ISSN: 2148-1148

International Journal of Science Culture and Sport (IntJSCS)

International Refereed Scientific Journal

2015 ICV Score: 73,35

Volume 6 Issue 1
March 2018

International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS

IntJSCS

INTERNATIONAL SCIENCE CULTURE AND SPORT ASSOCIATION

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS

TABLE OF CONTENTS

REFEREES OF THIS ISSUE

Dr. Adeel Nazir AHMAD
Dr. Ahmet Naci DİLEK
Dr. Ahmed BOUSAKRA
Dr. Arslan KALKAVAN
Dr. Atahan ALTINTAŞ
Dr. Benkazdali Hadj MOHAMED
Dr. Dana BADAU
Dr. Dusan MITIC
Dr. Fatih ÇATIKKAŞ
Dr. Fatih YAŞARTÜRK
Dr. Gülten HERGÜNER
Dr. Hanifi ÜZÜM
Dr. Hikmat ALMADKHORI
Dr. Kadir YILDIZ
Dr. Mehmet OCALAN
Dr. Menderes KABADAYI
Dr. Mikail TEL
Dr. Mitra Rouhi DEHKORDI
Dr. Murat TAŞ
Dr. Murat KUL
Dr. Osman İMAMOĞLU
Dr. Serdar USLU
Dr. Serkan HACICAFEROĞLU
Dr. S. Rana VAROL
Dr. Saadullah Abas RASHID
Dr. Vladimir PUZOVIC

International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS713

Dispositional Flow State among Open Skill Athletes: A Predictor and Quantification of Sport Performance

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Type: *Research Article (**Received:** 06.12.2017 – **Corrected:** 21.01.2018 – **Accepted:** 27.01.2018)*

Abstract

The present study was aimed to identify the role of Dispositional Flow Scale-2 (DFS-2) among open skill athletes. In order to achieve the objective of the study, Sixty (N=60) male university level open skill athletes of 19 to 25 years of age were selected to act as a subject. A prior consent was sought from all the subjects after being informed about the objective and protocol of a study. The sixty (N=60) subjects were segregated into three groups i.e. N_1= 20 Basketball, N_2=20 Handball, N_3=20 Football. To measure the level of Flow of the subjects, the Dispositional Flow Scale-2 (DFS-2) Questionnaire constructed by Jackson and Eklund (2004) was administered. One way Analysis of Variance (ANOVA) was employed to compare various sports groups i.e. open skill athletes. Where 'F' values were found significant, LSD (Least Significant Difference) Post-hoc test was applied to find out the direction and degree of differences. For testing the hypothesis, the level of significance was set at 0.05. Significant differences were found among various sport groups (basketball, handball, and football) on the sub-variables of DFS-2 i.e. unambiguous feedback, sense of control, loss of self-consciousness and overall dispositional flow scale-2. However, no significant differences were found on the sub-variables of DFS-2 i.e. challenge-skill balance, action-awareness merging, clear goals, concentration on the task at hand, transformation of time and autotelic experience.

Keywords*:* Dispositional Flow Scale-2 (DFS-2), Open Skill Athletes, Performance

Introduction

Understanding the psychological factors that accompany successful athletic performance is a high priority for applied sport psychology, with a major area of focus being mental links to optimal performance. To advance knowledge in this area, it is important to examine specific psychological constructs with theoretical relevance to optimal performance in order to understand what psychological processes might be contributing to the quality of performance. The first and primary construct examined was flow.

Flow is an optimal psychological state that occurs when there is a balance between perceived challenges and skills in an activity (Csikszentmihalyi, 1990). It is a state of concentration so focused that it amounts to absolute absorption in an act concentration so focused that it amounts to absolute absorption in an activity. Research on flow in sport and exercise has increased in recent years (e.g., Jackson, 1992; 1995; 1996; Jackson, Kimiecik, Ford, & Marsh, 1998; Jackson & Marsh, 1996; Kimiecik & Stein, 1992) encouraged the application of flow theory to physical activity settings. Based on their respective research findings, Jackson and Csikszentmihalyi (1999) have recently written a book describing flow in sport and how to attain this optimal mental state. Knowledge of factors associated with the attainment of flow is an important goal for those interested in the quality of athletes' experience and performance in competition.

Theoretically, flow, as an optimal mental state, would be expected to be associated with optimal athletic performance as well as providing an optimal experience. Flow is generally viewed as a peak performance state, and there is some support for this assumption (e.g., Jackson & Roberts, 1992; McInman & Grove, 1991). Jackson et al. (1998) have suggested that experiencing flow states frequently when involved in a specific activity promotes the desire to perform the activity for its own sake. In other words, the activity becomes autotelic (Csikszentmihalyi, 1975, 1990) that is, the reasons for participation are grounded in the process of involvement in the activity and not in attaining goals that are external to the activity. It appears that attaining flow during exercise may promote intrinsic motivation, which, in turn, has been shown to enhance persistence in participation (Ryan et al., 1997).

In contrast to the Jackson (1996) and Sugiyama and Inomata (2005) studies, Young investigated a sample that was gender and sport specific. Compared to the other samples, lower scoring on eight out of nine flow dimensions for elite tennis athletes could indicate that specific performance or situational demands, or a combination of both, influence the experience of flow. Young (2000) concluded that flow in tennis is an unstable and volatile state. The results of the Jackson (1996), Young (2000), and Sugiyama and Inomata (2005) studies have provided some evidence for the general importance of some flow dimensions. More research needs to be conducted that aims to detect similarities and differences in flow between sports with contrasting task characteristics. These findings would be valuable to develop sport-specific interventions that aim to increase critical flow dimensions to enhance flow state.

Material and Methods

Participants

For this purpose, Sixty (N=60) male university level open skill athletes of 19 to 25 years were selected to act as a subject. A prior consent was sought from all the subjects after being informed about the objective and protocol of a study. The sixty (N=60) subjects were segregated into three groups i.e. N_1= 20 Basketball, N_2=20 Handball, N_3= 20 Football.

Procedures

To measure the level of Flow of the subjects, the Dispositional Flow Scale-2 (DFS-2) Questionnaire constructed by Jackson & Eklund (2004) was administered.

Statistical Analysis

One way Analysis of Variance (ANOVA) was employed to compare various sports groups i.e. open skill athletes. Where 'F' values were found significant, LSD (Least Significant Difference) Post-hoc test was applied to find out the direction and degree of differences. For testing the hypothesis, the level of significance was set at 0.05.

Results

Table 1. Analysis of Variance (ANOVA) results with regard to (DFS-2) among open skill athletes (basketball, handball and football) on the sub-variable challenge-skill balance

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	60.400	2	30.200	2.441	.096
Within Groups	705.200	57	12.372		
Total	765.600	59			

F 0.05 (2, 57)

It can be ascertained from table 1 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable challenge-skill balance were found statistically insignificant (P>0.05). Since 'F' value was found insignificant, therefore, post-hoc test has not been applied to see the direction and degree of differences.

Table 2. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable action-awareness merging

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	66.533	2	33.267	2.264	.113
Within Groups	837.650	57	14.696		
Total	904.183	59			

F 0.05 (2,57)

It can be seen from table 2 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable action-awareness merging were found statistically insignificant (P>0.05).

Table 3. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable clear goals

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	126.233	2	63.117	3.004	.057
Within Groups	1197.500	57	21.009		
Total	1323.733	59			

F 0.05 (2,57)

It can be observed from table 3 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable clear goals were found statistically insignificant (P>0.05).

Table 4. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable unambiguous feedback

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	183.100	2	91.550	8.497*	.001
Within Groups	614.150	57	10.775		
Total	797.250	59			

*Significant at 0.05 level F 0.05 (2,57)

It is evident from table 4 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable unambiguous feedback were found statistically significant (P<0.05).Since the obtained F-ratio 8.497 was found statistically significant, therefore, Post-hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable unambiguous feedback. The results of Post-hoc test have been presented in table 5 below.

Table 5. Comparison of Mean Values of Post-hoc test (LSD) among open skill athletes (basketball, handball, and football) with regard to sub-variable Unambiguous feedback

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Basketball (Mean=15.70)	**Handball**	3.40000	.007
	Football	3.95000*	.002
Handball (Mean=12.30)	**Basketball**	3.40000	.007
	Football	.55000	.869
Football (Mean=11.75)	**Basketball**	3.95000*	.002
	Handball	.55000	.869

A glance at table 5 showed that the mean value of basketball group was 15.70 whereas handball group had mean value as 12.30 and the mean difference between both the groups was found 3.40. The p-value sig .007 shows that the basketball group had demonstrated significantly better on unambiguous feedback than their counterpart's handball group. The mean difference between basketball and football group was found 3.95. The p-value sig .002 revealed that the basketball group had exhibited significantly better on unambiguous feedback than their counterpart's football group. The mean difference between football and handball group was found .550. The p-value sig .869 showed that the handball group had demonstrated better on unambiguous feedback than their counterpart's football group though not significantly.

Table 6. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable concentration on the task at hand

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	4.133	2	2.067	.204	.816
Within Groups	576.050	57	10.106		
Total	580.183	59			

F 0.05 (2, 57)

It can be seen from table 6 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable concentration on the task at hand were found statistically insignificant (P>0.05).

Table 7. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable sense of control

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	150.533	2	75.267	5.947*	.005
Within Groups	721.400	57	12.656		
Total	871.933	59			

*Significant at 0.05 level F 0.05 (2,57)

It can be observed from table 7 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable sense of control were found statistically significant (P<0.05). Since the obtained F-ratio 5.947 was found statistically significant, therefore, Post-hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable sense of control. The results of Post-hoc test have been presented in table 8 below.

Table 8. Comparison of Mean Values of Post-Hoc Test (LSD) among open skill athletes (basketball, handball and football) with regard to sub-variable sense of control

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Basketball (Mean=15.60)	**Handball**	3.20000*	.023
	Football	3.50000*	.011
Handball (Mean=12.40)	**Basketball**	3.20000*	.023
	Football	.30000	.965
Football (Mean=12.10)	**Basketball**	3.50000*	.011
	Handball	.30000	.965

A glance at table 8 showed that the mean value of basketball group was 15.60 whereas handball group had mean value as 12.40 and the mean difference between both the groups was found 3.20. The p-value sig .023 shows that the basketball group had demonstrated significantly better on sense of control than their counterpart's handball group. The mean difference between basketball and football group was found 3.50. The p-value sig .011 revealed that the basketball group had exhibited significantly better on sense of control than their counterpart's football group. The mean difference between football and handball group was found .300. The p-value sig .965 showed that the handball group had demonstrated better on sense of control than their counterpart's football group though not significantly.

Table 9. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable loss of self-consciousness

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	167.433	2	83.717	5.425*	.007
Within Groups	879.550	57	15.431		
Total	1046.983	59			

F 0.05 (2, 57)

It can be ascertained from table 9 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable loss of self-consciousness were found statistically significant (P<0.05).Since the obtained F-ratio 5.425 was found statistically significant, therefore, Post-Hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable loss of self-consciousness. The results of Post-hoc test have been presented in table 10 below.

Table 10. Comparison of Mean Values of Post-Hoc Test (LSD) among open skill athletes (basketball, handball, and football) with regard to sub-variable loss of self-consciousness

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Basketball (Mean=15.80)	**Handball**	1.05000	.701
	Football	2.90000	.074
Handball (Mean=16.85)	**Basketball**	1.05000	.701
	Football	3.95000*	.010
Football (Mean=12.90)	**Basketball**	2.90000	.074
	Handball	3.95000*	.010

A glance at table 10 showed that the mean value of basketball group was 15.80 whereas handball group had mean value as 16.85 and the mean difference between both the groups was found 1.05. The p-value sig .701 shows that the handball group had demonstrated better on self-consciousness than their counterpart's basketball group though not significantly. The mean difference between basketball and football group was found 2.90. The p-value sig .074 revealed that the basketball group had exhibited better on self-consciousness than their counterpart's football group though not significantly. The mean difference between football and handball group was found 3.95. The p-value sig .010 showed that the handball group had demonstrated significantly better on the loss of self-consciousness than their counterpart's football group.

Table 11. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable transformation of time

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	70.300	2	35.150	2.442	.096
Within Groups	820.300	57	14.391		
Total	890.600	59			

F 0.05 (2, 57)

It is evident from table 11 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable transformation of time were found statistically insignificant (P>0.05).

Table 12. Analysis of Variance (ANOVA) results with regard to open skill athletes (basketball, handball, and football) on the sub-variable autotelic experience

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	73.233	2	36.617	2.250	.115
Within Groups	927.700	57	16.275		
Total	1000.933	59			

F 0.05 (2, 57)

It can be ascertained from table 12 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the sub-variable autotelic experience were found statistically insignificant (P>0.05).

Table 13. Analysis of Variance (ANOVA) results with regard to open skill athletes among (basketball, handball, and football) on the variable overall dispositional flow scale-2

Source of Variance	Sum of Squares	df	Mean Square	F-ratio	Sig.
Between Groups	3823.433	2	1911.717	7.757*	.001
Within Groups	14048.500	57	246.465		
Total	17871.933	59			

*Significant at 0.05 level F 0.05 (2, 57)

It can be observed from table 13 that results of Analysis of Variance (ANOVA) among various sport groups (basketball, handball, and football) with regard to open skill athletes on the variable overall dispositional flow scale-2 of open skill athletes were found statistically significant (P<0.05). Since the obtained F-ratio 7.757 was found statistically significant, therefore, Post-hoc test (LSD) was applied to find out the degree and direction of differences between paired means among various sport groups (basketball, handball, and football) with regard to open skill athletes on the variable overall dispositional flow scale-2. The results of Post-hoc test have been presented in table 14 below.

Table 14. Comparison of Mean Values of Post-Hoc Test (LSD) among open skill athletes (basketball, handball, and football) with regard to overall dispositional flow scale-2

Group (A)	Group (B)	Mean Difference (A-B)	Sig.
Basketball (Mean=139.30)	**Handball**	9.45000	.173
	Football	19.55000*	.001
Handball (Mean=129.85)	**Basketball**	9.45000	.173
	Football	10.10000	.136
Football (Mean=119.75)	**Basketball**	19.55000*	.001
	Handball	10.10000	.136

A glance at table 14 showed that the mean value of basketball group was 139.30 whereas handball group had mean value as 129.85 and the mean difference between both the groups was found 9.45. The p-value sig .173 shows that the basketball group had demonstrated better on overall dispositional flow scale-2 than their counterpart's handball group though not significantly. The mean difference between basketball and football group was found 19.55. The p-value sig .001 revealed that the basketball group had exhibited significantly better on overall dispositional flow scale-2 than their counterpart's football group. The mean difference between football and handball group was found 10.10. The p-value sig .136 showed that the handball group had demonstrated better on overall dispositional flow scale-2 than their counterpart's football group though not significantly.

Discussion and Conclusion

A thorough cogitation of all the variance tables with special references to flow of open skill athletes revealed significant differences among various sport groups (basketball, handball, and football) on the sub-variables i.e. unambiguous feedback, sense of control, loss of self-consciousness and overall dispositional flow scale-2. However, no significant differences were found on the sub-variables of DFS-2 i.e. challenge-skill balance, action-awareness merging, clear goals, concentration on the task at hand, transformation of time and autotelic experience. The outcome of the above results might be due to the inherent feedback in the activity, control over the demands of the activity without conscious effort, knows what is happening in mind & body, sense of balance between the perceived demands of the activity and the skills, enjoyable experience that is intrinsically rewarding and thoughts & feelings the players may have experienced while taking part in the competitions. These findings substantiate the assertion of Jackson et al. (1998) that the strongest associations between a self-report assessment of performance and flow state were with the autotelic experience and challenge-skill balance dimensions of flow. When considering the errors reported by the orienteering sample, several flow dimensions were significant predictors. One unexpected finding was a positive relationship between the flow dimension, unambiguous feedback, and a number of errors made. It seems that feedback regarding performance, when it focused on errors rather than positive aspects of performance, may have the unwanted effect of generating more errors. Kimiecik and Stein (1992) proposed a two-part experience form to

measure flow in golf, with the first questionnaire assessing possible antecedents of flow, such as confidence, concentration, expectations, and competency before playing the hole, whereas the second questionnaire examines key flow dimensions, such as challenges and skills, goals, concentration, and control to be filled out after the completion of the hole. A similar approach in sports that offer time for athletes to complete flow measures during the performance, such as tennis, would more clearly pinpoint antecedents of flow and provide more detailed information on the connection and interaction of flow and performance.

Significant differences were found among various sport groups (basketball, handball, and football) on the sub-variables i.e. unambiguous feedback, sense of control, loss of self-consciousness and overall dispositional flow scale-2. However, no significant differences were found on the sub-variables i.e. challenge-skill balance, action-awareness merging, clear goals, concentration on the task at hand, transformation of time and autotelic experience.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS715

Cohesion Perception of Tunisian Elite Sport Children

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Type: *Research Article (* ***Received:*** *22.12.2017 –* ***Corrected:*** *24.01.2018 –* ***Accepted:*** *27.01.2018* ***)***

Abstract

The purpose of the current study was to examine perceptions of team cohesiveness in Tunisian sport elite children aged 9 to 12 years. Eighty-one young Tunisian athletes (43 males, 38 females) age 10.34±1.87 years, from four elementary schools in the city of Tunisian voluntarily participated in this study. This work is designed to examine participants' perceptions of (a) the definition of cohesion and indicators of cohesive and no-cohesive groups and (b) methods used to attempt to develop cohesion in their groups. Overall, the results demonstrated that Tunisian sportive children understand the concept of cohesion and comprehend the phenomenon known as cohesion. Specifically, participant distinct to both task cohesion and social cohesion, describe the characteristics of cohesive and non-cohesive teams and identify methods used to attempt to develop cohesion in their groups.

Keywords: Cohesion; Children; Sports team

[1] *The order of appearance of the first and second authors was determined at random: both should be considered first authors.*

Introduction

In the field of sport psychology, the study of group dynamics has increased our understanding with regard to the nature and measurement of various group constructs including cohesion (e.g. Carron, Widmeyer and Brawley, 1985). Team cohesion is one of the key concepts within sport teams that have received substantial research attention over the last three decades (Carron and Eys, 2012; Spink, 2011). Cohesion defined as "a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs" (Carron, Brawley, and Widmeyer, 1998, p. 213). Team cohesion is directly associated with other main sport measures (Delorme et al., 2011) such as collective efficacy (e.g., Spink, 1990), performance, adherence to team goals (Tauber and Sassenberg 2012) and achievement. In addition, Carron, Widmeyer, and Brawley (1985) suggested that there are two types of cohesion within sport teams: task and social. Task cohesion relates to team members' unity toward achieving their collective performance goals whereas social cohesion pertains to the quality of the social interactions and the tendency for members to spend time with one another.

In the sport setting, preliminary results indicate the presence and importance of cohesion for younger populations (Martin et al., 2011). The research investigated with youth samples also demonstrated cohesion to be the main predictor of athlete satisfaction (e.g., Paradis and Loughead, 2012; Spink, Nickel, Wilson, and Odonokon, 2005). Overall, a vast number of studies in sport and physical activity contexts have provided support for this contention. However, the conceptualization and examination of cohesion have predominately been oriented toward adult populations (Eys et al., 2009; Martin et al, 2011). Recent research with younger populations (ages 9 to 17), however, contributes to the suggestion that youth do not necessarily perceive cohesion in the same way as adults (Eys et al., 2009a; Eys et al., 2009b). More recently, for several reasons, researchers are considering the nature of cohesion in younger populations.

The first reason is the belief that many of the benefits of cohesion found for adults should also be expected for younger populations. For example, it is suggested that the "need to belong," and the concurrent desire for interpersonal attachments, is a fundamental human motivation (Baumeister and Leary, 1995). It is also suggested that this need can lead to multiple psychological benefits if satisfied throughout one's lifespan (Baumeister and Leary, 1995). The second argument arises from research with variables closely aligned with cohesion (e.g., social relationships, affiliation) that demonstrate the benefits derived from social interactions. For example, children consistently report affiliation," "to play as part of a team," and "to make new friends" as reasons for participating in sport (Ewing and Seefeldt, 1996; Weiss and Petlichkoff, 1989). The third argument supporting the importance of cohesion in younger age groups relates to preliminary findings within and external to sport. Research in non-sport related social contexts such as the family has identified cohesion as important for youth development.

Furthermore, most studies in the group cohesion literature have examined amateur or semi-professional adult athletes. The purpose of the current study was to garner an understanding of what cohesion means to Tunisian young elite sport participants with the regard to the Tunisian culture (Boughattas and Kridis, 2016; 2017) and in comparison with the other culture (Eys et al., 2009a; 2009b; Martin and al., 2011; 2012). It would be important to examine whether the perceptions of cohesion can be used with elite young athletes with regard to children specifically (ages 9-12).

Method

Participants

81 young Tunisian athletes (43 males, 38 females) age 10.34±1.87 years, from four elementary schools in the city of Tunisian participated in the present study. The participants engaged in two varieties of interactive sports. These included soccer player and handball. All participants had been competing with the national team for at least 3 years, and the training sessions lasted between 3 and 5 h per week. A heterogeneous sample of sports was sampled to ensure that the results were not sport-specific. The relatively equal balance of males and females was deliberate to ensure that the results were not gender-specific.

Design and Procedure

Ethical approval was obtained to conduct the study and permission was subsequently grated from the principals of secondary schools to solicit volunteers to participate. Each participant was given verbal information on the purpose of the investigation and signed an informed consent before taking part in the study, and obtained permission from apparent/guardian to participate. An interview guide was based on suggestions by Krueger and Casey (2000), Martin et al., (2011) and Eys et al., (2009)a. A moderator who posed questions and probed response. In addition to the above, the moderators were trained to use probing questions to allow participants to expand upon responses (Krueger and Casey, 2000). This interview guide contained (a) introductory questions (i.e., questions to encourage participation and conversation between the participants), (b) transition questions (i.e., questions designed to move the discussion toward the critical subject), (c) four key questions (i.e., questions designed specifically for the purposes of the current study), and (d) an Concluding questions (i.e., designed to close discussion but also to allow any further thoughts/concerns to emerge). The four key questions were concerned with understanding participants' perceptions of (a) the definition of cohesion (b) indicators of cohesive and no-cohesive groups (questions one to three), (c) method of cohesion's development. In the present study, focus groups were comprised of five participants. Each session lasted an average of 45 minutes and took place in a classroom.

Introductory questions: The goal of these questions was to stimulate conversation between the moderator and participants and among participants (e.g. are you plain now in a team? Have you participate in a competition with your team?). 2. Transition questions: The purpose of these questions was to direct attention towards the participants' teams (e.g. since how long time you belong to this team, do you know all players?). 3. Key questions: The aim of these questions was to gather information on individuals 'perceptions of the indicators of cohesive teams, the indicators of non-cohesive teams, as well as methods in which cohesion could be developed within teams (e.g. 'Thinking back to your team, why do you believe your team was cohesive? What goes on in a cohesive group? What goes on in a non-cohesive group? How could you increase the cohesion of your group?'). It was assumed that having respondents focus on the team (cohesive, no-cohesive) would direct attention to the group integration manifestations of cohesiveness from the Carron et al. (1985) model. Concluding questions: The goal of these questions was to terminate the session while also allowing for any final thoughts on the topic (e.g. that is the end of our discussion, is there anything you would like to add?).

Results

For this study, four proposes are undertaken based on the literature: 1/cohesion's perception, 2/ indicators of cohesive teams, 3/ indicators of no-cohesive teams and 4/ method of cohesion's development in teams. For each axis, all responses are classified into two categories: task cohesion and social cohesion. Figures 1, 2,3 and 4 present an overview of the responses to each of the four key questions and the number of meaning units for each category are presented in parentheses. It is important to note, however, that the frequency with which a particular category was discussed in the focus groups is not necessarily an indication of importance; it is just a frequency indicator of quotation of the topic in verbatim. (Krane et al., 1997).

Axe 1: Perception of cohesion

For this first axis of our study, one obtained in total 172 quotations: 103 for task cohesion and 69 for social cohesion.

Task cohesion

The participants' responses (103 meaning units) were represented by five themes related to the perception of task cohesion: 1-play together, 2-help and support, 3-positive communication, 4-respect other's abilities, 5- a total engagement in the team. We noted that the Tunisian sporting children operational cohesion means "play together". For example, subject 73 indicates, "as long as a team plays together correctly, as long as it is cohesive". In addition, a number of participants discussed the concept of "total engagement" in the team, "respected the other's abilities, and help/support. These tree themes are an indicator to team's unit: respect between players, give all importance to team's object before individual goal and respect capacities' of each player. Subject 63 explain: "to be in a team it is like being in a family, and in a family or you should be completely engaged completely or you are". Also, subject 40 affirms: "the team functions only if each player gives 100% of his effort"

Social cohesion

For social cohesion, 69 units are obtained for 5 categories: 1- have friends in the team, 2- know all team's memberships, 3- respect /accept coach and team's memberships, participate in the team's activity, 5- lack of conflict. The responses of the participants are concentrated on the first three themes. Its replicate the principal characteristic of the group's cohesion: the social exchange between team's members, accepting all the difference between them and respecting the personality of each one.

Subjects 80 explains: "*the coach learned us how to us to respect ourselves mutually, for this reason, our team functions correctly*".

Subject 65 indicates: "*everyone must know all the players of the team and we must be friendly with everyone to be able to play together*".

The final two categories reflected typical behaviours and social aspect of cohesive groups that included: participate in team's activity and lack of conflict.

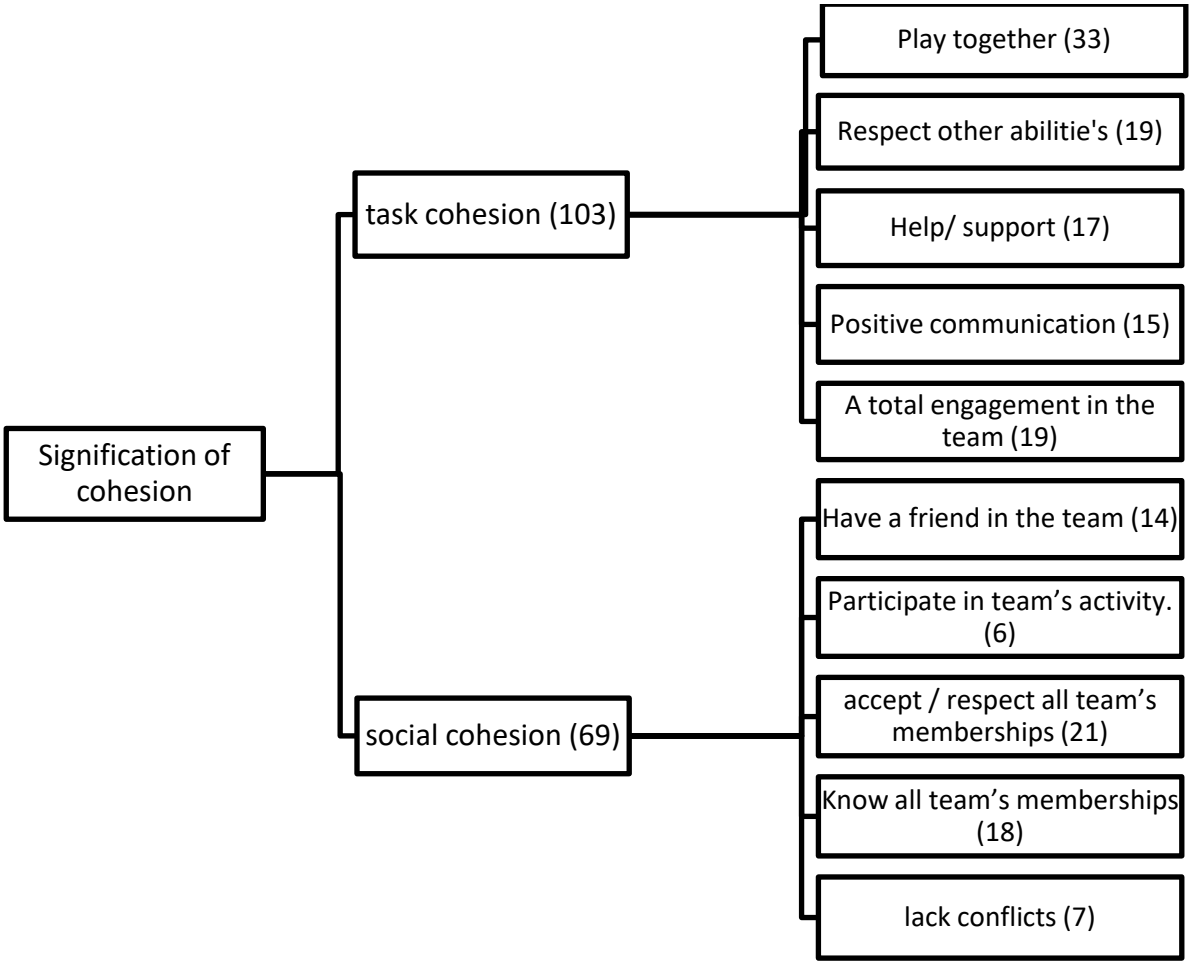

Figure 1. A conceptual framework for perceptions of cohesion by Tunisian sports children. (Number of meaning units in parentheses)

Axe 2: Indicators of a cohesive team

Overall, 83 meaning units were obtained. In terms of the meaning units associated with task cohesion, five themes emerged. These were: 1-play together, 2-respect coach, 3-support team's memberships, 4-correct and help other players, 5- cooperation in competition. For social cohesion, three themes emerged. These were: 1- resolve conflict, 2-good climate, 3-effective communication.

Task cohesion

An important number of participants discussed two concepts of 'play together' and "respect coach" as an indicator of task cohesion. For example, subject 67 say: "…*if players respect the coach and play together, the team wins all match*".

In addition, other indicators of task cohesion were "cooperation", "help/correction other players" and "support team's membership". Subject 17 explain: "*for me the first sign of the cohesion of the team it is the co-operation and the assistance during the match, without this criterion the team cannot gain*".

These themes reflect, for the Tunisian sports children, the capacity of the members of the team to discuss together, to solve the problems, to be supported by the other players and the cooperation during the training and the competitions. Subject 54 explain: "*when we are in a*

team, we should help other players, correct them, to have a better game's strategies in the match"

Social cohesion

For social cohesion, the 26 answers collected of verbatim are classified, as cited, in 3 themes only: 1- resolve conflict, 2-good climate, 3-effective communication. The Tunisian children consider that solve problem and to have a good climate in the team is a sign of social cohesion. Also, these participants focus on the effective communication. This theme reflected the capacity of the players to, not just discuss, but to their capacity to build a positive project starting from this discussion.

For example, subject 20 indicates: *"in my team, we learn how to discuss our mistakes during the competition and we start from this discussion in order to make a strategy to correct our game. Our team is the best, and I think that it is an indicator of cohesion*".

Subject 15 affirms: "*the exchange and the discussion between the players make it possible to avoid any misunderstandings and conflicts, and this is a sign of social cohesion*".

