

PHYSICAL ACTIVITY AND EXERCISE STAGES OF CHANGE LEVELS  
OF MIDDLE EAST TECHNICAL UNIVERSITY STUDENTS

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Approval of the Graduate School of Social Sciences

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## **ABSTRACT**

### **PHYSICAL ACTIVITY AND EXERCISE STAGES OF CHANGE LEVELS OF MIDDLE EAST TECHNICAL UNIVERSITY STUDENTS**

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The purposes of this study were to examine (a) physical activity participation levels, (b) exercise stages of change levels and (c) physical activity preferences of the Middle East Technical University undergraduate students with respect to gender, residence and faculty. Participants were 953 students from 5 different faculties (496 male, and 547 female). For the data collection, International Physical Activity Questionnaire (IPAQ), Physical Activity Stages of Change Questionnaire, and Physical Activity Preferences Questionnaire were used. Descriptive statistics (frequency, mean, median, percentage), and nonparametric statistical methods (Mann Whitney U test, Kruskal-Wallis test, Pearson chi-square test) were used for the data analysis. According to the IPAQ, male students were more physically active than female counterparts. Students who were living in campus had higher physical activity levels, and faculty of architecture students were more sedentary compared to

other faculty students ( $p < 0.05$ ). In general, 24.8% of the students were physically active, 59.9% of the students were moderately active, and 15.3% of them were inactive. The results on exercise stages of change revealed that male students were at upper stages as compared to the female students. Faculty of architecture students were at lower stages compared to the other faculty students ( $p < 0.05$ ). There was no significant differences on the stages of students who were living in and out of the campus ( $p > 0.05$ ). In general, students at pre-contemplation, contemplation, preparation, action and maintenance stages were 15.2%, 31.4%, 25.3%, 7.5%, and 20.6% respectively. Swimming (59.2%), walking (56.7%), cycling (36.2%) and football (30.4%) were the most frequently preferred physical activities. Dancing and tennis were preferred more with the female students while football and basketball preferred more with the male students. Physical activity preferences of students living in and out of campus were similar. In conclusion, female students, students living out of the campus and students of faculty of architecture were more at risk. Approximately 75% of the METU undergraduate students' physical activity levels were not satisfactory for a healthy life. University physical activity facilities, extracurricular programs and the courses should be reconsidered based on the findings of this study.

**Keywords:** Physical activity level, exercise stages of change, university students

## ÖZ

### ORTA DOĞU TEKNİK ÜNİVERSİTESİ ÖĞRENCİLERİNİN FİZİKSEL AKTİVİTE DÜZEYLERİ VE EGZERSİZ DAVRANIŞININ DEĞİŞİM BASAMAKLARI

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Bu çalışmanın amaçları Orta Doğu Teknik Üniversitesi (ODTÜ) lisans öğrencilerinin (a) fiziksel aktiviteye katılım düzeylerini, (b) egzersiz davranışının değişim basamaklarını ve (c) tercih ettikleri spor aktivitelerini cinsiyet, yaşadıkları yer (yerleşke içi-dışı) ve okudukları fakülteye göre incelemektir. Çalışmaya beş ayrı fakülteden 953 öğrenci (496 erkek ve 457 kadın) katılmıştır. Verilerin toplanması için Uluslararası Fiziksel Aktivite, Egzersiz Davranışının Değişim Basamakları ve Fiziksel Aktivite Tercihleri anketleri kullanılmıştır. Veri analizinde tanımlayıcı istatistik (frekans, aritmetik ortalama, medyan, yüzde) ile Mann Whitney *U*, Kruskal-Wallis, Pearson ki-kare testleri kullanılmıştır. Fiziksel aktivite düzeyi ile ilgili bulgulara göre erkek öğrencilerin kadınlara göre daha aktif oldukları, yerleşke içinde kalan öğrencilerin dışarıda kalanlara göre daha yüksek fiziksel aktivite düzeyine sahip oldukları ve mimarlık fakültesi öğrencilerinin diğer fakültelerdeki öğrencilere göre daha hareketsiz oldukları tespit edilmiştir ( $p < 0.05$ ). Genel olarak öğrencilerden

%24,8'inin fiziksel aktivite düzeyi yüksek, %59,9'unun orta ve 15,3'ünün ise düşük olduğu belirlenmiştir. Egzersiz Davranışının Değişim Basamakları anketinin sonuçlarına göre erkek öğrencilerin kadınlara göre daha yüksek basamaklarda oldukları görülmüştür. Mimarlık fakültesi öğrencilerinin diğer fakültelere göre daha alt basamaklarda oldukları saptanmıştır ( $p < 0.05$ ). Yerleşke içinde veya yerleşke dışında yaşayan öğrenciler arasında anlamlı bir fark bulunamamıştır ( $p > 0.05$ ). Bütün katılımcıların verileri ele alındığında, %15,2'sinin eğilim öncesi, %31,4'ünün eğilim, %25,3'ünün hazırlık, %7,5'inin hareket ve %20,6'sının devamlılık basamaklarında olduğu görülmüştür. Öğrencilerin fiziksel aktivite tercihlerine bakıldığında ise en çok tercih edilen aktivitelerin yüzme (%59,2), yürüme (%56,7), bisiklet (%36,2) ve futbol (%30,4) olduğu belirlenmiştir. Dans ve tenis kadınlar tarafından daha çok seçilirken, futbol ve basketbol erkekler tarafından daha çok tercih edilmiştir. Yerleşke içinde ve dışında yaşayan öğrencilerin tercih ettikleri aktiviteler benzer bulunmuştur. Sonuç olarak, kadın öğrenciler, yerleşke dışında yaşayan öğrenciler ve mimarlık fakültesinde okuyan öğrencilerin daha çok risk altında olduğu görülmüştür. ODTÜ öğrencilerinin yaklaşık olarak %75'inin fiziksel aktivite düzeyi sağlıklı yaşam için gerekli olan düzeyin altındadır. Bu çalışmanın bulguları sonucunda üniversitedeki fiziksel aktivite ile ilgili imkânların, ders dışı etkinliklerin ve derslerin yeniden gözden geçirilerek gerekli düzenlemelerin yapılması önerilir.

**Anahtar Kelimeler:** Fiziksel Aktivite Düzeyleri, Egzersiz Davranışının Değişim Basamakları, Üniversite Öğrencileri.

TO MY WIFE AND SON

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# **CHAPTER I**

## **INTRODUCTION**

### **1.1 Background to the Study**

The relationship between physical activity and the good health has been very well documented. To date, studies have indicated that regular exercise is associated with increased life expectancy, and reduced risk of coronary heart diseases (McCarley and Salai, 2007), hypertension (Mainous et al., 2007), stroke (Berry et al., 2005), some kinds of cancer (Mayer et al., 2007), osteoporosis (Herson, 2007), back injuries (Elfving, Andersson & Grooten, 2007), diabetes (Figuro et al., 2007), obesity (USDHHS, 2000), and mental health ailments, including stress and mood disturbances (Bhui, 2002). Physical activity also positively influences health promoting behaviors and discourages the use of tobacco, alcohol, and drugs (Lankenau, Solari & Pratt, 2004). Therefore, promoting regular physical activity participation has been a public health priority in many developed countries like United States of America, United Kingdom, and New Zealand (Sinclair, et al., 2005; USDHHS, 2000).

Considering the dose-response of physical activity for health promotion and disease prevention, the American College of Sports Medicine (ACSM) guidelines (2000) recommend accumulating 30 minutes or more of moderate intensity physical activity on the most, preferably all, days of the week. However, including vigorous

intensity exercises into daily regimens are likely to produce greater health benefits (Fahey, Insel & Roth, 2007).

Despite the documented benefits and given interest to the promotion of regular exercise participation, recent studies have demonstrated that physical activity participation level was lower than the recommended level (ACSM, 2000; Harrison et al., 2005). Eurobarometer survey (2003), examined the physical activity participation rate in 15 European Union countries and revealed that more than half of the respondents (57.4%) did not participate vigorous physical activity. Similarly, studies in North America revealed that only 23% of the United States adult population engages in vigorous physical activity longer than 20 minutes, 3 or more days per week (USDHSS, 2005). Studies examining the lifespan physical activity participation levels clearly indicated that physical activity levels decreased with increasing age (Eurobarometer, 2003; Wallace, et al., 2000). Especially, late adolescence, and university years seem to be a very critical period for the decreased physical activity level (Leslie et al., 2001). Due to the university students' future societal roles as leaders in establishment of social and cultural norms, their physical activity levels have been considered as an important element (Irwin, 2004). However, studies examining their physical activity indicated very low level, and variety of risky health behaviors (Reed and Phillips, 2005). A large-scale study including students from 21 European countries demonstrated that 64% of males and 70% of females were insufficiently active (Steptoe et al., 1997). Another study representing the United States undergraduate university students showed that 67% of females and 56.3% of males had low physical activity level (Douglas et al., 1997).

There has been very limited knowledge about the physical activity levels of university students in Turkey. Recently, Savcı et al. (2006) have studied the physical activity level of one Turkish university students studying medical subjects. Findings of this study indicated a similar pattern with the European and United States university students that only 18% of the students were physically active, and female students had significantly lower level than those of male students’.

Epstein (1998) stated that lack of theoretical approach in physical activity studies was a serious limitation in understanding the exercise behavior of the people. In other words, just describing the physical activity level of the university students is not enough to understand the complex nature of the exercise behavior. Hagger and Chatzisarantis (2005) recommend the use of social cognitive theories (e.g., health belief model, protection motivation theory, theory of reasoned action, and theory of planned behavior), especially the transtheoretical model (TM), in understanding and promoting the physical activity participation.

TM is an integrative and comprehensive model of behavior that has been first developed to identify the progression that people undergo when changing unhealthy behaviors like alcohol addiction and smoking (Hagger and Chatzisarantis, 2005; Prochaska, DiClemente, and Norcross, 1992). TM explains the behavior change process as *“people pass through stages toward making a behavior change and each stage is characterized by a particular pattern of psycho-social and behavioral variables”* (Hagger and Chatzisarantis, 2005, p.38).

