneously with legs and arms regardless that both the rhythm of movements and the sequence of movements change. In the test – Frontal feet and hands hitting against a wall, d = 5.79 (d>0.8, Sig. <0.05) and in the test feet and hands hitting (in a corner) d = 2.36 (d>0.8, Sig. <0.05). The achieved 10.2 cycles for 20 sec. are indicative of good and accurate execution of the movements, because one cycle consists of 8 steps and actually, this result shows that the gymnasts make about 81.6 quick steps, and their peers from the other sports manage to make about 35.28 steps. In one of the tests the arm movements are twice as quick as those of the legs and with smaller amplitude, which corresponds to half a note and two following quarters of notes, according to the musical symbols. The gymnasts have perfected such exercises typical for rhythmic gymnastics mostly in the play with apparatuses when the combination of body and apparatus exercises require broader movements with bigger amplitude (jumps, travelling, broad steps) and quicker movements with smaller amplitude with the apparatus (small circles, spins, snakes, spirals, and windmills). The athletes practicing other kinds of sports show lower results in the tests requiring execution of movements with different rhythmical structure with lower and upper limbs. The results from the correlation analysis support this finding – with the gymnasts the correlation between these two tests is moderate 0.423.

The results from the other two tests for coordination in rhythm – Jumps in four squares and Cross jumps in four squares – correlate to a very great extent with the gymnasts (.707**) and moderately with the athletes from the other sports. The different kinds of running in athletics and locomotion in basketball, tennis and volleyball correspond to the inner rhythm of the athletes, but the execution of a number of rhythmical steps with musical accompaniment in competitive routines definitely helps the gymnasts' perfection of the coordination in rhythm. Rhythmical steps and musical accompaniment are two fixed components of rhythmic gymnastics imposed by the competitive rules. Music, in turn, is the only means which measures time accurately and enables to determine the duration of the different phases of gymnastics exercises in the same way during each performance. The everyday use of musical accompaniment in the education-training process, in our opinion, is one of the reasons why the gymnasts' rhythmical execution of movements with legs is better than that of their peers from the other sports.

The results from the test feet and hands hitting (in a corner) – correlate moderately with the other tests for coordination in rhythm with the gymnasts (.423*, .441**, .465**), and in the other group of researched individuals – only with two of the tests (.401*, .500**).

The results from the tests for agility correlate with each other with the gymnasts to a great extent (.702**), and moderately with the athletes practicing other kinds of sports (.684**).

The coefficients of correlation of the tests for agility do not show any dependence on the tests for coordination in rhythm with both groups of subjects. The moderate correlation dependence between the tests frontal feet and hands hitting against a wall and_6 with one of the groups – those practicing rhythmic gymnastics (.378*) is an exception.

Rhythmic gymnastics as motor activity belongs to sports disciplines based on an original way of interpretation of preliminarily set or familiar motor sample (Miletić et al., 2007). In conclusion, we can say that rhythmic gymnasts do not find much difficulty in the tests applied. That is why, in order to assess the coordination in rhythm and agility with gymnasts, we should look for additional factors (anthropometric data, sports experience, etc.) which will enrich the research.

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Evaluation of gender knowledge, behaviors and attitudes of physical training and sports students

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Abstract

Human sexuality is a highly complicated and specific phenomenon made of different components. Human sexuality is a component of physical and mental health and affects our thinking, behavior, interactions and our entire life. It has been observed in groups which offer training and service in Physical Training and Sports, numerous studies were made on physical, psychological and social aspects of individuals yet a very limited number of studies were made on assessment of sexual knowledge, attitudes and behaviors. In this descriptive study realized to evaluate sexual knowledge, behaviors and attitudes of students at the school of physical training and sports, data was collected by the student information form and the Sexual Attitudes Questionnaire (SAQ) and evaluated using percentage distribution, correlation and t test in SPSS 16.0 software. A large part of the student group which was mainly made of male students (75%) and those who have lived for a longer period of time at central areas in their life (73%), pointed at unofficial channels such as friends (62%) and the internet (46%) as their source of information on sexuality. The most widely known sexually transmitted disease (STD) is AIDS (72%). Other STDs have a very low level of acquaintance. While female students exhibited a more conservative attitude compared to males in all areas of SAS, they exhibited a similar attitude to male students in the subscale of attitude towards their own sexuality. The study determined that students needed accountable information sources on sexuality and their level of sexual attitude could be considered conservative.

Keywords: Sexual attitude, sexual health, physical training and sports students, university students

INTRODUCTION

Humans are sexual beings. Sexuality is a basic human need and an innate part of the current personality. Human sexuality is a highly complicated and specific phenomenon made of different components (Eser, 2006; MC Townsend, 2014). These components include psychological, physical and biological traits of the individual as well as social, economic, political, cultural, legal, historical, religious and other factors (CEDAT, 2007; WHO, 2015). Contrary to common belies, sexuality covers not only sexual organs but also the entire body and mind. Human sexuality is a component of physical and mental health and affects our thinking, behavior, interactions and our entire life.

Historically considered to be a taboo, sexuality has been accepted as a scientific field of study since 1960s (MC Townsend, 2014). Since then, developments have been achieved in sexuality and sexual health with scientific studies. However, it is a known fact that the number of these studies is limited, a number of areas have not been addressed yet and silence remains about sexuality (Parker, 2009). Despite the silent attitude towards sexuality, increased number and rate of sexually transmitted diseases, changes in definitions, attitudes and behaviors related to sexuality with the effect of technology and globalizations, claiming sexual rights and other developments require a change in this silent attitude (Parker, 2009).

This silent attitude towards sexuality also reveals itself in Physical Training and Sports. As in other areas of the society, the study conducted by the authors indicates that numerous studies were conducted on individuals' physical (Sevindi et al., 2007; Yılmaz, 2006.) psychological (Şenel et al., 2014; Bingöl et al., 2012; Özşaker et al., 2014; Taşğın et al., 2007) and social aspects (Avsar, 2004; Tekin et al., 2006) in groups which receive training and offer service in physical training and sports. The number of studies which evaluate individuals' sexual knowledge, attitudes and behaviors, however, is very limited. It is required to provide a fair, safe and free environment and lifestyle of education and practice for students and other members of the society vested with different characteristics in professional lives of physical training and sports students. Identification of attitudes of persons to provide training and service in this field towards their own sexuality and towards sexual variables of others they would serve, work with or offer training is critical in bringing a light on a dark field.

This study has been conducted with an aim to identify sexual knowledge, behaviors and attitudes of physical training and sports students.

METHOD

This study planned to be descriptive was conducted in the spring semester in 2012-2013 academic year at School of Physical Training and Sports, Gazi University. All students who continued education in the concerned academic year constituted the study population and 154 students who accepted participation were included in the study. 108 students who completely filled out the data collection form created the sample group and data was collected using the student information form and the Sexual Attitudes Questionnaire and was evaluated using percentage distribution, correlation and t test in SPSS 16.0 software.

Student Information Form: The form created through literature search by the authors is made up of two parts. The first part reviews sociodemographic variable of students while the second inquires into other variables which might possibly be associated with sexuality.

Sexual Attitudes Questionnaire: The Trueblood Sexual Attitudes Questionnaire (TSAQ); (revised by Hannon et al., 1999; Turkish Version, Duyan, 2004), this questionnaire assesses the attitudes (not behaviors) toward sexuality for self (40 items) and for others (40 items) on five subscales. Each subscale has eight items that are rated on a 9-point Likert scale that ranges from 1 (I completely disagree) to 9 (I completely agree). Higher numbers indicate a more accepting or liberal attitude toward sexuality.

To prepare the Turkish version, the double translation method was used. Test re-test results were correlated for all subscales and for the total scale ($p < 0.001$). Alpha values of the subscales and total scale were found to be very high (for autoerotism-self = .8341; or heterosexuality-self =.6478, for homosexuality-self = .8101, for variations self = .7542, for commercial sex-self = .7315, autoerotism-other = .8552, for heterosexuality other = .7413, for homosexuality-other = .9354, for variations-other = .8382, for commercial sex-other =.8015, for total self = .9178, and for total other =.9537), (Duyan, 2004).

RESULTS

Table 1. The socio demographic characteristics of the students

The socio demographic characteristics		n	%
Gender	Women	27	25.0
	Men	81	75.0
Grade year	1st year	26	24.1
	2nd year	28	25.9
	3rd year	29	26.9
	4th year	25	23.1
Current Resettlement Unit	Village	9	8.3
	County	20	18.5
	City	79	73.1
Families' Income	Extra Low	31	28.4
	Low	57	52.3
	Middle	5	4.6
	High	16	14.7
Total		109	100

Table 1 demonstrates distribution of students by sociodemographic variables. A large majority of the students are male (75%) and live in urban areas (73.1%). The number of students almost distributes evenly between classes. Roughly half of the students are from families at low income level.

Table 2. Students' characteristics related to sexuality and their information sources

		n	%
Has a girl/boyfriend	Yes	72	66.7
Talks about sexuality with others	Yes	78	72.2
To consent sex without marriage for men	Yes	66	61.1
To consent sex without marriage for women	Yes	29	26.9
Has an activesex life	Yes	51	47.2
Information sources related to sexuality	Curriculum	0	0
	Specialist	20	18.5
	İnstitutions	7	5.5
	Books	19	17.6
	Teachers	9	8.3
	Newspaper	15	13.9
	Magazines	15	13.9
	Internet	50	46.3
	Cassetteand CD	18	16.7
	Family	26	24.1
	Siblings	5	4.6
	Friends	67	62.0
	Sexual experiences	48	44.4
Known sexually transmissible diseases	AIDS	78	72.2
	Hepatitis	18	16.7
	Gonorrhea	19	17.6
	Syphilis	10	8.3
	HPV	2	1.9
	Herpes	2	1.9
How felt while answering this questions	Negative	32	29.6
	Neutral	59	54.6
	Positive	17	15.7
Total		**108**	**100**

Table 2 demonstrates variables which might be associated with sexual attitude. More than half of the students have a girlfriend/boyfriend (66.7%) and a majority of the students state they can talk with others about sexual topics (72.2%). While 61.1% of the students found premarital sex acceptable for men, 26.9% reported they found it acceptable for women. Considering how the students acquired information about sexuality, the most widespread sources are unofficial channels including friends (62.0%), the internet (46.3%) and their own experiences (44.4%). The most widely known STD is AIDS. The rate of acquaintance of life critical diseases including Hepatitis (16.7%) and HPV (1.9%) is very low. Many sexually transmitted parasites and bacterial infections are not known by the students at all. While 54.6% of the students stated they had neutral feelings while filling out the sexual attitude form 29.0% reported negative feelings.

Table 3. Students' attitudes towards sexuality according to their gender

Sub-scales	Women $\overline{X}$	Sd	Men $\overline{X}$	Sd	Statistic	
Masturbation self	13.56	8.01	27.73	12.80	t=-5.4	p<0.01
Masturbation others	11.59	6.08	29.93	14.98	t=-6.2	p<0.01
Heterosexuality self	30.70	4.99	37.65	11.07	t=-3.2	p<0.01
Heterosexuality others	30.59	6.25	36.95	9.58	t=-3.2	p<0.01
Homosexuality self	12.04	7.11	16.72	11.90	t=-1.9	p>0.05
Homosexuality others	12.04	6.78	22.11	15.27	t=-3.3	p<0.01
Variations-self	13.22	9.23	27.85	14.61	t=-4.9	p<0.01
Variations-others	12.81	8.91	27.79	15.54	t=-4.7	p<0.01
Commercial sex self	18.19	6.34	27.15	10.27	t=-4.3	p<0.01
Commercial sex others	17.56	5.99	32.05	13.49	t=-5.4	p<0.01

* Used Mann-Whitney U Test

Table 3 demonstrates distribution of sexual attitudes by gender. On all subscales apart from attitude towards self homosexuality, female students scored much lower than men. No difference was obtained between scores of men and women on homosexuality self subscale (t=-1.9; p>0.05).

Table 4. Students' attitudes towards sexuality according to their sexual life

Sub-scales	Have an active sex life $\overline{X}$	Sd	Not have an active sex life $\overline{X}$	Sd	Statistic	
Masturbation self	30.57	13.31	18.47	10.39	5.3	p<0.01
Mastubation others	31.92	16.53	19.46	11.86	4.5	p<0.01
Hetero sexuality self	40.47	10.80	31.84	8.02	4.7	p<0.01
Heterosexuality others	38.39	9.46	32.65	8.25	3.4	p<0.01
Homosexuality self	17.73	12.43	13.60	9.35	2.0	p>0.05
Homosexuality others	23.41	15.94	16.18	11.78	2.7	p<0.01
Variations-self	30.49	14.84	18.56	12.53	4.5	p<0.01
Variations-others	30.14	16.77	18.60	12.14	4.1	p<0.01
Commercial sex self	30.08	9.90	20.28	8.04	5.7	p<0.01
Commercial sex others	33.69	14.41	23.72	10.92	4.0	p<0.01

* Used Mann-Whitney U Test

Table 4 demonstrates distribution of scores in the sexual attitude questionnaire by active sex lives of the students. Similar to Table 3, the students with active sex life scored statistically significantly higher compared to other students on all subscales of the sexual attitude questionnaire apart from homosexuality self subscale. No difference was obtained between scores of students with and without active sex life on homosexuality self subscale (t=-2.0; p>0.05).

Tablo 5. Students' attitudes towards self and others

Sub-scales	Self	SD	Others	SD	t	p
Masturbation	24.19	13.29	25.34	15.50	-1.4	p>0.05
Homosexuality	15.55	11.06	19.59	14.31	.00	p<0.01
Heterosexuality	35.92	10.34	35.36	9.26	.47	p>0.05
Sexual Variations	24.19	14.86	24.04	15.56	.90	p>0.05
Commercial sex	24.90	10.19	28.42	13.58	.00	p<0.01

Table 5 provides data on assessment of students' attitude toward sexuality of their own and sexuality of others. No significant difference was obtained between students' sexual attitudes for self and for others in Masturbation (t=-1.4; p>0.05), Heterosexuality (t=.47; p>0.05), Sexual Variations (t=.90; p>0.05). However, their score in homosexuality self subscale is significantly lower than the score in

homosexuality other subscale (t=-.00; p<0.01). Similarly, their score in Commercial sex self subscale is significantly lower than the score in commercial sex other subscale (t=-.00; p<0.01).

DISCUSSION

As in many societies, sexuality is also a taboo in our society (CEDAT, 2007; Duyan, 2004). However, the fact that sexuality is a taboo does not eliminate sexuality which has an effect on almost all aspects of human life. Our study demonstrates that almost half the students have had sexual experience (47.2%). However, considering information sources on sexuality used by the students, they are mainly informal sources despite being at higher education level. It is not possible to identify the limits and accuracy of information obtained from informal sources such as the internet, DVDs, magazines and friends which are defined by the main information sources by the students. Sungur reported in a study published in 1998 that "although sexual education is a lifelong process, an important part of it is realized on the "streets" informally" (Sungur, 1998b). The study results show this condition still remains to be valid. It would be easy to support our study results with many studies from the literature (Demir, 2014; Büyükkayacı Duman, 2015; Yildirim, 2008).

Negative consequences of missing or faulty information about sexuality can be critical. It is known that mission or faulty information about sexuality have many negative consequences including sexual dysfunctions, unplanned pregnancy and life critical diseases (Pınar et al., 2009; Sungur, 1998a). In our study, the students knew about AIDS only by 72% and their acquaintance rate with other sexually transmitted diseases was very low. Life critical hepatitis types were only known by 16%. HPV, which can result in cervix cancer, was only known by 1.6%. Many sexually transmitted parasites and bacterial infections were not even addressed by the students at all. These findings indicate the students do not have sufficient knowledge and thus, they are not aware of possible risks they can encounter. According to the study results of Demir, 70.1% of the university students did not find their knowledge in this field sufficient (Demir, 2014). The students suggest education is required in this field (Demir, 2014; Pınar et al., 2009).

Another finding of our study is that attitudes towards social gender continue to be valid although the study was conducted at higher education level. While 61.1% of the students found premarital sex acceptable, only 29.9% of them reported they would find women engaging in premarital sex acceptable. The results of the studies conducted by Demir in 2006 in the Central Anatolia Region and by Yıldırım in 2008 in the Thrace region show similarity to our study results (Demir, 2014; Yıldırım, 2008).

Considering sexual attitudes of the students by gender, women exhibited a more conservative attitude than men as expected. Similarly, all the students who do not have active sex life are more conservative compared to others. However, on both conditions, not difference was obtained between attitudes towards their own homosexuality (t=-2.0; p>0.05 by gender, t=-1.9; p>0.05 by active sex life). In other words, while male students and students with active sex life exhibited a more liberal attitude in all areas, they are conservative about their own homosexuality. This similarity is believed to be expected by the fact that a large majority of the students who reported to have active sex life are male. This finding of our study is parallel to the study results that homophobia level is associated with gender and men generally show a more negative attitude towards homosexuality (Gill et al., 2006; Şah, 2011).
When Tables 3, 4 and 5 are evaluated together, attitudes of the students towards their own homosexuality are more conservative than other areas. Considering all the subscale scores of the questionnaire, it can be observed that the students obtained the lowest score in the subscale of their

attitudes toward homosexuality. The study conducted by Sah reviewed into social representations related to sexual orientation of young people in Turkey and demonstrated, when homosexuality representations and representations related to the homosexual individual are evaluated together, negative content representations were more widespread, powerful and rooter compared to positive ones (Şah, 2011). A study conducted by Sarac at a different university in our country demonstrated moderately negative attitude by both males and females towards homosexuality (Saraç, 2014). This is coherent with the fact that they live in a society where heterosexuality is considered to be only normal and proper sexual orientation. Heterosexuality is an attitude supported by Turkish society and heterosexual men are expected to exhibit masculine social gender roles (Duyan et al., 2005). University students do not go beyond social norms although they are aware of social taboos (Civil et al., 2010). Besides all these factors, insufficient and faulty information about sexuality is also known to be associated with the negative attitude towards homosexuality (McKelvey et al., 1999).

Another condition which might have an effect on this result is that sports area is a structure which includes components associated with men by the society including competitiveness, achievement, dominance, assertiveness, endurance to pain and physical strength (Bulgu, 2012). Studies in different cultures also demonstrate negative attitude by athletes towards homosexuality (Gill et al., 2006; Southall et al., 2009).

When students' attitudes towards their own sexuality is compared to their attitudes towards sexuality of others, there is a difference between students' attitudes towards their homosexuality and commercial sex ($t=-.00$; $p<0.01$) and towards homosexuality and commercial sex of others ($t=-.00$; $p<0.01$). This can be construed as when it is only about commercial sex and homosexuality, they distinguish their own sexuality and sexuality of others. They exhibit a more conservative attitude for themselves and a more liberal attitude for others.

CONCLUSION

The study demonstrates that students' sources of information about sexuality are largely informal, they do not have sufficient information about sexually transmitted diseases, female students exhibit a more conservative attitude, students have a more conservative attitude towards homosexuality compared to other sexual attitude areas and their attitudes for themselves and for others differ in terms of homosexuality and commercial sex. This study demonstrates that students need more accountable information sources and their sexual attitude can be considered at a conservative level; therefore initiatives are recommended to ensure students have access to formal and more accountable information.

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Comparison of cardiopulmonary resuscitation skills of physically active and inactive university students

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Abstract

Sudden cardiac arrest is one of the life threatening conditions, and if not treated immediately and effectively death will occur within minutes. Cardiopulmonary resuscitation (CPR) is the most effective way to save lives of cardiac arrest patients. Studies showed a correlation between physical fitness and quality of CPR. The aim of this study is to compare the CPR skills of female and male physically active (PA) and physically inactive (PIA) undergraduate students. Of the 120 undergraduate students, 37.5% were physically active and 62.5% were physically inactive. The participants' mean age was 21.40±2.02 years. In order to identify physically active and physically inactive students, they were asked about their physical activity participation. Data on students' CPR performance were collected via Laerdal Resusci Anne SkillReporter™ manikin. During the data collection (after training), each student was instructed to perform 10 sets of CPR in an isolated laboratory environment. Training included standard CPR content for the all the participants. The results of this study showed that the physically active participants performed better CPR ventilation and compression skills than physically inactive participants did. Physically active female and male participants achieved a higher mean percentage of correct ventilations and chest compressions. In conclusion, the findings suggest that physical activity positively correlated with CPR quality.

Keywords: Physical education, PE major, physical activity, first aid, CPR

INTRODUCTION

The Physical Education (PE) Teacher Education Program in Turkey consists of various compulsory and elective courses. Health Education and First Aid course is one of these compulsory courses. The aim of this course is to provide PE teacher candidates with the necessary knowledge and skills to save lives of their students and all other individuals in the society (Council of Higher Education [CoHE], 2007).