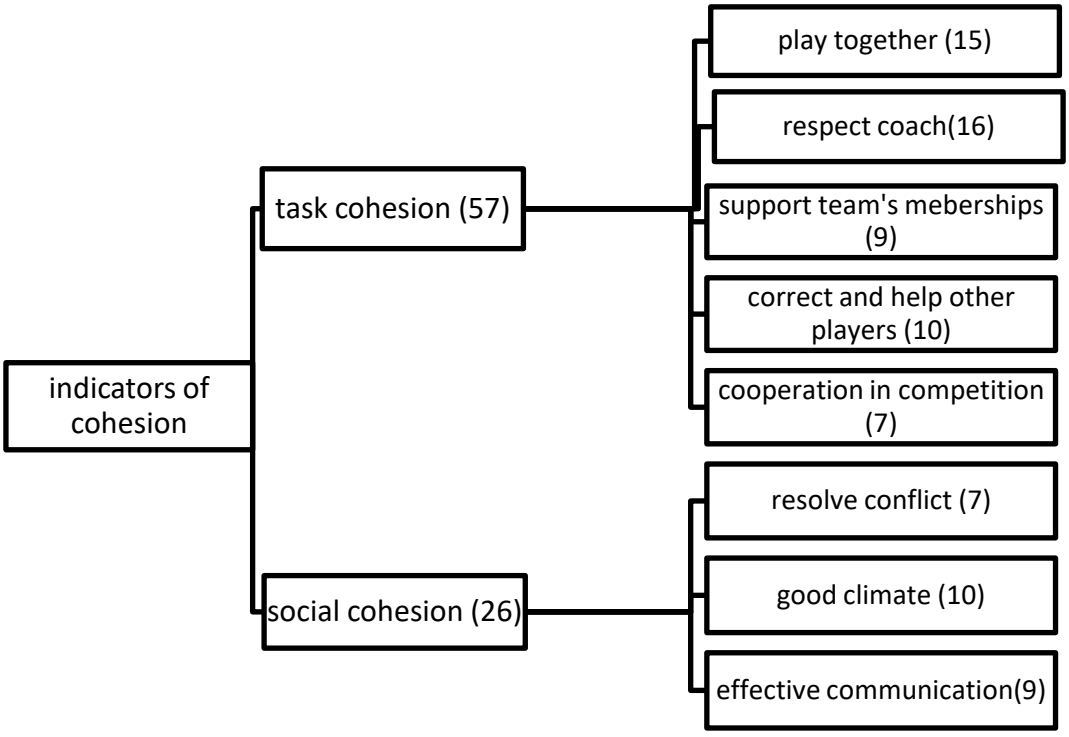

Figure 2. Indicators of cohesive team by Tunisian sports children. (Number of meaning units in parentheses)

Axe 3: Indicators of no-cohesive teams

In response to the question about the indicators of non-cohesive teams, 88 units emerged. For task cohesion, the five themes were 1-do not play together, 2-negative critics, 3-problem/conflict, 4-jealousy, 5- selfishness. As for social cohesion, the three themes were; the 1-create problem, 2-no communication, 3- no respect for coach and team's players. Figure 3 detailed the frequency of each theme.

Task cohesion

These participant's responses suggest that individual character (jealousy, selfishness and negative critics) may be an initial contributing factor to creating problems and conflict in the team. Therefore, these themes represent an indicator of no-cohesive teams.

Subject 14 affirms: "*one time, we play with a bad team, the player is very selfish and don't cooperate together. I think that this way created problem in the team*".

Subject 42 explain: *"the egoist players do not respect the others and create conflicts in the team".*

Social cohesion

Participants' responses were represented by three categories reflecting the social character of the Tunisian perception of the non-cohesive team. A number of participants discussed the concept of "no communication". Subject 50 affirms: "*no communication, no game, no team, it's related*". In addition, the theme "no respect for coach and team's players" represent an important cause of the non-cohesive team. Subject 48 support: "*if we don't respect our coach, we can't respect and applique his instructions*"

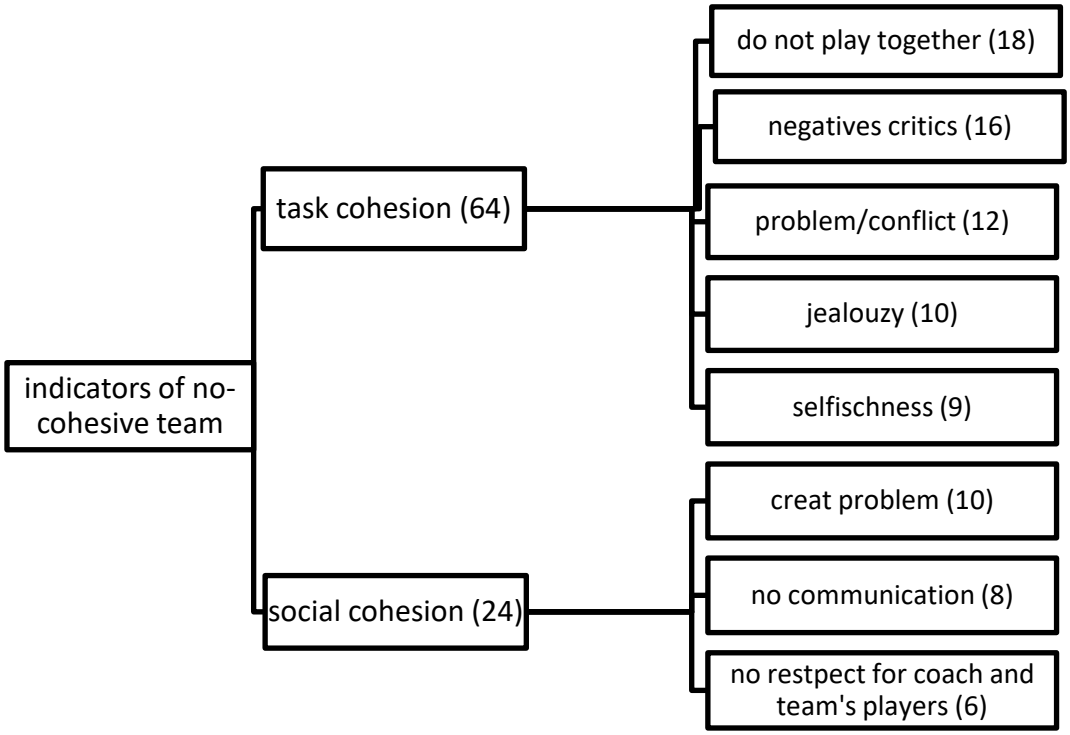

Figure 3. Indicators of the non-cohesive team by Tunisian sports children. (Number of meaning units in parentheses)

Axe 4: Method of cohesion's development in teams

For this propose, we collect 98 responses: 52 for task cohesion and 46 for social cohesion. The responses resulting from questions concerning the procedures for developing task cohesion are classified into five themes and for developing social cohesion into four themes.

Task cohesion

The participants' responses were represented by five categories related to the development of task cohesion. They are 1-positive attitude, 2-positive critics, 3-priority for the team,

4- punishing for players with negative attention and 5- share game's task. An important number of participants discuss the concept of "positive attitude" and "accept critics". Subject 70 explain: "*if we remain positive and we accept critics of the coach and of the other players, it will not have conflicts in the team".*

However, the Tunisians children consider other themes like "punishing for players with negative attention". This theme refers to a specific conception of the method of development of task cohesion. Subject 41 explain: "*if we let certain intrigues and actions malicious develop, the conflicts will be multiplied. It is necessary to act directly and punish all player which tries to create a problem".*

Social cohesion

The four themes resulting from questions concerning general procedures for developing social cohesion were 1-resolve conflict, 2-have friends in the team, 3- talk together and exchange ideas, 4- share positive/good moment/activity of the team. This classification suggests that social acceptance "have friends in the team" and "share positive/good moment/activity of the team" may be an initial contributing factor that develops social cohesion. This is consistent with the others themes "resolve conflict, talk together, and exchange ideas. Subject confirm "in our team, we are friends, we discuss all time with our team, and we share so many happy moments together…"

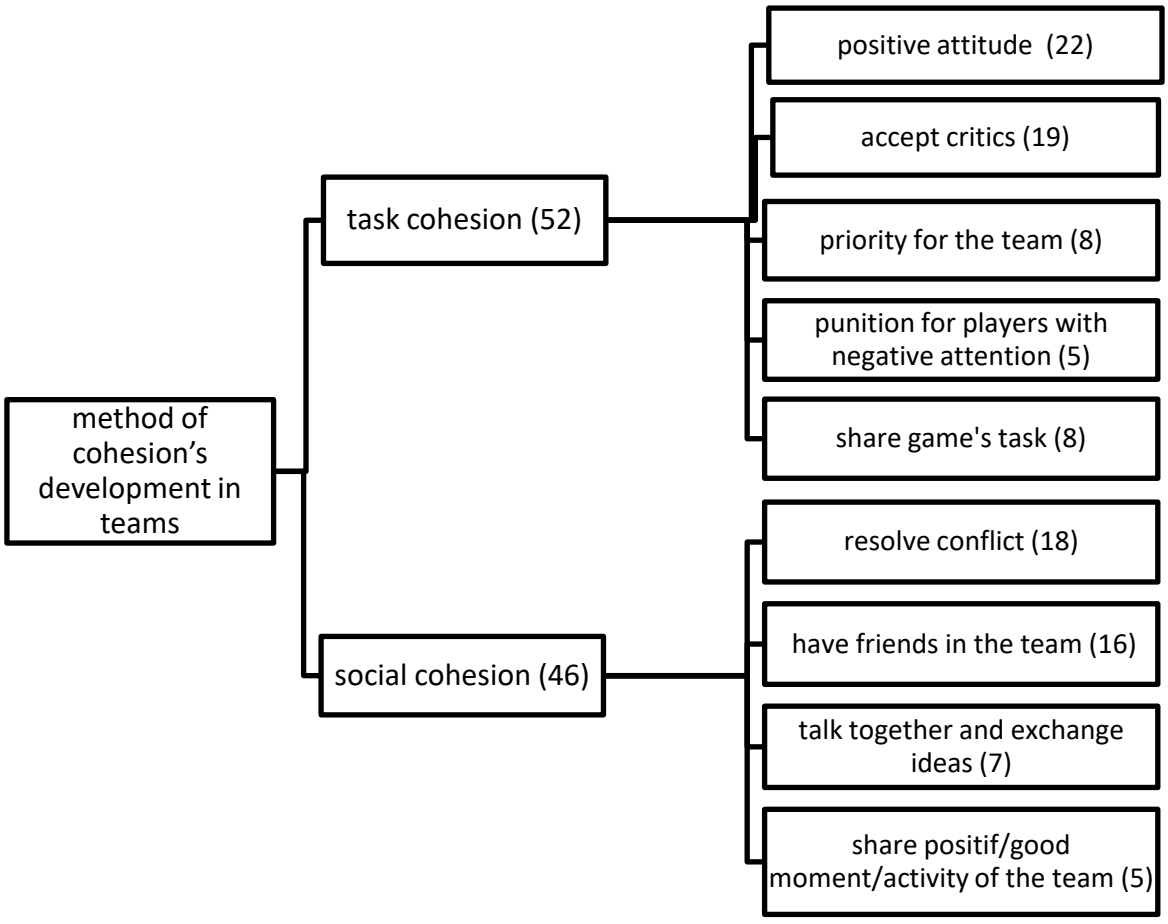

Figure 4. Perceptions of the method of cohesion's development in teams by Tunisian sports children (Number of meaning units in parentheses).

Discussion and Conclusion

The objective of this current study was to examine perceptions of team cohesiveness in Tunisian sport elite children aged 9 to 12. Three axes where undertaken: the first was to examine the meaning of cohesion for the Tunisian children, second, to inspect the indicator of team cohesion and the indicator of the no-cohesive team and their perceptions of how it develops in their teams. Several issues pertaining to the current findings warrant further discussion.

First, decided to use a deductive strategy and group responses into either task- or social-related categories based on theoretical perspectives advanced in sport cohesion literature (e.g., Carron et al., 1985; Eys et al., 2009a; Martin et al., 2011).

However, the first result relates to Tunisian sportive children's understanding of the concept of cohesion. Our results demonstrated the participants comprehend the phenomenon known as cohesion, Specifically, participants distinct between to both task cohesion and social cohesion, describe the characteristics of cohesive and non-cohesive teams, and identify methods used to attempt to develop cohesion in their groups.

This finding parallels those with the results from previous research of Martin et al. (2011) who affirmed that "children begin to understand complex constructs and differentiate among them at different stages". Martin's study found also, that children as young as nine years understand the phenomenon known as cohesion. They can discuss the group as a totality and they can, in fact, differentiate between task and social cohesiveness. In addition, the study of Eys et al. (2009a) highlighted the ability of youth sport participants to distinguish between task and social cohesion: children are not only attracted to the social aspect of their teams but also understand and enjoy the closeness of a task-oriented group.

The second finding is related to the perception of cohesion by Tunisian sports children. The result demonstrates that our participant's considerate task cohesion as play together, respect other's abilities, help/ support, positive communication and a total engagement in the team. These themes focused on the group attraction as an indicator of task cohesion. This result are partial consistent with Eys study's (2009a) whose provides the same themes for task cohesion, in addition with other categories like coach's behaviour: for Eys's population, task cohesion is associated with the question of whether the task subcategory, Coach Relationship with Team, is considered as a separate and primary dimension of cohesion. Thus, horizontal cohesion refers to cohesion experienced within the group whereas vertical cohesion reflects relations between leaders and followers (Dion, 2000). In the other hand, our results are in contradiction with the conclusion of Martin's study (2011) who provided task cohesion as a phenomes base on an individual social character like "eliminate conflict", "be unselfish", share the blame" and "talk things out".

For the perception of social cohesion, the number of themes is the same as task cohesion as social cohesion but the number of citation is important for task cohesion then social cohesion. This result indicates that the Tunisian sports children appreciate task cohesion more than social cohesion. This conclusion confirms the literature provided by Eys et al. (2009) as it demonstrated that the young athletes (13-17 years) cited ten categories for task cohesion and only seven categories for social cohesion. This conclusion is in contradiction with Martin et al. (2011) who found that children (9-12 years) appreciate social cohesion than task cohesion. They also precise that the source of attraction to the group is social as the conclusion advanced by Baumeister and Leary (1995), Donkers et al. (2014).

Further, consistent with the results from previous research (Martin et al., 2011), the perception of Tunisian children (9-12 years) for social cohesion is based on the individual attraction to the group like have a friend in the team, know all players, participate in team's activity.

On the other hand, although our results confirm in party those of Eys's study (perception of task cohesion more than social cohesion), our conclusions are in contradiction with those of the same study with regard to the categories cited: the participant of Eys's study considerate the coach relationship to the team as a principal indicator of social cohesion.

The third issue for this study is related to the indicators of cohesion and non-cohesion team. Tunisian sports children cited as an indicator of cohesion team: "play together", "respect coach", "support team's memberships", "correct and help other players" and "cooperation in competition". Those themes support, as the study of Martin et al. (2011), that a cohesive team has necessary decreased levels of interpersonal conflict. Our participants give importance to help, support and respect between coach and players as an indicator of cohesion. In addition, the importance attached to conflict appeared with the indicator of social cohesion: Tunisian participants cited "resolve conflict", good climate" and "effective communication" in contradiction with Martin's study which gives more importance to team attraction as an indicator of social cohesion (for example, have team events, make new friendships).

Interestingly, the indicators of the no-cohesiveness team seem contrary to those quoted as an indicator of the cohesive team: for example, for task cohesion, Tunisian participants cited "do not play together" and "conflict". For social cohesion, they mentioned "created problem" and "no communication". Regardless, another point to consider is that our sample gives importance to individual factors as an indicator of no cohesiveness team (example: jealousy and selfishness). Interestingly, it seem that Tunisian children distinguish between "individual attractions to the group" and "the groups integration" in contradiction with the literature: recent study with younger populations suggests that children and adolescents (ages 9-17) do not distinguish between individual attractions to the group and the groups' integration, but rather, simply perceive cohesion as encompassing task and social orientations, a two-dimensional construct (Eys et al.,2009a, 2009b; Martin et al., 2011). This will be explained by cultural context and the nature of Tunisian sport's team: the study of Boughattas and Kridis (2016) suggest that the Tunisian sportive team show an important interest to players' responsibility, punishment if players do not assume their responsibility, and give importance to task cohesion more than social cohesion. This way can explain the tendency of our sample to the cited individual as an indicator of the no-cohesiveness team. This suggests also, that we should investigate more study in these axes to understand more the perception of cohesion by the younger population.

The last issue for this study is focused on the method of development of team's cohesion. As the other axes (perception of cohesion, indicators of cohesive team and indicators of the no-cohesiveness team), it seems that children are more concentrated on individual cases as an important factor of development of team's task cohesion: for example "positive attitude", and "accept critic". In addition, our sample quoted tow method related to the group: "priority for the team" and "punishing for players with negative attention. As was mentioned in the results section, it is not possible to confer importance to certain ideas simply based on the frequency with which they were discussed. The development of an operational measure of cohesion for children would critically assist in determining the salience of these categories. However, we can suppose that the specific nature of the sample may have contributed to this result as cited in the study of Boughattas and Kridis (2016). With regard to the literature (Eys et al., 2009a;

2009b), the method for development of task cohesion is totally different; Eys affirmed that 'the participants' responses to how individuals (e.g., coaches) have developed cohesion in their groups represent a very narrow perspective of the many avenues through which this group property can be improved". Moreover, there are a number of avenues to pursue the development of group cohesion cited by Eys, to which the Tunisian participants in the current study did not refer (e.g. coach's behaviours and practice structure). Eys and colleagues explain that "this is not a statement on the quality of their responses but rather their exposure to methods devoted to developing group cohesion". For social cohesion, Tunisian participants quoted methods related to the group attraction like "talk together/exchange idea" and "have friends in the team" in adequacy with Eys's and colleagues study. This category refers to the participant shave developed cohesion in their groups. It represents a very narrow perspective of the many avenues through which this group property can be improved, Eys et al. (2009a).

These findings suggest that having more cohesive sport teams may provide children with greater opportunities to be satisfied with their sport experiences, more confident in their abilities to complete a task, and less anxious prior to attempting that task. Further, consistent with the results from previous research, individual factors attracting children to sport teams (and, therefore, contributing to cohesion) include being with friends and being affiliated with others (Ewing and Seefeldt, 1996; Weiss and Petchlickoff, 1989). The fact that children seemingly begin to understand complex constructs at young ages (e.g., Hall et al., 2007; Passer, 1996; Scanlan et al., 2005). The present results contribute to a suggestion that by the age of nine, children understand the concept of cohesion as it relates to their sport teams (Martin et al., 2011). In addition to understanding the concept, our results suggest that children have the cognitive ability to distinguish between task and social aspects of cohesion. This is an important finding; it suggests that children are not only attracted to the social aspect of their teams but also understand and enjoy the closeness of a task-oriented group.

Overall, this study demonstrated that Tunisian children (9 to 12 years) understand the concept of cohesion along with the advantages associated with its presence and the disadvantages associated with its absence. They also can discuss how to develop cohesion in their team. It seems that children's perception of cohesion is very different from the adult's perception. In addition, our sample presented a bi-dimensional conceptualisation of cohesion (task/social cohesion) inadequacy with the literature. Although, this study provides same new result concerning the nature of perception of cohesion related to the Tunisian culture and the specific character of Tunisian sport team. Moreover, this study highlights the importance of the group for children especially cohesion. For the contradictory results between our study and literature, a greater investigation in this subject should be engaged to examine more the cohesion's conceptualisation in young sport participants. Therefore, a necessary next step is to develop a cohesion inventory specifically tailored for Tunisian sport children. A greater conceptual understanding of this construct with a young population will likely serve to prompt the development of a useful measure.

To summarize, children populations understand the concept of cohesion as it pertains to their sport team and respond to queries about the concept based on task and social orientations of the group. Given the important role cohesion seems to play in sport and physical activity contexts in older populations including both performance (e.g., Carron et al., 2002) and adherence (e.g., Spink and Carron, 1994), a greater conceptual understanding of this construct with a children population, will likely serve to prompt the development of a useful measure, spur greater research interest in the area, and foster increased enjoyment and participation in physical activity through effective, evidence-based methods to enhance group functioning.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS716

The Effectiveness of Yoga Practicing on Blood Pressure and Some Physiological Indexes of Patients with Stage 1 Hypertension

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Type: *Research Article (**Received:** 26.12.2017 – **Corrected:** 27.01.2018 – **Accepted:** 27.01.2018)*

Abstract

Hypertension is a major public health issue affecting millions of people around the world and is also a major risk factor for stroke, cardiovascular and chronic kidney disease. Lifestyle modifications have been recommended as a first line approach for both prehypertension and stage 1 hypertension. Yoga had been shown to be one of the most popular therapies in older hypertensive patients. This study is carried out with controlled trial of yoga practice. After 12 weeks of yoga training, the results show that systole of yoga group decreased 13.1 mmHg and diastole of yoga group decreased 6.2 mmHg. Indicators such as BMI, Waist significantly decreased ($p < 0.001$). Cholesterol and Triglyceride also significantly decreased ($p < 0.05$). There is no change for HDL – C and LDL – C.

Keywords: Blood pressure, Hypertension, Yoga

Introduction

Hypertension is one of the most common diseases in the world, affecting approximately 26% of the adult population (Kearney et al., 2005). Hypertension is also known as high blood pressure, is a long-term medical condition in which the blood pressure in the arteries is persistently elevated (Naish & Court, 2014). Long-term high blood pressure; however, is a major risk factor for coronary artery disease, stroke, heart failure, peripheral vascular disease, vision loss, and chronic kidney disease (Lackland and Weber, 2015; Mendis et al., 2011). Lifestyle changes and medications can lower blood pressure and decrease the risk of health complications. Lifestyle changes include weight loss, decreased salt intake, physical exercise, and a healthy diet (Poulter et al., 2015). Modern medicines can treat hypertension but in the long run they have side – effects (Vogel, 1992).

Previous studies have also shown that yoga may reduce blood pressure (Cade et al., 2010; Cohen et al., 2011; Mourya et al., 2009). The current study provides further evidence about the usefulness of Yoga in treating hypertension.

Materials and Methods

Participants

This study was carried out on 29 hypertensives at stage 1. Patients were examined to have hypertension at stage 1 at Cardiology Department, Vinh city hospital, and not ever use any dose for hypertension treatment.

Inclusion criteria: Patients aged 30-64 and not using any dose of hypertension treatment and any drugs that affect blood pressure (such as corticoid). Participants are non-smoker and volunteer to consent to study.

Exclusion criteria: Patients with hypertension have complication of heart, kidney, eyes, and peripheral blood vessels. Not capable to practice yoga and not on a diet. Participate in 90 percents of yoga sessions.

Design

This is a pre and post study. Intervention group practiced 70 minutes/day and 3 sessions/weeks including meditation (10 minutes), breathing exercise (10 minutes), Yoga gentle (30 minutes), laughing yoga (10 minutes), yoga nidra (10 minutes).

Blood pressure is determined by sphygmomanometer. Anthropology: for measuring height, weight, waist, BMI. Triglyceride, cholesterol, LDL-C, HDL-C are determined by Automatic Analytic Biochemistry Machine Hitachi 704.

Statistical analysis

Pre and post comparison was used to assess the differences among phases of study. $P < 0.05$ was considered to be statistically significant. Epi Info software was used to analyse data.

Results

Characteristics of study sample

The average age of research sample is 54.8 ± 4.1; including 6 males and 24 females. There are 6 people have salty food daily (appro. 20%); nobody stays up late after 23 o'clock.

Effectiveness of yoga practicing on blood pressure

Systole and diastole were checked in the early mornings at different phases of study. The results are indicated in table 1.

Table 1. Effectiveness of yoga practicing on blood pressure

Indexes	Phases				
	Baseline (0)	After 6 weeks (6)	After 12 weeks (12)	(12) – (0)	$P_{0\text{-}6;\ 0\text{-}12}$
Systole (mmHg)	151.2± 8.4	146.5 ± 7.5	137.1 ± 6.9	-13.1	<0.001
Diastole (mmHg)	90.6 ± 6.2	88.1 ± 4.7	84.4 ± 4.5	- 6.2	<0.001

Results in table 1 showed that after 6 weeks of yoga practicing, systole and diastole of patients with hypertension decreased significantly; systole decreased 13.1 mmHg and diastole decreased 6.2 mmHg (p<0.001).

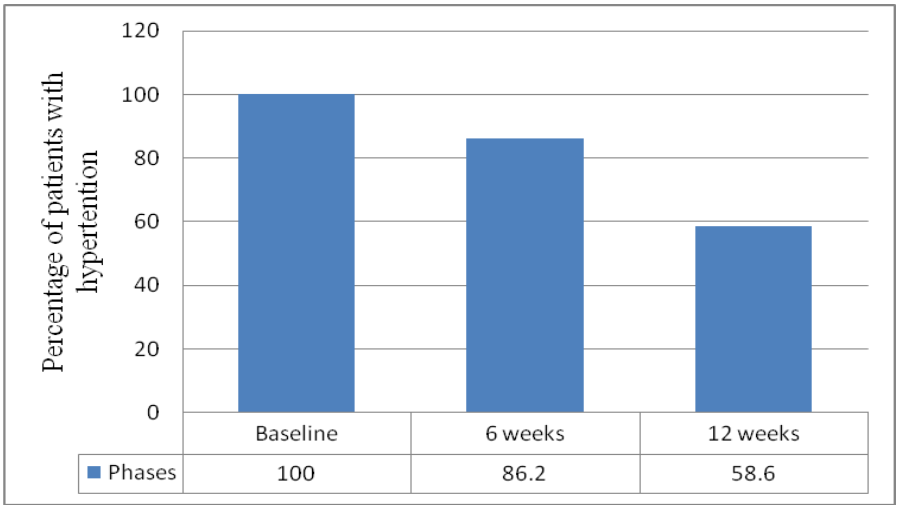

Chart 1. Rate of hypertensives at different phases of study

There were 100% of patients with hypertension at the baseline, however after 6 weeks of yoga practice, the rate of hypertensive decreased to 86.2%, and 58.6% after 12 weeks (chart 1).

Effectiveness of yoga practice on some physiological indexes

Table 2. Effectiveness of yoga practicing on some morphological indexes

Phases	Weight (kg)	BMI	Waist (cm)
Baseline (0)	61.6 ± 5.9	23.7 ± 3.4	84.4 ± 5.6
Afer 6 weeks (6)	60.2 ± 5.5	23.2 ± 1.7	82.9 ± 4.5
Afer 12 weeks (12)	58.4 ± 4.6	22.5 ± 1.4	80.3 ± 4.4
$P_{0\text{-}6;\ 0\text{-}12}$	>0.05; <0.001	>0.05	<0.05; <0.001

The results in table 2 showed that after 6 weeks and 12 weeks of yoga training, weight and waist of hypertensives decreased significantly in comparison with baseline (p<0.001). BMI reduced but no significance (p>0.05).

Table 3. Effectiveness of yoga practicing on some physiological indexes

Phases	Cholesterol (mmol/l)	Triglycerid (mmol/l)	HDL-C (mmol/l)	LDL-C (mmol/l)
Baseline (0)	6.6 ± 2.3	2.6 ± 1.1	1.1 ± 0.5	3.5 ± 1.2
Afer 6 weeks (6)	6.1 ± 2.6	2.4 ± 1.3	1.3 ± 0.9	3.2 ± 1.6
Afer 12 weeks (12)	5.3 ± 2.0	2.0 ± 0.8	1.4 ± 0.6	3.0 ± 1.4
$P_{0\text{-}6;\ 0\text{-}12}$	>0.05; <0.01	>0.05; <0.05	>0.05	>0.05

The results in table 3 indicated that after 6 weeks of yoga practicing, blood lipids indexes such as cholesterol, triglyceride, LDL-C decreased and HDL-C increased but no statistical significance. Cholesterol decreased significantly with $p<0.01$, triglyceride also decreased with $p<0.005$. There is no significant reduction for HDL-C and LDC-C.

Discussion and Conclusion

The aim of this study was to assess the effectiveness of yoga exercise on hypertension and some indexes involve hypertension. The results of the study showed that after 12 weeks of yoga training (gentle yoga, meditation, laughing yoga, breathing yoga, and yoga nidra contributed to hypertension treatment

Previous findings suggested that yoga exercises may be beneficial for reducing triglyceride, cholesterol, LDL in patients with diabetes (Shantakumari and Sequeria, 2013), reducing stress, cholesterol (Mandape et al., 2015). Another prior study was an 8-week pranayama and asana yoga program conducted in 27 untreated hypertensive patients and 27 controls living in Thailand, the intervention group showed a significant reduction in systole blood pressure by 25mmHg at 8 weeks compared to 2mmHg increased in the control group (McCaffrey et al., 2005). In another finding suggested that yoga program has positive effect on hypertensive patients and on set-rated quality of life. Yoga practicing may be useful as a supplementary blood pressure therapy in addition to medical treatment when prescribed by primary care physicians (Wolf et al., 2013). The author of another study observed that after 12 weeks of yoga training the systolic blood pressure decreased 10 mmHg (Bagga and Gandhi, 2005).

This finding, to some extent, is consistent with results of the previous study that yoga improved hypertension (Murugesan et al., 2000), systolic blood pressure (Wolf et al., 2013), blood pressure (Cohen et al., 2011). However, added to this study, next study may be focused on effects of yoga on patients with chronic diseases.

To conclude, after 12 weeks of yoga training, blood pressure of patients with hypertension at stage 1 decreased significantly. Yoga may have a contribution to hypertension treatment.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS717

Trend of Recreational Activities among the Lawyers

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Type: *Research Article (**Received:** 30.12.2017 – **Corrected:** 11.02.2018 – **Accepted:** 22.02.2018)*

Abstract

The present study was an effort to know the trend of recreational activities among the lawyers. All the lawyers of district Dera Ismail Khan were taken as the population of the study. For the collection of data, a closed form of the questionnaire which was personally distributed by the researcher among the respondents and collects it back after getting it filed by the respondents. The collected data were tabulated and analyzed by using percentage (%) as a statistical tool. After data analysis, it was concluded that there are many recreational trends among the lawyers in District Dera Ismail Khan.

Keywords: trend, recreational activities, lawyers, District Dera Ismail Khan

Introduction

Physical activity, recreation, and sport are not only necessary resources to encourage optimal mental health and well-being, but they are also playing a vital role in the prevention of physical and mental illness. It can also develop Positive emotion, enjoyment, relaxation, and success. People of all ages and abilities can experience these elements of well-being from participation in personally meaningful and pleasant physical activity, recreation, leisure, and sport (Henderson and Karla, 2006). Making this opportunity more available to other peoples often has the possibility to make an important difference to the mental health and well-being of citizens, families, and communities (Heintzman, 2008).

According to Halpenny (2010), regular visiting public parks are the best sources and play a significant role in social development and also contribute towards the social contact. Playgrounds and parks are the best means for the people of society to use their free time in a positive manner and avoiding the tense environment and also very important for society by putting optimistic impact upon their physiological, mental and sociological aspect of life (Kaźmierczak, 2013).

In the current technological age, we do each and every task of our routine life to the machines and computers which tend to make the man not only idle, lazy and unfit but also develop various types of diseases such as obesity, diabetes and also various types of heart problems. Games and sport are the only helpful means for getting recreation, happiness and proper use of the abundance of leisure time but also play a significant role in solving the important social issue (Ginsburg, 2007).