TM is composed of four main components: (a) stages of change, which are depending on the behavior, (b) processes of change, which are depending on

behavioral and cognitive processes, (c) self-efficacy and (d) decisional balance (Prochaska, DiClemente, and Norcross, 1994). Stages of change, including five stages, are the most widely used aspects of the model in exercise behavior. It refers to *“a person’s readiness (intention) to engage in regular exercise”* (Spencer et al., 2006). The stages of change are called pre-contemplation, contemplation, preparation, action, and maintenance. According to the conceptualization of these five stages of changes by Marcus et al. (1992), pre-contemplation stage includes someone who does not exercise and is not planning to start exercising within six months. Contemplation stage describes a person who does not exercise but is planning to start within six months. Preparation stages include a person who is planning to start exercise within one month and has taken some initial steps toward it. Action stage describes a person who has been exercising or less than six months, and maintenance stage includes a person who has been exercising for six months or more.

Recent studies using exercise “stages of change” constructs of TM have demonstrated concurrent and predictive validity of this approach in explaining physical activity behavior (Hagger and Chatzisarantis, 2005; Wallace et al., 2000). Although stages of change levels of different populations (e.g., adolescents, adults, older people, and different ethnicities) have been studied extensively, few studies have examined these levels in university students so far (Keating et al., 2005a; Marcus et al., 1992; Riebe et al., 2005; Wallace et al., 2000). In one of these few examples, Wallace et al. (2000) found that 52.3% of one United States university students were at pre-contemplation and contemplation stage (inactive) or exercising irregularly (preparation stage). Thirty-one percent of the students were at the

maintenance stage (exercised regularly). Their study also showed a significant difference between male and female students' exercise stage distribution. A greater proportion of the female students were in the pre-contemplation, contemplation, preparation, and action stages compared to male students. More male students were in the maintenance stage. To authors' knowledge, there was no study examining the exercise or physical activity participation using exercise stages of change constructs in any Turkish population.

In the physical activity literature, low participation level has been explained by the ecological barriers to exercise. Studies examining the perceived barriers for physical activity by the university students indicated that access to sport facilities, supportive social environment (Daşkapan et al., 2006), lack of time (Gyurcsik et al., 2006; Koçak, 2005), and heavy class schedule (Koçak, 2005) were the most important factors.

## **1.2 Statement of the problem**

Studies to date on “physical activity” and “exercise stage of change levels” of university students indicated low physical activity level, and low exercise intention. Especially, female university students had lower values, and they were more at risk compared to the male students. Perceived barriers to physical activity findings revealed that perceived access to sport facilities, non supportive social environment, lack of time, and heavy class schedule were the important reasons for low participation and low exercise intention. Living in or out of campus and studying at different departments/faculties may influence some of these perceived barriers and

change physical activity levels of these students. In the literature, there is very limited knowledge for these issues for the Turkish university context.

The problem of this study was to determine the (1) physical activity levels, (2) exercise stages of change levels, and (3) physical activity preferences of the Middle East Technical University (METU) undergraduate students with respect to gender (male and female), residence (in or out of campus), and faculties (education, arts and sciences, engineering, architecture, economic and administrative sciences).

### **1.3 Research questions**

The following research questions guided this study;

1. Is there a difference in the “physical activity levels” of METU undergraduate students in terms of (a) gender, (b) residence, and (c) faculty?
2. Is there a difference in the “exercise stage of change levels” of METU undergraduate students in terms of (a) gender, (b) residence, and (c) faculty?
3. What are the “physical activity preferences” of METU undergraduate students in terms of gender and residence?

### **1.4 Significance of the study**

There have been limited knowledge on the physical activity levels, exercise stages of change levels, and physical activity preferences of the university students. In addition, knowledge of interaction regarding to the influence of gender, residence

(living close to university campus sport facilities or out of campus), and educational context of studied faculty (different course loads) on the physical activity levels of students in Turkish university context is limited.

This study will provide the necessary information to take proper precautions for enhancing health-related physical activities in universities and developing interventions to increase the physical activity levels. Findings will provide an insight to Physical Education and Sports Department in offering physical activity courses to meet the specific needs of undergraduate students. Extracurricular physical activities in universities may be re-structured based on the findings of this study. Furthermore, the results will provide data to compare the current status of physical activity and exercise stages of change levels in Turkey with other countries.

### **1.5 Assumptions of the study**

It is assumed that participants of this study completed “International Physical Activity Questionnaire”, “Exercise Stage of Change Questionnaire”, and “Physical Activity Preferences Questionnaire” truthfully.

### **1.6 Limitations of the study**

There were several limitations of the present study that need to be taken into consideration when interpreting the data. Specifically, only stages of change construct of TM was used in this research. Therefore, the information was not sufficient to predict the individuals’ exercise behavior as a whole. The study sample was included only METU undergraduate students and findings can only be generalized to this

population. In addition, data of this study was collected in May, two weeks before the final exams.

### **1.7 Definition of terms**

**Physical activity:** It is any form of bodily movement produced by skeletal muscles that result in expenditure of energy. Physical activity may include a planned activity like walking, running, basketball or daily activities such as household chores, yard work etc. (IPAQ, 2005).

**Physical activity levels:** These are categorized in three levels, low, moderate and high level, based on the “International Physical Activity Questionnaire” scoring method (Craig et al., 2003).

**Moderate-intensity physical activity:** It refers to a level of effort in which a person should experience some increase in respiratory or heart rate (3 to 6 MET) (IPAQ, 2005).

**High / Vigorous-intensity physical activity:** It refers to a level of effort in which a person should experience a large increase in respiratory or heart rate (greater than 6 MET) (IPAQ, 2005).

**Exercise stages of change:** It is the stage of readiness to change of individuals’ physical activity behavior (Marcus et al., 1992). The stages were classified according to the readiness to change. There are five stages: pre-contemplation, contemplation, preparation, action, and maintenance.

## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

In this chapter, the research literature relevant to physical activity, theories of health models, TM and exercise stages of changes and physical activity preferences are presented.

#### **2.1 Physical Activity**

##### **2.1.1 Basic definitions**

Physical activity is defined as muscle movements and can range from sports to lifestyle activities. Another definition is planned, structural movement of the body to increase physical fitness (Marcus et al., 2003). The intensity of physical activity is mostly calculated as metabolic equivalents (MET). One MET is, metabolic expenditure at rest, corresponding to an oxygen uptake of 3.5 ml/kg/min. According to the International Physical Activity Questionnaire scoring manual, accumulation of less than 600 MET-min/weeks is accepted as low level of physical activity. Physical activity rate between 600-3000 MET-min/week is accepted as moderate, and accumulation of more than 3000 MET-min/week is accepted as high physical activity level (IPAQ, 2005).

### 2.1.2 Physical activity levels of general population

The interaction between physical activity and health is stated in numerous researches (Berry et al., 2005; Elfving, Andersson, & Grooten, 2007; USDHHS, 2000). For this reason, regular exercise participation is recommended by many health related organizations; (ACSM, 1995; McCarley & Salai, 2007; USDHHS, 2000; WHO, 2003). According to the ACSM (1995), 30 minutes of moderate to vigorous physical activity, all or more of the days of a week is required to improve the health.

Despite the documented benefits, many people do not participate in regular physical activity (Harrison et al., 2005). The steepest decline occurs between the ages of 15 to 24 years (Nigg and Corneya, 1999). According to a recent report on Turkish National Burden of Disease in Turkey (2004), 35% of the male and 71% of the female population was physically inactive or minimally active between the ages of 15-29. This report indicated that only 20% of the male and 5% of female population participated in vigorous physical activities. Findings from the other countries were similar. According to the Centers for Disease Control and Prevention (CDC), more than 55% of adults in United States do not engage in recommended amount of physical activity; 25% are not active at all (Fahey, Insel & Roth, 2007). Eurobarometer study (2003) revealed a similar trend in European Union countries, 50.9% of the 15-25 age groups has low physical activity levels.

Previous studies on the physical activity engagement of the population also indicated that physical activity participation levels were decreasing as people get older (Anderssen et al., 2005; Caspersen et al., 2000; Eurobarometer, 2003; Turkish National Burden of Disease Study, 2004). Especially, this decrease was significant

when adolescent population was moving from high school to universities (Gyurcsik et al., 2004; Pinto et al., 1998; Sinclair et al., 2005).

### 2.1.3 Physical activity levels of university students

University students' physical activity level and awareness about the value of exercise participation are quite important because of their future societal roles as leaders in establishment of social and cultural norms (Irwin, 2004). However, studies indicated that low physical activity and risky health behaviors were quite high in this population. Recent studies have found that more than 50% of the university students were inactive or exercising below the recommended level (Pinto et al., 1998; Reed and Philips, 2005; Savcı et al., 2006; Sinclair et al., 2005; Steptoe et al., 1997) (Table 1). Lower physical activity level of female university students as compared to the male students was also reported in many studies (Douglas et al., 1997; Keating et al., 2005a; Savcı et al., 2006; Steptoe et al., 1997).

In physical activity literature, barriers are usually identified as the most important reasons for low physical activity level (Gyurcsik et al., 2004). These barriers to physical activity previously classified two dimensionally including external and internal barriers (Daşkapan et al., 2006; Gyurcsik et al., 2004). However, using multidimensional ecological models have been advocated more frequently by the researches to identify barriers to exercise recently (Sallis et al., 1999). Ecological barriers to exercise categorized into five types: intrapersonal (e.g. lack of motivation), interpersonal (e.g. lack of support from family, friends), institutional (e.g. fitness facilities offering limited hours of operation), community (e.g. poor fitness facilities), and public policy (e.g. a law to make rollerblading illegal

on city). A **sixth** barrier, physical-environmental (e.g. weather conditions) was also identified later (Gyurcsik et al., 2004).

Gyurcsik et al. (2004) examined the barriers to vigorous physical activity of 132 students transitioning from high school to the first year of university. 47% of the sample was exercising below the national recommendations. This study revealed that institutional, intrapersonal and interpersonal barriers were the most of ten cited barriers to exercise.