Cardiopulmonary Resuscitation (CPR) is one of the most important and essential lifesaving first aid skills for patients with sudden cardiac arrest (abrupt loss of heart function) (Lloyd-Jones et al., 2010; McKenna & Glendon, 1985). Although the precise causes of cardiac arrest may vary, circulatory disorders are the leading cause of mortality and causing nearly 40% of the total annual deaths in Turkey (Turkish Statistical Institute [TUIK], 2013a). In addition, according to The AHA (2013) data, 382.800 cardiac arrest cases occurred in 2012 in The United States. Road traffic accidents also lead cause of death in Turkey, resulting in more than 1200.000 accidents and 3.500 deaths annually at the site of the accident (TUIK, 2013b). Natural disasters, such as earthquakes (26.973 earthquakes in 2012), are also potentially life threatening events (Disaster and Emergency Management Presidency [AFAD], 2013). Many examples may be cited, but it is well known that life-threatening conditions are mostly unexpected, and they can occur at any time and in any place. Delivery of effective CPR by well-equipped bystander is critical until ambulance service arrives to the scene (McKenna & Glendon, 1985; Nolan et al., 2010). It is, therefore, essential to increase the number of people who are trained in CPR in the society.

Since high quality CPR is directly related to the survival of the casualty, studies focused on the identification of possible factors that have positive and negative effects on CPR performance (Field et al., 2010). Rescuer's fatigue is stated to be one of the main causes of ineffective CPR, since it is reported as a primarily aerobic effort (Van Hoeyweghen et al., 1991). In addition, research findings have indicated that physical fitness is necessary to perform high quality CPR, especially during long periods of time (McKenna & Glendon, 1985; Lucia et al., 1999; Ock et al., 2011; Ochoa et al., 1998). Considering the long ambulance response time, physically capable first aiders may provide greater benefit to cardiac arrest patients (Zenginol et al., 2011; Pierce et al., 1992).

Studies have noted that physical education and sports majors participate in regular physical activity and sports and they have a good level of physical fitness (Bozkuş et al., 2013; Petersen et al., 2003). In addition, each physical education major candidate is required to pass Special Talent Exam that consists of different skill testing stations (Yaprak & Durgun, 2009). Furthermore, it was thought that the physically active participants, as being physical education majors, would already have one of the important elements of high quality CPR. Accordingly, this study aims to determine whether there are differences between physically active and inactive university students on the CPR skills.

METHOD

Subjects

Participants of the study were physically active (PA) physical education majors (n_{female}= 20, n_{male}= 25) and physically inactive (PIA) university students (n_{female}= 42, n_{male}= 33) taking First Aid as an elective course. The average age of participants was 21.40±2.02 ($\bar{x}_{female}$= 20.95±1.67, $\bar{x}_{male}$=21.87±2.25). Participants were asked to self-report their sex, age and perception of their own physical activity

condition (being a PA or PIA). All participants were informed about the study and were asked to voluntarily participate in the study.

Data Collection Procedures

Physically active group consisted of physical education teacher candidates taking compulsory Health Education and First Aid Course during their freshman level; the physically inactive group were 2nd year students (sophomores) enrolled in an elective undergraduate First Aid Course at the Department of Physical Education. Participants had similar task-related characteristics and had no previous knowledge and skill of CPR. Therefore, participants were not given any test to determine their CPR knowledge and skill level before training. The standard CPR, as a one of the units of these two courses, provided for physically active and inactive participants. The unit included both theoretical and hands-on practice sessions. On completion of the basic CPR unit, participants were tested individually for their CPR performance.

Within the context of the test, each participant required to perform the task alone in an isolated laboratory environment; and asked to perform 10 sets of CPR (1 set= 30 chest compressions, 2 ventilations). Data related to CPR skills were collected using a Laerdal Resusci Anne SkillReporter™ manikin. Manikin focuses on students' CPR performance through printed quantitative reports on ventilation (average volume of ventilations, number of correct ventilations, number of too much ventilations, etc.) and compression (average depth of compressions, number of correct compressions, number of too deep compressions, etc.) skills.

Data Analysis

A two-way between-groups analysis of variance was conducted to compare the interaction between sex of the participant and physical condition on the CPR ventilation and compression skills. The sex of the participants included two levels (female, male) and physical condition consisted of two levels (PA, PIA). Data were analyzed using SPSS version 16.0 software.

RESULTS

A two-way between-groups analysis of variance was conducted to explore the impact of sex (female, male) and groups (physically active, physically inactive) on ventilation skills. The main effects were ignored if the interaction effect was significant. There was a statistically significant interaction effect between the sex of the participants and the participants' physical condition on the number of correct ventilations [$F(1,116)= 5.58$, $p= .02$] (Table 1). Simple main effects analysis showed that both physically active female ($\bar{x}_{PA}= 11.7\pm4.41$) [$F(1, 116)= 26.36$, $p< .001$] and male participants ($\bar{x}_{PA}= 15\pm3.3$) [$F(1, 116)= 74.74$, $p< .001$] performed significantly more correct ventilations compared to physically inactive female ($\bar{x}_{PIA}= 5.9\pm4.3$) and male participants ($\bar{x}_{PIA}= 5.3\pm4.4$). Similarly, the statistically significant interaction effect was found between the sex of the participants and the participants' physical condition on the percent of correct ventilations [$F(1,116)= 6.2$, $p= .01$] (Table 1). The simple main effects analyses demonstrated that physically active female [$F(1, 116)= 19.71$, $p< .001$] ($\bar{x}_{PA}= 58.1\pm20.3$) and male participants [$F(1, 116)= 65.80$, $p< .001$] ($\bar{x}_{PA}= 73.0\pm14.5$) performed higher percentage of correct ventilations than physically inactive female ($\bar{x}_{PIA}= 33.2\pm23.2$) and male participants ($\bar{x}_{PIA}= 28.7\pm21.0$) (Table 1). In addition, analysis showed that the main effect of groups on number of too much [$F(1,116)= 12.94$, $p= .001$]; and too little ventilations [$F(1,116)= .95$, $p= .33$] was statistically significant. Participants in physically active group ($\bar{x}= 1.67\pm2.45$) performed fewer number of too little ventilations than participants in physically inactive group ($\bar{x}_{PIA}= 4.43\pm4.48$). No

interaction and main effects of sex and groups on average volume of ventilations, minute volume of ventilations, and number of too fast ventilations was found, $p>.05$.

Table 1. Means and standard deviations for the ventilation skills of participants

		Groups					
		Physically Active Group			Physically Inactive Group		
Ventilation skills	Sex	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
Average volume (ml)	Female	20	642.5	790	42	658.5	275.0
	Male	25	688.5	75.5	33	751.0	241.5
Minute volume (ml/min)	Female	20	2515.0	687.4	42	2417.6	1390.0
	Male	25	2655.2	437.6	33	3646.3	5246.7
Number correct (#) [a,c]	Female	20	11.7	4.41	42	5.9	4.3
	Male	25	15.0	3.3	33	5.3	4.4
Percent correct (%) [a,c]	Female	20	58.1	20.3	42	33.2	23.2
	Male	25	73.0	14.5	33	28.7	21.0
Too little (#) [a]	Female	20	3.00	3.06	42	4.65	4.50
	Male	25	.60	.96	33	4.15	4.50
Too much (#) [a]	Female	20	2.25	2.22	42	5.02	5.88
	Male	25	2.24	2.63	33	6.64	5.71
Too fast (#)	Female	20	4.40	4.44	42	3.81	5.50
	Male	25	3.72	1.97	33	6.24	6.49

[a] Groups main effect, [b] Sex main effect, [c] Groups X Sex interaction effect

A two-way ANOVA was conducted to explore the impact of sex and physical condition groups on chest compression skills; and the main effects were ignored if the interaction effect was significant. Analysis showed a significant interaction between the sex and physical condition of the participant on the average depth of the compressions [$F(1,116)= 5.69$, $p= .02$] and number of too shallow compressions [$F(1,116)= 4.36$, $p= .04$]. Simple main effects analysis showed that the difference between physically active and inactive female [$F(1, 116)= 66.57$, $p< .001$] and male participants [$F(1, 116)= 24.44$, $p< .001$]. Both physically active female ($\bar{x}= 52.25\pm2.88$) and male participants ($\bar{x}= 53.68\pm1.95$) performed closer to the required compression depth (at least 5 cm) compared to the physically inactive female ($\bar{x}= 34.86\pm9.37$) and male participants ($\bar{x}= 43.39\pm10.15$). Accordingly, simple main effects showed that the physical condition was significant for both female [$F(1, 116)= 104.49$, $p< .001$] and male participants [$F(1, 116)= 56.00$, $p< .001$]. Physically active female ($\bar{x}=50.05 \pm46.30$) and male participants ($\bar{x}= 23.68\pm17.79$) performed fewer number of shallow chest compressions compared to physically inactive female ($\bar{x}= 265.86\pm66.50$) and males ($\bar{x}= 177.88\pm121.30$). An analysis resulted in a significant main effect of physical condition on the number [$F(1,116)= 555.16$, $p= .00$] and percent of correct chest compressions [$F(1,116)= 581.85$, $p= .00$]; also analysis resulted in significant main effect of sex on a number [$F(1,116)= 14.43$, $p= .00$] and percent of correct chest compressions [$F(1,116)= 12.00$, $p= .00$]. Physically active female ($\bar{x}= 217.65\pm57.82$) and male participants ($\bar{x}= 259.84\pm35.47$) performed greater number of correct chest compressions compared to physically inactive female ($\bar{x}= 10.60\pm24.45$) and males ($\bar{x}= 37.61\pm68.24$); similarly physically active female ($\bar{x}= 71.80\pm17.36$) and male participants ($\bar{x}= 82.72\pm11.53$) performed greater percent of correct chest compressions compared to physically inactive female ($\bar{x}= 3.27\pm7.57$) and males ($\bar{x}= 12.30\pm21.97$).

Table 2. Means and standard deviations for the compression skills of participants

		Groups					
		Physically Active Group			Physically Inactive Group		
Compression skills	Sex	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*
Average depth (mm) [a,b,c]	Female	20	52.25	2.88	42	34.86	9.37
	Male	25	53.68	1.95	33	43.39	10.15
Average number per min (#/min)	Female	20	64.60	15.46	42	71.52	15.71
	Male	25	65.72	10.37	33	87.55	110.91
Average compression rate (#/min)	Female	20	116.80	32.16	42	129.12	23.17
	Male	25	115.36	24.01	33	118.94	25.59
Total number (#) [b]	Female	20	291.35	51.57	42	294.71	38.43
	Male	25	313.44	24.33	33	302.45	23.70
Number correct (#) [a,b]	Female	20	217.65	57.82	42	10.60	24.45
	Male	25	259.84	35.47	33	37.61	68.24
Percent correct (%) [a,b]	Female	20	71.80	17.36	42	3.27	7.57
	Male	25	82.72	11.53	33	12.30	21.97
Too deep (#)	Female	20	0	0	42	0	0
	Male	25	0	0	33	0	0
Too shallow (#) [a,b,c]	Female	20	50.05	46.30	42	265.86	66.50
	Male	25	23.68	17.79	33	177.88	121.30

[a] Groups main effect, [b] Sex main effect, [c] Groups X Sex interaction effect

DISCUSSION

The aim of the study was to examine whether physically active female and male participants perform better CPR ventilation and compression skills than the physically inactive participants do. In line with the bystander CPR literature, findings from the current study are significant in that physically active participants performed better CPR ventilation and compression skills compared to physically inactive participants (Baubin et al., 1996; Berrones, 2010). These findings suggest that the physically active female and male individuals are more likely to perform high quality of CPR. Studies that have examined the association between physical activity and CPR have reported that physical exertion during implementation of CPR similar to the exertion during high intensity exercises (Badaki-Makun et al., 2013). In their preliminary work on the CPR and exercise relationship Van Hoeyweghen et al. (1991) investigated cardiovascular and ventilatory parameters during 40 min CPR, and concluded that CPR was a mainly aerobic effort. In an analysis of rescuers work capacity and CPR performance Baubin et al. (1996) have found that physical stress occurring during implementation of CPR is associated with the rescuer's work capacity. Their findings suggest that rescuer's work capacity and physical fitness should be improved by implementing regular aerobic exercises. In another study, Bridgewater et al. (2008) examined the ambulance crew's 10 min CPR performance and physical fitness level. The results of this study indicated that the implementation of 10 min CPR necessitates a superior physical effort, and 73% of the study participants described the test as being moderate- to vigorous-intensity and 27% being high-level intensity. A study conducted by Hansen et al. (2012) investigated whether physical fitness levels and chest compression performance of healthcare professionals are correlated. Their research identified ventilatory threshold as the important determinant of quality chest compressions for first 5 min, and maximal muscle strength for latter 5 min. Like other studies, their findings suggest that healthcare professionals, who give aid at emergencies and have a legal duty to give CPR, need to be physically well prepared to save lives of victims of cardiac arrest (Ock et al., 2011). Other researchers have found similar results for

relationship between rescuers' fitness level and CPR performance quality. A study of medical students experienced in CPR from Korea showed that muscle strength correlated significantly with quality chest compressions during 5 min chest compressions (Ock et al., 2011). Russo et al. (2011) showed that the higher levels of physical fitness and Body Mass Index are positively correlated with high quality chest compressions. The findings of the current study are also in agreement with Berrones's (2010) findings, which showed that aerobic fitness, and muscular endurance positively affects resuscitation efforts. There are also similarities between the better CPR ventilation and compression skills in the current study and those described by Lucia et al. (1999). Researchers compared the CPR performance of physically fit adults and healthcare professionals, and found no significant difference between their CPR performances. The evidence from their study Lucia et al. (1999) suggested CPR providers to participate in light to moderate aerobic exercise to perform CPR effectively.

Effective chest compression is one of the determinants of blood flow to vital organs during cardiac arrest (Rajab et al., 2011; Abella et al., 2005). European Resuscitation Council (ERC) guidelines for resuscitation recommend that CPR providers should implement at least 5 cm (but not exceeding 6 cm) deep chest compressions (Nolan et al., 2010). The findings observed in the present study showed both female and male physically active participants achieved the suggested compression depth of 5 cm; but physically inactive male and male participants performed compression depth below 5 cm. These results may be explained by the fact that physical activity positively affects chest compression quality. This finding is in agreement with Ock et al.'s (2011) findings, which showed the positive effects of physical fitness, especially muscular strength, on chest compression quality.

Although 2010 guidelines let first responders to apply chest compression only CPR, research evidence suggests that conventional CPR (combination of mouth-to-mouth ventilation and chest compression) more effective on survival rates of cardiac arrest patients, Therefore, the first responder plays key role in providing effective ventilations as well as chest compressions (Kitamura et al., 2010). The current study's findings related to ventilations revealed that both physically active female and male participants performed better ventilation skills compared to female and male physically inactive participants. Similarly, in their study Lucia et al. (1999) stressed the importance of physical fitness in the ventilation and chest compression skills for the survival of the cardiac arrest patients.

CONCLUSION

In conclusion, this study showed that physically active female and male participants performed CPR significantly better than physically inactive female and male participants did. This study revealed that, although it was unintentional, physical education and sports departments train their students as first responders who are successful and physically capable of saving lives of cardiac arrest patients. While physical education majors' actual level of physical activity (or level of physical fitness) was not measured, it could make a difference in terms of CPR performance. In agreement with previous studies, this study's findings strongly suggest a potential value in participating in regular physical activity and sports for individuals to achieve good quality CPR when needed. Future studies are needed to further investigate the association of CPR performance with different parameters of physical fitness.

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Investigating the relationship between football coaches' humor styles and their perceived stress levels

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Abstract

This study aimed to investigate the relationship between football coaches' humor styles and their perceived stress.
In order to realize this aim, 10-item "Perceived Stress Scale" developed by Cohen et. al (1983) and "Humor Styles Questionnaire" developed by Martin and Puhlik-Doris (1999) to measure four different styles of humor were used. "Humor Styles Questionnaire" was first developed with 60 items which were reduced to 32 following a revision by Martin, Puhlik-Doris, Larsen, Gray and Weir (2003),
Sampling group for the study was composed of 451 coaches who were randomly selected from among TUFAD Ankara Branch coaches.
Statistical analysis of the research data was undertaken in 4 steps. Firstly, frequencies and average values were used to determine participants' descriptive statistics. Secondly, one sample Kolmogorov-Smirnov test was utilized to determine whether data collection tools presented normal distribution. Test results showed normal distribution in sub dimensions ($p>0,05$). Regression analysis and Two-Way MANOVA tests were used to identify linear relationships for sub dimensions and for multiple comparisons respectively.
Results showed that compared to other individuals, football coaches had different humor styles in sports environments and used aggressive and self-defeating humor parallel to increases in age.

Keywords: Football coach, humor style, stress level

INTRODUCTION

Humor is the most important origin of ecstatic actions for individuals in stressful and constrained moments caused by many negative environmental and psychological factors in daily life (Shammi & Stuss, 1999) Humor which is defined as "the quality of an action, speech or writing that evokes feelings of fun, eccentricity, funniness or joy" as well as "the skill of perceiving things that are amusing or fun or the skill of expressing amusing or fun things through writing, speech or work of art" is an phenomenon that increases psychological or physical well being, cultivates social relationships, reduces job related stress and extricates positive characteristics of individuals such as optimism, self-acceptance, self-confidence and autonomy (Yerliyaka, 2009; Ilhan, 2005; Bennett & Lengacher,2006; Ozdemir et al.,2011) Today, individuals with a sense of humor are believed to have some positive characteristics (Yerlikaya, 2007). Some studies have presented the importance of humor in terms of life satisfaction, in reducing loneliness, stress, anxiety and burnout and in developing social relationships (Ilhan, 2005; Bennett & Lengacher, 2006; Yerlikaya, 2007; Chen & Martin, 2007; Cann et al., 2008; Durmus & Tezer, 2001; Kazarian et al., 2004; Tumkaya, 2008). Individuals with a high sense of humor have been identified to have some positive characteristics such as optimism, self-acceptance, self-confidence, autonomy and ability to communicate effectively (Tras et al., 2011; Tumkaya, 2006; Chauvet & Hofmeyer, 2007). Stress, which is believed to be associated with the sense of humor in literature and generally regarded as an unfavorable and unwanted condition is found in the individuals employed in lines of work that involves high level of hardships such as education, health and sports although it generally is not distinguished based on time, place or line of work. Research has shown that stress consists of perceiving an extreme or unfamiliar external stimulus as threatening or dangerous and it is related to faulty attitudes and behaviors such as inadequate communication, psychological pressures, competition and exclusion (Yerliyaka, 2009; Arslan, 2007; Duda, 2003; Sar and Sayar, 2012). Another point made by the researchers is the fact that stress can be a long-term impact caused by economic problems, unwillingness, discipline problems, low performance and fear of failure in courses when appropriate coping skills are not used. In this sense, student perceptions regarding the situation and their efforts to cope with it are rather crucial in cases where having academic skills is not enough.

In order to generate data to contribute to the efforts to regulate educators' attitudes and approaches in line with the concepts cited above, this study was planned to present football coaches' humor styles and their levels of coping with stress. Previous studies have shown that sense of humor plays an important role in coping with various negative factors. It is also known that use of humor is one of the methods to cope with stress. However, since studies related to whether humor styles affect stress and which type of humor style generates more stress in football coaches are insufficient in Turkish literature, current study chose to focus on these issues.

This study set out to examine football coaches' humor styles and stress coping levels based on age, certification and seniority variables. In the context of this aim, answers to the following hypotheses were sought:

Hypothesis 1: There is a statistically positive and significant relationship between football coaches' humor styles and the methods they use for coping with stress based on age.

Hypothesis 2: There is a statistically positive and significant relationship between football coaches' humor styles and the methods they use for coping with stress based on certification.

Hypothesis 3: There is a statistically positive and significant relationship between football coaches' humor styles and the methods they use for coping with stress based on seniority.

METHOD

This section includes the universe and sample of the study, data collection tools, data collection, data analysis, methods and techniques and data interpretation.

Research Model

Quantitative research design was used in the study. The study utilized the general survey model since this model is used to perform a survey on the general universe or a sample of the universe in order o arrive at a general conclusion about the universe composed of many elements. In addition, the study utilized relational screening model since it focused on determining the relationships between the variables (Kalayci, 2009).

Study Group

500 voluntary active football coaches randomly selected from TÜFAD Ankara Branch during 2015-2016 season participated in the study. The study was planned to be conducted with the participation of 500 football coaches, however, 49 coaches were excluded from the study due to questionnaires that were missing or erroneous.

Based on the numbers for the universe, a specific number of primary schools were selected randomly to determine the sample size and the ample group was generated (Kalayci, 2009).