The best use of leisure in terms of engaging us in different types of sport activities of our own choice and interest (Shannon, 2006) and Place, 2004). A well-known saying “Free mind is the shop of the devil” it means when we do not keep ourselves busy in routine work or in any sort of recreational activity then different abnormal activities like aggressive, violence and drugs abuse behaviour occur in our daily life.

Physical activity and recreation are well documented for reducing the risk of physical health problems and improving mental functions in children and youth. Leisure, recreation, sport and physical activity can develop good physical health and psychological well-being and decrease risks of internalizing problems that may put youth further at risk for addiction and problem behaviour. Leisure or recreation participation can also be a resource for adolescents to cope with stress in their lives (Riner and Sellhorst, 2013).

Participation in recreational activity has been associated with decreased anxiety and mental depression, improved confidence, decrease mental stress and reduced drug use (Meyer et al., 2014; Ngô, 2013). Conversely, lack of physical activity has been associated with worried and depressed symptom, social separation, community problems, pressure and nervousness (Eimeetal, 2013).

Statement of the problem

Lawyers are the persons who are deal all legal problems in societies. Due to work stress and lack of physical and recreational activities they fall in many kinds of diseases, like obesity, Blood pressure as Haastrup (2011) keenly observed the incessant hospital attendance of lawyers through hospital records for treatment of cardiovascular and cardio respiratory-related health problems as a result of obesity and overweight; a product of inactivity. In the light of the above statements, the researchers intend to determine the recreational trends among lawyers in District Dera Ismail Khan. The questionnaire will be used for the purpose of data collection.

Objectives of the study

- Following were the objectives of the study;
- To find out the recreational trends among lawyers in District Dera Ismail Khan.
- To determine the interest and motivation of lawyers towards recreational activities
- To determine the causes behind the inactivity of lawyers regarding recreation
- To suggest some recreational activities which will be suitable for lawyers

The significance of the study

The study will be significant for the lawyers because through findings of the present study the lawyers will know their attitude, interest, and motivation towards recreational activities. Then they work on their negatives and promote and develop their positives. This study will give new life to the lawyer's enjoyment of work. This study will prove to be significant for the policymakers to know ground situation and work on negatives and promote recreation trends among lawyers through new policies and to decrease the aggressiveness of lawyers.

Research Questions

- Whether there are any recreational trends among lawyers in District Dera Ismail Khan.
- Whether there are any interest and motivation of lawyers towards recreational activities
- Whether there are any causes behind the inactivity of lawyers regarding recreation.

Literature Review

Recreation is defined as the practice that outcome from freely chosen involvement in physical, social, mental, intellectual, creative and spiritual pursuit that develop individual and the public well-being (Corazon et al., 2010). Recreation activities that take place in parks include comforting, social meeting, reading, observing wildlife, walking, photography, or simply just enjoying the surroundings. Taking time to slow down mental tension and relax alleviates stress, especially when a freely selected leisure activity is being participated (Moore, et al., 2012).

Recreation generally classified physical activities in which the activities, the nature of involvement, and the time are freely chosen and do not require inventory for a program or a league. This consists of walking, running, children playing, skateboarding, shiny and other pick-up sports games, and numerous other activities (Gallegos-Carrillo, Katia et al. 2012). Some of the benefits of regular participating in impulsive recreation activities include improved life expectancy, reduced rates of sadness and the development of a strong sense of society. Proper and regular recreation program policy to promote an active lifestyle and without the convenience of urban parks systems. The chance for impulsive recreation would be greatly limited in most cities (Henderson and Karla, 2006). The Trends recommend that recreation interests are developing in such a way that favors spontaneous involve over planned as well as individual activities over team sports.

According to Alberta Park and Recreation Association (2002), Many informal detections can be done alone or in small groups, at elastic times, for less cost, and are accessible closer to home. Parks must remain accessible to everyone for enjoying their leisure time and inclusive to afford all inhabitants the opportunity to take part in their desired activities and to formulate a positive common sense of place and belonging the benefits of customs and tradition and

also recreation experiences contribute to community progress (Wellness Alberta, 2015). Socializing, volunteering, friendships, civic pride, preserving history, and appreciate one another difference are just in the way of activities in parks relay into community growth. Take part in recreation through urban parks and open spaces creates leadership development chance that constructs strong community, social assets, and consistency (Payne and Laura, 2002).

According to Borges et al. (2015) incentive to take on in free time activities include socializing with friends and to meet new people as leisure activities instill a sense of belonging. Parks are placed for facilitating the amount of activities to take place in which a sense of belonging is searched. If an individual get that sense of belonging the environment in which it was achieved is internally developed into having a strong and positive sense of place. Presently only one percent of the total healthcare budget is devoted to the primary avoidance of chronic diseases, illness, and injuries.

Government's arrangement to address this issue, parks should be located to play a leading role. Recreation departments are too commonly viewed as tangential rather than core community services but a major problem such as inactive lifestyles and fatness are becoming a financial trouble on society; therefore, it has been argued that parks and recreation should be repositioned as health care providers (Meyer et al., 2014). The amount of funding that is invested in preventing health issues is underinvested. Parks need to be placed as preventive health care facilitators or enablers, which needs to be understood better by the public through improved infrastructure and encouragement initiatives.

The physical fitness, wellness and health benefits of parks are an easier sell as active living chance are generally seen as a way to improve physical health, which has been well proven through widely accepted research (Liu and Walker, 2015; Pye et al., 2015). Mental health is not as easy to understand as physical health however mental health benefits and physical activity have been proven to absolutely correlate. Recreation parks are a platform for learning different skill and education. Continuing on the topic of the natural environment, urban parks are a great place for hands-on learning good habits and experiences. Targeting children and youth for nature education is critical in influencing the next generation of leaders to take care of their environment.

Methods and Materials

To reach certain findings and conclusion the researcher adopted following research methodology.

Population; All the Lawyers of District Dera Ismail Khan was the population of the study

Sample and Selection of Sample; There are total 450 lawyers working in District Dera Ismail Khan, being a student's researcher it is a very large population to investigate to overcome this difficulty the researcher adopt Dr. Khan and L. R. Gay formula and takes 20% of total population. The researcher takes 90 lawyers using simple random sampling technique.

Tool for Data Collection; A closed form of Questionnaire was used for the purpose of data collection.

Mode of Data Collection; Questionnaire was developed under the supervision of research supervisor and related literature used. The final version of the questionnaire distributed by the researcher upon the respondents and collected I back personally after the completion of course of work. The collected data put in the form of the data matrix in SPSS.

Data Analysis; The collected data tabulated and analyzed using percentage on the basis of data analysis the researcher will draw findings and conclusions.

Findings

Research Question: Whether there are any recreational trends among lawyers in District Dera Ismail Khan?

Table 1. Recreational trends among lawyers

Respondent	N	No	Statement	Yes%	No%
Lawyers of District Dera Ismail Khan	**90**	**1.**	Recreation is the joy of mind	98%	02%
		2.	Recreational activities includes all those activities which we played in our free time	90%	10%
		3.	Recreational activities include Watching TV Playing small area, Games, Picnic, Travelling and Dancing.	91%	09%
		4.	Chances of Recreational activities is given to you	69%	31%
		5.	Recreational activities refresh your modes and reduce tension after doing any activity for a longer period of time	97%	03%
		Total		**89%**	**11%**

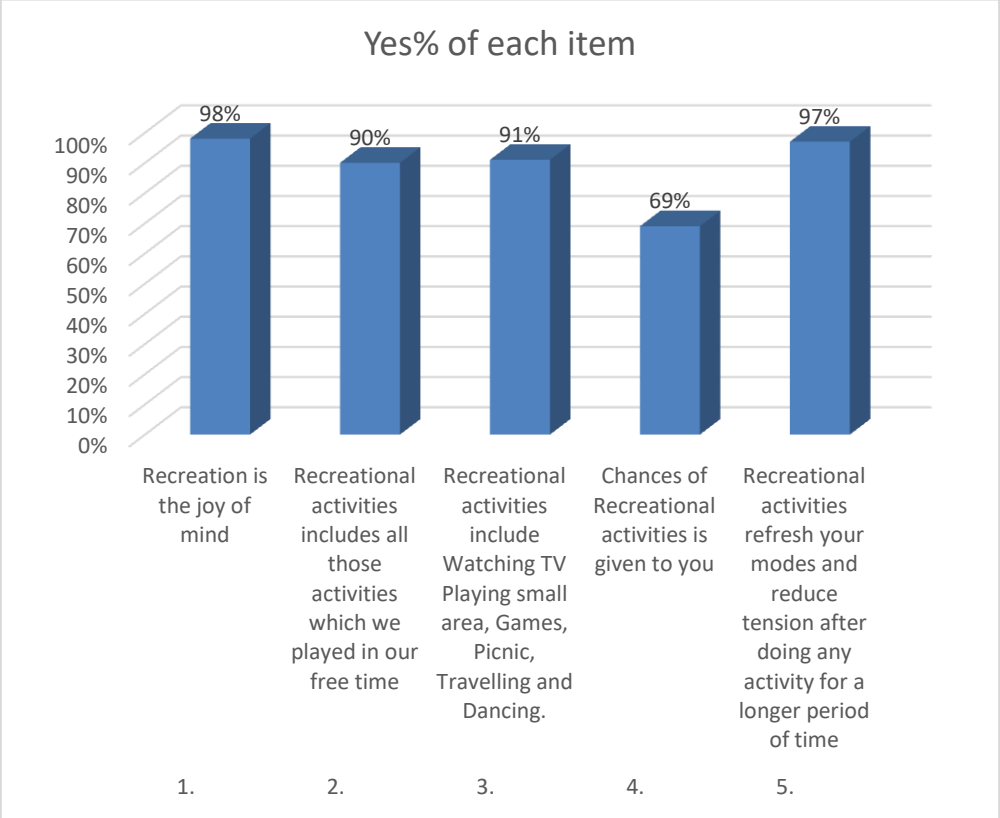

Figure 1. Recreational trends among lawyers

The above table and figure showing the responses about the trend of recreational activities. In response to the first item, table depicts that 97% of population opined that Recreation is the joy of mind while 2% not agree with this statement of the total population. Which indicate that majority of the respondents agree with the statement (98% >02%). At the same time, In response of the second statement in table 1 and figure 1 showing that 90% of population opined that recreational activities are all those activities which we played in our free time while 10% does not agree with this statement of the total population. Which indicate that majority of the respondents agree with the statement (90% >10%). In the same way, All the lawyers were asked about the kinds of different recreational activities and researcher found that 91% of population opined that Recreational activities include Watching TV, Playing small area games, Picnic, Travelling, and Dancing etc while 9% does not agree with this statement of the total population. The percentages of the third item indicate that majority of respondents agree with the statement and shows their trends positive towards recreational activities (91% >09%).

Similarly, in the response of the fourth statement, the above table and figure depict that 69% of population opined that they are given Chances of participation in recreational activities while 31% does not agree with this statement of the total population. Which indicate that majority of respondents shows agreement with the statement (69% >31%). At the same time, the lawyers were asked about the refreshing their moods and reducing tension remedy, the above table depicts that, 97% of population opined that recreational activities help in refreshing your modes and reduce tension after doing any activity for a longer period of time while 3% does not agree with this statement of the total population. Which indicate that majority of respondents agree with the statement (97% > 03%). The lawyers were asked about their recreational trends in five different states the researcher found that total 89% respondents respond that there is a recreational trend among lawyers while only 11% were against the recreational trend. The total percentage of above table shows that there is a recreational trend among lawyers (89% >11%).

Research Question: Whether there are any interest and motivation of lawyers towards recreational activities

Table 2. Interest and motivation of lawyers towards recreational activities.

Respondent	N	S.No	Statement	Yes%	No%
		Interest of lawyers towards recreational activities			
Lawyers of District Dera Ismail Khan	**90**	**1.**	I love to participate in recreational activities	87%	13%
		2.	I participate in recreational activities on regular basis	88%	12%
		3.	I have purchased some equipment for my recreational activities and keep it in my office	73%	27%
		4.	I have set special time for my recreational time in my daily schedule	76%	24%
		5.	I prefer to participate in recreational activities in my leisure time.	89%	11%
		Total		**83%**	**17%**
		Motivation of lawyers towards recreational activities			
		6.	I participate in recreational activities to refresh mode	91%	09%
		7.	Best way to reduce tension is recreational activities	70%	30%
		8.	I'm feeling pleasure when me active in recreational activities.	81%	19%
		9.	I'm involving my clients to take part in recreational activities with me to reduce his worry.	72%	28%
		10.	I motivate my other friends to take part with me	68%	32%
		Total		**76%**	**24%**
		Grand Total		**79%**	**21%**

Figure 2. Interest of lawyers towards recreational activities

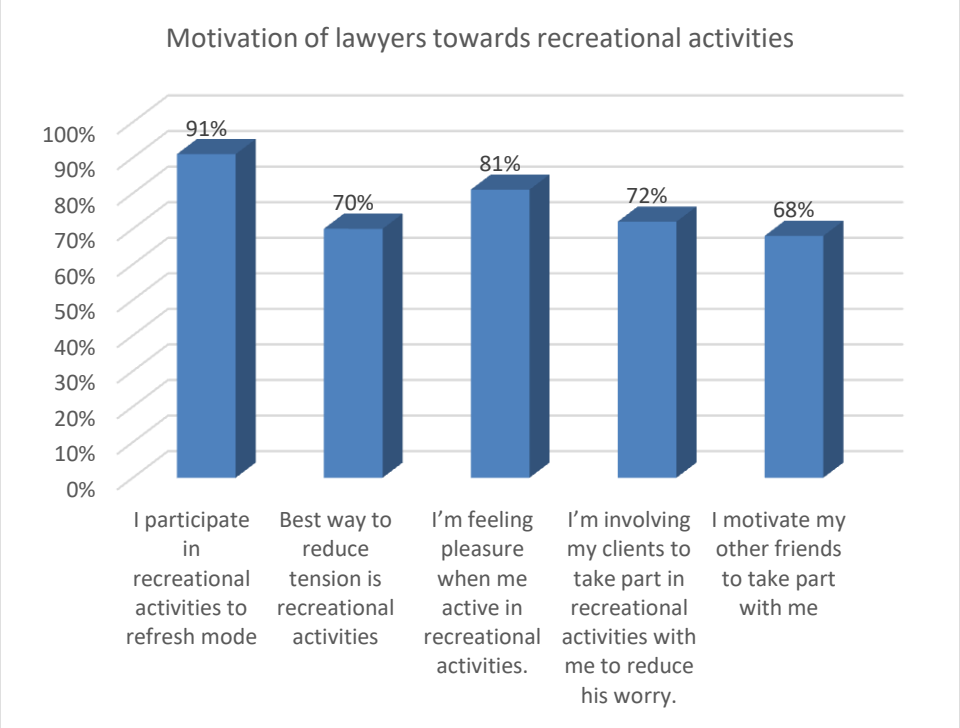

Figure 3. Motivation of lawyers towards recreational activities

In the above table 2 has two different parts the first consisted of 5 items which were asked to measure interest of lawyers in recreational activities and in the second part the researcher try to motivation of lawyers towards recreational activities the statement of motivation portion is also five. The total number of respondents is 90 who are all the lawyers of District Dera

Ismail Khan Bar council. The researchers have used a nominal scale with two options yes and no.

In response of first item in table 2 and figure 2 about interest, the table depicts that 87% lawyers agree with the statement that they love to participate in recreational activities while only 13% shows disagreement with the statement which indicates that majority of the respondents agree with the statement that "I love t participate in recreational activities (87% > 13%). At the same time lawyers were asked about participation frequency in recreational activities the researcher found that 88% lawyers take part in recreational activities on a regular basis while 12 % are not which indicates that majority of lawyers take part in recreational activities on regular basis (88% > 12%).

In the same way, 73% respondents agree with the statement that "I have purchased some equipment for my recreational activities and keep it in my office while 27% shows disagreement with the statement (73% > 27%). Similarly, 76% respondents agree with the statement that "I have set special time for recreational activities in my daily schedule while 24% are against the statement. Which indicates that majority of the lawyers shows agreement with the statement (76% >24%). Subsequently, in response of the last statement of interest portion, the researcher found that 89% lawyers prefer to participate in recreational activities in their leisure time while only 11% avoid participating in recreational activities in their leisure time. Which indicate that majority of lawyers prefer to take part in recreational activities in their leisure time (89% >11%).

So it is concluded according to the above table that, 83% lawyers take interest in recreational activities while only 17% shows disagreement with 5 statement of interest towards recreational activities. Which indicates that majority of the lawyers take interest in recreational activities (83% > 17%)

At the same time, in table 2 and figure 3 the lawyers were asked about their motivation towards recreational activities in 5 statements. The 91% lawyers respond that "I participate in recreational activities to referees mode" while only 09% are against the statement (91% >09%). In the same way, 70% respondent's shows agreement with the statement that, "the best way to reduce tension is recreational activities" while only 30% are against the statement (70% 30%). Subsequently, 81% lawyers respond that I'm feeling pleasure when me active in recreational activities while only 19% are against the statement (81% > 19%). In the same way, the lawyers were asked about the statement "I'm involving my clients to take part in recreational activities with me to reduce his worry" the total 72% lawyers agree with the statement and only 28% are lawyers against the statement so it is concluded that the majority of the lawyers involve their clients to take part in recreational activities with them to reduce their worry (68% > 32%).

To total percentage of motivational portion indicates that majority of respondents motivated towards recreational activities. The total yes % is 76% and total No % is 24% (76% > 24%). The cumulative percentage of aforementioned two portion of interest and motivation of lawyers towards recreational activities in table 4.2 and figures 4.2, 4.3 shows that majority of the respondents take interest and fully motivated towards recreational activities because total yes % is 79% and no is 21% which indicate that the lawyers of District Dera Ismail Khan take interest in recreational activities and also they are fully motivated towards recreational activities.(79% >21%).

Research Question: Whether there are any causes behind the inactivity of lawyers regarding recreation

Table 3. Causes behind the inactivity of lawyers in recreational activities.

Respondent	N	S.No	Statement	Yes%	No%
Lawyers of District Dera Ismail Khan	**90**	**1.**	Work load	93%	07%
		2.	Availability of leisure time	91%	09%
		3.	Spaces for recreational activities	64%	36%
		4.	Strict rules and regulation of organization	50%	50%
		5.	Obesity	93%	07%
		6.	Health problems	62%	38%
		7.	Take care about status	72%	28%
		8.	Availability of equipment and facilities	65%	35%
		9.	Interest of lawyers	10%	90%
		10.	Feeling shame in front of their clients	92%	08%
		Total		**69%**	**31%**

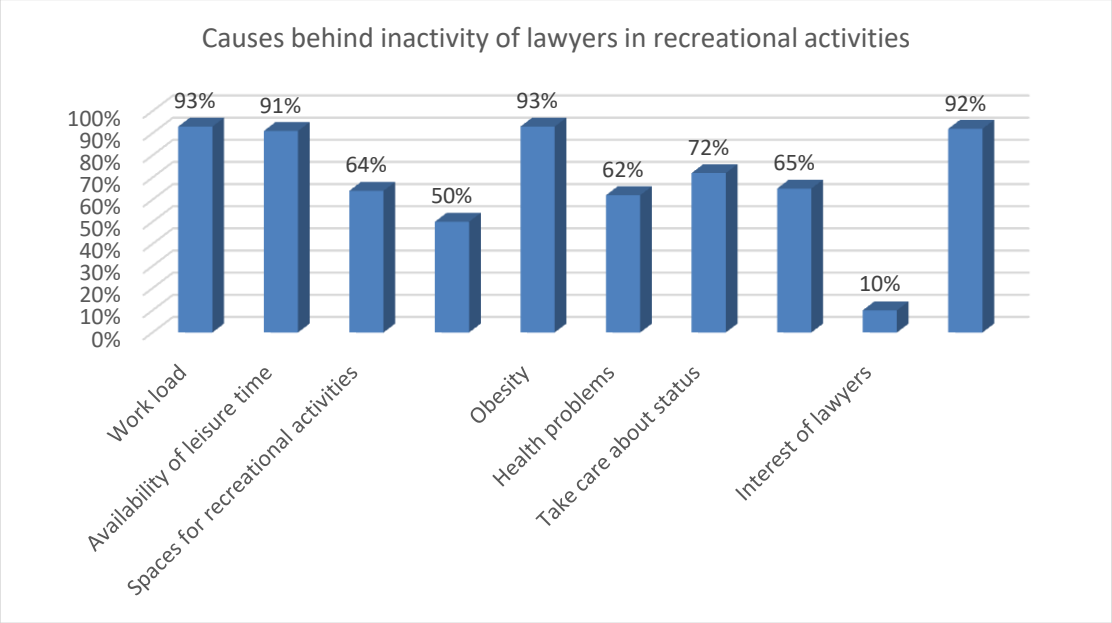

Figure 4. Causes behind the inactivity of lawyers in recreational activities

The above table depicts that, the 93% lawyers shows inactivity due to workload while only 7% shows disagreement with this statement which indicates that majority of respondents agree that workload is a cause behind their inactivity in recreational activities (93% > 07%). In the same way, 91% lawyers agree with the statement that causes behind the inactivity in recreational activities is un-availability of leisure time while only 9% disagrees with the statement, the percentage shows that majority of respondents agree with the statement (91% > 09%).

Subsequently, 64% respondents agree with the statement that spaces for recreational activities are a cause for inactivity in recreational activity while only 36% disagrees with the statement, which indicates that majority of the respondents agree with the statement (64% > 36%). In the same way, 50% lawyers agree with the statement that strict rules and regulation of the organization is a cause behind the inactivity of lawyers in recreational activities while 50% are disagreed (50% = 50%). Similarly, 93% lawyers show agreement that obesity is the main cause behind the inactivity in recreational activities among lawyers while only 7% disagrees with that, mean majority lawyers agree with the statement (93% >07%).

Consequently, 62% lawyers reported health problem as a cause of inactivity while 38% are against the statement (62% > 38%). 72% lawyers take care of their status and avoid to take part in recreational activities while 28% lawyers do not take care of their status when taking part (72% > 28%). In the same way, 65% lawyers show agreement with the statement that unavailability of equipment and facilities is the main cause behind the inactivity of lawyers in recreational activities while 35% are against the statement (65% > 35%). 92% lawyers feeling shame in front of their clients to participate in recreational activities while 08% respond that it doesn't matter (92% > 08%).

Cumulative percentage of table 3 is 69% which indicate that total 69% lawyers agree that there are some causes which make hurdles to take part in recreational activities while only 31% lawyers disagree with that. So, it is concluded that many causes behind the inactivity of lawyers regarding recreation (69% >31%).

Discussion

The lawyers were asked about their recreational trends in five different statements the researcher found that total 89% respondents respond that there is a recreational trend among lawyers while only 11% were against the recreational trend. The total percentage of above table shows that there is a recreational trend among lawyers (89% >11%) (See Table 1).

The researcher found that 83% lawyers take interest in recreational activities while only 17% shows disagreement with 5 statement of interest towards recreational activities. Which indicates that majority of the lawyers take interest in recreational activities (83% >17%) to the total percentage of motivational portion indicates that majority of respondents motivated towards recreational activities. The total yes is 76% and total no is 24% (76% > 24%). The cumulative percentage of aforementioned two portion of interest and motivation of lawyers towards recreational activities indicates that majority of the respondents take interest and fully motivated towards recreational activities because total yes is 79% and no is 21% which indicate that the lawyers of District Dera Ismail Khan take interest in recreational activities and also they are fully motivated towards recreational activities (79% >21%) (See Table 2).

The researcher found that total 69% lawyers agree that there are some causes which make hurdles to take part in recreational activities while only 31% lawyers disagree with that. So, it is concluded that there are many causes behind the inactivity of lawyers regarding recreation (69% >31%) (See Table 3).

Conclusion

In this research, it is concluded that there are many recreational trends among lawyers in District Dera Ismail Khan it also concluded that the lawyers take full interest and fully motivation of lawyers towards recreational activities. It is also concluded that there are many

causes behind the inactivity of lawyers regarding recreation the researcher concluded that, most of the lawyers love to participate in recreational activities, and they purchased equipment for recreational activities and kept it in their offices. This study also conveyed that they have set a special time for their recreational activities in their daily schedule. Besides, they take part in recreational activities to refresh their mood. On the other hand, there are many causes which are responsible for inactivity of lawyers, such as workload, obesity, and feeling shame in front of their clients.

Suggestions

On the basis of findings of the study the researcher suggests some following valuable suggestions;

- The lawyers should take care of their obesity and do regular exercises.
- The lawyers should take part in recreational activities to refresh their mood and reduce the tension and worry.
- The organization should organize recreational games tournament to motivate the lawyers towards recreational activities
- Lawyers should develop their interest in recreational activities and should keep light equipment in their offices to utilize leisure time in positive manners.
- Lawyers should motivate their colleagues to take part in recreational activities.
- Lawyers should define special time to the recreational activities in their daily schedule.
- The organization should design grounds, courts, and places where light recreational activities could be possible.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS721

The Effects of Cherry Juice Supplementation on Antioxidant Capacity, Hydrogen Peroxide and Creatine Kinase Following an Exhaustive Aerobic Exercise in Non-Athlete Men

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Type: *Research Article (**Received:** 07.01.2018 – **Corrected:** 14.02.2018 – **Accepted:** 22.02.2018)*

Abstract

Introduction: Oxidative stress is a condition in which the reactive oxygen species production exceeds the antioxidant system capacity to neutralize these peroxidases. In these situations, proteins, lipids, and nucleic acids are damaged. In this regard, the cherry can be noted as a food antioxidant which leads an increasing antioxidant capacity and reducing inflammation and damage muscle. Therefore, The purpose of this study was to determine the effect of cherry juice supplementation on total antioxidant capacity (TAC), creatine kinase (CK), hydrogen peroxide (H_2O_2) in non-athlete men after an exhaustive aerobic exercise. Method: In this quasi-experimental research, ten untrained (UT) men were randomly selected. Then, they were divided into two equal groups: supplement group (cherry juice) and placebo group (commercial Cherry juice diluted with natural water). After eight days of supplementation period, all subjects were participated in aerobic exercise protocol (Bruce test run to the point of exhaustion) on the treadmill. Primary blood samples in the baseline were taken. The second was immediately after the Bruce test, third and fourth were six and twenty-four hours later were taken (5 ml). For analysis of the results. Analysis of variance with repeated measures was used at the significant level. Result: A significant effect of short-term cherry juice supplementation on TAC, H_2O_2, and CK was observed ($p \leq 0.05$). Conclusions: In general, it can be concluded that probably eight days of cherry juice supplementation probably cannot prevent the adverse effects of oxidative stress caused by acute aerobic exercise.

Keywords: Cherry juice supplementation, Antioxidants, Oxidative stress, Exhaustive exercise.

Introduction

Today, researchers believe that participation in physical activities can be effective in improving the health of athletes or even people with diseases (Edge et al.,2006; Helgerud et al.,2006) While participating in these activities, especially exhaustive activities is accompanied to releasing free radicals (free radicals) and depletion of antioxidant resources that Lipid peroxidation and oxidative stress indices of blood and urine rises(increases), in fact, free radicals can cause inflammatory responses (Scott and Jackson Malcolm 2008). Although the production of free radicals is necessary to some extent (partly) for the body's physiological processes, increase its useless, that often introduced in the form of reactive oxygen species (ROS), is harmful to the body and lead to oxidative stress (Hamedi Nia, 2002). On the other hand, some research results have shown that oxidative stress is involved in the pathogenesis of many diseases, including atherosclerosis, hypertension, ischemic heart disease, diabetes, cancer, rheumatoid arthritis and inflammatory, degenerative disease of the nervous system and also in the aging process (Meagher and Rader, 2001). although, one way to deal with the adverse effects of oxidative stress caused by intense and heavy exercise is using natural and edible antioxidant supplements (Williams et al., 1990). In this regard, the cherry can be noted as a food antioxidant rich in vitamins A and c, phenolic compounds, anthocyanin and melatonin Which leads an increasing antioxidant capacity and reducing inflammation and damage muscle (Barrett et al., 2005). As Dimitriou et al., 2015) studies showed that consumption of cherry juice before and after marathon reduced developing symptoms of inflammation of the upper respiratory tract caused by trauma, hyperventilation caused by exercise and also other causes of infectious and non-infectious in runners. Also, the results of some studies suggest that consumption of cherries and its products are effective in reducing oxidative stress(Bell et al., 2014), However, few studies are at hands regarding the role of Cherry in increasing antioxidant properties and reducing oxidative stress and muscle damage caused by doing aerobic exercise. So that, Bell et al. (2014)'s study showed that consumption of 30 ml cherry concentrate for seven days decreasing lipid peroxidation and inflammatory cascade in cyclists. Traustadóttir and colleagues (2015) showed that the consumption of 240 ml sour cherry juice for 14 days in older adults improves the antioxidant defense (Traustadóttir et al., 2009). Also, Howatson and colleagues (2010) showed that consumption of cherry juice for five days before the Marathon, increased antioxidant capacity, reduced inflammation and lipid peroxidation.

Due to limited and contradictory studies on cherry supplementation on antioxidant properties and muscle damage caused by aerobic exercise, the question is whether short-term consumption of cherry juice can reduce oxidative damage caused by moderately severe aerobic exercise by Increasing the antioxidant capacity and at least reduce the adverse effects of oxidative stress and its characteristics?

Therefore, this study aimed to determine the effect of cherry juice on total antioxidant capacity, creatine kinase and hydrogen peroxide in non-athlete men following an exhaustive aerobic exercise.

Methods

This study was conducted as quasi-experimental design in two groups (experimental and placebo) with repeated measures (four stage) as double-blind. The study participant consisted of untrained and employed men that among theme 30 volunteers announced to participate in this research project.

All subjects participated in a coordination meeting and were aware of goals and methods of measurement by the researcher, then informed consent form and completed the 24-hour recall diet, then underwent medical examinations. Volunteers had not used natural and industrial supplements in the past month. Ten days before starting the study, anthropometric measurements, height, weight, and BMI, maximal oxygen consumption (VO_2max) were measured. Then from among 30 volunteers, ten people with an average age of 41.9±2.9 were selected and randomly divided into two equal groups of Cherry juice supplementation (710 ml two times daily for seven days) and placebo (710 ml commercial Cherry juice diluted with city water that is similar but it has significantly declined nutrients).in this study, Cherry juice obtained Natural cherry that had no commercial additives.

In this study, levels of TAC, H_2O_2, and CK were measured through blood sampling. At each sampling time, approximately five-milliliter blood samples were taken from the left brachial vein. Values of TAC, H_2O_2, and CK were measured by using the ELISA test and spectrophotometer (made in America Biotech). Used kits were from Padgin Medicine Company. Blood samples for determination of blood parameters were used without the addition of anticoagulant for preparation of serum. All measurements in the same condition (9-10 o'clock in the morning, the temperature of 28-26 °C and humidity 50%) were performed. In addition, the subjects 48 hours Before the test, they avoided doing any heavy physical activity and also the meal before the test had no fruit and antioxidants, tablets or supplements. Initial blood samples were obtained at baseline before making of Cherry juice from in all subjects.

