

# INTERNATIONAL REFEREED ACADEMIC JOURNAL OF SPORTS

PRINT ISSN: 2146-8508 - ONLINE ISSN: 2147-1711

ISSUE: 20 YEAR: 2016



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### **Distinguished Readers.,**

There are a total of 5 valuable papers in this 20th volume of SSTB Sports, Health and Medical Sciences Journal. An applied study discussing elderly and prepared with the statistics of TUIK (Turkish Statistical Institute) socio-culturally was written by relevant authors and published in our journal after evaluations. We would like to thank the authors who contributed to the literature with this paper. In the applied study directed to the diabetes patients, the effect of health beliefs on metabolic controls was mentioned, evaluated in our journal and entered into the literature. The life quality of female students in badminton exercises was written by related authors, evaluated in our journal and entered into the literature. The attributes of child athletes regarding speed and agility in tennis were considered in terms of condition and a valuable study was created. This applied study was evaluated and published in our journal. The applied study directed to the determination of the relation between the endurance of physically-challenged athletes in basketball and sitting balance will be a highly useful source for researchers. Our next volume of the journal being published four times a year will be published in December 2016. We would like to thank our esteemed authors who shared their valuable studies with us and with journal and the volume referees who contributed great efforts in referee evaluation process. We wish you healthy and happy days with full of sports until seeing you in our next volume.

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**DETERMINATION OF THE RELATIONSHIP BETWEEN CORE  
ENDURANCE AND SITTING BALANCE IN WHEELCHAIR  
BASKETBALL PLAYERS: A PILOT STUDY <sup>1</sup>****TEKERLEKLİ SANDALYE BASKETBOL SPORCULARININ CORE  
ENDURANSLARI İLE OTURMA DENGESİ ARASINDAKİ İLİŞKİNİN  
BELİRLENMESİ: PİLOT ÇALIŞMA**

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**Öz:** Bu çalışma tekerlekli sandalye (TS) basketbol sporcularında core-enduransı ile oturma dengesi arasındaki ilişkiyi belirlemek amacıyla yapıldı. Çalışma; kriterlere uyan ve katılmayı gönüllü olarak kabul eden 16-26 yaş aralığında olan 9 erkek paralimpik basketbol sporcusunun katılımı ile gerçekleştirildi. Denge ölçümleri Human Body Equilibrium 360 (HUBER 360®) olarak adlandırılan elektronik cihaz ile yapıldı. Denge parametrelerinden, stabilite ve fonksiyonel uzanma testleri oturma pozisyonunda değerlendirildi. Stabilite testleri gözler açık ve kapalı olacak şekilde ölçüldü. Core endurans ölçümleri statik gövde fleksiyon endurans testi, statik gövde ekstansiyon endurans testi ve lateral köprü endurans testleri ile değerlendirildi. TS basketbol sporcularının stabilite testlerinden gözler açık ve kapalı olarak ölçülen merkez, uzunluk, alan ve hız değerleri ile statik gövde fleksiyon endurans testi, statik gövde ekstansiyon endurans testi ve lateral köprü endurans testi ölçüm sonuçları arasında istatistiksel olarak anlamlı bir ilişki bulunmazken ( $p>0,05$ ) fonksiyonel uzanma ile sol lateral köprü ve sağ lateral köprü değerleri arasındaki istatistiksel olarak anlamlı bir ilişki bulundu ( $p<0,05$ ). TS basketbol sporcularında core enduransı oturma dengesi üzerinde önemli bir parametredir. TS basketbol sporcularında antrenman programlarında core endurans parametrelerini arttıracak egzersizler eklenmesi, sporcuların fonksiyonel oturma dengelerini pozitif yönde etkileyecektir. Bu bağlamda TS basketbol sporcularının core-enduransları ve fonksiyonellikleri artırılarak müsabakalarda sporcuların performanslarının artırılabilceğini düşünmekteyiz.

**Anahtar Kelimeler:** Paralimpik Basketbol, Core Endurans, Denge

**Abstract:** This study was conducted to determine the relationship between core endurance and sitting balance in wheelchair (WC) basketball players. The study consisted of 9 male paralympic basketball players aged between 16-26, who complied with the criteria and voluntarily participated in the study. Equilibrium measurements were performed with electronic devices so-called the Human Body Equilibrium. Parameters of balance, stability and functional reach test in the sitting position were evaluated. The stability tests were measured with eyes open and closed. Core endurance was measured by using the static trunk extensor endurance test, trunk flexor endurance test and side bridge endurance test. While there was no significant relation between side bridge, trunk extension, trunk flexion tests and center, length, area and velocity values in the stability test which measured eyes open and closed, we found out a statistically significant relation between functional reach test and side bridge tests values. Core endurance is an important parameter on sitting balance in WC basketball players. Adding exercises which will improve core endurance parameters, will affect functional sitting balance of WC players positively. Consequently, we think that performance of WC athletes in competition can be improved by increasing functionality and core endurance.

**Key Words:** Paralympic Basketball, Core Endurance, Balance

*Doi: 10.17363/SSTB.20162022365*

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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

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## INTRODUCTION

Today, the most popular sport of disabled people is Wheelchair basketball (Yalcin, 2015:1). Wheelchair basketball is a fast paced, exciting sport that conforms to the same standards as its stand up counterpart. Unlike most sports for people with disabilities, wheelchair basketball is a team oriented activity that provides athletes with varying degrees and levels of disabilities to participate in an inclusive atmosphere based on a player classification system. (Brasile and et., 1996:114-117).

WC basketball classification system is used in a variety of performance and physiological criteria (Brasile, 1990:289-297). These criteria include trunk stabilization, sitting balance and body movement in the horizontal-frontal- sagittal plane (Santos, 2014: 77-80). The most important of these criteria is sitting balance in WC basketball players (Brasile et al., 1996:114-117). Good sitting stability control has a great importance. Sitting stability control directly affects the transfer performance during the game (Bolin et al., 2000: 425-434). Trunk muscle control is an important subsystem which contributes to postural control and balance (Westcott et al., 1997:629-625). Postural stability and balance is almost inseparable throughout all movements (Wade and Jones, 1997:619-628; Assaia et al., 2005:263-272). Core stabilization plays an

important role in maintaining the trunk of muscle control.

In a study, the core stabilization is defined as connection between the pelvis floor, multifidus, transversus abdominus and diaphragma muscles and this structure is explained being effectively in stabilization of the trunk (McLean, 2006).

Because of this, the aim of our study is to determine the relation between core endurance and sitting balance in WC basketball players and the results of this study will guide us to improve athletic performance in WC basketball players training programme.

## METHOD

The study was conducted with the aim of determining the relation between core endurance and sitting balance in WC basketball players in the Ministry of Youth and Sports, Sports General Directorate, Department of Health Services Center of Athlete Training and Health Research in Ankara, Turkey. All the athletes who accepted to participate in the study were informed about the study purpose, the assessments included in the study and the benefits of the study and the study was based on volunteerism. The necessary permit and approval was obtained from the Ethics Committee of Ankara Yıldırım Beyazıt University to conduct the study [13/05 (348)].



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ISSN Print: 2146-8508 Online 2147-1711

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The inclusion criteria of the study are not having any systemical problem, any healthy problem except their problems, any visually and hearing problems and being cooperated to the test parameters, being able to do tests and being voluntary to participating to the study.

The disability types of the WC basketball players who participate to study are; polio-myelitis (n=4), spina bifida (n=1), spinal cord injury (n=2) and amputation (n=2).

### **Data Collecting Tools**

#### **Equilibrium Evaluation**

Equilibrium measurements were performed with Human Body Equilibrium 360 (HUBER 360®). HUBER 360® is an electronic device with a screen used in dynamic and static balance measurement and training, including specific sensors which are sensitive to motion and providing visual feedback to the person. The evaluation that can be done with HUBER 360® consists of seven basic parameters, including stability, standing on one leg, walking stability limitation (functional reach), mobility restriction, strength and coordination. And also stability test and stability limitation can be done in standing and sitting position. We evaluated stability and stabilization limits in the sitting position due to players' disability and playing with wheelchair. Stability was assessed for 50 sec separately when their eyes were open and closed at sitting position. In

this test, how well the individual maintained his position, getting away from the center (mm), the length (mm) drawn during center change and the area of place change (mm<sup>2</sup>) and their velocity during these changes (mm/sec) were assessed. An individual sees an arrow and dot on the monitor during the assessment of stabilization limits. The dot represents the individual. Arrows appear on the monitor at the degrees 0-45-90-135-180-225-270-315 respectively on the coordinate system. The individual is asked to move the dot toward the arrow tip at a flat slope without disconnecting its contact with the ground and without the body rotation upon the warning sounds. This test represents doing the functional extension test in an electronic setting (© LPG Systems., 2015) and the results were recorded as square millimeters.

#### **Core Endurance Evaluation**

Core endurance of athletes; was measured by using static trunk extensor endurance test, trunk flexor endurance test and side bridge endurance test, the results were recorded in seconds.

#### **Trunk Flexor Endurance Test**

The WC Basketball Player sits at 60° with both hips and knees at 90°, arms folded across the chest with the hands placed on the opposite shoulder, and the toes secured by the physiotherapist. The trunk flexor muscles endure





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ance tested by timing how long the player can hold a position of seated trunk flexion up to inferior angulus of the scapulae (about 60° trunk flexion). Failure was occur when the player falled back from 60° trunk flexion to the under inferior angulus of the scapulae (Bliss and Teeple, 2005: 179-185; Evans et al., 2005:447-55; Demoulinet al., 2005: 43-50).

### Extensor Endurance Test

The WC Basketball Player is prone over the edge of couch at the point of Spina Iliaca Anterior Superior, with the pelvis, hips, and knees secured by the pyhsiotherapist. The upper limbs are held across the chest with the hans resting on the opposite shoulders. The trunk extansor muscles endurance tested by timing how long the player can hold a position of the upper body horizontally to floor. Failure was occur when the player falled from horizontally to the fleksed position (Bliss and Teeple, 2005: 179-185; Evans et al., 2005:447-55; Demoulinet al., 2005: 43-50).

### Right and Left Lateral BridgeTest

The WC Basketball Player's legs are extended as can and the top foot placed in front of the lower foot for support. Players support themselves on one elbow and their feet while lifting their hips off the floor to create a straight line over their body length. The uninvolved arm is held across the chest with

the hand placed on the opposite shoulder. The lateral bridge test assesses the lateral core muscles. The lateral core muscles endurance tested by timing how long the player can hold a position of lifted hip and staright line postur. Failure was occur when the player loses the straighth postur and the hip fals toward the table (Bliss and Teeple, 2005: 179-185; Evans et al., 2005:447-55; Demoulinet al., 2005: 43-50).

### Analysis of Data

All the data obtained from the measurements of athletes' core endurance and balance were analyzed with statistical software package "SPSS (Statistical Package for Social Sciences Inc., Chicago, IL, USA) For Windows Release15.0" The data verified with the Kolmogorov-Smirnov test is normally distributed. The correlation between core endurance tests and sitting balance was done by Pearson correlation test. The statistical significance was set at  $p < 0.05$  (Sümbüloğlu, 1994:152-155).

### RESULTS

A total of 13 basketball players were invited to the study but 4 of these athletes were disqualified because they could not complete some tests due to their disabilities. So 9 WC basketball players aged between 23-40 years were included in the study. The mean age of players included in the study was  $29.8 \pm 6.64$



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years, weight  $73.61 \pm 10.15$  kg, height  $1.78 \pm 0.06$  meter and body mass index values  $23.18 \pm 2.95$  kg / m<sup>2</sup> were recorded (Table 1).

**Table 1. Demografik Characteristics of the Wheelchair Basketball Players**

**BMI: Body Mass Index**

	Mean	Standar Deviation
Age (year)	29,88	6,64
Height (cm)	178,22	6,18
Weight (kg)	73,61	10,15
BMI (kg/m <sup>2</sup> )	23,18	2,95

**\*p<0.05, r=Pearson Correlation**

The relationships between the stability tests and core endurance tests of the athletes along with p and r values are shown in Table 2. It was found out that there was no statistically significant relationship between the length, area and velocity values measured by the stability tests when the athletes' eyes were closed and open and the results of the flexor endurance test and static body extensor test ( $p>0,05$ ), there were significant

correlations found ( $p<0,05$ ) between the functional extension measurements made by the stability tests of the athletes and the results of left lateral ligament and right lateral ligament tests. Moreover, the balance value results and the core endurance test results of the athletes showed significant correlation among themselves ( $p<0,05$ ) (Table 2).



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GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

Variables		Fleksor Endurance Test (sec)		Extansor Endurance Test (sec)		Left Lateral Bridge Test (sec)		Right Lateral Bridge Test (sec)	
		r	p	r	p	r	p	r	p
Eyes Opened Stability Test	Area (mm <sup>2</sup> )	-0,094	0,809	0,119	0,760	0,229	0,553	0,364	0,336
	Length (mm)	-0,132	0,735	-0,291	0,448	-0,052	0,894	0,227	0,558
	Speed (mm/sec)	-0,132	0,735	-0,291	0,448	-0,052	0,895	0,227	0,557
Eyes Closed Stability Test	Area (mm <sup>2</sup> )	0,461	0,211	0,367	0,331	-0,012	0,975	-0,114	0,771
	Length (mm)	0,280	0,466	-0,038	0,923	-0,080	0,837	0,068	0,862
	Speed (mm/sec)	0,280	0,466	-0,038	0,923	-0,081	0,837	0,068	0,862
Stabilization Limitation (mm <sup>2</sup> )		0,434	0,243	0,524	0,147	0,748	0,021*	0,711	0,032*

\*:p<0.05

## DISCUSSION

The aim of our study was to investigate the relationship between the core endurance and sitting balance of TS basketball players. As a result of our study, there was no significant relationship found between the static balance performance of the athletes and the measurement results of the lateral ligament test, static extensor test and flexor endurance test, and there was a significant relationship determined between the functional extension test results of the athletes and the measurements of right and left lateral ligament test. This illustrated the importance of the force of spinal

muscles and abdominal muscles not to distort the sitting balance during the functional extension movement. This information supported the literature and showed the relationship between the body balance and core stability that is defined as the simultaneous contraction of the external and internal oblique abdominal muscles and spinal muscles by right and left lateral ligament tests.

Recently conducted studies focused on core stability, force and endurance of body muscles and body balance because the core is the center of body movements, effective on achieving the body balance and the funda-



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

mental component of the kinetic chain. The studies showed that the inadequacy of core muscles can affect individual performance and enable injury formation (Petrofsky et al, 2005: 423). In this context, the body balance is very important for movement and performance for TS athletes. There are studies in the literature including various measurement techniques for postural balance assessment of disabled individuals (Mason et al., 2012;126-34; Yildirim et al, 2010;55-61; Patatoukas et al, 2011:40-46; . Mockova et al, 2006:211-217; Valent et al, 2009:1051-160). In a study conducted on amputee soccer players, static balance was assessed by SPORKAT 2000 device only when their eyes were open (Aytar et al, 2012:332-338), and in another study, modified functional extension test, bilateral extension and lateral extension tests were used (Özünlü et al, 2012:44-50). We used different balance device in our study. We assessed both static and dynamic balances of our athletes in the sitting position when their eyes were open and closed. We could not find a study in the literature scrutinizing the relationship between core endurance and sitting balance of TS basketball players. However, there are various studies in the literature investigating the relationship between lower extremity and upper extremity muscular force and core endurance. One of these is the study investigating the relationship between lower extremity static balance performance and core stabili-

zation on 40 individuals who exercised. In this study, core stabilization was assessed by Sorensen test, prone plank test, abdominal exhaustion test and Sahrman's core stabilization test. Static balance was assessed by Flamingo balance test at both the right side and left side. As a result of this study, a significant relationship was found between static balance performance and Sorensen test, Prone Plank test and Sahrman's core stabilization test. It was concluded as a result of the study that lower extremity static balance performances of individuals who had strong core stabilization were better (Aggarwal et al., 2012:11-16). In a study supporting this study, the relationship between the endurance of the body muscles and static balance was investigated on healthy 50 male students, and static balance was assessed by Flamingo balance test, and the endurance of the body muscles was assessed by static body extensor endurance test, flexor endurance test and lateral ligament test. As a result of the study, a positive relationship was found between static balance and the endurance of the body muscles (Barati et al, 2013:289). We could not find a relationship between static balance and core endurance in our study. We think that this result stems from the measurement made in sitting position because the individuals included in the study were TS-using athletes and due to their disabled profiles, low number of participants and sensitive measurement



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of the device. Moreover, in a study assessing the relationship between core stabilization, balance and muscular force of amputee soccer players, static balance was assessed when the athletes were standing up on their healthy lower extremity without a prosthesis and when their eyes were open. As a result of this study, it was found out that the balance had no relationship between core stabilization and force (Aytar et al, 2012:332-338). We could not find a relationship between stability tests when their eyes were open and closed and core endurance tests. It is stated in the literature that there are only a few research investigating the body balance of paralympic athletes (Aytar et al, 2012:332-338). We determined during our research that the literature was not full adequately on this issue. We think that our study will contribute to the literature on this issue. In a study investigating the effect of the body muscles on mobility and balance in 70 elderly people, the body extension force and endurance, the body flexion force and endurance, Berg balance scale and the balance was assessed by Flamingo balance test. In this study, a significant relationship between balance and body muscles was found (Suri et al, 2009:916-924). In another study, the relationship between static and dynamic balance and the force of core muscles was investigated on 32 autistic children; and static and dynamic balances were assessed by Flamingo balance test and Walking Heel To Toe Test re-

spectively. Core muscle force was assessed by the stabilizer by measuring dominant and non-dominant leg maximum isometric hip external rotation and maximum isometric hip abduction force. In this study, a relationship between dynamic balance and core was found and there was no significant relationship between static balance and core (Salar et al, 2014: 33-42). As similar to this study, in a study investigating the relationship between static and dynamic balance and core endurance on 100 basketball players, static balance was assessed by Flamingo balance test, and dynamic balance was assessed by Y Balance test. Core endurances were assessed by Prone plank test, flexion endurance test and Sonersan test. In this study, a strong relationship was found between dynamic balance and core endurance, and there was no significant relationship found between static balance and core endurance (Saki et al, 2015:33-41). The results of these two studies support our study results. In addition to these studies; the relationship between core stabilization and athlete performance was investigated in a study conducted on male and female athletes attending a university, and it was found that the athletes who had a strong core stabilization had better athletic performance (Sharnock et al., 2011:63). These results supported the literature and showed the importance level of core endurance parameter for ensuring body balance.





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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

In our study we hypothesized that core endurance affects sitting balance positively and core endurance is an important parameter for improving the performance of WC basketball players. We observed that there was a relation between the functional reach and side bridge test. These results showed us how much trunk balance which is even important in classification of WC basketball player is related to core stability, and reminded us not to forget to add the exercises which will improve core stability to training programme. Nevertheless, the training programs of the athletes whose core muscles don't function due to their disabilities must be planned. In this context, 4 athlete tests were not included in the study because they could not do core endurance tests especially. The limitation of our study was the low number of the individuals who participated in our study. Studies are needed by increasing the individual number to investigate and compare the relationship between upper and lower extremity muscular force and functionality.