Table 1. Distribution of Personal Information for the Study Group

Factor	Variable	F	%
Age	18-29	253	56,10
	30-39	167	37,00
	40 and higher	31	6,90
	Total	451	100,00
Certification	Goalkeeper	94	20,80
	A	80	17,70
	B	88	19,50
	C	189	41,90
	Total	451	100,00
Experience	5 years or less	156	34,60
	6 years or more	295	65,40
	Total	451	100,00

Table 1 presents the distribution of personal information for the coaches who participated in the study. According to the data, 56,10% of the participants were in the age range of "18-29" (N=253), 37,0% were in the age range of "30,39" (N=167) and 6,90% were in the age range of 40 an higher. The study used two intervals for seniority. Examination of the categories of experience for participants showed that 34,60% worked as coaches for "5 years or less" (N=156) and 65,40% (N=295) worked as coaches for 6 years or more. Certification category showed that 41,90% had C category certification (N=189) and 17,70% (N=80) had A.

Data Collection Tools

The questionnaire given to participants in the framework of the study consisted of two parts. The first part of the questionnaire included 3 questions related to age, certification and seniority along with Humor Styles Questionnaire, while the second part included Perceived Stress Scale.

Humor Styles Questionnaire

The questionnaire developed by Martin et. al. (2003) to measure individual differences in the use of humor in everyday life was adapted to Turkish by Yerlikaya (2003) the questionnaire with 30 items has four sub scales, two positive and two negative, that aim to measure four different styles of humor. These sub scales are: Affiliative humor, Self-enhancing humor, Aggressive humor and Self-defeating humor. Each of the subscales using a 7-point Likert type ranking between "Completely Disagree" and "Completely Agree" has 8 items and there are eleven items that are scored in reverse. Items 1-7-9- 15-16-17-22-23-25-29-31 are scored in reverse in the questionnaire with a total of 32 items (Martin et al., 2003) Therefore, the lowest and highest scores that can be obtained form each subscale changes between 7 and 56. High scores from subscales point to the frequency of use in the related style of humor. Cronbach Alpha internal consistency coefficients for the scale are as follows: Affiliative humor, .73, Self-enhancing humor, .69, Aggressive humor .71 and Self-defeating humor.70. Time-dependent invariance of subscales were found as .84, .80, .82, .80 respectively.

Perceived Stress Scale

The scale was developed by Cohen et. al. in 1983, Erci provided the reliability and validity studies of the scale in 2006 and Yerlikaya (2003) adapted the scale into Turkish (Cohen et al., 1983; Erci; 2006). the scale is composed of 10 items which is scored as 1,2,3,4,5 in turn. Four of the items in the scale are scored as positive (4.5.7.8) and six as negative (1.2.3.6.9.10). The scale is assessed by its total score and the scores are between 10 and 50. Higher scores point to higher stress levels. Score of 30 and higher show that the individual is stressed. This scale, which is often used in studies that examine the relationships between sense of humor and stress, asks participants to rate the frequency of specific feelings they have experienced in the last month between 0 (none at all) and 5 (very frequently). The scores obtained from the items are added to identify perceived stress level of the participant and higher scores point to higher stress levels. Cronbach Alpha internal consistency coefficient of the scale was found to be .74, and test-retest reliability coefficient calculated as a result of two measurements given with a gap of two days was .80.

Data Analysis

SPSS 21,0 statistical package program was used in data analysis and in calculations. Statistical analysis of research data was undertaken in four steps. Firstly, frequencies and average values were used to determine participants' descriptive statistics. Secondly, one sample Kolmogorov-Smirnov test was utilized to determine whether data collection tools presented normal distribution. Test results showed normal distribution in sub dimensions ($p>0,05$). Regression analysis and Two-Way MANOVA tests were used to identify linear relationships for sub dimensions and for multiple comparisons respectively.

RESULTS

Table 2. Two-Way MANOVA results of humor styles based on age, certification and seniority

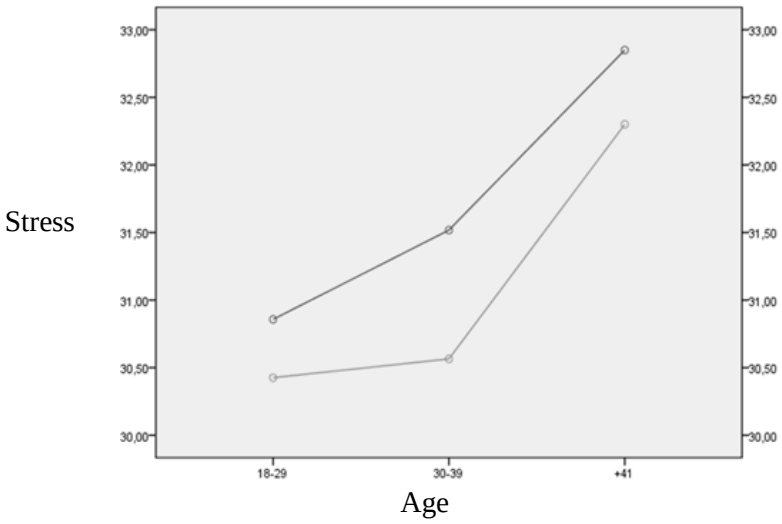
Multiple comparisons	Value	F	Hypothesis sd	Error sd	p	η2
Intercept	0,966	3030,36	4	424	0,00	0,96*
Age	0,947	2,916	8	848	0,00	0,27*
Certification	0,924	2,824	12	1122	0,01	0,26*
Seniority	0,981	2,049	4	424	0,09	0,016
Age* Seniority	0,961	2,136	8	848	0,03	0,20*
Age * Certification	0,937	1,164	24	1480,3	0,27	0,016

According to Two-Way MANOVA results, the effect of age and certification was significant for all subscales of the humor styles questionnaire (λ_{age}=0,96, $F_{age(8)}$=2,916; $\lambda_{certification}$=0,92, $F_{certification(12)}$=2,824, p<0,05). However, seniority had no significant effect on Humor Styles (λ=0,981, $F_{seniority}$(4)=2,049, p>0,05). Partial eta square results showed that age (η2 =0,27) and certification (η2 =0,26) had medium level effect on humor styles based on Wilk's lambda test.

Joint effect of age and certification variables on humor styles was found to be rather low (η2 =0,016).

As can be observed in Graphic 1, coaches with 5 years or less experience had more stress. Although stress seemed to increase by age, the highest level of stress was observed in coaches that were 40 years and older.

Stress levels of coaches with different certification were depicted in above graphics based on their experiences.



Graphic 1. The effect of the variables age and experience on the stress

Table 3. Multiple Linear Regression results for stress predicted by humor styles

Variables	B	Standard Error	β	t	p
(fixed)	34,832	1,539		22,638	.000
Self-defeating humor	-,061	,028	-,101	-2.144	,033*
Aggressive humor	-,159	,023	-,338	-6.838	,000*
Self-enhancing humor	,070	,027	,146	2,590	,010*
Affiliative humor.	,014	,031	,023	,431	,667
R:.422 ;R^2=,179 F:24,227					

*p<0,05

Results of regression analysis showed that humor styles are significant predictors of stress levels (R:0.422 ; R^2=0.17; p<0,05). The most significant predictor among humor styles is aggressive humor ($\beta_{agressivehumor}$:-,338). When aggressive humor levels increase, stress levels significantly decrease. Similarly, increases in self-defeating humor decreases stress levels ($\beta_{selfdefeating}$:-,101).; however increases in self enhancing humor increases stress levels ($\beta_{selfenhancing}$:,146). These four subscales explain 17,9% of the total variance in stress.

RESULTS

The study compared football coaches' perceived stress and their humor styles and examined stress and humor based on different variables. Findings are presented below and supported by literature.

Table 2 shows that the effects of participants' age and seniority status were found to be significant on all subscales of the humor styles questionnaire whereas the effect of seniority was not significant. Partial eta square results showed that age and certification had medium level effect on humor styles based on Wilk's lambda test. However, combined effect of age and certification variables on humor styles was found to be low which means coaches' humor styles were affected by age and certification variables separately but the combined effect of these two variables did not affect humor styles. On the other hand, football coaches' humor styles were bot found to be affected by age at all. Medium level of age and seniority on humor styles may be based on the effect of age by itself on humor styles; an expected outcome since seniority increases by age.

Graphic 1 explains the relationship of age-seniority-stress. Graphic shows that more senior coaches had less stress. However, both seniority variables show increases in stress by age and stress levels of more experienced coaches even present a steep increase in the graphic. First of all, less experienced coaches' efforts to prove themselves, looking for acceptance from others related to their achievements and being less skilled in coping with the variables in the field -compared to more experienced coaches- affect their stress levels in general. In addition, increases in stress by age in both seniority variables may be generated from awareness that new achievements are called for and there is a realization that more innovative things are needed to prove themselves since they think they are at the end of their careers. Also, it is a rather expected result that more experienced coaches feel this type of stress more since they are in this community for many years and their careers are about to end. Future research in the field may focus on studying general moods of coaches and activities that will decrease their stress levels.

In general, successful adaptation and successful coaching is closely related to stress which means success in coaching is an indicator of humor and humor is an indicator of a life without stress.

However, the case of a coach without any stress should be studies to observe whether this is caused by success or by other reasons. There is a fact we definitely know and it is that a life without any stress cannot explain humor in full. Based on the first conceptualizations that are widely accepted, humor is related to meanings associated with life and events by the individual. Stress levels of coaches can be affected by many factors in sports environments but coping with stress through humor is an important weapon for the coaches who can manage to do this. In this sense, excluding coaches via aggressive humor and exposing them to defame and disgrace damage their authority and may cause lack of ability to fulfill their roles in their clubs. Sportsmen may also be negatively affected in this process. In addition, other expected results can be decreases in interest and commitment towards the club, losing the feelings of responsibility, lack of communication and decreases in job satisfaction. In this context, whatever the level is, stress caused by aggressive humor, generate negative impact on interpersonal relationships (Recepoglu et al., 2011; Tumkaya et al., 2008). As can be observed in Table 3, stress levels of coaches who utilize aggressive humor may decrease since they may be using aggressive humor towards the sportsmen and therefore decrease their own stress levels. Results of some studies in literature are similar to the results in the current study. For instance, in their study with 442 students attending Faculty of Education, Tras et. al. (2011) found a positive relationship between self respect and self-enhancing humor and affiliative humor whereas they pointed to a negative relationship between aggressive humor and self-defeating humor. They stated that increases in problem solving skills generated increases in self respect, hence pointing to a linear relationship between problem solving skills and humor styles. In addition, in their study on primary school teachers, Ozdemir et. al. (2011) showed that teachers with affiliative and self-enhancing humor styles used better skills in coping with stress. In another study, Kuiper et. al. (2004) examined university students' sense of humor and psychological well beings and found that affiliative and self-enhancing humor styles had negative relationships with depression and anxiety, that aggressive humor styles had no significant relationships with depression and anxiety and that self-defeating humor had positive relationships with depression and anxiety (Tazegul;2012). Yerlikaya's (2009) study with university students from different departments found negative and significant relationships between aggressive humor and perceived stress and results of this study are similar to the results in the current study. Different results obtained in the current study in general can be explained with the fact that coaches that work in sports environments with busy schedules use humor differently.

Data support that sports is a humor style by itself and affects perceived stress, supports positive personality development and allows individuals to be more assertive and extroverted (Akadandere et al., 2015; Ikizler, 2002; Tepekoylu, 2009; Uzum, 2010). In a study that compared strategies used to cope with stress in individual and team sports, Ceylan (2005) did not found a significant finding (Ceylan, 2005). According to Turkcapar's (2007) research data, there were no significant differences between total stress scores and social environments and most favorite pastime activity of the students in School of Physical Education and Sports and classroom teaching departments. This result may be related to the fact that sportsmen in individual sports branches know that in case of failure they will receive all the criticisms and therefore they can be better prepared beforehand to cope with any situations that may cause stress and failure whereas errors and failure in team sports are shared by the whole team (Kuiper et al., 2004). Since no differences detected in terms of sports branch, it is believed that individual or team sports do not affect humor styles or stress and the most important concept here is to do sports. It can be claimed that no sport branch will generate a difference in humor styles or stress. However, the case of coaches is not the same with the case of doing sports, since they do not actively do sports but direct and manage the individuals who do sports. The fact that there are differences between the humor styles of the sportsmen and the coaches is a normal outcome.

As a results, it was found that football coaches have humor styles that are different than the other individuals in sports environments and by age, they tend to use more aggressive and self defeating humor styles.

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Pedobarographic differences between female soccer players and sedanteries during barefoot walking and bilateral stance

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Abstract

The athletic function of the foot is also extremely important in soccer and constantly exposed to the full impact of weight bearing, because it plays a vital role as a contact point with the ground, absorbing abnormal forces, and main area of the body to kick the ball. The purpose of this study was to compare female soccer players and sedentary individuals in terms of plantar pressure distribution while walking and bilateral standing with barefoot. Eleven female soccer players (21.44±2.12 years, 162.25±5.77 cm, 53.12±6.01 kg, BMI=20.23±1.52 kg/m2, Experience=5.98±0.78 years) and 14 sedentary individuals (23.38±5.79 years, 164.92±5.88 cm, 56.31±6.56 kg, BMI=20.67±1.78 kg/m2) participated in this study. Participants performed self-paced walking and 30 seconds bilateral standing on a 1.5-meter walking platform with barefoot. Each footprint was divided into 12 areas as total foot, hindfoot, midfoot, forefoot, 1st metatarsal, 2nd metatarsal, 3rd metatarsal, 4th metatarsal and 5th metatarsal, big toe, second toes and toes 3-4-5. Maximum force [MF (N)], peak pressure [PP (kPa)], contact area [CA(cm2)], mean pressure [MP (kPa)] and maximum force normalized to body weight [MFNBW (N)] plantar pressure values were analyzed with Mann-Whitney-U test. Results indicated that sedentary group showed significantly higher CA in the forefoot, 3rd and 4th metatarsals; MF in 4th and 5th metatarsals; MP in 5th metatarsal, $p<0.05$. On the other hand, soccer players demonstrated significantly higher MP in the forefoot, 2nd and 3rd metatarsals and PP in 2nd and 3rd metatarsals, $p<0.05$. This study indicates that soccer players and physically inactive sedentary individuals demonstrate different plantar pressure patterns during gait and bilateral stance. Coaches and athletic trainers should consider these different patterns while planning intervention protocols.

Keywords: Pedobarography, plantar pressure, soccer, female athletes

INTRODUCTION

The foot is constantly exposed to full impact of weight bearing, because it plays vital role as contact point with ground, absorbing abnormal forces, and main area of body to kick the ball in soccer (Ozer et al., 2012). The athletic function of the foot is also extremely important as it is important to maintain posture and balance during walking, running, and movements related to agility and jumping. It has been previously reported that most of the injuries on the foot are associated with repeated, excessive plantar pressure (Mueller, 1995). Foot injuries represented between 6 -7 % of in game injuries among soccer players (Hawkins et al., 2011; Junge et al., 2012) and Sobhani et al., (2012) indicated that soccer is most commonly researched sport in terms of foot injuries. While it may be expected that athletes who participate in regular soccer exercises would enhance foot function in athletic tasks, overuse of foot and configuration of the soccer footwear are the two main reasons causing non-contact foot injuries.

Knowles et al. (2006) and Philips (2000) emphasized that exposure of force per hour or minute is the most appropriate method to express the incidence rate of injuries. Therefore, undergoing extremities to forces repetitively may lead to overuse injuries. The most prevalent foot injuries related to overuse are Achilles tendon pathology and stress fractures of the foot (Paavola et al., 2002). To illustrate fifth metatarsal fractures in soccer was associated with overuse (Shuen et al., 2009). Moreover, Eils et al. (2004) indicated that soccer specific movements lead to loading forces to heel region of the foot. Nunns et al. (2016) suggested that these injuries caused by repetitive forces in soccer may lead to temporary weakening of the structure of foot. Thus, injuries related to overuse of foot might affect the daily life and sport performance of athletes.

Biomechanical researches focused on (I) various footwear (Bentley et al., 2011; Carl et al., 2014; Urabe et al., 2014) (II) shoe inserts (Nunns et al., 2016) and (III) soccer-related movements with various footwear (Girard et al., 2011; Wong et al., 2007) to prevention of foot injuries (Jordan & Barlett, 1995). Diversities in shape, materials and thickness of insoles of soccer footwear may lead to change in plantar pressure distributions and this is especially important to reduce excessive loads on foot during athletic performance (Santos et al., 2001). Santos et al. (2001) demonstrated that soccer footwear increases lateral forefoot loading comparing to running shoes. Insufficient information on effect of exercises and sport specific footwear does not allow comprehending the effect of these factors on daily routines of athletes. As athletes spend genuine time on practices and games, their foot are expected to be exposed to excessive forces comparing to sedentary individuals. However, there is still lack of study investigating whether regularly participating soccer practices and wearing soccer specific footwear make any difference to individuals' plantar distribution in daily routines such as walking and standing with bare foot compared to sedentary individuals who never experienced soccer practice and footwear. Therefore, the purpose of this study was to compare female soccer players and sedentary individuals in terms of plantar pressure distribution while walking and standing with bare foot to explicate long-term effect of soccer and soccer footwear on daily movements. Based on the literature, we hypothesized that plantar pressure values of the dominant and non-dominant foot would be different in soccer players during walk test and bilateral stance comparing to sedentary individuals in selected areas of foot.

METHOD

Study design

Cross-sectional study design was implemented in this research. Maximum force [MF (N)], peak pressure [PP (kPa)], contact area [CA(cm^2)], mean pressure [MP (kPa)] and maximum force normalized to body weight [MFNBW (N)] plantar pressure values of the dominant and non-dominant foot were dependent variables and being in a soccer group or control was the independent variable of this study. Ethical approval was obtained from Ethical Board Commission of Osman Gazi University (Protocol No.:80558721/175).

Participants of the Study

In total, 25 participants voluntarily completed this study. Soccer group (SG) consisted of 11 female soccer players (21.44±2.12 years, 162.25±5.77 cm, 53.12±6.01 kg, BMI=20.23±1.52 kg/m^2, Experience=5.98±0.78 years). Participants reported that they are completing at least 4 training sessions per week. Moreover, a soccer player who was previously injured in lower extremities (i.e., foot, ankle and knee) was excluded from the study for maintaining internal validity. On the other hand, control group (CG) consisted of 14 sedentary individuals (23.38±5.79 years, 164.92±5.88 cm, 56.31±6.56 kg, BMI=20.67±1.78 kg/m^2). Inclusion criteria for control group were to have physically inactive life style (i.e., <60 mins physical activity per week) and had no athletic background. One of the participants in the control group was excluded from the study because of active life style, reported by International Physical Activity Questionnaire which was found valid and reliable in Turkish language (Saglam et al., 2010). All participants provided informed consent forms. Foot dominance was determined according to kicking feet. Right foot was dominant limb of all participants.

Data Collection Protocol

Measurements were applied in two different conditions (condition I: dynamic walking; condition II: bilateral stance). Participants performed self-paced walking on 1.5-meter walking platform (Emed, Novel GmBH, Germany) with bare foot. Walking protocol consisted of 5 trials (Bosch and Rosenbaum, 2010). Then, participants performed 2 unilateral stances for 30-seconds with 2 minutes resting time between trials (Fernandes et al., 2015). Familiarization protocols were conducted for dynamic walking and static balance tests. Data were collected at 100 Hz sampling frequency. Each foot print was divided into 12 areas as total foot, hindfoot, midfoot, forefoot, 1^{st} metatarsal, 2^{nd} metatarsal, 3^{rd} metatarsal, 4^{th} metatarsal and 5^{th} metatarsal, big toe, second toes and toes 3-4-5 with Multimask software (Novel GmBH, Germany). From each of the observed parts of foot, the following parameters were evaluated (Emed System Manual v.23):

- *Maximum force* [PF(N)] was the peak force on the total foot or region.
- *Peak pressure* [PP(kPa)] was the maximum pressure value on the total foot or region.
- *Contact area* [CA(cm^2)] was the maximum contact area during stance.
- *Mean Pressure* [MP (kPa)] was the ratio of the sum of peak pressures under the sensors to the number of loaded sensors.

Statistical Analyzes

Five trials were averaged automatically by the Emed software for each mask of each foot for dynamic walking test. The data obtained from the second attempt of the static balance stance were used in

statistical analyzes. All dependent variable values (MF, PP, CA, MP, and MFNBW) were recorded separately for each masks and foot. Parameters of the foot geometry were also observed as hallux angles (HA), arch indexes (AI), display of each frame in rollover process (ROP%) and foot lengths (FL).