On the day of testing, all subjects warmed up their body with stretching and exercising after 30-minute rest interval. Then, they ran to the point of exhaustion on the treadmill (Bruce test run to the point of exhaustion) and Second Blood samples were taken immediately after exercise protocol. third and fourth blood sampling were measured 6 and 24 hours after the test, respectively. The normal state of the data (mean and standard deviation) was conducted by using Shapiro-Wilk test; For analysis of the results. repeated variance analysis was used. All operations and statistical analysis were performed at the significant level (P <0/05) by Using SPSS version 20.

Results

Subject's characteristics are presented in table 1. Average antioxidant capacity, creatine kinase, hydrogen peroxide in cherry juice and placebo groups are presented in Table 2.

Table 1. Subjects' characteristics

Variable	Supplement	Placebo
Age (year)	40.04±9.35	41.80±1.06
Height (cm)	173.92±5.5	170.25±4
Weight (kg)	86.80±9.31	91.20±9.56
BMI (kg/m^2)	28.86±3.72	31.37±3.72
VO_2max (ml/kg/min)	39.43±2.79	39.34±1.44

× Values are reported as mean±SD.

Table 2. Changes in total antioxidant capacity, creatine kinase and hydrogen peroxide in different stages (M±SD)

Variables	Group	Before	Immediately	After 6 hours	After 24 hours
Total antioxidant	Placebo	0.1391±0.8600	0.1337±0.8800	0.1047±0.9420	0.1742±0.8220
Capacity(U/ml)	Cherry juice	0.08526±0.7580	0.1456±0.8240	0.1298±0.8780	0.1291±0.8240
Hydrogen	Placebo	16.51±39.20	9.56±20	11.97±43.60	14.71±17
Peroxide(mμ)	Cherry juice	15.67±30.40	3.27±15.20	10.47±33.20	6.74±17
Creatine	Placebo	27.973±61	24.382±84	38.895±84.40	21.064±91.20
Kinase(U/ml)	Cherry juice	24.674±62.60	61.063±95.20	107.934±134.20	44.136±109

According to results, the sustainability of antioxidant capacity, creatine kinase, hydrogen peroxide were not significantly different in cherry juice and placebo conditions after supplementation of cherry juice.

Discussion

According to the results, short-term use of cherry juice supplement did not significantly change the total antioxidant capacity, hydrogen peroxide and creatine kinase in non-athletic men.

Howatson et al (2010) showed that the average of antioxidant capacity increased by only 10% compared to control group in athletes. In addition, Su et al. (2008) reported that there was no reduction in total antioxidant capacity following by exhausting aerobic exercise (Su et al., 2008). Sacheck et al. (2003) also found that oxidative capacity did not decrease after 45 minutes of jogging in healthy young men. In addition, other researchers have reported that inhibiting free radicals, stimulating second-phase enzymes, reducing the formation of oxidative increases in DNA and lipid peroxidation and also, mutagenic inhibition by environmental and carcinogenic agents, including anthocyanin and phenolic compounds in cherry juice (Kong et al., 2003). In this regard, Traustadóttir et al. (2015), in their study on older adults found that cherry juice reduces oxidative damage in nucleic acids. Also, Bell et al (2014) reported cellular disorders, caused by oxidative stress, reduce in cycling men after taking cherry juice. While in the study of Shadmanfard et al (2012), TAC and MDA reduction was observed after an exhausting aerobic exercise period. In connection with the justification of these differences, can mention the difference in the type of activity and demographic characteristics (type, race, age, gender, health status and physical fitness) (Su et al., 2008); because in the present study, the subjects were non-athletic men who were able to complete the Bruce test in four steps. Also, Baradaran and et al (2012) stated that exercise increases the intensity of plasma H_2O_2 concentration in female athletes. In this case, muscle damage may be increased in this process (Córdova et al., 2010); some studies have reported about increasing plasma H_2O_2 concentration levels, as the intensity of exercise increases, the production and releasing of this free radical also increases (Groussard et al., 2003). However, the findings contradict to results of some previous studies. These contradictions in studies probably indicate that hydrogen peroxidation levels may also be affected by inflammatory

markers, some researchers have pointed to the relationship between LDH and free radicals, and it has been reported that increased LDH enzymes have an inhibitory role in increasing of free radicals (Bloomer and Cole, 2014).

Other possible mechanisms of herbal supplements, such as cherry juice, can be the direct accumulation of free radical species which are responsible for cell damage (Martinez, 2009). In fact, cherries form a complex resistant to the attack of free radicals (Sarma and Sharma, 1999) and rejuvenating the androgenic enzymes of antioxidant defense systems (Shih et al., 2007) and finally the mix of genetic sequence of all these things is one of these mechanisms (Traustadóttir et al., 2009; Bell et al., 2014).

Anthocyanin is responsible for the antioxidant properties of cherries that poorly absorbed in the body (Bitsch et al., 2004; Charron et al., 2009) and quickly repel from the human system (Felgines et al., 2003; Kurilich et al., 2005). Therefore, the direct removal of free radicals a lonely will not be responsible for immediately reducing H_2O_2 after exercise. In addition, experiments show that the formation of resistant complexes of oxidative damage that formed with a mixture of cherries anthocyanin is shown only by DNA, not by measuring the amount of H_2O_2 from blood sampling (Sarma and Sharma, 1999). The redox regulation of Endogenous antioxidant defense seems to be a prominent mechanism of protection against H_2O_2 peroxidation

On the other hand, the findings of the present study suggest that insignificant blood creatine kinase changes after aerobic exercise (Bruce test) is consistent with the results of some studies.

In a study, Howatson et al. (2010) examined the consumption of cherry juice for 8 days on 20 Morton runners. The results showed aerobic exercises does not have an effect on the amount of creatine kinase in the blood. In this regard, Hindell et al. (2001) did not achieve significant increases in subjects Ck after 20-minute protocol of the step test (Hindell et al., 2001) and also in another study by Walsh et al (2001), which examined 30 minutes of cycling, they could not find significant increases in subjects Ck. The researchers say that this intensity of exercise has not been able to cause muscular damage, and in fact, the test should be performed in more intensely. On the other hand, in a study Tokmakidis et al., 2003, examined the effect of ibuprofen after hamstring muscle contractions on CK and delayed muscle soreness. The results showed CK decrease in ibuprofen group (Tokmakidis et al.,2003). Also, the Tartibian and Azizbeigi (2008) observed the inhibitory effect of naproxen after 48 hours on CK. They believe Probably naproxen reduces the release of CK into the blood by preventing increased muscle damage. The contradiction of this finding with the results of some previous studies may be due to variations in the range of training programs, the intensity, and duration of activities, the type of supplementation, the time of blood transfusion, and the level of readiness of subjects.

Indeed, the unreasonable increase in creatine kinase after the Bruce test could possibly result in minor damage to the sarcolemma, which leads to the entry of creatine kinase into the outer space of the cell. The peak levels of creatine kinase vary from person to person and do not necessarily indicate muscle damage (Jordan, 2007; Brenner et al.,1990). According to Brenner et al. (1999) study, the increase in creatine kinase levels does not occur in parallel with the increase in cytokines, why so the mechanism involved in cytokines diffusion may be different from muscle damage. Changes in creatine kinase are depended on muscle mass, severity, duration and volume of exercise, and whether the subject is familiar with exhausting activity is different (Jordan, 2007). Perhaps the difference in protocol type used that in studies is the most important factor in the difference in creatine kinase changes. As noted earlier,

muscle damage causes CK to be released into the bloodstream. The more and wider damage, cause the greater amount of CK released. For example, marathon is much more than extreme and persistent extravagant activities produce creatine kinase (Nieman et al.,2005).

In general, according to the findings of this study, it can be concluded that probably eight days of cherry juice supplementation cannot prevent the adverse effects of oxidative stress caused by intense aerobic activity. However, by considering the previous studies and the benefits of cherry fruit as a source of antioxidant properties, more accurate results are needed in further studies on more doses and longer periods of consumption of cherry juice on the oxidative stress caused by aerobic exercises in the number of more samples from the athlete and non-athlete population.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS722

A Four-Week Upper-Extremity Exercise Program on a Balance Device Improves Power and Stability in Collegiate Golfers

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Type: *Research Article (**Received:** 07.01.2018 – **Corrected:** 14.02.2018 – **Accepted:** 22.02.2018)*

Abstract

Relatively little research has been conducted examining the physical characteristics that are important to a golfer's performance. The investigators studied whether a series of upper-extremity exercises on a balance device would significantly improve upper-extremity stability and power in collegiate golfers. A total of 23 collegiate golfers (ages: 20.4 ± 1.4 years, height: 67.7 in ± 6.6 in, weight: 171.8 lb. ± 87.6 lb.) participated in the study. A two group non-equivalent pre-test/post-test design was selected for this study. Testing included shoulder flexion, hyper-extension (shoulder flexibility), and a Closed-Kinetic Chain Upper-Extremity Stability test (Upper-Extremity stability and power). Testing was conducted before and after a 4-week upper-extremity exercise conducted on a balance device. An independent t-test was selected to analyze differences if any between the experimental and control group. The experimental group revealed a significant improvement in upper-extremity power (p=0.01) and stability (p=0.01). The shoulder flexibility for the experimental group demonstrated no significance (p=0.058) in the left shoulder hyperextension but showed significant value (p=0.033) in the right shoulder hyperextension. The control group demonstrated a significant (p=0.044) decrease in shoulder flexion in the right shoulder. The results demonstrate that specific upper-extremity exercises on a balance device do improve upper-extremity power, upper-extremity stability, and over-head shoulder flexibility within 4 weeks.

Keywords: Closed-Kinetic Chain Upper-Extremity Stability Test (CKCUEST), Shoulder Flexibility, Golf, Conditioning

Introduction

In a basic description of golf, one would say golf is a sport where you hit a small white ball to a small hole over a few hundred yards. The truth is, golf is not so simple after all. A golf swing requires a set of relatively short but highly complicated movements, in a specific sequence. The golf swing consists of a slow, deliberate rotation away from the target, followed by a powerful trunk, shoulder, and hip rotation towards the target. The change from the backswing to the follow-through requires a quick shift of weight from the one side of the body to the other (Lindsay et al., 2014; Nesbit et al., 2015). The flexibility of the shoulders, the rate of force development at the top of the backswing, and the ability to shift weight smoothly are all variables which separate golf players with low stroke averages (handicaps >0) from average golf players (handicaps 1-20) (Gryc et al., 2015; Sell et al., 2007).

As demonstrated by elite golfers and tour professionals, to perfect a golf technique requires several hundred repetitions per day. Each repetition of the golf swing requires backward shoulder rotation, and a hyperextension of whichever shoulder is furthest from the target, a downward-shoulder motion followed by a hyperextension by the shoulder closest to the target (Lindsay et al., 2014; Mitchell et al., 2003). By consistently repeating the shoulder rotations and range of motions, the over-use of shoulder joints could easily cause an injury (Cohn et al., 2013; Lindsay et al., 2014). Gosheger et al. (2003) reported that 82.6% of golf-related injuries are caused by overuse of poorly conditioned joints and that shoulder injuries are among the top three most injured sites. By establishing an exercise program where the upper-extremities, especially the shoulder joints, are properly conditioned, the risk of injuries could be lowered (Cohn et al., 2013).

The greater shoulder rotation and shoulder hyperextension can create a larger swing arch. A larger arch means there is more distance to create a high club head velocity. Nesbit and Serrano (2005) describe how the primary generation of power (the initial movement) in a golf swing comes from the torso, but the secondary generation of power (the generation of the club head velocity) comes from the shoulders. They conclude that the generation of joint power is mostly dependent on joint range of motion. Therefore, club head velocity is reliable on the joint range of motion.

Not only is golf performance reliant on shoulder flexibility and upper-extremity power, the ability to shift weight smoothly from a backswing to a follow-through quickly and the ability execute shots from even and uneven ground surfaces is essential in golf. Wells et al. (2009) found a strong positive correlation between balance and greens in regulation and another strong positive correlation between balance and the distance of putts after a chip shot. Gryc et al. (2015) found similar results by comparing four elite golfers. The top ranked golfer in the group had significantly higher stability and club head speed. This indicates that the proprioceptive ability to transfer weight while making a powerful swing motion is critical to generate powerful and controllable golf swing.

The introduction of balance devices into conditioning programs is a relatively accepted practice among many sport activities. Very few studies have been conducted regarding upper-extremity specific exercises on a balance device. With regards to an upper extremity movement such as golf, exercises on balance devices should be recommended since stability is a variable which increases club head velocity greatly (Gryc et al., 2015; Mitchell et al., 2003). By incorporating a balance device in a golf conditioning program that could develop power, improve stability, and increase shoulder flexibility simultaneously would be beneficial towards performance. Very little research has been done to study adequate conditioning programs for golf players, especially in the specific areas of upper extremity stability and

power. The purpose of this study was to examine whether a series of upper-extremity exercises on a balance platform would improve upper-extremity power, stability, and shoulder range of motion in college golfers.

Methods

Participants

Twenty three collegiate golfers were asked to participate in the study. All participants completed a medical history and signed the informed consent according to the university's Institutional Review Board who granted permission to conduct this study. Participants were divided into an experimental and control group. Thirteen of the participants agreed to be part of the experimental group and 10 participants agreed to be placed in the control group. The experimental group consisted of 4 males and 9 females. The control group consisted of 9 males and 1 female. All the participants were physically active, exercising 2 times a week prior to the study.

Table 1. Subject Characteristics.

	Ages (years)	Height (in.)	Weight (lb.)
Control			
Male (n=4)	20.5 ± 1	69.79 ± 1.94	160.25 ± 26.25
Female (n=9)	20.2 ± 0.97	65.04 ± 2.3	166.29 ± 42.4
Group (n=13)	20.31 ± 0.95	66.5 ± 3.11	164.43 ± 37.14
Experimental			
Male (n=9)	20.44 ± 1.42	69.51 ± 4.28	176.47 ± 31.63
Female (n=1)	21	63.87	160.4
Group (n=10)	20.5 ± 1.35	68.95 ± 4.41	174.86 ± 30.26

Protocol

The exercises prescribed to the experimental group were practiced on a balance device (StrongBoard LLC, El Segundo, CA.)). This board was designed to create an unstable surface on which a variety of exercises could be done. It consisted of two platforms, joined by 4 compression springs. The compression springs were in the middle of the two platforms, allowing the top board to become unstable when weight is placed on it. All testing procedures and exercises were conducted in the university motor behavior research laboratory. Before every exercise session, all participants were required to complete a 15-minute general warm-up.

Upper-body stability and power were tested by using the Closed-Kinetic Chain Upper-Extremity Stability test (5). It is a test which requires two spots at three foot apart. The participant acquires a push-up position with hands between the two spots. The participant touches each spot with the opposite arm and continues alternating to each side for 15 seconds as fast as possible. The first set is done as a warm-up, proceeded by three trials with a 40 second break between sets. The average amount of touches for the three sets is calculated and used to calculate a normalized score and a power score. Power is calculated by multiplying

the average number of touches by 68% of the subject's body weight (lb.) divided by 15. Shoulder flexion and hyperextension on both the left and right side were measured by a goniometer according to procedures described by Norkin and White (1985).

The training program was a 4-week training program, consisting of 8 exercises, 3 times a week. Each exercise was a dynamic upper-body exercise with a certain number of repetitions. The exercises had a 2-minute break in between to achieve maximal effort for every exercise. The Closed-Chain Upper-Extremity Stability Test is widely used by physical therapists to evaluate shoulder stability and upper-extremity power. Thus, making it the perfect test in this study. Flexibility was measured by finding the shoulder flexion and hyper-extension of both the right and left shoulders. The shoulder flexibility test was The CKCUEST and the shoulder flexibility test were conducted before and after the 4-week exercise program

Statistical Analysis

SPSS (ver. 24; Chicago, IL) was used to calculate all the data. A Levene's Test for Equality was calculated to determine equal variances assumed. A two-tailed independent t-test was used to compare inter-group means of the upper-extremity power, upper-extremity stability, average amount of touches and shoulder flexibility. For the inter-group calculations, the differences between the pre-and post-tests results were calculated and used to find group means and to further calculate the t-test. The intra-group calculations used the pre- and post-test result means to calculate the upper-extremity power, upper-extremity stability, average amount of touches and shoulder flexibility ($p=0.05$).

Results

Upper-Extremity Power

Statistically significant ($p=0.01$) improvements were observed in the inter-group comparison of upper-extremity power in the CKCUEST (refer to Table 2). The mean difference of the pre-and post-test for the experimental and control group were 63.34 and 4.05 respectively. The intra-group results agree with the inter-group results as the experimental group's pre- and post-test comparison reflected a significant ($p=0.01$) result. However, the pre- and post-test of the control group had no statistical significance ($p=0.498$).

Table 2. CKCUEST Power Pre- and Post-Test Mean ± SD

	Pre-Test	Post-Test
Control	215.68 ± 35.5	219.73 ± 44.51
Experimental	162.75 ± 45.13*	226.09 ± 49.61*

The * indicates significance at the 0.05 level.

Upper-Body Stability Test

The results for the stability calculations in the CKCUEST mirror the results of the power calculations (refer to Table 3). The inter-group differences of the pre- and post-test were significant ($p=0.01$). The experimental group showed a great improvement when the pre- and post-tests were compared ($p=0.01$). Yet again, the control group failed to show any significance when their pre- and post-test scores were compared ($p=0.796$).

Table 3. CKCUEST Stability Pre- and Post-Test Mean ± SD

	Pre-Test	Post-Test
Control	.40 ± .09	.40 ± .09
Experimental	.33 ± .07*	.46 ± .07*

The * indicates significance at the 0.05 level.

Flexibility

Table 4 revealed no significance in the right shoulder flexion of the inter-group comparison (p=0.555) and the left shoulder flexion (p=0.421). However, for the shoulder hyperextension on the right side, there was a significant difference (p=0.033) and the left shoulder hyperextension had no significance (p=0.56).

No significance was found in the pre- and post-test comparison of the experimental group's right shoulder flexion (p=0.106) nor was there a significance in the left shoulder flexion (p=0.415). The experimental group did have a significant result for the right shoulder hyperextension (p=0.033) and no significance in the left shoulder hyperextension (p=0.058) was found. The control group had an interesting significance in the right shoulder flexion (p=0.044). The difference is significant but the pre-test mean (193.27) was significantly higher than the post-test mean (180.69). The left shoulder flexion had no significant results (p=0.121), as did the right shoulder hyperextension (p=0.804) and left shoulder hyperextension (p=0.451).

Table 4. Shoulder Flexibility Pre- and Post-Test Measurements Mean ± SD

	Pre-Test	Post-Test
Right-Shoulder Flexion		
Control	193.27 ± 21.1*	180.69 ± 5.35*
Experimental	190.37 ± 21.38	198.64 ± 26.88
Left-Shoulder Flexion		
Control	196.93 ± 31.11	181.33 ± 5.97
Experimental	189.2 ± 35.25	195.36 ± 24.63
Right-Shoulder Hyperextension		
Control	81.76 ± 8.43	82.16 ± 10.84
Experimental	74.36 ± 10.95	84.54 ± 15.33
Left-Shoulder Hyperextension		
Control	79.63 ± 9.07	81.93 ± 11.89
Experimental	74.98 ± 11.28*	82.2 ± 8.45*

The * indicates significance at the 0.05 level.

Average Number of Touches

When the between-groups means of the pre- and post-test were compared, the results were significant (p=0.01). The mean amount of touches from the experimental group increased from 22.1 touches in 15 seconds to 30.66 in the pre- and post-tests and resulted in a significant difference (p=0.01). The control group had little difference as the mean went from 27.23 touches in 15 seconds to 27.59, thus, resulting in no significance (p=0.630). When the differences of the pre- and post-test results were compared between the groups, the results were significant once again (p=0.01).

Table 5. CKCUEST Average Number of Touches Pre- and Post-Test Means ± SD

	Pre-Test	Post-Test
Control	27.23 ± 6.3	27.59 ± 6.37
Experimental	22.1 ± 5.38*	30.61 ± 5.53*

The * indicates significance at the 0.05 level.

Discussion and Conclusion

Upper-extremity power between the groups greatly improved in the experimental group. The pre-test mean for the experimental group was 162.75 W and for the control group it was 215.68 W. However, by the post-test measurements, the experimental group had a mean power of 226.09 W and the control group had a power mean of 219.73 W. A golf swing requires work to be done to create kinetic energy in the club head. The greater the kinetic energy (club head speed), the greater impact the club head will have on the ball, causing the ball to go further and even spin faster (Nesbit et al., 2005). The individual requires power to be able to accelerate the club head speed after the work is done to generate a greater club head speed. Research comparing golfers from different skill levels were examined and it was found that advanced level golfers had significantly greater arms speed during the swing (Wrobel et al., 2012). A study which was similar to the current study and found similar results is Lephart et al. (2007). By developing a golf-specific training program, golfers significantly improved power and stability, which resulted in an increased club head velocity, carry distance and total distance. The current study improved upper-extremity power and stability as well and will also likely assist in club head velocity, carry distance, and total distance.

Stability was another variable which demonstrated improvement. Wrobel et al. (2012) found that players from more advanced levels of golf had significantly better postural stability than intermediate golfers. Therefore, if this exercise program improves postural control, it could greatly benefit the smooth transition between the back-swing and follow-through. Wrobel et al. (2012) also found better postural control during the point of maximal arm speed. This means that the more advanced golfers could shift weight during a high-speed movement more comfortably. The exercises used in the study were designed to exercise stability as well as a full range of motion in dynamic power movements simultaneously. Therefore, upper-extremity exercises on a balance device will improve an individual's comfort with shifting weight during a power movement, in turn, improving a golf swing.

The shoulder flexibility displayed an interesting result as the shoulder flexion had no significant results in either group. The hyperextension on the right-shoulder did reveal a significant result. The hyperextension of the left-shoulder came very close to being accepted as significant as the significance level is 0.058. The means for the hyperextension of the left shoulder was a 7.2° improvement for the experimental group and a -2.3° decline for the control group. Even if the significance level is insignificant, the means show an improvement in the experimental group. A study which found a similar result was conducted by Santos et al. (2010). They found that sedentary women improved flexibility during an 8-week resistance training program, in the current study shoulder hyperextension improved during a 4-week power and stability program. When exercising resistance training, tendon and ligament strength improves and will create a more powerful contraction. This contraction will pull joints and ligaments, causing them to stretch, which would increase flexibility (Spirduso et al., 1995). In the current study, the increase in muscle power may have gradually stretched the pectoralis major tendon, creating a larger range of motion. The golf swing does not require a shoulder flexion during the swing, but considering the exercises used on the balance device, many shoulder movements which resemble an over-head extension were exercised. The hyperextension movement is used in the back-swing and follow-through. Recent studies have found that golfers who could create a shoulder rotation and had a greater shoulder rotation had lower stroke averages (Sell et al., 2007). Therefore, if the series of exercises could improve hyperextension in the shoulder rotator cuff, it will likely assist in the individual's full range of motion on the backswing arch and in the follow-through arch (Gryc et al., 2015; Nesbit et al., 2005).

Mitchell et al. (2003) describe the movements of the left and right shoulder during the golf swing. In a sample group of right-handed golfers, they concluded that the right shoulder does have a larger hyperextension in the backswing compared to the left shoulder in the follow-through part of the swing. In the current study, with 22 out of 23 participants being right-hand golfers as well, the right shoulder's hyperextension was more than the left shoulder, which would agree to the study of Mitchell et al. (2003).

The control group's decrease in both the left and right shoulder flexion should be a concern. Lack of shoulder mobility places an athlete at a high risk for an injury (Mitchell et al., 2003). Daneshmandi et al. (2010) state that by not appropriately incorporating stretching of the muscle joints in exercise programs, the muscle joints will decrease range of motion. Also, if the flexibility of a joint is not maintained, over time the joint will decrease in range of motion (Daneshmandi et al., 2010). Perhaps the standard exercise program continued by the control group lacked appropriate shoulder stretching and this caused the decrease in shoulder flexion. This also proves that the upper-extremity exercises on a balance device properly maintain shoulder flexion.

This study concluded that a 4-week upper-extremity program on a balance device does improve upper-extremity power, stability, and shoulder hyperextension. The benefits of exercising the upper-extremities on a balance device are the combination of variables which are exercises and increase rapidly over a 4-week period, each exercise session was timed at 30 minutes. The space needed for these exercises is little and only one device is needed, which means an individual can exercise anywhere and will not need much storage space for the device. The study did not directly test whether there was an improvement in clubhead speed or ball spin, but according to the literature, upper-extremity power, stability, and flexibility are variables which will contribute to a longer, more powerful, and smooth golf swing. Nonetheless, a direct study of upper-extremity exercises on a balance device and golf swing mechanics is encouraged.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS723

Understanding of Organizational Democracy: A Research on the Personnel of the Provincial Directorate of Youth Services and Sports

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Type: *Research Article (**Received:** 10.01.2018 – **Corrected:** 19.02.2018 – **Accepted:** 26.02.2018)*

Abstract

Aim: The purpose of this research was to examine the perceived level of organizational democracy for the staff working in the different statuses and positions in Provincial Directorates of Youth Services and Sports in Turkey. Material and Method: The study was carried out using the quantitative research method, which is frequently used in social sciences. In this process, the scanning pattern was utilized. The survey technique was used to collect data from the study group. The universe of the research was the entire personnel working in the Provincial Directorates of Youth Services and Sports, which is the provincial organization of the Turkish sports administration in 81 provinces. The sample group consists of 920 individuals selected using the simple random sampling method. In the analysis process, primarily, descriptive statistics (frequency, percentage, mean, standard deviation values) were used. Subsequently, the nonparametric test techniques (Mann Whitney U and Kruskal Wallis) were used. Findings: The perception of organizational democracy in the Provincial Directorates of Youth Services and Sports may be evaluated as above the average (high). When the scores related to the factors constituting this level of democracy perception are examined, it is understood that the personnel of Youth Services and Sports Provincial Directorates find participation-criticism environments in their institutions at the most democratic level while the accountability environment is found to be at the least democratic level. There were statistically significant differences between the factors of participation-criticism, transparency, justice, equity, and accountability, according to the demographic characteristics of the personnel. Results: The perception of organizational democracy has been found to be above the average (high) in the Provincial Directorates of Youth Services and Sports. It has been determined that the level of organizational democracy is highest for personnel who work in the South-eastern Anatolia Region and for the personnel who have PhD degree.

Keywords: Sport, Youth, and Sport, Sport Management, Democracy, Organizational Democracy.

Introduction

As the sports improve the mental health of individuals and influence the formation of their personalities, they also contribute in the development of social networks, social integration and social communication (Tel, 2014; Yetim, 2005:132; Allender et al., 2006). In addition, the sports help to improve the productivity, morale and health status of the individuals while also accelerating the multi-faceted development (Koç et al., 2015, Tozoglu et al., 2015, Sherlock et al., 2010, Edwards, 2013, Vermeulen and Verweel, 2006).

The Republic of Turkey has dealt with the benefits and effects of the sports, which are referred above, within the constitutional framework. Article 58 and 59 of the Constitution of the Republic of Turkey contain the extension of the sports and the protection of youth (Constitution of the Republic of Turkey, 1982). The institutions, which are responsible for the fulfillment of this constitutional duty of the State in the first place, are the Ministry of Youth and Sports (MYS) and the Provincial Directorates of Youth Services and Sport (PDYSS), which are the provincial organizations of this ministry.

While steps were being taken in the field of physical education and sports, it was necessary to train educators since the 1920s (Türkmen, 2013). The first organized establishment of Turkish sports administration was Türkiye İdman Cemiyetleri İttifakı (TİCİ - Turkey Training Communities Alliance), founded in 1922; and it can be said that the administrative development started with the establishment of that organization (Fişek, 1998:338) have been continuing under the name of PDYSS, operating under MYS, in accordance with the Decree-Law No.649, adopted in 2011 (Decree-Law No.649, 2011). Therefore, today, PDYSS is the provincial organization which is responsible for the administration of sports (Sunay, 2016: 204).

It can be said that the development of the societies has followed a parallel course with the formation and settlement of the institutional structures. The need for the management of societies has always existed since humanity came together. Hence, different management models have emerged. The oldest and well-established of these models is "democracy". According to the Turkish Language Association, democracy is a form of governing, which is based on the sovereignty of the public (TLA, 2017). In the societies, where democracy is embraced, it can be said that democratic values are internalized and that the needs of the people changed accordingly (Atac and Köse, 2017). In a democratic environment, all individuals will have equal rights to shape policies that affect them in a direct or indirect way (Kesen, 2015).

Since democracy is basically an understanding of management that includes equality and participation, it has begun to shape the organizational policies, not only in the form of being a type of public administration (Coşan and Gülova, 2014). Yet, organizations are also a form of a living-organism established by human communities. Thus, as democracy theories and industrial relations became intricate, democratic understandings have begun to be adapted to organizational administrations and the concept of organizational democracy have emerged (Pausch, 2013). It has been stated that technology, political transitions, democratic lifestyle, globalization, and innovation are very effective in switching to this understanding of management after the emergence of the concept of organizational democracy (Fenton, 2011: 183; Butcher and Clarke, 2002).

Organizational democracy is a management approach in which employees are involved in the decision-making and management process, where participation, discussion, and consensus are maintained, mutual communication and solidarity is strengthened, managers have

responsibility against the personnel, and the understanding of acting in unity is presented (Kerr and Caimano, 2004; Hoffman, 2002; Weber et al., 2009; Yazdani, 2010; Harrison and Freeman, 2004).

Geçkil and Tikici (2015) argued that organizational democracy is constituted of seven steps of participation, criticism, transparency, justice, equity, accountability and power sharing. Bozkurt (2012:17) stated that, within this overall process in this democratic organizational environment, the real owners of the sovereignty are the regulations, norms, and the will of the ruler and the ruled. Organizational democracy is an understanding of management that involves taking organizational decisions together, participating and making use of the opinions of the personnel inside the organization. This understanding also aims at the organizational sensitivity (Sadykova and Tutar, 2014, Barley and Kunda, 1992: 17). In the long run, it aligns democratic, social, economic, environmental and individual goals that support creating values (Forcadell, 2005).

The complete harmonization of social, individual and organizational goals is also of special importance in PDYSS. This is because of the fact that the achievement of the managerial productivity of the sport and the expected benefits (organizational-social) from the sports is one of the most concrete examples of the sport the above-mentioned harmony. The functionalization and strengthening of the concept of organizational democracy in the PDYSSs emerge as the inevitable necessities to achieve this harmony. At this point, ways of implementing a democratic public administration model can be sought within the framework of a decentralized sports management approach.

The purpose of the research

The purpose of this research is to examine the organizational democracy perception levels of the personnel in different statuses and positions in PYDSSs in Turkey. In response to this purpose, the answers to the following questions have been searched:

- What is the level of organizational democracy in the institution according to the perceptions of the personnel working in PDYSSs?
- Does the level of organizational democracy perceived by the PDYSS personnel vary according to the demographic characteristics of this personnel?