Another study (Gyurcsik et al., 2006), examining the barriers to physical activity of students from grade 7 to first year university, indicated the highest barriers reports by the first year university students than all other groups. Highest cited barriers in this study by university students were: weather conditions (81%), high school workload (74%), lack of transportation to facilities (62%), social invitation during leisure time (52%), and health issues (39%).

Considering the Turkish university context, Koçak (2005) studied the perceived barriers to exercise of 314 Middle East Technical University students, and found the lack of time (38.5%) and heavy class schedule (25.2%) as the main barriers. In another study, Daşkapan et al., (2006) found the external barriers (lack of time due to busy lesson schedule, given priority to academic success by family, lack of time due to the responsibilities related to family and social environment) more important than the internal ones in 303 university students in one university.

Table 1. Recent studies on the physical activity level of university students

<b>Author (year)</b>	<b>Participants</b>	<b>Data collection instruments</b>	<b>Findings</b>
Steptoe et al. (1997)	16.483 (42.7% male, 55.7% female) university students from 21 European Union countries	The European Health and Behavior Survey	26.8 % of the male participants were inactive, 31.7 % of the female participants were inactive
Pinto et al. (1998)	708 first-year (40% male, 60 % female) university students	Physical activity 7 day recall questionnaire	42 % of the participants was either inactive or exercising below recommended levels
Mack et al. (2004)	1.625 undergraduate students (36,7% male, 63.3 % female)	Attitudes Toward Exercise and PA Questionnaire	73.19 % of the participants were inactive
Reed & Phillips (2005)	411 undergraduate students	Modified Godin Leisure-Time Exercise and Home Environment Questionnaire	Less than 66.7 % engaged in regular physical activity
Sinclair et al. (2005)	60 first-year university students	Modified New Zealand Sport and Physical Activity Survey	60% of the students were inactive or exercise below the recommended level
Savcı et al. (2006)	1097 (376 male, 721 female) university students from health related subjects	International Physical Activity Questionnaire	68 % of the participants were minimally active. Male students were physically more active than female students

## **2.2 Theories of Health Models**

To gain health benefits from exercise or regular physical activity health promotion programs must be rooted from existing theories and models. Models or theories are systematic method of planning and a decision-making guide. In other words, theories are the foundation of the planning process and models are the subsets of theories. Methods provide application of the theories. A well-defined model can provide effective health promotion programs, direction for the program, and structure to the program development process. Another advantage is the theories are empirically tested before being used for exercise behavior change intervention (Baban and Craciun, 2007). Models are flexible and they can be modified or expanded according to the specific needs of participants.

There are two main categories of theories and models that are related to health promotion planning. First category is behavior change, which helps to explain individual and group health behavior. Second category is program planning, which includes theories and models that support the entire program planning process (ACSM, 2003).

### **2.2.1 Health Behavior change models**

Behavior change models are; (1) Health belief model, (2) the stages of change theory, and (3) the social learning theory and mainly used to enhance health behavior change process and how to most effectively reach to the participants to obtain health behavior change.

(1) Health belief model (HBM): This model was first introduced by a group of social psychologists (1950's) in the United States. HBM's components are perceived

susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. The model suggests that some definite cues to action can trigger exercise behavior when appropriate health beliefs are held. These cues can be internal (feeling pain etc.), or external (a close friend having cancer etc.) (Baban and Craciun, 2007).

(2) Stages of change theory: Developed by Prochaska, DiClemente, and Norcross (1992). Mainly used for smoking cessation and treatment of drug and alcohol addiction (Prochaska, DiClemente, and Norcross, 1992). Basis of the theory is defined as “*health behavior is a process and that individuals are at varying levels of readiness for change*” (ACSM, 2003, p.8). It is a spiral model, individuals move through the stages in response to internal and external factors.

(3) Social learning theory: This theory developed by Bandura (1986) and named it the Social Cognitive theory. Even though its complex nature, the constructs (personal factors, environmental factors, and behavioral factors) are useful in the health promotion setting. The essence is that there is a continual interaction between a person and the environment (ACSM, 2003), and people perform behavior if they believe that they have control over the results. The main component of the model is self-efficacy and means personal sense of control that facilitates behavior change (Baban and Craciun, 2007).

### 2.2.2 Program planning models

This model mainly aims planning toward successful programs that result long-lasting outcomes. There are two models; (1) Precede-Proceed model and (2) Social Marketing model (ACSM, 2003).

(1) Precede-Proceed model: Developed by Green and Kreuter (1999) and requires deep analysis before program planning. Reasons for that are; understanding the population, the environment, the health issues, and the available resources.

(2) Social Marketing model: This model was designed by Kotler and Andreasen (1987). This model is based on the commercial marketing practice, while planning, implementing, and evaluating of the program progresses, individuals are considered (ACSM, 2003).

### **2.3 Transtheoretical Model (TM) and exercise stages of change**

Transtheoretical model (TM) is one of the main stage models in health psychology. TM was developed through different behavioral therapy systems and attempted to determine the structure of change (Prochaska, DiClemente and Norcross, 1994). It had received lots of empirical support over the last 20 years. At the beginning, it was used for smoking cessation and alcoholism treatment. However, at the moment, it has been used for wide variety of health behaviors, including exercise (Riebe et al., 2005). Advantages of the TM are; (1) the general implications for different areas of intervention development and implementation, (2) the model provides sensitive measures of progress (Baban and Craciun, 2007). This model had 3 dimensions; temporal (i.e., stages of change), mechanistic (i.e., self-efficacy, processes of change, decisional balance, and temptation), and contextual (i.e., interrelated levels of psychological problems that may be addressed in treatment (Dannecker et al., 2003).

According to the TM model, people move through a series of stages as they attempt to eliminate unwanted behavior and adopt a desired behavior (Prochaska, DiClemente and Norcross, 1994). People are positioned in one of the five stages: The stage construct is important, because it represents a temporal dimension of exercise behavior. The TM formulates behavioral change as a process involving progress through a series of five stages (Glantz, et al., 1997). The five stages are (Prochaska, DiClemente, and Norcross, 1992);

(1) Pre-contemplation stage: there is no intention to change behavior in the near future by the individuals. Studies revealed that many individuals are unaware or unaware of their problems. For behavioral change pre-contemplators need pressure from others.

(2) Contemplation stage: individuals are aware of the problem and seriously thinking about overcoming it. However, they have not made any commitment to take action. Individuals in this stage intend to change within the next six months. They appear to struggle with their positive evaluations of the problem behavior and the amount of energy, effort.

(3) Preparation stage: individuals combine intentions and behavioral criteria. They are intending to take action in the next month and have unsuccessfully taken action in the past year. This stage is sometimes conceptualized as the early stirrings of the next stage and actually called decision making.

(4) Action stage: individuals modify their behavior, experiences, or environment to overcome their problems. This stage requires considerable commitment of time and energy and also involves behavioral changes. The

modification of the problem behavior receives the most external recognition. Individuals are accepted in this stage if they have successfully changed the problem behavior for a period of from one day to six months.

(5) Maintenance stage: individuals work to prevent relapse and stabilize the gains attained during action. It was viewed as a static stage but is a continuation, not an absence of change. Action stage extends from six months to an indeterminate period past the beginning of the stage and can be considered to last a lifetime period.

The focus of the current study is on exercise stages of change dimensions; therefore following parts of the literature review will address this dimension only. More detailed explanation of the TM and other 2 dimensions (mechanistic and contextual) of TM can be found in Prochaska, DiClemente and Norcross (1994).

### 2.3.1 Exercise Stages of Change

Marcus et al. (1992) conceptualized the five stages of changes for the exercise context as follows: a) pre-contemplation: includes someone who does not exercise and is not planning to start exercising within six months; b) contemplation: describes a person who does not exercise but is planning to start within six months; c) preparation: include a person who is planning to start exercise within one month and has taken some initial steps toward it; d) action: describes a person who has been exercising or less than six months; and e) maintenance: includes a person who has been exercising for six months or more. After the study of Marcus et al. (1992), exercise stages of change have been widely used as the theoretical basis for understanding and changing the lifestyle exercise behavior of individuals (Wakui et al., 2002). Prapavessis et al. (2004) reported three advantages of using the exercise

stages of change in understanding the components of exercise behavior. First, using a stage view could provide interventions to particular motivational needs of individuals in each of the stages. Second advantage was discovering target individuals who were at least likely to act to physical activity programs. Lastly, finding the readiness of an individual could help adopting and maintaining of the exercise program.

### 2.3.2 Exercise stages of change levels of general population

Exercise stages of the changes have been studied with different population (Juniper et al., 2004; Nigg and Corneya, 1998; Prapavessis et al., 2004; Wakui et al., 2002). To date, studies conducted in United States, Canada, Australia, United Kingdom, 15 European Union States, the Netherlands, China, Malaysia, and Japan, and Mexico. A meta-analysis on application of transtheoretical model to exercise by Spencer et al. (2006) stated that United States, Scandinavians, Canadians, and Australians were similar and in upper stages, more Mexican women were in lower stages. Tung et al. (2005) studied the model in 108 primary family caregivers and the majority (65.7%) of caregivers were in the maintenance stage for regular physical activity, the other stages were (PC=20.4%, C=5.6%, A=5.6%, P=2.8%).

Older adults were examined through stages of change questionnaire by Riebe et al. (2005). Majority of the subjects were either in upper stages (M=50.4%, A=4.8%) or lower stages (PC=21.0%, C=5.8%).

Ronda et al. (2001) studied stage of change in Netherlands with an adult sample (M=46 years). Subjects were in precontemplation stage with (29.6%) and other stages were (C=10.4%, P=18.3%, A=10.1%, M=31.6%). Closely related findings in a longitudinal study were found by Plotnikoff et al. (2001) in a Canadian

sample. Participants completed the questionnaire and developed their stages over six months. Subjects were in lower stages and developed slightly their stages (PC=11.4-13.8%, C=29.1-22.3%). However, upper stages improvement was significant (A=8.3-10.4%, M=36.9-41.4%).