Mean and standard deviations were calculated for demographic information regarding each of the participants. Before the statistical analysis, all of the measures were found to be distributed non-normally based on the Shapiro-Wilk test. It was examined whether there were any statistically significant differences between the experimental and control groups' means by using Mann Whitney-U test in dynamic walking test and bilateral stance according to distribution of normality. The data were analyzed using SPSS Statistics 20.0 (SPSS, Chicago, IL). In the measurements 95% reliability range and $p<0.05$ were accepted as significance level.

RESULTS

Totally 50 feet of 25 participants were investigated. Twenty-two of the feet belonged to SG and other 28 to CG. Mann Whitney-U test indicated that there were no significant differences in age, weight, height and BMI values between groups ($p>0.05$). Similarly, no significant differences were observed for hallux angles (HA), arch indexes (AI), display of each frame in rollover process (ROP%) and foot lengths (FL) values between groups (Table 1).

Table 1. Female soccer players' and sedentary individuals' demographics of dominant and non-dominant foot

Foot Geometry Parameters	**Non-Dominant Foot**			**Dominant Foot**		
	SG	**CG**	**p**	**SG**	**CG**	**p**
FL	24.59±0.95	25.30±1.37	0.232	24.58±1.06	25.53±1.24	0.088
AI	0.23±0.04	0.22±0.05	1.000	0.22±0.06	0.23±0.03	0.927
HA	4.13±3.14	4.56±3.27	0.784	3.60±2.69	3.94±2.43	0.693
ROP%	94.09±2.21	94.88±2.01	0.343	95.63±2.63	95.06±2.10	0.208

FL: Foot Length (cm); **AI:** Arch Index; **HA:** Hallux Angle (degree); **ROP%**: Rollover Process

Dynamic Walking Test

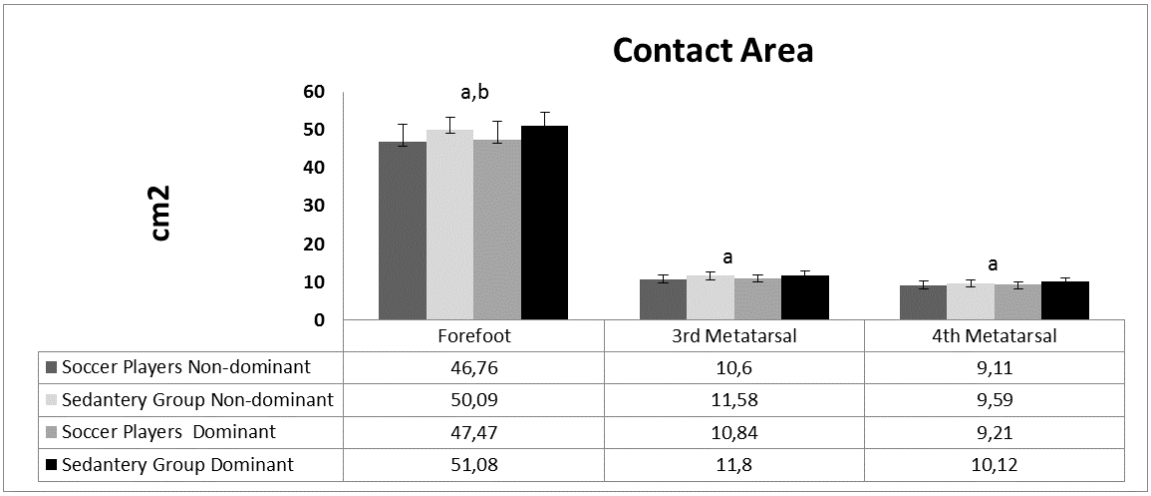
Contact Area

Forefoot:

For fore foot mask, results indicated that CG demonstrated significantly higher CA comparing to SG, in dominant foot [(SG= 47.47±4.75), (CG= 51.08±3.66), p= 0.049] and non-dominant foot [(SG= 46.76±4.77), (CG= 50.09±3.17), p= 0.026].

Metatarsals:

Significant differences were also observed for CA in dominant foot [(SG= 10.84±1.08), (CG= 11.80±1.07), p= 0.042] for 3rd metatarsal mask. Contact Area results were also significantly different between groups for 4th metatarsal mask in dominant foot [(SG= 9.21±0.77), (CG= 10.12±0.88), p= 0.021].



	Forefoot	3rd Metatarsal	4th Metatarsal
Soccer Players Non-dominant	46,76	10,6	9,11
Sedantery Group Non-dominant	50,09	11,58	9,59
Soccer Players Dominant	47,47	10,84	9,21
Sedantery Group Dominant	51,08	11,8	10,12

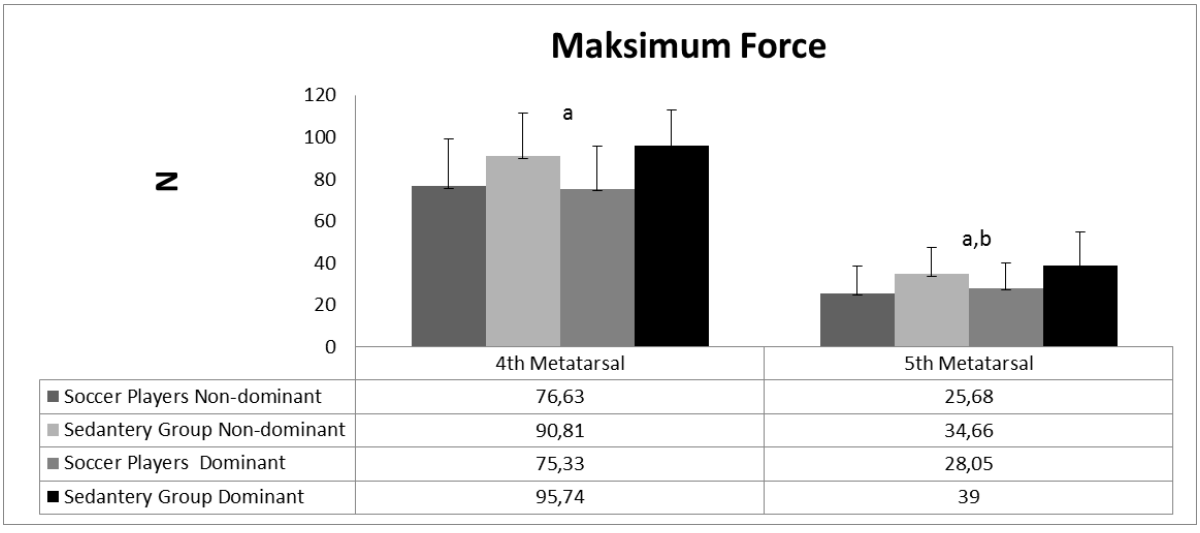
a: Differences between dominant foot of soccer players and control group
b: Differences between non-dominant foot of soccer players and control group
p<0.05

Figure 1. Contact area differences between during walking test

Maximum Force

Metatarsals:

Maximum force [(SG= 75.33±20.56), (CG= 95.74±17.27), p= 0.036] values were significantly different for 4th metatarsal mask in dominant foot. Similarly, CG demonstrated significantly higher MF in both dominant [(SG= 28.05±12.03), (CG= 39.00±16.01), p= 0.036] and non-dominant foot [(SG= 25.68±12.87), (CG= 34.66±12.86), p= 0.012] for 5th metatarsal mask.



	4th Metatarsal	5th Metatarsal
Soccer Players Non-dominant	76,63	25,68
Sedantery Group Non-dominant	90,81	34,66
Soccer Players Dominant	75,33	28,05
Sedantery Group Dominant	95,74	39

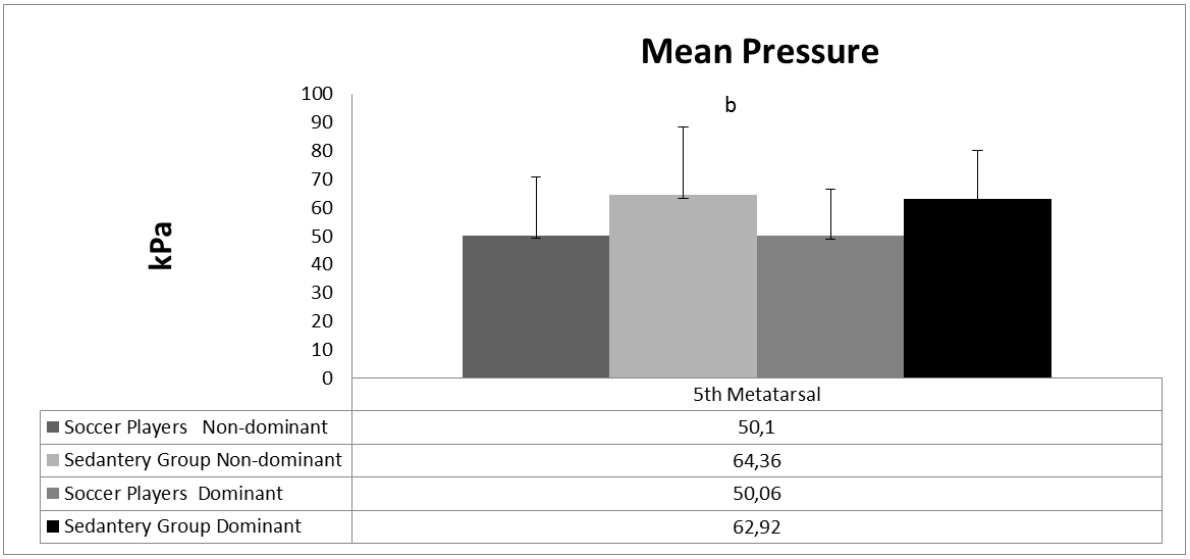
a: Differences between dominant foot of soccer players and control group
b: Differences between non-dominant foot of soccer players and control group
p<0.05

Figure 2. Maximum force differences during walking test

Mean Pressure

Metatarsals:

Finally, MP results were also significantly different between groups in non-dominant foot [(SG= 50.10±20.77), (CG= 64.36±23.93), p= 0.049] for 5th metatarsal.



b: Differences between non-dominant foot of soccer players and control group
$p<0.05$

Figure 3. Mean pressure differences during walking test

Bilateral Stance Test

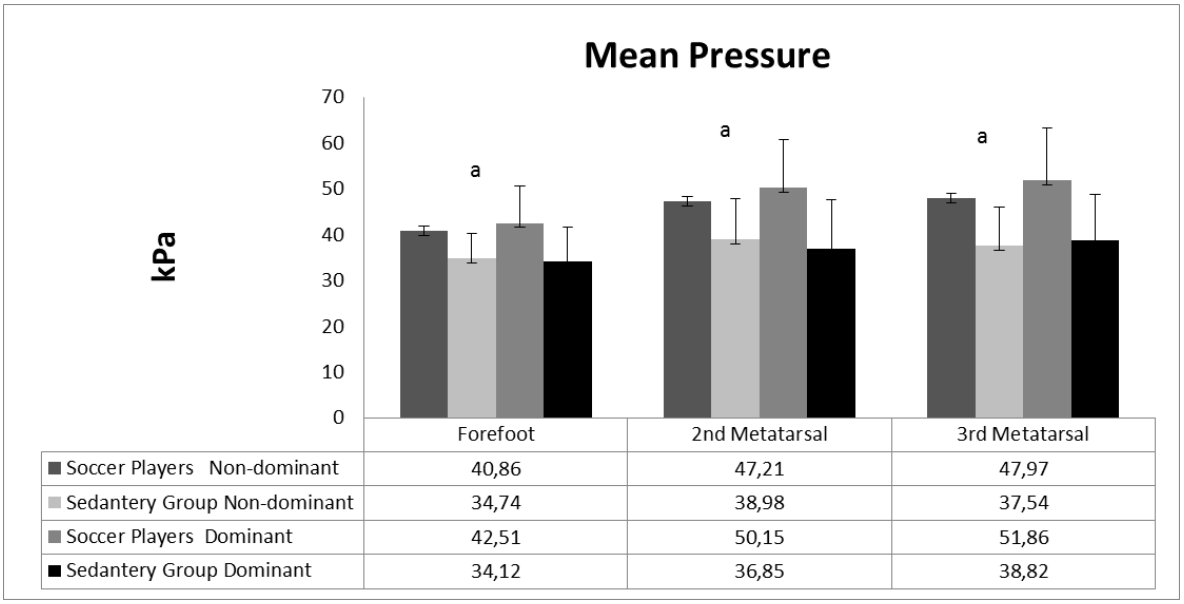
Mean Pressure

Forefoot:

For forefoot mask, SG (42.51±8.10) significantly higher than CG (34.12±7.58) in MP for dominant foot, (p=0.042).

Metatarsals:

For dominant foot MP [(SG= 50.15±10.59), (CG= 36.85±10.74), p= 0.031] values were significantly different in 2nd metatarsal. Similarly, MP values in 3rd metatarsal were different in dominant foot [(SG= 51.86±11.65), (CG= 38.82±9.88), p= 0.042].



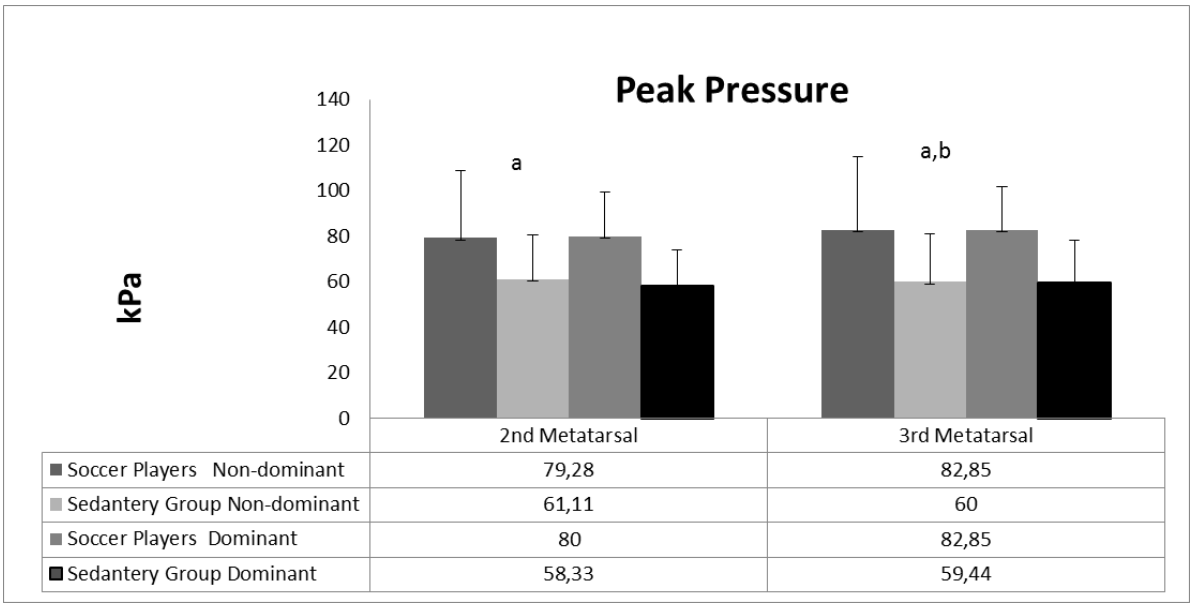
a: Differences between dominant foot of soccer players and control group
$p<0.05$

Figure 4. Mean pressure differences during bilateral stance

Peak Pressure

Metatarsals:

Soccer group demonstrated significantly higher PP [(SG= 80.00±19.36), (CG= 58.33±15.61), p= 0.031] 2nd metatarsal in dominant foot. For 3rd metatarsal mask, PP values were also significantly different between groups for both dominant [(SG= 82.85±18.89), (CG= 59.44±18.61), p= 0.042] and non-dominant foot [(SG= 82.85±32.25), (CG= 60.00±21.06), p= 0.042].



a: Differences between dominant foot of soccer players and control group
b: Differences between non-dominant foot of soccer players and control group
p<0.05

Figure 5. Peak pressure differences during bilateral stance

DISCUSSION

In this research MF, PP, CA, MP and MFNBW values of female soccer players were examined in twelve selected areas of the foot and compared to sedentary controls for both dominant and non-dominant foot separately. The main purposes of this examination and comparisons were to evaluate the effects of regular soccer participation on plantar distribution as foot function in daily activities such as walking and stance. Although previous studies examined pedobarographic differences between female soccer players and sedentary individuals during barefoot walking (Uzun et al., 2013), there was no study examined differences during static stance.

One of the main finding of this study was sedentary individuals' demonstrated higher CA in their both dominant and non-dominant foot for forefoot mask and in dominant foot 3rd and 4th metatarsals comparing to SG during self-paced walking. A possible explanation of these results could be attributed to soccer specific movements. Eils et al. (2004) highlighted that plantar pressure is significantly increasing in medial heel, medial forefoot, big toe and metatarsal heads during running movement in soccer players with boots. As pressure variable increases with decreasing contact area surface, the significant differences during dynamic condition can be explained by soccer specific training effects. Thus soccer specific movements may lead to decrease in contact surface in some specific areas of the foot such as metatarsal heads. Secondly, Santos et al. (2001) highlighted (I) football boots are cut

narrower comparing to regular shoes to improve control feeling in the soccer field and (II) soccer players are generally reported that they use 1 size smaller football boots comparing to other shoes. To illustrate, their results indicated that the contact area with the soccer boots was 7.2 % less comparing to trainers, in dominant foot. Another explanation of significant CA differences between SG and CG attributed to foot arch index. Although it is not significant CG group foot arch index is higher than SG which indicates CG group is closer to pes planus (Cavanagh & Rodgers, 1987). Therefore, similar to our results, Queen et al. (2009) indicated that a participant with pes planus demonstrates higher contact area during different athletic tasks.

Another main finding of this study was that MF variable was significantly higher in CG group comparing to SG in 4th metatarsal of dominant feet and 5th metatarsal of both foot during dynamic walking test. Fourth and fifth metatarsals are placed in lateral side of the foot; however, literature has demonstrated that soccer specific movements predominantly load forces to medial side of the foot (Eils et al., 2004; Wong et al., 2007). In addition, Shuen et al. (2009) and Jacquot et al. (2005) highlighted that fifth metatarsal fracture is highly in common among soccer players because of overuse of this area. Therefore, soccer players might behave protective on those sensitive areas which are prone to injury because of overuse. The mean pressure differences in 5th metatarsal head might me related to this possible explanation as well.

Other important observations were the MP and PP differences between CG and SG. In bilateral stance SG demonstrated significantly higher MP on dominant foot for forefoot mask, 2nd and 3rd metatarsals. Moreover, SG demonstrated significantly higher PP in both foot for 2nd and 3rd metatarsals. One of the possible explanations might be related to joint laxity. Barber Foss et al. (2009) has demonstrated that joint laxity is attributed to higher plantar loading in medial side of the foot among female athletes. Similar to results of current study, their study indicates that female athletes with joint laxity demonstrated higher PP and MF in medial side of both dominant and non-dominant foot. Ferrari and Atkinson (2005) reported that joint laxity is more pronounced among girls compared to boys. Another explanation of might be attributed to soccer boots. Notwithstanding they had measured athletes with the regular soccer boots, Uzun et al. (2013) indicated that female soccer players demonstrated higher pressure in inner part of their forefoot comparing to control group. In line with our results, they have concluded that long term participation in soccer may lead to change in foot structure which can create different pressure distribution values in different areas of the foot among female soccer players.

This study has some methodological limitations. First of all, considering the different type of soccer boots cause different pressure distribution in various areas of the foot (Nunns et al., 2016), our SG group reported that players use different types of soccer boots. Secondly, this study could not consider the methodological limitation of large sample size. Finally, the experience level of soccer players could be considered as moderate, as more experience level is expected to more structural change in foot structure. With regard to results and limitations of this study, professional participation in soccer exercises and matches may lead to structural changes in foot such as, joint laxity and highly common metatarsal stresses. These changes might affect the soccer player's athletic and daily life in long term with respect to injuries. Instantaneous feedback practices with shoe insoles should be considered for coaches and researchers to refrain from unexpected injuries caused by overuse leaded changes in foot structure and plantar distribution. Moreover, guiding athletes to select proper soccer boots also suggested in order reducing injury risk and obstacles caused by repetitive loads in athletic tasks.

