Available online at www.sciencedirect.com

SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 46 (2012) 1581 – 1586

Procedia
Social and Behavioral Sciences

WCES 2012

Investigation of physical activity levels by gender and residential areas: a case study on students in Akdeniz University

Yeliz Ozdol [a] *, M. Kamil Ozer [b] , Salih Pinar [c] , Emel Cetin [d]

[a] *Akdeniz University. School of Physical Education and Sport. Antalya.*
[b] *Çanakkale Onsekiz Mart University. School of Physical Education and Sport. Çanakkale*
[c] *Marmara University. School of Physical Education and Sport. İstanbul.*
[d] *Akdeniz University. School of Physical Education and Sport. Antalya.*

Abstract

Problem Statement: The promotion of a healthy lifestyle is the main goal of physical education in many countries. However, very little is known about the relationship between different residential areas and physical activity patterns among young people. **Purpose of Study:** To compare the physical activity levels (PAL) of university student in accordance with gender (male, n=250; female, n=200) and residential areas (in campus; n=196 and out of campus; n=254). **Methods:** This study included a total of 450 voluntary healthy subjects (21.04±1.61 years old) from two different residential areas. PAL's of students were evaluated by using the long form International Physical Activity Questionnaires. BMI was computed as kg/m^2. Data from the questionnaires was collected in a suitable relational database and analyzed with statistical software. The independent-samples t test was applied to understand differences in Physical Activity (PA) levels in terms of genders and also their residential areas. **Results:** Total PAs (MET min./week) of male students were higher than female counterparts ($p<.01$). On the other hand, PA at home or in garden domains of female students were higher than male counterparts ($p<.05$). It was observed that male students walk more and performed more moderate activities (MPA) than female counterparts ($p<.01$). When their residential areas were taken into consideration, students living in their own house had higher total PA (MET min./week) and higher MPA than students living in dormitory ($p<.01$). **Conclusion:** This study showed that PAL is higher for male students than female counterparts as indicated in the current literature. On the other hand, living far distant from campus played important role in having higher PAL in this study.

Keywords: Physical Activity, IPAQ, MET;

1. Introduction

Insufficient physical activity is related to the progress of different diseases (Kohl, 200, Hernelahti et al, 2004) causing 1.9 million premature deaths per year globally (WHO, 2002). Furthermore, physical activity is closely related to mental health and well-being (Sjogren et al, 2006). Therefore, many strategies for promoting physical activity have been developed and implemented, such as "Global Strategy of Diet, Physical Activity and Health" and "Healthy People 2010" (US Department of Health and Human Services, 2000). Preventing obesity among adults, children and young people is a key public health Challenge (Ells and Cavill, 2009).

Some studies report that environment and socio-economic conditions have significant role in the occurrence of overweight and obesity related to insufficient physical activity (Wang 2002, McVeigh 2004, Ramachandran 2002,

* Yeliz ÖZDÖL Tel.: +90 242 3106819
E-mail address: yelizozdol@akdeniz.edu.tr

1877-0428 © 2012 Published by Elsevier Ltd. Selection and/or peer review under responsibility of Prof. Dr. Hüseyin Uzunboylu
doi:10.1016/j.sbspro.2012.05.343

Burke 2001, Dunton 2005). In an effort to solve the PA participation problem, research in the past two decades has employed theoretical perspectives to better understand the factors that enhance and detract from PA participation. In particular, social cognitive models that emphasize the interaction of intrapersonal factors, micro-environmental influences and PA behavior, have gained empirical support. This has allowed researchers to identify cognitive (e.g., efficacy beliefs), affective, and social influences on the individual's choice to be active and to aid in the development of interventions to increase PA levels [King et al, 2002]. Several recent studies have highlighted regional or community environmental characteristics that have demonstrated associations with physical activity, for example less sprawl (Ewing et al, 2003) greater neighborhood walk ability, and more access to places for physical activity (Powell et al, 2003). This new emphasis on understanding how community environments impact active living has created a need to develop measures of environments and routine activities. The majority of public health studies have used self-report surveys to assess people's perceptions of their environments (Sallis and Saelens, 2000). Urban planning studies of walking and bicycling for transportation, on the other hand, have relied on existing data sources to provide objective environmental measures, often with limited availability or flexibility of the content or scale of measurement. In addition, most studies have assessed gender or environments-related physical activity, but not both (Hoehner et al, 2005).

The purpose of this study was to compare the physical activity levels (PAL) of university student accordance with their gender and their residential areas.

2. Material and Method

This study included a total of 450 students (age:21.04±1.61 years) in Akdeniz University. Students were categorized in two groups by living in dormitory (n=254) and house (n=196).

2.1. Measurements

Height and weight measurements of the study group were taken, and accordingly, BMI (height/weight^2) values were calculated.