In the general population male participants' stages were higher than female. This finding was supported by Umstattd and Hallam (2006). Female participants' stages were lower (PC=10.9%, C=16.3%, P=18.6%, A=17.8%, and M=36.4%) than other general population results.

### 2.3.3 Exercise stages of change levels of university students

Studies examined the exercise stages of change level of university students indicated that most of students were in lower stages (pre-contemplation, contemplation and preparation) (Cardinal et al., 2004; Juniper et al., 2004; Keating et al., 2005b; Wakui et al., 2002; Wallace et al., 2000). College sample (under 28 years) was studied by Zizzi, Keeler, and Watson (2006). Subjects of the study were assigned across the five stages respectively for male and female: precontemplation (6.8%); contemplation (4.9%); preparation (26.2%); action (23.8%); and maintenance (38.3%). However, recent literature shows that male students were in higher stages as compared to stages of female students (Wakui et al., 2002; Wallace et al., 2000).

A related finding was found in the study of Suminski and Petosa (2002). More male students were in upper stages (A=12.5%, M=25.0%) than female students (A=13.6%, M=16.0%). In addition to that, females were in lower stages (PC=16.0%, C=20.5%) when comparing males' stages (PC=2.9%, C=14.8%).

Daley and Duda (2006) explored 409 (158 men, 251 women) undergraduates aged 18–30 years. Students' intention about exercise was 18.4% which is the total number of students in the first two stages (precontemplation, contemplation). The upper stages which are related to exercise behavior of students (male versus female) were close to other findings' results. Female subjects were in upper stages with 53.2% (A=22.8%), males were 69.1% (A=28.3%). Summary of the other studies examining university students is presented in table 2.

## **2.4 Physical activity preferences**

Physical activity preferences may be influenced by the contextual factors in the living environment such as most popular sports, access to facilities, perceived talent and competency, social and cultural environments (Tsai and Coleman, 2007) and perceived need to a certain activity (Hildebrand and Johnson, 2001).

Previous studies indicated differences in the exercise preferences of male and female participants, and different ethnicities. Greenwood and Stillwell (2001) indicated that female adolescent students more frequently preferred swimming, basketball, and volleyball, while male students preferred basketball, swimming, cycling, and wrestling. Dowda et al. (2003) examined the correlates of physical activity among United States young adults (18-30 years old), and found that dancing was preferred more by female participants while weight lifting preferred more by male participants. According to this study walking, jogging and gardening are preferred with both gender. In addition, basketball was more preferred by black

males', ethnic dances was preferred more with male Mexican Americans compared to white population with regard to ethnicity.

There is a lack of knowledge about the physical activity preferences of Turkish population. Examining of the university students exercise preference may help in selecting appropriate strategies for facility development and intervention studies.

Table 2. Recent studies on the exercise stages of changes of university students.

<b>Author (year)</b>	<b>Participants</b>	<b>Data collection instruments</b>	<b>Findings</b>
Juniper et al. (2004)	233 African-American college students	Stages of Exercise Change Questionnaire	Pre-contemplation (3.9%), Contemplation (18.0%), Preparation (32.2%), Action (18.0%), and Maintenance (27.9%). Total inactive students were 21.9 %.
Cardinal et al. (2004)	169 American and 168 Finnish college students	Stages of Exercise Change Questionnaire	<u>Finnish</u> -Pre-contemplation (4.8%), Contemplation (33.2%), Preparation (9.1%), Action (13.3%), and Maintenance (52.7%). <u>American</u> - Pre-contemplation (4.2%), Contemplation (7.8%), Preparation (12.6%), Action (26.3%), and Maintenance (49.1%).
Keating et al. (2005b)	1843 university students (55.3% male and 44.7% female)	Stages of Exercise Change Questionnaire	Pre-contemplation (38.2%), Contemplation (9.8%), Preparation (20.1%), Action (10.6%), and Maintenance (17.3%).
Wakui et al. (2002)	450 Japanese female university students	Stages of Exercise Change Questionnaire	Pre-contemplation (24.7%), Contemplation (26.7%), Preparation (39.3%), Action (3.8%), and Maintenance (5.6%).
Wallace et al. (2000)	937 university students	Stages of Exercise Change Questionnaire	Pre-contemplation (7.2%), Contemplation (24.8%), Preparation (19.9), Action (17.2%), and Maintenance (30.9%) * (17-24 years old)

## **CHAPTER III**

### **METHOD**

This chapter includes information about the study design and sampling, participants, data collection instruments, data collection procedures, and data analysis.

#### **3.1 Design and sampling**

Survey method was used in this study. Participants were selected by stratified sampling method based on the total number of students in each faculty except the students who had foreign nationality. Reason for the elimination of the students who had a foreign nationality was the use of Turkish version of the questionnaires. Total number of Turkish undergraduate students of the five different faculties (education, arts and sciences, engineering, architecture, economic and administrative sciences) was obtained from the student affairs of the university. According to these data, there were 11,621 undergraduate students (7,288 males, 4,333 females) at the time of the study. Distribution of the students to each faculty was as follows: Faculty of Education= 1,496 students (589 males, 907 females), Faculty of Arts and Sciences= 1,974 students (1,054 males, 920 females), Faculty of Engineering= 5,907 students (4,597 males, 1,310 females), Faculty of Architecture= 608 students (218 males, 390 females), and Faculty of Economic and Administrative Sciences= 1,636 students (830 males, 806 females). After approval of the research protocol by METU Graduate

School of Social Sciences, the author visited each faculty, and identified the convenient classes according to the class schedule. While selecting the classes, representation of freshman, junior, senior, and sophomore students were considered. The aim was reaching to the 10% of the undergraduate student population of each faculty.

### **3.2 Participants**

Participants of this study were 953 METU undergraduate students (8.2% of total undergraduate student population) who were studying in 2005-2006 fall semester. The mean age of the participants was  $21.3 \pm 1.9$  years. 379 of the participants were living in campus (39.8%) while 574 of them were living out of the campus (60.2%). Distributions of the participants based on their faculties, gender, and years (1. freshman, 2. junior, 3. senior, 4. sophomore) in the university are presented in Table 3.

Table 3. Distribution of the participants based on faculty, gender, and years in the university (percentages indicates the representation rate of the related population) (N=11,621).

Variables	Faculties n (%)					Total
	Educ.	Engine.	Econ & Admin. Sciences	Architec .	Arts and Sciences	
Gender						
Male	95 (10.4)	200 (4.4)	80 (9.6)	25 (11.5)	96 (10.4)	496 (6.4)
Female	132 (22.4)	81 (6.2)	80 (9.9)	39 (10.0)	125 (11.9)	457 (9.5)
Years 1	62 (16.6)	111 (8.6)	33 (6.9)	7 (4.7)	52 (9.9)	265 (8.7)
2	64 (17.6)	88 (6.0)	48 (12.6)	22 (15.4)	66 (13.4)	288 (9.0)
3	53 (15.5)	22 (1.6)	39 (10.5)	14 (10.1)	42 (9.3)	170 (5.7)
4	48 (14.0)	60 (3.4)	40 (9.6)	21 (11.9)	61 (12.1)	230 (7.0)

### 3.3 Data collection instruments

In the present study, three data collection instruments, (1) International Physical Activity Questionnaire-Short Form (IPAQ), (2) Physical Activity Stages of Change Questionnaire (PASCQ), and (3) Physical Activity preference checklist were used (See Appendix F).

#### 3.3.1 International physical activity questionnaire

IPAQ is a validated instrument to determine the participants' physical activity level (Craig et al., 2003). IPAQ measures the frequency, duration, and level of intensity of physical activity in the last seven days across all contexts and allows for the calculation of metabolic equivalents (MET). MET represents the weekly amount of physical activity. It is a product of frequency, duration, and intensity of the physical activity performed in the last seven days. Physical activity related METs as hours per week (MET-hours/week) were calculated according to the existing guidelines (IPAQ, 2005). Based on the self-reported MET, frequency and intensity of

the physical activity, people can be classified into a low, moderate and high level of physical activity group (Appendix E).

Low (sedentary, inactive) group included the participants who reported lower than 600 MET-min/week of exercise participation, moderate level of physical activity group included the participants who reported 601-3000 MET-min/week of exercise participation, and physically active group (high, recommended level) included the participants who reported more than 3000 MET-min/week of exercise participation.

In this study, participants' PA level was evaluated through Turkish short version of IPAQ (Öztürk, 2005). Translation and validation study of Turkish version for the university students indicated an evidence for construct validity, criterion validity (accelerometer-IPAQ short form) ( $r=0.30$ ), and test-retest reliability ( $r=0.69$ ) (Öztürk, 2005).

### 3.3.2 Physical activity stages of change questionnaire

Exercise stages of change were evaluated by an adapted version of PASCQ (Marcus et al., 1992; Marcus and Lewis, 2003). PASCQ is a binary type (yes/no) questionnaire. Participants answer each question related to their physical activity participation as “yes” or “no”. Based on their responses, they classified in five different stages by using a scoring algorithm.

A translated version of PASCQ to Turkish was used in this study (Appendix D). Two independent translators translated the English version of PASCQ into Turkish. After having a consensus on each item, another translator performed the back translation of the questionnaire into English, in order to check the translation quality into Turkish. Then, the final Turkish version of the questionnaire was

prepared. After that, questionnaire was applied to 10 university students for face validity. Participants of face validity checked the item clearness. In addition, Turkish version was applied to 23 university students for test-retest reliability. There was two weeks of interval between the test and retest sessions. Test-retest reliability of the Turkish version was high ( $ICC=0.80$ ).

### 3.3.3 Physical activity preferences

In order to determine the physical activity preferences of the participants, a physical activity list including 36 different exercises or sports was given to the participants. They selected the activities that they preferred to participate. Participants had a chance of selecting more than one activity. They were also free to include other physical activities if they did not exist in the given list (Appendix F)

## 3.4 Data collection procedures

Following the approval of the study by METU Graduate School of Social Sciences, the author contacted with the instructors of each selected class for the convenient time to apply questionnaire. Questionnaires were administrated prior or at the end of the class. Before applying the questionnaire, participants were informed about the study, and their informed consents were taken. Then, the participants completed the questionnaire and returned to the author.