The significance of the study

It can be said that the democratic environment in Turkey is also reflected in the management of the organizations. At this point, democratic organization management to be formed in PDYSS, which is responsible for the administration of sports, is extremely striking in terms of being the subject of this study. Deist (2008) stated that organizations have a living structure and a communication-oriented side, which means that organizations must be open to democratic actions. PDYSSs are among the leading institutions that are active in sports society, and development of individuals and therefore a society healthy in the physical, mental, social and cultural aspects. It is because of the fact that Koçak and Sunay (2016) point out that sports structure and adopted policies are important for the development of sports in a country. Therefore working in an environment, where the personnel involved in these institutions are comfortable, independent and able to express themselves, the ideas and discourses are valued, can be decisive in the ability of an institution to achieve its goals. Yet, it is observed that while the productivity and motivation of the individuals working in a democratic and positive organizational environment increases, there are less negative work-place behaviors (Vardi, 2001; Mulki et al., 2008).

It can be said that the organizational democracy level in the PDYSS should be emphasized within the centralized structure of the Turkish sports administration and that the concept of organizational democracy, which is a subject of the literature studies within the scope of management science, has to be discussed in a way specific to PDYSSs. So much so that, as the result of the literature review, the lack of a study that examines the relationship between organizational democracy and PDYSSs emphasizes the authenticity of this research. In addition, it is thought that the views about reviewing the institutional structures in order to increase the efficiency and productivity levels of the PDYSSs are put forward in the study.

Material and Method

Research Process

It is very important for a researcher to work within the framework of a business plan for a research to be able to produce healthy results. In this context, a plan related to the course of the study was established and it is presented in the Fig.1 below.

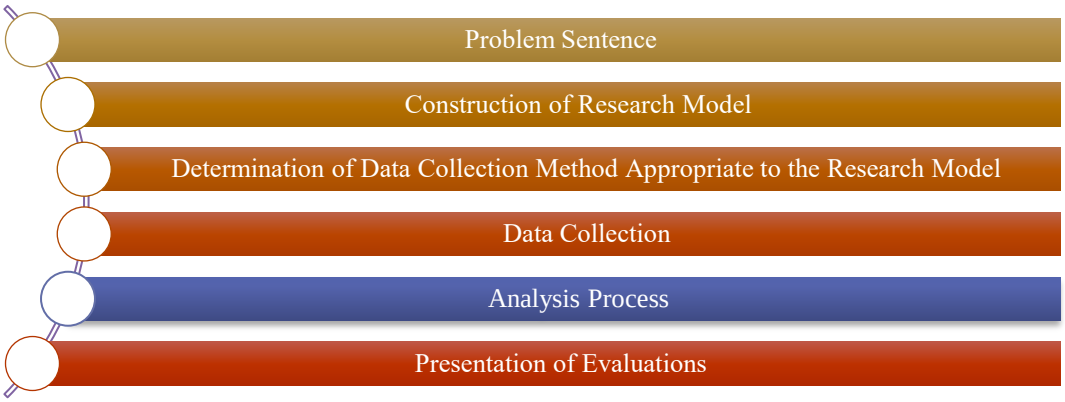

Figure 1. The work plan

Research Model

This research has been carried out with quantitative research method which is frequently used in social sciences, because, quantitative studies enable the obtained findings to be expressed and measured with numerical values (Ekiz, 2003: 47). In this study, the scanning design, which aims to describe a situation as it exists (Karasar, 2017:84, Merter, 2009). The scanning design mediates the collection of the detailed data from large groups (Büyüköztürk et al., 2017: 97), and the relationship between the different characteristics of the research group can be examined in this collected data (Fraenkel et al., 2012: 121). The questionnaire (Ural and Kılıç, 2013: 53) technique was used to collect data from the study group.

Universe and Sampling

The universe of this research is the entire personnel employed in the PDYSSs, which are the members of the provincial organization of the Turkish sports administration in 81 provinces. According to data from the Ministry of Youth and Sports, there are a total of 7,351 people working in PDYSSs (Koçak and Sunay, 2016). In the study, a simple random sampling method was used to create a sample group of sufficient size over this universe. In the simple random sampling method, each unit in the universe is chosen in an impartial manner in order to be equal and independent in the sampling selection (Balcı, 2016: 74). This working group selected by the sampling method from the overall population is composed of 1200 personnel of PDYSSs around Turkey. According to Balcı (2016: 75), it is sufficient for the sample

group to represent the universe at the level of 3% to 5%. A total of 1200 questionnaires were delivered to the sample group, which was formed within the scope of the study. At the controls after the return, 280 questionnaires were deemed to be invalid, and finally, the study was carried out with a sample group of 920 people. For this study, the sample size was calculated as 12.5%. In this case, it is understood that the sample is at a level that can represent the universe. Descriptive information for the related research group is presented visually in Table 1.

Table 1. Demographic Characteristics of the Sample Group

		n	%
Age	25 and under	113	12.3
	Between 26-30	349	37.9
	Between 31-35	165	17.9
	Between 36-40	135	14.7
	Over 41	158	17.2
Gender	Female	322	35.0
	Male	598	65.0
Marital status	Married	559	60.8
	Single	361	39.2
Educational Status	Primary School	16	1.7
	Secondary School	112	12.2
	Associate Degree	181	19.7
	Bachelor's Degree	576	62.6
	Master's Degree	24	2.6
	PhD	11	1.2
Job description	Provincial Director	12	1.3
	Branch Manager	77	8.4
	Sportive Training Specialist	117	12.7
	Coach	156	17.0
	Civil Officer	558	60.7
Geographical region	Marmara	98	10.7
	Aegean	97	10.5
	Mediterranean	153	16.6
	Central Anatolia	128	13.9
	Black Sea	156	17.0
	Eastern Anatolia	160	17.4
	Southeastern Anatolia	128	13.9

12.3% of the PDYSS personnel participating in the survey are 25 years old or younger, 37.9% between 26-30 years, 17.9% between 31-35 years, 14.7% between 36-40 years and 17.2% are 41 and older. In terms of the gender distribution of PDYSS employees, 35% of employees are female and 65% are male. The rate of those who are married is 60.8% and the rate of unmarried people is 39.2%. When the descriptive results regarding the educational status of the employees are analysed, 1.7% of the personnel is primary school graduate, 12.2% is secondary school graduate, 19.7% is associate degree graduate, and 62.6% has undergraduate, 2.6% has master's and 1.2% has PhD degree.

1.3% of the PDYSS personnel participating in the survey were provincial directors, 8.4% were branch managers, 12.7% were sportive education experts, 17% were coaches and 60.7% were civil officers. When the participation to the survey is analysed depending on the geographical area, the ratio of employees in the Marmara Region is 10.7%, in the Aegean Region is 10.5%, in the Mediterranean Region is 16.6%, in the Central Anatolia Region is 13.9%, in the Black Sea Region is 17%, in the Eastern Anatolia Region is 17.4%, and the proportion of those working in the South-eastern Anatolia Region is 13.9%.

Data Collection Tool

In the study, *Organizational Democracy Scale* developed by Geçkil and Tikici (2015) was used as the data collection tool. The scale used is a 5-point likert type scale consisting of 28 questions and 5 sub-dimensions. The Organizational Democracy Scale is a 5-point likert type scale with scoring of responses, 1 = Absolutely Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree and 5 = Totally Agree. The items 21 and 23 are reversed and when the scale scores are evaluated, the scores should be reversed to 5 = 1, 4 = 2, 3 = 3, 2 = 4 and 1 = 5. The lowest score that can be taken from the scale is 28, and the highest score is 140. Organizational democracy perception rises as scores from the scale increase. In the study for the development of the scale, Chornbach Alfa value of .95 and a test-retest correlation coefficient of r=.87 (p<.001) were calculated by Geçkil and Tikici (2015), and the scale was determined to be a valid and reliable measurement tool.

Collection of Data

In the study group determined by the simple random sampling method in the data collection process of the research, it was asked to fill in the questionnaire once the workers in the approximate regions and provinces were reached individually and detailed information about the questionnaire and the content of the study was transmitted. The PDYSS personnel who could not be reached in a face-to-face way were reached with the online questionnaire and the information about the questionnaire and the contents of the work was also transmitted online. The collected data were recorded in a computer environment and prepared for the analysis process.

Analysis of Data

The analysis of the collected data in accordance with the purpose of the study was made with the SPSS 22 program and worked with a 95% confidence level. In the analysis process, primarily descriptive statistics (frequency, percentage, mean, standard deviation values) were used. Non-parametric test techniques were used for the analyses performed on the organizational democracy scale and subscale scores; since the data were not normally distributed according to the normality analysis ($p < 0.05$).

The Mann Whitney U test was used to examine whether the scores obtained from two unrelated samples significantly differed from each other, and the Kruskal Wallis test was used to examine whether the mean scores of the two samples differed significantly (Büyüköztürk, 2017: 165). Obtained values for the normality test are presented visually in Table 2 below.

Table 2. Normality Test on the Points of the Organizational Democracy Scale and Its Sub-Dimensions

	Shapiro-Wilk		
	Statistic	n	p
Participation-Criticism	.926	920	.000
Transparency	.974	920	.000
Justice	.953	920	.000
Equity	.959	920	.000
Accountability	.940	920	.000
Organizational Democracy	.968	920	.000

Findings

In this section, the findings were investigated by analysing the data obtained in accordance with the purpose of the research, and in accordance with the nature of the quantitative studies, the quantitative data were visualized on the tables.

Table 3. Descriptive Statistics on the Points of the Organizational Democracy Scale and Its Sub-Dimensions

	n	Minimum	Maximum	Mean	sd
Participation-Criticism	920	8.00	40.00	29.12	7.20
Transparency	920	9.00	30.00	22.18	3.93
Justice	920	5.00	25.00	18.96	3.90
Equity	920	9.00	30.00	19.77	2.68
Accountability	920	3.00	15.00	11.31	2.52
Organizational Democracy	**920**	**59.00**	**129.00**	**101.34**	**12.75**

Table 3 gives the average for the scale and sub-dimensions used. According to this, the average of participation-criticism scores was 29.12 ± 7.20, the average of transparency scores was 22.18 ± 3.93, the average of justice scores was 18.96 ± 3.90, the average of equality scores was 19.77 ± 2.68, the average of accountability scores was 11.31 ± 2.52 and the mean scores of total scores of organizational democracy scale were 101.34 ± 12.75. The average score of the PDYSS personnel's total scores on the organizational democracy scale was found to be 101.34. Perceptions of organizational democracy can be interpreted as above average (high) for the PDYSS personnel as the highest score that can be taken from the scale was 140. When the scores of the factors constituting this level of democracy are examined, it is understood that the PDYSS personnel finds the participation-criticism environments in the institutions to be the most democratic level while the accountability environment is the least democratic.

Table 4. Analysis of Organizational Democracy Perception and Scale Sub-Dimension Points in Terms of Educational Status Variable

Educational Status		n	Line Avg.	X2	p
Participation-Criticism	Primary School	16	410.41	**3.866**	**.569**
	Secondary School	112	492.71		
	Associate Degree	181	477.23		
	Bachelor's Degree	576	449.98		
	Master's Degree	24	466.90		
	PhD	11	467.23		
Transparency	Primary School	16	557.75	**8.649**	**.124**
	Secondary School	112	447.87		
	Associate Degree	181	483.14		
	Bachelor's Degree	576	450.28		
	Master's Degree	24	455.65		
	PhD	11	621.23		
Justice	Primary School	16	542.03	**18.266**	**.003***
	Secondary School	112	451.55		
	Associate Degree	181	464.85		
	Bachelor's Degree	576	451.47		
	Master's Degree	24	486.88		
	PhD	11	776.45		
Equity	Primary School	16	516.22	**3.334**	**.649**
	Secondary School	112	439.91		
	Associate Degree	181	443.62		
	Bachelor's Degree	576	465.83		
	Master's Degree	24	512.17		
	PhD	11	474.91		

Accountability	Primary School	16	585.06	**11.441**	**.043***
	Secondary School	112	496.97		
	Associate Degree	181	471.00		
	Bachelor's Degree	576	444.80		
	Master's Degree	24	439.52		
	PhD	11	602.86		
Organizational Democracy	Primary School	16	540.16	**11,542**	**,042***
	Secondary School	112	471.56		
	Associate Degree	181	482.65		
	Bachelor's Degree	576	444.21		
	Master's Degree	24	488.25		
	PhD	11	660.27		

A statistically significant difference was found in the justice and accountability subscales ($p<0.05$) when the relationship between the educational status variables of PDYSS personnel and scale subscales was examined. According to this, it is understood that the PDYSS personnel with PhD degree has the highest perception of justice (776.45), while the number of personnel with bachelor's degree is the lowest (451.47). However, while the perception of accountability of the PDYSS personnel with PhD degree was still highest (602.86), the value for the master graduates was the lowest (439.52).

There was a statistically significant difference in terms of Organizational Democracy perception among the PDYSS personnel with different educational status ($p<0.05$). According to this, while the perception of organizational democracy is the highest (660.27) for the personnel with PhD degree, the perceptions personnel with bachelor's degree is the least (444.21).

Table 5. Analysis of Organizational Democracy Perception and Scale Sub-Dimension Points in Terms of Job Description Variable

Job Description		n	Line Avg.	X2	p
Participation-Criticism	Provincial Director	12	355.83	**6.066**	**.194**
	Branch Manager	77	441.45		
	Sportive Training Specialist	117	431.04		
	Coach	156	492.92		
	Civil Officer	558	462.49		
Transparency	Provincial Director	12	379.29	**9.805**	**.044***
	Branch Manager	77	488.51		
	Sportive Training Specialist	117	446.32		
	Coach	156	512.44		
	Civil Officer	558	446.83		
Justice	Provincial Director	12	436.25	**9.064**	**.060**
	Branch Manager	77	522.94		
	Sportive Training Specialist	117	475.98		
	Coach	156	486.61		
	Civil Officer	558	441.86		
Equity	Provincial Director	12	464.96	**1.400**	**.844**
	Branch Manager	77	467.40		
	Sportive Training Specialist	117	433.71		
	Coach	156	464.93		
	Civil Officer	558	463.83		
Accountability	Provincial Director	12	490.71	**1.263**	**.868**
	Branch Manager	77	489.00		

	Sportive Training Specialist	117	462.38		
	Coach	156	460.33		
	Civil Officer	558	455.57		
Organizational Democracy	Provincial Director	12	363.71	**9.039**	**.060**
	Branch Manager	77	483.60		
	Sportive Training Specialist	117	446.26		
	Coach	156	509.92		
	Civil Officer	558	448.56		

When the organizational democracy perception and subscale scores of PDYSS staff working in different positions and titles were examined, a statistically significant difference was found between the job description of the personnel and only the transparency sub-dimension ($p<0.05$). According to this, the personnel, who work as a coach, has the highest perception of transparency (512.44), while the provincial director has the least (379.29). A statistically significant difference was not found between the perception of organizational democracy and the job definition of the staff ($p<0.05$).

Table 6. Analysis of Organizational Democracy Perception and Scale Sub-Dimension Points in Terms of Geographical Region Variability

Coğrafi Bölge		n	Line Avg.	X2	p
Participation-Criticism	Marmara	98	442.69	**51.354**	**.000***
	Aegean	97	487.88		
	Mediterranean	153	389.06		
	Central Anatolia	128	411.78		
	Black Sea	156	421.08		
	Eastern Anatolia	160	573.34		
	Southeastern Anatolia	128	494.48		
Transparency	Marmara	98	484.86	**75.255**	**.000***
	Aegean	97	490.24		
	Mediterranean	153	319.72		
	Central Anatolia	128	490.98		
	Black Sea	156	442.81		
	Eastern Anatolia	160	456.68		
	Southeastern Anatolia	128	583.43		
Justice	Marmara	98	498.05	**53.719**	**.000***
	Aegean	97	545.46		
	Mediterranean	153	358.62		
	Central Anatolia	128	483.45		
	Black Sea	156	412.66		
	Eastern Anatolia	160	445.42		
	Southeastern Anatolia	128	543.36		
Equity	Marmara	98	460.47	**17.819**	**.007***
	Aegean	97	428.41		
	Mediterranean	153	453.03		
	Central Anatolia	128	512.05		
	Black Sea	156	408.78		
	Eastern Anatolia	160	453.67		
	Southeastern Anatolia	128	513.79		
Accountability	Marmara	98	443.07	**6.706**	**.349**
	Aegean	97	488.13		
	Mediterranean	153	437.84		
	Central Anatolia	128	457.00		
	Black Sea	156	449.02		
	Eastern Anatolia	160	454.44		
	Southeastern Anatolia	128	505.06		

Organizational Democracy	Marmara	98	450.47	**74.494**	**.000***
	Aegean	97	518.57		
	Mediterranean	153	331.57		
	Central Anatolia	128	460.03		
	Black Sea	156	414.95		
	Eastern Anatolia	160	507.28		
	Southeastern Anatolia	128	575.80		

A statistically significant difference was found between the geographical region variable and participation-criticism, transparency, justice and equity sub-dimensions when the relationship between the geographical region variable and PDYSS personnel's scale sub-dimensions were examined ($p<0.05$). However, it is seen that there is a statistically significant difference between the geographical region variable and the organizational democracy perception of PDYSS personnel ($p<0.05$).

According to this;

- The personnel working in the Eastern Anatolia Region have the highest perception of participation-criticism (573.34), while those working in the Mediterranean Region have the least (389.06).
- The personnel working in the South-eastern Anatolia region have the highest perception of transparency (583.43), while those working in the Mediterranean Region have the least (319.72).
- The personnel working in the Aegean Region have the highest perception of justice (545.46), while staff in the Mediterranean Region have the least (358,62).
- The personnel working in the South East Anatolia region have the highest perception of equity (513.79) while the staff working in the Black Sea Region has the least (408.78).
- The personnel working in the South East Anatolia Region have the highest perception of organizational democracy (575.80), while those working in the Mediterranean Region have the least (331.57).

Discussion

Management of sports is the responsibility of the state in Turkey. PDYSS, which is a provincial organization operating under the MYS parent organization, is a public institution responsible for the development and spreading of the sports. Therefore, the development of the administrative features of this institution may be decisive in the achievement of sports' reaching the society. One of the management models discussed in the field during the last period in the development of managerial characteristics is the understanding of organizational democracy. The main aim of this understanding, which expresses a democratic organizational environment, can be interpreted as increasing efficiency and productivity. Hence, in the research, organizational level of democracy perceptions of the personnel at different status and positions in the overall of the PYDSSs in Turkey has been studied.

According to the findings obtained in response to the research questions, it was understood that the average score of organizational democracy perception level of PDYSS personnel was 101.34 and the level was above the average (relatively high). When the field is examined, it is determined that the level of organizational democracy perception of the staff working at university hospitals is at the middle level in the study conducted by Geçkil (2013: 85).

When the relationship between the level of organizational democracy and the demographic characteristics of the personnel was examined, it was determined that there was a statistically significant difference between the educational status of the personnel and the geographical region variables and the level of organizational democracy. According to this, while the level of organizational democracy is highest for the PhD graduates (660.27), the level of bachelor's degree graduates is the lowest (444.21). Again, while the level of organizational democracy perception is highest in the personnel working in the South-eastern Anatolia Region (575.80), the personnel working in the Mediterranean Region is the lowest (331.57). When the previous studies were examined, it was determined that there was no significant relationship between the educational status of the employees and the organizational democracy perception levels in the research conducted by Erkal (2012:176). However, according to the results obtained by Geçkim (2013:93), Collom (2001) and Catherine and Evelyn (2009), the level of organizational democracy perception increases as the level of employees' education increases. It has been found that there is no statistically significant difference between the level of organizational democracy perceived in the research findings and the job description variable of the personnel. Unlike the results of this research, it was determined that managers' perception level of organizational democracy is higher than other employees in the studies conducted by Şeker (2010: 117) and Erkal (2012: 177).

The democratic rules applied in organizations can not only favour workers but also affect the productivity of enterprises positively (Bilge, 2003). So much so that, in organizations, democratic management contributes to freedom, meaningfulness of work and increased efficacy (Gourevitch, 2016). This contribution can be felt by both the organization and the workers. When it brings innovation and change for the organization, the sense of responsibility is reinforced for the workers. (Harrison and Freeman, 2004; Breen, 2015). Finally, with the understanding of organizational democracy, the behaviours and loyalty of employees are positively affected, and the organizational citizenship perceptions are developed (Geçkil, 2013: 2).

When findings related to organizational democracy level were examined, a statistically significant difference was found between participation-criticism factor and geographical region variable. According to this, while the perception of participation-criticism of the personnel working in the Eastern Anatolia Region is the highest (573.34), the employees working in the Mediterranean Region have the least (389.06). It has been determined that there is no significant difference between the education and job definition variables and the participation-criticism factor.

A similar result was obtained in the research conducted by Takmaz (2009: 85), and it was determined that there was no statistically significant difference between the level of participation of the personnel and the education level. However, in the research carried out by Şeker (2010: 114), it was concluded that the level of participation of personnel with bachelor's degree is higher than that of associate degree and the level of participation of personnel working in managerial status is higher than other personnel. Adoption of the organization by the employees and the establishment of an effective working environment are elements by participation-criticism of the personnel are a sensitive subject for them. Thus, employees consider it unfair if decisions are taken without considering their own views and without their active participation (Greenberg and Colquitt, 2005: 164). Because, involvement in decisions brings important benefits in organizational commitment, team mentality, motivation, self-sacrifice, coordination and job satisfaction (Bakan and Büyükbeşe, 2008).

According to the findings related to the transparency factor revealing the level of organizational democracy, a statistically significant difference was found between the personnel's perception of transparency and the job description and the geographical region variables. According to this, while the employee who works as a coach has the highest sense of transparency (512.44), the staff working as a provincial director has the least (379.29). Employees working in the Southeast Anatolia region have the highest sense of transparency (583.43), while those working in the Mediterranean region have the least (319.72). Depending on the developments in management understanding, principles and values such as openness and transparency are seen as the foreground (Usta and Akıncı, 2016). Transparency, as one of the most important parts of the public administration, plays an important role in the management structures of organizations. In addition, a sense of transparency at a high level enables a corporate chain to be formed by initiating a positive chain reaction (Narbay and Sönmez, 2016).

According to the research findings, a statistically significant difference was found between organizational democracy level, justice factor, personnel education status and geographical region variables, however, it was determined that there was no significant difference in terms of job definition. According to this, it is understood that the PDYSS personnel with PhD degree has the highest perception of justice (776.45), while the value for the personnel with bachelor's degree is the lowest (451.47). Again, the personnel working in the Aegean Region has the highest perception of justice (545.46), while the personnel working in the Mediterranean Region has the least (358.62). In a study conducted by Güner and Bozkurt (2017), it was determined that one of the factors negatively affecting employees' happiness at work was the perception of justice. According to participant statements, the main reason for unhappiness at work is unfair working conditions and management understanding.

In the literature, it is emphasized that there is a close relationship between the sense of justice in organizations and the attitudes and behaviours of employees. In the democratic organizational environment, this relationship is more important. As such, Çetinkaya and Çimenci (2014) point out that the perception of justice is an important motivator in organizations. Because, when a fair management mentality is displayed in the business environment, positive attitudes and behaviours can be seen in the employees, whereas negative results can occur in terms of organizations and employees in adverse conditions (Beugr, 2002). Justice perception is important for the sustainability of relations. When the sense of justice is not observed between the employer and the employee, mutual trust is reduced and internal relations are damaged (Çakır, 2006: 31). Indeed, there is a strong link between employees' perceptions of justice and the attitudes and behaviours they exhibit (Çakici, 2012: 8).

According to research findings, a statistically significant difference was found between the level of organizational democracy and the equity factor and the geographical region where the personnel worked, however, it was determined that there was no significant difference in terms of educational status and job definition variables. According to this, while the sense of equality is the highest in the employees working in the South-eastern Anatolia Region (513.79), the personnel working in the Black Sea Region has the least (408.78). Employees should be guided and managed with an equal understanding of management, and having the knowledge or feeling of this by organizational personnel can shape the attitudes and behaviours within the organization. Because, according to the perceptions of equality within the organization, the employees develop negative or positive attitudes towards the managers, the business and the organization (Cihangiroğlu, 2009: 87, Gürbüz, 2006). Management may establish a cohesion and co-operation among personnel (Kirby and Richard, 2000) (Polat,

2012). Therefore, it can be said that, in the commitment of employees to their organizations, as in the sense of justice, the concept of equality is also determinant (Sağnak, 2005). It was determined that there was no significant difference in terms of geographical region and job definition variables when there was a statistically significant difference between the factor of accountability of organizational democracy level and the educational status variable of personnel in the obtained findings. According to this, while the perception of accountability of PDYSS personnel having PhD degree is highest (602.86), the value for the master's degree graduates is the lowest (439.52).

Accountability, which is questioning the organizational activities or outcomes, ensures continuity of activities (Andre, 2010), enabling the monitoring of services, the identification of errors, and the verification of the adequacy of individual services (Lin and Chang, 2009). In addition, accountability, a tool that organizations use to capture maximum performance, allows institutions to learn from their mistakes and righteousness (Cavill and Sohail, 2007). Yet, in a study conducted by Çınar (2016), managers stated that they are in compliance with the accountability principles and attach importance to them for institutional performance success. Accountability is a determining factor in increasing the institutional performance, providing quality service, lowering costs and providing services in a respectable manner. (O'Connell, 2005).

Conclusion

Organizational democracy can be an understanding of management that both private and public institutions can adopt in increasing their performance and productivity. In PDYSS, responsible for referral and administration of sports, institutional productivity can be strengthened through the democratic organizational environment to achieve the goals and objectives adopted. In this context, in the research, whether the perceived level of organizational democracy across the PDYSS staff in Turkey and demographic characteristics of workers varies in response to questions has been sought. The following results were obtained in the light of the derived findings.

- It is understood that the level of organizational democracy perceived by PDYSS personnel is above the average (relatively high).
- It has been determined that the level of organizational democracy is highest for personnel who work in the South-eastern Anatolia Region and have PhD degrees.
- It is determined that the factor, which the personnel perceives at the least democratic level, is accountability.
- PhD graduate personnel have the highest perceptions of justice and accountability.
- Personnel working as coaches have the highest level of transparency, while provincial directors have the lowest level of transparency.
- Personnel working in the Eastern Anatolia Region have the highest perception of participation (573.34), while those working in the Mediterranean region have the least perception (389.06).
- Personnel working in the South-eastern Anatolia Region have the highest perception of transparency (583.43) while those working in the Mediterranean Region have the least (319.72).
- Personnel working in the Aegean Region have the highest perception of justice (545.46), while those working in the Mediterranean region have the least (358.62).

- Personnel working in the South-eastern Anatolia Region have the highest perception of equity (513.79), while those working in the Black Sea Region have the least (408.78).

Since the acquisition of the expected benefits from the sports, PDYSS represent an important institutional figure. Hence, these institutions' having a democratic structure, increasing the level of organizational democracy in all regions and provinces to a certain level, and the attainment of a standard will bring up organizational efficiency and performance. Hence, it is expected that MMS will be able to identify more areas of action and increase the organizational initiative potential for PDYSSs. For this reason, it can be said that the Ministry needs to emphasize the factors of participation-criticism, equality, transparency, justice and accountability in provincial directorates, to make these elements operative and to develop policies and practices in this direction. From this point of view, this research, which is expected to shed light on the relationship between organizational democracy and sports management, may also be a source of inspiration for future studies. Organizational democracy studies can be carried out in different units and institutions of sports management.

Conflict of Interest

The author has not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS724

The Study of Sports Open Space Area Factors in Affecting the Levels of Community's Sport Participation in Slawi Sub-District, Tegal Regency, Indonesia

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Type: *Research Article (**Received:** 25.01.2018 – **Corrected:** 26.02.2018 – **Accepted:** 03.03.2018)*

Abstract

The present research aims to identify and study the factors of sport open space area in affecting the levels of community's sport participation in Slawi Sub-district, Tegal Regency, Indonesia. This research was conducted by using qualitative approach and ethnography design with critical ethnography type and it was conducted in sports open space area as the center of community's recreational sport activities. The sources of data were collected from the research informants by using Purposive Sampling and Snowball technique. Data collection technique used observation, interview, and documentation studies, while data analysis was conducted inductively by using Miles and Huberman's interactive cycle. The results of the research show that there were three factors of sports open space area which could affecting the levels of community's sport participation including: 1) The condition of the physical and social environment in the sports open space area, 2) The features and attributes in the sport open space area, and 3) The accessibility of sports open space area which could be reached by the community. The factors could add the value of happiness and excitement emanated on their faces when they were doing sport activities, because they expected to be healthy, fit, safe, and comfortable to do the activities which were always be kept in their mind and heart, so that they would always be excited to do sports.

Keywords: Sport Open Space Area, the Levels of Participation, Sport Activities, Community.

Introduction

Global issue about healthy life, through physical activity has been a reference for many countries and institutions to encourage the community to be actively involved with physical activities, especially through sports. (Soegiyanto, 2013). Sport is an important thing in the world which becomes an inseparable part of all communities, because it is the main priority of health to prevent obesity and other lifestyle-related degenerative diseases. (Bedimo-Rung et al., 2005; Gabbe et al., 2005). According to Kristiyanto (2012:2-3), sport has to be seen as a purpose and developmental asset. In their previous study Eime et al. (2013) explain a health model through sports which is developed for child, adolescent, and adult, and there are many psychological and social health benefits, the most common ones are increasing self-esteem and social interaction/integration, followed by preventing the symptoms of depression.

The development and growth of sport in community shows that there are many dimensions and they play an important role related to life enrichment, character building, moral education, and be able to balance the physical, spiritual, and social needs. One of the sports which can comprehensively realize the foundation of sport development is recreational sport to the community (MacPhail et al., 2009). Sport activities done by the community are identical with recreational sports because they can be a lifestyle which is considered to give a contribution in balancing the condition of physical, spiritual, and social needs of those who do sports (Hanani, 2017; Priyono et al., 2017).

The results of initial observation show that recreational sport activities in day off or leisure time done by the community of Tegal Regency in some open space areas gave positive development from the number, variation, and form of the activities. As for the type of recreational sport activities that were mostly done including aerobics with its varieties, cycling, walking, jogging, football, badminton, and volley, while the traditional sport activities often done by the community were gobag sodor, egrang, and bakiak jumbo, all of them were done in open space areas, and mostly those who did the sports were from middle and lower group and classified among adolescents and people aged 35 years old and over. Usually those who did the sports were adolescents. The areas of recreational sport activities were on the tracks of Slawi Square, Trisanja Slawi Sport Centre, Taman Rakyat Slawi, around the Struggle Monument of Gerakan Banteng Nasional (GBN), and around the housing complex environments in Tegal Regency.

To be able to do sport activities optimally, sport facilities and infrastructures are needed including the open space areas which can be accessed for sports. Therefore, people can move freely without any obstacle. Maksum (2004:5) argues that more available public sport facilities and infrastructures make people easier to use and utilize them for sports, conversely limited available public sport facilities and infrastructures make limited opportunity for the community to use and utilize them for sports. According to Kristiyanto (2012:189) the correlation of public open space and sport activities in the community is reciprocity and mutually strengthening.