The suggestion of this study; core endurance is an important parameter on sitting balance in WC basketball players and this should be taken into account when planning training programmes.

## REFERENCES

- AGGARWAL, A., KUMAR, S., KALPANA, Z., JITENDER, M., SHARMA, V. P., (2012).** The Relationship Between Core Stability Performance and the lower Extremities Static Balance Performance in Recreationally active Individuals. Nigerian Journal of Medical Rehabilitation, 15(1 and 2): pp.11-16
- ASSAIANTE, C., MALLAU, S., VIEL, S., JOVER, M., SCHMITZ, C., (2005).** Development of postural control in healthy children: A functional approach. Neural Plast. 12(2-3): pp.109-18; discussion 263-72
- AYTAR, A., ÖZÜNLÜ, N., ERGUN, N., KARATAŞ, M., (2012).** Is there a relationship between core stability, balance and strength in amputee soccer players? A pilot study. Prosthetics and Orthotics International, 36(3): pp.332-338
- BARATİ, A., SAFARCHERATİ, A., AGHAYARİ, A., AZİZİ, F., ABBASİ, H., (2013).** Evaluation of relationship between trunk muscle endurance and static balance in male students. Asian journal of sports medicine, 4(4): pp.289
- BLISS, LS., TEEPLEP., (2005).** Core stability: the centerpiece of any training program. Curr Sports Med Rep, 4:pp. 179-83



SSTB

www.sstbdergisi.com

International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

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(TRADEMARK)

(2015/04315- 2015-GE-18972)

**BOLİN, I., BODİN, P., KREUTER, M., (2000).** Sitting position-posture and performance in C5-C6 tetraplegia. *Spinal Cord*, 38(7): pp.425-434

**BRASİLE, FRANK M., BRADLEY N. HEDRICK., (1996).** The relationship of skills of elite wheelchair basketball competitors to the international functional classification system. *Therapeutic Recreation Journal*, 30(2) : pp.114-127

**BRASİLE, F. M., (1990).** Performance Evaluation of Wheelchair Athletes: More Than a Disability Classification Level Issue. *Adapted Physical Activity Quarterly*, 7(4): pp.289-297

**DEMOULİN, C., VANDERTHOMMEN, M., DUYSSENS, C., CRİELAARD, J. M., (2006).** Spinal muscle evaluation using the Sorensen test: a critical appraisal of the literature. *Joint Bone Spine*, 73(1): pp.43-50

**EVANS, K., REFSHAUGE, K. M., ADAMS, R., (2007).** Trunk muscle endurance tests: reliability, and gender differences in athletes. *Journal of Science and Medicine in Sport*, 10(6): pp.447-455

© **LPG Systems., (2015).** Erişim 28.05.2016, [http://international.chatt-group.com/sites/default/files/user\\_guide\\_huber\\_360\\_-\\_1786.pdf](http://international.chatt-group.com/sites/default/files/user_guide_huber_360_-_1786.pdf)

**MASON, BS., VAN DER WOUDE, LH., TOLFREY, K., LENTON, JP., GOOSEY-TOLFREY, VL., (2012).** Effects of wheel and hand-rim size on submaximal propulsion in wheelchair athletes. *Med Sci Sports Exerc.* Jan, 44(1): pp.126-34

**MCLEAN, C., (2006).** Core Stability: Anatomical, Biological and Psychological Evidence Chapter V

**MOCKOVA, M., GREENWOOD, R. J., DAY, B. L., (2006).** A method for quantifying directional strength and motor control of the trunk. *Journal of neuroscience methods*, 156(1): pp. 211-217

**ÖZÜNLÜ, N., ERGUN, N., (2012).** Trunk balance assessment in wheelchair basketball players. *Fizyoter Rehabil.* 23(1): pp.44-50

**PATATOUKAS, D., FARMAKİDES, A., AGGELİ, V., FOTAKİ, S., TSİBİDAKİS, H., MAVROGENİS, A., PAPAGELOPOULOS, P., (2011).** Disability-related injuries in athletes with disabilities. *Folia medica*, 53(1): pp. 40-46

**PETROFSKY, J. S., CUNEO, M., DİAL, R., PAWLEY, A. K., HİLL, J., (2005).** Core strengthening and balance in the geriatric population. *Journal of applied research in clinical and experimental therapeutics*, 5(3): pp.423



SSTB

www.sstbdergisi.com

International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**SAKİ, F., BAGHBAN, M., (2015).** Relation-  
ship between Core Stability Muscle En-  
durance and Static and Dynamic Balance  
in Basketball Players. Journal of sports  
biomechanics, 2(3) : pp.33-41

**SALAR, S., DANESHMANDİ, H.,  
KARİMİZADEH ARDAKANI, M.,  
NAZARİ SHARİF, H., (2014).** The Re-  
lationship of Core Strength with Static  
and Dynamic Balance in Children with  
Autism. Annals of Applied Sport Sci-  
ence, 2(4): pp.33-42

**SANTOS, S. D. S., MONTEIRO, C. B.  
D. M., CANTELLI, B., ALONSO, A.  
C., MOCHIZUKI, L., RE, A. H. N.,  
GREVE, J. M. D. A., (2014).** Analysis of  
velocity and direction of trunk movement  
in wheelchair basketball athletes. Medi-  
calExpress, 1(2): pp.77-80

**SHARROCK, C., CROPPER, J., MOS-  
TAD, J., JOHNSON, M., MALONE, T.,  
(2011).** A Pilot study of core stability and  
athletic performance : is there a relation-  
ship?, The International Journal of Sports  
Physical Therapy, 6(2): pp.63, June

**SURI, P., KIELY, D. K., LEVEILLE, S.  
G., FRONTERA, W. R., BEAN, J. F.,  
(2009).** Trunk muscle attributes are asso-  
ciated with balance and mobility in older  
adults: a pilot study. PM&R, 1(10): pp.  
916-924

**SÜMBÜLOĞLU, K., SÜMBÜLOĞLU,  
V., (1994).** Biyoistatistik, Özdemir  
Yayıncılık, Ankara: pp.152-155

**YALÇIN, İ. A., (2015).** Farklı Klasifikasyon  
Puanlarına Sahip Tekerlekli Sandalye  
Basketbol Oyuncularında Üst Eks-  
tremite Fiziksel Uygunluk Parametreleri  
İle Spora Özgü Beceriler Arasındaki  
İlişkinin İncelenmesi. Hacettepe Üniver-  
sitesi Sağlık Bilimleri Enstitüsü, Yüksek  
Lisans Tezi, Ankara, pp.1

**YILDIRIM, NU., COMERT, E., OZENGİN,  
N., (2010).** Shoulder pain: a comparison  
of wheelchair basketball players with  
trunk control and without trunk control.  
J Back Musculoskelet Rehabil. ; 23(2):  
pp.55-61

**VALENT, L. J., DALLMEIJER, A. J.,  
HOUDİJK, H., SLOOTMAN, H. J.,  
JANSSEN, T. W., POST, M. W., VAN  
DER WOUDE, L. H., (2009).** Effects of  
hand cycle training on physical capacity  
in individuals with tetraplegia: a clinical  
trial. Physical therapy, 89(10): pp. 1051-  
1060

**WADE, MG., JONES, G., (1997).** The role of  
vision and spatial orientation in the main-  
tenance of posture. Phys Ther. , 77(6):  
pp.619-628



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[www.sstbdergisi.com](http://www.sstbdergisi.com)

International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: I00-I10-I12-I18-I19-I20-I21 ID:299 K:381

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

---

**WESTCOTT, SL., LOWES, LP., WILLARDSON, J.M., (2007).** Core stability training: Application to sports conditioning Programs (Brief Review), *Journal of Strength and Conditioning Research*, Vol 21(3): 979-985

**RICHARDSON, P. K.,(1997).** Evaluation of postural stability in children: Current theories and assessment tools. *Phys Ther.*, 77(6): pp.629-645

INVESTIGATING THE EFFECTS OF COORDINATION TRAININGS ON  
VELOCITY, BALANCE AND AGILITY FEATURES OF TENNIS KIDS <sup>1</sup>KOORDİNASYON ANTRENMANLARIN ÇOCUK TENİSÇİLERDE  
SÜRAT DENGİ VE ÇEVİKLİK ÖZELLİKLERİNE ETKİSİNİN  
İNCELENMESİ*Gürhan SUNA<sup>1</sup>, Malik BEYLEROĞLU<sup>2</sup>, Mahmut ALP<sup>1</sup>, Seda YALÇIN<sup>2</sup>**<sup>1</sup>Süleyman Demirel University, Faculty of Sports Sciences, Sport Sciences Dep. Isparta / Turkey**<sup>2</sup>Sakarya University, Faculty of Sports Sciences, Coaching Training Dep. Sakarya / Turkey*

**Öz:** Bu çalışmanın amacı, koordinasyon antrenmanlarının çocuk tenisçilerde sürat, denge ve çeviklik özelliklerine etkisinin incelenmesidir. Araştırmaya Isparta ilinde bulunan 20 erkek tenisçi katıldı. Tenisçilerin yaş ortalaması 11,30±0,73 yıl, boy ortalaması 147,75±3,94 cm ve vücut ağırlığı ortalaması ön test 40,85±2,03 kg; son test 40,61±2,02 kg olarak hesaplandı. Araştırma grubunun tüm antrenmanları ve testleri Süleyman Demirel Üniversitesi Tenis Merkezi binasında yapıldı. Sporculardan antrenman periyodu öncesi ve sonrası Illinois Çeviklik Testi, Flamingo Denge Testi, Beş (5) ve On (10) Metre Sürat Testi ölçümleri alındı. Koordinasyon antrenmanları 8 hafta, haftada 3 gün, günde 90 dakika uygulandı. Elde edilen veriler SPSS 18.0 istatistik programında “Paired t Testi” kullanılarak karşılaştırıldı. Tenisçilere uygulanan tüm testlerin karşılaştırılması sonucunda istatistiksel olarak önemli derecede fark bulundu ( $p<0,05$ ). Sonuç olarak, puberte dönemindeki erkek tenisçilerin koordinasyon antrenmanına bağlı olarak denge, sürat ve çeviklik özelliklerinde iyileşmeler olduğu görülmüştür. Buna paralel olarak tenisçilerin performansının olumlu yönde etkilendiğini söyleyebiliriz.

**Anahtar Kelimeler:** Tenis, Koordinasyon, Çocuk

**Abstract:** The aim of this study was to investigate the effects of coordination trainings on velocity, balance and agility features of tennis kids. 20 male kids living in Isparta participated in the study. The mean age of tennis players was 11,30±0,73 year, the mean height was 147,75±3,94 cm and the mean weight was calculated in pre-test 40,85±2,03 kg; in post-test 40,61±2,02 kg. All trainings and tests of research group were applied at Süleyman Demirel University Tennis Center. Measurements of Illinois Agility Test, Flamingo Balance Test, Five (5) and Ten (10) Meters Velocity Tests were taken before and after coordination trainings. Coordination trainings were applied for 8 weeks, 3 days a week, 90 minutes a day. Handled datas were compared by using “Paired t Test” by SPSS 18.0 statistic programme. As a result of comparing all the tests applied to the players, the differences were found to be statistically significant ( $p<0,05$ ). To conclude, we can say that positive improvements have been seen in balance, velocity and agility depending on coordination trainings of male tennis players at puberty. In parallel, we can say that performances of tennis players were affected positively.

**Key Words:** Tennis, Coordination, Kid

Doi: 10.17363/SSTB.20162022364

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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: M0-M00-M10-M12-M19 ID:291 K:44

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## INTRODUCTION

Tennis, which is an individual branch of sport, is of great significance because it is the sort of game which requires the players to do effective strokes, to meet the ball at the most suitable posture and by extension require them to adjust themselves to varied movements and help them to improve their motor skills.

Coordination is an important factor which determines the technique. Coordination exercises provide movements to be quick, high-efficiency, safe, aesthetic and relevant (Komi, 1992: 249-250.). An athlete with good coordination can perform more effectively for longer periods. He can perform better and longer because he is less likely to suffer from muscle weakness while performing the movements (Whiting and Vereijken, 1993: 343-357; Ringenbach and Amazeen, 2005: 1-18). Teenagers are more likely to develop good coordination compared to adults. Because the adaptability of the neural system to the changing environment is much better at early ages (Ölçücü, 2010: 1-11). Tennis players try to develop this skill in order to do effective shots during trainings and games. Playing tennis requires fast swings, quick arm movements, jumps and moves (Gullikson, 2003: 135-156). While performing techniques in tennis, arm, torso and leg muscles must be stretched in coordination with each other by means of which one can control the

movements done with more than one junction (multi-junction movement). A tennis player is supposed to perform moves in every possible direction. If a player does not take the proper position during the game, he is less likely to conduct a good stroke. In such a case, speed is extremely important to be able to catch the ball (Bompa, 1998: 47-65).

Balance in addition to agility, which is one of the basic requirements of tennis, is also of great significance (Kejonen, 2002: 78-81). The applicability of the movements done in daily life and in exercises is in direct proportion with the proper balance being established and agility being improved. Having the proper balance is claimed to raise performance in exercises. It is also pointed out that the movements essential for better performance in sports are a prerequisite for sports (Zenbilci, 1995: 194-197).

In the light of the knowledge obtained from the literature, this study seeks to examine the effects of coordination exercises on speed, balance and agility among children.

## MATERIALS and METHODS

20 male tennis players took part in the study. The average age of the children (n=20) who took part in the study was found to be  $11,30 \pm 0,73$  years while the average height was determined  $147,75 \pm 3,94$  cm. Parents' consent was taken. All the training and tests



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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

of the subjects were conducted in Tennis Center at Süleyman Demirel University between 16:00 and 18:00.

**Measurement of height:** Measurements were conducted with the subjects standing upright barefoot, in deep inspiration. A measuring steel scale was placed against the head and the span between the sole and the top of the head was measured with a margin error of 0,5 cm.

**Measurement of weight:** Measurements were done with an electronic scale (SECA) with 0,5 kg fallibility. The subjects were weighed barefoot in shorts and t-shirts.

**Illinois Agility Test:** The athlete lies face-down with his head at the start line. Then he runs for the first 10 meters on the start command; he runs 10 meters again having turned around the cone and after that the athlete weaves in and out of the row of cones. Having performed a slalom of 10 meters, he returns and repeats this slalom and arrives at the starting point of the slalom. After that point, he runs 10 meters and turns around the cone and finishes the last 10 meters and arrives at the finish line, where the test is complete.

**Flamingo Balance Test:** A wooden beam with a length of 50 cm, a height of 4 cm and width of 3 cm was used for this test. The athletes stand on the beam barefoot with one foot on the beam like a flamingo. While

standing on one leg, the other is flexed at the knee, with the foot close to the buttocks, the stopwatch is started. The watch was stopped when the person lost his balance. Timing was started again and kept until the person lost balance again. Balance losses in 60 seconds were counted.

**Five (5) and Ten (10) Meter Sprint Test:** In a standard tennis court, after a 15 minute warmup, the athletes ran a 5 meter and a 10 meter course back and forth on the start command given for the each single athlete. The total time taken between the start and the finish was found. The test was applied to the athletes three times and the best performances were recorded.

**The Training Program:** Coordination trainings were given to the participants for 90 minutes a day and 3 days a week for a period of 8 weeks. In the training, after a 15-minute warm up, the athletes were given coordination training for 60 minutes and in the final 15 minutes they performed a stretching and cooling down exercise. In the training, the athletes did rope skipping, foot exercises with cones and plates, jumping over hurdles, slalom exercises, agility ladder exercises, cone drills, drills on court lines, balls to bounce and dribbling with a racket and knee bending drills.



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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**Data Analysis:** SPSS 18.0 program was used in this study to obtain statistical results. In order to determine whether there was a difference between pre-training and post-training,

an in-group paired test was applied. The level of significance was evaluated according to “0,05” importance level.

## FINDINGS

**Table 1. Descriptive Statistics Related to Athletes' Physical Values**

	N	Minimum	Maximum	Mean±SS
Age (year)	20	10,00	12,00	11,30±0,73
Height (cm)		140,00	150,00	147,75±3,94

**Table 2. Comparison of Athletes' Weight Pre and Post Test Values**

Weight (kg)	Test Sequence	Mean±SS	t	p
	Pre Test	40,85±2,03	4,81	,000*
	Post Test	40,61±2,02		

**\*p<0,05**

Upon analyzing the Table 2,a significant difference was found statistically in pre and post t test values of research group (p<0,05).



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: M0-M00-M10-M12-M19 ID:291 K:44

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**Table 3. Comparison of Athletes' Agility Pre and Post Test Values**

Illionis Agility Test (sec)	Test Sequence	Mean±SS	t	p
	Pre Test	19,62±1,01	3,78	,010*
	Post Test	19,53±0,98		

**\*p<0,05**

cally significant between pre and post values (p<0,05).

According to the agility test parameters in Table 3, a difference was found to be statisti-

**Table 4. Comparison of Athletes' Balance Pre and Post Test Values**

Flamingo Balance Test (piece)	Test Sequence	Mean±SS	t	p
	Pre Test	16,30±2,75	9,73	,000*
	Post Test	14,15±2,85		

**\*p<0,05**

As shown in Table 4, a significant difference was found between pre and post values of Flamingo Balance test (p<0,05).

**Table 5. Comparison of Athletes' Velocity Pre and Post Test Values**

Velocity Test	Test Sequence	Mean±SS	t	p
5 m (sec)	Pre Test	1,29±0,04	11,26	,000*
	Post Test	1,27±0,04		
10 m (sec)	Pre Test	2,41±0,04	7,85	,000*
	Post Test	2,39±0,04		

**\*p<0,05**



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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

As seen in Table 2, significant differences were found statistically in pre and post t test values of 5 and 10 m velocity tests ( $p<0,05$ ).

## DISCUSSION

This study seeks to examine the effects of coordination drills on speed, balance and agility among children. 20 male tennis players from Isparta took part in the study. The average age of the children ( $n=20$ ) who took part in the study was found to be  $11,30\pm0,73$  years while the average height was determined to be  $147,75\pm3,94$  cm. The Pre-test average weight was found to be  $40,61\pm2,02$  kg while the posttest average weight was found to be  $40,85\pm2,03$  kg. A statistically significant difference was found between the body weight measurement values ( $p<0,05$ ).

In modern tennis, players should be able to take the proper position against the ball in the fastest possible time so that they can do effective strokes; therefore, agility is of great significance for a better performance in tennis.

In the study conducted in the light of the obtained data, while the pre training agility measurement value was  $19,62\pm1,01$  sec, the post training measurement was  $19,53\pm0,98$  sec. A significant difference was determined between the pre training and post training agility values ( $p<0,05$ ).

Fresno et al. (2010) studied the change in the body composition and physical fitness in elite tennis players over the season. The average of agility of the seven elite players in the first month was found to be  $11.42\pm0.66$  sec while it was found  $11.05\pm0.59$  sec at the end of the 10th month.