## 3.5 Data analysis

Two types of statistical analysis, descriptive and inferential, were performed in this study. Descriptive statistics were used to describe the basic features of the

research. The descriptive approach involved frequencies, percentages and cross-tabulation.

The inferential statistics used in this study was nonparametric methods; Mann Whitney *U*, Kruskal-Wallis test, and Pearson chi-square. There were two conditions that necessitated the use of nonparametric statistics in this study. First condition was the unequal variances between groups (e.g. in physical activity level), and second was the presence of nominal data (e.g. exercise stages of change levels).

More specifically, physical activity level difference with regard to gender, and residence Mann Whitney *U* test was used. Kruskal-Wallis test was used to analyze physical activity level differences with regard to different faculties.

Analyses of exercise stages of changes with regard to gender, residence and faculty were performed using the Pearson chi-square test. Analysis of physical activity preferences with regard to gender and residence were examined using descriptive statistical methods (frequency and percentage).

Statistical Package for the Social Sciences (SPSS, version 15.0) was used for all the analysis.

## CHAPTER IV

### RESULTS

International Physical Activity Questionnaire (IPAQ), Physical Activity Stages of Change Questionnaire (PASCQ) and Physical Activity Preferences Questionnaire were administered to 953 METU undergraduate students. Descriptive statistics and nonparametric statistical methods were used for the data analysis where appropriate. Results for each research question are presented below.

**4.1 Research question 1.** Is there a difference in the “Physical Activity Levels” of METU undergraduate students in terms of (a) gender, (b) residence, and (c) faculty?

#### 4.1.1 Gender and physical activity level

Mann-Whitney *U* test revealed that there were significant differences in the physical activity levels of students with respect to gender (Table 4). Male students’ physical activity level was higher than the female counterparts. The results of descriptive statistics (mean, standard deviation and median) are presented in Table 5.

Table 4. The results of the Mann-Whitney *U* test for physical activity in terms of gender.

Mann-Whitney <i>U</i> Test							
	Gender	n	Mean rank	Sum of ranks	U	z	p
IPAQ (MET- min/week)	Male	445	453.70	201896.5	80678.5	-3.038	0.002*
	Female	412	402.32	165756.5			

\* Significant difference (p< 0.05)

Table 5. Physical activity levels (MET) in terms of gender.

Variable		Mean	SD	Median
Physical activity level (MET- min/week)	Male (n=445)	2388.2	1999.9	1752.0
	Female (n=412)	2241.0	2725.7	1386.0
	Overall (n=857)	2317.5	2376.4	1422.0

Categorized physical activity levels of the participants in terms of gender according to the IPAQ classification (See Appendix E) as low, moderate and high are presented in Table 6.

Table 6. Categorized physical activity levels in terms of gender

		Categories f (%)		
Variable	Gender	Low	Moderate	High
Physical activity level	Male (n=445)	57 (12.8)	268 (60.2)	120 (26.9)
	Female (n=412)	74 (17.9)	245 (59.5)	93 (22.6)
	Overall (n=857)	131 (15.3)	513 (59.9)	213 (24.8)

#### 4.1.2 Residence and physical activity level

Mann-Whitney *U* test indicated a significant difference in the physical activity levels of the students who were living in and out of campus (Table 7). Students who were living in campus were more physically active than the students who were living out of campus. Descriptive statistics (mean, standard deviation and median) are presented in Table 8.

Table 7. The results of the Mann-Whitney *U* test for physical activity levels (MET) with respect to residence.

Mann-Whitney <i>U</i> Test							
	Residence	n	Mean rank	Sum of ranks	U	z	p
IPAQ (MET- min/week)	In campus	338	463.25	156579.5	76133.5	-2.371	0.001*
	Out of campus	519	406.69	211073.5			

\* Significant difference ( $p < 0.05$ )

Table 8. Physical activity levels (MET) in terms of residence.

Variable	Residence	Mean	SD	Median
Physical activity level (MET- min/week)	In campus (n=338)	2469.0	2117.5	1776.0
	Out of campus (n=519)	2218.8	2527.9	1386.0
	Overall (n=857)	2317.5	2376.4	1422.0

Categorized physical activity levels of the participants in terms of residence according to the IPAQ classification (See Appendix E) as low, moderate and high are presented in Table 9.

Table 9. Categorized physical activity levels in terms of residence.

Variable	Residence	Categories f (%)		
		Low	Moderate	High
Physical activity level	In campus (n=338)	38 (11.2)	204 (60.4)	96 (28.4)
	Out of campus (n=519)	93 (17.9)	309 (59.5)	117 (22.5)
	Overall (n=857)	131 (15.3)	513 (59.9)	213 (24.8)

#### 4.1.3 Faculty and physical activity level

Kruskal-Wallis Test was conducted to evaluate differences between the faculties with respect to physical activity levels. The results indicated a significant difference in physical activity levels of the students from different faculties,  $X^2 (4, n=857)=15.6$ ,  $p=0.004$ , (Table, 10). Students of the faculty of architecture had a lower physical activity level than the other faculties. Descriptive statistics (mean, standard deviation and median) are presented in Table 11.

Table 10. The results of Kruskal-Wallis  $H$  test for physical activity levels (MET) with respect to faculties.

Kruskal-Wallis $H$ Test					
Faculty	n	Mean Rank	df	$\chi^2$	p
Education	204	453.00	4	15.6	0.004*
Engineering	247	437.03			
Econ & Admin. Sciences	149	414.47			
Architecture	59	314.84			
Arts And Science	198	439.21			

\* Significant difference ( $p < 0.05$ )

Table 11. Physical activity levels (MET) in terms of the studied faculty.

Variable	Faculty	Mean	SD	Median
Physical activity level (MET-min/week)	Education (n=204)	2363.0	1923.0	1764.8
	Engineering (n=247)	2294.9	2173.6	1666.0
	Econ & Admin. Sciences (n=149)	2253.2	2829.7	1386.0
	Architecture (n=59)	1720.1	2026.7	990.0
	Arts And Science (n=198)	2525.1	2728.8	1408.5
	Overall (n=857)	2317.5	2376.4	1422.0

Categorized physical activity levels of the participants in terms of faculty according to the IPAQ classification (See Appendix E) as low, moderate and high are presented in Table 12.

Table 12. Categorized physical activity levels in terms of faculty.

Variable	Faculty	Categories f (%)		
		Low	Moderate	High
Physical activity level	Education (n=204)	29 (14.2)	121 (58.8)	54 (26.5)
	Engineering (n=247)	36 (14.6)	152 (61.5)	59 (23.9)
	Econ & Admin. Sciences (n=149)	16 (10.7)	99 (66.4)	34 (22.8)
	Architecture (n=59)	20 (33.9)	29 (49.2)	10 (16.9)
	Arts And Science (n=198)	30 (15.2)	112 (56.6)	56 (28.3)
	Overall (n=857)	131 (15.3)	513 (59.9)	213 (24.8)

**4.2 Research question 2.** Is there a difference in the “exercise stage of change levels” of METU undergraduate students in terms of (a) gender, (b) residence, and faculty?

#### 4.2.1 Gender and exercise stages of change level

Chi-square analysis indicated that there were significant differences in the stages of exercise change levels with respect to gender of students,  $X^2(4, n=953) = 27.98, p < 0.05$ . Descriptive statistics (frequency and percentages) are presented in Table 13. Central tendency statistics revealed that a higher percentage of male students was at maintenance stage than those of female students. The most of the students were at lower stages, namely pre-contemplation, contemplation and preparation stages, regardless of their gender.

Table 13. Stages of exercise change (SEC) levels based on gender

SEC levels	Gender		
	Male f (%)	Female f (%)	Overall f (%)
Pre-contemplation	91 (18.3)	54 (11.8)	145 (15.2)
Contemplation	135 (27.2)	165 (36.1)	300 (31.4)
Preparation	109 (22.0)	132 (28.9)	241 (25.3)
Taking Action	36 (7.3)	35 (7.6)	71 (7.5)
Maintenance	125 (25.2)	71 (15.6)	196 (20.6)

#### 4.2.2 Residence and exercise stages of change level

Chi-square analysis indicated that there were no significant difference in the stages of exercise change levels with respect to residence of students,  $X^2(4, N=953) = 3.99, p > 0.05$ . Descriptive statistics (frequency and percentages) are presented in Table 14.

Table 14. Stages of exercise change (SEC) levels and residence.

SEC levels	Residence		
	In campus f (%)	Out of campus f (%)	Overall f (%)
Pre-contemplation	65 (17.2)	80 (13.9)	145 (15.2)
Contemplation	109 (28.8)	191 (33.2)	300 (31.4)
Preparation	102 (26.9)	139 (24.2)	241 (25.3)
Taking Action	26 (6.9)	45 (7.8)	71 (7.5)
Maintenance	77 (20.3)	119 (20.7)	196 (20.6)

#### 4.2.3 Faculty and exercise stages of change level

Chi-square analysis indicated that there were significant difference in the stages of exercise change levels with respect to faculties,  $X^2 (16, n=953) = 31.90, p < 0.05$ . Descriptive statistics (frequency and percentages) are presented in Table 15. Results indicated that most of the students were at lower stages of the exercise stage of changes regardless of the studied faculty. However, this finding was more pronouncing in the faculty of architecture students as compared the other faculty students.

Table 15. Stages of exercise change (SEC) levels of students from different faculties.