According to Regional Profile Information System (2016), currently Tegal Regency has 1.420.132 people and an area of 87.870 Ha. In the reality, Tegal Regency has faced an obstacle in providing green space area which can be accessed by the community to do recreational sport activities in weekends and day offs. According to Wahdah and Dewi (2013) Green Space Area (GSA) is used for the fulfillment of sport needs in Slawi City where the area becomes the center of the most crowded activities in Tegal Regency which is currently not be able to be fulfilled. The recapitulation of the fulfillment of the need of sports fields in Slawi City can be seen on table 1.

Table 1. The Calculation of the Need of Sports Fields in Slawi Sub-district Tegal Regency

Region	Name of Village (*Desa*)/Administrative Village (*Kelurahan*)	Total Population	The standard of sports fields (m^2/person)	The Existing Area of Sports Fields (m^2)	The Need of Sports Fields (m^2)	Note
The Centre of the City	Kudaile	7169	3,5	1157	2150,7	Unfulfilled
Sub-Urban	Slawi Kulon	7688	3,5	1705	2306,4	Unfulfilled
	Pakembaran	7670	3,5	126	2301	Unfulfilled
Peri-Urban	Kalisapu	9707	3,5	1304	2912,1	Unfulfilled
	Kabunan	65524	3,5	750	1957,2	Unfulfilled

Source: Research by Wahdah and Dewi (2013)

The data is also supported by a research conducted by Zulfa (2017), based on the data which were concluded from the available open space areas in the coastal area in Tegal Regency show that it still had a minimum area under 5.272,1 m^2. The number of open space areas included in big category over 5.272,1 m^2 was 5 sports fields, 20.83% from the total sports fields available in the regency. The first sports field was Suradadi football field which had an area of 6.052 m², the second was Ki Gede Mlangse football field with an area of 6.372,68 m², the third was Larangan football field with an area of 6.862,88 m², the fourth was Padaharja football field with an area of 6.996,6 m², and the last was Tekstil football field with an area of 6.391,6 m². The number of open space areas was still categorized as small with the areas under 5.271,1 m² were 19 fields, that was 79.19% from the total sports fields available in the regency. Based on the facts above, therefore, the conditions make the community in Tegal Regency lacks access to sports.

Open space area is a need of the community to do physical activities. The availability of sports open space area which is easy to be accessed by all people will encourage the creation of a community who likes to do sports and physical activities. Natalia et al. (2017) also reveal that the Ratio of open space area influences the community's participation in doing sports. According to Mutohir and Maksum (2007:38), sports open space area refers to a place used by people (community) to do sports and the form of the place is a building or land. The open building or land can be a standardized or unstandardized, indoor or outdoor sports field, or a land which is designed for the community to do sports.

The results of a research conducted by Satriawan (2015) shows that the public interest in the utilization of public open space area as a place to do sports was categorized as high with the percentage was 76.14% in child category, 74.42% in adolescent category, 82.08% in adult category, and 76.86 in old people aged 50 years old and over from 50 respondents for each age category. The public interest in the utilization of public open space area was also influenced by the indicator of interest, with the description that the community tried to get

close and act to get the information about the utilization of public open space as a place to do sports. The indicators which became the factors of public interest in the utilization of public open space area as a place to do sports consisted of attention, interest, desire, belief, decision, and act indicator.

Based on the data and the phenomena above, the problem statement of the present research is 1) How are the factors of sports open space area in affecting the levels of community's sport participation in Slawi Sub-district, Tegal Regency, Indonesia ?. The present research aims to identify and study the factors of sports open space area in affecting the levels of community's sport participation in Slawi Sub-district, Tegal Regency, Indonesia.

Material and Method

This research was conducted by using a qualitative approach and ethnography design with critical ethnography type. (Creswell, 2012:476). The research was conducted in sports open space area as the center of community's recreational sports activities of the community in Slawi Sub-district, Tegal Regency, Indonesia.

The sources of data in this research consisted of primary and secondary data. The primary data were collected by an interview process with the community and observation in the sports open space area, while the secondary data were collected by the study of documentation analysis. The sources of data were obtained from the research informants by using Purposive Sampling and Snowball technique.

The instruments used in this research were 1) The interview guidelines on interview data collection technique, 2) The observation guidelines on observation data collection technique, and 3) Checklist blank on data collection technique of documentation study, the supporting media used a tape recorder, camera, and notebook. To collect primary data for this research, there were three kinds of data collection technique: 1) Direct observation, 2) Semi-structured interview, 3) Documentation study or documentation searching and documentation in the form of archives used as the supporting data or secondary data.

The validity of data in this research was investigated by triangulation technique and reviewing the sources of the data. The triangulation techniques used by the researcher were technical and source of triangulation.

Data analysis used in this research was based on the interactive analysis model developed by Miles and Huberman (1984) in Sugiyono (2015:534). Processing and analyzing data consisted of 4 interactive components 1) Data Collection, 2) Data Reduction, 3) Data Display, and 4) Conclusion/Verifying. Data analysis was done during data collection process. Data reduction was done by summarizing data into some pre-defined categories. This division used the coding method. Data display was done by using a brief description, table, or diagram. Table and diagram were based on the pre-defined categories.

Results

The description of the region

Slawi Sub-district is one of the sub-districts and the capital district of Tegal Regency which consists of 5 administrative villages (*keluarahan*) and 5 villages (*desa*). This region cannot be separated from the activities done by the communities of various sub-districts in Tegal Regency. The longitude of Slawi Sub-district is 109°04'25" E - 109°08'04" E and the latitude

of Slawi Sub-district is 6°53'44" S – 6°55'11" S, it has an area consisting of land, with a flat slope.

Slawi Sub-district region is the smallest sub-district in Tegal Regency with an area of 1.363 Ha (1.55% of the total area of Tegal Regency, that is, 87.879 Ha), it consists of 32% rice fields and 68% non-rice fields, while the irrigated rice field area is decreasing year by year. The area of dry land is 868.41 Ha and it consists of buildings and yards, and 494.63 Ha is used for dry and wet rice fields.

The average precipitation of Slawi Sub-district in 2016 was 184.27 mm, while the humidity in 2016 was 76.00 to 80.00 %. As a city, Slawi Sub-district is experiencing the effects of global warming and the temperature reached to 24.90—32.90 C° (Source: Central Bureau of Statistics (BPS) of Tegal Regency)

The availability of sport open space area which can be accessed by the community

In Slawi Sub-district, green space area is rarely encountered due to dense development. Many green space areas have been converted into business areas, supermarkets, and housing complexes, however, there are more sport facilities and infrastructures built in this sub-district, such as the construction of volleyball and badminton courts, futsal fields, and swimming pools as well as open space areas for playgrounds that can be accessed to be sport areas by the community. Not all of the sport facilities are owned by the administrative village or sub-district government, some of them are also owned by private parties in Slawi Sub-district as the places for the community to do sports in their leisure time.

Table 2. The Data of Sports Open Space Area in Slawi Sub-district Region, Tegal Regency

No.	Name of Field	Location (Administrative Village/Village)	Type (Indoor/Outdoor)	Ownership Status	Area (m^2)
1.	Football Field (1 Field)	Kalisapu	Outdoor	Government	4.200
2.	Badminton Court (8 Courts)	Kalisapu	Outdoor	Government	776
3.	Volleyball Court (4 Courts)	Kalisapu	Outdoor	Government	882
4.	Football Field (1 Field)	Dukuh Ringin	Outdoor	Government	4.200
5.	Badminton Court (2 Courts)	Dukuh Ringin	Outdoor	Government	147
6.	Volleyball Court (2 Courts)	Dukuh Ringin	Outdoor	Government	335
7.	Football Field (1 Field)	Dukuh Salam	Outdoor	Government	4.115
8.	Badminton Court (5 Courts)	Dukuh Salam	Outdoor	Government	370
9.	Football Field (1 Field)	Slawi Kulon	Outdoor	Government	4.232
10.	Badminton Court (9 Courts)	Slawi Kulon	Outdoor	Government	752
11.	Volleyball Court (2 Courts)	Slawi Kulon	Outdoor	Government	337
12.	Football Field (1 Field)	Slawi Wetan	Outdoor	Government	4.225

13.	Badminton Court (3 Courts)	Slawi Wetan	Outdoor	Government	220
14.	Volleyball Court (2 Courts)	Slawi Wetan	Outdoor	Government	329
15.	Open Space Area Taman Rakyat Slawi (TRASA)	Slawi Wetan	Outdoor	Government	2.700
16.	Football Field (1 Field)	Kagok	Outdoor	Government	4.100
17.	Badminton Court (6 Courts)	Kagok	Outdoor	Government	443
18.	Volleyball Court (1 Court)	Kagok	Outdoor	Government	170
19.	Badminton Court (6 Courts)	Procot	Outdoor	Government	440
20.	Volleyball Court (3 Courts)	Procot	Outdoor	Government	492
21.	Open Space Area Taman GBN	Procot	Outdoor	Government	752
22.	Football Field (1 Field)	Kudaile	Outdoor	Government	4.120
23.	Badminton Court (7 Courts)	Kudaile	Outdoor	Government	439
24.	Volleyball Court (4 Courts)	Kudaile	Outdoor	Government	672
25.	Football Field (1 Field)	Trayeman	Outdoor	Government	4.100
26.	Badminton Court (8 Courts)	Trayeman	Outdoor	Government	582
27.	Volleyball Court (1 Court)	Trayeman	Outdoor	Government	172
28.	Trisanja Sport Centre Slawi (1 Football Field and Jogging Track)	Pakembaran	Outdoor	Government	8.850
29.	Open Space Area Slawi Square	Pakembaran	Outdoor	Government	2.200
30.	Badminton Court (3 Courts)	Pakembaran	Outdoor	Government	225
31.	Bangun Tirta Swimming Pool	Pakembaran	Outdoor	Government	3.500
32.	Futsal Field (2 Fields)	Pakembaran	Indoor	Private	2.200
33.	Hj. Muria Swimming Pool	Pakembaran	Indoor	Private	3.200
				Total Area (m^2)	**64.447** m^2

Source: The Results of the Research

Based on the data on table 2, it can be described that the total number and area of available sports open space area was 92 and the total area was 64.447 m^2 and they could be accessed by the community to do sports. The available sports open space area including futsal fields,

swimming pools, and parks. The majority of open space areas are football fields, volleyball and badminton courts.

The surface of the sports open space area is made of grass, plaster/cement, soil, brick, and wood. The condition of the sports open space area was fairly good, however, there were also bad areas that made of grass, for example in the rainy season they could not be used because they became muddy and even had to be covered by more soil, and sometimes there was a flood as well.

The profile of location and form of the community's sport activities

The results about what the community did through their active participation to obtain information about the community's recreational sport activities in a day off or leisure time in some places show that the development was quite positive, from the number, variation and the form of the activities. The type of recreational sport activities done by the community can be seen on Table 3 as follows:

Table 3. The Profile of Location and Type of the Community's Recreational Sport Activities

No	Location	Type of Activities	Form of Activities	Time		Note
				Morning	Afternoon	
1.	On the tracks of Slawi Square, *Pendopo* of Tegal Regency's Government, Dr. Soetomo Street.	Walking, cycling, and jogging	Mass, recreational sport activities and a day off	√	√	The participants are common, on Sunday in car free day event
2.	Complex of Trisanja Sport Centre Slawi	Walking, cycling, jogging, football, volley, roller skating, badminton, and fitness activities (such as pushup, backup, and pullup)	Mass, recreational sport activities, day off, and leisure time.	√	√	The participants are common, in the afternoon and Sunday morning in car-free day event
3.	Complex of Taman Rakyat Slawi (TRASA)	Healthy walking, aerobics, cycling, jogging, and badminton.	Mass, recreational sport activities, day off	√		The participants are common, on Sunday morning
4.	Complex of the Struggle Monument	Healthy walking, jogging,	Mass, recreational	√	√	The participants

No	Location	Type of Activities	Form of Activities	Time		Note
				Morning	Afternoon	
	of Gerakan Banteng Nasional (GBN), the Monument of Poci Slawi	badminton, cycling	sport activities, day off, and leisure time.			are common, on Sunday morning and afternoon
5.	Village fields	Aerobics with its varieties, volley, football, badminton	Mass, recreational sport activities, day off, and leisure time	√	√	The participants are common to do sports in a day off/weekend, leisure time

Source: The Results of the Research

The results of the community's recreational sport activities show that the activities were done in a day off or leisure time and the participants were increasing more and more. The activities were done in groups together with friends, family, or their communities. There was the value of happiness and joy emanated on their faces because they expected to be healthy, fit, safe, and comfortable to do the activities which were always be kept in their mind so that they were excited. The people who came to do sports in open space areas were not only the local people but also people from some sub-districts in Tegal Regency.

Sport activities done by the community were influenced by the availability of open space areas and the existed culture. The people who jogging cycled, walked, and did aerobics aged ±16-60 years old, while those who did football, volley, badminton, and fitness activities aged ±18-27 years old. The times for doing sport activities were in the morning and afternoon and most of the activities took place in Trisanja Sport Centre Slawi and on the tracks of Slawi Square, *Pendopo* of Tegal Regency's Government, and Dr. Soetomo Street. From the various places, the chosen place showed a positive indication, the people wanted to get supporting situation and condition for their sport activities. One of the considerations of the people in doing sports was having open space areas and environments which could be accessed.

The factors of sports open space area that affected the levels of the community's sport participation

Based on the results by using the study of participant observation and interview with the community there are 3 factors that influenced the community in choosing sports open space area in Slawi Sub-district Region as the places to do sports, including 1) The condition of the physical and social environment in the sport open space area, 2) The features and attributes in the sport open space area, and 3) The accessibility of sport open space area which could be reached by the community.

The first factor is the condition of the physical and social environment. It refers to the condition of quality and feasibility of sports open space area and the places around them,

based on the observation results toward the quality and feasibility of sports open space area in Slawi Sub-district almost all people who did sports in those places argued that they wanted to get the benefits of the sport activities they did for their bodies. They realized that the factors of quality and feasibility of places they had chosen to do sports were really helpful for their movements because they were effective and efficient and would not cause injury. The weather was cool the atmosphere was shady, being in the sports open space area was also a reason why people chose those places, and the criteria referred to the potential environment which gave healthy nuance and the availability of O_2 (oxygen), sunlight, green and clean environment, so that they were motivated to do sport activities in order to maintain their physical condition, as well as keep their mental and social consistency. In the condition of social environment, some people revealed that they felt safe and comfortable because the sports open space area they had chosen did not disturb their sport activities, because there were some security guards who maintained and secured the areas and there was no conflict between people in the community. This safety feeling was marked because around the sports open space area there was a participation of the authorities.

The second factor is the features and attributes in the sports open space area. This factor refers to the facilities in the sports open space area. People argued that sports open space area in Slawi Sub-district had enough facilities; they could do various sport activities so that every day they did different sports and they did not get bored. They also argued that the sports open space area had fitness facilities that could be used, some toilets for those who wanted to defecate, cafeterias or stalls so that the sport activities they did could be facilitated and they would not be bothered or confused. They also argued that the attributes in sports open space area were quite interesting such as size, form, and function designed for the community's recreational sport activities.

The third factor is the accessibility of sports open space area which could be reached by the community. This factor refers to how people easily, comfortably, and safely went to the sports open space area. The opinions revealed by some people were they wanted their sport activities to be effective and they did not want to run out of time to do sports. Most of the sports open space area in Slawi Sub-district are located near people's houses. Slawi Sub-district has a quite strategic geographic location which is lowland and it is located between some sub-districts in Tegal Regency, the options of available land transportations do not make people confused and the distance is quite near to go to the available sports open space area.

Discussion

Open space area is a need for the community to do sport activities. The availability of sports open space area which is easy to be accessed by all people can encourage the creation of a community who likes to do sports and physical activities. The sports open space area available in Slawi Sub-district is still not enough because they are not effective to be used in doing sports.

The results are in line with the research conducted by Maas et al. (2008) that the availability of open space areas had only little influence and could not guarantee and improve the community's participation in sports. The most important of sports open space area was the noticed condition and feasibility so that they could give effective contribution according to the purpose of the use, because the influence of the environmental condition around the sports open space area would influence the community's sport participation, such as physical and social environment and guaranteed security, the things would make people feel comfortable

when they were doing sports. (Cheryl et al., 2004; Abdulaziz et al., 2016; Setiawan et al., 2017).

Fermino et al., (2013) reveals that the number of positive attributes in all environments is related to the increasing of the use of public open space, the management of public open space should aim to improve and maintain the characteristics around the environment and sports open space area to be better placed near parks to facilitate and/or encourage the use of sports to open space area. Open space area with more facilities will be more accessed by the community to do sports, such as the facilities of sports, toilets, worship facilities, and playgrounds so that they can facilitate the community to do sports in the open space areas. (Cherly et al., 2004; Kaczynski et al., 2008). Sports open space area with interesting attributes such as size, form, and function designed for sport activities as well as the easiness of the access, and the location that is near people's houses can trigger the people to do sports such as walking and cycling because they will be a consideration for the people. (Corti et al., 2005; Cohen et al., 2007; Priyono et al., 2017).

The weaknesses and bad quality of open space area can be a serious limitation for the community welfare because they cannot support the people in developing a healthy lifestyle, including spending their time outside, walking, playing, and so on. (Holt et al., 2008; Mitchell and Popham, 2008). Open space area in community's environment is an important thing, particularly for certain groups such as old people, children, mothers who have babies, and disabled people, the availability of sports open space area can also support the healthy physical and psychological development for the community particularly children. (Lestan et al., 2014)

Therefore, investment in architecture project that will be built should have great innovation and idea, such as improving building aesthetics by planting and conserving trees so that the areas will be greener, it is encouraged to make the more enjoyable, interesting environment and increase the use of public open space. The use of public open space can promote physical activities affected to the physical and psychological welfare of certain population because the quality of facilities for physical activities is an important factor to the use of public open space (Fermino et al., 2013).

Conclusion

Based on the results and discussion explained above then it can be concluded that there are factors of sports open space area which can influence the levels of the community's participation in doing sports, including 1) The condition of the physical and social environment in the sports open space area, 2) The features and attributes in the sports open space area, and 3) The accessibility of sports open space area which could be reached by the community. The factors could add the value of happiness and excitement emanated on their faces when they were doing sport activities because they expected to be healthy, fit, safe, and comfortable to do the activities which were always be kept in their mind and heart, so that they would always be excited to do sports.

The suggestions from the author on the utilizing of sports open space area are, there should be rules of Regional Law on the utilizing, controlling and managing sport facilities and infrastructures in order to make clear rules on the implementation of sport facilities and infrastructures management so that sports open space area used by the community will always be qualified.

The structure of good management should always put the importance of the management purpose on the open space itself. The government can cooperate with private parties for the management. Indirectly the management of sport facilities will be good because the management held by private parties can always be kept, even they put the business thing first, but it is used for the safety and security of the community in doing sports. However, socialization should be given prior the management in order to make the community understand. Although it will be more expensive but the services, comfort, and safety are the advanced people's desires. The system can help the government in managing sports open space area. Sport facilities and infrastructures will be better and well maintained. If the management of sport facilities and infrastructures is better, it will positively influence the development of sport to be better and advanced.

Conflict of Interest

The author has not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS725

Research on Balance Performance of Hearing-Impaired Badminton Players*

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Type: *Research Article (**Received:** 05.02.2018 – **Corrected:** 28.02.2018 – **Accepted:** 03.03.2018)*

Abstract

The objective of this study is both to determine the balance features of the hearing-impaired badminton players and to examine the effects of badminton sport on balance development of hearing-impaired individuals by comparing the results with hearing-impaired individuals who do not deal with sports. 10 male and 10 female players from Turkey Hearing-Impaired Badminton National Team and 10 male and 10 female individuals who do not actively deal with any kind of sports, totally 40 individuals, participated in the study. Balance Error Scoring System was used in determining the balance features. SPSS 15.0 program was used in the analysis of the data, and Two Way ANOVA analysis was used in order to define the differences between the groups. Significance level was admitted as $p<0.05$. As the conclusion of the research, it was determined that the hearing-impaired male and female national players have statistically significant ($P<0.05$) scores in foam-floor double-foot measurements compared to sedentary individuals and have better (lower) scores in other parameters. As the conclusion, it was determined that hearing-impaired badminton players have better balance performances compared to hearing-impaired individuals who do not deal with sports.

Keywords: Badminton, balance, hearing-impaired.

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* *This study was based on a part of an unpublished master dissertation. Part of this research was presented as oral presentation in Konya-Turkey, 20-21 October 2017, during the 3rd International Physical Education and Sports Conference for the Disabled.*

Introduction

Sport activities are vital for balance development since the balance is the ability of the body to stay in the required position while moving. This ability can be performed simpler with increased sport activities. Balance function is the system that enables us to locate the exact position of our body in the space, thus to coordinate our posture and perform our moves according to the environment. Balance is an important factor in emergence of efficiency of move development, and performance players fulfill sequential moves by means of balance control (Tetik et al., 2013).

Functional inability of the balance center, functioning with each other, is the most important problem for the hearing-impaired people since they cannot turn the stimulus into auditory perception. The relation of balance performance and sport is revealed via researches on different sports branches. There are studies emphasizing that sport habits improve particularly vestibular system, and coordination features of the individuals (Butterfield, 1991; Short et al., 1999). There are numerous sports branches adapted for the hearing-impaired individuals. Having an archaic past from a historical point of view, badminton is one of the sport branches that disabled individuals participate (Yüksel, 2017a).

Badminton is one of the most favourite sports in the world, which can be played either for competition or for recreation within all age groups (Sucharitha et al., 2014). Since concentration needs to be always at a high level in badminton, it was accepted as a performance sport by large masses. Particularly hearing-impaired badminton is a fast and exciting sport having the same standards with able-bodied badminton in terms of play rules and court size. Particularly the balance is vital for technically challenging hits such as over-head hits and positioning on the court in a badminton game. When the literature is examined, there are numerous useful researches on badminton sport branch and on disabled individuals (Arslanoğlu et al., 2010; Aydoğmuş et al., 2006; Bankosz et al., 2013; Bhabhor et al., 2013; Eroğlu Eskicioğlu and Çoknaz, 2016; Giacobbi et al., 2008; Karahan et al., 2007; Yüksel and Aydos, 2017; Yüksel, 2017b). Besides, it is considered important to determine the balance performances of the hearing-impaired badminton players and to examine the effects of badminton sport on balance development of hearing-impaired individuals by comparing the results with hearing-impaired individuals who do not deal with sports.

The objective of this study is both to determine the balance features of the hearing-impaired badminton players and to examine the effects of badminton sport on balance development of hearing-impaired individuals by comparing the results with hearing-impaired individuals who do not deal with sports.

Materials and Method

10 male and 10 female players from Turkey Hearing-Impaired Badminton National Team and 10 male and 10 female individuals from Konevi Special Training and Vocational High School (Selçuklu/Konya) who do not deal with sports, totally 40 individuals, participated in the research. All the volunteers participating in the research signed the informed consent form and filled personal information form.

Firstly, necessary permissions for the research were taken from the Konya Konevi Special Education and Vocational High School Administration, and from the responsible person of the Hearing-Impaired Badminton National Team. The research was carried out in two steps. Firstly, measurements of Konya Konevi Special Education Vocational High School students (n = 20, 10 male-10 female) were carried out in the school sports hall. In the second stage, the

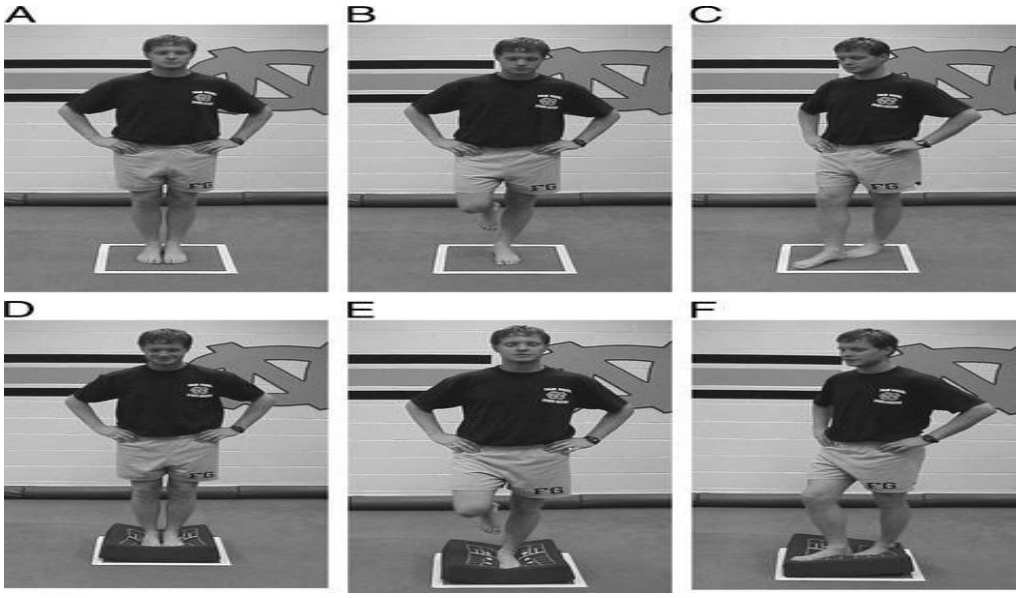
Hearing Impaired Badminton national team athletes (n = 20, 10 male-10 female) in the national team preparation camp in Ankara were carried out in Altındağ sports hall. After the height and weight measurements of the athletes, a 15 min warm-up period was given before the tests started. During the Balance Error Score measurements, video recordings were made to check once again the faults of the subjects. The protocols for the tests and measurements are as follows.

Applied Tests

Stature and Body Weight: A tape with 0.01 m sensitivity was used in the linear measurements. Weight measurements were made with a digital weighing scale with 0.01 kg sensitivity (Zorba and Saygın, 2009).

Balance: Balance performances of the participant players were measured with *Balance Error Scoring System (BESS)* test. The test was implemented for the participants on two different surfaces (plain floor, foam floor), and in three different positions (double foot, single foot, and tandem position), totally in six different conditions. Plain floor test was applied in the sports hall with tiled floor. A medium-density soft foam block with a diameter of 50x41x6 cm was used for soft foam floor test. The test was implemented in a way that the players stood still for 20 seconds with closed eyes, and the fault scores were determined through the standings. During the test, 1 fault score was recorded as the participant raised his/her hands over the hip, took a step, opened his/her hip joints more than 300, raised his/her tiptoe or heel, or opened his/her eyes (Erkmen et al., 2009; Riemann and Guskiewicz, 2000).

Picture 1. Balance fault scoring system positions



Statistical analysis

SPSS 15.0 program was used in the calculation and evaluation of the values obtained through the research. In order to simultaneously analyze the common effect of national players and the sedentary with females and males on dependent variables two-way variance analysis (two-way ANOVA) was used. Significance level was admitted as $p<0.05$.

Results

Table 1. Arithmetic mean and standard deviation values regarding the physical features of the participants

Variables	National Team		Sedentary	
	Female (N=10)	Male (N=10)	Female (N=10)	Male (N=10)
Age (years)	16.56±1.81	16.50±1.56	16.20±0.92	18.00±1.33
Stature (cm)	159.89±6.09	170.42±5.84	154.60±4.90	168.90±5.88
Body weight (kg)	51.44±3.13	59.92±5.40	56.10±5.43	73.10±5.11

Table 2. Arithmetic mean and standard deviation values regarding the balance scores of the participants

Variables	National Team		Sedentary	
	Female (N=10)	Male (N=10)	Female (N=10)	Male (N=10)
Hard floor double foot	0.00±0.00	0.00±0.00	0.00±0.00	0.40±0.97
Hard floor single foot	3.78±2.86	2.67±2.19	4.30±2.50	4.70±3.13
Hard floor tandem	2.33±2.18	0.67±1.16	3.20±2.62	2.20±1.99
Foam floor double foot	0.56±1.13	0.00±0.00	2.50±2.55	2.30±3.16
Foam floor single foot	8.00±1.32	7.83±1.70	7.20±2.57	6.80±2.04
Foam floor tandem	3.89±1.54	3.75±1.49	3.90±3.00	4.70±2.63

Table 3. Comparison of the balance scores of national team players and the sedentary participants with regards to groups, genders, and group*gender interaction

Variables		Total of squares	Average of squares	F	P
Hard floor double foot	Group	0.406	0.406	1.787	0.189
	Gender	0.406	0.406	1.787	0.189
	Group*Gender	0.406	0.406	1.787	0.189
Hard floor single foot	Group	16.557	16.557	2.334	0.135
	Gender	1.282	1.282	0.181	0.673

	Group*Gender	5.789	5.789	0.816	0.372
Hard floor tandem	Group	14.603	14.603	3.605	0.065
	Gender	18.028	18.028	4.451	**0.042***
	Group*Gender	1.127	1.127	0.278	0.601
Foam floor double foot	Group	45.673	45.673	10.640	**0.002***
	Gender	1.447	1.447	0.337	0.565
	Group*Gender	0.321	0.321	0.075	0.786
Foam floor single foot	Group	8.521	8.521	2.207	0.146
	Gender	0.814	0.814	0.211	0.649
	Group*Gender	0.138	0.138	0.036	0.851
Foam floor tandem	Group	2.342	2.342	0.466	0.499
	Gender	1.108	1.108	0.220	0.642
	Group*Gender	2.235	2.235	0.444	0.509

***P<0.05**

When Table 3 is examined, it was determined that there was statistically significant difference between male and female participants with regards to the average values of hard floor tandem position, and between national players and sedentary individuals with regards to the average values of foam floor double foot (P<0.05).

Table 4. Comparison of hard floor tandem position balance scores of national team players and the sedentary participants with regards to genders

Variables	**Gender**	**Average**	**Standard error**	**Gap between the averages**	**F**	**P**
Hard floor tandem	Female	2.76	0.462	1.333	4.451	**0.042***
	Male	1.43	0.431			

*P<0.05

When Table 4 is examined, it was determined that there was statistically significant difference between male and female participants with regards to the average values of hard floor tandem position (P<0.05).

Table 5. Comparison of double foot on foam floor position balance scores of national team players and the sedentary participants with regards to genders

Variables	Group	Average	Standard error	Gap between the averages	F	P
Foam floor double foot	National team	0.278	0.457	2.122	10.640	**0.002***
	Sedentary	0.400	0.463			
Female	National team	0.556	0.691	1.944	4.172	**0.048***
	Sedentary	2.500	0.655			
Male	National team	0.000	0.598	2.300	6.722	**0.014***
	Sedentary	2.300	0.655			

***P<0.05**

When Table 5 is examined, it was determined that there was statistically significant difference between national team players and sedentary participants with regards to the average values of foam floor double foot position (P<0.05).

Discussion and Conclusions

This study was carried out to determine the balance features of the hearing-impaired badminton players and to examine the effects of badminton sport on balance development of hearing-impaired individuals by comparing the results with hearing-impaired individuals who do not deal with sports.