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Investigations on participation and ownership of special field competences of physical education and sport teacher candidates

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Abstract

Competence is defined as having the knowledge, skills and attitude needed for a role (Balcı, 2005); teacher competencies are defined as the knowledge, skills and attitude that will enable teachers to fulfill the demands of their profession effectively and efficiently (MEB, 2008). When the teaching profession is thought of as a profession of specialization, it can be seen that special field education and qualifications should be sought in teacher candidates. In this study, we aim to determine the rates of participation in and possession of the physical education and sports special field competencies for Physical Education and Sport Teacher candidates with undergraduate education in the field of sport sciences obtainedthrough the Ministry of Education, Turkey. The research was conducted with a total of 1022 teacher candidates who had been educated in the highest grades of the physical education and sport teacher departments of 35 universities. In the study, the Physical Education Teacher Special Field competencies, which were put into effect by the Ministry of National Education and consist of six dimensions and 30 sub-competencies, were translated into the form of a measurement tool. In the analysis of the data, values were expressed using frequency and percentages and the t-test was used in binary comparisons. The significance level in the study was taken as 0.05. According to the findings of the research, the average participationscore of physical education and sports teacher candidates in teacher competencies was higher than the averagepossession score, andthe difference was found to be significant. When the teacher candidates' participation rates were evaluated according to gender, the difference between the average participation scores of male teacher candidates versus female teacher candidates was found to be significant. This difference stems from the high scores of male teacher candidates. When the rates of possession of competences of teacher candidates were evaluated according to gender, the difference between the average score of male candidates and the average score of female candidates was again found to be significant, and again, this difference stems from the high scores of male teacher candidates.

Keywords: Teacher candidate, physical education and sports, competency, special field competency

INTRODUCTION

Teachers play a vitally important role in assisting young people to develop the skills and acquire the knowledge they need in a rapidly changing world. The competencies teachers need are constantly being discussed in Turkey, as theyare elsewhere in the world, and it is known that in our country, one of the most important problems of the education system in recent years is teacher training and the quality of trained teachers. It has become important to assess whether teacher candidates have the necessary competencies for the teaching profession and how well equipped they are to begin teaching. It is necessary first to determine the competencies that teachers should have, and then to ensure that these competencies are acquired by teacher candidates and qualified teachers through pre-service and in-service training programs. It is also importantto constantly question and develop the role and qualificationsof teachers. Teachers themselvesplay an important role in this process,and for this reason, the Ministry of National Education collaborates with universities and joint studies on teacher competencies continue.In the National Education Basic Law of Turkey, it is judged that the teaching profession is a "specialization profession"; the qualifications to be sought in prospective teachers comprise general culture, special field education and pedagogical formation, and the qualifications appropriate to these fields will be determined by the Ministry of National Education (meb.gov.tr-a).

The topic of teacher competencies is covered in the Basic Education Support Project (BESP) and entered into force through an agreement signed with the European Commission in 2000.The overall purpose of the project is: "To improve the quality of education and access to education by increasing the level of education in the perspective of poverty reduction, improving the living conditions of the population in the most disadvantaged rural and urban areas and taking the children, young people and adults into the scope of basic education who are out of education and to improve the supply of teachers". The Basic Education Support Project consists of five components: Teacher Education, Quality of Education, Management and Organization, Non-formal Education, and Communication. The responsibility for project work on the Teacher Training component belongs to the General Directorate of Teacher Training and Education (meb.gov.tr-a). The General Directorate has established a commission in coordination with foreign experts to draft teacher competencies. This commission has drafted general qualifications and special field competencies within the context of qualifications of the teaching profession (MEB, 2006). Next, "Teacher Proficiency General Competencies" and "Special Field Qualifications" were developed by the Ministry of National Education in order to be able to fulfill teacher competencies, including the knowledge / skills and attitude of teachers inservice and of teacher candidates (MEB, 2008). Physical Education and Sports Teacher competencies are included. The most fundamental reflection of teaching programs of this kindin the learning-teaching environment are teachers who are creative, intellectual, curious, research-oriented, innovative, able to work together, and competent to train self-confident students. Sönmez (2003: 2-3) sees the most important and basic elements of the school system during the education process as student, program, and teacher, defining the teacher as a "professional person who gives the desired behavior in the educational environment". This means that the teacher must be very well trained and have general and specific competences that fulfill the needs of the teaching profession. It is considered that the degree to which teachers possessthese competencies directly affects the quality of the educationtraining period. As the teaching profession is considered to require specialized knowledge and skills, people choosing this profession must have certain competencies in order to be able to fulfill the requirements of the profession (Şişman, 2005; 2009a).

In the literature, multiple terms are used to describe qualifications understood as teacher competences. Most preferred are: "qualification", "competency", "standard", "quality", "capacity", "characteristics",

and “effectiveness”. Moreover, “adequacy”, “efficiency”, “capability”, and “sufficiency” are also explained in terms of competence, efficiency, and productivity in the Turkish languageaccording to their place (Şişman, 2009a). While the concept of “teaching competences” is used in the Turkish literature, “teaching profession standards” is used in foreign sources. Teaching profession standards include teachers’ professional qualifications and knowledge, understanding and skills (TED, 2009).

Competence is defined as having the knowledge, skills and attitude necessary to play a role (Balcı, 2005); teacher competencies are the knowledge, skills and attitude that enable teachers to fulfill the demands of their profession effectively and efficiently (MEB, 2008). Together with possessing general teacher competencies, teachers are expected to be very well acquainted with knowledge about the teaching field and to be able to facilitate students’ learning. Teaching is at the forefront of professions thatwill not be excluded from change and development. Identification of teacher competences is extremely important, in particular, to determine what kind of teacher is wanted and to safeguard theprofession. However, there is uncertainty as to how to deal with these competences, since they are not addressed during the preparation of qualifications in order to be applied in the identified areas of possible use (Şişman, 2009b). The different applications that often come to the fore with teacher education in the Turkish Education System have brought with them difficulties of standardization in this area (Akyüz, 2003). In this context, it is essential for the teaching profession to define changesfor the age and the environment in which we now operate, and to establish continuous professional development goals that will be reflectedin teaching practices. However, while emphasizing the aim of the competencies; “continuing the personal and professional development of teachers”, “imagining a performance evaluation system to be conducted periodically to determine the need for teachers’ development” and “increasing the quality of teachers’ personal and professional development activities from the candidacy period” are considered by the ministry of nationaleducation (meb.gov.tr-c).

In order to help teachers to cope with the difficulties they face, the importance of teaching education has increased and new responsibilities have been assigned to teacher training institutions. Higher education institutions—in particular, universities—are prominent among the institutions that educate teachers in our country. The Higher Education Council (HEC – YÖK, in Turkish), is the organizing body for universities and develops programs. Teacher training programs have been established, comprising theoretical and practical courses offered to students and the aims and qualifications of the students have been determined; studies were carried out to assess teacher competences in specific areas, and according to the competences envisaged for teachers, programs were continuously updated. In Turkey, physical education and sports teachers are educated according to a standard program defined by YÖK, at physical education and sports colleges and sport sciences faculties. The courses in the programs and the content of those courses are arranged according to the competencies that teachers are expected to have. Teacher competencies must be acquired through theoretical and practical studies during the teacher training program, and teachers must reach the expected levels (YÖK, 1998). It is important that in physical education teacher programs, candidates are equipped with general teacher competences and specific field competences. Increasing the proficiency of physical education and sports teachers will, in the process, contribute to the success of education and training activities. This research aims to determine to what degreesenior undergraduate students in the field of sport sciences in Turkey have participated in and attained special field competencies inthe area of physical education and sports, as defined by the Ministry of National Education.

METHOD

Based on student opinions, this research focused on the degree of participation in and ownership of physical education and sport-specific field competencies. The data was analyzed using quantitative techniques designed and collected according to the screening model.

Research Group

The research was conducted with a total of 1022 teacher candidates educated in the physical education and sports teacher departments of 35 universities. Of the participants, 608 (%59.5) were male and 414 (%40.5) female. Participants' distribution by age was as follows: 132 (12.9%) under 21 years, 424 (41.5%) between 22 and 23 years, 309 (30.2%) between 24 and 25 years, 118 (11.5) between 26 and 27 years, and 39 (3.9%) aged 28 years and over.

Data Collection Tools

In the study, the physical education teachers' special field competencies, which are composed of six dimensions and 30 sub-competencies, put into effect by the Ministry of National Education, were used in the form of a scale. Research permission was obtained from the General Directorate of Innovation and Education Technologies of the Ministry of National Education (YEĞİTEK) for the use of Physical Education Course Special Field Competencies in the measurement tool. A preliminary study was conducted, and factor analysis was applied to the validity of the scale; expert opinion was consulted and the scale was adaptedto suitthe scope of the study; the KMO measure was found to be .960 (p> 0.05). In the factor analysis of the main components using the Varimax transformation, 30 problems were collected under three factors; the percentage of disclosures in the total of the single factor was found to be 50.458 and the Cronbach alpha internal consistency coefficient (α) was .96. It is worth noting the high consistency in the values of the scale (Demircioğlu, 2011). The measurement tool was formed based on demographic information and information on teacher competencies. Demographic information included age, height, weight, income, etc. Multi-choice and gap-fillingquestions about teacher competencies consist of 5 Likert-type questions, designed to determine the degree of participation in and ownership of competences. In order to determine the levels of "participation in competences", for each question, 1 = "Absolutely Disagree", 2 = "Disagree", 3 = "No Opinion", 4 = "Agree" and 5 = "Absolutely Agree"; for"possessing competences" questions,1 = "Never", 2 = "Rarely", 3 = "Intermediate", 4 = "Frequently" and 5 = "Always".

EXPRESSIONS OF PHYSICAL EDUCATION AND SPORT TEACHER COMPETENCE	A DEGREE OF PARTICIPATION IN COMPETENCES					B DEGREE OF POSSESSION OF COMPETENCES				
	ABSOLUTELY DISAGREE	DISAGREE	NO OPINION	AGREE	ABSOLUTELY AGREE	NEVER	RARELY	INTERMEDIATE	FREQUENTLY	ALWAYS

Categories of degree of participation in and possession of competencies used in the scale.

Processing and Analysis of Data

In order to obtain permission to collect data from the Physical Education and Sport Teaching Departments of universities included in the research, the Rectorate of Cumhuriyet University was consulted. Written permission to collect data was then requested by the rectorate fromall the targeted universities. After receiving permission from the rectorates of 35 universities, during the second term of the 2015–2016 academic year, measurement tools were sent to the 35 institutions' Faculties of Sports Sciences, Schools of Physical Education and Sports, Physical Education and Sports Teaching Departments.The measuring instruments sent to the instructors and senior students assigned by the relevant departmentswere returned to the researcher upon completion.In the analysis of the data, values were expressed using frequency and percentages and the t-test statistic was used in binary comparisons. The significance level in the study was taken as 0.05.

RESULTS

In the research, participation in and ownership of special field competencies by physical education and sports teacher candidateswas expressed in the form of tables.

Table 1. The mean ($\overline{x}$) and standard deviation (Ss) values of participation and ownership grades of competences of physical education and sport teacher candidates

Physical Education Teacher Special Field Competences	Participation in Competencies		Possession Grades	
	$\overline{x}$	**Ss**	$\overline{x}$	**Ss**
A- Planning and Arranging the Teaching Process				
A1- Making an appropriate teaching plan	3.81	0.97	3.60	1.03
A2- Organizing appropriate learning environments	3.93	0.94	3.72	0.98
A3- Using appropriate tools and resources for the teaching process	4.03	0.95	3.85	1.01
A4- Planning school teamwork	3.91	0.99	3.66	1.10
A5- Using technological resources in the process of realizing the aims of teaching	3.89	1.01	3.72	1.08
A6- Making plans for special needs students	3.89	1.06	3.60	1.15
B- Providing and Sustaining Physical Performance Improvement				
B1- Developing basic and specialized movement knowledge and skills of students	3.89	1.00	3.76	1.04
B2-Making students aware ofregular physical activity and healthy lifestyles	3.96	0.98	3.88	1.02
B3- Enabling students to participate in competitions and to conduct their work	3.98	0.95	3.82	1.07
B4- Making students aware of healthy nutrition	4.01	0.97	3.85	1.06
B5- Applying first aid rules for sports injuries	3.98	0.95	3.75	1.06
B6- Developing students' leadership, responsibility, sharing and co-operation skills	4.05	0.91	3.94	0.99
B7- Helping students to recognize nature and creating awareness of environmental conservation	3.98	0.95	3.86	1.02
B8- Developing ability to ensure personal safety and attain preventive knowledge and skills	4.01	0.91	3.82	1.02
B9- Fostering awareness and love of sports and sports organizations in students	4.06	0.96	3.91	1.00
B10- Using educational games effectively in physical education classes and teaching	4.13	0.92	3.97	0.98
B11- Organizing activities for students who need special education	3.99	0.98	3.73	1.13
C- Celebrating national festivals in accordance with their meaning and importance				
C1- Reflecting the feelings and thoughts of Atatürk about physical education and sports	3.92	1.14	3.88	1.17
C2- Performing sports events at national festivals and on special occasions	4.00	1.04	3.87	1.14
D- Monitoring and Evaluating Development Performance				
D1- Determining the goals of measurement and evaluation applications	3.94	0.93	3.81	1.04

Physical Education Teacher Special Field Competences	Participation in Competencies		Possession Grades	
	$\overline{x}$	Ss	$\overline{x}$	Ss
D2- Using measurement-evaluation tools and methods	3.98	0.92	3.82	1.03
D3- Interpreting measurement results and providing feedback to determine the physical development of the students	3.94	1.02	3.84	1.08
E- Cooperation with School, Family and Society				
E1- Cooperating with parents and society in the mental, physical and spiritual development of students	3.89	1.07	3.79	1.13
E2- Making students and the community aware of the significance and importance of national festivals and ceremonies and ofbecoming active participants	3.96	1.00	3.87	1.05
E3- Developing ability in management and organization of national festivals and ceremonies	3.91	1.01	3.76	1.11
E4- Enabling cooperation with society in transforming the school into a center of culture and learning	3.94	1.00	3.84	1.07
F- Providing Professional Development				
F1- Determining professional competences	3.93	1.04	3.86	1.08
F2- Providing personal and professional development of physical education course teaching	4.06	0.93	3.99	0.99
F3- Learning to benefit from scientific research methods and techniques in applications for professional development	3.95	0.98	3.89	1.03
F4- Leadership ability	4.20	0.94	4.18	1.00

When Table 1 is examined, the average scores for the physical education and sport teacher candidates' participation in teacher competencies are higher than the average scores for the level of possession of the competencies.

Table 2. t-Test results between participation and ownership rates of competences

Situation	**N**	$\overline{x}$	**Sd**	**t**	**p**
Participation	1022	3.98	.66	243.63	0.001*
Possession	1022	3.83	.69		

*p< .01

According to the results of the t-test in Table 2, the difference between the mean score for the prospective teachers' participation in the competences (3.98 ± .66) and for possession (3.83 ± .69) was found to be significant (p< .01). This difference is due to the high level of the participation scores.

Table 3. t-Test results between competence participation rates according to gender

Gender	**N**	$\overline{x}$	**Sd**	**t**	**p**
Male	608	4.01	.63	4.43	0.02*
Female	414	3.92	.69		

*p< .05

In Table 3, the difference between the mean scores of participation in the competences by male teacher candidates (4.01 ± .63) and by female teacher candidates (3.92 ± .69) was found to be significant in the t-test results where the participation rates of teacher candidates were evaluated by gender (p< .05). This difference stems from the high scores of male teacher candidates.

Table 4. t-Test results between percentage of possession of competences according to gender

Gender	N	$\overline{x}$	Sd	t	p
Male	608	3.87	.67	2.36	0.01*
Female	414	3.76	.72		

*p< .05

In Table 4, the t-test results where the teacher candidates' competency ratios are evaluated according to gender, the differences between the mean scores for possession of the competences by the male teacher candidates (3,85 ± .41) and by the female teacher candidates (3,83 ± .41) were found to be significant (p < .05). This difference stems from the high scores of male teacher candidates.

DISCUSSION

According to the results of the research, the average participation scores of physical education and sport teacher candidates in teacher competencies (3.98 ± .66) were higher than the average scores (3.83 ± .69) for the possession of the competencies, and the difference between the means of the points was found to be significant (p < .01). This difference is due to the high participation scores of the teacher candidates. The research findings show that physical education and sport teacher candidates declared that they participated in the competencies determined by MEB for their fieldin large numbers; this can be interpreted as the adoption of physical education and sport-specific field competencies by prospective teachers.

Examining the literature in the field, it was not possible to find work done with physical education and sports teacher candidates regarding the possession of special field competencies, but work have been done with teacher candidates and teachers about general teacher competencies and teacher competencies in other fields. In our research, there are many reasons why the scores for possession of competence are lower than the participation scores. For example, prospective teachers may not have identified the competences in their field correctly, and providing information about competences as part of their undergraduate education could be considered. In this context, according to Book, Byers and Freeman (1983), it is important that teachers, in order to be able to do their job properly in terms of occupational competences, must be educated and observed in a school before beginning professional work as teachers—but this alone is not enough. The integration of theory and practice is of great importance in the acquisition of competences in teacher education. Teacher candidates are able to use the information from their undergraduate education in an efficient manner and supportive context in the professional setting, and they find that being able to apply their theoretical knowledge in the classroom before beginning professional service is very effective in acquiring new knowledge and skills. Candidates skilled in applying theoretical knowledgein their field will start in the profession trusting themselves more. Already, field education is an important element of teacher education programs. According to Ashton (1984), teacher training programs should help teachers acquire and develop the basic skills that provide confidence and motivation, such as human relations, communication and teaching skills.

Examining studies related todifferent branches of teaching in the literature, Fidan (2012)— who examined the science and technology special field competencies of both teachers and prospective teachers— stated that the professional teachers had higher levels of field competencies than teacher candidates. In Fidan's study, it was also found that gender did not affect science and technology teacher specific field competencies. Seferoğlu (2004) examined students' competency ratings in his

study and found that students assessed themselves moderately or well at a significant part of their qualifications. Demirtaş, Cömert and Özer (2011) point out that teacher candidates who have a positive attitude towards the profession will try to improve their proficiency, will be able to evaluate themselves more objectively in terms of competence, and will work harder to make up for any shortcomings. According to Ashton (1984), one of the purposes of teacher training programs is to develop candidates' desire to improve their competency. Teacher candidates must be motivated and have the necessary confidence to perform effectivelyin class. The research of Gelen and Özer (2008) on the general competency of teacher candidates and teachers in the profession has shown that teacher candidates have the competences required by the profession at a higher level than the teachers. Allinder (1994) found that teachers with high self-teaching competency planned the teaching process better and made extensive preparations based on this plan, and that those teachers who showed sincere and enthusiastic motivation in relation to the teaching process were willing to apply different and innovative approaches, techniques and materials in their teaching. Çiltaş and Akıllı (2011) think that teachers should have the necessary teaching methods as well as good knowledge of their field. In the study conducted by Köroğlu and Sıvacı (2017) with teacher candidates, it was found thatthe classroom teaching and pre-school teaching program students group with the highest level of special field competency; the lowest level of special field competency was among the Primary Mathematics Teaching Program student group. Özer and Acar (2011), who compared general teacher competencies in research conducted with trainees (4th grade prospective teachers), determined that the students felt the most important competence for a teacher was "student recognition"; next, in this order, came area of learning, developmental monitoring and evaluation, personal and professional values, professional development, learning and teaching process, school family and community relations, and, lastly, program and content knowledge.

According to the results of the research, the difference between the average participation scores for male teachers (4.01 ± .63) and female teachers (3.92 ± .69) was significant ($p < .05$). This difference is due to the high scores of male teacher candidates. This situation can be interpreted as beingdue to the fact that male teacher candidates were more likely to accept the competences. When the literature is examined, no study can be found that was conducted with physical education and sports teacher candidates regarding participation in special field competencies. However, when Kangalgil (2014) conducted a study with qualified physical education and sports teachers, the male teachers' scores were higher than those of the female teacherswhen it came to participation in the competency, and the difference was found to be significant. This finding is in parallel with our research results.

When the status of possessing competency was examined in the research results in terms of gender variation, the difference between the mean scores of male teacher candidates (3,85 ± .41) and female teacher candidates (3,83 ± .41) was found to be significantly in favor of the males ($p < .05$). In a study conducted by Sünbül and Arslan (2006), there was a significant difference in favor of female teachers in competency point averages. According to that study, female teachers find themselves more qualified than male teachers. In the study conducted by Kangalgil (2014) with qualified physical education and sports teachers, the difference between male and female teachers' possession of competences was not found to be significant. These findings are not parallel to our research results.

CONCLUSION and SUGGESTIONS

Based on our research findings, the rates of participation of physical education and sport teacher candidates in Physical Education and Sport Special Field Competencies were found to be higher than the rates of possession of the competencies. Furthermore, when the research subjects' gender was

taken into account, the male teacher candidates' rates of participation in the competencies were found to be higher than the female teacher candidates' rates. These results can be interpreted as showing that physical education and sports teacher candidates are not fully equipped with specific field competencies nor fully prepared for teaching. Based on these results, it is considered that physical education and sports teachercandidates should update the information about the Physical Education and Sport Teacher Special Field Competencies of the Ministry of National Education and that the entry of high-level teachers into the field will increase the quality of the teaching profession, whileat the same time contributing to an increase in the quality of education.