Ölçücü et al. determined the following agility measurement values in 2010, in the study in which they dealt with the factors contributing to the development of talent of tennis among children between 10-14 years. For the first group, while the value was  $17,90\pm0,74$  sec at the beginning, it was determined as  $13,54\pm0,68$  sec after 3 weeks and  $14,51\pm0,45$  sec after 6 weeks. For the second group, while it was  $15,31\pm0,82$  sec, it was found to be  $14,66\pm0,85$  sec after 3 weeks and  $14,46\pm0,45$  sec after 6 weeks. In the second measurements, a significant difference in the agility parameter was determined to be in favor of the first group ( $p<0,05$ ).

In their study in which they studied the effects of balance and flexibility on agility in the pre-pubescent period, Hazar and Taşmektepligil (2008) found the value of  $22,38\pm1,58$  sec in the Illinois Agility test they performed.

In 2012, Akdeniz et al, in their study in which they dealt with the effects of muscle injury generating from exercise on speed and agility, found the following measurement values





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International Refereed Academic Journal of Sports, Health and Medical Sciences

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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

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in the Illinois agility tests they conducted: The baseline  $16,78 \pm 1,56$  sec, 1 hour later  $18,50 \pm 1,83$  sec, 24 hours later  $19,68 \pm 1,63$  sec, 48 hours later  $19,13 \pm 1,18$  sec, 72 hours later  $17,74 \pm 1,42$  sec, 96 hours later  $17,34 \pm 1,70$  sec. They found significant differences between the pretest and posttest measurement scores ( $p < 0,05$ ).

In 2010, Kızılet et al in their study in which they discussed the effects of different strength training on the speed and jump ability of basketball players between 12-14 years old, found that for group A Illinois agility pretest value was  $18,65 \pm 1,03$  sec while the posttest value was  $17,97 \pm 1,01$  sec; for group B Illinois agility pretest value was  $18,34 \pm 1,15$  sec while it was found to be  $17,95 \pm 0,92$  sec for the posttest. They found a statistically significant difference between the respective pretest and posttest measurement values of the two groups ( $p < 0,05$ ).

In the light of the data obtained from the literature, although some improvements were observed in the agility performance of the athletes thanks to the training given, this was an average increase according to Illinois test values and we are of the opinion that the agility can be improved further over longer periods.

It is pointed out that balance exercises improves performance and that they are im-

portant to the dynamic sports which involve movements done with high speed and to the preservation of body composition necessary for high performance in sports. (Altınkök and Ölçücü, 2012: 273-276). It is an essential ability to keep the body balance during sudden swings, the right position during and after the stroke in a game of tennis.

When we studied the Flamingo balance test average test scores, we saw that it was  $16,30 \pm 2,75$  piece for pretraining and  $14,15 \pm 2,85$  piece for post training. The results suggest that the coordination drills significantly improved the balance ability of the athletes ( $p < 0,05$ ).

Karagöz et al studied in 2015 some physical and physiological parameters of a group of junior tennis players and did research on the relation between these parameters and fore-hand-backhand stroke performances. They found an average score of  $11,25 \pm 53$  piece in the flamingo balance test.

In 2007, Erkmen et al in a study in which they compared the balance performances of athletes from different sport branches determined the footballers' dominant leg stability balance scores as 17,15 piece.

Mohamed et al (2009) compared the anthropometric and performance values of the handballers to the reference group in order to determine the ability model for handballers



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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

and they found an average score of  $12.1 \pm 4.6$  piece for the handballers and an average score of 16.7 piece for the reference group in the Flamingo balance test.

The data obtained in our research bear resemblance to the data obtained in some studies in the literature; however, data in other studies do not bear resemblance to ours.

Speed is an explosive type of movement essential to the performance in many sports branches. Speed is of great significance in tennis because it enables players to catch the ball in the shortest time possible.

The pretest average scores of the athletes in 5 meter speed test was  $1.29 \pm 0.04$  sec and for the posttest was  $1.27 \pm 0.04$  sec; while the pretest average score was  $2.41 \pm 0.04$  sec in 10 meter speed test, the posttest average was found to be  $2.39 \pm 0.04$  sec. For the training group, in the 5 and 10 meter speed test parameters a statistically significant difference was found between the pretest and posttest measurement values ( $p < 0.05$ ).

In 2005 in a study by Hazar to determine the effect of agility on good performance, the pretest 10 meter speed scores were found to be  $2.53 \pm 0.1$  sec and the posttest 10 meter speed scores were found to be  $2.38 \pm 0.1$  sec. For the 10 meter speed variable, a statistically significant difference was found between the pretest and posttest scores ( $p < 0.05$ ). The re-

spective 10 meter speed scores in our study and in Hazar's are close.

Okur (2011) in a study in which he worked on the effects of a speed training program on acceleration and agility in basketball, conducted an eight week speed training program for junior basketball players. For the study group, the respective pretest and posttest scores in the 5 meter speed test were  $1.17 \pm 0.08$  and  $1.10 \pm 0.05$  sec and for the 10 meter speed test the respective scores were  $1.97 \pm 0.09$  and  $1.88 \pm 0.08$  sec. For the control group, in the 5 meter speed test, the respective pretest and posttest scores were  $1.17 \pm 0.06$  and  $1.14 \pm 0.03$  sec; for the 10 meter speed test, the respective scores were  $1.98 \pm 0.10$  and  $1.95 \pm 0.08$  sec. A statistically significant difference was determined between the 5-10 meter speed test posttest scores of the study and control group ( $p < 0.05$ ).

We suppose that the fact that the speed scores in Okur's study in 2011 are better than those in ours may be due to the age gap between the athletes in that study and in ours.

Aktaş et al in a study in 2011 worked on the effects of a strength training on the motor skills of a group of male tennis players between 12-14 years old. They found that for the experimental group the respective pretest and posttest scores for the 5 meter speed test were  $1.05 \pm 0.03$  and  $0.99 \pm 0.06$  sec; for the 10



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

meter speed test, the respective scores were  $1,86 \pm 0,07$  and  $1,80 \pm 0,07$  sec. The speed test scores in Aktaş et al's study are lower compared to those in ours, which may generate from different training programs.

## RESULTS

To conclude, it was observed that 8-week coordination training programs improved balance, agility and speed in 10-12 years old male tennis players. In the light of these, we can conclude that as a result of the coordination training of male tennis players in adolescence period, the improvement in balance, speed and agility positively contributed to the performance. Furthermore, we are in the opinion that tennis training periods may be longer and as a result, the progress made may be analyzed in detail thanks to the better data to be obtained. Also, better and more useful data may be obtained from studies done on groups with more athletes.

The coordinative ability of the players in tennis is supposed be in the upper levels. Within this context, we think that if the coordinative and fitness qualities of athletes are trained simultaneously, they can perform better.

## REFERENCES

**AKDENİZ, Ş., KARLI, Ü., DAŞDEMİR, T., YARAR, H., YILMAZ, B., (2012).** Effects Of Exercise Induced Muscle Dam-

age On Sprint And Agility Performance. Niğde University Journal of Physical Education and Sport Sciences, 6(2)

**AKTAŞ, F., AKKUŞ, H., HARBİLİ, E., & HARBİLİ, S., (2011).** The Effect Of Strength Training On Some Motor Abilities In 12-14 Years-Old Male Tennis Players. Journal of Physical Education and Sport Science, 5(1)

**ALTINKÖK, M., ÖLÇÜCÜ, B., (2012).** The Examination on Postural Control and Agility Performance of 10 Year Old Tennis Players before the Competition. Selçuk University Journal of Physical Education and Sport Science, 14(2): 273-276

**BERDEJO DEL FRESNO, D., VICENTE RODRÍGUEZ, G., GONZÁLEZ RAVÉ, J.M., MORENO, L.A., REY LÓPEZ, J.P., (2010).** Body Composition And Fitness In Elite Spanish Children Tennis Players. Journal Of Human Sport & Exercise, 5(2): 250-264

**BOMPA, T.O., (1998).** Theory And Methodology Of Training: Periodization. Ankara: Bağırhan Publishing; 47-65

**ERKMEN, N., SUVEREN, S., GÖKTEPE, A.S., YAZICIOĞLU, K., (2007).** Comparison of Balance Performances of Athletes in Different Branches. Spormetre



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: M0-M00-M10-M12-M19 ID:291 K:44

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

Journal of Physical Education and Sport Sciences, 3: 115-12

**GULLIKSON, T., (2003).** Pyhsical Fitness Tests in Tennis. Journal of Sport Researches, 7(1): 135-156

**HAZAR, F., TAŞMEKTEPLİĞİL, Y., (2008).** The Effects Of Balance And Flexibility On Agility In Prepuberte Period. Spormetre Journal of Physical Education and Sport Sciences, 6(1): 9-12

**HAZAR, F., (2005).** Effects of Agility on Performance in Badminton and Training Applications to Improve. Marmara University Institute of Health Sciences, Published PhD Thesis

**KARAGÖZ, Ş., ERDOĞMUŞ, M., CELEPAKSOY, F., BOZLAK, K., ALKAN, F., (2015).** Inspection Of The Affects Of Some Physical And Physiological Parameters On Groundstroke Performances Of Junior Tennis Players. Niğde University Journal of Physical Education And Sport Sciences, 9

**KEJONEN, P., (2002).** Body Movements During Postural Stabilization. Dissertation, Department of Physical Medicine and Rehabilitation, Oulu University; 78-81

**KIZILET, A., ATILAN, O., ERDEMİR, İ., (2010).** The Effect Of The Different

Strength Training On Quickness And Jumping Abilities Of Basketball Players Between 12 And 14 Age Group. Atabesbd; 12(2): 44-57

**KOMI, P.V., (1992).** Strenght And Power in Sport, Germany, 249-250

**MOHAMED, H., VAEYENS, R., MATTHYS, S., MULTAEL, M., LEFEVRE, J., LENOIR, M., PHILIPPAERTS, R., (2009).** Anthropometric and performance measures for the development of a talent detection and identification model in youth handball. Journal of Sports Sciences, 27(3): 257-266

**OKUR, M., (2011).** Effects of 8-Week Speed Training Programme on Acceleration and Agility in Youth Basketballers. Selçuk University Institute of Health Sciences, Published Master Thesis

**ÖLÇÜCÜ, B., CANIKLİ, A., AĞAOĞLU, Y.S., ERZURUMLUOĞLU, A., (2010).** Evaluating The Factors Affected Development Of Tennis Skills In 10-14 Age Children. Atabesbd; 12(2): 1-11

**RINGENBACH, S.D., AMAZEEN, P.G., (2005).** How do children control rate, amplitude, and coordination stability during bimanual circle drawing? Ecological Psychology, 17(1): 1-18



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: M0-M00-M10-M12-M19 ID:291 K:44

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

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**WHITING, H.T.A., VEREIJKEN, B., ZENBİLCİ, N., (1995).** Nervous System  
(1993). The Acquisition Of Coordination Diseases. İstanbul University Publishing,  
In Skill Learning, International Journal İstanbul, 194-197  
Of Sport Psychology, Dec, 24 (4): 343-  
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ELDERLY ANALYSIS OF TURKEY; TSI DATA FOR 2011-2015<sup>1</sup>

## TÜRKİYE YAŞLI ANALİZİ; 2011-2015 TUIK VERİLERİ

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**Abstract: Introduction:** Old age is a biological, chronological and social process that is hard to prevent. It is foreseen according to the projections made for the future that the world's population will reach to 7.5 billion in the year 2020 and the population group aged sixty and above will reach to 1 billion. The needs of aging population change by the years. In this regard, society's knowledge about the elderly population is important in terms of creating health policies about elderly people and planning the services to be offered to them. The purpose of our study is to conduct an analysis on elderly population in our country for the period between 2011 and 2015 by some variables and to create a data source relevant to the subject. **Material and Method:** This study was based on TSI-News Bulletin / data of Elderly Statistics – 2015. The variables were determined for the period 2011-2015. Data obtained from this study were analyzed with E-Views 8.0 program. The factors affecting the industrial production at most were established following the regression and correlation analyses conducted. The method of panel data analysis was used in analysis of data. **Findings:** One-unit of increase in the number of elderly people by years increases the number of dependent people by 0,003 units. One-unit of increase in the number of patients with Alzheimer by years increases the number of total dependent people by 0,002 units. A percentile increase in the number of total married elderly people by years increases the total number of happy elderly by 4.2 units. One-unit of increase in the number of total dependent people by years increases the total number of unhappy people by 1.16 units. One-unit of increase in the number of elderly satisfied with their health condition by years increases the number of happy individuals by 1.54 units. One-unit of increase in the number of total dependent people by years increases the number of those not satisfied with their health condition by 3.21 units. **Conclusion:** There is a correlation between variables. It has been determined that as none of the variables include unit root, they can be used in future analyses. The causality relation between the variables of old age statistics can be analyzed.

Key Words: Elderly, Turkey, Analysis

**Öz: Giriş:** Yaşlılık, önüne geçilmesi mümkün olmayan biyolojik, kronolojik ve sosyal bir süreçtir. Yapılan projeksiyonlarda 2020 yılında dünya nüfusunun 7.5 milyara, altmış yaş ve üstü nüfus grubunun 1 milyara ulaşacağı tahmin edilmektedir. Nüfusun yaşlanması ile birlikte yaşlanan nüfusun gereksinimleri de değişmektedir. Bu anlamda toplumların yaşlı popülasyonlarını tanımları, yaşlılar ile ilgili sağlık politikalarının oluşturulmasında ve onlara verilecek hizmetlerin planlanmasında önemlidir. Bu gerekçe ile planladığımız çalışmamızın amacı, ülkemizdeki yaşlı popülasyonunun 2011-2015 arasındaki dönem için bazı değişkenlere göre analizini yapmak ve konu ile ilgili göre veri kaynağı oluşturmaktır. **Gereç ve Yöntem:** Bu araştırma TUIK-Haber Bulteni / İstatistiklerle Yaşlılar-2015 verileri temel alınarak yapılmıştır. Değişkenler 2011-2015 arasındaki dönem için belirlenmiştir. Bu araştırmadan elde edilen veriler E-Views 8.0 programı ile analiz edilmiştir. Yapılan regresyon ve korelasyon analizleri sonucunda sanayi üretimini en çok etkileyen faktörler belirlenmiştir. Veriler analiz edilirken panel veri analizi metodundan faydalanılmıştır. **Bulgular:** Yıllar bazında yaşlı sayısındaki bir birimlik artış toplam bağımlı insan sayısını 0,003 birim artırmaktadır. Yıllar bazında alzheimer'lı hasta sayısındaki bir birimlik artış toplam bağımlı insan sayısını 0,002 birim artırmaktadır. Yıllar bazında toplam evli yaşlı sayısındaki yüzde birlik artış toplam mutlu yaşlı sayısını 4.2 birim artırmaktadır. Yıllar bazında toplam bağımlı sayısındaki bir birimlik artış toplam mutsuz kişi sayısını 1.16 birim artırmaktadır. Yıllar bazında toplam sağlık durumundan memnun yaşlı sayısındaki bir birimlik artış toplam mutlu kişi sayısını 1.54 birim artırmaktadır. Yıllar bazında toplam bağımlı sayısındaki bir birimlik artış toplam sağlık durumundan memnun olmayan kişi sayısını 3.21 birim artırmaktadır. **Sonuç:** Değişkenler arasında korelasyon bulunmaktadır. Değişkenlerin hiçbirisinin birim kök içermediği bundan dolayı da ileriki analizlerde kullanılabilecekleri belirlenmiştir. Yaşlılık istatistikleri değişkenleri arasında nedensellik ilişkisi incelenebilmektedir.

Anahtar Kelimeler: Yaşlı, Türkiye, Analiz

Doi: 10.17363/SSTB.20162022366

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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: C01-G80 ID:298 K:03

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## INTRODUCTION

Old age is a biological, chronological and social process that is hard to prevent. Old age is a period in which individuals lose status, dependence and the risk of accident increase, physical abilities diminish and many chronic diseases occur. World Health Organization has defined the old age as “Decrease in the ability to adapt to environmental factors” (Gülen M et al., 2013).

The share of elderly within the total population outreached children in 1998 for the first time in the world. 10% of the world population is composed of the individuals aged sixty five and above. It is predicted in the projections that world population will reach to 7.5 billion in the year 2020 and the population group aged sixty and above will reach to 1 billion. Approximately 800 thousand people reach old age every month all over the world (Kutsal A. 2012).

Turkey goes through a process similar to the demographic developments in many countries. Length of life has extended in parallel to the decrease in high mortality and then in high fertility rates. Moreover, age structures of population also changed and a transition has been experienced from young age groups to advanced age groups (Tezcan S& Seçkiner P; 2012). Today, the elderly population in Turkey (65 years and older) reached to 6 million

495 thousand and 239 people in 2015. While the proportion of elderly people in total population was 8% in 2014, this proportion increased to 8.2% in 2015. The proportion of elderly population was 43.8% for males and 56.2% for females (TSI Elderly Statistics 2015). The needs of aging population are also changing. The studies point out that elderly population use health services more than young population. Elderly population tends to stay at hospitals more. The need felt for long-term care services has increased due to chronic diseases and dramatic increases in disabilities (Gökçe K, 2003). In this sense, it is thought that the society’s knowledge about the elderly population is important in terms of creating health policies about elderly people and planning the services to be offered to them. The purpose of our study is to conduct an analysis on elderly population in our country for the period between 2011 and 2015 by some variables and to create a data source relevant to the subject.

## MATERIAL and METHOD

This study was based on TSI-News Bulletin / data of Elderly Statistics – 2015. The variables were determined for the period 2011-2015.

### Data Analysis

Data obtained from this study were analyzed with E-Views 8.0 program. The factors affecting the industrial production at most were established following the regression and cor-



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: C01-G80 ID:298 K:03

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

relation analyses conducted. The method of panel data analysis was used in analysis of data.

### Research Hypotheses

- ✓ **H1:** Total number of elderly people has a positive effect on the number of dependent people.
- ✓ **H2:** Total number of patients with Alzheimer has a positive effect on the number of dependent people.
- ✓ **H3:** Total number of married people has a positive effect on the number of happy elderly people.
- ✓ **H4:** Increase in total number of dependent people has a positive effect on the number of unhappy people.
- ✓ **H5:** The total number of elderly people satisfied with their health condition has a positive effect on the number of happy elderly people.
- ✓ **H6:** Total number of dependent people has a positive effect on those not satisfied with their health condition.

- ✓ **H7:** The number of those whose source of happiness is children has a positive effect on the number of married people.
- ✓ **H8:** The number of those whose source of happiness is spouse has a positive effect on the number of married people.
- ✓ **H9:** There is no relation between the variables.
- ✓ **H10:** There is no unit root in any of the variables.
- ✓ **H11:** There is causality between the variables of aging statistics.