Balance Error Scoring System was used in determining the balance performances of the participants of the research. The most important factors in the differences in balance scores were gender and doing active sports. It was determined in this study that the hearing-impaired male national badminton players had better (lower) values compared to hearing-impaired male sedentary individuals with regards to hard floor double foot, single foot, tandem, and foam floor tandem positions; and that the hearing-impaired female national badminton players had better values compared to hearing-impaired female sedentary individuals with regards to hard floor single foot, tandem, and foam floor tandem positions. Moreover, it was determined in foam floor double foot measurements that both male and female national badminton players had statistically significant and better values compared to hearing-impaired sedentary individuals (P<0.05). It was determined in inter-gender results that males had statistically significant and better results compared to females, and it was observed that all of the other parameters yielded similar results.

It is observed that there is much research on balance performance in different age groups and different disabilities in the literature. Karakoç (2014), stated that regular balance and coordination exercises contribute to the performances of hearing-impaired judo players in a positive manner and that dynamic balance exercises rather than static balance exercises affected the performances of the players. In a research on hearing-impaired individuals Kurt (2007), stated that the group which was actively doing sports had better balance performances than the group who did not deal with sports. In another research, dynamic balance values of three groups composed of able-bodied wrestlers, hearing-impaired wrestlers, and the

sedentary individuals were compared. As a result of this study, it was determined that able-bodied wrestlers had statistically significant and better (lower) values compared to hearing-impaired wrestlers, and hearing-impaired wrestlers had statistically significant and better (lower) values compared to the hearing-impaired individuals with sedentary lifestyles, and as the conclusion it was stated that wrestling sport developed the dynamic balance in hearing-impaired individuals (Polat, 2008). It can be mentioned that the findings of studies of different sports branches on the hearing-impaired individuals are parallel with the findings of our study.

In a research using Balance Error Scoring System, balance performances of football players, basketball players, and gymnasts were compared. When the balance error scoring average scores were examined it was reported that the gymnasts had the best performances, while football players had the second best and basketball players had the worst balance performances (Erkmen, 2006). In another research, it was stated that hearing-impaired volleyball players had statistically significantly better performances compared to handball players (Taşkın et al., 2015). In another research on volleyball players, it was determined that there were statistically significant differences between hearing-impaired players and able-bodied players (Ciğerci et al., 2011). Using Balance Error Scoring System and focusing on the effects of badminton sport on physical parameters, it was reported that badminton players had better (lower) balance performances (Yüksel et al., 2015). The different type of sport branches, activities, and disabilities have different effects on balance performance. As the conclusion of the study, the findings regarding that the hearing-impaired badminton players had better balance performances compared to the hearing-impaired individuals who did not deal with sports, are supported by many research stating that hearing-impaired individuals who deal with sports had better balance performances (Erkmen 2006; Karakoç, 2014; Kurt, 2007; Polat 2008; Rajendran et al., 2013; Yağcı et al., 2004; Yüksel et al., 2015)

Balance is an important factor in badminton as is in many sport branches. During the game, the player needs to keep his/her balance to perform almost all kinds of hits and balance exercises are regularly included into the exercise programs of the badminton players whether they are disabled or able-bodied. According to the findings of this study, the result that hearing-impaired badminton players had better values in 9 test parameters was evaluated to be the indicator of the fact that the individuals who exercised for years in this sport branch had more developed balance performances compared to the sedentary individuals.

As the conclusion, determining that hearing-impaired national badminton players had better balance performances compared to the hearing-impaired sedentary individuals, we can mention that badminton sport had positive contributions to the balance skills of the hearing-impaired individuals.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS726

Development of e-Sport in Turkey and in the World

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Type: *Review Article (**Received:** 06.02.2018 – **Corrected:** 02.03.2018 – **Accepted:** 12.03.2018)*

Abstract

The extraordinary development of technology has caused to emerge some new improvements by affecting sport field as it has affected the other fields. The world which has become the huge market economically with the effects of globalization expanded including the-Sport with the developing of information and communication technologies. One of the developments related to the sport field is e-Sport. The history of e-Sport dating back 1970s in the world has started to build a foundation in Turkey's 2000s years. Although plenty of e-Sport players take part in the international contests in the national level, the studies related to the e-Sport and the developments of e-Sport between the countries are very few in the world, and scarcely any in Turkey. Sport has increased the capacity of viewers and being a big sector. Therefore, comparing the situation and improvement of e-Sport both in Turkey and the world is the main goal of this research. The research carried out as part of a scan study model. It has been done to understand the situation of our country in this field, and how to ameliorate it by considering the last improvements of e-Sport in Turkey and the world.

Keywords: E-Sport, Digital Gaming, Cybersports, Competitive Gaming

Introduction

In this new technological age, the world has moved more towards using the Internet as a medium for a variety of purposes. From finding information to set up businesses, the Internet has become a part of daily life for many people. This also comes to affect entertainment, giving rise to a new way to broadcast events, and with this ability, the Internet allows entrepreneurs and companies to reach millions of viewers. One of the largest growing forms of entertainment is e-Sport (Southern, 2017).

Most people have never heard of e-Sport, ‘‘a catchall term for games that resemble conventional sports insofar as they have playoffs, fans, superstars, uniforms, comebacks, and upsets. But all the action in [e-Sport] occurs online, and the contestants hardly move’’ (Segal, 2014).Welcome to the world of competitive gaming, also known as e-Sport.

While the study of computer games, in general, is slowly becoming accepted in the academic world, the scientific investigation of competitive computer gaming is still in its infancy. One of the main reasons appears to be that in western culture competitive gaming is usually only seen within the contact of first-person shooting games. Almost any attempted academic discussion is immediately locked into a debate about game ethics. This debate, however, represents only a small part of the whole spectrum of competitive computer gaming that should be of interest to academia.

Development of e-Sport in the world

With an origin tracing to October 19, 1972, when the first video game competition occurred at Stanford University (Baker, 2016), electronic sports (dubbed e-Sport) steadily gained market space, with exponential growth happening over the last decade. Eight years later, the first large-scale video game competition attracted overall, 10,000 participants when Atari held the Space Invaders Championship in New York City (Players Guide, 1982).

The origin of e-Sport is said to rely heavily on the launching of the worldwide web (www) in 1989, and on the early 1990s software and hardware technologies with network and multiplayer functions. In the early 1990s, the history of e-Sport started and it became increasingly popular during this decade the number of players increasing considerably. Besides, e-Sport also created a new marketplace for both manufacture and service and organizational aspects (Samur, 2018).

The term “electronic Sports” or “e-Sport” dates back to the late nineties. One of the earliest reliable sources that use the term “e-Sport” is a 1999 press release on the launch of the Online Gamers Association (OGA) in which then Eurogamer evangelist Mat Bettington compared e-Sport to traditional sports (OGA, 1999). Around that time, the sport discussion was also fuelled by a failed attempt of the organization of the UK Professional Computer Gaming Championship (UKPCGC) 1999 to have competitive gaming recognized as an official sport by the English Sports Council (Knox, 1999).

In the United States and Europe, the history of competitive gaming is usually associated with the release of networked first-person shooting games, in particular, the 1993 released game “Doom” and the 1996 follow-up title “Quake” by id software (Kushner, 2004).During that time, teams of online players, also called “Clans”, started to compete in online tournaments. By 1997 several professional and semi-professional online gaming leagues had formed, most noticeably the still influential “Cyberathlete Professional League” whose business concept was modeled after the major professional sports leagues in the United States (Welch, 2002).

Among the first CPL tournament events held in front of live audiences was the "The Foremost Roundup of Advanced Gamers" otherwise known as "The Frag" in 1997 (Frag Diary, 1997).In the philosophy of the CPL, Professional computer gaming was now considered an emerging spectator sport. In 1999, game development company Valve released the game "Counter-Strike" as a modification of their first-person shooter "Half-Life". The game quickly replaced Quake in popularity in competitive gaming and has since then remained the central element in western e-Sport events (Wagner, 2006).

At the turn of the 21st century, e-Sport grew tremendously by increasing the number of global entities in competitions (e.g., the World Cyber Games, Intel Extreme Masters, and Major League Gaming); in the year 2000, there were 49 tournaments with the average professional player earning US$3,061 annually through tournament awards (e-Sport Earnings, 2000).South Korea took the concept of e-Sport to new heights, embracing it within popular culture. In an attempt to grow the culture of e-Sport, the South Korean government created the Korean e-Sport Association in 2000 (2013), a department embedded in South Korea's Ministry of Culture, Sports, and Tourism agency and hastened by massive Internet bandwidth growth (Huhh, 2007).PC bangs, a place where South Koreans rent time to play on a computer, were fundamental in growing e-Sport, becoming social spaces where interaction and fandom could emerge (Huhh, 2007) by placing a human face to people from this virtual world (Huhh, 2007).

In the second decade of the 21st century, the popularity and emergence of online streaming software hastened rapid e-Sport growth. Twitch, launched in 2011, was the main provider for e-Sport competitions shown online, as it was (and is) free for everyone as well as the most common way everyone watched e-Sport (Twitch, 2016). In 2013, users spent over 12 billion min on Twitch watching e-Sport (O'Neill, 2014), most notably League of Legends (LoL) and DotA 2. Due to the success and profitability of Twitch, a variety of competitors emerged including Beam.pro, Azubu tv, and Hitbox.tv.

The most popular genres within e-Sport are first-person-shooter (FPS), real-time strategy (RTS) and sports games. In FPS games the player controls an avatar, the virtual representation in the game. The virtual environment of the game is approached from the perspective of the avatar. The only thing visible of the avatars on the screen is the hands and the weapons they handle. In contrast, in RTS games the player controls a whole army, which is seen from a 'bird's-eye view', and the games include combat in different ways. One of the most popular FPS games is Counter-Strike, and its counterpart in RTS games is StarCraft. In sport games, naturally, traditional (or modern) sports are simulated. A popular title is the FIFA football series. E-Sport is always about defeating other contestants, by either destroying them, or, as in sport games, just racing the fastest, or scoring the most goals. Over time the number of different games in which competitions are held has increased and it is still increasing. A good e-Sport game is delimited in time and space where the players are competing individually or in a team. The competitions are carried out over the Internet or through so-called Local Area Networks (LAN).The most prestigious competitions are carried out in LAN, where both smaller and larger numbers of computers are linked together in one building (Jonasson and Thiborg, 2010).

Understanding e-Sport is complex because of the relative novelty of the industry as well as the convergence of culture, technology, sport, and business (Jin, 2010).Unlike traditional sports such as hockey, baseball, and soccer, e-Sport is an interconnection of multiple platforms. E-Sport, which is also synonymous with gaming, is computing, gaming, media, and sports event all wrapped up into one (Jin, 2010). Consequently, defining e-Sport is equally difficult.

It is imperative to first distinguish the difference between sedentary sport video games (SSVGs) and e-Sport. SSVGs are video games that emulate real-life-Sport but do not involve PA (Kim & Ross, 2006).Examples of SSVGs include, but are not limited to EA Sports UFC, NHL 15, MLB 14: The Show, NBA 2K15, Madden NFL 15, and FIFA 15.All of the previously mentioned games center on professional sports leagues. On the contrary, e-Sport is not bound by definition by a specific genre of game. In fact, top e-Sport competition games are not related to real-life-Sport but are more centered on fantasy worlds. LoL is described as a competitive game set in an imaginative world where players take the role of a "powerful Summoner" to call and control "brave Champions into battle" (GEForce, 2015).

In 2006, Wagner argued that e-Sport is too narrowly defined if it is merely seen as "a competitive way of playing computer games within a professional setting". Instead, Wagner developed a definition for e-Sport as "An area of sport activities in which people develop and train mental or physical abilities in the use of information and communication technologies". Wagner's expanded definition, though more encompassing, does not truly define e-Sport. One reason why the authors believe Wagner's definition does not completely fit is because of the option of the sporting activity to be mental or physical. It is clearly accepted that one characteristic which separates a game from a sport is the physical application of skill (Coakley, 2008; Suits, 2007). For the sake of remaining analogies to the e-Sport industry, the authors will consider the definition of e-Sport to be physical. However, the use of physical skill in e-Sport is often questioned and will also be discussed later this article (Jenny at all, 2017).

Also, Wagner's (2006) definition leaves ambiguity in how e-Sport is played. The statement that people develop and train with the use of information and communication technologies in e-Sport leaves out the aspect of competition. Competition is important to include in the definition because the foundation of the e-Sport industry is centered on competition. Moreover, Wagner fails to define the platform in which e-Sport is played, which is online. This is important to include in the definition because the growth and viewership of e-Sport are largely attributed to the accessibility of the contests being online and interactively independent of location.

Table 1. Top Games Awarding Prize Money in e-Sport

Games	**Money**	**Players**	**Tournaments**
1.Dota	$132,213,754.64	2321	872
2.League of Legend	$49,476,883.20	5219	1974
3.Counter-Strike	$46,543,728.43	9174	3007
4.Starcraft	$25,061,166.06	1740	4705
5.Heroes of the Storm	$11,901,239.19	958	382

Source: *https://www.*e-Sport*earnings.com/gamesAccess (Received on 24.01.2018)*

This list represents the top 5 games in e-Sport with the most prize money based on information published on the internet. Sources include news articles, forum posts, live report threads, interviews, official statements, reliable databases, VODs and other publicly-accessible sources that preserve "historical" information.

Development of e-Sport in Turkey

In our country, e-Sport is an ever-developing sport. Dot A, Counter-Strike games which started with the cyberspace battles has lapsed into silence for a while. They were the beginning of the sector. People were trying to prove their power with the competition in these games. Probably, no one was thinking that e-Sport would develop and arouse interest. However, especially in the Far East and several areas in the world, e-Sport culture has begun to occur and teams started to travel between countries to play in tournaments. In our country, the big teams like Dark Passage have tried to show up by taking part in organizations like Dream hack. The eliminations that World Caber Games organized has founded the e-Sport in Turkey.

Turkey was always a follower of e-Sport, and it is still proceeding in this way. Particularly the opening of Riot Games Turkey office made a move in this field. Today the most played MOBA typed game is League of Legends. This game has become widespread rapidly and dragged people to play competitive games. In the beginning, players teamed up and went to tournaments. Now people are preparing for battles by practicing at homes that teams provide for them. Players do not start to practice when one week left to the tournament. They are practicing regularly during the season.

Turkish Digital Games Federation was established with the aim of serving to players who play in the digital environment and their communities in 2011. In 2013, this federation was included in Developing Sport Branches Federation's structure. League of Legends Championship and Rising has carried on the activities as official e-Sport league since 2013. Players who compete these leagues get an official license from the Ministry of Youth and Sports (Üçüncüoğlu and Çakır, 2017).

Table 2. Number of Players with License

Years	Female	Male	Total
2013 year	1569	3920	5489
2014 year	1863	6961	8824
2015 year	2100	8540	10640
2016 year	2170	9003	11173
2017 year	2321	9156	11477

Source: *The Ministry of Youth and Sport, Statistics*

Within the Developing Sport Branches Federation connected to The Minister of Youth and Sport, there are Korfball, Cricket, Offshore, Rafting, Squash and Digital Games which get into the act. Despite the failure to reach to the number of digital sports licensed players, it is a fact that a number of licensed players has increased day by day since 2013. Generally, in digital sports which men mostly take part in there is an increase of 80% from 2013 to 2014. The reason for this increase is that players get their licenses as part of Developing Sport Branches Federation.

Beşiktaş led the way as a sport team by entering e-Sport field in 2015. After that, Fenerbahçe entered the e-Sport with the name as 1907 Fenerbahçe by buying out the SuperMassive TNG team in 2017. Galatasaray also bought the Victorious Ace team and entered this field with the

name of Galatasaray e-Sport. There are three leader e-Sport teams out of the modern sport clubs: Dark Passage founded in 2003, HWA Gaming in 2008, and SuperMassive in 2016.

Turkey has become a region which can be accepted as worldwide thanks to the investment Riot Games had. Although it is not considered as big as the leagues in North America, Europe, China, Korea, it can be considered as a quadratic region. Wild Card tournaments entitle our teams to confront with senior regions in international organizations. Dark Passage deserved to compete in World Championship in this way and represented Turkey in 2014. That Beşiktaş incorporated Aces High and made a team of e-Sport becomes a first in the world.

The competitive environment increasing with the League of Legends also affected other games. People started to appear in worldwide arenas. One of the best examples is that Zerghamdi who is the Starcraft 2 player of HWA Gaming took part in Dreamhack Summer tournaments in Valencia in 2014. Besides, Space Soldiers which is the team of Counter-Strike: Global Offensive set up in 2015 establishes a game house and do practicing, also it is the first team that went abroad. This shows the improvement of e-Sport.

There are also important steps for our country in the DotA2 arena. During the last months of 2013, the tournament which Merlin Kazanı organized with sponsored by Turkcell Superonline has gained much interest and showed the potential of DotA2. Another important DotA 2 activity is a 21.000 TRY awarded tournament organized by ESL in GameX in December 2014, which Hearthstone was also sharing the same award pool.

Unfortunately, some e-Sport branches do not get succeed as others. Because of the inadequate attention which caused cancellation of tournaments and the low award, players left the game. Turkey has not got enough interest in Starcraft 2. Likewise, DotA 2 has not built community. There were players thinking that it is not profitable. However, the most important thing is that old DotA 2 player of HWA Gaming Elwind passed to League of Legends. He is playing in the top lane in Dark Passage which is the best second team of Turkey.

e-Sport is a sport branch came into existence with the awarded tournaments gained speed at the beginning of the 2000s and players maintain their life by playing games in official league and activities within professional teams. E-sport's age of onset is 13-14 years and players mostly retire before they are 30 years old. The most popular games in e-Sport field are League of Legends, DotA 2, Counter-Strike: Global Offensive, Overwatch, Hearthstone.

Table 3. Most Profitable Countries

Countries	**Profit**	**Number of Players**
1.China	$69,100,319.18	2655
2.United States	$64,019,893.42	9634
3.Korea Republic of	$57,610,458.43	2553
4.Sweden	$23,348,391.70	1915
40.Turkey	$948,944.18	270

Source: *https://www.e-Sportearnings.com/countries*

According to above table, China, America, and Korea are seen as the countries that can get huge profit. However, Turkey is far behind these countries according to the number of players and profits gained.

Conclusion

In today's world, new generations are moving away from traditional sports and begin to play games which are more competitive and exciting. The award pool can be raised up to 20 million dollars and these tournaments called World Championships which almost have about one hundred million instant viewers.

It is possible that the investments in e-Sport both in the world and Turkey offer an insight into the future of sector which is taking its first steps. Besides, the contribution of football clubs to the sector in Turkey, America, and Europe's sport clubs has also increased the e-Sport teams. However, in countries like Korea and China e-Sport has already become a culture.

As it seems in table 3, people can get huge profits from e-Sport. Herein, with Turkey's rising from 40 to first ranks trade volume will grow and provide a return. E-Sport keeps developing day by day and it has become a job. Teams should have a broad vision and be encouraged to go after the success. The development of e-Sport in Turkey should not be with only League of Legends and other games should gain importance with tournaments and players should have enough opportunities. Besides, there should be eliminations by both state and private clubs between the players who play these games and determined the skilled ones. Skilled players should have a scholarship, office, and education from experts. The teams need to be motivated to take part in national and international tournaments. This is the only way Turkey can compete with other countries.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS729

Determination of Macronutrient, Liquid, and Nutritional Supplement Consumption in Male Athletes[1]

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Type: *Research Article (**Received:** 13.02.2018 – **Corrected:** 07.03.2018 – **Accepted:** 12.03.2018)*

Abstract

The present study was conducted to determine macronutrient, liquid, and nutritional supplements intake in male athletes. Forty male athletes living in Ankara and attending to various sport clubs participated in this study. A survey was given to subjects for including questions about sports life, nutrition habits, and liquid consumption. Within the scope of the study, i; a questionnaire containing questions about sporting life, eating habits and liquid consumption, ii; 3-day food consumption record form, iii; 3-day physical activity record form were applied to athletes. Athletes were grouped as strength/power (P) athletes (n=26) and team (T) athletes (n=14). 55,0% of the athletes use nutritional supplements and the most commonly used nutritional supplements are branched chain amino acids (35,0%), whey protein (32,5%) and glutamine (20,0%), respectively. When the food consumption records of the athletes are examined, it was found that both groups of athletes were found to have inadequate energy (P:46,1±17,6 kcal/kg/day, T:41,7±11,1 kcal/kg/day; p>0,05). It was found that athletes consumed low amount of carbohydrate (P:5,0±2,4 g/kg/day, T:5,5±1,7 g/kg/day; p>0,05) and that P athletes consumed high protein while T athletes consumed at recommended levels (2,7±1,3 g/kg/day, 1,5±0,5 g/kg/day; p<0,05). While the difference between groups was significant for the percentages of energy from carbohydrates (P:42,7±8,2%, T:52,1±5,5%; p<0,05) and proteins (P:24,3±8,6%, T:14,6±2,4%; p<0,05), the percentages of energy from the lipids are within the recommended levels and there is no significant difference between the groups (P:33,0±11,5%, T:33,3±5,1%; p>0,05). Finally, it can be said that the liquid intake of athletes is at normal levels according to recommended values for adults.

Keywords: Sports nutrition, Eating habits, Athlete health, Fluid consumption

[1] *Some findings of this research were presented as oral presentation in the First International Congress of Health Sciences (29 June – 1 July 2017) and was published as a summary paper.*

Introduction

Sport is an occupation that is people do in order to live a healthy life by having a good time and also is activities in which some people are professed and gain financial gain from it. People are encouraged to do sports thanks to the increasing interest in sport day by day and various reasons. As a result of increased interest and the number of individuals engaged in sports, the nutrition of athletes has become an increasingly explored subject (Canbolat, 2016). In recent years, important and reliable results have been put forward in the scientific studies carried out on this subject. Along with these studies, almost every athlete now knows the importance of nutrition in the sport and tries to get information about nutrition. For this reason, individuals exercising and doing sports need to learn basic knowledge about the subject (Ersoy, 2012).

The aim of the nutrition is to feed the athlete in an adequate and balanced manner considering the factors such as gender, age, physical activity level, sports type, and training or competition periods (Güneş, 2016). Proper nutrition in the athletes ensures optimal health, increased lean body mass and low-fat percentage and long-lasting durability in training. In addition to all these, proper food selection with proper timing before, during and after the competition increases performance and accelerates the recovery (Ersoy, 2004).

However, it is known today that erratic and irregular eating habits among athletes are seen. Generally, athletes who are prepared for races apply low-calorie intake, and the use inappropriate diuretics, nutritional supplements, anabolic steroids and fat burning substances. As a result of applying these methods, it has been found that decrease in bone mineral density, deterioration of metabolic events, increase in the risk of cardiovascular disease, loss of eating control, anxiety and hormonal and psychological problems are observed. In addition, it has been reported that the athlete's muscle strength, function, and durability are reduced (Robinson et al., 2015:1-2).

In the light of this information, it is necessary to examine and evaluate the athletes' nutrition. This study was conducted to determine macronutrient, liquid, and nutritional supplement intake of strength/power and team athletes.

Materials and Method

Research group

40 male athletes (26 strength/power and 14 team athletes) from various sports clubs in Ankara province participated in the survey between January-March 2017. Doing sports regularly for at least 2 years and that there is no disease and lack of use of any pharmacologic ergogenic aids (stimulants, diuretics, narcotic analgesics, anabolic agents, peptide hormones and analogs and masking agents) has been defined as the criteria for inclusion in the study. After being informed about the purpose and method of study participants signed voluntary consent forms and they were put into practice. Declaration of Helsinki principles was adhered to in the study.

Data collection tools

A questionnaire including demographic information, sports life, and eating habits were applied to 40 athletes participating in the research using face to face interview method. In addition, data were collected from the 3-day food consumption records, the 3-day physical activity records, the use of nutritional supplements and daily fluid consumption from athletes.

Data evaluation

Nutritional supplements that the athletes use are added and average energy and nutrient intake of the athletes were calculated using the Nutritional Information System (BEBIS) package program. The results were assessed based on the energy and macro nutritional values recommended by athletes per kilogram by the International Society of Sports Nutrition (ISSN), the American College of Sports Medicine (ACSM) and the International Olympic Committee (IOC). In determining the physical activity status, a practical 24-hour physical activity record form was used and the Physical Activity Level (PAL) values of the athletes were calculated (PAL=total daily energy expenditure / basal metabolic rate). According to data based on Turkey Nutrition Guide (2015) PAL values physical activity levels indicated 1,4-1,5=sedentary; 1,6-1,7=moderately active; 1,8-1,9=active and ≥2,0=overactive. Since there is no reference value for the total amount of liquid to be taken daily for the athletes the number of fluid athletes daily receive was also evaluated according to Turkey Specific Food and Nutrition Guide (2015) and Turkey Nutrition Guide (2015) the recommended amount of fluid consumed daily for adults.

Analysis of data

SPSS 18.0 package software was used to evaluate the data obtained in the study. Research data are presented in table form with absolute and percent (%) values. Mean ($\bar{X}$), standard deviation (±SD) and minimum-maximum values are given where necessary. Statistical analyzes were carried out after grouping the athletes as strength/strength and team athlete. The Independent Samples T Test was used to evaluate the means of independent groups with normal distribution according to Shapiro Wilk test results. In cases where the normality assumption is not met, the logarithms of the data to be compared is taken; normal distribution was determined to be appropriate and parametric statistical analysis was performed. Significance level in the study was taken as 0,05.

Results

The average age of the participating athletes is 24,4±4,8 years (min:19,0 years; max:40,0 years) and the athletes regularly perform sports for an average of 9,6±5,4 years (min:2,0 years; max:27,0 years). After examining sports branches performed by the athletes, it was determined that 26 of them were strength/power (65,0%) and 14 were team (35,0%) athletes. Table 1 shows findings of athletes eating habits.

Table 1. Eating Habits of Athletes (n=40)

Nutrition Habits	**n**	**%**
Number of Main Meals		
2	8	20,0
3	32	80,0
Number of Snack Meals		
1	9	22,5
2	11	27,5
3	16	40,0
Never	4	10,0
Nutritional Supplement Use		
Yes	22	55,0
No	18	45,0
Smoking		
Yes	4	10,0
No	36	90,0
Alcohol Use		
Yes	3	7,5
No	37	92,5

It was determined that the majority of the athletes performed 3 main meals (80,0%) and 3 snacks (40,0%) per day. 10,0% of the athletes never make meals, and 22,5% make only 1 snack. According to the answers given in question; would you use nutritional supplement? It is understood that 55,0% of the athletes use nutritional supplement. The most commonly used nutritional supplements were branched chain amino acids (35,0%), whey protein (32,5%) and glutamine (20,0%), respectively. Smoking and alcohol use are not common among athletes. Only 10,0% of the athletes used cigarettes and 7,5% used alcohol.

Table 2. Physical Activity Levels of Athletes (n=40)

Physical Activity Findings	**Strength/Power**		**Team**		**$\bar{X}$ ± SD (Min-Max)**	
	$\bar{X}$ ± SD (Min-Max)		**$\bar{X}$ ± SD (Min-Max)**			
Physical Activity Rate	2,21±0,38 (1,65-3,29)		2,14±0,22 (1,79-2,40)		2,18±0,33 (1,65-3,29)	
Physical Activity Level					**Total**	
	n	**%**	**n**	**%**	**n**	**%**
Intermediate Active	1	3,8	1	7,1	2	5,0
Active	6	23,1	3	21,4	9	22,5
Overactive	19	73,1	10	71,4	29	72,5
Total	**26**	**100**	**14**	**100**	**40**	**100**

The average PAL values were found to be 2,18±0,33 according to the physical activity records of the athletes for 3 days. When the physical activity levels of the athletes were examined, it was determined that 72,5% were overactive, 22,5% active and 5,0% had moderately active physical activity level. When the physical activity levels are compared

according to the sports activity it is understood that close to all of the two group athletes have physical activity at active and overactive level (Table 2).

Table 3. Energy and Macro Nutrients Received by Athletes Daily (n=40)

Energy and Macro Nutrients	Strength/Power X̄ ± SD (Min-Max)	Team X̄ ± SD (Min-Max)	t Test t	sd	p
Energy (kcal/day)*	3749,9±1466,4 (1967,8-7590,2)	3204,9±706,3 (2192,6-4831,2)	1,109	28	0,274
Energy (kcal/kg/day)*	46,1±17,6 (24,0-91,5)	41,7±11,1 (23,5-64,4)	0,638	38	0,527
Carbohydrate (%)	**42,7±8,2 (24,0-63,8)**	**52,1±5,5 (41,6-60,2)**	**-3,833**	**38**	**0,000**
Carbohydrate (g/kg/day)*	5,0±2,4 (1,9-11,7)	5,5±1,7 (2,4-8,5)	-1,015	38	0,316
Protein (%)	**24,3±8,6 (5,4±41,5)**	**14,6±2,4 (11,0-18,8)**	**5,357**	**31,484**	**0,000**
Protein (g/kg/day)*	**2,7±1,3 (1,0-6,8)**	**1,5±0,5 (1,0-2,8)**	**4,090**	**38**	**0,000**
Fat (%)*	33,0±11,5 (9,6-61,0)	33,3±5,1 (27,2-43,2)	-0,780	34,666	0,441
Fat (g/kg/day)*	1,7±1,0 (0,3-5,1)	1,5±0,4 (1,0-2,4)	0,007	38	0,994

***** *Logarithm of the data was taken because it did not show normal distribution; then normal distribution was determined to be appropriate and parametric statistical analysis was performed.*

In Table 3, the energy and macronutrients that the athletes get daily compared to the sports they play. According to this, it was determined that the strength/power athletes had higher energy than the team athletes (P:3749,9±1466,4 kcal/day, T:3204,9±706,3 kcal/day; p>0.05). The same situation is observed in the energy values per kilogram of the athletes (P:46,1±17,6 kcal/kg/day, T:41,7±11,1 kcal/kg/day; p>0,05). When the amount of carbohydrates received by the athletes was examined, it was found that the team athletes were receiving more carbohydrates (P:5,0±2,4 g/kg/day, T:5,5±1,7 g/kg/day; p>0,05). The difference between the percentages of energy coming from carbohydrates in the diet of the athletes was statistically significant (P:42,7±8,2%, T:52,1±5,5%; p<0,05). According to the findings, it was found that the strength/ power athletes were receiving higher amount of protein than the team athletes (P:2,7±1,3 g/kg/day, T:1,5±0,5 g/kg/day; p<0,05). In addition, the difference between the percentages of energy coming from the protein in the athletes' diet was statistically significant (P:24,3±8,6%, T:14,6±2,4%; p<0,05). Finally, it was determined that the amount of fat (P:1,7±1,0 g/kg/day; T:1,5±0,4 g/kg/day) consumed by athletes on a daily diet and the percentage (P:33,0±11,5%; T:33,3±5,1%) of energy from fat in their diets were similar in both groups and there was no statistical difference between the groups (p>0,05).