According to the results of this study, the following suggestions are made, with the aim of guiding the work to be done from this point on:

1. Acquirement of competences can be regulated and ensured by updating the higher education programs that train teachers.

2. More progress can be made in undergraduate programs by cooperating with the Ministry of Education (MEB) and the Higher Education Council (YÖK) to ensure prospective teachers grasp and acquire the competences of physical education and sports special fields by the time they reach graduation.

3. Activities should be planned to providefuture physical education and sports teachers on the staff of higher education institutions with the necessary qualifications to train teacher candidates for the profession.

4. In this study, physical education lessons did not employ performance indicators related to special field competencies. Any subsequent work could include special area performance indicators.

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Self-objectification in the fitness center environment: A qualitative perspective

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Abstract

The purpose of this study was to explore the perceptions and experiences of physically active individuals in the fitness center environment. We adopted the interpretive description methodology to examine the question of whether, and how, this environment played a role in individuals' experiences of self-objectification and their body image. Interviews were conducted with 16 college-age individuals, who were exercising in a fitness center, at two time points separated by 12 weeks. Deductive and inductive content analyses of the semi-structured interviews revealed three general themes: (a) body image and body (dis)satisfaction, (b) reasons and goals for exercising, and (c) the physical environment. This interpretive description inquiry provided a preliminary framework for future studies of self-objectification in potentially objectifying fitness and exercise environments.

Keywords: Fitness centers, exercise, self-objectification, interpretive description method

INTRODUCTION

Longitudinal, cross-sectional, and experimental studies consistently suggest a positive relationship between physical activity[1] and personal well-being (e.g., Biddle and Mutrie, 2008). It has long been established that regular exercise increases physical and cardiorespiratory fitness, immune system function, and longevity (Biddle and Mutrie, 2008). Regular exercise has also been shown to have a positive influence on various aspects of psychological well-being including self-esteem, affect, mood, trait anxiety, depression, and stress (e.g., Biddle and Mutrie, 2008; Dunn, Trivedi, and O'Neal, 2001; Rethorst, Wipfli, and Landers, 2009). In addition, meta-analytic reviews have indicated that exercise can serve to improve body image and body satisfaction (Campbell and Hausenblas, 2009; Loland, 2000). However, despite the wide range of physical and mental benefits of physical activity and exercise, millions of U.S. adults remain essentially inactive (American's Health Rankings, 2015) and less than 21% of adults meet the physical activity guidelines proposed by the U.S. Department of Health and Human Services (2008-2015; i.e., at least 150 minutes per week of moderate-intensity aerobic physical activity or 75 minutes per week of vigorous-intensity aerobic exercise).

There are numerous determinants as to why people choose to be physically active and engage in exercise including enjoyment, stress relief, improved body tone, and weight control (Ingledew and Markland, 2008). Broadly speaking, these reasons can be grouped into three conceptually discrete categories: physical health reasons (e.g., improve stamina, increase physical fitness, improve health), mental health reasons (e.g., stress relief, enjoyment), and appearance reasons (e.g., body tone, weight loss to look better; Furnham, Badmin, and Sneade, 2002; Strelan, Mehaffey, and Tiggemann, 2003). Maintaining and controlling a desirable physical appearance has been cited as one of the most common determinants for exercise (Leary, 1992).

In society today, intense pressure exists, from various sources (e.g., media) to look "good" and attractive (Sharma and Black, 2001). Individuals are constantly being observed, looked at, evaluated by others, and therefore "always potentially objectified" or seen as objects (Fredrickson and Roberts, 1997, p. 177). Awareness of this objectification can lead to habitual monitoring and evaluation of one's body to attempt to approximate society's ideals. Objectification theory, proposed by Fredrickson and Roberts (1997), provides a framework for understanding the psychological experiences and consequences of preoccupation with and surveillance of female, and to a lesser extent male, attractiveness. These authors suggest that individuals internalize an outsider's perspective of the physical self in a process known as self-objectification. In this process, individuals become self-conscious and preoccupied with how others perceive their bodies. As such, self-objectification may result in body dissatisfaction, reduced body esteem, disordered eating, shame, anxiety, sexual dysfunction, and reduced performance on cognitive tasks (Calogero, 2009; Fredrickson and Roberts, 1997; Quinn, Kallen, Twenge, and Fredrickson, 2006; Strelan and Hargreaves, 2005). Within the framework of objectification theory (Fredrickson and Roberts, 1997), our aim was to provide an in-depth understanding of individuals' perceptions of (a) their bodies, (b) their reasons for exercise, and (c) their exercise environments.

Exercise, Body Satisfaction, and Body Image

Previous studies have consistently demonstrated an inverse relationship between exercise and body dissatisfaction (Campbell and Hausenblas, 2009; Hausenblas and Fallon, 2006; Loland, 2000; Reed and Ones, 2006; Reel et al., 2007). Research indicates that both physically active men and women are more satisfied with their body across their lifespan compared to inactive individuals (Loland, 2000). Specifically, meta-analytic studies, including one that focused on experimental designs, have

suggested that exercise is associated with reduced body dissatisfaction (Campbell and Hausenblas, 2009; Hausenblas and Fallon, 2006; Reed and Ones, 2006; Reel et al., 2007). Additionally, a review of six studies directed at exercise interventions among patients with eating disorders reported decreased negative features such as body dissatisfaction and drive for thinness (Hausenblas, Cook, and Chittester, 2008).

Because an increase in positive features is not the same as a decrease in negative features (Fredrickson, 2001; Tylka, 2011), researchers have also investigated whether exercise is associated with increased *positive* aspects of perception of one's body (e.g., body satisfaction, positive body image) as well as decreased body dissatisfaction. Evidence from both qualitative and quantitative studies supports a positive relationship between exercise and body image. For example, two qualitative inquiries suggest that women with positive body image viewed exercise as a means to relieve stress, to enjoy themselves, and to improve and promote health and well-being rather than to lose weight (Frisén and Holmqvist, 2010; Wood-Barcalow, Tylka, and Augustus-Horvat, 2010). In another qualitative study, female student-athletes reported that they focused on the functions and capabilities of their bodies (Krane, Choi, Baird, Aimar, and Kauer, 2004). They appreciated having strong, well-developed muscles that enabled them to perform optimally. Several quantitative studies also provide support for the relationship between exercise and positive body image. For example, dancers (modern and street) scored higher on body appreciation compared to their non-dancing counterparts (Langdon and Petracca, 2010; Swami and Tovée, 2009). Also, women who frequently engaged in moderate to strenuous exercise showed higher levels of body appreciation, body orientation (i.e., focusing on physical capability rather than body appearance), and functional body satisfaction (Homan and Tylka, 2014).

It is likely that the benefits of exercise are not the same for all individuals. Numerous factors have been shown to play a moderating role in psychological outcomes associated with exercise, including type of exercise engagement, pre-existing body image concerns, and cognitions during the activity (Lepage and Crowther, 2010; Melbye, Tenenbaum, and Eklund, 2007; Vocks, Hechler, Rohrig, and Legenbaugher, 2009). For example, engagement in cardio-based fitness programs was related to increased self-objectification levels, disordered eating, and lower body esteem; however, engagement in resistance-based exercise was not associated with body image concerns (Melbye et al., 2007; Prichard and Tiggemann, 2008). Women with pre-existing weight concerns and a desire for thinness reported feeling slimmer after a bout of physical activity compared to women with no pre-existing body image concerns (Vocks et al., 2009). In terms of cognitions during the activity, participants who focused on their breathing during exercise (running) experienced reduced gains in positive affect compared to those whose minds wandered during their running session (Blanchard, Rodgers, and Gauvin, 2004). Such results suggest that multiple characteristics can influence the psychological effects of exercise.

Motives for Exercise

The research suggests that motivation for exercise also plays a role in whether exercise acts as a buffer for body image and disordered eating concerns (Prichard and Tiggemann, 2008). For example, exercising for health, endurance, enjoyment, and fitness-related reasons has been associated with improved body image and self-esteem, body satisfaction, and decreased symptoms of disorder eating (DiBartolo, Lin, Montoya, Neal, and Shaffer, 2007; Strelan et al., 2003). On the other hand, exercising for appearance-related reasons has been linked to poor body image and self-esteem, disordered eating, body dissatisfaction, and increased depressive symptoms (DiBartolo et al., 2007; Gonçalves and Gomes, 2012; Mond, Hay, Rodgers, and Owen, 2006; Tiggemann and Williamson,

2000). Determinants for exercise have not only been linked to psychological health, but also to physical health. Exercising for health-related reasons has been associated with lowered levels of stress hormones and systolic blood pressure, whereas exercising for weight reasons was unrelated to these physiological indicators (DiBartolo et al., 2007). Together, these findings suggest that exercising for health and enjoyment reasons is qualitatively different from exercising for weight, physical condition, or appearance reasons.

Exercise Environment

Whether individuals experience positive or negative effects of exercise also depends on the environment in which they exercise (Prichard and Tiggemann, 2008). According to the Physical Activity Council (2016), 62.7% of individuals who exercise, engage in fitness activities (e.g., aerobics, free weights), 48.6% participate in outdoor sports, and 34.6% engage in individual sports. Walking, weightlifting, and using cardiovascular equipment are cited as the most frequent modes of exercise among the U.S. population (United States Department of Labor, 2003-2006). Fitness facilities are venues where people usually engage in health-benefiting exercise behaviors. In this setting, the body is often an individual's central focus and one which lends itself to seeing the body as an object that can be trimmed, shaped, and refined via appropriate exercise protocols (Szymanski, Moffitt, and Carr, 2010). Moreover, people are surrounded by full-length mirrors in which they are likely to observe others and themselves, possibly in clothing that reveals their physical shape. Moreover, fitness facilities often display media (e.g., music videos, posters) of ideal bodies and bodybuilders, which might have a great impact on exercisers. This suggests that fitness center facilities can serve as an objectified environment (Prichard and Tiggemann, 2008). Indeed, exercising in the fitness center environment has been positively correlated with self-objectification concerns, disordered eating, and excessive weight loss (Martin Ginis, Jung, and Gauvin, 2003; Prichard and Tiggemann, 2008). Additionally, in their longitudinal study, Prichard and Tiggemann (2012) found an increase in self-objectification levels among young women (ages 16-28) after 12 consecutive months of fitness center membership, whereas the levels of self-objectification decreased for women who terminated their membership. However, the levels of self-objectification did not change among older subgroups of women (ages 29-68). These findings suggest that young women exercising in the fitness center environment may be at greater risk of developing self-objectification, which is one of the predictors of negative body image and disordered eating. Other survey-based empirical and experimental research has yielded evidence of the negative effects of the self-objectifying environment in physically active individuals (Prichard and Tiggemann, 2005; Thøgersen-Ntoumani, Ntoumanis, Cumming, Bartholomew, and Pearce, 2011).

Despite the evidence for self-objectification in the extant literature, there is a dearth of understanding from the qualitative perspective regarding the environmental antecedents of self-objectification. The overall purpose of the present study was to gain a deeper and a more comprehensive understanding of the exercisers' perceptions of their bodies in the fitness center environment and to examine whether this environment would foster self-objectification. Specifically, the focus was to gain in-depth information on individuals' perceptions of the determinants of exercise, body image, and the exercise environment. We have adopted an interpretive research methodological framework to provide insight into the experiences of individuals exercising in the fitness center environment over a three-month period (e.g., Burgess, Grogan, and Burwitz, 2006; Thorne, 2008). A better understanding of these individuals' experiences may benefit researchers who study physical self-concept and health issues concerning body image. It may also provide a starting point for those wishing to explore a confluence of self-objectification antecedents including body esteem, exercise motives, and the exercise

environment. Finally, the use of qualitative research has largely been overlooked in objectification theory research to date. The use of the qualitative inquiry can provide a more comprehensive understanding of the phenomenon as empirical measures may be limited in assessing multifaceted concepts (Smith and Sparkes, 2009). Therefore, the current study extends the conceptual understanding of self-objectification as experienced by adult exercisers.

METHOD

We utilized the interpretive descriptive approach to capture themes and patterns based on subjective perceptions, and to generate interpretive descriptions of the studied phenomenon (Thorne, 2008; Thorne, Reimer Kirkham, and O'Flynn-Magee, 2004). The interpretive descriptive approach presents a comprehensive summary of a phenomenon or events and their facts in everyday language (Sandelowski, 2000). It borrows the design from grounded theory, naturalistic inquiry, and ethnography while relying on the values associated with the phenomenological approach (Thorne et al., 2004). Through both inductive and deductive analytic approaches, we sought an understanding of the self-objectification phenomenon, its characteristics, and patterns generated, based on critical and analytical examination of the data and the use of reflective techniques.

Sampling

Uncovering the meanings of a phenomenon requires carefully capturing descriptions of people's experiences, including their perceptions, emotions, feelings, and judgments. Therefore, we utilized purposeful and criterion sampling, whereby participants were selected based on the criteria outlined below. To acquire a broad range of individuals' experiences and their perceptions of the fitness center, we sought exercisers who (a) had either low (i.e., -18 or below) or high (i.e., 2 or above) levels of self-objectification (Noll and Fredrickson, 1998), (b) had a range of experience exercising in fitness centers, and (c) were willing to participate in the interviews.

The primary author screened 60 exercisers to identify eligible participants. All recruits agreed to participate in the initial prescreening stage of the study by completing demographic questions, exercise behavior questions, and the self-objectification questionnaire. Of those recruits, 13 women and 5 men met the inclusion criteria. In addition, two certified personal trainers (CPTs) were recruited to provide their perspective of self-objectification phenomena among exercisers.

Participants

The age range of the exercisers who were interviewed was from 19 to 52 years (M_{age} = 22.89, *SD* = 7.9). The age range for female participants was from 19 to 52 (M_{age} = 24, *SD* = 9.13) and for male participants was from 19 to 21 (M_{age} = 20, *SD* = 1). The race/ethnicity of the sample was as follows: White (72.2%), White non-Hispanic (5%), African-American (11.1%), and Asian Pacific Islander (11.1%). Participants had completed at least one year of a college degree (50%), or had received an associate's degree (22.2%), bachelor's degree (11.1%), or master's degree (16.7%). Most of the participants had never been married (83.3%), 11.1% were divorced, and 5.6% were married.

All recruited participants had previous exposure to the fitness center environment. They were involved in various exercise routines including yoga, aerobics, and individual cardio- and/or resistance-based workouts. The mean self-reported average weekly minutes of moderately intense (4 individuals) and strenuous (14 individuals) physical activity was 182.65 (*SD* = 90.66) for Time 1 and 179.69 (*SD* = 94.51) for Time 2. Two of the male participants dropped out over the course of study. Both CPTs (male – CPT1 and female – CPT2) were college-aged students (M_{age} = 21.50, *SD* = .71)

with an average of seven months' experience working at the fitness center where the study took place. To ensure the participants' anonymity, pseudonyms were used throughout the study.

Measures

Participants who met the inclusion criteria completed demographic questions, exercise behavior questions, and self-objectification questionnaire at two time points. The CPTs completed only the demographic questions.

Demographic questionnaire. Self-report demographic questions were used to obtain information on gender, age, ethnicity, education, marital status, and months/years of membership in the fitness center. The CPTs were asked additional questions regarding their work experiences.

Exercise behavior. The extent of exercise participation was measured via self-report. Participants were asked how many months/years they had been members of the fitness center, how often (e.g., times per week) they exercised, and in what type of exercise they engaged (e.g., aerobics [e.g., Zumba, aerobics classes], yoga, and cardio- [e.g., running, biking, rowing] or resistance-based workouts). They were also asked about the duration of their workouts in the fitness center, and whether they were involved in any additional physical activities. Finally, participants indicated the intensity level of their physical activity (i.e., strenuous, moderate, or mild).

*Self-objectification***.** The Self-Objectification Questionnaire (SOQ; Noll and Fredrickson, 1998) was used to examine individual differences in self-objectification. In the SOQ, participants rank 12 different body attributes as being most to least important to their physical concept. Six of these 12 attributes are appearance-based (i.e., weight, sex appeal, physical attractiveness, firm/sculpted body, body measurements, and coloring). The remaining six are competence-based (i.e., physical condition, health, muscular strength, physical energy level, physical fitness level, and stamina). Potential scores range from -36 to +36 with higher and positive scores indicating a greater focus on appearance, which is interpreted as greater self-objectification (Noll and Fredrickson, 1998). Convergent and divergent validity were established by positive correlations with appearance anxiety, r = .56, and body size dissatisfaction, r = .33. Body shame and self-objectification were found to be positively correlated, r = .54 (Noll, 1996). Internal consistency has been supported in previous studies with Cronbach's alpha coefficients ranging from .87 to .97 (e.g., Noll, 1996; Noll and Fredrickson, 1998; Miner-Rubino, Twenge, and Fredrickson, 2002). The internal consistency as indicated by Cronbach's alpha for this sample was .75.

Data Collection

This interpretive description utilized multiple data collection strategies to avoid naïve overemphasis on the interview data and to offer comprehensive and contextual interpretations (Sandelowski, 2002). The data collection process consisted of the recruitment stage, two one-on-one interview phases, and observations. After institutional ethical approval was granted, participants were recruited with flyers posted at the local fitness center bearing the description of the study, the selection criteria, and the study contact information. All data were collected by the primary author.

During the recruitment stage, the purpose of the study was explained in detail, and participants signed an informed consent and completed the three questionnaires. Individuals who met the inclusion criterion were invited to a follow-up meeting. At this meeting (i.e., Time 1), a 20- to 60-minute one-on-one semi-structured interview was conducted in a private room (see the Appendix A for the interview questions). The purpose of these interviews was to seek a concrete, detailed description of

the self-objectification phenomenon in the fitness center to provide a coherent conceptual description of the thematic patterns and commonalities that characterized the participants' experience (Thorne et al., 2004). Interviews began with an open-ended question, and were subsequently guided by specific probes and follow-up questions to elicit more detailed information about the participants' experience and deeper insight into the research question (Kvale, 1996). These questions were also used to encourage participants to supplement their original descriptions while allowing the interviews to remain conversational in nature (Patton, 2015).

The second meeting (i.e., Time 2) occurred 12 weeks later utilizing the same procedures (i.e., participants completed the same battery of questionnaires and participated in a one-on-one semi-structured interview). The primary author also conducted 6 rigorous observations in the fitness center over the course of 12 weeks. Each observation lasted between 30 and 60 minutes with the aim of gaining information on individuals' behavior (e.g., working out, use of mirrors, etc.) and their clothing. At the end of the second interview, participants were debriefed about the nature of the study and were provided with contact information, should they wish to attend a follow-up meeting to learn the results of the study.

Data Analysis

The interviews were audio-recorded and transcribed verbatim by the primary author. Each interview was listened to numerous times to capture not only the words themselves, but their meaning and importance. Participants completed member checks to ensure that the transcriptions accurately reflected their experiences (Creswell, 2014). Any identifying information was removed to maintain participants' confidentiality. The primary author then finalized the transcripts as organized raw data, and performed an inductive content analysis to identify the meaning units and categorize them into thematic patterns or themes. The raw data from the interviews and observations were divided into textual parts to generate information contributing to the understanding of the phenomena (Patton, 2015). The primary author then organized (i.e., coded) the data into subcategories or second-order themes by comparing, contrasting, and grouping the meaning units. These subcategories were deductively organized into major or third-order themes. Deductive analysis was done using pre-established groups of categories to organize first- and second-order categories. In particular, previous literature and theoretical framework on potential attributes of self-objectification were used to deductively group the first- and second-order categories into third-order categories (Patton, 2015).

Data triangulation was done by adopting multiple sources of data. Specifically, the semi-structured interviews and observations in the fitness center were utilized (Patton, 2015). To explore the findings that might arise from these sources, different verification strategies were used, including comparative and iterative analyses of these data. Finally, a validity check was performed using two methods. The first method was member checking, which was done through email. All participants expressed satisfaction with the transcribed interviews. The second validity check was done by two experienced "critical friends." After their independent analysis review, disagreements were discussed and resolved by further review of the raw data.

RESULTS

Based on the qualitative analyses, we propose three essential themes in the participants' lived experiences in the fitness center environment: (a) body image and body (dis)satisfaction, (b) reasons and goals for exercising, and (c) the physical environment. We also discuss the gender differences that emerged within these themes.

Body Image and Body (Dis)Satisfaction

The relative importance of body image and body (dis)satisfaction varied among individuals from "the most important thing is that I feel good about it. . . . If I feel like I'm healthy, and the doctor says I'm healthy, then I think that's the most important" to "I just want to lose that weight." Themes and subthemes that emerged for body (dis)satisfaction at Time 1 and Time 2 were health, psychological well-being, appearance, body weight, and the upper body.