### FINDINGS

**H1:** Total number of elderly people has a positive effect on the number of dependent people.

With reference to the regression analysis, the coefficient of the total number of elderly people has been found positive. Accordingly, one-unit of increase in the number of elderly people by years increases the number of dependent people by 0,003 units.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

DependentVariable: DEPENDENT

Method: LeastSquares

Date: 04/02/16 Time: 23:25

Sample: 2011 2015

Includedobservations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ELDERLY	0.003412	3.20E-05	106.7172	0.0000
R-squared	0.795977	Meandependent var		11.46000
Adjusted R-squared	0.795977	S.D. dependent var		0.531977
S.E. of regression	0.240288	Akaikeinfocriterion		0.162903
Sumsquaredresid	0.230954	Schwarzcriterion		0.084791
Loglikelihood	0.592742	Hannan-Quinnriter.		-0.046743
Durbin-Watson stat	0.466294			

**H2:** Total number of patients with Alzheimer has a positive effect on the number of dependent people.

With reference to the regression analysis, the coefficient of the total number patients with

Alzheimer has been found positive. Accordingly, one-unit of increase in the number of patients with Alzheimer by years increases the number of total dependent people by 0,002 units.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: C01-G80 ID:298 K:03

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

DependentVariable: DEPENDENT

Method: LeastSquares

Date: 04/03/16 Time: 00:33

Sample: 2011 2015

Includedobservations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ALZ	0.002372	0.000231	10.28403	0.0005
R-squared	-20.176392	Meandependent var		11.46000
Adjusted R-squared	-20.176392	S.D. dependent var		0.531977
S.E. of regression	2.448044	Akaikeinfocriterion		4.805312
Sumsquaredresid	23.97168	Schwarzcriterion		4.727200
Loglikelihood	-11.01328	Hannan-Quinncrier.		4.595666
Durbin-Watson stat	0.407562			

**H3:** Total number of married people has a positive effect on the number of happy elderly population.

With reference to the regression analysis, the coefficient of the total number of married el-

derly people has been found positive. Accordingly, a percentile increase in the number of total married elderly people by years increases the total number of happy elderly by 4.2 units.





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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

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(TRADEMARK)

(2015/04315- 2015-GE-18972)

DependentVariable: HAPPY

Method: LeastSquares

Date: 04/03/16 Time: 00:35

Sample: 2011 2015

Includedobservations: 5

Variable	Coeffici- ent	Std. Error	t-Statistic	Prob.
LOG(MARRIED)	4.203526	0.096063	43.75780	0.0000
R-squared	0.116523	Meandependent var		59.56000
Adjusted R-squared	0.116523	S.D. dependent var		3.238518
S.E. of regression	3.043996	Akaikeinfocriterion		5.241075
Sumsquaredresid	37.06364	Schwarzcriterion		5.162963
Loglikelihood	-12.10269	Hannan-Quinnccriter.		5.031429
Durbin-Watson stat	1.157155			

**H4:** Increase in total number of dependent people has a positive effect on the number of unhappy people.

With reference to the regression analysis, the coefficient of the total number of dependent

people has been found positive. Accordingly, one-unit of increase in the number of total dependent people by years increases the total number of unhappy people by 1.16 units.



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(TRADEMARK)

(2015/04315- 2015-GE-18972)

DependentVariable: UNHAPPY

Method: LeastSquares

Date: 04/03/16 Time: 00:45

Sample: 2011 2015

Includedobservations: 5

Variable	Coeffici- ent	Std. Error	t-Statistic	Prob.
DEPENDENT	1.160735	0.070656	16.42797	0.0001
R-squared	-0.894903	Meandependent var		13.36000
Adjusted R-squared	-0.894903	S.D. dependent var		1.316435
S.E. of regression	1.812144	Akaikeinfocriterion		4.203755
Sumsquaredresid	13.13547	Schwarzcriterion		4.125643
Loglikelihood	-9.509388	Hannan-Quinnccriter.		3.994109
Durbin-Watson stat	1.018279			

**H5:** The total number of elderly people satisfied with their health condition has a positive effect on the number of happy elderly people.

With reference to the regression analysis, the coefficient of the total number of elderly pe-

ople satisfied with their health condition has been found positive. Accordingly, one-unit of increase in the number of elderly satisfied with their health condition by years increases the number of happy individuals by 1.54 units.



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(2015/04315- 2015-GE-18972)

DependentVariable: HAPPY

Method: LeastSquares

Date: 04/03/16 Time: 00:47

Sample: 2011 2015

Includedobservations: 5

Variable	Coeffici- ent	Std. Error	t-Statistic	Prob.
SATISFIED	1.546344	0.072762	21.25198	0.0000
R-squared	-2.720355	Meandependent var		59.56000
Adjusted R-squared	-2.720355	S.D. dependent var		3.238518
S.E. of regression	6.246525	Akaikeinfocriterion		6.678784
Sumsquaredresid	156.0763	Schwarzcriterion		6.600672
Loglikelihood	-15.69696	Hannan-Quinnccriter.		6.469138
Durbin-Watson stat	2.116250			

**H6:** Total number of dependent people has a positive effect on those not satisfied with their health condition.

With reference to the regression analysis, the coefficient of the total number of dependent

people has been found positive. Accordingly, one-unit of increase in the number of total dependent people by years increases the number of those not satisfied with their health condition by 3.21 units.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

DependentVariable: NOT SATISFIED

Method: LeastSquares

Date: 04/03/16 Time: 00:52

Sample: 2011 2015

Includedobservations: 5

Variable	Coeffici- ent	Std. Error	t-Statistic	Prob.
DEPENDENT	3.210675	0.184448	17.40696	0.0001
R-squared	-0.631454	Meandependent var		36.92000
Adjusted R-squared	-0.631454	S.D. dependent var		3.703647
S.E. of regression	4.730609	Akaikeinfocriterion		6.122841
Sumsquaredresid	89.51464	Schwarzcriterion		6.044729
Loglikelihood	-14.30710	Hannan-Quinnccriter.		5.913195
Durbin-Watson stat	0.740969			

**H7:** The number of those whose source of happiness is children has a positive effect on the number of married people.

With reference to the regression analysis, the coefficient of those whose source of happi-

ness is children has been found positive. Accordingly, one-unit of increase in the number of those whose source of happiness is children by years increases the total number of married people 63.155 units.



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(TRADEMARK)

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DependentVariable: MARRIED

Method: LeastSquares

Date: 04/03/16 Time: 00:55

Sample: 2011 2015

Includedobservations: 5

Variable	Coeffici- ent	Std. Error	t-Statistic	Prob.
CHILDREN	63,155	4244.361	14.87978	0.0001
R-squared	-2.194421	Meandependent var		1430570.
Adjusted R-squared	-2.194421	S.D. dependent var		119542.7
S.E. of regression	213658.0	Akaikeinfocriterion		27.55900
Sumsquaredresid	1.83E+11	Schwarzcriterion		27.48088
Loglikelihood	-67.89749	Hannan-Quinnccriter.		27.34935
Durbin-Watson stat	0.805137			

**H8:** The number of those whose source of happiness is spouse has a positive effect on the number of married people.

With reference to the regression analysis, the coefficient of those whose source of happi-

ness is spouse has been found positive. Accordingly, one-unit of increase in the number of those whose source of happiness is spouse by years increases the total number of married people 30.02 units.



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(TRADEMARK)

(2015/04315- 2015-GE-18972)

DependentVariable: MARRIED

Method: LeastSquares

Date: 04/03/16 Time: 00:59

Sample: 2011 2015

Includedobservations: 5

Variable	Coeffici- ent	Std. Error	t-Statistic	Prob.
SPOUSE	30.02	37187.57	8.073618	0.0013
R-squared	-9.407827	Meandependent var		1430570.
Adjusted R-squared	-9.407827	S.D. dependent var		119542.7
S.E. of regression	385658.6	Akaikeinfocriterion		28.74015
Sumsquaredresid	5.95E+11	Schwarzcriterion		28.66204
Loglikelihood	-70.85037	Hannan-Quinnccriter.		28.53050
Durbin-Watson stat	1.872378			

**H9:** There is no relation between the variables.

The results related to the correlation analysis are indicated below.

0,3-0,5 indicates low correlation

0,5-0,8 indicates medium correlation

0,8-1 indicates high correlation





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	ALZ	DE- PEN- DENT	CHILD- REN	SPO- USE	MAR- RIED	SA- TISFI- ED	NOTSA- TISFI- ED	HAPPY	UNHAPPY	EL- DERLY
ALZ	-									
DEPENDENT	0,98	-								
CHILDREN	-0,48	-0,47	-							
SPOUSE	-0,41	-0,37	-0,29	-						
MARRIED	0,99	1,00	-0,49	-0,36	-					
SATISFIED	0,63	0,49	-0,48	-0,40	0,55	-				
NOTSATISFIED	-0,54	-0,45	0,88	-0,24	-0,50	-0,75	-			
HAPPY	0,63	0,52	-0,80	-0,08	0,57	0,91	-0,95	-		
UNHAPPY	-0,70	-0,72	0,73	-0,37	-0,73	-0,32	0,74	-0,58	-	
ELDERLY	1,00	0,99	-0,51	-0,35	1,00	0,57	-0,53	0,60	-0,74	-

**H10:** There is no unit root in any of the variables.

According to the unit root analysis made, due to the fact that the probability values are

higher than the confidence level of 0.05, H0 hypothesis is accepted. Therefore, it has been determined that none of the variables include unit root, so they can be used in future analyses.



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(TRADEMARK)

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Groupunitroot test: Summary

Series: ALZ, DEPENDENT, CHILDREN, SPOUSE, MARRIED, SATISFIED, NOTSATISFIED

HAPPY, UNHAPPY, ELDERLY

Date: 04/03/16 Time: 01:56

Sample: 2011 2015

Exogenousvariables: Individualeffects

Automaticselection of maximumlags

Automaticlaglengthselectionbased on SIC: 0

Newey-West automaticbandwidthselectionandBartlettkernel

Balancedobservationsforeach test

Cross-				
Method	Statistic	Prob.**	sections	Obs
Null: Unitroot (assumescommonunitrootprocess)				
Levin, Lin &Chu t*	2.45557	0.9930	10	40
Null: Unitroot (assumesindividualunitrootprocess)				
Im, PesaranandShin W-stat	1.21184	0.8872	10	40
ADF - FisherChi-square	18.3276	0.5658	10	40
PP - FisherChi-square	21.4319	0.3721	10	40

\*\* ProbabilitiesforFishertestsarecomputedusing an asymptoticChi-squaredistribution. Allothertestsassumeasymptoticnormality.

## GRANGER CAUSALITY TEST

**H11:** There is causality between the variables of aging statistics.

When the causality relations between the variables are analyzed, it has been determined

that prob values are higher than 0.05 and H0 hypothesis must be accepted. Therefore, the causality relation between the variables of elderly statistics can be analyzed.



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(TRADEMARK)

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#### PairwiseGrangerCausalityTests

Date: 04/03/16 Time: 01:58

Sample: 2011 2015

Lags: 1

NullHypothesis:	Obs	F-Statistic	Prob.
DEPENDENT does not GrangerCause ELDERLY	4	2.12452	0.3828
ELDERLY does not GrangerCause DEPENDENT		2.13759	0.3819
MARRIED does not GrangerCause ELDERLY	4	1.09418	0.4857
ELDERLY does not GrangerCause MARRIED		1.37588	0.4494
ALZ does not GrangerCause ELDERLY	4	11.4379	0.1830
ELDERLY does not GrangerCause ALZ		3.31625	0.3197
HAPPY does not GrangerCause ELDERLY	4	124.988	0.0568
ELDERLY does not GrangerCause HAPPY		0.11121	0.7951
UNHAPPY does not GrangerCause ELDERLY	4	0.38470	0.6466
ELDERLY does not GrangerCause UNHAPPY		11.0986	0.1856
CHILDREN does not GrangerCause ELDERLY	4	377.819	0.0327
ELDERLY does not GrangerCause CHILDREN		6.02651	0.2463
SPOUSE does not GrangerCause ELDERLY	4	0.47818	0.6148
ELDERLY does not GrangerCause SPOUSE		253.043	0.0400
SATISFIED does not GrangerCause ELDERLY	4	175.314	0.0480
ELDERLY does not GrangerCause SATISFIED		0.18493	0.7415
NOTSATISFIED does not GrangerCause ELDERLY	4	0.57015	0.5883
ELDERLY does not GrangerCause NOTSATISFIED		10729.1	0.0061



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MARRIED does not GrangerCause DEPENDENT	4	2.97272	0.3346
DEPENDENT does not GrangerCause MARRIED		3.86099	0.2997
ALZ does not GrangerCause DEPENDENT	4	26.0123	0.1233
DEPENDENT does not GrangerCause ALZ		0.42400	0.6326
HAPPY does not GrangerCause DEPENDENT	4	20.0189	0.1400
DEPENDENT does not GrangerCause HAPPY		0.26003	0.6998
UNHAPPY does not GrangerCause DEPENDENT	4	0.12697	0.7821
DEPENDENT does not GrangerCause UNHAPPY		2.56187	0.3555
CHILDREN does not GrangerCause DEPENDENT	4	0.45251	0.6230
DEPENDENT does not GrangerCause CHILDREN		0.06406	0.8422
SPOUSE does not GrangerCause DEPENDENT	4	0.43917	0.6274
DEPENDENT does not GrangerCause SPOUSE		93.2039	0.0657
SATISFIED does not GrangerCause DEPENDENT	4	50118.0	0.0028
DEPENDENT does not GrangerCause SATISFIED		0.08206	0.8224
NOTSATISFIED does not GrangerCause DEPENDENT	4	0.85070	0.5257
DEPENDENT does not GrangerCause NOTSATISFIED		106.281	0.0616
ALZ does not GrangerCause MARRIED	4	171.775	0.0485
MARRIED does not GrangerCause ALZ		1.04832	0.4925
HAPPY does not GrangerCause MARRIED	4	102.535	0.0627
MARRIED does not GrangerCause HAPPY		0.17387	0.7485
UNHAPPY does not GrangerCause MARRIED	4	0.21223	0.7252
MARRIED does not GrangerCause UNHAPPY		6.44165	0.2389
CHILDREN does not GrangerCause MARRIED	4	8.72100	0.2079



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MARRIED does not GrangerCause CHILDREN		2.05674	0.3876
SPOUSE does not GrangerCause MARRIED	4	0.36345	0.6546
MARRIED does not GrangerCause SPOUSE		8549.68	0.0069
SATISFIED does not GrangerCause MARRIED	4	104.826	0.0620
MARRIED does not GrangerCause SATISFIED		0.13681	0.7745
NOTSATISFIED does not GrangerCause MARRIED	4	0.78005	0.5394
MARRIED does not GrangerCause NOTSATISFIED		7402.21	0.0074
HAPPY does not GrangerCause ALZ	4	0.34120	0.6634
ALZ does not GrangerCause HAPPY		0.29260	0.6843
UNHAPPY does not GrangerCause ALZ	4	65.1934	0.0784
ALZ does not GrangerCause UNHAPPY		39.6303	0.1003
CHILDREN does not GrangerCause ALZ	4	1.76459	0.4108
ALZ does not GrangerCause CHILDREN		3.63322	0.3076
SPOUSE does not GrangerCause ALZ	4	33.4542	0.1090
ALZ does not GrangerCause SPOUSE		44.2612	0.0950
SATISFIED does not GrangerCause ALZ	4	1.16038	0.4763
ALZ does not GrangerCause SATISFIED		0.14167	0.7708
NOTSATISFIED does not GrangerCause ALZ	4	0.33998	0.6639
ALZ does not GrangerCause NOTSATISFIED		5.07811	0.2659
UNHAPPY does not GrangerCause HAPPY	4	0.21262	0.7249
HAPPY does not GrangerCause UNHAPPY		26.7003	0.1217
CHILDREN does not GrangerCause HAPPY	4	0.07839	0.8262
HAPPY does not GrangerCause CHILDREN		11.3292	0.1839



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SPOUSE does not GrangerCause HAPPY	4	0.80419	0.5346
HAPPY does not GrangerCause SPOUSE		4.80546	0.2725
SATISFIED does not GrangerCause HAPPY	4	0.00018	0.9915
HAPPY does not GrangerCause SATISFIED		0.42503	0.6322
NOTSATISFIED does not GrangerCause HAPPY	4	0.60707	0.5786
HAPPY does not GrangerCause NOTSATISFIED		0.03425	0.8835
CHILDREN does not GrangerCause UNHAPPY	4	1.98815	0.3927
UNHAPPY does not GrangerCause CHILDREN		0.00249	0.9682
SPOUSE does not GrangerCause UNHAPPY	4	19.3544	0.1423
UNHAPPY does not GrangerCause SPOUSE		91.7245	0.0662
SATISFIED does not GrangerCause UNHAPPY	4	6.70481	0.2346
UNHAPPY does not GrangerCause SATISFIED		1.87091	0.4019
NOTSATISFIED does not GrangerCause UNHAPPY	4	9.38385	0.2009
UNHAPPY does not GrangerCause NOTSATISFIED		0.01948	0.9117
SPOUSE does not GrangerCause CHILDREN	4	0.06031	0.8467
CHILDREN does not GrangerCause SPOUSE		91.6234	0.0663
SATISFIED does not GrangerCause CHILDREN	4	5.37298	0.2593
CHILDREN does not GrangerCause SATISFIED		0.17914	0.7451
NOTSATISFIED does not GrangerCause CHILDREN	4	14.3708	0.1642
CHILDREN does not GrangerCause NOTSATISFIED		7.41772	0.2240
SATISFIED does not GrangerCause SPOUSE	4	1.30566	0.4577
SPOUSE does not GrangerCause SATISFIED		31.1425	0.1129
NOTSATISFIED does not GrangerCause SPOUSE	4	5.40609	0.2586





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SPOUSE does not GrangerCause NOTSATISFIED		0.06705	0.8387
NOTSATISFIED does not GrangerCause SATISFIED	4	1.53328	0.4325
SATISFIED does not GrangerCause NOTSATISFIED		0.04996	0.8600

## DISCUSSION

It is observed in the analyses conducted in our study that one-unit of increase in the number of elderly people by years increases the number of dependent people by 0,003 units. The rate of elderly dependence corresponds to the number of elderly people per 100 people at working age. The rate of elderly dependence in Turkey was 11.82% in 2014. While the number of elderly people who must be cared by 100 employees in 2014 in Turkey was 12, this number is expected to be 15 in the year 2023 (TSI, 2015).

Another finding obtained from the study is that one-unit of increase in the number of patients with Alzheimer by years increases the number of total dependent people by 0,002 units. In parallel to the rapid increase of elderly population, frequently observed diseases in old-age become a problem in the society. Alzheimer disease is observed frequently in old age. Alzheimer is a progressive and degenerative disease leading to neuronal loss and decreased metabolic activity in some parts of the brain and affecting remembrance, speaking and emotions. This disease starting with

memory disorders progresses with the disability of mental functions and changes of personality. In the last stage, patients become fully dependent individuals who have lost their verbal and motor skills (Akyar&Akdemir,2009).