Faculties	Stages				
	PC* f (%)	C* f (%)	P* f (%)	TA* f (%)	M* f (%)
Education	43 (18.9)	59 (26.0)	51 (22.5)	23 (10.1)	51 (22.5)
Engineering	41 (14.6)	97 (34.5)	72 (25.6)	19 (6.8)	52 (18.5)
Econ. & Adm. Sciences	25 (15.6)	44 (27.5)	49 (30.6)	10 (6.3)	32 (20.0)
Architecture	8 (12.5)	35 (54.7)	12 (18.8)	2 (3.1)	7 (10.9)
Arts and Science	28 (12.7)	65 (29.4)	57 (25.8)	17 (7.7)	54 (24.4)
Overall	145 (15.2)	300 (31.4)	241 (25.3)	71 (7.5)	196 (20.6)

\*PC = Pre-contemplation, \*C= Contemplation, \*P= Preparation, \*TA= Taking Action, \*M= Maintenance

**4.3 Research question 3.** What are the physical activity preferences of METU undergraduate students in terms of gender and residence?

#### 4.3.1 Gender and physical activity preferences

According to the findings, male students five frequently marked physical activity preferences were swimming (56.4%), soccer (55.8%), walking (45.2%), basketball (35.9%), and cycling (32.6%). The five most frequently marked physical activity preferences of the female students were walking (68.2%), swimming (62.0%), dancing (47.5%), cycling (39.8%), and tennis (32.0%). Other preferred physical activity frequencies and percentages are presented in Table 16.

#### 4.3.2 Residence and physical activity preferences

Living in campus or out of campus did not change the most frequently marked physical activity preferences. The first five most frequently marked physical activities by the in campus inhabitants were walking (58.0%), swimming (59.2%), cycling (33.8%), soccer (31.4%), and dancing (29.1%). The order for the out of campus inhabitants were swimming (61.7%), walking (55.7%), cycling (38.6%), dancing (30.1%), and soccer (29.4%). Other preferred physical activity frequencies and percentages are presented in Table 16.

Table 16. Physical activity preferences of students based on gender and residence.

	Gender f (%)				Residence f (%)				Overall %
	Male		Female		In campus		Out campus		
Swimming	280	(56.4)	284	(62.0)	210	(55.4)	354	(61.7)	(59.2)
Walking	224	(45.2)	316	(68.2)	220	(58.0)	320	(55.7)	(56.7)
Cycling	163	(32.6)	182	(39.8)	128	(33.8)	217	(38.6)	(36.2)
Soccer	277	(55.8)	13	(2.9)	119	(31.4)	171	(29.4)	(30.4)
Dancing	58	(11.7)	224	(47.5)	110	(29.1)	172	(30.1)	(29.6)
Tennis	97	(19.6)	149	(32.0)	104	(27.5)	142	(24.1)	(25.8)
Basketball	178	(35.9)	61	(14.3)	103	(27.2)	133	(23.0)	(25.1)
Volleyball	91	(18.3)	135	(29.1)	89	(23.5)	137	(23.9)	(23.7)
Table tennis	159	(32.1)	64	(14.7)	96	(25.3)	127	(21.5)	(23.4)
Billiard	135	(27.2)	49	(11.4)	80	(21.2)	104	(17.4)	(19.3)
Body-building	124	(25.0)	18	(4.8)	58	(15.3)	84	(14.5)	(14.9)
Bowling	72	(14.5)	69	(15.1)	50	(13.2)	91	(16.4)	(14.8)
Ice-skating	28	(5.6)	56	(12.0)	31	(8.2)	53	(9.4)	(8.8)
Aerobic	8	(1.6)	69	(14.6)	25	(6.6)	52	(9.6)	(8.1)
Gymnastic	20	(4.0)	52	(11.2)	25	(6.6)	47	(8.6)	(7.6)
Mountain clim.	35	(7.2)	33	(7.0)	28	(7.4)	40	(6.8)	(7.1)
Track & field	45	(9.1)	13	(3.1)	27	(7.1)	31	(5.1)	(6.1)
Yoga	15	(3.0)	41	(8.8)	22	(5.8)	34	(6.0)	(5.9)
Skiing	23	(4.6)	31	(6.8)	19	(5.0)	35	(6.4)	(5.7)
Badminton	11	(2.2)	30	(6.4)	17	(4.5)	24	(4.1)	(4.3)
Boxing	32	(6.4)	5	(1.4)	17	(4.5)	20	(3.3)	(3.9)
Archery	19	(3.8)	18	(4.0)	21	(5.5)	16	(2.3)	(3.9)
Wrestling	32	(6.4)	2	(0.8)	11	(2.9)	23	(4.3)	(3.6)
Teakwondo	25	(5.0)	6	(1.6)	11	(2.9)	20	(3.7)	(3.3)
Weight lifting	29	(5.8)	0	-	8	(2.1)	21	(3.9)	(3.0)
Aikido	21	(4.0)	6	(1.6)	10	(2.6)	17	(3.0)	(2.8)
Rowing	17	(3.4)	10	(2.2)	11	(2.9)	16	(2.7)	(2.8)
Karate	16	(3.2)	7	(1.6)	10	(2.6)	13	(2.2)	(2.4)
Judo	15	(3.0)	2	(0.6)	4	(1.1)	13	(2.5)	(1.8)
Fencing	4	(0.8)	7	(1.6)	6	(1.6)	5	(0.8)	(1.2)
Baseball	6	(1.2)	4	(0.8)	4	(1.1)	6	(0.9)	(1.0)
Handball	5	(1.0)	5	(1.4)	3	(0.8)	7	(1.2)	(1.0)
Amer.Football	8	(1.6)	1	(0.2)	5	(1.3)	4	(0.5)	(0.9)
Golf	4	(0.8)	1	(0.2)	3	(0.8)	2	(0.2)	(0.5)
Ice-hockey	3	(0.8)	1	(0.2)	2	(0.3)	2	(0.2)	(0.4)
Triathlon	1	(0.2)	0	-	1	(0.2)	0	-	(0.1)

## **CHAPTER V**

### **DISCUSSION**

The purpose of this study was to determine the (1) PA levels, (2) exercise stages of change levels, and (3) PA preferences of the METU undergraduate students with respect to gender, residence, and faculty. In this chapter, firstly sample representativeness, and then the findings of each research question are discussed.

#### **5.1 Representativeness of the sample**

Total number of participants of this study (n=953) was 8.2% of the university undergraduate students population (N=11,621). Considering the university male and female population ratio (male=62.7%, female=37.3%), female students were over represented within the sample (male=6.4%, female=9.5%). Male and female students from all faculties were represented more than 9.6%, except faculty of engineering students. It was 4.4% for male, and 6.2% for female faculty of engineering students. Female students from the faculty of education were over represented (22.9%) within the sample.

379 of the participants were living in campus (39.75) while 574 of them were living out of the campus (60.2%). All years (1. freshman, 2. junior, 3. senior and 4. sophomore) from each faculty were within the sample. Third (1.6%) and 4<sup>th</sup> (3.4%) years students from the faculty of engineering were represented with lower

percentages compared to 1<sup>st</sup> and 2<sup>nd</sup> year students of the same faculty, and compared to the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> years students percentages of other faculties within the sample.

The reason for deviation from the 10% in some of the subgroups was the sampling process, selection of the classes instead of students, used in this study. Some selected classes included high number of students (e.g. 100), some classes included low number of students (e.g. 12). Smaller class numbers were especially the case for upper years. Within these limitations the sample was representing the METU undergraduate student population.

**5.2 Research question 1.** Is there a difference in the “Physical Activity Levels” of METU undergraduate students in terms of (a) gender, (b) residence, and (c) faculty?

#### 5.2.1 Gender and physical activity level

Findings of the present study indicated that physical activity levels of the male university students were significantly higher than those of the female students. Analyses of the categorized physical activity levels (physically inactive, moderately active, and physically active) revealed that most of the students were cumulated into the moderately active part, regardless of the gender (male 60.2% versus female 59.5%). Furthermore, more male participants were in the physically active group (male 26.9% versus female 22.6%), while more female students were in physically inactive group (male 12.8% versus female 17.9%).

These results were consistent with the previous studies demonstrating lower physical activity level in female university students as compared to those of male students in other countries including United States (Buckworth and Nigg, 2004; Douglas et al., 1997), European countries (Steptoe et al., 1997), and in Turkey (Savcı et al., 2006). However, the findings of Savcı et al. (2006), describing the Turkish university students, were limited to medical subject students from one university. The current study demonstrated that female students had lower physical activity levels, by representing the whole university population in METU context.

Even though the male students' physical activity levels were higher than the female students' physical activity level in this study, only 26.9% of them were physically active at the recommended level in ACSM guideline (2000). Therefore, low physical activity level was not a problem only for the females but also for the males. This finding was parallel with the previous studies mentioning the low physical activity habits in general university population (Douglas et al., 1997; Keating et al., 2005a; Steptoe et al., 1997).

#### 5.2.2 Residence and physical activity level

According to the results, students who were living in campus had higher physical activity level than those who were living out of the campus. Categorized physical activity levels indicated that students who were living in campus had more high-level physical activity and less inactivity levels than those who were living out of campus. The university context in the current study had rich physical activity facilities, extracurricular programs (offered by the university directory of sport), and

elective physical activity course alternatives (offered by physical education and sports department).

Based on the finding of the current study, it could be argued that living in campus had a positive influence on eliminating some of the perceived barriers to physical activity, for example lack of time, low access to physical facilities/extracurricular programs (transportation problem), and non supportive social environment, that were reported by previous studies (Daşkapan et al., 2006; Gyurcsik et al., 2006; Koçak, 2005). Further studies should focus on this mechanism.

### 5.2.3 Faculty and physical activity level

Analysis of the physical activity level based on the studied faculty indicated that faculty of architecture students had lower levels than other faculties. More than 33% of faculty of architecture students reported sedentary physical activity behavior, and only 16.9% of them were physically active at the recommended level (ACSM, 2000). To author's knowledge, there were no study in the literature examining the faculty based student activity differences previously. Current study presented evidence for physical activity level differences with respect to the studied faculty.

Reasons for lower physical activity level in faculty of architecture students can be explained with the educational context that the students were studying. Therefore, there is a need for further studies examining the ecology of this faculty that caused sedentary behaviors in the students. Especially, students' academic workloads should be considered as a variable in future studies (Gyurcsik et al., 2006; Koçak, 2005).