Physical activity levels were determined by International Physical Activity Questionnaire (IPAQ) (Craig et al, 2003). Validity and reliability of the questionnaire were performed for Turkey (Öztürk, 2005). In the present study, the long form of the questionnaire covering "the last seven days" was used for the assessment of physical activity levels. This long form is composed of 27 questions and 5 parts (related to job, transportation, house, recreation, sport and spare time activities, sedentary time). MET (metabolic equivalent) of these 5 parts in the long form were determined by MET levels of moderate-difficulty activities and total scores obtained from questionnaires.

Minute, day and MET (recreation oxygen consumption layers) of each part are multiplied according to questionnaire results, and consequently, a score (MET-minute/week) is obtained

In terms of MET values at moderate and vigorous levels, activities between 3 and 8 were accepted moderate, while those ≥8 were accepted vigorous activities, and calculations were made accordingly. Times of these activities were calculated by the number of days per week * duration of daily activities (minute).

2.1.1. Statistics

Descriptive statistics and distributions of all groups were taken into consideration. Groups were classified by gender and living places, and intergroup differences were evaluated by descriptive statistics and independent T-test. Significance level was set to 0.05 (*: $p<0.05$) and 0. 01 (**: $p<0,01$). All statistical analyses were performed by SPSS 10.01 packet software.

3. Tables

The necessary comparisons and analyses were made by investigating the findings related to MET values and descriptive data of physical characteristics of study group obtained through the long form (5 parts) of international physical activity questionnaire applied to randomly-selected 450 students of Akdeniz University

Table 1. Arithmetic Mean (A.M), Standard Deviation (SD), Minimum (Min.) and Maximum (Max.) Values of Anthropometric Data of All Groups

n=450	A.M±SD	Min.	Max.
Age	21.04±1.61	18.45	26.01
Height (cm)	172.21±7.81	152	196
Weight (kg)	64.78±10.30	43	98
BMI(kg/m^2)	21.76±2.66	16.26	30.45

Arithmetic Mean (A.M.), Standard Deviation (S.D.), Minimum (Min.) and Maximum (Max.) values regarding age, height, weight and body mass index (BMI) parameters of all students in the study are given in Table 1.

Table 2. MET Values of Each Parts According to Questionnaire Results

n=450	A.M±SD	Min.	Max.
1st part **(MET)**	142.90±1552.65	0	21600
2nd part **(MET)**	1237.14±1021.06	0	6264
3rd part **(MET)**	205.22±511.29	0	3120
4th part **(MET)**	1407.09±1789.54	0	14628

Table 2 presents Arithmetic Mean (A.M.), Standard Deviation (S.D.), Minimum (min.) and Maximum (Max.) values of MET parameters calculated for the 1st part (job-related physical activity), 2nd part (transportation), 3rd part (house affairs, house maintenance and family care) and 4th part (recreation, sports and spare-time physical activities) according to questionnaire data of all participant students.

Table 3. MET Values and Times of Moderate and Vigorous Activities of All Group

n=450	A.M±SD	Min.	Max.	Time (minute)
Walking (MET)	1572.04±1168.26	0	7128	476.28±354.02
MPA (MET)	607.52±913.65	0	7200	152.85±227.06
MPA$_{total}$ (MET)	2179.56±1543.20	0	9042	629.23±441.82
VPA (MET)	812.80±1873.81	0	15360	101.60±234.23

Table 3 presents Arithmetic Mean (A.M), Standard Deviation (SD), Minimum (min.) and Maximum (Max.) times of walking, moderate level, total moderate level (walking + moderate level) and vigorous level activities (VPA) of all participant students.

Table 4. Comparison of Anthropometric Values of Study Group by Gender

	Female (n=200)	p	Male (n=250)
Age	20.81±1.48	0.109	21.21±1.68
Height (cm)	165.82±5.71	0.485	176.83±5.53
Weight (kg)	56.58±6.38	*	70.72±8.34
BMI (kg/m^2)	20.51±2.31	0.361	22.62±42

No statistically significant difference was detected in the comparison of age, height and BMI values of all groups participating in the study ($p>0.05$). Male students were found heavier than female students ($*p<0.05$).

Table 5. Comparison of MET Values Obtained from the Parts of Questionnaire by Gender

	Female (n=200)	p	Male (n=250)
1st part **(MET)**	22.43±191.53	0.066	230.15±2031.46
2nd part **(MET)**	945.52±733.60	**	1448.31±1143.93
3rd part **(MET)**	133.45±331.78	*	257.20±605.33
4th part **(MET)**	1093.98±1569.24	0.211	1633.83±1908.11

No statistically significant difference was detected in the comparison of female and male students' MET values in the 1st and 4th parts by gender ($p>0.05$). However, there was a significant difference between male and female students in terms of MET values in the 2nd and 3rd parts ($*p<0.05$, $**p<0.01$).