It has been determined in the study that satisfaction from the health condition in elderly people and being independent regarding functions increase the number of happy elderly people. While the rate of elderly people saying that they are happy in Turkey was 63.4% in 2013, this rate dropped to 62.8% in 2014. Concerning the general level of happiness analyzed on the basis of sex, it was determined that 63% of elderly men and 62.7% of elderly women stated that they were happy in 2014 (TSI 2015). It is stated in literature that aging is an important determiner in terms of getting satisfaction from life (Birtane et al., 2000), being dependent for functions decreases the life satisfaction especially in elderly people (Tajvar, 2008; İnal, 2003; Eser, 2005). As the mobility reduces by aging, person's ability to do their work decreases and it becomes difficult to meet the needs, this condition negatively affects the life satisfaction.



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## Conclusion and Evaluation

- One-unit of increase in the number of elderly people by years increases the number of dependent people by 0.003 units.
- . One-unit of increase in the number of patients with Alzheimer by years increases the number of total dependent people by 0.002 units.
- A percentile increase in the number of total married elderly people by years increases the total number of happy elderly by 4.2 units.
- One-unit of increase in the number of total dependent people by years increases the total number of unhappy people by 1.16 units.
- One-unit of increase in the number of elderly satisfied with their health condition by years increases the number of happy individuals by 1.54 units.
- One-unit of increase in the number of total dependent people by years increases the number of those not satisfied with their health condition by 3.21 units.
- One-unit of increase in the number of those whose source of happiness is children by years increases the total number of married people 63.155 units.

- One-unit of increase in the number of those whose source of happiness is spouse by years increases the total number of married people 30.02 units.
- There is a correlation between the variables.
- It has been determined that as none of the variables include unit root, they can be used in future analyses
- The causality relation between the variables of old age statistics can be analyzed.

## REFERENCES

- AKYAR, İ., AKDEMİR, N., (2009).** Alzheimer Hastalarına Bakım Verenlerin Yaşadıkları Güçlükler. Faculty of Health Sciences Hemşirelik Dergisi pp.32–49
- BİRTANE, M., TUNA, H., EKUKLU, G., UZUNCA, K., AKÇİ, C., KOKİNO, S., (2000).** Edirne Huzurevi Sakinlerinde Yaşam Kalitesine Etki Eden Etmenlerin İncelenmesi. Geriatri 3(4): pp.141-145
- ESER, E., ESER, S., ÖZYURT, C., FİDANER, C., (2005).** Türk yaşlıları Örneğinde Yaşam Kalitesi Algısı: Whoqol-Old Projesi Türkiye odak grup çalışması. Türk Geriatri Dergisi, 8(4): pp.169-183
- GÖKÇE-KUTSAL, Y., (2016).** Yaşlanan Dünya, Yaşlanan Toplum, Yaşlanan İnsan. <http://www.thb.hacettepe.edu.tr/ar->



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www.sstbdergisi.com

International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: C01-G80 ID:298 K:03

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

siv/2003/sayi\_3-4/baslik1.pdf Accessed: 11.03.2016

**GÜLEN, M., AKTÜRK, A., ACEHAN, S., SEĞMEN, M., AÇIKALIN, A., BİLLEN, A., (2013).** Yaşlı İstismarı ve İhmal. Arşiv Kaynak Tarama Dergisi 22(3): pp.393-407

**İNAL, S., SUBAŞI, F., MÜNGAN-AY, S., UZUN, S., ALPKAYA, U., HAYRAN, O., AKARCA, V., (2003).** Yaşlıların fiziksel kapasitelerinin ve yaşam kalitelerinin değerlendirilmesi. Türk Geriatri Dergisi, 6(3): pp.95-99

**KUTSAL, A., (2012).** Yaşlılık Döneminde Çevrel Damar Hastalıkları. Birinci Basamak İçin Temel Geriatri. [http://www.geriatri Dernegi.org.tr/pdf/sempozyum\\_kitabi.pdf#page=42](http://www.geriatri Dernegi.org.tr/pdf/sempozyum_kitabi.pdf#page=42) Accessed: 13.03.2016

**TAJVAR, M., ARAB, M., MONTAZERİ, A., (2008).** Determinants of health-related quality of life in elderly in Tehran, Iran. BMC Public Health, 8: p.323

**TEZVAN, S., SEÇKİNER, P., (2012).** Türkiye’de Demografik Değişim; Yaşlılık Perspektifi. Yaşlı Sağlığı, Sorunları ve Çözümler. Halk Sağlığı Uzmanları Derneği

July 2012. [http://halksagligiokulu.org/anasayfa/components/com\\_booklibrary/ebooks/yasl%C4%B1sagligiyeni16.7.2012.pdf](http://halksagligiokulu.org/anasayfa/components/com_booklibrary/ebooks/yasl%C4%B1sagligiyeni16.7.2012.pdf) Accessed: 15.03.2016

**TSİ (Turkish Statistical Institute). (2015).** İstatistiklerle Yaşlılar. <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=21520> Accessed: 14.03.2016

DIYABETİK HASTALARIN SAĞLIK İNANÇLARININ METABOLİK KONTROL ÜZERİNE ETKİSİNİN İNCELENMESİ<sup>1</sup>

## AN INVESTIGATION OF THE EFFECTS OF THE HEALTH BELIEFS OF DIABETICS ON METABOLIC CONTROL

Nurgül GÜNGÖR TAVŞANLI<sup>1</sup>, Dilek ÖZMEN<sup>1</sup><sup>1</sup> Celal Bayar University, of Health Science Faculty, Manisa / Turkey

**Öz:** Bu araştırmada diyabetik hastaların sağlık inançlarının metabolik kontrol üzerine etkisinin incelenmesi amaçlanmıştır. Araştırma tanımlayıcı tiptedir. Araştırma Manisa Devlet Hastanesi Endokrinoloji Bölümü'nde tedavi gören Tip 2 diyabet hastalarında yürütülmüştür. Araştırmada veri toplama aracı olarak Diyabetik Hastaların Tanımlayıcı Özellikleri Bilgi Formu ve Diyabet Hastalarında Sağlık İnanç Modeli Ölçeği kullanılmıştır. Çalışmada tip 2 diyabetli bireylerin sağlık inançları ile yaş, cinsiyet, eğitim durumu, gelir durumu, çalışma durumları, diyabet süresi ve diyabet tedavisinin tipi arasında anlamlı bir ilişki olmadığı görülmüştür. Algılanan duyarlılık puan ortalaması tokluk kan şekeri kötü kontrol düzeyinde olan hastalarda daha yüksek, algılanan duyarlılık puan ortalaması BKİ obez sınıfında olan hastalarda daha yüksek, hastaların sağlıkla ilgili önerilen aktiviteler alt boyutu puan ortalamalarının HbA1c değeri iyi kontrol düzeyinde olan hastalarda daha yüksek, algılanan ciddiyet alt boyutu puan ortalaması diyabet tedavisine uyum algıları ve diyetle uyum algıları kötü olan hastalarda anlamlı düzeyde daha yüksek saptanmıştır. Bu çalışmada hastaların sağlık inançlarının negatif düzeyde olduğu ve tedavi uyumsuzluklarını yadsıdıkları belirlenmiştir. Bu bulgular hastaların diyabet ve tedavisi ile ilgili olumsuz tutumlara ve bilgi eksikliklerine ya da yanlış bilgilere sahip oldukları düşündürmektedir.

**Anahtar Kelimeler:** Sağlık inançları, Diyabet, Metabolik Kontrol

**Abstract:** The aim of this study was to investigate the effects of the health beliefs of diabetic patients on metabolic control. This descriptive study. The study was performed on type 2 diabetes patients who were receiving treatment at the Endocrinology Department of Manisa State Hospital. Data collection in the study was performed by using an Identifying Characteristics Form for Diabetic Patients and a Model Scale for Health Beliefs in Diabetic Patients. It was established that the mean perceived sensitivity score was higher in patients whose postprandial blood sugar was poorly controlled and in patients whose BMI was classified as obese; the mean scores on the subscale of activities recommended in relation to patients' health were higher in patients whose HbA1c values were at a good level of control, and the mean scores on the subscale of perceived seriousness were significantly higher in patients whose perceptions of conformity to diabetes treatment and perceptions of conformity to diet were poor. It was shown in the study that patients' health beliefs were at a negative level, and that they denied their lack of conformity to treatment. These findings suggest that patients have negative attitudes towards diabetes and its treatment, and that their knowledge is incomplete or wrong.

**Key Words:** Health Beliefs, Diabetes, Metabolic Control

Doi: 10.17363/SSTB.20162022363

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SSTB

www.sstbdergisi.com

International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## INTRODUCTION

Diabetes is a chronic disease, which occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces (WHO, 2013: 1-2). The two main forms are type 1 diabetes and type 2 diabetes (Mansour-Ghanaei *et al.*, 2013:470-477). About 90% of all diabetics have type 2 diabetes (Karaca Sivrikaya, 2006). The World Health Organisation (WHO) has named diabetes mellitus as one of the most serious public health problems of the new millennium (Karaca Sivrikaya, 2006).

The prevalence of diabetes mellitus is increasing in developing countries due to population growth, aging, unhealthy diets, obesity and sedentary lifestyles (Ayele *et al.*, 2012). According to the results of a 2010 study by Turkish Diabetes Epidemiology (TURDEP-II), the rate of diabetes in the adult Turkish population is 13.7% (Satman, 2010). The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030, while in developing countries the prevalence is projected to double between 2000 and 2030 (Cappelle, 2010:1-77).

Diabetes is a chronic illness that requires continuing medical care and patient self-management education to prevent acute complications and to reduce the risk of long-term complications (ADA 2008, Cappelle, 2010:1-77).

To prevent serious morbidity and mortality, diabetes treatment requires dedication to demanding self-care behaviors in multiple domains, including food choices, physical activity, proper medications intake and blood glucose monitoring (Ayele *et al.*, 2012). Diabetes management primarily depends on the behavior and self-care of the patient (Clarke *et al.*, 2002:340–349, Jahanlou *et al.*, 2013: 297-312). Studies carried out in many countries (Da Qing, DPP, DPS) have shown that in diabetes, healthy changes in lifestyle alone can reduce risks by 44-58%, or at the very least put them off (TEMED 2013). Therefore, detecting the factors which are effective in changing the behavior of diabetic patients is very important (Pourghaznein *et al.*, 2013). In order for diabetic patients to achieve successful daily management of their illness, they must have a positive attitude to information on diabetes and to adapting their behavior in the light of the information which they receive. Studies have found that the attitudes of patients to diabetes affect the course of their diabetes care (Çelik 2002, Karaca Sivrikaya 2006, Keskin & Balcı 2011). It is important to investigate the attitudinal components of health-related behavior. If attitudes related to health behavior can be identified, health protection interventions to secure attitudinal change can be developed, and an increase in desirable health behavior would be detected (Jirojwong & Mac Lennan, 2003).





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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

Various behavior models are used in developing healthy lifestyle behaviors. One of these is the Health Beliefs Model. The health beliefs of diabetic patients are considered to be one of the factors which are influential on health behavior performance and help to control complications (Pourghaznein et al., 2013). The Health Belief Model has been used to predict and explain compliance with preventive health behaviors, as well as with disease-specific health-promoting activities (Graziani et al., 1999: 358-363). According to the Health Beliefs Model, it is presumed that when a person follows the health-related activities recommended, he or she is under the influence of Perceived sensitivity, Perceived severity of disease and Perceived benefits against Perceived obstacles to following recommended behaviors. The health beliefs of diabetic patients are considered to be one of the factors which influence health behavior performance and which help control complications (Pourghaznein et al., 2013).

The aim of this study was to investigate the influence of the health beliefs of diabetic patients on metabolic control.

- The effect of patients' sociodemographic characteristics on their health beliefs,
- The effect of patients' treatment, diet and exercise regime on metabolic control,

- The application of health beliefs relating to recommended activities regarding the perceived sensitivity, seriousness, benefits, obstacles and health of patients to treatment, diet and exercise,
- The effect of health beliefs relating to suggested activities regarding the perceived sensitivity, seriousness, benefits, obstacles, and health of patients on metabolic values such as preprandial and postprandial blood sugar levels, HbA1C and BMI, were also studied as specific aims.

## BACKGROUND

Health beliefs model was introduced in 1960's in order to provide a framework for discovering why some people who are not ill, take preventive measures while some people fail in doing preventive actions. This model is a framework for simulating people for positive behaviors and avoiding negative health behaviors. Many researchers apply this model for health intervention development to change behaviors. According to Health Beliefs Model, it is presumed that when a person follows recommended health related activities, it is under the influence of Perceived sensitivity, Perceived severity of disease and Perceived benefits against Perceived barriers for following recommended behaviors. If Perceived barriers were less than Perceived sensitivity or Perceived severity of disease it is more





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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

probable to do recommended health related activities. A perceived benefit is defined as how sticking to medication adherence is useful for their health. Perceived barriers refer to barriers for receiving medication regimen such as forgetfulness, family problems, lack of motivation and disorders in activity daily living. Perceived sensitivity is defined as people's beliefs about what would happen if they do not obey physician's orders, and Perceived severity is subjective understanding of severity of disease (Pourghaznein et al., 2013: 39).

In order for diabetic patients to successfully manage their illness on a daily basis, they must have sufficient knowledge and skills, and a positive attitude. Patients need knowledge which includes their beliefs and attitudes in order to prevent complications, ensure effective treatment, and develop strategies.

Surit (2001) examined the relationship between diabetes complications and the health belief model in diabetic patients, and found a medium-level relationship between diabetic complications and all fields in the health model. In a monitoring study by Daniel and Messer (2002) on the effects of perceived seriousness and obstacles on glycaemic control, it was emphasised that there was a statistically significant relationship between patients' glycaemic control and their belief levels, and that it was easier to secure the cooperation

of patients in recommended approaches to treatment. Kartal and Özsoy (2007) found that as metabolic control values fell in type 2 diabetics, their mean health belief scores increased in a positive way. In a study by Şermet (2012) on the health beliefs of aged diabetic patients on the care and treatment of diabetes, it was found that these patients had negative health beliefs, and that this affected their methods of diabetes care and treatment. Pourghaznein et al. (2013), in a study of the relationship between the conformity to treatment of type 2 diabetics and their health beliefs, established that there was a relationship between their health belief model fields and their conformity to treatment.

## METHODS

The study was performed on type 2 diabetes patients who were being treated at the Endocrinology Department of Manisa State Hospital. Data were collected between 15 January and 1 June 2013. The research sample was recruited after they gave informed consent, and consisted of 200 patients who were over the age of 18, had no mental problems, and who had had type 2 diabetes for at least three months.

## Data Collection

An Identifying Characteristics Form for Diabetic Patients and the Health Beliefs in Diabetics Model Scale were used to collect data.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## The Identifying Characteristics Form for Diabetic Patients

This form was developed by Kartal and Özsoy in 2005 in accordance with the literature for the purpose of determining the socio-demographic characteristics of patients and their condition with regard to diabetes and diabetes control, and contains 25 questions. The first part of the questionnaire concerns the socio-demographic characteristics of the patients, while the second part asks about the patients' condition regarding diabetes and diabetes control (Kartal & Özsoy, 2007).

## Health Beliefs in Diabetics Model Scale (HBM)

This scale was developed by Tan (2004) based on the five subscales of the Health Beliefs Model to assess the health beliefs and attitudes of diabetics towards their illness and to investigate their health behaviors (Tan 2004). The validity and reliability studies of the Turkish scale were performed by Kartal & Özsoy (2007) on type 2 diabetic patients. The study on the validity and reliability of the scale in Turkey was carried out on 352 type 2 diabetes patients between the ages of 30 and 70 who attended the Denizli Province Diabetics Association. The scale consists of a total of 33 items with five subscales on perceived sensitivity (4 items), perceived seriousness (3 items), perceived benefits (7 items), per-

ceived obstacles (9 items), and health-related recommended activities (10 items). The test-retest reliability of the scale is 0.90, the Cronbach alpha values of the subscales vary from 0.73 to 0.86, and the Cronbach alpha value of the whole scale is 0.89 (Kartal & Özsoy 2007).

In evaluating the scale, each item is graded from 1 to 5 by Likert-type scoring. Responses ranged from "I definitely disagree" (1) to "I definitely agree" (5). Negative questions on the scale were scored the other way round. These were items 3 and 4 of the perceived sensitivity subscale, and items 16, 17, 18, 19, 20, 21, 22 and 23 of the perceived obstacles subscale. Subscale mean scores were calculated by totaling the scores of the items on each subscale and dividing it by the number of items in the subscale. A score of 4 or above was taken to show a high (positive) health belief, while a score of less than 4 showed a low (negative) health belief (Tan 2004, Kartal & Özsoy 2007).

The Cronbach alpha coefficients of the scale in this study were 0.57 for the subscale of perceived sensitivity, 0.71 for perceived seriousness, 0.81 for perceived benefits, 0.70 for perceived obstacles, and 0.89 for health-related recommended activities.

For metabolic control, the levels of preprandial and postprandial blood sugar, triglyceride,



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

cholesterol, HDL and HbA1C in the patients' most recent routine monitoring were tested. Separate laboratory tests were not required to determine patients' metabolic values in the study, and the results of laboratory tests ordered by the endocrinologists at the clinic were used. For this reason, the metabolic data on some of the patients were incomplete. In the assessment of metabolic control monitoring, the values for good control and poor control of the World Health Organisation (WHO) and the American Diabetes Association (ADA) were used (ADA 2013, WHO 2013a). Thus, for preprandial blood sugar, 80-110 mg/dl was taken as good control and 111 mg/dl as poor control; for postprandial blood sugar, 80-140 mg/dl showed good control and 141 mg/dl poor control; HbA<sub>1C</sub> of 6.5 % and below indicated good control and 6.6% or above showed poor control; total cholesterol of below 200 mg/dl showed good control and 201 mg/dl and above poor control; HDL of over 40 mg/dl was good and below 39mg/dl was poor; triglyceride of below 150 mg/dl was good and above 151 mg/dl was poor; systolic blood pressure of below

140mmHg was good and above 141 mmHg was poor, and diastolic blood pressure of below 90 mmHg was good and above 91 mmHg was poor (ADA 2005). Also, patients' height and weight were measured in order to calculate their BMI. Patients' BMI was calculated according to the international obesity categories of the WHO (WHO 2013b). A BMI of between 18.5 and 24.9 kg/m<sup>3</sup> was considered normal, and one above 25 kg/m<sup>3</sup> was considered obese. Patients' conformity to diabetes treatment and diet was evaluated according to the statements given by the patients.