**5.3 Research question 2.** Is there a difference in the “exercise stage of change levels” of METU undergraduate students in terms of (a) gender, (b) residence, and faculty?

#### 5.3.1 Gender and exercise stages of change level

Findings demonstrated a significant difference between male and female students in exercise stages of change levels. Analysis of the central tendency statistics indicated that male students’ percentages in the maintenance stage (25.2%) were higher than those of female students’ (15.6%). However, the female students’ percentages in the lower levels of exercise stages of change, namely, pre-contemplation, contemplation, and preparation (76.8%) were higher than those of male students (67.5%). The difference, in the stages, in favor of male students was consistent with the findings of Wallace et al. (2000).

Considering the meaning of each step of exercise stages of change (pre-contemplation: no intention to exercise; contemplation: intention to exercise but has not started yet; preparation: has an intention, and planning to start exercise within one month; taking action: exercising less than six months, and maintenance: exercising for sixth months or more) (Marcus et al., 1992), most of the students had an intention to participate physical activity but have not started yet (overall percentages of students in contemplation and preparation: % 56.7), regardless of gender difference in the current study.

In two previous studies, higher ratios of students with no intention to exercise were reported in a mixed gender student sample from Chinese universities (38.3%) (Keating et al., 2005b) and in a female student sample from a Japan university (24.7%) (Wakui et al., 2002). This study findings indicated a lower percentage of students with no intention to exercise in a Turkish sample (male: 18.3%, female 11.8%, overall: 15.2%).

#### 5.3.2 Residence and exercise stages of change level

The results did not indicate a significant difference in the exercise stages of change levels of students who were living in or out of campus. Twenty seven percent of the students who were living in campus and 28.5% of the students who were living out of the campus were at the higher stages (taking action and maintenance). Seventy three percent of the students who were living in campus and 71.3% of the students who were living out of the campus were at lower stages.

Considering the higher percentage of physical activity levels of students who were living in campus (28.4%) compared to those of the students living out of the campus (22.5%), it would be expected that a lower percentage of in campus inhabitants (approximately 6%) should have been in the taking action and maintenance stage. However, current data on the exercise stages of change did not support this argument. There is a need for further research to clarify this conflict.

#### 5.3.3 Faculty and exercise stages of change level

According to the findings there was a significant difference in exercise stages of change levels of students with respect to studied faculty. Central tendency analysis

demonstrated that 86% of the faculty of architecture students was in the lower stages, and only 14% of them were in taking action and maintenance level. This result was parallel to low physical activity level finding of this group with respect to students in other faculties in the previous research question. Therefore, there is a need for further research on the reasons for the sedentary behavior of these students.

**5.4 Research question 3.** What are the physical activity preferences of METU undergraduate students in terms of gender and residence?

#### 5.4.1 Gender and physical activity preferences

Analysis indicated that swimming (56.4%), soccer (55.8%), walking (45.2%), basketball (35.9%), and cycling (32.6%) were the most frequently preferred exercises by male students. The order of most frequently preferred exercises by female students was walking (68.2%), swimming (62.0%), dancing (47.5%), cycling (39.8%), and tennis (32.0%).

Male students' preference of football and basketball and female students' preference of dancing and tennis indicate the popularity of these sports for each gender. However, preference of swimming, walking, and cycling with both male and female students demonstrated that these sports were valued by both sex.

Participants' enjoyment and positive socialization has been proposed as an important variable for attending physical activities regularly (Nahas et al., 2003). Therefore, these gender specific preferences can be a good guide for the future physical activity intervention studies. In addition, extracurricular programs and

physical activity courses offered within the universities may be prepared based on these preferences. Developing the campus facilities and improving the access to these facilities, based on the preferences of the students, may increase their exercise stages of change level to higher stages.

#### 5.4.2 Residence and physical activity preferences

According to the findings, living in or out of campus did not influence the most frequently preferred physical activities. Students from both samples most frequently preferred the walking, swimming, soccer, cycling, and dancing exercises. These results implied that gender was more influential on preferred physical activities rather than residence.

## **CHAPTER VI**

### **CONCLUSIONS AND RECOMMENDATIONS**

This research examined the physical activity level and exercise stages of change levels of the 953 METU undergraduate students with respect to gender, residence, and faculties. In addition, physical activity preferences of the participants were analyzed based on the gender and residence. Following conclusions and recommendations for future studies were done based on the study findings.

#### **6.1 Conclusions**

**6.1.1 Research question 1.** Is there a difference in the “Physical Activity Levels” of METU undergraduate students in terms of (a) gender, (b) residence, and (c) faculty?”

Examination of the data revealed significant differences with respect to gender, residence, and faculties. Male students were more physically active than female counterparts. Students who were living in campus had higher physical activity levels, and faculty of architecture students were more sedentary compared to other faculty students. Furthermore, findings indicated that most of the METU undergraduate students were moderately active. They need to increase their physical activity level for a healthy lifestyle.

**6.1.2 Research question 2.** Is there a difference in the “exercise stages of change levels” of METU undergraduate students in terms of (a) gender, (b) residence, and faculty?

The results indicated that there was a significant difference in the exercise stages of change levels of male and female students. Percentages of the male students at the upper stages (taking action and maintenance) were higher while the percentages of female students in the lower stages (pre-contemplation, contemplation, and preparation) were higher. Living in or out of the university campus did not influence the exercise stages of change levels of the students. More faculty of architecture students were at the lower stages of exercise stages of change as compared the other faculty students. As a whole, most of the students were at contemplation and preparation stages. In other words, they had an intention to exercise.

**6.1.3 Research question 3.** What are the physical activity preferences of METU undergraduate students in terms of gender and residence?

Most frequently preferred exercises by male students were swimming, soccer, walking, basketball, and cycling. Female students preferred walking, swimming, dancing, cycling, and tennis. Living in or out of the campus did not change the exercise preferences. Walking, swimming, football, cycling, and dancing were within the most preferred exercises by both students who were living in or out of the campus. Determinants of physical activity preferences should be questioned in detail

to understand the underlying reasons. Moreover, this would provide strategies to design and increase in physical activity participation.

## **6.2 Recommendations**

The following recommendations for future studies would enhance current knowledge toward increasing the physical activity and exercise stages of change levels of university students:

1. There is a need for increasing regular physical activity participation of the university students. Especially, female students, students who live out of the campus and the students of faculty of architecture are at more risk. Physical activity interventions through the courses offered by physical education and sport departments and the extracurricular exercise programs offered by the university directory of sport should focus on the needs of these groups.
2. Stage based exercise intervention programs should be prepared based on the students exercise stages of change level. Most of the students were at contemplation and preparation stages. Therefore, intervention programs should focus on increasing personal awareness on the value of physical activity, improving personal attitudes and practices toward physical activity, learning personal health related fitness characteristics, keeping physical activity record, increasing self efficacy, and improving social support.

3. Intervention programs should prefer swimming, walking, football, dancing, cycling, basketball, and tennis to increase the student motivation toward participation.
4. University physical activity facilities should be reconsidered in terms of the student access, quality of the facilities, trainers' and instructors' knowledge, and students' physical activity preferences. The influence of physical environment
5. Replication of this study in other universities will provide the generalization of the findings in other university contexts.
6. Reason for the low physical activity level of faculty of architecture students should be examined in detail with qualitative research methods.
7. Further studies should focus on the effectiveness of interventions in improving the health related fitness characteristics, and health promotion behavior of university students.
8. Future studies should identify the determinants of physical activities and sedentary exercise behaviors in the context of university and daily living environment. Physical activity preference literature is still based on cross-sectional studies, longitudinal and intervention studies in this area are needed.

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## APPENDICES

### APPENDIX A



Orta Doğu Teknik Üniversitesi  
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03.05.2006

B.30.2.ODT.0.36.00.00/211/06- 384

Anket Uygulaması

#### REKTÖRLÜK MAKAMINA,

Fakültemiz Beden Eğitimi ve Spor Bölümü Yüksek Lisans öğrencilerinden 103371-1 no'lu Cevdet CENGİZ'in tez çalışması için "Uluslararası Fiziksel Aktivite Formu ve Fiziksel Aktiviteye Katılım Durumu" anketlerini üniversitemiz fakültelerinde okuyan lisans öğrencilerine uygulamak istemektedir.

Üniversitemiz Fakültelerinden gerekli iznin alınması hususunda gereği için bilgilerinize arz ederim.

Saygılarımla.

  
Prof. Dr. Meral AKSU  
Eğitim Fakültesi Dekanı

EK: Bölüm Başkanlığı yazısı  
Dilekçe  
Anket örneği



20 315 315 sy

## APPENDIX B



Orta Doğu Teknik Üniversitesi  
Middle East Technical University

Eğitim Fakültesi  
Faculty of Education

Beden Eğitimi ve Spor Bölümü  
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Sayı: BESB/2006/107

01.05.2006

Konu:

### EĞİTİM FAKÜLTESİ DEKANLIĞINA,

Bölümümüz Yüksek Lisans öğrencilerinden 103371-1 no'lu Cevdet Cengiz'in tez çalışması için "Uluslararası Fiziksel Aktivite Formu ve Fiziksel Aktiviteye Katılım Durumu" anketlerini üniversitemiz fakültelerinde okuyan lisans öğrencilerine uygulamak istemektedir. Üniversitemiz Fakültelerinin bölümlerinde okuyan öğrencilere uygulanabilmesi için gerekli iznin alınması konusunda gereğini bilgilerinize arz ederim.

Saygılarımla.

Doç.Dr.M. Sertan KOÇAK  
Beden Eğitimi ve Spor  
Bölümü Başkanı Yard.

EK:Dilekçe(1)

Anket Örneği (1)



25/2 sy

## APPENDIX C

### ÖĞRENCİ ANKETİ

Değerli Katılımcı,

Bu çalışmanın amacı sizlerin fiziksel aktivite düzeyinizi, fiziksel aktiviteye katılım durumunuzu ve katılmayı tercih ettiğiniz fiziksel aktiviteleri belirlemektir.