No statistically significant difference was observed between MET values of male and female students at moderate and vigorous levels ($p>0.05$) (table 6). On the other hand, there was a significant difference between walking and total MET values of female and male students at moderate level ($**p<0.01$) (table 6).

Table 6. Comparison of Activity-Dependent MET Values by Gender.

	Female (n=200)	p	Male (n=250)
Walking (MET) (minute)	1239.07±803.28 (375.48 dk)	**	1813.15±1325.31 (549.44 min)
MPA (MET) (minute)	504.88±695.26 (127.86 dk)	0,07	681.85±1039.45 (170.95 min)
MPA_{total} (MET) (minute)	1743.95±1036.09 (503.33 dk)	**	2495.00±1762.73 (720.39 min)
VPA (MET) (minute)	451.43±1308.40 (56.43 dk)	0,05	1074.48±2162.36 (134.31 min)

Table 7. Anthropometric Characteristics of Students Living in Dormitory and House and Comparison Results.

	Dormitory (n=196)	p	House (n=254)
Age	20.55±1.34	*	21.53±1.71
Height (cm)	170.68±7.54	0.77	173.73±7.81
Weight (kg)	62.92±9.71	0.61	66.64±10.58
BMI (kg/m^2)	21.53±2.49	0.44	22.01±2.71

No statistically significant difference was detected between two groups in terms of MET values of height, weight and BMI of students living in dormitory and house ($p>0.05$). However, there was a significant difference between students living in dormitory and house in terms of MET values of age ($*p<0.05$).

Table 8. MET values of Questionnaire Parts of Students living in dormitory and House and the Comparison Results.

	Dormitory (n=196)	p	House (n=254)
1^{st} part **(MET)**	54.84±398.81	0.11	230.97±2161.26
2^{nd} part **(MET)**	1241.19±971.46	0.20	1233.09±1073.27
3^{rd} part **(MET)**	7.80±35.06	**	402.65±667.46
4^{th} part **(MET)**	1408.67±1651.28	0.19	1405.52±1926.28

No statistically significant difference was detected between MET values of the 1^{st}, 2^{nd} and 4^{th} parts of students living in dormitory and house ($p>0.05$). However, there was a significant difference between MET values of the 3^{rd} part of students living in dormitory and house ($**p<0.01$).

Table 9. MET Values of Students living in dormitory and House by Activities and the Comparison Results

(MET)	Dormitory (n=196)	p	House (n=254)
Walking (MET)	1577.40±1096.48	0.09	1566.68±1241.43
MPA (MET)	434.30±651.19	**	780.75±1091.37
MPA_{total} (MET)	2011.70±1337.92	0.05	2347.43±1714.65
VPA (MET)	700.80±1425.25	0.09	924.80±2236.31

No statistically significant difference was detected between MET values of students living in dormitory and house at walking, total moderate and vigorous levels ($*p>0.05$). On the other hand, there was a significant difference between moderate level MET values of students living in dormitory and house ($**p<0.01$).

4. Results and Discussion

For all study groups, MET values of job-related activities (1^{st} part) were calculated as 142.90±1552.65, MET values of transportation activities (2^{nd} part) as 1237.14±1021.06, MET values of house affaire activities (3^{rd} part) as 205.22±511.29 and MET values of spare time activities (4^{th} part) as 1407.09±1789.54. All study groups spent 476.28±354.02 minutes per week for walking, 152.85±227.06 minutes per week for moderate level activities and 101.60±234.23 minutes per week for vigorous level activities.

The investigation of all group by gender revealed that male students were heavier than female students ($p<0.05$). This result is not compatible with literature, and it was attributed to the fact that random selection method and the number of study group did not represent the population. MET values of male students regarding transportation activities were found higher than those of female students ($p<0.01$). However, MET values of female students regarding house and garden works were higher than those of male students ($p<0.05$). Considering the activity levels, male students were determined to walk longer periods of time ($p<0.01$), make more moderate level

activities and have higher vigorous activity level. In general, male students of all ages were found more active than their female contemporaries. The difference increases in adolescence and subsequent periods. In parallel with literature, MET activity values of male students of nearly all ages tend to be higher than those of female students (Pınar, 2003).

The investigation of study group by living places revealed that students living in houses make more activities and have higher moderate and vigorous activity levels than other students living in dormitory ($p<0.01$). Many studies examined the effects of living conditions on physical activity level. Student dormitory is located within the university boundaries, which negatively affects the physical activity levels of students living in dormitory (Cardon, 2008). At the same time, many studies also report the effects of socio-cultural differences on physical activity levels (Dencker and Andersen, 2008).