## Design

This was a cross-sectional and descriptive study. Patients attending the Endocrinology Department who gave their informed consent and agreed to take part in the study were taken to rooms in the clinic, and when they felt comfortable, the study, its purpose and the questionnaire forms were explained to them. The questionnaire forms were completed in twenty minutes by a researcher by using the face-to-face interview technique.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

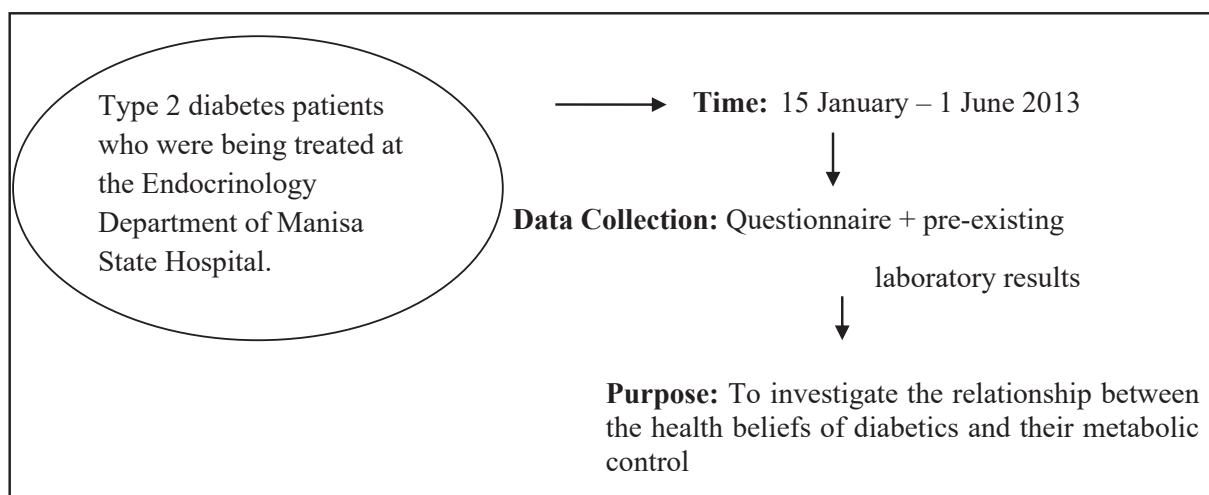
ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**Figure 1. Survey Research Design**



### **Ethical Considerations**

Before starting the research, approval was given by the Ethics Committee for Non-Invasive Research of the Medical Faculty of Celal Bayar University, and written permission was obtained from Manisa State Hospital. Patients who attended the Endocrinology Department were recruited into the study after giving their informed consent to take part.

### **Data Analysis**

The analysis of the research data was performed by using SPSS 15.00, using numeri-

cal and percentage distributions, Independent t-test for independent variables, variance analysis, ANOVA, and Mann Whitney U and Kruskal Wallis tests.

### **RESULTS**

The following results shows the identifying characteristics of the 200 diabetic patients who participated in the study. It was found that 69.5% of the patients were women, 53.5% were aged 59 or over, 80% were married, 7.0% were primary school graduates, 63.5% were not working, and 70% had an income equal to or more than expenses.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**Table 1. Distribution of Patients According to Illness-Related Characteristics**

Characteristics	n	%
<b>Duration of diabetes</b>		
1 year or less	28	14.0
2 - 9 years	77	38.5
10 years or more	95	47.5
<b>How was diabetes detected?</b>		
By measurement of blood sugar	28	14.0
After going for treatment for another illness	79	39.5
After going to the doctor with suspected diabetes	79	39.5
Other	14	7.0
<b>Diabetes in first-degree relatives</b>		
Yes	104	52.0
No	96	48.0
<b>Current type of diabetes treatment</b>		
Diet	12	6.0
Tablets	113	56.5
Insulin	75	37.5
<b>Conformity to diabetes treatment</b>		
Good	180	90.0
Poor	20	10.0
<b>Blood sugar monitoring</b>		
Yes	181	90.5
No	19	9.5
<b>Frequency of blood sugar monitoring (N=181)</b>		
Once a day	100	55.24
Once a week	31	17.12
Once a month	25	13.82
Other (when I don't feel well)	25	13.82
<b>Smoking</b>		
Yes	26	13.0
No / Stopped	174	87.0
<b>Conformity to diet (n=106)</b>		
Good	190	95.0
Poor	10	5.0



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

<b>Exercise</b>		
Yes	73	36.5
No	127	63.5
<b>Frequency of exercise (n=73)</b>		
Regularly every day	40	54.1
1-2 times a week	10	13.5
Irregularly	23	32.4
<b>Frequency of going to the doctor for diabetes check-up</b>		
I don't go to the doctor for check-up	19	9.5
1- 3 times a month	133	66.5
6 -12 times a month	48	24.0
<b>Hospitalization for diabetes within the past year</b>		
Yes	119	59.5
No	81	40.5
<b>Reason for hospitalization</b>		
Hypoglycemia (low blood sugar)	12	7.2
Hyperglycemia (hig blood sugar)	108	65.1
Starting insulin	11	6.6
Other chronic illnesses	34	21.1
Total	200	100.0

Table 1 shows the distributions of patients according to illness-related characteristics. According to their statements, it was seen that 47.5% of the patients had had diabetes for more than 10 years; 39.5% had come for treatment for another illness; 39.5% had been diagnosed after coming to the doctor with suspected diabetes; 52% had first-degree relatives with diabetes; 56.5% were currently taking tablets as diabetes treatment; 90.5% were monitoring blood sugar levels; 55.24% measured blood sugar every day; 87% did not smoke, and 63.5% did not take exercise. Also, 90% stated that their perception of conformity to diabetes treatment was good,

and 95% that their perception of conformity to diet was good, while 54.1% of those who took exercise stated that they took regular exercise every day. In addition, 66.5% of the patients stated that they had seen the doctor for a diabetes check-up once in the previous 1-3 months, 59.5% that they had been hospitalized because of diabetes in the past year, and 65.5% that the reason for hospitalization was hyperglycemia.





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International Refereed Academic Journal of Sports, Health and Medical Sciences

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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**Table 2. Distribution of Mean Scores on the Health Beliefs Model Scale and Patients' Mean Metabolic Control Values**

Subdimensions on the Health Beliefs Model Scale	Av $\pm$ SD	Min-Max
Perceived Sensitivity ( 4 items)	2.66 $\pm$ 0.83	1-5.00
Perceived Seriousness ( 3 items)	1.64 $\pm$ 0.77	1-5.00
Perceived benefits ( 7 items)	1.84 $\pm$ 0.62	1-3.86
Perceived obstacles ( 9 items)	1.89 $\pm$ 0.76	1-4.56
Health-related recommended activities (10 items)	1.67 $\pm$ 0.65	1-4.00
Metabolic Values	Av $\pm$ SD	Min - Max
Preprandial blood sugar (mg/dl)	148.29 $\pm$ 59.70	36 – 389
Postprandial blood sugar (mg/dl)	208.06 $\pm$ 76.61	66 – 450
HbA1c (%)	8.84 $\pm$ 2.63	5.06 – 14.69
Total cholesterol (mg/dl)	177.27 $\pm$ 37.68	97 – 255
HDL (mg/dl)	37.03 $\pm$ 9.80	20 – 65
Triglyceride (mg/dl)	212.15 $\pm$ 156.64	26 – 793
Blood pressure - systolic (mm/Hg)	119.32 $\pm$ 14.98	80 – 170
Blood pressure - diastolic (mm/Hg)	72.84 $\pm$ 9.73	50 – 90
BMI (Kg/m <sup>2</sup> )	28.75 $\pm$ 5.51	18 – 49

Table 2 shows the mean scores obtained by patients on the scale of the Health Belief Model (HBM). Mean scores were 2.66 $\pm$ 0.83 (min=1 max=5) for perceived sensitivity, 1.84 $\pm$ 0.62 (min=1 max=5.00) for perceived seriousness, 1.84 $\pm$ 0.62 (min=1 max=3.86) for perceived benefits, 1.89 $\pm$ 0.76 (min=1 max=4.56) for perceived obstacles, and 1.67 $\pm$ 0.65 (min=1 max=4) for health-related recommended activities.

An examination of the distribution of the mean values of patients' metabolic control showed that the mean preprandial blood sugar level was 148.29 $\pm$ 59.70 (min=36 max=389) mg/dl; mean postprandial blood sugar level was 208.06 $\pm$ 76.61 (min=66 max=450) mg/dl; mean HbA1c was 8.84 $\pm$ 2.63 (min=5,06 max=14,69) %; total cholesterol was 177.27 $\pm$ 37.68 (min= 97 max=255) mg/dl; mean HDL was 37.03 $\pm$ 9.80 (min=20 max=65) mg/dl; mean triglyceride was



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

212.15±156.64 (min= 26 max=793) mg/dl; mean systolic blood pressure was 119.32±14.98 (min= 80 max=170) mm/Hg; mean diastolic blood pressure was 72.84±9.73 (min= 50 max=90) mm/Hg; and mean BMI was 28.75±5.51 (min= 18 max=49) Kg/m<sup>2</sup> (Table 2).

**Table 3. Relationship between Various Patient Characteristics and Mean Scores on the Health Beliefs Model Scale**

Characteristic	n	Perceived Sensitivity	Perceived Seriousness	Perceived Benefits	Perceived Obstacles	Health-related Recommended Activities
<b>Age</b>		t= -0.294 p=0.769	t= -0.973 p=0.332	t=-0.757 P=0.450	t=-0.293 p=0.770	t=-1.350 p=0.179
58 years and below	93	2.64±0.78	1.58±0.74	1.81±0.58	1.87±0.76	1.60±0.63
59 years and above	107	2.67±0.87	1.69±0.80	1.87±0.66	1.90±0.75	1.72±0.66
<b>Sex</b>		t= -0.417 p=0.677	t= 1.060 p=0.290	t= 0.924 P=0.357	t=-0.252 p=0.801	t=-0.899 p=0.402
Female	139	2.64±0.82	1.68±0.82	1.87±0.63	1.88±0.72	1.64±0.63
Male	61	2.70±0.85	1.55±0.64	1.78±0.61	2.06±0.89	1.72±0.70
<b>Educational Status</b>		f=0.096 P=0.908	f=1.904 P=0.152	f=2.430 P=0.091	f=0.132 P=0.876	f=0.494 P=0.611
Illiterate / Literate	47	2.69±0.75	1.78±0.87	1.96±0.63	1.92±0.81	1.74±0.75
Primary school	140	2.66±0.85	1.62±0.75	1.83±0.60	1.87±0.74	1.65±0.62
Secondary school or above	13	2.57±0.90	1.33±0.49	1.54±0.50	1.95±0.74	1.56±0.57
<b>Work status</b>		t=-0.036 p=0.971	t=-1.028 p=0.305	t=-1.501 P=0.135	t=-0.220 p=0.826	t=1.084 p=0.280
Working	73	2.66±0.83	1.57±0.61	1.76±0.58	1.87±0.78	1.73±0.68
Not working	127	2.66±0.83	1.68±0.85	1.89±0.64	1.90±0.74	1.63±0.63
<b>Marital Status</b>		t= 0.488 p=0.626	t=-0.273 p=0.785	t=-1.107 P=0.199	t=-1.638 p=0.103	t=-0.200 p=0.842
Married	160	2.67±0.79	1.63±0.74	1.82±0.61	1.85±0.72	1.67±0.62
Single	40	2.60±0.98	1.67±0.89	1.94±0.66	2.06±0.89	1.65±0.76
<b>Duration of diabetes</b>		f= 0.255 p=0.858	f= 0.090 p=0.914	f= 0.756 p=0.520	f= 0.119 p=0.949	f= 2.116 p=0.930
1 year or less	28	2.66±0.95	2.11±1.51	1.91±0.73	1.92±0.81	1.69±0.55
2 - 9 years	77	2.76±0.78	1.53±0.59	1.88±0.52	1.83±0.72	1.82±0.53
10 years or more	95	2.63±0.83	1.67±0.79	1.93±0.60	1.91±0.77	1.78±0.79



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

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<b>Type of diabetes treatment</b>		$X^2=0.261$ $P=0.878$	$X^2=0.656$ $P=0.720$	$X^2=0.444$ $p=0.642$	$X^2=0.699$ $P=0.705$	$X^2=0.776$ $P=0.679$
	12	$2.58 \pm 0.70$	$1.75 \pm 1.13$	$1.57 \pm 0.45$	$1.82 \pm 0.71$	$1.57 \pm 0.50$
Diet	113	$2.64 \pm 0.80$	$1.61 \pm 0.74$	$1.81 \pm 0.60$	$1.88 \pm 0.78$	$1.68 \pm 0.60$
Tablets	75	$2.70 \pm 0.89$	$1.66 \pm 0.75$	$1.93 \pm 0.66$	$1.91 \pm 0.74$	$1.67 \pm 0.65$
Insulin						
<b>Perception of conformity to diabetes treatment</b>		$z=-0.463$ $p=0.643$	$z=-2.098$ $p=0.036^*$	$z=-0.224$ $P=0.823$	$z=-0.861$ $p=0.389$	$z=-0.453$ $p=0.650$
	180	$2.65 \pm 0.82$	$1.60 \pm 0.73$	$1.84 \pm 0.61$	$1.88 \pm 0.77$	$1.65 \pm 0.62$
Good	20	$2.73 \pm 0.76$	$2.05 \pm 1.00$	$1.91 \pm 0.75$	$1.96 \pm 0.59$	$1.85 \pm 0.89$
Poor						
<b>Perception of conformity to diet</b>		$z=-1.040$ $P=0.298$	$z=-2.099$ $P=0.036^*$	$z=-0.085$ $P=0.932$	$z=-0.813$ $P=0.416$	$z=-1.199$ $P=0.230$
	190	$2.64 \pm 0.82$	$1.59 \pm 0.68$	$1.84 \pm 0.61$	$1.88 \pm 0.77$	$1.65 \pm 0.64$
Good	10	$2.64 \pm 0.82$	$1.59 \pm 0.68$	$1.84 \pm 0.61$	$1.88 \pm 0.77$	$1.65 \pm 0.64$
Poor		$2.90 \pm 0.68$	$2.56 \pm 1.50$	$1.97 \pm 0.82$	$1.97 \pm 0.82$	$1.95 \pm 0.74$

### \*Mann Whitney U

Examining the relationship between the mean scores on subdimensions of the HBM scale and various patient characteristics, it was found that there was no significant relationship between the mean scores on the HBM subdimensions and patients' age sex, education level, income status, work status, marital status, duration of diabetes or type of diabetes treatment ( $p>0.005$ ) (Table 3).

The mean score of the subdimension of perceived seriousness on the HBM scale of pa-

tients in the study was significantly higher in patients whose perception of conformity to diabetes treatment was poor than in those who perceived it as high ( $z=-2.098$   $p=0.036^{**}$  Mann Whitney U). The mean score of the subdimension of perceived seriousness on the HBM scale was significantly higher in those whose perception of conformity to diet was poor than in those who perceived it as good ( $z=-2.099$   $P=0.036^{**}$  Mann Whitney U) (Table 3).



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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

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**Table 4. Relationships between Various Metabolic Values of Patients and the Health Beliefs Model Scale**

Metabolic Values	N	%	Perceived sensitivity	Perceived seriousness	Perceived benefits	Preceived obstacles	Health-related recommended activities
<b>Preprandial blood sugar (n= 200)</b>			t=-1.265 p=0.207	t=-0.363 p=0.717	t=-1.529 p=0.128	t=0.746 p=0.457	t=-0.765 p=0.445
Good control	56	28	2.54±0.81	1.61±0.83	1.95±0.70	1.95±0.88	1.61±0.57
Poor control	144	72	2.71±0.83	1.65±0.75	1.80±0.58	1.86±0.71	1.69±0.68
<b>Postprandial blood sugar (n= 200)</b>			t=-2.771 <b>p=0.006*</b>	t=-0.725 p=0.469	t=-1.219 p=0.224	t=1.324 p=0.187	t=-1.833 p=0.068
Good control	33	16.5	2.30±0.72	1.55±0.72	1.96±0.74	2.05±0.89	1.48±0.55
Poor control	167	83.5	2.73±0.83	1.66±0.78	1.82±0.59	1.86±0.73	1.70±0.66
<b>HbA1c (n= 42)</b>			z=-0.596 p=0.551	z=-0.166 p=0.868	z=-0.916 p=0.360	z=-0.533 p=0.594	z=-2.200 <b>p=0.034**</b>
Good control	10	23.8	2.52±0.59	1.66±0.70	2.04±0.46	2.12±0.45	1.99±0.47
Poor control	32	76.2	2.59±0.73	1.62±0.68	1.83±0.68	2.14±1.02	1.49±0.65
<b>BMI (n=107)</b>			X <sup>2</sup> =-2.043 <b>P=0.044**</b>	X <sup>2</sup> =-1.401 P=0.164	X <sup>2</sup> =0.605 P=0.547	X <sup>2</sup> =2.858** P=0.005	X <sup>2</sup> =0.137 P=0.891
Normal	17	16	2.33±0.79	1.41±0.67	1.96±0.70	2.26±1.17	1.67±0.73
Obese	90	84	2.76±0.78	1.64±0.61	1.87±0.54	1.74±0.57	1.65±0.54

\*t-test \*\* Mann Whitney U

In evaluating the relationship between the patients' metabolic values and their mean scores on the HBM scale, it was seen that the mean score on the perceived sensitivity subscale of the HBM scale was significantly higher in patients whose postprandial blood sugar level was at a poor level of control than in those whose blood sugar level was at a good level of control (t=-2.771 p=0.006\* t - test) (Table 4).

It was found that the perceived sensitivity mean score on the HBM scale was significantly higher in patients whose BMI was in the

obese category than in those whose BMI was normal (X<sup>2</sup>=-2.043 P=0.044\* t-test) (Table 4).

It was shown that the mean scores of the patients on the health-related recommended activities subscale of the HBM scale were significantly higher in patients whose HbA1c values were at a good level of control than in those in which it was at a poor level of control (z=-2.200 p=0.034\*\* Mann Whitney U test) (Table 4).

No significant relationship was found between other metabolic variables and the subdivisions of the scale (p>0.005) (Table 4).



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## DISCUSSION

In this study, which was conducted to investigate the effect of patients' health beliefs on their metabolic control, the mean age of patients was high and their mean education level was low. All the patients stated that they had received training from diabetes nurses and that they went to the doctor for diabetes checks. Most had had diabetes for more than two years, their preprandial and postprandial blood sugar levels and HbA1C were at a poor level of control, and most were obese according to their BMI. It is of interest that a majority of patients whose preprandial and postprandial blood sugar levels and HbA1C were at a poor level of control and who were mostly obese according to their BMI perceived their conformity to diabetes treatment and diet as good. Also, patients' health beliefs as measured on the HBM scale were at a negative level. As a result, it was thought that patients were in denial regarding their conformity to treatment because of their health beliefs, and that they had insufficient or mistaken information regarding diabetes.

Following this general evaluation, there will be a discussion of the variables among the mean scores on subscales of the HBM scale which were found to have a significant relationship.

The health beliefs of diabetic patients are considered to be a significant factor affecting their health behaviors. For this reason, health workers must know the beliefs and attitudes of patients in order to prevent complications caused by diabetes, to achieve conformity to treatment, and to be able to develop strategies for treatment (Şermet, 2012).

When patients' health beliefs were examined with the Diabetic Patients' Health Beliefs Model Scale, health beliefs scores on all subscales of the health scale (perceived sensitivity, perceived seriousness, perceived benefits, perceived obstacles and health-related recommended activities) were found to be at a negative level.