At Time 1, Maggie stated that "the most important [thing] is to stay comfortably functional and to never let myself fall into the state of obesity. To maintain good health because if you don't have health you don't have anything." Regarding specific body parts, Nick explained that the most important aspect of his body was "core, like my abs and lower back." Abby wanted to have "a nice flat stomach." Overall, females valued their appearance and wanted to "look [their] best all the time." They emphasized their abdominal muscles, shoulders, thighs, and biceps. Males stated that they emphasized their core, abdominals, chest, and arm muscles during their workouts. Personal trainers had similar experiences with the clients they saw on a regular basis. CPT1 stated that both males and females emphasize their abdominal muscles. "Girls also, legs, more so butt, and sometimes arms, they never want to work out chest and back. . . . Most guys wouldn't want to work out legs, or they haven't been working out legs in a while."

Regarding body image, participants valued appearance, body weight, and psychological well-being. For the females, it was important to "feel like I'm pretty" and "to be a little slimmer." Joe expressed that "a big thing for me is not to be overweight, to be in shape, to look good, to feel good, and to have more energy." On the other hand, for Jane it was important "to feel good, working out properly, having a healthy diet, and actually feeling good about how I look afterwards."

In general, participants were satisfied and "pretty happy" with their bodies and the way they looked. The main subthemes that emerged regarding body modifications were height, body fat, and the waist-hip area. In general, females wanted to be "just a little taller" and "get rid of [extra stomach fat]," whereas males wanted to "tone up a little bit" and gain muscle mass. Workout attire for males and females was usually shorts or yoga pants, a regular t-shirt, and for some, a tank top. Adrianna stated, "I don't want it to be tight. I like it comfortable." If female participants did not feel comfortable with their bodies, or felt self-conscious about a certain body part(s) due to skin conditions, scars, body fat, menses, or not being waxed, and covered up these self-described "offending" body part(s). Abby explained that "if I really didn't really like the way my stomach looks, I probably wouldn't wear really tight shorts, but bigger loose-fitting clothing is more comfortable to work out in anyway." During the observations, it was noticed that some of the exercisers in the fitness center wore very baggy t-shirts and shorts, while others wore more revealing workout attire. For example, one male wore a torn sleeveless t-shirt revealing almost his entire back.

At Time 2, some of the participants were more aware of specific parts of their bodies. They noticed that they had gained or lost weight and had experienced muscle hypertrophy and other physiological changes. Ada stated that she "gained weight. Well, since I've been doing yoga more consistently I'm feeling like my upper body is stronger." Nick explained, "I feel bigger, more defined. I feel overall my body got bigger." Julio expressed that he "gained a lot of strength and when I ran my time decreased and improved" and "I built some muscles [especially] my chest and shoulders."

Reasons and Goals for the Exercise

Four main themes emerged in terms of reasons and goals for exercise at both Time 1 and Time 2. At Time 1, participants stated that they exercised for psychological, physical, health, and appearance-related reasons. Their goals were in alignment with these reasons. Specifically, they wanted to increase their levels of flexibility and endurance, relieve stress, reduce heart disease, and stay healthy. For example, Mitch's goal was to get "overall greater physical ability and just feel healthier. I feel better after I exercise." Maggie wanted "to maintain the level of physical fitness that I have now." In the same manner, MaryKay was exercising "mainly to be healthy. I don't do it to look good, I never had big weight issues, so, but to have strong bones and not to have a hard time later in life."

Others were exercising mainly for appearance-related reasons. Their goals were to look slimmer and better. Jane was exercising "to lose weight" and to have a "better physique." Angela wanted "to lose that fat under my arms, my belly and my legs. I just want to lose that weight. Just not to be so darn fat." She further stated, "I don't want to be jiggly, I want to have toned legs. I don't want to be flabby. I don't want to have a muffin top. I just want toned arms and legs."

Three months later, at Time 2, motivation for exercise engagement did not appear to have changed drastically. Individuals continued to assert that they were exercising mainly for the physical and mental benefits they gained. Mitch was exercising "to feel healthy, mainly. Gives me more energy and usually the more I work out, the more natural energy I have. Building up flexibility, not to get stronger, just get healthier and fit." Marisa expressed that exercise "makes me feel calmer, it was stress relief when I would have a hard day. . . . gets out all these tensions. . . . makes me feel better when I see my body transforming." Angela stated that she exercised to lose weight and to "feel better. It feels like you're accomplishing something."

Overall, females expressed that they exercised for physical and appearance-related reasons to "maintain weight and stay healthy." Males' primary reasons for exercise were related more to health and physical ability. Their main goal was to increase healthy weight, mainly muscle mass. CPT1 stated that "usually the males, their goal is to get bigger" and "females want to decrease body fat and get toned, have more muscular definition and decrease fat." CPT2 stated that for 90% of her clients, their primary goal was "getting toned."

Physical Environment

Fitness facilities may promote weight loss via classes that encourage individuals to become aware of their physique and weight. Additionally, most fitness centers are heavily equipped with mirrors, and display posters of ideal lean bodies and bodybuilders, which may have an impact on exercisers. This was evident from the constant physique monitoring among individuals observed in the fitness center, which occurred during both workouts and breaks. Most of the individuals working out in the free-weight area watched themselves in the mirrors during sets, between, sets, and/or during breaks between different segments of their routines. Exercisers looked at themselves in the mirror to gain feedback on either their performance and/or appearance. At Time 1, Claire stated that she watched herself in the mirror when she lifted weights "to make sure I'm doing it right and I like to see myself sweat when I work out." Julio stated that he looked at himself in the mirror "a lot for the form, but I also like to see how much I improved." Anne also said that she watched herself in the mirror "to make sure that I'm doing them right."

Interviewees had different perceptions of others using mirrors. Nick stated that "my friends are like me, they use it purely for form. . . . Some guys I think check themselves out." Julio stated, "I think

most of them are probably doing the same as me [for the form] or sometimes their vanity is getting to them and they're just checking themselves out." Exercisers also observed others and compared themselves to the "ideal" individuals they saw. These observations were either body- or exercise/performance-focused. For example, Joe stated "I always look at the weight. . . . Is he doing more? Oh, he's doing more, next set I'll do more." Jane stated that "every time I walk in [the gym], I'll look around. . . . I'm like, I want that part of the body."

When asked about their interactions with others, many exercisers reported keeping conversation to a minimum. For example, Angela stated that she kept her conversations very short "because I would feel like they would be judging me. Because I'm not comfortable with myself, therefore, they're not comfortable with how I am either. So, I don't talk to other people." Marisa also stated that going to the gym for her was "nerve-wracking." She explained, "I found myself focusing on what everyone else was doing. Oh, that girl looks better than you; maybe I should be doing it that way."

At Time 2, however, after three months of exercising, most of the interviewees also reported a positive, enjoyable, and fun experience. Some of them stated that they thought about their individual muscles more than at Time 1. Adrianna explained that "I look at [my body] more analytically." Joe explained that "even though I run on the track and there are people around, I still think about how I look."

Reasons for looking in the mirror did not drastically change from Time 1. Participants reported that they mainly watched themselves in the mirror to monitor their technique. They also stated that they used the mirrors as much as or more than at Time 1. Some interviewees paid attention to people's form and technique whereas others judged and compared their physique to that of other exercisers in the fitness center.

The two personal trainers reported various views about using the mirrors in the fitness center. CPT2 stated that she encouraged her clients to use mirrors. She told her clientele, "when I'm not here, check yourself and make sure you're doing the right range of motion" and "if you don't remember, ask, or you can watch yourself in the mirror." She stated that "[mirrors] are there for a reason, so you can watch yourself -- your form. . . . I wish there would be more mirrors." On the other hand, CPT1 did not promote the use of mirrors to his clients. He stated that "I would hope that they'd remember all my form cues and that they wouldn't have to rely on the mirror."

DISCUSSION

The present study is one of the few qualitative inquiries to examine individuals' experiences in the fitness center environment. Specifically, our aim was to provide a deeper understanding of the exercisers' perceptions of their bodies, reasons for exercise, and exercise environment. From the interviews and observations, a broad range of rich data on exercisers' experiences in the fitness center environment yielded three main themes: (a) body image and body (dis)satisfaction, (b) reasons and goals for exercise, and (c) perceptions of the physical environment. The results of the current study support previous research regarding the potential antecedents of self-objectification from the qualitative perspective (e.g., Prichard and Tiggemann, 2005; 2008; 2012; Strelan and Hargreaves, 2005). The current findings also provide insight into exercisers' experiences and how the exercise environment may contribute to the internalization of an observer's perspective, or even the development of self-objectification as demonstrated by the previous quantitative study (Prichard and Tiggemann, 2012).

Regular participation in exercise and physical activity provides many benefits, including physiological, psychological, and health benefits (Biddle and Mutrie, 2008; Campbell and Hausenblas, 2009; Rethorst et al., 2009). However, whether individuals experience these positive effects depends to a large extent on a myriad factors such as preexisting body image concerns, cognitions during the activity, reasons for engagement in exercise, and exercise environment (Lepage and Crowther, 2010; Melbye et al., 2008; Vocks et al. 2009; Strelan et al., 2003). Below we discuss the main themes that emerged from the interviews and observations.

Body Image and Body (Dis)Satisfaction

Emerging themes on the importance and value of one's body ranged from health and psychological well-being to appearance and body weight. The current findings are consistent with the evolutionary psychology perspective, specifically Darwin's (1859) sexual selection, wherein males and females engage in sex-appropriate strategies to attract and secure mates. Evolutionary theorists propose that mate selection largely depends on the characteristics that denote reproductive fitness (Buss, 1989; Symons, 1979). For example, females tend to choose mates based on their potential for resource acquisition, whereas males value females' reproductive capacity (Buss, 1989). Supporting this notion, we found that males were more likely to engage in behaviors to look bigger and to increase their muscle mass. Additionally, they mainly focused on the upper body including abdominals chest, and arms (Ridgeway and Tylka, 2005). On the other hand, females were more likely to engage in behaviors to look their best at all times, to look appropriately thin, and to stay healthy – health in females signals reproductive fitness. Similar patterns were observed by the CPTs, who stated that males primarily focused on their upper bodies while females emphasized their abdominal muscles, legs, and buttocks.

Perhaps one of the most overlooked aspects of body image deals with everyday appearance-management behaviors such as clothing (Cash, 1990). Especially in fitness centers, where the body is generally the individual's central focus, clothing is important for both the individual wearing it and for others. Some research evidence suggests that people use clothing not only to meet societal dress codes/norms, but also to address self-presentational concerns to manage and improve their appearance, as a camouflage, and/or for comfort and assurance (Rudd and Lennon, 2000; Tiggemann and Andrew, 2012; Tiggemann and Lacey, 2009). Relevant to the present study, Prichard and Tiggemann (2005) found that exercisers in the gym wearing baggy clothing had lower levels of trait self-objectification and self-surveillance than those in close-fitting attire. Congruent with the previous research, participants endorsed wearing comfortable and functional clothing, as well as using clothing to address self-conscious concerns and to cover up and conceal their own perceived weight-based imperfections (Kwon and Parham, 1994; Rudd and Lennon, 2000; Tiggemann and Lacey, 2009). On the other hand, some exercisers wore very revealing outfits, which might have had an impact on others' perceptions of their own bodies. That is, although revealing outfits may also lead to increased self-objectification levels and/or other negative consequences (Prichard and Tiggemann, 2005). However, these possibilities are beyond the scope of the present study.

Motives for Exercise

Another theme that emerged from this study was reasons and goals for exercise. Individuals' motives for exercise ranged from appearance-related to health-related and did not change extensively over the three-month period of this study. Congruent with some of the previous research (Kilpatrick, Hebert, and Bartholomew, 2005), many women reported their reasons for exercising to be related to appearance, physique, and weight management, whereas men primarily exercised to stay healthy and to increase strength and muscle mass. Similarly, the CPTs observed that males' goals were to get

bigger and increase muscle mass and females' goals were to decrease body fat and increase their muscular definition. These observations are which is in line with the subthemes that emerged in the body (dis)satisfaction and body image sections as described above.

Research using figure drawings has indicated that women tend to desire an ideal body shape that is slimmer than their current body form, whereas up to 91% of men desire to have a more muscular body frame (Jacobi and Cash, 1994). Evidence suggests that individuals who tend to engage in exercise to address self-objectification concerns are more likely to exercise for appearance-related reasons (Prichard and Tiggemann, 2008; Strelan and Hargreaves, 2005). In turn, exercising for appearance has been linked to a plethora of negative consequences such as poor body image and self-esteem, disordered eating, body dissatisfaction, and increased depressive symptoms (DiBartolo et al., 2007; Gonçalves and Gomes, 2012; Mond et al., 2006; Tiggemann and Williamson, 2000).

A vast majority of the research on objectification and self-objectification has focused on women, who are typically more often objectified and exhibit higher self-objectification levels than men (Fredrickson and Roberts, 1997; Fredrickson, Roberts, Noll, Quinn, and Twenge, 1998; Oehlohf, Musher-Eizenman, Neufeld, and Hauser, 2009). From the evolutionary psychological perspective, it is argued that a female's body provides more information about fertility and reproductive value compared to a male's body (Buss, 1989; Singh, 1993). However, this is not to say that males are not being perceived as objects or that they are immune to self-objectification and its consequences. Instead, males are as likely as females to be vulnerable to experiencing this phenomenon (Calogero, 2012). In fact, viewing sexualized images increased self-objectification for both men and women (Linder and Daniel, 2017). Still, research suggests that some groups of men are more affected than others. For example, male bodybuilders and homosexual men had higher levels of self-objectification than their non-athletic counterparts and heterosexual men, respectively (Hallsworth, Wade, and Tiggemann, 2005; Martins, Tiggemann, and Kirkbride, 2007). Together, this evidence suggests that objectification and detrimental consequences of self-objectification may have varied effects on individuals.

Exercise Environment

Whether individuals experience the positive effects of physical activity also depends on the physical/exercise environment, which is the third theme that emerged from the interviews and observations (Prichard and Tiggemann, 2008). In the fitness center environment, individuals observe others either directly or indirectly via their reflections in mirrors. Specifically, they may observe others' bodies, body parts, and/or their exercise routines. By observing and paying attention to a particular part of the body, a person may be engaging in an objectifying behavior, which can potentially lead to internalizing an outsider's perspective of the physical self or self-objectification and self-surveillance (Fredrickson and Roberts, 1997). Evidence of this may be the fact that the participants in this study often watched themselves and others in the mirrors, not only while actually performing a workout technique that may have required monitoring, but also during breaks between repetitions or sets. For example, participants reported "checking their form," "their body/body parts," and/or others' bodies and performance. While looking in the mirror, a person's attention and thoughts may be focused on specific body parts (local processing) rather than the entire body (globalized processing; for review on local and global processing see Förster, and Higgins, 2005). Even though some participants stated that they watched themselves in the mirrors to check their form, they might have been seeing their body/body parts and other bodies as objects or as bodies performing routines. However, this possibility, and its potential influence on other exercisers, is beyond the scope of the current investigation.

According to the sexual body part recognition bias, women's bodies (vs. men's) tend to be reduced to their (sexual) body parts and are better recognized when presented in isolation (local/body part recognition; Gervais, Vescio, Förster, Maass, and Suitner, 2012). Men's bodies, on the other hand, are recognized better when presented in the context of the entire body (whole body recognition), which may help to explain why women tend to be more objectified compared to men (Gervais et al., 2012; Oehlohf et al., 2009; Tanaka and Farah, 1993). Our data indicate that the fitness center environment may foster objectification and self-objectification in both males and females, at least to some degree. The specific extent of this objectification and self-objectification in the fitness center is a question for potential future explorations.

Another subtheme that emerged from the interviews is comparison with others. Individuals were making either body or performance/exercise comparisons. According to social comparison theory, individuals are motivated to gauge and evaluate how they are doing in certain domains by comparing themselves to others to reduce their uncertainties (Festinger, 1954). Previous research has indicated that women tend to engage in body comparison when they are exposed to thin-ideal media advertisements and images of women's bodies or body parts (Bessenoff, 2006; Tiggemann and McGill, 2004). Fewer studies have addressed similar issues in men, that is, the effects of ideal male images on men in relation to social comparison. A few studies on the impact of ideal male images and TV advertisements on men found increased muscle dissatisfaction, depressive symptoms, and eating symptomology (Agliata and Tantleff-Dunn, 2004; Harrison and Cantor, 1997; Leit, Gray, and Pope, 2002). Together, these findings suggest that in order to gain a broader understanding of objectification and self-objectification constructs, future studies should take an integrative approach by incorporating related phenomena and examining them from different theoretical perspectives (e.g., social comparison theory; see Tylka and Sabik, 2001).

Finally, even though assessing the role of personal trainers in the fitness center was not a primary focus of our study, we chose to interview two personal trainers to learn about their insight on self-objectification in this environment. Their observations were useful because they provided a professional personal trainers' perspective and training philosophy for exercisers engaging in individual workouts. Future studies could explore additional determinants of self-objectification, including personal trainers and instructors of various group classes in fitness centers from the qualitative perspective.

CONCLUSION

This study provides a preliminary step toward obtaining insight into the self-objectification phenomenon for exercisers in the fitness center environment from the qualitative perspective. Further investigation is, however, clearly required because comprehensive understanding of the influence of situational factors on the progression of self-objectification is beyond what is possible in a single study.

Although we found the interpretive descriptive approach to be a good fit for our research questions, we cannot be confident that we recruited participants who actually experienced the phenomenon of self-objectification to a meaningful degree, or that the 12-week period of exposure to the fitness center environment was phenomenologically sufficient relative to self-objectification. Moreover, even though participants reported that they exercised on a regular basis, we did not have control over, or precisely measure, how physically active they were during those three months. It would be useful to track their physical activities objectively, such as using an activity tracker (e.g., Fitbit®) to monitor the

frequency, intensity, and duration of their exercise regimes. Additionally, describing the abstract phenomenon of self-objectification from the qualitative perspective is very different from describing something tangible. The emerged themes are indicators and potential contributors to objectification and self-objectification. However, the question remains open as to the actual tipping point at which the individual begins to develop other harmful psychological and health consequences. In addition, the interviews and observations were limited to one fitness center, specific mean college-age sample, and were conducted by the same individual. Researchers should explore objectification and self-objectification in other samples and populations of physically active vs. sedentary individuals (e.g., different cultural, ethnic and even religious backgrounds; different ages; and longitudinally across the lifespan) and in different settings in order to support or contradict the themes identified within this investigation. Also, different themes might have emerged if the interviews were conducted by different individuals. Finally, fitness centers can vary greatly in terms of their clientele (e.g., behavior, dress style), location, pricing, and services offered, therefore, the observations reported here may not generalize to other fitness centers. In the same manner, generalizability of the observations from the CPTs is not presumable due a plethora of factors such as CPT's work experiences and their clientele among others.

Despite these limitations, our study is one of the few to provide a qualitative inquiry into the potential underlying mechanisms of the self-objectification experience in the fitness center environment. In addition, it provides a preliminary framework for future studies of self-objectification in potentially body-objectifying environments. The findings of this interpretive query are especially applicable both to staff working in fitness centers (e.g., personal trainers, instructors) and to the individuals exercising in these fitness centers and/or similar environments.

Footnote

[1]For the purposes of this paper, physical activity and exercise are used interchangeably.

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The effect of a physical activity program on some anthropometric characteristics in children with emotional and behavioral problems

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Abstract

The aim of this study was to investigate the effects of physical activity on some anthropometric characteristics of children with emotional and behavioral disturbances. Sample consisted of 19 children (between 6,00-12,99 ages) from the child and adolescent psychiatry Unit of the Ege University Medical School. They participate in a twelve-week educative program including controlled PA (2 days a week, 60 min a day, aerobic exercises). Anthropometric data were collected before and after enrolling in the educative program by an accredited ISAK Level II anthropometrist following the ISAK manual (Marfell-Jones et al., 2006). Relaxed Arm (RAG), Contracted Arm (CAG), Waist (WG), Gluteal (GG) and Calf (CG) Girths, Triceps (Tsk), Subscapular (Sbsk), Biceps (Bsk), Iliac (Isk), Supraspinale (Ssk), Abdominal (Ask), Thigh (Thsk) and Calf (Csk) skinfolds, Humeral (HB) and Femoral (FB) breadths, body weight (W), stature (St), sitting height (Sh) and arm span (AS) (Restricted Profile) were measured and used to determine the sum of 8 skinfolds (S8), BMI and percentage of body fat (%BF)(2). Children were divided into two mixed groups according to the age and gender. Student T-test was run for comparing pre- and post- results and Wilcoxon Signed-Rank Tests were used for identify differences by gender and age groups setting always statistical significances at α=0.05. When general pre- and post- test data were compared, significant differences in W, St, Sh, AS, GG and CG were observed ($p<0.05$). Considering only the boys' data, differences ($p<0.05$) were found for W, St, Sh, AS, Tsk and GG results, but in girls only for St, Sbsk, and CG. Finally, children under-10 significantly changed their W, St, Sh, AS, and CG measurements and children over-10 changed their St, Sh, AS, and GG. PA programs can lead to significant changes in some anthropometric characteristics of children with emotional and behavioral problems. Educative programs with PA contents can support their physical fitness levels and physical properties.