Recommendations:

- More concrete results can be obtained through studies implementing objective methods on higher number of subjects.
- Booklets about physical activities could be prepared and distributed to students in order to increase the habits of physical activity.
- Participation in physical activities can also be provided by increasing the fields of physical activities in university and dormitory.
- Physical activity level can be increased by forming convenient and safe physical activity areas and bicycle paths in the environment and encouraging physical activities.

References

Kohl, HW. (2001). III Physical activity and cardiovascular disease: evidence for a dose response. *Med Sci Sports Exerc.*;33(6) Suppl: (472–83).

Hernelahti, M., Kujala. U., Kaprio, J., (2004). Stability and change of volume and intensity of physical activity as predictors of hypertension. *Scand J Public Health.* ;32: (303–9).

World Health Organization. (2002). *The world health report*: reducing risk, promoting health life. Geneva: *World Health Organization*; p. 61

Sjogren, T., Nissinen, K.J., Jarvenpaa, S.K., Ojanen, M.T., Vanharanta, H., Malkia, E.A.(2006). Effects of a physical exercise intervention on subjective physical well-being, psychosocial functioning and general well-being among office workers: a cluster randomized-controlled cross-over design. *Scand J Med Sci Sports*; 16: (381–90).

US Department of Health and Human Services. (2000) Healthy people 2010, understanding and improving health. Washington (DC): *US Government Printing Office*; p. 26.

Ells, L.J., Cavill, N. (2009). Preventing childhood obesity through lifestyle change interventions: A briefing paper for commissioners. *Oxford: National Obesity Observatory*

Wang, Y. (2002). Is Obesity Associated With Early Sexual Maturation? A Comparison of the Association in American Boys versus Girls. *Pediatrics*; 110, 5, 903

McVeigh, J.A., Norris, S.A., Wet, T. (2004). The Relationship between Socio-Economic Status and Physical Activity Patterns in South African Children. *Acta Pediatrica*, 93(7).

Ramachandran, A, Snehalatha, C, Vinitha, R, Thayyil, M., Sathish-Kumar, C.K., Sheeba, L., Joseph, S., Vijay, V. (2002). Prevalence of Overweight in Urban Indian Adolescent School Children. *Diabetes Research & Clinical Practice,* 57(3).

Burke, V., Beilin, LJ., Dunbar, D. (2001). Family Lifestyle and Parental Body Mass Index as Predictors of Body Mass Indeks in Australian Children: A Longitudinal Study. International Journal of Obesity,; 25, 147-157.

Dunton, F.G., Whalen, C.K., Jamner, L.D., Henker, B., Floro, J.N. (2005). Using Ecologic Momentary Assessment to Measure Physical Activity during Adolescence. American Journal of Preventive Medicine. 29(4), 281-287

King, A.C., Stokols, D., Talen, E., Brassington, G.S. (2002). Killingsworth : Theoretical approaches to the promotion of physical activity: Forging a transdisciplinary paradigm. *Am J Prev Med*, (Suppl 1):15-25.

Ewing, R., Schmid, T., Killingsworth, R., Zlot, A., Raudenbush, S.(2003). Relationship between urban sprawl and physical activity, obesity, and morbidity. *Am J Health Promotion*;18: (47–57)

Powell, K.E., Martin, L.M., Chowdhury, P.P. (2003). Places to walk: convenience and regular physical activity. *Am J Public Health*;93: (1519 – 21).

Sallis, J.F., Saelens, B.E. (2000). Assessment of physical activity by self-report: status, limitations, and future directions. *Res Q Exerc Sport*;71(suppl 2): (1–14).

Hoehner, C.M., Ramirez, K.B., Elliott, M.B., Handy, S.L., Brownson, R.C. (2005). *Am J Prev Med*;28(2S2): (105-116).

Craig, C.L., Marshall, A.L., Sjostrom, M., Bauman, A.E., Booth, M.L., Ainsworth, B.E., et al. (2003). International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc*;35: (1381-95).

Öztürk, M. (2005). "Determination of physical activity level and validity and reliability of International Physical Activity Questionnaire at University students". *Disertation thesis [Master's thesis]*. Hacettepe University Health Science Institute. Ankara;

International Physical Activity Questionnaire [Internet]. Available from: http.//www.ipaq.ki.se/ipaq.htm

Pınar, S. (2003). Çocuklarda Fiziksel Aktivite İle Daha Sağlıklı Yaşam. IX. Ulusal Spor Hekimliği Kongresi. Nobel Yayın Dağıtım. 261.

Cardon, G., Cauwenberghe, E.V., Labarque, V., Haerens, L. and Bourdeaudhuij, I.D. (2008). The contribution of preschool playground factors in explaining children's physical activity during recess. *International Journal of Behavioral Nutrition and Physical Activity*, (5:11).

Dencker, M. and Andersen, L.B. (2008). Health-related aspects of objectively measured daily physical activity in children. Clin Physiol Funct Imaging 28, pp133–144