Kartal (2006) reported in a preliminary study on a planned training program for diabetic patients that mean health belief scores were negative, and Yandım (2011) reported that health beliefs were at a negative level in the two groups of patients – those with feet and those without – in a study of diabetics who were mostly over 40 years of age (Kartal 2006, Yandım 2011). In a study by Sermet (2012) it was reported that the mean health belief scores of a group of aged diabetic patients showed a negative health belief. Tan (2004), in a study investigating the health beliefs of diabetic patients in relation to their diabetes, found that these beliefs were negative, and Daniel (2002) found in a study monitoring diabetic training





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(TRADEMARK)

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that before intervention the health beliefs of diabetics in relation to their illness were negative (Daniel & Messer 2002, Tan 2004).

Although socio-demographic characteristics such as age, sex, educational level and income level have been evaluated as factors in variations in health beliefs in HBM, there are varying findings in the literature on the topic of the effect of socio-demographic characteristics on health beliefs in diabetic patients. Surit (2001), Johnson (2005), Hazavehei et al. (2007) and Şermet (2012) reported a relationship between patients' health beliefs with regard to diabetic care and treatment and individual characteristics, while in studies by Javanshir (2006), Vardar İnkaya and Karadağ (2011), Ratanasuwan et al. (2012), Mansour-Ghanaei et al. (2013) and Pourghaznein et al. (2013) and also in our study no relationship was found between the health beliefs of diabetics and age, sex, educational status, income status or work status. A significant relationship was found between the patients' mean scores on the subscale of perceived seriousness and conformity to diabetes treatment and diet ( $p < 0.005$ ). The mean score for perceived seriousness was higher in patients whose conformity to diabetes treatment and to diet was poor. These results differ considerably from those of other studies (Mshungane et al. 2012, Pourhigaznein et al. 2013), and was considered to be the opposite of the expected result.

Patients who are aware of their personal responsibilities and conform to the principles of treatment may get along well for years with their illness. At the same time, living for so long under the same discipline with a chronic illness like diabetes is very difficult. In this study, patients' conformity to diabetes treatment and conformity to diet were interrogated with two open-ended questions: 'How well do you conform to diabetes treatment?' and 'How well do you conform to your diet?' Although most patients answered both questions by saying that their conformity was good, the metabolic results did not support their statements. It is thought that patients who know that they must conform to treatment and diet but who do not will not report the truth on this topic but will give the answer which is expected of them, and this may have affected the results. When the patients' mean scores of perceived benefits were compared with their perception of conformity to diet and diabetes treatment, it was seen that this result was to a certain extent supported.

The mean score on the perceived sensitivity subscale of the HBM scale was higher in patients whose control of postprandial blood sugar was at a poor level of control than in those who had a good level of control, and there was a statistically significant relationship between them. Diabetes is a disease which both causes stress and is greatly affected by stress.





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Sensitive individuals experience greater pressure and stress (Kuloğlu et al., 2000). It has been reported that diabetics are at greater risk of psychosocial distress and depression than the general population (Peyrot & Rubin 1997, Anderson et al. 2001). Psychosocial distress and depression can have a negative effect on a diabetic's self-care, and may result in poor metabolic control (Ciechanowski et al., 2000). It was thought in this study that as a result of patients' use of negative coping skills, inability to control their eating habits had an adverse effect on their postprandial blood sugar levels. The fact that hyperglycemia was the most frequent among the reasons for hospitalization of patients in the study supports this. In particular, it was thought that social support from the family and health staff for patients with negative coping skills would support a tendency towards more positive coping skills.

The mean score on the subdimension of health-related recommended activities was higher in patients whose HbA1c values were at a good level of control than in those in whom control was at a poor level, and a significant relationship was found between them. This expected result is similar to the research findings of Skinner (2001), Daniel & Messer (2002) and Kartal (2006).

The mean score on the subdimension of perceived sensitivity was found to be higher in individuals whose BMI put them in the obese group than in those whose BMI was normal, and the relationship between them was significant. This is different from the results of studies by Swan (2010) and Zareban (2013). Obesity and a sedentary lifestyle are among the strong determinants of diabetes. The prevalence of diabetes in Turkey according to a study by TURDEP-II is 32% (Satman 2010). Obesity is an important risk factor for type 2 diabetes and 90% of type 2 diabetics are obese (ADA 2013). In the present study, 84.1% of patients were obese. It is thought that this value may have had an effect on the results.

## CONCLUSION

The conclusion of this study was that health beliefs were low in type 2 diabetes patients in a city in the west of Turkey who had a high mean age and a low education level, and whose metabolic values were at a poor level, and whose body mass index was high.

## LIMITATIONS

A limitation of this study was that the sample was small and was taken from only one centre. For this reason, the findings can only represent the research population.



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## REFERENCES

### **AMERICAN DIABETES ASSOCIATION –**

**ADA, (2005).** Diabetes management in correctional institutions Diabetes Care, 28 (1) pp. 53–60

### **AMERICAN DIABETES ASSOCIATION –**

**ADA, (2008).** Standards of medical care in diabetes-2008. Diabetes Care, 31(suppl 1), pp.5-11

### **AMERICAN DIABETES ASSOCIATION**

**– ADA, (2013).** Diagnosing Diabetes and Learning About Prediabetes, <http://www.diabetes.org/diabetes/basics/diagnosis/?loc=DropDownDB-diagnosis>, (accessed 5 January 2013).

### **ANDERSON, R.J., FREEDLAND, K.E.,**

**CLOUSE, R.E., LUSTMAN, P.J., (2001).** [The prevalence of comorbid depression in adults with diabetes: a meta-analysis](#). Diabetes Care. Jun;24(6):1069-78

### **AYELE, K., TESFA B., ABEBE, L., TILAHUN, T., GIRMA, E., (2012).**

Self Care Behavior among Patients with Diabetes in Harari, Eastern Ethiopia: The Health Belief Model Perspective. PLoS ONE, April, Volume 7, Issue 4, e35515

### **CAPPELLE, M., (2010).**

Type 2 diabetes mellitus beliefs and experiences, University of Wisconsin Oshkosh Oshkosh, Wisconsin 54901-8621, Master of Science in

Nursing, Family Nurse Practitioner, January, p:1-77

### **CLARKE, P., GRAY, A., HOLMAN, R.,**

**(2002).** Estimating utility values for health states of type 2 diabetic patients using the EQ-5D (UKPDS 62). Med Decis Making 22:340–349

### **ÇELİK, S.G., (2002).**

Tip 2 diyabetli hastaların bakıma ve tedaviye yönelik tutumlarının ve iyilik hallerinin belirlenmesi [Determination of attitudes to diabetes care and well-being of patients with type 2 diabetes]. (Unpublished master's dissertation), İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, Yüksek Lisans Tezi, İstanbul, Türkiye (University Health Sciences Institute. Medical Nursing Department. Master Thesis. Istanbul, Turkey)

### **CIECHANOWSKI, P.S., KATON, W.J.,**

**RUSO, J.E., (2000).** Depression and diabetes: impact of depressive symptoms on adherence, function, and costs. Arch Intern Med. Nov 27;160(21):3278-85

### **DANIEL, M., MESSER, L.C., (2002).**

Perception of Disease Severity and Barriers to Self Care Predict Glycemic Control in Aboriginal Persons With Type 2 Diabetes Mellitus, Chronic Diseases in Canada, Vol,23 ( 4), 130-128



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(TRADEMARK)

(2015/04315- 2015-GE-18972)

- GRAZIANI, C., ROSENTHAL, P.M., DIAMOND, J.J., (1999).** Diabetes Education Program Use and Patient –Perceived Barriers to Attendance. *Fam Med*; 31(5):358-63
- HAZAVEHEI, S.M.M., SHARIFIRAD, G., MOHABI, S., (2007).** The effect of educational program based on health belief model on diabetic foot care, *7; 27 (1):23-28*
- JAHANLOU, A.S., LOTFIZAD, M., KARAM, I N.A., (2013).** A New Behavioral Model (Health Belief Model Combined with Two Fear Models): Design, Evaluation and Path Analysis of the Role of Variables in Maintaining Behavior, licensee InTech. *Diabetes Mellitus – Insights and Perspectives*, Chapter 16, p: 297-312
- JAVANSHIR, M., (2006)** Tip 1 ve Tip 2 diyabetli hastaların tutumlarının değerlendirilmesi. [Evaluation of the Attitudes of Type 1 and Type 2 Diabetic Patients] (Unpublished master's dissertation), İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, Yüksek Lisans Tezi, İstanbul, Türkiye (Istanbul University Health Sciences Institute. Medical Nursing Department. Master Thesis. Istanbul, Turkey.)
- JIROJWONG, S., MACLENNAN, R., (2003).** Health beliefs, perceived self-efficacy, and breast self-examination among Thai migrants in Brisbane. *Journal of Advanced Nursing*. 41:241–249
- JOHNSON, C., WHETSTANE, W.R., (2005).** Assessing Transcultural Attitudes Towards Diabetes in Trinidad. *Journal of National Black Nurses' Association*. Dec;16(2):15-9
- KARACA, S.S., (2006).** Tip 2 diyabetes mellitus hastalarına verilen planlı eğitimin hastaların tutumlarına, iyilik hallerine ve metabolik kontrol değişkenlerine etkisi [The effect of planned education given to the patients with type 2 diabetes mellitus on the attitudes, well-being and metabolic control variations of patients] Atatürk Üniversitesi Sağlık Bilimleri Enstitüsü, İç Hastalıkları Hemşireliği Anabilim Dalı, Erzurum, Türkiye (Erzurum University Health Sciences Institute. Medical Nursing Department. Doctorate Thesis. Erzurum, Turkey).
- KARTAL, A., (2006).** Diyabetli Hastalarda Planlı Eğitim Programının Sağlık İnançına Ve Diyabet Yönetimine Etkisinin İncelenmesi [Effectiveness of A Planned Education Program on Health Belief and Diabetes Management of Patients With Diabetes] Ege Üniversitesi Sağlık Bilim-



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(TRADEMARK)

(2015/04315- 2015-GE-18972)

leri Enstitüsü, Doktora Tezi, İzmir, Türkiye (Ege University Health Sciences Institute. Public Health Nursing Department. Doctorate Thesis. İzmir, Turkey)

**KARTAL, A., ÖZSOY, S., (2007).** Validity and reliability study of the Turkish version of Health Belief Model Scale in diabetic patients. International Journal of Nursing Studies, 44 (8): 1447 – 1458

**KESKIN, Ö., BALCI, B., (2011).** Diabetes Mellitus ve Kardiyovasküler Komplikasyonlar (Diabetes Mellitus and Cardiovascular Complications), Kafkas J Med Sci 2011; 1(2):81–85

**KULOĞLU, M., KARAOĞLU, A., ATMACA, M., ÖZKAN, Y.A., TEZCAN, E., (2000).** Tip II Diabetik Hastalarda Psikiyatrik Belirtiler ve Kan Şekeri Kontrolü (Blood Sugar Control and Psychiatric Symptoms in Patients with Type II Diabetic), Düşünen Adam (The Thinker: Journal of Psychiatry and Neurological Sciences), 13 (1):19-23

**MANSOUR-GHANAEL, R., JOUKAR, F., SOATI, F., GHANBARI, KHANEGHA, A., (2013).** Association between knowledge, locus of control and health belief with self-management, Hb A1c level and number of attendances in type 1 diabetes mellitus patients. Int J Clin Exp

Med;6(6):470-477, [www.ijcem.com](http://www.ijcem.com) / ISSN:1940-5901/IJCEM1303024

**MSHUNQANE, N., STEWART, A.V., ROTHBERG, A.D., (2012).** Type 2 diabetes management: Patient knowledge and health care team perceptions, South Africa. Afr J Prm Health Care Fam Med. 4(1), Art. 392, 7 pages. <http://dx.doi.org/10.4102/phcfm.v4i1.392>

**PEYROT, M., RUBIN, R.R. (1997).** Levels and risks of depression and anxiety symptomatology among diabetic adults. Diabetes Care. Apr;20(4):585-90

**POURGHAZNEIN, T., GHAFARI, F., HASANZADEH, F., CHAMANZARI, H., (2013).** The relationship between health beliefs and medication adherence in patients with type 2 diabetes: A correlation-cross sectional study. Life Science Journal, 10(4s).

**RATANASUWAN, T., INDHARAPAKDI, S., PROMRERK, R., KOMOLVIPHAT, T., THANAMAI, Y., (2005).** Health belief model about diabetes mellitus in Thailand: the culture consensus analysis. J Med Assoc Thai. 88:623–31

**SATMAN, İ., (2010).** Türkiye Diyabet, Hipertansiyon, Obezite ve Endokrinolojik Hastalıklar Prevalans Çalışması-II, 2010 (TURDEP-II) [Turkey Diabetes, Hyper-



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

tension, Obesity and Endocrinology Diseases Prevalence Study-II, 2010]. [http://www.itf.istanbul.edu.tr/attachments/021\\_turdep.2.sonuclarinin.aciklamasi.pdf](http://www.itf.istanbul.edu.tr/attachments/021_turdep.2.sonuclarinin.aciklamasi.pdf) , (accessed 10 November 2013)

**SERMET, Ş., (2012).** Diyabetli Yaşlıların Diyabetin Bakım Ve Tedavisine Yönelik Sağlık İnançları [Health Beliefs of Elders with Diabetes About Care and Treatment of Diabetes]. Gazi Üniversitesi , Sağlık Bilimleri Enstitüsü, Yüksek Lisans Tezi. Ankara, Türkiye (Gazi University Health Sciences Institute. Nursing Department. Master Thesis. Ankara, Turkey)

**SKINNER, T.C., HAMPSON, S.E., (2001).** Personal Models of Diabetes in Relation to Self Care, Well Being, and Glycemic Control, *Diabetes Care*, 24, 828-833

**SURIT, P., (2001).** Health Beliefs, Social Support and Self Care Behaviors of Older, Thai Persons With Non Insulin Dependent Diabetes Mellitus, A Dissertation Submitted to The Faculty of the School Nursing, The Catholic University of America, Doctor of Nursing Science

**SWAN, H., (2010).** Knowledge, Beliefs, and Practices of Hispanic Type 2 Diabetics in South Philadelphia, Capstone Project, July, Masters of Public Health, Jefferson School of Population Health, Thomas Jefferson University

**TAN, M.Y., (2004).** The relationship of health beliefs and complication prevention behaviors of chinese individuals with type 2 diabetes mellitus. *Diabetes Research and Clinical Practice* , 66 (1): 71- 77

**TÜRKİYE ENDOKRİNOLOJİ VE METABOLİZMA DERNEĞİ - TEMD, (2013).** Diabetes Mellitus Ve Komplikasyonlarının Tani, Tedavi Ve İzlem Kılavuzu 2013 - Guide follow and treatment Diagnosis of Diabetes Mellitus and its complications], ISBN 978-605-4011-16-2, 6.Baskı (The sixth edition) , BAYT Bilimsel Araştırmalar Basın Yayın ve Tanıtım Ltd. Şti. (company of Scientific Research Press Release and Promotion) May 2013 / Ankara, Turkey p:1-254

**VARDAR, İ. B., KARADAĞ, E., (2011).** Tip 2 Diyabetli Bireylerin Hastalıkları ve Tedavilerine Yönelik Tutumlarını Etkileyen Faktörler [Factors Affecting the Attitudes Diseases and Treatment of Individuals with Type 2 Diabetes]. *Diyabet, Obezite ve Hipertansiyon Hemşirelik Formu Dergisi*, Ocak-Haziran (Diabetes, Obesity and Hypertension Journal of Nursing Form January-June), 3 (1):1-8

**WHO - WORLD HEALTH ORGANISATION, (2013a).** Diabetes, <http://www.who.int/mediacentre/factsheets/fs312/en/index.html>, (accessed 5 November 2013)





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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: E12 ID:292 K:371

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

**WHO - WORLD HEALTH ORGANISATION, (2013b).** *Obesity and overweight*, Fact sheet no. 311, available [online] <http://www.who.int/mediacentre/factsheets/fs311/en/index.html>. (accessed 5 November 2013)

**YANDIM, A., (2011).** *Diyabetik Ayağı Olan ve Olmayan Diyabetes Mellituslu Hastaların Sağlık İnançları [Health Beliefs of Patients with Diabetes Mellitus of Diabetic Foot And Non Diabetic Foot]*. Yayınlanmamış yüksek lisans tezi (Unpublished master's dissertation), Mersin Üniversitesi Sağlık

Bilimleri Enstitüsü, Hemşirelik Bölümü, Yüksek Lisans Tezi, Mersin, Türkiye (Mersin University Health Sciences Institute. Medical Nursing Department. Master Thesis. Mersin, Turkey.)

**ZAREBAN, I., NIKNAMI, S., HIDARNIA, A., RAKHSHANI, F., KARIMY, M., SHAMSI, M., (2013).** *The Effect of Education Program Based on Health Belief Model on Decreasing Blood Sugar Levels in Diabetic Type 2 Patients in Zahedan, Health Scope. Summer; 2(2): 73-8*



## 8 HAFTALIK REKREATİF BADMİNTON ANTRENMANININ KADIN ÖĞRENCİLERİN YAŞAM KALİTESİNE ETKİSİ <sup>1</sup>

### THE EFFECT OF 8-WEEK RECREATIVE BADMINTON TRAININGS ON THE LIFE QUALITY OF FEMALE STUDENTS

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**Öz:** Bu çalışmanın amacı; rekreatif Badminton etkinliklerinin kadın üniversite öğrencilerinin yaşam kalitesi üzerine etkisinin araştırılmasıdır. Bu araştırma, kontrol gruplu deneysel bir çalışmadır. Çalışmaya 18 ile 29 yaş grubu, Batman Üniversitesi'nde okuyan ve spor yapmayan 42 katılımcının verileri değerlendirmeye alınmıştır. Katılımcıların 21'i araştırma grubu ve 21'i de kontrol grubunu oluşturmuştur. Araştırma grubunda 8 hafta, haftada 3 gün ve günde 60 dakika kurallı Badminton oyunu uygulandı. Yaşam kalitesini belirlemek için de, egzersiz öncesi ve egzersiz sonrası tüm katılımcılara Short Form 36 (SF-36) uygulandı. Çalışmamızda; literatür ile kısmen uyumlu olarak, araştırma grubunda egzersiz sonrası BKİ değerleri, egzersiz öncesi değerlerine göre anlamlı azalma gösterdi. Araştırma grubunda; Role-Physical (ön test 66,7 ve son test 78,6) General Health (ön test 63,9 ve son test 70,7) ve Mental Health (ön test 65,7 ve son test 70,7) yönünden, antrenman sonrası veriler antrenman öncesi verilere göre önemli artış gösterdi. Diğer yaşam kalitesi alt gruplarında herhangi bir farklılık görülmedi. Rekreatif spor etkinliklerinin yaşam kalitesi üzerindeki etkisinin daha belirgin olarak görülmesi için, etkinliğin 8 haftadan daha uzun sürdürülmesi önerilir.