Keywords: Children, physical activity, body composition, emotional and behavioral problems

INTRODUCTION

Physical activity (PA), any bodily movement produced by skeletal muscles that requires energy expenditure (ACSM, 2016). Contemporary educational organizations propose that children' experiences in sport and physical edication contribute to the mental acuity, skills and strategies that are important for navigating challenges faced across the life span (America SoHaPe, 2016).

Developmental disabilities, emotional disorders, and disruptive behaviour disorders are the leading mental health related cause of the global burden of disease in children aged below ten years (Patel et al., 2013). Like adults, children and adolescents can have mental health disorders such as depression, anxiety, mood status or self-esteem (Ortega et al., 2008). The term "serious emotional disturbance" refers to a diagnosed mental health problem that substantially disrupts a child's ability to function socially, academically, and emotionally (Brauner and Stepens, 2006). Regular exercise reduces the symptoms of mental disorders (Deslandes et al., 2009) and exercise can be an adjuvant treatment for several mental diseases (Portugal et al., 2013) and promotes a healthy body weight and body composition (Physical Activity Guidelines for Americans, 2008).

The ongoing distortions in the physical condition level of the children have been observed (Runhaar et al., 2010; Trembley et al., 2010) Thus, it is thought that the children with emotional and behavioral disabilities may reveal the similar result. Since some of these children demand medicine then it can be said that their daily physical activities and physical abilities can be affected.

Body composition is a key component of an individual's health and physical fitness profile (Heyvard, 2006; ACSM, 2010). Regular PA is often viewed as essential to normal growth and maturation (Malina, 2002). PA, especially weight bearing activity, is important for growth and maintenance of the muscle and bone compartments (Zemel, 2002). And also several studies have examined between PA and cognitive performance (ACSM, 2016; Etnier et al., 1997), executive function (Diamond, 2013; Chen et al., 2014) in children. But relatively very few data are available examining of PA to physical properties' changes in children with emotional and behavioral disturbances. Therefore the aim of present study was to investigate some anthropometric characteristics' changes of children with emotional and behavioral disturbances in a controlled PA program.

METHOD

Participants

Sample consisted of 19 volunteer children (between 6,00-12,99 ages, n=6 girls and n=13 boys) from the child and adolescent psychiatry Unit of the Ege University Faculty of Medicine. They participate in a twelve-week educative program including controlled PA (2 days a week, 60 min a day, moderate-to-vigorous physical activities and children's plays) in 2011. The aim of the study and the kind of measurements to be used was explained to the participants and their parents, who gave their written informed consent.

Anthropometric Measurements

Anthropometric data were collected before and after enrolling in the educative program by an accredited ISAK (International Society for the Advancement of Kinanthropometry) Level II anthropometrist following the ISAK manual (Marfell-Jones et al., 2006). Relaxed Arm (RAG), Contracted Arm (CAG), Waist (WG), Gluteal (GG) and Calf (CG) Girths, Triceps (Tsk), Subscapular (Sbsk), Biceps (Bsk), Iliac (Isk), Supraspinale (Ssk), Abdominal (Ask), Thigh (Thsk) and Calf (Csk)

skinfolds, Humeral (HB) and Femoral (FB) breadths, body weight (W), stature (St), sitting height (Sh) and arm span (AS) (Restricted Profile) were measured and used to determine the sum of 8 skinfolds (S8), BMI and percentage of body fat (%BF).

Body weight (BW) was measured through an electronic scale with a sensitivity of 0.1 kg. Stature, sitting height and arm span were measured with anthropometric tape (Cescorf-brand, 0.1 cm distinction) on the wall. BMI was calculated as body weight (kg) divided by stature (m) squared. RAG, CAG, WG, GG and CG girths were measured with anthropometric tape (Cescorf-brand, 0.1 cm distinction). The breadths of Humerus and Femur were measured with calipers (Cescorf). Skinfold thickness were measured with a Holtain skinfold calipers. Measurements were performed twice (the average was used as criterion score) and at the right side of the body (Tsk, Sbsk, Bsk, Isk, Ssk, Ask, Thsk, Csk). Sum of 8 skinfolds was also determined. BF% was calculated with formulas developed by Slaughter for girls [0,610 x (triceps+medial calf) + 5.1] and for boys [0,735 x (triceps+medial calf) + 1] (Slaughter et al., 1988). BMI was calculated by dividing weight by height squared (kg/m^2).

Statistical Analyses

Children were divided into two mixed groups according to the age and gender. Student T-test was run for comparing pre- and post- results and Wilcoxon Signed-Rank Tests were used for identify differences by gender and age groups setting always statistical significances at α=0.05.

RESULTS

When general pre- and post- test data were compared, significant differences in W, St, Sh, AS, GG and CG were observed ($p<0.05$) (Table 2). Considering only the boys' data, differences ($p<0.05$) were found for W, St, Sh, AS, Tsk and GG results (Table 4), but in girls only for St, Sbsk, and CG Table 3). Finally, children under-10 significantly changed their W, St, Sh, AS (Table 5), and CG measurements and children over-10 changed their St, Sh, AS, and GG (Table 6).

Table 1. Frequence distribution according to ages and genders

	Ages (Decimal age)						
	6.00-6.99	7.00-7.99	8.00-8.99	9.00 - 9.99	10.00-10.99	11.00-11.99	12.00-12.99
Girls n=6	-	1	3	2	-	-	-
Boys n=13	1	1	2	4	2	1	2

Table 2. Change of physical properties in children (general)

N=19	Pre-Test	Post-Test	Student t Test		Wilcoxon Rank Test	
	$\bar{X}$ SD	$\bar{X}$ SD	t	p	z	p
Body Weight (kg)	32.5±13.8	33.4±13.4	-2.30	0.03*	-2.92	0.00*
Stature (cm)	134.4±10.4	135.6±10.6	-6.38	0.00*	-3.73	0.00*
BMI (kg/m^2)	17.4±4.5	17.6±4.3	-1.16	0.26	-2.01	0.04*
Sitting Height (cm)	69.2±4.6	70.4±5	-4.55	0.00*	-3.49	0.00*
Arm Span (cm)	133.1±10.6	134.4±10.5	-4.44	0.00*	-3.33	0.00*
Triceps (mm)	10.5±6.7	10.9±6.8	-1.45	0.16	-1.29	0.20
Subscapular (mm)	8.3±6.7	8.5±6.8	-0.64	0.53	-0.57	0.57
Biceps (mm)	6.1±4.4	6.1±4	-0.07	0.95	-0.50	0.62
Iliac-crest (mm)	12.7±12	12.1±11.3	1.42	0.17	-1.64	0.10
Suprasipinale (mm)	8.0±6.7	8.0±6.9	-0.06	0.95	-0.35	0.73
Abdominal (mm)	11.8±10.9	11.5±9.8	0.78	0.45	-0.39	0.70
Front Thigh (mm)	15.8±9.4	15.3±8.4	1.03	0.32	-0.75	0.45
Calf (mm)	10.4±8.3	10.2±7.4	0.62	0.55	-0.44	0.66
Sum of 8 Skf. (mm)	84.0±63.3	83.0±60.3	0.81	0.43	-0.28	0.78
BF (%)	16.9±10.7	17.1±10.1	-0.71	0.49	-0.98	0.33
Arm (Relaxed) (cm)	19.3±4.1	19.5±4.4	-1.49	0.15	-1.02	0.31
Arm (Flexed and Tensed)	20.6±4.4	20.8±4.4	-1.22	0.24	-1.20	0.23
Waist (cm)	58.8±10.5	59.2±10.3	-0.64	0.53	-0.40	0.69
Gluteal (Hip) (cm)	72.9±12	73.6±12.1	-2.65	0.02*	-2.52	0.01*
Calf (cm)	27.1±4.7	27.6±5	-2.89	0.01*	-2.47	0.01*
Humerus (Biepicondylar) (cm)	5.4±0.5	5.5±0.5	-1.86	0.08	-1.71	0.09
Femur (Biepicondylar) (cm)	7.9±0.7	7.9±0.7	-0.24	0.81	-0.19	0.85

*p<0.05

Table 3. Change of physical properties in girls

N=6	Pre-Test	Post-Test	Wilcoxon Rank Test	
	$\bar{X}$ SD	$\bar{X}$ SD	z	P
Body Weight (kg)	26.7±6	27.6±5.8	-1.89	0.06
Stature (cm)	128.1±4.8	129.3±5.3	-2.21	0.03*
BMI (kg/m^2)	16.2±3.2	16.4±3	-0.94	0.35
Sitting Height (cm)	66.9±1.4	67.9±1.6	-1.75	0.08
Arm Span (cm)	127.3±4.9	128.5±5.4	-1.69	0.09
Triceps (mm)	10.5±5.2	10.1±5.1	-1.57	0.12
Subscapular (mm)	7.3±4.3	8.5±6.1	-2.02	0.04*
Biceps (mm)	5.7±2.6	5.9±2.1	-0.81	0.42
Iliac-crest (mm)	11.8±10.6	11.3±8.7	0.00	1.00
Suprasipinale (mm)	7.3±5	8.0±6.4	-1.08	0.28
Abdominal (mm)	11.0±7.1	11.7±7.2	-1.58	0.12
Front Thigh (mm)	16.2±10.8	15.4±7.9	-0.32	0.75
Calf (mm)	8.5±4.2	8.8±4.7	-1.84	0.07
Sum of 8 Skf. (mm)	78.4±49	79.9±47.6	-1.05	0.29
BF (%)	16.5±5.8	16.6±6	-1.21	0.23
Arm (Relaxed) (cm)	18.0±2	18.0±1.9	-0.41	0.68
Arm (Flexed and Tensed)	18.9±2.3	19.1±2.2	-0.31	0.75
Waist (cm)	55.3±7.7	55.7±6.6	-0.73	0.46
Gluteal (Hip) (cm)	68.7±7.4	69.3±6	-0.73	0.46
Calf (cm)	24.8±2	25.4±1.9	-2.00	0.05*
Humerus (Biepicondylar)(cm)	5.1±0.4	5.2±0.38	-1.63	0.1
Femur (Biepicondylar) (cm)	7.4±0.4	7.4±0.3	-0.41	0.68

*p<0.05

Table 4. Change of physical properties in boys

N=13	Pre-Test	Post-Test	Wilcoxon Rank Test	
	$\bar{X}$ SD	$\bar{X}$ SD	z	P
Body Weight (kg)	35.2±15.7	36.1±15.2	-2.20	0.03*
Stature (cm)	137.3±11.2	138.5±11.3	-3.06	0.00*
BMI (kg/m^2)	17.9±5.1	18.2±4.8	-1.78	0.08
Sitting Height (cm)	70.2±5.2	71.6±5.6	-2.99	0.00*
Arm Span (cm)	135.7±11.5	137.0±11.4	-3.01	0.00*
Triceps (mm)	10.6±7.4	11.2±7.6	-2.14	0.03*
Subscapular (mm)	8.7±7.6	8.5±7.3	-0.62	0.53
Biceps (mm)	6.3±5.1	6.3±4.7	-0.24	0.81
Iliac-crest (mm)	13.2±13	12.5±12.6	-1.82	0.07
Suprasipinale (mm)	8.3±7.5	8.0±7.4	-1.19	0.24
Abdominal (mm)	12.2±12.5	11.4±11	-0.67	0.50
Front Thigh (mm)	15.6±9.1	15.3±8.9	-1.02	0.31
Calf (mm)	11.3±9.7	10.9±8.5	-0.32	0.75
Sum of 8 Skf. (mm)	86.6±70.6	84.4±67.1	-0.94	0.35
BF (%)	17.1±12.5	17.3±11.8	-0.53	0.59
Arm (Relaxed) (cm)	19.9±4.7	20.2±5.1	-1.30	0.20
Arm (Flexed and Tensed)	21.4±4.9	21.6±5	-1.38	0.17
Waist (cm)	60.5±11.5	60.9±11.4	-0.11	0.92
Gluteal (Hip) (cm)	74.8±13.4	75.6±13.8	-2.59	0.01*
Calf (cm)	28.2±5.3	28.6±5.7	-1.69	0.09
Humerus (Biepicondylar)(cm)	5.6±0.5	5.7±0.6	-0.99	0.32
Femur (Biepicondylar) (cm)	8.2±0.7	8.2±0.6	-0.12	0.91

*p<0.05

Table 5. Change of physical properties in children under ten years old.

N=14	Pre-Test	Post-Test	Wilcoxon Rank Test	
	$\bar{X}$ SD	$\bar{X}$ SD	z	P
Body Weight (kg)	27.6 ±7	28.6 ±7.3	-3.08	0.00*
Stature (cm)	129.7±6.2	130.9±6.4	-3.18	0.00*
BMI (kg/m^2)	16.2±3	16.5±3.1	-1.82	0.07
Sitting Height (cm)	67.1±2.6	68.3±2.7	-2.83	0.00*
Arm Span (cm)	128.7±6.9	130.1±6.5	-2.80	0.01*
Triceps (mm)	9.4±5.3	9.5±5.5	-0.47	0.64
Subscapular (mm)	6.9±4.6	7.4±5.8	-1.20	0.23
Biceps (mm)	5.3±2.9	5.4±2.9	-0.71	0.48
Iliac-crest (mm)	10.7±10.5	10.0±9.8	-1.73	0.08
Suprasipinale (mm)	6.5±4.4	6.8±5.6	-0.31	0.76
Abdominal (mm)	9.7±8.2	9.8±8.3	-0.88	0.38
Front Thigh (mm)	14.1±9.2	13.6±7.5	-0.51	0.61
Calf (mm)	8.4±5.9	8.5±5.3	-1.17	0.24
Sum of 8 Skf. (mm)	71.3±49.8	71.2±49.8	-0.25	0.81
BF (%)	14.8±7.9	15.0±7.6	-1.01	0.31
Arm (Relaxed) (cm)	17.9±2.6	18.0±2.6	-0.53	0.60
Arm (Flexed and Tensed)	19.1±2.6	19.3±2.8	-0.82	0.41
Waist (cm)	55.6±6.9	56.4±7.7	-1.01	0.31
Gluteal (Hip) (cm)	69.0±7.9	69.7±8	-1.63	0.10
Calf (cm)	25.3±2.8	25.7±2.9	-2.21	0.03*
Humerus (Biepicondylar)(cm)	5.3±0.4	5.3±0.4	-0.52	0.60
Femur (Biepicondylar) (cm)	7.6±0.6	7.7±0.5	-0.18	0.86

*p<0.05

Table 6. Change of physical properties in children over ten years old.

N=5	Pre-Test	Post-Test	Wilcoxon Rank Test	
	$\overline{X}$ SD	$\overline{X}$ SD	z	p
Body Weight (kg)	46.3±19.6	46.9±18.1	-0.67	0.50
Stature (cm)	147.5±8.7	148.5±9.5	-2.02	0.04*
BMI (kg/m^2)	20.6±6.7	20.7±6	-0.67	0.50
Sitting Height (cm)	74.9±4.1	76.6±4.9	-2.02	0.04*
Arm Span (cm)	145.3±9.9	146.4±10.9	-2.12	0.03*
Triceps (mm)	13.7±9.6	14.6±9.4	-1.48	0.14
Subscapular (mm)	12.3±10.3	11.6±9.1	-0.67	0.50
Biceps (mm)	8.5±7.1	8.3±6.2	0.00	1.00
Iliac-crest (mm)	18.4±15.6	18.0±14	-0.54	0.59
Suprasipinale (mm)	12.2±10.5	11.4±9.7	-1.07	0.29
Abdominal (mm)	17.8±16	16.2±13	-0.67	0.50
Front Thigh (mm)	20.5±9.3	20.2±9.6	-0.37	0.72
Calf (mm)	16.0±12	15.2±10.7	-0.68	0.50
Sum of 8 Skf. (mm)	119.6±88.5	115.8±80.5	-0.68	0.50
BF (%)	22.8±15.8	22.9±14.7	0.00	1.00
Arm (Relaxed) (cm)	22.9±5.5	23.7±6.1	-1.10	0.27
Arm (Flexed and Tensed)	24.9±5.8	25.3±5.5	-1.10	0.27
Waist (cm)	68.0±14.4	67.2±13.3	-0.67	0.50
Gluteal (Hip) (cm)	83.6±15.8	84.7±15.6	-2.02	0.04*
Calf (cm)	32.2±5.6	32.8±6.2	-1.10	0.27
Humerus (Biepicondylar)(cm)	5.9±0.6	6.1±0.4	-1.83	0.07
Femur (Biepicondylar) (cm)	8.8±0.5	8.7±0.4	-0.58	0.56

*p<0.05

DISCUSSION

Anthropometric measurements give a good description of the body as a whole. The measurements are those which are routinely taken for a variety of purposes such as monitoring athletes, tracking growth, development, aging and motor performance, and linking physical activity and nutrition interventions to changes in body size, shape and composition (Marfell-Jones et al., 2006).

The aim of present study was to investigate some anthropometric characteristics' changes of children with emotional and behavioral disturbances in a twelve-week educative program including controlled PA (2 days a week, 60 min a day, aerobic exercises). The mid childhood growth spurt, which occurs in many children around 6-8 years old, is small increase in the rate of gain in weight, height, and body breadth (Zemel, 2002). In this study we determined this properties, when general pre- and post- test data were compared, significant differences in W, St, Sh, AS, GG and CG were observed ($p<0.05$) (Table 2). In addition we examined anthropometric characteristics' changes at two groups (under and over 10 years old). Children under-10 significantly changed their W, St, Sh, AS (Table 5), and CG measurements and children over-10 changed their St, Sh, AS, and GG (Table 6). In this observation, we found almost same physical properties of differences according to general data.

In children with emotional and behavioral disturbances, comparing changes in body composition associated with a program of regular PA studies is limited. In this study, considering only the boys' data, differences ($p<0.05$) were found for W, St, Sh, AS, Tsk and GG results (Table 4), but in girls only for St, Sbsk, and CG (Table 3). But in other anthropometric measurement' values were not observed differences both in boys and in girls.

Body weight and length or stature, the most basic information used to assess growth and nutritional status (Zemel, 2002). Body weight can be potentially influenced by regular activity, resulting in changes in body composition (Malina, 2002). In this study, it was considered that pre-and post-test differences might be effected both growth and PA. And also girls compared to their counterparts, it was observed that W, St, BMI values are similar with Turkish children (% 50 persentile) (Neyzi et al., 2008). And also it was observed that according to the classification designed by Lohman et al. for 6-17 ages of %BF values (Heyvard, 2006) were seen medium levels in girls and boys.

In this study, changes in some anthropometric measurements have been observed. All the same, the results of girls under 10 (n=6, 7-9 ages) and boys over 10 (n=5, 10-12 ages) were compared with the studies done with healthy children. The study done with the girls (on triceps skinfold and arm circumference values) have revealed similar results with Öztürk et al. (2009) and the waist circumference results were similar with the average results of Hatipoğlu et al. (2007). In the boys, the W, St, BMI values were above average of the standards for 11-12 ages obtained from Akgün et al. (1990) and Neyzi et al. (2008) (% 50 percentile values). It has also been observed in some studies that the children are now heavier and taller than they were in the past (Trembley et al., 2010). The arm circumference and triceps skinfold results were bigger than average observed from Akgün et al. (1990) and also Öztürk et al. (2009). The waist circumference measurements were also above than the ones measured (average values) by Hatipoğlu et al. (2007). This made us think that the positive environmental factors were not adequate for these children to support an active living.

Each child, in order to maintain his/her normal physical growth and development, needs to attend the activities on a regular basis (Leblanc et al., 2011). Children and adolescents should do 60 minutes or more of physical activity daily (aerobic, muscle-strengthening, and bone-strengthening). It is important to encourage them to participate in physical activities that are appropriate for their age, that are enjoyable, and that offer variety (Physical Activity Guidelines for Americans, 2008). Children with emotional and behavioral problems and their parents may keep themselves away from social surroundings in order not to be labelled. It is suggested that furter studies can be performed with more participation.

Consequently, in this study we observed potential influences of regular PA on children' some anthropometric properties during growth. Certain limitations may affect the interpretation of our study findings. We would like to point out that these were because there hasn't been enough number of participants in this study and there were also differences between ages and gender. Nevertheless, it is thought that this study may be aware of these issues. This feature is not increased in children who are the future of health care costs and to participate in such activities in terms of reduction of efficiency is recommended.

In conclusion, PA programs can lead to significant changes in some anthropometric characteristics of children with emotional and behavioral problems. Educative programs with PA contents can support their physical fitness levels and physical properties.

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