Konuya ilişkin sorulara vereceğiniz samimi cevaplarınız çalışmayı yönlendirecektir. Tüm veriler çalışmayı yürüten kişi tarafından gizliliği korunarak saklı tutulacaktır. Bu çalışmaya katılmayı kabul ettiğiniz ve zaman ayırdığınız için şimdiden çok teşekkür ederim.

ODTÜ Beden Eğitimi ve Spor Bölümü

Yüksek Lisans Öğrencisi

Cevdet Cengiz

#### A. KİŞİSEL BİLGİLER

Yaşınız : .....

Cinsiyetiniz : ☐ Bay ☐ Bayan

Fakülteniz : ☐ Eğitim ☐ Mühendislik ☐ İktisadi ve İdari Bilimler  
☐ Mimarlık ☐ Fen – Edebiyat

Sınıfınız : ☐ 1. sınıf ☐ 2. sınıf ☐ 3. sınıf  
☐ 4. sınıf ☐ 5. sınıf

Kaldığınız yer: ☐ Yurtta kalıyorum ☐ Evde kalıyorum

## APPENDIX D

### B. FİZİKSEL AKTİVİTEYE KATILIM DURUMU

Bu bölümdeki sorular genel olarak sizin orta düzeyde fiziksel aktiviteye katılım durumunuzla ilgilidir.

**Orta düzeyde** fiziksel aktiviteler nefes alımında ve kalp atımında biraz artış gözlenen aktivitelerdir. Ritimli yürüyüş, dans, bahçe işleri, düşük şiddette yüzme veya arazide bisiklet sürme gibi etkinlikler orta düzeyde aktivite olarak değerlendirilir.

Orta düzeyde fiziksel aktivitenin **düzenli sayılabilmesi** için, aktivitenin haftada 5 veya daha fazla günde 30 dakika veya daha fazla olması gerekir. Örneğin, 30 dakika süreyle yürüyüş yapabilir veya 10 dakikalık 3 farklı aktivite ile 30 dakikayı doldurabilirsiniz.

Lütfen her soru için **Evet** veya **Hayır** seçeneğini işaretleyiniz.

		<b>Evet</b>	<b>Hayır</b>
1	Şu anda <u>orta düzeyde</u> fiziksel aktiviteye katılmaktayım.	<input type="radio"/>	<input type="radio"/>
2	<u>Gelecek 6 ayda</u> orta düzeyde fiziksel aktiviteye katılımımı arttırmak niyetindeyim.	<input type="radio"/>	<input type="radio"/>
3	Şu anda <u>düzenli</u> olarak orta düzeyde fiziksel aktivite yapmaktayım	<input type="radio"/>	<input type="radio"/>
4	<u>Son 6 aydır</u> düzenli olarak orta düzeyde fiziksel aktiviteye katılmaktayım	<input type="radio"/>	<input type="radio"/>
5	Geçmişte, <u>en az 3 aylık dönemde</u> düzenli olarak orta düzeyde aktivitelere katıldım	<input type="radio"/>	<input type="radio"/>

#### Puanlama İşlemseli:

**Eğilim Öncesi (EÖ)= 1. soru=Hayır; 2. soru=Hayır**

**Eğilim (E)= 1. soru=Hayır; 2. soru=Evet**

**Hazırlık (H)= 1. soru=Hayır; 2. soru=Evet**

**Hareket (HT)= 1. soru=Evet; 3. soru=Evet; 4. soru=Hayır**

**Devamlılık (D)= 1. soru=Evet; 3. soru=Evet; 4. soru=Evet**

## APPENDIX E

### C. ULUSLARARASI FİZİKSEL AKTİVİTE ANKETİ

Bu bölümdeki sorular son **7 gün** içerisinde fiziksel aktivitede harcanan zamanla ilgilidir.

Lütfen son 7 günde yaptığınız şiddetli fiziksel aktiviteleri düşünün. (işte, evde, bir yerden bir yere giderken, boş zamanlarınızda yaptığınız spor, egzersiz veya eğlence vb.)

Şiddetli fiziksel aktiviteler yoğun fiziksel efor gerektiren ve nefes alıp verme temposunun normalden çok daha fazla olduğu aktivitelerdir. Sadece herhangi bir zamanda **en az 10 dakika** süre ile yaptığınız aktiviteleri düşünün.

**1. Geçen 7 gün** içerisinde kaç gün ağır kaldırma, kazma, aerobik, basketbol, futbol, veya hızlı bisiklet çevirme gibi şiddetli fiziksel aktivitelerden yaptınız?

**Haftada**\_\_\_\_**gün**

☐ Şiddetli fiziksel aktivite yapmadım. → **(3.soruya gidin.)**

**2.** Bu günlerin birinde şiddetli fiziksel aktivite yaparak genellikle ne kadar zaman harcadınız?

**Günde**\_\_\_\_**saat**

**Günde**\_\_\_\_**dakika**

☐ Bilmiyorum/Emin değilim.

**3. Geçen 7 günde** yaptığınız **orta** dereceli fiziksel aktiviteleri düşünün. Orta dereceli aktivite orta derece fiziksel güç gerektiren ve normalden biraz sık nefes almaya neden olan aktivitelerdir. Yalnız bir seferde en az 10 dakika boyunca yaptığınız fiziksel aktiviteleri düşünün.

**Geçen 7 gün** içerisinde kaç gün hafif yük taşıma, normal hızda bisiklet çevirme, halk oyunları, dans, bowling veya çiftler tenis oyunu gibi **orta** dereceli fiziksel aktivitelerden yaptınız? Yürüme hariç.

**Haftada \_\_\_\_gün**

☐ Orta dereceli fiziksel aktivite yapmadım. → **(5.soruya gidin.)**

**3.** Bu günlerin birinde **orta** dereceli fiziksel aktivite yaparak genellikle ne kadar zaman harcadınız?

**Günde \_\_\_\_saat**

**Günde \_\_\_\_dakika**

☐ Bilmiyorum/Emin değilim.

**5.** Geçen 7 günde **yürüyerek** geçirdiğiniz zamanı düşünün. Bu işyerinde, evde, bir yerden bir yere ulaşım amacıyla veya sadece dinlenme, spor, egzersiz veya hobi amacıyla yaptığınız yürüyüş olabilir.

Geçen 7 gün, bir seferde en az 10 dakika yürüdüğünüz gün sayısı kaçtır?

**Haftada \_\_\_\_gün**

☐ Yürümedim. → **(7.soruya gidin.)**

**6.** Bu günlerden birinde yürüyerek genellikle ne kadar zaman geçirdiniz?

**Günde \_\_\_\_saat**

**Günde \_\_\_\_dakika**

☐ Bilmiyorum/Emin değilim.

**7.** Son soru, **geçen 7 günde hafta içinde oturarak** geçirdiğiniz zamanlarla ilgilidir. İşte, evde, çalışırken ya da dinlenirken geçirdiğiniz zamanlar dahildir. Bu masanızda, arkadaşınızı ziyaret ederken, okurken, otururken veya yatarak televizyon seyrettiğinizde oturarak geçirdiğiniz zamanları kapsamaktadır.

Geçen **7 gün** içerisinde, günde **oturarak** ne kadar zaman harcadınız?

**Günde** \_\_\_\_ **saat**

**Günde** \_\_\_\_ **dakika**

☐ Bilmiyorum/Emin değilim.

**Puanlama İşlemseli:**

MET-Yürüyüş-dakika/hafta = 3.3 x yürüyüş dakika x yürüyüş gün sayısı

Orta Düzeyde MET-dakika/hafta = 4.0 x orta-düzeyde aktivite dakika x orta-düzey gün sayısı

Yüksek Düzey MET-dakika/hafta = 8.0 x yüksek-düzey dakika x yüksek-düzey gün sayısı

Toplam Fiziksel Aktivite MET-dakika/hafta = toplam Yürüyüş + Orta Düzey + Yüksek-Düzey-dakika/hafta değerleri.

## APPENDIX F

### D. TERCİH EDİLEN FİZİKSEL AKTİVİTELER

Bu bölümde lütfen yapmayı tercih ettiğiniz spor aktivitelerini işaretleyiniz (Birden fazla tercih yapabilirsiniz).

- |   |                                     |                                      |   |
|---|-------------------------------------|--------------------------------------|---|
| <input type="checkbox"/> Yüzme              | <input type="checkbox"/> Boks       | <input type="checkbox"/> Aikido      | <input type="checkbox"/> Beyzbol          |
| <input type="checkbox"/> Bisiklet           | <input type="checkbox"/> Aerobik    | <input type="checkbox"/> Judo        | <input type="checkbox"/> Dağcılık         |
| <input type="checkbox"/> Voleybol           | <input type="checkbox"/> Cimnastik  | <input type="checkbox"/> Tekvando    | <input type="checkbox"/> Eskrim           |
| <input type="checkbox"/> Futbol             | <input type="checkbox"/> Kayak      | <input type="checkbox"/> Karate      | <input type="checkbox"/> Triatlon         |
| <input type="checkbox"/> Basketbol          | <input type="checkbox"/> Buz Pateni | <input type="checkbox"/> Güreş       | <input type="checkbox"/> Golf             |
| <input type="checkbox"/> Bowling            | <input type="checkbox"/> Buz Hokeyi | <input type="checkbox"/> Yoga        | <input type="checkbox"/> Vücut Geliştirme |
| <input type="checkbox"/> Hentbol            | <input type="checkbox"/> Bilardo    | <input type="checkbox"/> Badminton   | <input type="checkbox"/> Okçuluk          |
| <input type="checkbox"/> Dans               | <input type="checkbox"/> Tenis      | <input type="checkbox"/> Masa Tenisi | <input type="checkbox"/> Kürek            |
| <input type="checkbox"/> Halter             | <input type="checkbox"/> Atletizm   | <input type="checkbox"/> Yürüyüş     | <input type="checkbox"/> Amer. Futbolu    |
| <input type="checkbox"/> Diğer .....,....., |                                     |                                      |   |

Anketimiz sona ermiştir. Teşekkürler