**Anahtar Kelimeler:** Rekreatif Badminton, Spor, Yaşam Kalitesi, Yetişkin Kadın

**Abstract:** The objective of this study is to research the effect of recreative Badminton activities on the life quality of female university students. This research is an experimental study with a control group. The data of 42 participants between the ages of 18 and 29 who study at Batman University and don't exercise was included the study. Among the participants, 21 constituted the research group while 21 of them were the control group. In the research group, regular Badminton game was applied for 8 weeks, 3 days a week and 60 minutes a day. In order to determine the life quality, all the participants were applied Short Form 36 (SF-36) prior and after exercising. Partly in line with the literature, the Body Mass Index (BMI) values after the exercises were found to be significantly lower in our study than that of prior to the exercising in the research group. In the research group, the post exercise data showed more significant increase than that of pre exercise period from the point of Role-Physical (Pre-Test 66,7 and Post-Test 78,6) General Health (Pre-Test 63,9 and Post-Test 70,7) and Mental Health (Pre-Test 65,7 and Post-Test 70,7). In the other sub-groups of life quality, no difference was observed. In order to express the effect of recreative sport activities on life quality more clearly, it is suggested to prolong the activity more than 8 weeks. The Badminton sport which easily learned and applied as a recreative activity is thought to be useful for the participation to the physical activities especially among the students at the school age and in the maintenance of the activity and this will positively affect the life quality.

**Key Words:** Adult Female, Life Quality, Recreative Badminton, Sport

*Doi: 10.17363/SSTB.20162022362*

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SSTB

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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: A2-L83-L84 ID:293 K:93

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## INTRODUCTION

The life quality is defined as the integrity of the processes such as subjective perception, emotions and cognition which is based on the self-evaluation of the individual for his own life while it is the expression of individual wellness status and consists of satisfaction expressions of the individuals about the various aspects of the life (Berterö, 2003). Researches were conducted on numerous working groups related to the life quality and at the end of the researches; the factors related to life quality were recorded as age, the history of disease, economic level, working time, the number of children, education level, marital status and physical activities (Brundtland, 2001; Kuan-Lang et al., 2005; Li et al., 2009; Kırgız et al., 2014).

There are numerous studies related to the positive effect of participating free time activities, especially active participation to them (Caldwell, 1992). It is expressed in the studies that the increase in sportive activities contributes to the self-improvement and making spiritually healthy individuals (Passmore and French, 2001). The World Health Organization estimated that the mental health disorders in the form of depression and anxiety which is gradually affecting more and more people will become one of the reasons threatening the life quality in 2020's (Brundtland, 2001). Nevertheless, regular exercising was determined to

be the most effective and economic method in the developed and developing countries (Ersoy, 2004).

The complicated and exhausting exercise programs prevent the continuity of the exercises. Through new tendencies, entertaining programs and dances were added to the exercises and some activities such as water activities, yoga, and tha chi and some themes such as fire brigade, detective, commando, superman etc. were also included. One of the alternative sports is Badminton because its equipment's can be obtained easily and cheaply, it is not limited to children and it can be played at every age and it is conducted to satisfy the need of individuals for community health care and activity. It draws great attention since it doesn't employ violence and it is enjoyable to watch. Since it belongs to the family of tennis game, there is a net between the players; thus, everybody plays in a field allocated for him and its ball (shuttlecock) is rather harmless. For that reason, it is one of the activities with the lowest risk of injuries or mutilation (Wikipedia, 2014). The Badminton sport is an Olympic game which requires moving fast; highly alactic anaerobic and slightly lactic anaerobic and aerobic metabolism is on charge since it takes much time (Cabello and Gonzalez, 2003).



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: A2-L83-L84 ID:293 K:93

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## MATERIAL and METHODS

### Participants

This research is an experimental study with control group. 50 sedentary female university students between the ages of 18 and 29, studying at Batman University and who don't play any sports participated to the study. The participants were randomly divided into two groups with 25 members each. However, the data of research (Badminton) group with 21 members and control group with 21 members with a total of 42 participants was evaluated after those who don't attend the trainings and miss the final measurements are excluded. All the participants declared that they hadn't any permanent diseases. Before the measurements and training practices are conducted, all the participants filled and signed the "Informative Voluntary Consent Form".

### Pre-Test and Post-Test Measurements

All the participants were applied Pre-Test measurements 2 days before starting the trainings, the participants filled the personal information form and Short Form 36 (SF-36). Two days after the Badminton trainings of 8 weeks, the Post-Test measurements were made and the participants filled SF-36. The linear measurement was conducted through milimetric height the scale while the weight was measured through an electronic bascule and recorded in kg.

### Short Form 36 (SF-36)

In order to determine the life quality, the SF-36 questionnaire form which consists of 36 questions was applied. (Ware and Sherbourne, 1992). The activities for reliability and validity of the Turkish version of SF-36 were conducted by Koçyiğit et al. (1999). The questionnaire scorings, the questionnaire data were obtained through accessing the related internet pages. The results were recorded in 8 sub-groups (Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional, and Mental Health) and 2 abstract scores (Physical Health Summary and Mental Health Summary) (Sf-36.org, 2014).

### Recreative Badminton Training

The training activity were conducted for 3 days a week and for 8 weeks. The trainings were executed in the form of active technical training for the first 4 weeks and the final 4 weeks were spent on reciprocal match games. Each technique which is taught was consolidated through reciprocal activities and was made entertaining through games and setting goals. The matching activities were executed through matching all the sportswomen with each other by turns. Prior to the training, warm up for 10 minutes, main practice for 60 minutes and 5 minutes of cooling exercises



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: A2-L83-L84 ID:293 K:93

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

were conducted. Extreme fatigue wasn't allowed in the training activities.

### Statistical Analysis

During the intra-group comparison of the Pre-Test and Post-Test, paired samples t-test was employed while independent samples-test was used for the intergroup comparisons. In the tests, the value  $P < 0,05$  was accepted statistically significant. In the statistical table,

the arithmetical averages of the data of the groups, their standard deviations, t-test and P values were given.

### FINDINGS

It was found that there was no statistical difference between the averages of age in the groups (research group  $20,76 \pm 2,90$  and control group  $20,95 \pm 3,29$ ) ( $P > 0,05$ ).

**Table 1. Comparison of the data of Pre-Test and Post-Test related to the Body Mass Index (BMI) and Life Quality Levels of Badminton (research) Group and Control Group**

Variants		Badminton Group $\bar{X} \pm Sd$	Control Group $\bar{X} \pm Sd$	t-test / P-value
BMI (kg/m <sup>2</sup> )	Pre-Test	23,9 $\pm$ 3,7	23,0 $\pm$ 2,7	,919/,364
	Post-Test	23,5 $\pm$ 3,4	23,2 $\pm$ 2,8	,259/,797
	t-test / P-value	4,638 / ,000**	-2,977 / ,009**	-
Physical Functioning	Pre-Test	82,1 $\pm$ 14,4	80,0 $\pm$ 22,4	,369/,714
	Post-Test	84,8 $\pm$ 13,1	78,3 $\pm$ 18,9	1,280/,208
	t-test / P-value	-,879 / ,390	,791 / ,438	-
Role-Physical	Pre-Test	66,7 $\pm$ 24,2	65,5 $\pm$ 34,9	,129/,898
	Post-Test	78,6 $\pm$ 19,8	57,1 $\pm$ 39,6	2,216/,032*
	t-test / P-value	-2,351 / ,029*	1,581 / ,130	-
Bodily Pain	Pre-Test	69,4 $\pm$ 18,4	64,6 $\pm$ 20,4	,801/,428
	Post-Test	73,3 $\pm$ 20,0	63,5 $\pm$ 22,8	1,475/,148
	t-test / P-value	-1,200 / ,244	,317 / ,755	-
General Health	Pre-Test	63,9 $\pm$ 16,0	69,1 $\pm$ 18,2	-,981/,332
	Post-Test	70,7 $\pm$ 17,0	65,3 $\pm$ 20,1	,937/,354
	t-test / P-value	-2,099 / ,049*	1,427 / ,169	-



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International Refereed Academic Journal of Sports, Health and Medical Sciences

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<b>Vitality</b>	Pre-Test	66,4±19,1	52,9±20,8	2,200/,034
	Post-Test	71,0±18,0	51,0±22,0	<b>3,224/,003*</b>
	<b>t-test / P-value</b>	-1,914 / ,070	1,191 / ,248	-
<b>Social Functioning</b>	Pre-Test	70,8±21,0	59,5±24,3	1,611/,115
	Post-Test	70,8±19,9	61,3±23,4	1,423/,163
	<b>t-test / P-value</b>	,000 / 1,000	-,826 / ,419	-
<b>Role-Emotional</b>	Pre-Test	55,6±40,0	46,0±38,7	,785/,437
	Post-Test	60,3±38,9	44,5±38,5	1,329/,191
	<b>t-test / P-value</b>	-,679 / ,505	,566 / ,578	-
<b>Mental Health</b>	Pre-Test	65,7±13,8	54,1±17,8	2,367/,023
	Post-Test	70,7±12,4	54,3±19,0	<b>3,313/,002**</b>
	<b>t-test / P-value</b>	<b>-2,210 / ,039*</b>	-,116 / ,909	-
<b>Physical Health Summary</b>	Pre-Test	48,9±5,83	50,2±6,5	-,683/,499
	Post-Test	51,2±6,0	48,5±7,0	1,350/,185
	<b>t-test / P-value</b>	-1,890 / ,073	1,386 / ,181	-
<b>Mental Health Summary</b>	Pre-Test	44,3±8,8	37,5±12,0	2,117/,041
	Post-Test	45,9±7,0	37,8±11,7	<b>2,703/,010*</b>
	<b>t-test / P-value</b>	-1,075 / ,295	-,504 / ,620	-

\*: P<0,05 \*\*: P<0,01 it expresses the significance of the Pre-Test/Post-Test averages between the group in the same line and intra-groups in the same column.

When the Table 1 is analyzed, it was determined in both Pre-Test and Post-Test measurements that there was no statistical difference between Badminton group and control group from the point of BMI and life quality sub-groups (P>0,05). Moreover, no statistical difference was obtained between the Post-

Test data of Badminton group and the control group from the point of BMI (P>0,05).

In the comparison of the Pre-Test data and Post-Test data of Badminton group (intra-group), a significant decrease was observed in BMI values (P<0,01). In the comparison of the Pre-Test data and Post-Test data of Control group (intergroup), there was a significant increase in BMI values (P<0,05).

In the Badminton group, the data for the post-exercise from the point of Role-Physical (Pre-Test 66,7 and Post-Test 78,6) General





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International Refereed Academic Journal of Sports, Health and Medical Sciences

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ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

Health (Pre-Test 63,9 and Post-Test 70,7) and Mental Health (Pre-Test 65,7 and Post-Test 70,7) was found higher than the data of pre-exercise period ( $P<0,05$ ). In the control group no difference was obtained between the data of Pre-Test and that of Post-Test from the point of sub-groups of life quality ( $P>0,05$ ).

Moreover, the intergroup Post-Test data was analyzed. The Role-Physical values of Badminton group was found higher than the sedentary group (78,6 and 57,1 respectively) ( $P<0,05$ ). According to the Vitality variant, the values of Badminton group was found higher than the sedentary group (71,0 and 51,0) ( $P<0,05$ ). According to the Mental Health variant, the values of the Badminton group was found higher than the sedentary group (70,7 and 54,3) ( $P<0,01$ ). According to the Physical Health Summary variant, no statistical difference was found between the groups ( $P>0,05$ ) while the values of Badminton group was found higher than the sedentary group according to the variant of Mental Health Summary (45,9 and 37,8) ( $P<0,05$ ).

## DISCUSSION

In the research conducted on randomly chosen 131 males and females, the subjects were divided into two groups such as experimental group and control group and it was recorded after the exercise program of 16 months after the executed Pre-Tests that the BMI values in

exercise group decreased. Without conducting a dietary program, the moderate physical activities planned as 150-250 minutes a week prevents the increase of body weight in most adults and even may lead to decreases in body weight. However, achieving more weight requires increasing the duration of moderate exercises (Donelley et al., 2003).

In line with the information above obtained from our study, the BMI values of research group after the exercises showed a significant decrease when compared to the values before the exercises. However, the lacking of differences between the research group and control group reminds us that the exercises period of 8 weeks is not sufficient.

University students reported that there was a positive relationship between exercises and life quality (Li et al., 2009). In a research which the life quality of the adult sportsmen and sedentary are compared, physical health scores of the sportsmen and their mental health scores were found 53,2 and 49,6, respectively, while physical health scores of the nonathletic individuals and their mental health scores were found as 53,3 and 46,6 (Snyder et al., 2010). In New Zealand, the average scores of the participants as a result of life quality scale which was applied to the general population over the age of 15 is as follows; Physical Functioning 86, Physical Role 80,7, Pain 77,9, General Health Percep-





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(TRADEMARK)

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tion, 73,8, Vitality 65,6, Social Functioning 86,6, Mental Role 85, and Mental Health, 78. In the study, all the parameters except General Health Perception employ higher scores for males (Scott et al., 1999). In a research conducted on adults in Columbia, the relationships between physical activities of individuals and their life quality was analyzed and a positive relationship was observed only between walking physical activities and the life quality (Blacklock et al., 2007). In a research conducted on white-collar in Turkey, the relationships between physical activities of individuals and their life quality was analyzed and no relationship was observed between physical activities and the life quality (Vural et al., 2010).

Partly in line with the data of research above, following results were obtained in our study; Role-Physical (Pre-Test 66,7 and Post-Test 78,6) General Health (Pre-Test 63,9 and Post-Test 70,7) and Mental Health (Pre-Test 65,7 and Post-Test 70,7). Accordingly, the data for the post-training period was found higher than that of pre-training period. The intergroup data of Post-Test period is compared; the values of Badminton group were found higher than the control group from the point of the variants of Role-Physical, Vitality and Mental Health. When the abstract scores of Short Form 36 test is analyzed, no statistical difference was found between the groups

from the point of Physical Health Summary variant while the values of Badminton group were found higher than those of control group from the point of the Mental Health Summary variant.

## CONCLUSION

When the results of our study is analyzed in whole, it can be stated that recreative Badminton sport has positive effects on mental health elements rather than physical health elements. However, it can be concluded that training of 8 weeks isn't enough for exercising to provide significant changes and the exercises with longer periods can yield to better results.

The Badminton sport which can be easily learned and applied as a recreative activity is thought to be useful especially for students in the school ages for their participation to the regular exercises and sustaining the activity.

Moreover, it is assumed that the data obtained in the study will constitute a scientific basis for the comparison of the weight levels and healthy life quality levels of sedentary group and adult females executing physical activities and will provide contribution to the literature of sports and health.



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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: A2-L83-L84 ID:293 K:93

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(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

## REFERENCES

**BERTERÖ, C., (2003).** What do women think about menopause? A qualitative study of women's expectations, apprehensions and knowledge about the climacteric period. *International Nursing Review*, 50(2): 109

**BRUNDTLAND, G.H., (2001).** WHO and ministers of health forge an alliance on mental health. in: *Mental health. Ministerial round tables, 54th World Health Assembly, Geneva*, pp. 6

**KUAN-LANG, L, RONG-JYE, T., BING-LONG, W., et al., (2005).** Health related quality of life and health utility for the institutional elderly in Taiwan. *Qual Life Res*, 14:1169-80

**LI, G.S.F., LU, F.J.H., WANG, A.H.H., (2009).** Exploring the relationships of physical activity, emotional intelligence and health in taiwan college students. *Journal of Exercise Science & Fitness*, 7(1): 55-63

**KIRGIZ, C., ŞENEL, Ö., SEVER, O., ARSLANOĞLU, E., (2014).** Investigation of quality of life of teaching staffs in physical education and sport department. *e-Kafkas Journal of Educational Research*, 1(1): 26-31

**CALDWELL, L., SMITH, E., WEISSENGER, E., (1992).** The Relationship of Leisure Activities and Perceived Health of College Students. *Society and Leisure*, 15(2): 545-56

**PASSMORE, A., FRENCH, D., (2001).** Development and administration of a measure to assess adolescents' participation. *Adolescence Spring*, 36(141): 67-75

**ERSOY, G., (2004).** Egzersiz ve Spor Yapanlar İçin Beslenme. Üçüncü Baskı, Nobel, Ankara [In Turkish]

**WIKIPEDIA, (2014).** Badminton on WIKIPEDIA. [Online]. Available: <http://tr.wikipedia.org/wiki/Badminton>. Date of Access: 16.12.2014

**CABELLO MANRIQUE, D., GONZALEZ BADILLO, J.J., (2003).** Analysis of the characteristics of competitive badminton. *Br J Sports Med*, 37(1): 62-6

**WARE, J.E., SHERBOURNE, C.D., (1992).** The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*, 30(6): 473-483

**KOÇYİĞİT, H, AYDEMİR, Ö, FİİEK, G, ÖLMEZ, N., MEMİŞ, A., (1999).** Kısa form-36 (KF-36)'nın Türkçe versiyonunun güvenilirliği ve geçerliliği. *İlaç ve Tedavi Dergisi*, 12: 102-106 [In Turkish]



SSTB

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International Refereed Academic Journal of Sports, Health and Medical Sciences

July / August / September Summer Issue: 20 Year: 2016

GEL CODE: A2-L83-L84 ID:293 K:93

ISSN Print: 2146-8508 Online 2147-1711

(ISO 9001-2008 Document No: 12879 & ISO 14001-2004 Document No: 12880)

(TRADEMARK)

(2015/04315- 2015-GE-18972)

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**SF-36.ORG, (2014).** Sf-36 on sf-36.org. [Online]. Available: <http://www.sf36.org/cgi-bin/demos/report.cgi>. Date of Access: 16.12.2014

**DONNELLY, J.E., et al., (2003).** *Effects of a 16-month randomized controlled exercise trial on body weight and composition in young, overweight men and women: the Midwest Exercise Trial.* Arch Intern Med, 163(10): 1343-1350

**SNYDER, R.A., et al., (2010).** Health-related quality of life differs between adolescent athletes and adolescent nonathletes. J Sport Rehabil 19: 237-48

**SCOTT, M., TOBIAS, I., SARFATI, D., (1999).** SF-36 health survey reliability, validity and norms for New Zealand. Aust N Z J Public Health, 4: 401-6

**BLACKLOCK, R.E., RHODES, R.E., BROWN, S.G., (2007).** Relationship between regular walking, physical activity, and health-related quality of life. Journal of Physical Activity and Health, 4: 138-52

**VURAL, Ö., ELER, S., ATALAY G.N., (2010).** The relation of physical activity level and life quality at sedentary profession. Spormetre Journal of Physical Education and Sports, 8(2): 69-75

**Author's Note:** This article was presented orally at the International Human and Nature Sciences: Problems and Solution Seeking Congress (7-9 October 2016 / Bosnia / Sarajevo).

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Table 1. ....results.

Variable / Group

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Xort.

Ss

F / t

p

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