Table 4. Liquid Consumption Situations of Athletes (n=40)

Total Fluid Intake	Strength/Power $\bar{X}$ ± SD (Min-Max)	Team $\bar{X}$ ± SD (Min-Max)	t Test t	sd	p
mL/day*	3810,1±1461,2 (1600,0-6500,0)	3264,5±1527,9 (1170,0-6500,0)	1,359	38	0,182
mL/kg*	47,2±19,6 (19,2-93,3)	41,6±18,5 15,4-81,2	1,033	38	0,308
mL/kcal*	1,1±0,6 (0,4-3,1)	1,1±0,6 (0,3-2,1)	0,457	38	0,650

* *Logarithm of the data was taken because it did not show normal distribution; then normal distribution was determined to be appropriate and parametric statistical analysis was performed.*

In Table 4, daily amounts of liquids that athletes have taken are compared according to the type of sports they play. According to the findings obtained, it was determined that the daily amount of fluid received by the strength/ power athletes was higher than that of the team athletes but the difference was not statistically significant (P:3810,1±1461,2 mL/day, T:3264,5±1527,9 mL/day; p>0,05). The differences between the amounts of fluid that the athletes received per kilogram and the amount of fluid they received per total energy with food were not statistically significant (p>0,05).

Discussion and Conclusion

Along with the increased interest in spores in recent years, the nutrition of athletes has become a subject of further research. Regular and balanced diet is important in many respects for the athlete. Many situations that affect the athlete directly or indirectly, such as the protection of health, the improvement of performance, the prevention of weight loss and excessive weight gain, the prevention of discomfort caused by electrolyte loss in the body as a result of sweating during exercise, the regular operation of the digestive system, renewal of energy deposits during recovery period (Süel et al., 2006:272). In the light of this information, this study was carried out to evaluate the athletes' macronutrients, nutritional support, and fluid intake and to determine the current data on the feeding of athletes.

65,0% of the athletes participating in the study are in strength/ power, 35,0% are team athletes. The average age of the athletes was 24,4±4,8 years and it was determined that they had a sports life of 9,6±5,4 years. It was determined that the majority of the athletes who examined eating habits performed 3 main meals (80,0%) and 3 intermediate meals (40,0%). It is stated that the athletes should be fed at least 4-6 meals a day to meet the increased energy requirements (Potgieter, 2013). In this study, it was determined that 10,0% of the athletes did not make any snacks and 22,5% made only 1 snack. It is thought that this situation will affect the energy balance of the athletes, the sport performance and the general health condition negatively.

The various materials used by athletes to improve their performances are generally referred to as ergogenic support. Nutritional supplements contained in ergogenic supplements are prepared in liquid, powder, tablet forms of natural and daily nutrients. It was determined that nutritional supplements use was 55,0% for the participating athletes. The most commonly used nutritional supplements were branched chain amino acids (35,0%), whey protein (32,5%) and glutamine (20,0%), respectively. In a study conducted with football athletes, it was determined that 42,0% of athletes use nutritional supplements (Jazayeri and Amani,

2004). The use of nutritional supplements in professional athletes was found to be 55,8% in the study conducted by Saygın et al. (2009). Salgado et al. (2014), found that the use of nutritional supplements in running athletes was 28,3%, and it was found that athletes used carbohydrates (52,2%), vitamins (28,7%) and protein (13,5%). Wiens et al. (2014), found that 95,0% of the athletes participating in the study used at least 1 nutritional supplement and that the strength/power athletes used the most creatine, glutamine and protein powders. When this study and similar study data are examined, it is understood that nutritional supplements are widely used among athletes. It is stated that nutritional supplements threaten athletes' health in the case of unconscious use as well as benefits such as improving sport performance, balancing body fat ratio and regaining nutrients lost by exercise. For this reason, it is clear that nutritional supplements should be used in conjunction with a nutritionist (Argan and Köse, 2009). It is known that athletes need more energy and nutrients than normal adults. When the physical activity records of the participating athletes are examined, it is seen that the majority have active (22,5%) and overactive (72,5%) physical activity. For this reason, the reference values recommended for the athletes should be used when evaluating the energy and nutrient intake of the athletes. According to ISSN (2010), it is stated that athletes performing medium and high-intensity exercise should receive 50-80 kcal/kg/day energy per kilogram. According to these values, it is understood that the strength / power and team athletes participating in the study did not get enough energy (P:46,1±17,6 kcal/kg/day, T:41,7±11,1 kcal/kg/day; $p>0,05$). In a study conducted by male volleyball athletes, it was determined that the athletes received energy of 30,9±5,7 kcal/kg/day (Gamage and De Silva, 2014). Incorrect eating habits, such as skipping meals in sports, lead to inadequate energy intake. Athletes who do not have enough energy are likely to develop sport problems due to reduced sports performance, weight loss and lack of micronutrients.

Carbohydrates are one of the most important nutrients for athletes and play a role in regulating blood sugar throughout the training, in renewing the glycogen stores that emerge after training, and in achieving optimum performance of the athlete. Inadequate carbohydrate intake results in fatigue in the athletes, prolonged recovery after exercise and loss of performance (Güneş, 2016). ACSM (2009), estimates that the daily amount of carbohydrate required for athletes is 6-10 g/kg/day; ISSN (2010), estimates 5-8 g/kg/day for athletes with moderate intensity and 8-10 g/kg/day for high-intensity athletes. It is observed that the strength/power and team athletes participating in the study have received the lower recommended carbohydrate (P:5,0±2,4 g/kg/day, T:5,5±1,7 g/kg/day; $p>0,05$). Parnell et al. (2016), reported that male adolescents aged 14-18 years in their study received 5,3 g/kg/day carbohydrates; Burkhart and Pelly (2016), found that male athletes took 3,5 g/kg/day of carbohydrate in their study. The tendency of athletes to make high-protein diets can be cited as the reason for low carbohydrate intake in sports.

Daily recommended protein intake for athletes is 1,2-1,7 g/kg/day for strength/power athletes for ACSM (2009), 1,0-1,5 g/kg/day medium-intensity exercise athletes, 1,5-2,0 g/kg/day for high-intensity athletes for ISSN (2010), 1,3-1,8 g/kg/day for International Olympic Committee (IOC). However, it is known that athletes tend to consume a higher amount of protein than is generally recommended in order to improve their performance and provide muscle growth (Güneş, 2016). Spendlove et al. (2015), found that male athletes averaged 2,0-4,3 g/kg/day protein in their meta-analysis. In a study conducted by rugby athletes, it was found that athletes received an average of 2,2 g/kg/day protein (MacKenzie et al, 2015). In this study, it was determined that the strength/power athletes were high and the team athletes were receiving the recommended protein (P:2,7±1,3 g/kg/day; T:1,5±0,5 g/kg/day; $p<0,05$). The reason for the high protein intake in strength/power athletes is that more than half of the

athletes use nutritional supplements and protein supplements are involved most of them. Excessive protein intake is associated with dehydration, kidney and liver damage, urinary calcium excretion, increased risk of kidney stone formation, and joint diseases such as gout. For this reason, athletes need to pay attention to their protein intake (Ersoy, 2012).

Fats play an important role in the protection of the health of the athlete, the maintenance of energy balance, the availability of essential fatty acids and fat-soluble vitamins, and the renewal of intramuscular triacylglycerol deposits. It is stated that in the athletes' diets the energy from the fat should be around 30.0% and may reach up to 50,0% in the over-exercising athletes (40 hours/week) (ISSN, 2010). According to ACSM (2009), it was emphasized that energy in the athletic diet should be between 20,0%-35,0% and that it should not fall below 20,0%. In the athletes participating in the study, the energy from the oil in the strength/power athletes was 33,0±11,5%; and 33,3±5,1% in team athletes ($p>0,05$). In the study conducted by Wardenaar et al. (2017), the energy from the fat in the male strength/power athletes diet was 29,8% and 29,7% for team athletes. In both studies, it is seen that the energy from the oil in the athletes' diets is in the recommended range. However, it is thought that the athletes need to determine the reference amounts to be taken per kilogram, such as energy, carbohydrate, and protein, in order to evaluate the amount of fat in the diet.

Fluid intake has an important role in maintaining optimal performance and health for all athletes. Dehydration, which is likely to result in the inadequate fluid intake, not only affects the athlete's heat balance negatively but also disrupts cardiovascular functions, making it difficult to transport oxygen and nutrients to working muscles (Eskici, 2015). Athletes who play in hot and humid weather are experiencing fluid loss with 2-3 L/hour. In order to compensate for the loss of fluid, 2 cups of liquid should be consumed for every 0,5 kg loss (Ersoy, 2012). The amount of fluid lost due to variables such as sports type, weather conditions, and duration of exercise is not clearly known. For this reason, there is no recommendation for the total amount of liquid to be taken daily for athletes. However, for adult individuals, 1mL/kcal liquid intake in Turkey Specific Food and Nutrition Guide (2015) data, 35 mL/kg liquid intake in Turkey Nutrition Guide (2015) data is recommended. According to this, it can be said that the athletes take liquid at the recommended amount (P:1,1±0,6 mL/kcal, T:1,1±0,6 mL/kcal; $p>0,05$; P:47,2±19,6 mL/kg, T:41,6±18,5 mL/kg; $p>0,05$).

As a result, in this study, it was determined that the intake of energy and carbohydrates in the diet of the strength/power and team athletes was low, the intake of fluid was recommended, and the protein intake was high only in the power athletes. It has also been found that more than half of the athletes use nutritional support. These results are likely to have a negative effect on the athletes' success, performance, and general health. It is necessary for athletes to consult specialists such as sport dietitians in order to get accurate information about nutrition and prepare nutrition programs. It is thought that this study will provide both up-to-date and important information both in the country literature and in the international literature, as there are few studies on the feeding of athletes in Turkey.

Acknowledgments

The authors would like to thank the athletes who participated voluntarily in this study.

Conflict of Interest

The authors have not declared any conflicts of interest.

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International Journal of Science Culture and Sport
March 2018 : 6(1)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS736

The Effect of the Interval Training During 8-Week Preparation Period on the Athletic Performances of 9-12 Year Old Swimmers

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Type: *Research Article (**Received:** 14.02.2018 – **Corrected:** 09.03.2018 – **Accepted:** 12.03.2018)*

Abstract

The aim of this study was to determine the effect of interval training on the athletic performances of 9-12 years old swimmers in addition to the eight-week preparation stage. Athletes were split into two groups as the ones with performing branch specific swimming training (n=9) and the ones with performing interval training along with swimming training (n=11). Before and after training programs, 12-minutes Cooper test was applied to determine aerobic endurance in both groups. Wingate test was used for anaerobic measurements. Respiratory functions measurements were done with Spirometer. According to the results, level of body weight, body mass index, VO_{2max}, relative maximum strength, relative anaerobic capacity, forced vital capacity and maximum voluntary ventilation was found to be insignificant between groups ($p>0.05$) while vital capacity and forced expiratory volume values were found to be significant between groups ($p<0.05$). Two-way analysis of variance was used in statistical analysis of the data obtained in this study. When measurement times were compared, body weight, forced vital capacity, forced expiratory volume, vital capacity and maximum voluntary ventilation values were found as insignificant ($p>0.05$), yet body mass index, VO_{2max}, relative maximum force and relative anaerobic capacity levels were found to be significant ($p<0.05$). In conclusion, while body mass of athletes was reduced by 3.55% with interval training made in addition to swimming training, increase in forced vital capacity and forced expiratory volumes of athletes were determined as 1.35% and 8.79%, respectively. This result shows that interval training performed during preparation stage affect the performance of child athletes.

Keywords: Interval training, aerobic endurance, anaerobic capacity, anaerobic force, respiratory functions

Introduction

Trainers, conditioning coaches, and sports scientists are constantly searching new training methods to improve the performance of athletes (Issurin, 2010). Searching is usually aimed to improve aerobic capacity because improving aerobic capacity requires substantially long time and hard effort (Akgul et al., 2017). The American College of Sports Medicine (ACSM) (2011) reports that at least 45-50 minutes of endurance training per each session and repeated at least 3 times per week for 8 to 12 weeks is required for aerobic capacity development.

Continuous endurance training increase performance in aerobic energy metabolism-based functions. Gibala (2007) reported that high-intensity interval training (HIIT), which has been adequately applied for at least a few weeks, increases oxygen uptake and activity of energy-producing mitochondrial enzymes in skeletal muscles. Therefore, interval training methods are one of the most effective performance improving the method. Interval training means repetition of various training at regular intervals. Characteristic of interval training is the systematical changes in training and recovery (Revan et al., 2008). The recovery here does not mean a complete rest. Therefore, it means enhancing fatigue resistance in order to improve the capacity of the intended endurance performance in the training (Demiriz, 2013).

In swimming, moves made out of water called “land training” and the purpose is to improve athlete’s physical suitability. Land training should be performed before water training that should also support land training. Land training can be performed with athlete’s own body weight or use various special equipment (Devirmenci and Karacan, 2017). In this context, the purpose of this research is to demonstrate the effect of basic strength (running) training, performed on the land during the general training period, on the athletic performance parameters of the 9-12 age swimmers, except for the general endurance work in the pool during the general preparation period.

Materials and Methods

Participants

22 voluntary athletes from Gazi University Sports club swimming team participated in the study. Participants were randomly split into two groups. Experimental group practiced interval training in addition to pool training while control group practiced routine pool training. The study was completed with 20 volunteers due to quitting of two participants in the control group.

Measurement methods and tests

All tests were carried out at Gazi University Physical Education and Sports College, Physiology Laboratory and Gazi University Sports Club football field. The athletes and their parents were given preliminary information about the measurement methods and tests to be applied to the study groups, and a voluntary consent form was obtained.

Height and weight measurement

The height of the subjects (m) was measured with an anthropometric set (Holtain brand), with bare feet, legs flat on the ground, heels adjacent, knees tense, and body in a vertical position with a sensitivity of 1 mm. Body weight (kg) was measured with bare feet, shorts, and T-shirt using an electronic scale (Tefal brand) with a setting accuracy of 100 gr.

Determination of maximum heart rates

Maximum heart rates of all participants were measured with using Karvonen method. Target pulse is calculated as [((220 - Resting pulse) - age)*intensity of training + resting pulse]

Aerobic capacity

It is asked from groups to run the longest distance that can last for 12 minutes at the beginning and end of an 8-week training period. Every running lap of athletes was recorded. The formula to determine aerobic capacity in 12-minutes Cooper test is as follows: VO_{2max}: (Running distance (m) - 504.9)/44.73

Anaerobic strength

Wingate (Monark Wingate Testing Ergometer 849E) anaerobic strength test was applied to the participants as preliminary and final test in Gazi University Physical Education and Sports College, Physiology Laboratory. The maximum anaerobic power and mean anaerobic power obtained at the end of the test were divided by body weight and the results were recorded as relative anaerobic strength and relative anaerobic capacity.

Respiratory functions measurements

(COSMED Pony FX Desktop Spirometer) device was used to measure respiratory functions to the participants as preliminary and final test in Gazi University Physical Education and Sports College, Physiology Laboratory. Forced vital capacity (FVC), forced expiratory volume (FEV), vital capacity (VC) and maximum voluntary ventilation (MVV) values were recorded from the data obtained.

Experimental design

Groups trained for 6 days per week in order to equate the number of training. Experimental groups practiced swimming training for three days and practiced running interval training at 60-80% intensity following three days while control group practiced routine swimming training for six days. Athlete's heart rates intervals were personally determined and their heart rates were kept at reference interval using polar watches. Eight week-long interval training in addition to routine swimming training were given to experimental group were shown in the table below.

Distance/Week	**1-2 week**	**3-6 week**	**7-8 week**
250 m	-1 min active rest was provided between distances. -One set was done. -Cooling exercise was done for 5-10 min.	-1 min active rest was provided between distances. -2 sets were done -Cooling exercise was done for 5-10 min.	-1 min active rest was provided between distances -3 sets were done. -Cooling exercise was done for 5-10 min.
400 m			
650 m			
900 m			
650 m			
400 m			
250 m			

Statistical Analysis

Data were analyzed using SPSS package software. Percentage difference between measurement times was calculated using the formula: "Δ%= (Final test – Preliminary Test)/Preliminary Test × 100" and Two-way analysis of variance (Group X Time) were used to compare the data obtained in this study. Confidence interval and significance level were determined as 95% and $p<0.05$, respectively.

Results

The average age of the athletes participating in the experimental group was determined as 10.64± 0.51 years and their average height was 150.55±7.34 cm. The mean age of the control group was determined as 10.78± 0.44 years and the mean height as 153.67±7.04.

Table 1. Comparison of body weight values based on different training types and measurement times.

Variables	N	Preliminary test (kg)	Final Test (kg)	Total	F	p
		$\overline{X}$ ± SS	$\overline{X}$ ± SS	$\overline{X}$ ± SS		
Experimental Group	11	40.82±8.84	39.27±8.63	40.05±2.30	0.118	0.735
Control Group	9	40.44±5.81	42.00±6.24	41.22±2.54		
Total	20	40.65±7.44	40.50±7.58			
F=0.000; p=0.987						

***p<0.001; kg: kilogram*

When Table 1 was examined, it was determined that mean values of preliminary test and final test body weights did not show any statistical significance with time (F=0.000; p=0.987). Furthermore, body weight values did not show statistical significance compared to training types (F=0.118; p=0.735). Additionally, interaction between training types and measurement times were found to be significant (F=26.004; p=0.001). Accordingly, it is found that body weights' mean of experimental group decreased by 3.55% and body weights' mean of control group increased by 3.32%.

Table 2. Comparison of Body Mass Index values based on different training types and measurement times.

Variables	N	Preliminary test (kg/m^2)	Final Test (kg/m^2)	Total	F	P
		$\overline{X} \pm SS$	$\overline{X} \pm SS$	$\overline{X} \pm SS$		
Experimental Group	11	18.21±2.45	17.70±2.35	17.96±0.63	0.317	0.580
Control Group	9	17.46±1.74	17.40±1.53	17.43±0.69		
Total	20	17.87±2.14	17.57±1.98			
F=5.389; p=0.032*						

**p<0.05; kg: kilogram; m: meter*

When Table 2 was examined, it was determined that mean values of preliminary test and final test body mass index showed statistical significance with time (F=5.389; p=0.032). Moreover, body mass index values did not show statistical significance compared to training types (F=0.317; p=0.580). Also, the interaction between training types and measurement times were found to be insignificant (F=3.477; p=0.079).

Table 3. Comparison of Aerobic endurance (VO_{2max}) values based on different training types and measurement times.

Variables	N	Preliminary test (ml/kg/min)	Final Test (ml/kg/min)	Total	F	p
		$\overline{X} \pm SS$	$\overline{X} \pm SS$	$\overline{X} \pm SS$		
Experimental Group	11	39.12±5.90	42.97±4.25	41.05±1.64	0.687	0.418
Control Group	9	37.64±6.15	40.39±6.33	39.02±1.82		
Total	20	38.45±5.90	41.81±5.30			
F = 23.295; p = 0.001 **						

***p<0.01; ml: milliliter; kg: kilogram; min: minute*

When Table 3 was examined, it was determined that mean values of preliminary test and final test VO_{2max} showed statistical significance with time (F=23.295; p=0.001). Besides, VO_{2max} values did not show statistical significance compared to training types ((F=0.687; p=0.418) In addition to that, interaction between training types and measurement times were not found to be significant (F=0.650; p=0.431).

Table 4. Comparison of Relative anaerobic strength (Relative peak strength) values based on different training types and measurement times

Variables	N	Preliminary test (W×kg^{-1})	Final Test (W×kg^{-1})	Total	F	p
		$\overline{X}$ ± SS	$\overline{X}$ ± SS	$\overline{X}$ ± SS		
Experimental Group	11	7.32±1.03	7.73±1.05	7.53±0.36	2.359	0.142
Control Group	9	7.85±1.44	8.84±1.46	8.34±0.39		
Total	20	7.56±1.23	8.23±1.34			
F=17.428; p=0.001**						

***p<0.01; W: Watt; kg: kilogram*

When Table 4 was analyzed, it was determined that mean values of preliminary test and final test of relative anaerobic strength values showed statistical significance with time (F=17.428; p=0.001). Furthermore, relative anaerobic strength values did not show statistical significance compared to training types (F=2.359; p=0.142). Additionally, interaction between training types and measurement times were found to be insignificant (F=3.025; p=0.099).

Table 5. Comparison of Relative anaerobic capacity (Relative mean strength) values based on different training types and measurement times

Variables	N	Preliminary test (W×kg^{-1})	Final Test (W×kg^{-1})	Total	F	p
		$\overline{X}$ ± SS	$\overline{X}$ ± SS	$\overline{X}$ ± SS		
Experimental Group	11	5.62±0.70	5.99±0.83	5.81±0.26	3.251	0.088
Control Group	9	6.12±1.01	6.87±1.02	6.50±0.28		
Total	20	5.85±0.87	6.38±1.00			
F=25.969; p=0.001**						

***p<0.01; W: Watt; kg: kilogram*

When Table 5 was analyzed, it was determined that mean values of preliminary test and final test of relative anaerobic capacity values showed statistical significance with time (F=25.969; p=0.001). Further, relative anaerobic capacity values did not show statistical significance compared to training types (F=2.359; p=0.142). Additionally, the interaction between training types and measurement times were found to be insignificant (F=3.059; p=0.097).

Table 6. Comparison of Forced vital capacity values based on different training types and measurement times

Variables	N	Preliminary test (L/Sec)	Final Test (L/Sec)	Total	F	p
		$\overline{X} \pm SS$	$\overline{X} \pm SS$	$\overline{X} \pm SS$		
Experimental Group	11	2.21±0.38	2.24±0.46	2.23±0.12	5.796	**0.027***
Control Group	9	2.64±0.47	2.67±0.36	2.66±2.38		
Total	20	2.42±0.46	2.42±0.47			
F=0.000; p=0.999						

**p<0.05; L:Liters; Sec:Second*

When Table 6 was analyzed, it was determined that mean values of preliminary test and final test of forced vital capacity values were insignificant with time (F=0.000; p=0.999). Further, forced vital capacity values showed statistical significance compared to training types (F=5.796; p=0.027). Hence, increase in forced vital capacity in experimental groups was 1.35% higher compared to control group. In addition to this, the interaction between training types and measurement times were found to be insignificant (F=0.279; p=0.604).

Table 7. Comparison of forced expiratory volume values based on different training types and measurement times

Variables	N	Preliminary test (L/Sec)	Final Test (L/Sec)	Total	F	p
		$\overline{X} \pm SS$	$\overline{X} \pm SS$	$\overline{X} \pm SS$		
Experimental Group	11	2.16±0.32	2.35±0.40	2.26±0.12	5.980	**0.025***
Control Group	9	2.55±0.47	2.61±0.39	2.58±0.13		
Total	20	2.34±0.43	2.35±0.45			
F=0.329; p=0.573						

**p<0.05; L:Liters; Sec:Second*

When Table 7 was analyzed, it was determined that mean values of preliminary test and final test of forced expiratory volume values were insignificant with time (F=0.329; p=0.573). Moreover, forced expiratory volume values showed statistical significance compared to training types (F=5.980; p=0.025). Therefore, increase in forced expiratory volumes in the experimental group was higher (8.79%) than the control group. Additionally, interaction between training types and measurement times were found to be insignificant (F=0.853; p=0.368).

Table 8. Comparison of vital capacity values based on different training types and measurement times

Variables	N	Preliminary test (L/Sec)	Final Test (L/Sec)	Total	F	p
		$\overline{X} \pm SS$	$\overline{X} \pm SS$	$\overline{X} \pm SS$		
Experimental Group	11	1.82±0.48	1.92±0.59	1.87±0.15	1.607	0.221
Control Group	9	2.11±0.41	2.21±0.76	2.16±0.17		
Total	20	2.01±0.45	2.00±0.68			
F=0.000; p=0.986						

L: Liter; Sec: Second

When Table 8 was examined, it was determined that mean values of preliminary test and final test of vital capacity values showed no statistical significance with time (F=0.000; p=0.986). Furthermore, forced expiratory volume values did not show statistical significance compared to training types (F=1.607; p=0.221). Additionally, the interaction between training types and measurement times were found to be insignificant (F=0.682; p=0.420).

Table 9. Comparison of maximum voluntary ventilation values based on different training types and measurement times

Variables	N	Preliminary test (L/Sec)	Final Test (L/Sec)	Total	F	p
		$\overline{X} \pm SS$	$\overline{X} \pm SS$	$\overline{X} \pm SS$		
Experimental Group	11	78.98±19.85	95.96±17.07	87.47±6.02	2.971	0.362
Control Group	9	90.06±22.04	100.67±23.65	95.36±6.66		
Total	20	83.97±21.07	87.08±23.40			
F=18.000; p=0.100						

***p<0.01; L: Liter; Sec: Second*

When Table 9 was examined, it was determined that mean values of preliminary test and final test of maximum voluntary ventilation values showed no statistical significance with time (F=18,000; p=0.100). Moreover, maximum voluntary ventilation values did not show statistical significance compared to training types (F=3,971; p=0.062). Additionally, interaction between training types and measurement times was found to be significant (F=18.000; p=0.006). Therefore, maximum voluntary ventilation is a variable that can change based on training types and durations.

Discussion and Conclusion

The main purpose of this study was to investigate whether there is an effect of interval training in addition to eight-week preparation stage swimming training on athletic performances of 9-12 years old swimmers.

Longitudinal studies in literature reported that when body weight values before training program and the values after training are compared, decrease ($p<0.01$) and increase ($p<0.05$) in body weights were found to be significant (Al Abdilh and Savas, 2017; Koc, 2010; Yuksel et al., 2007; Kiyici, 2009). Al-Abdilh and Savas (2017) reported that the Body Mass Index variable was statistically different from the results of the different type of endurance training measurements applied to young basketball players. Demirel et al. (2017) found that there was no statistical difference between body mass index values of experimental and control groups in their study which consists of elite wrestlers for examining the effect of aerobic and anaerobic training program on body composition. Gokhan et al. (2011) found that there was no significant difference between preliminary test values (25.2±3.3 kg/m2) and final test values (24.3±2.8 kg/m2). Yapici et al. (2017) reported in their study that the analysis of preliminary and final test values of the group performing the training with liquid fortification did not yield a statistically significant result in the body mass index; The results of the analysis of the preliminary and final test values of the group performing the training without receiving liquid fortification have reached a statistically significant results. According to experimental results, it was identified that body weight mean of experimental group decreased by 3.55%, meanwhile mean body weight of control group increased by 3.32%. Additionally, there was no significant difference between mean body mass indexes ($p>0.05$).

Cimen et al. (2017) have reported that regular and gradually increasing intensity of aerobic training can increase VO_{2max} levels. Revan (2007) found that whenVO_{2max} values were compared before and after regular training, there were statistically significant differences in groups with performing continuous and interval running, yet control groups Akgul et al. (2016) observed significant increases in VO_{2max} (4.44%), VO_{2peak} (8.09%) and exhaustion period (7.4%) at the end of 2 weeks. Moreover, Revan et al. (2008) found that the continuous running method is more effective than the interval running method in decreasing body weight, and both methods show similar positive effects in decreasing body fat percentage and improving aerobic capacity in the 8-week study they performed. According to our results, even though significant difference detected between measurement times of eight week-long training, there was no significant difference between groups.

Calculation of anaerobic strength and capacity per kg provides more reliable comparison in evaluation among individuals. Anaerobic strength and capacity values of participants who enrolled in this study were compared. Although the significant difference between measurement times of eight week-long training was detected, there was no significant difference between groups. Alemdaroglu et al. (2008) found no statistically significant difference between peak strength (PS) and mean strength (MS) in values of strength variables obtained from WanT. Colakoglu and Karacan (2016) found a statistically significant increase in anaerobic strength values of young and middle-aged women. In another study, they reported that 12-week table tennis practice made a significant difference in anaerobic strength values (Akgon and Agirbas, 2015). In the study performed by Erim (2006) to examine the effect of certain parameters on the performance of 8-week rapid-force and weighted training programs in the male table tennis players, it was found that there was no significant increase in the anaerobic strength values of both groups. Demiriz et al. (2015) reported improved

anaerobic capacities in the study named as the effect of anaerobic interval training in different resting intervals on aerobic capacity, anaerobic threshold, and blood parameters.

Atan et al. (2013) reported that swimmers had the best forced vital capacity values compared to other branches in their study that compares respiratory functions of athletes who deals with other branches in star categories (Atan et al., 2013). Gokhan et al. (2011) found that measurement of forced vital capacity values in final test significantly increased in respect to before training measurements when measured values after training compared with measured values before training in an experimental group. Increase in forced vital capacity values was significant when the first measurement before training compared to the second measurement after training in the study which investigated the effect of Koc (2010) aerobic training program on some circulation and respiratory parameters in male handball players (Koc, 2010). Gokdemir et al. (2007) found increased forced vital capacity in first minutes ($p<0.01$) when measured values before training compared statistically to measured values after training. Gokdemir and Koc reported that forced vital capacities (from 4.60±0.45 to 5.26±0.69) were increased as a result of general endurance training which was applied three times a week for eight weeks. We found significant differences between groups in our study. Accordingly, forced vital capacity of the experimental group (1.35%) is higher compared to control group after eight-week-long training.

Koc (2010), increase in forced expiratory volume values in the first minute was found to be significant when results of the first measurement before training compared to results of the second measurement after training. Gokdemir et al. (2007) identified statistical significance between measurements before training and measurements after training. Gokhan et al. (2011) observed that forced expiratory volume values of the final test in the first minute significantly increased with respect to measurements before training when test measurements after training (final test) compared to test measurements before training (preliminary test) in the experimental group. According to results, a significant difference was observed between groups. Therefore, increase in forced expiratory volumes in the experimental group was higher (8.79%) than the control group.

Bjurstrom and Schoene (1987) reported that vital capacities of swimmers were found to be quite high when vital capacities of the experimental group consisting of elite swimmers compared to control group. Koc (2010) reported a significant increase in vital capacities when the result of the first measurement before training compared to the result of the second measurement after training. Koc and Gunay (2000) found a significant increase in vital capacity values as a result of general speed training program they applied for three days in a week for eight weeks. Iri (2000) reports an increase in respiratory parameters due to aerobic training programs over a period of time. Kurkcu et al. (2009) reported that the difference in respiratory function values was insignificant in the study they conducted in order to determine the effect of pre-season preparatory training for eight weeks. According to our results, there was no significant difference between study groups and measurement times. This result indicates that there is no difference in the context of improving vital capacity between trainings.

Kandeydi (1994) found that the maximum voluntary ventilation value of university students was significantly higher at the end of 3-month swimming training. In another study, Kurkcu and Gokhan (2011) found maximum voluntary ventilation measurement values of handball player kids were 799.40 ± 130.17 L/min while maximum ventilation measurement values of kids who do not do sports were 611.55 ± 23.16 L/min. The difference in maximum voluntary

ventilation measurement values was found to be significant between groups. According to results, there was no significant difference between groups and measurement times

Kubiak and Janczaruk (2005) reported a statistically significant difference between vital capacity, forced expiratory volume, and forced expiratory volume at the first minute of preliminary test and final test values at the end of a six-month study with 310 elite swimmers aged 12-14 years.

In conclusion, while body mass of athletes was reduced by 3.55% with interval training made throughout swimming training, increase in forced vital capacity and forced expiratory volumes of athletes were determined as 1.35% and 8.79% respectively. This result shows that interval training performed during preparation stage affect the performance of child athletes.

According to the results, it is suggested that swimmers exercise resistance training on land, especially during the preparation periods, in addition to the exercises practiced in water. Thus, it is thought that the swimmers will have a positive effect on their athletic performances

Conflict of Interest

The authors have not declared any conflicts of interest.

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