

THE EFFECTIVENESS OF PARTICIPANT-CENTERED PHYSICAL ACTIVITY  
COUNSELING ON THE PHYSICAL ACTIVITY LEVEL OF SEDENTARY  
WORKING WOMEN

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## **ABSTRACT**

### **THE EFFECTIVENESS OF PARTICIPANT-CENTERED PHYSICAL ACTIVITY COUNSELING ON THE PHYSICAL ACTIVITY LEVEL OF SEDENTARY WORKING WOMEN**

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The purposes of this study were to test the effect of four-week PACE<sup>®</sup> program in increasing participants' physical activity level and stages of change and examine the relationship between physical activity level and stages of change. A controlled trial, experimental design was applied. Physical activity level and stages of change were recorded at baseline and at study conclusion. For the data collection What is Your PACE Score Questionnaire, FADA Questionnaire and Physical Activity Readiness Questionnaire (PAR-Q) were used. Descriptive statistics, one way repeated measures of ANOVA and simple linear correlation were used to analyze data.

Participants were 182 women Middle East Technical University personnel from different units. Study participants were randomized into intervention and control groups. 87 women received the PACE<sup>®</sup> program were compared 95 women in the control group who did not receive PACE<sup>®</sup> program. The intervention group received PACE<sup>®</sup> program with respect to their stages and a booster phone call or e-mail two

weeks later after counseling. After 4 weeks, all participants were reassessed for stages of change and physical activity level. There was a significant difference in measurement of physical activity level and stages of change between intervention and control group before and after intervention. The intervention group' physical activity level ( $p < .05$ ) and stages of change ( $p < .10$ ) increased but the control group decreased. Besides, changes in physical activity level were moderately and positively correlated with stages of change.

**Keywords:** Physical activity counseling, sedentary women, PACE, physical activity stages of change, physical activity level.

## ÖZ

### KATILIMCI MERKEZLİ FİZİKSEL AKTİVİTE DANIŞMANLIĞININ SEDENTER KADINLARIN FİZİKSEL AKTİVİTE DÜZEYLERİ ÜZERİNDEKİ ETKİNLİĞİNİN ÖLÇÜLMESİ

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Bu çalışmanın amacı 4 haftalık PACE<sup>®</sup> programının (Katılımcı Merkezli Fiziksel Aktivite Danışmanlığı Programı) çalışan sedenter kadınların fiziksel aktivite seviyesindeki ve fiziksel aktivite davranış basamakları üzerindeki etkisini ölçmek ve fiziksel aktivite seviyesi ile fiziksel aktivite davranış basamağı arasındaki ilişkiyi incelemektir. Araştırmada kontrol gruplu deneysel yöntem kullanılmıştır. Fiziksel aktivite seviyesi ve fiziksel aktivite davranış basamakları çalışmanın başlangıcında ve bitişinde ölçülmüştür. Ölçümler için PACE Skorunuz Nedir? Anketi, Fiziksel Aktivite Hazır Olma Durumu Anketi (PAR-Q), Fiziksel Aktivite Değerlendirme Anketi (FADA) kullanılmıştır. Dataların incelenmesi için betimsel istatistik, tekrarlı tek faktörlü ANOVA ve doğrusal korelasyon kullanılmıştır.

Bu çalışmaya ODTÜ’de farklı birimlerde çalışan 182 sedenter kadın katılmıştır. Çalışmaya katılanlar random olarak kontrol ve deney gruplarına ayrılmışlardır. 87 katılımcı deney grubunda PACE<sup>®</sup> programını almıştır, 95 katılımcı ise kontrol grubunda herhangi bir fiziksel aktivite danışmanlık programı almamışlardır. Deney grubu PACE<sup>®</sup> programı başlangıcından 2 hafta sonra destek telefonu veya elektronik posta ile bilgilendirilmiştir. 4 hafta sonra her iki grubun fiziksel aktivite seviyeleri ve fiziksel aktivite davranış basamağı yeniden ölçülmüştür. Gruplar arasında 4 hafta sonunda fiziksel aktivite seviyeleri ve fiziksel aktivite davranış basamakları arasında istatistiksel olarak anlamlı bir değişim gözlenmiştir. Fiziksel aktivite danışmanlığı alan

grubun fiziksel aktivite seviyesi artmıştır ( $p < .05$ ) ve fiziksel aktivite davranış basamağında ilerlemiştir ( $p < .10$ ). Kontrol grubun fiziksel aktivite seviyesi ve fiziksel aktivite davranış basamağı seviyesi azalmıştır. Ayrıca fiziksel aktivite seviyesi ile fiziksel aktivite davranış basamağı arasında anlamlı bir ilişki saptanmıştır. PACE<sup>®</sup> programı alan deney grubunun fiziksel aktivite seviyesi ve fiziksel aktivite davranış basamağında olumlu yönde gelişme görülmüştür.

Anahtar Kelimeler: Fiziksel aktivite danışmanlığı, sedenter kadınlar, PACE, fiziksel aktivite davranış basamağı, fiziksel aktivite seviyesi.

TO MY MOTHER



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## **LIST OF ABBREVIATIONS**

AHA	American Heart Association
ACSM	American College of Sports Medicine
FADA	7 Day Physical Activity Assessment Questionnaire
MET	Metabolic Equivalent
METU	Middle East Technical University
PAR-Q	Physical Activity Readiness Questionnaire
TTM	Transtheoretical Model
USDHHS	United States Department of Health and Human Services
WHO	World Health Organization

## CHAPTER I

### INTRODUCTION

#### 1.1 Background of the Study

A vast amount of information is available in the literature, which is supporting the benefits of physical activity on the physical and psychological health. It is well documented that physical activity has a beneficial role on decreasing the risk of morbidity and mortality from several chronic diseases. For example, Blair and his colleagues (1992) claim in their study "... that regular physical activity reduces the risk of morbidity and mortality from several chronic diseases and increases physical fitness" (p. 120). Clinical and epidemiological investigators indicated the benefits of physical activity in the prevention of health diseases such as hypertension (Fagard, 2005), non-insulin-dependent diabetes (LaMonte, Blair, & Church, 2005), coronary heart disease (Sundquist et al., 2005), cardiovascular disease (Wannamethee & Shaper, 2001; Oguma & Tagawa-Shinoda, 2004) and obesity (Blair & Brodney, 1999). Moreover, participating in regular physical activity may reduce the risk of developing of colon cancer (Colditz et al., 1997) and breast cancer among postmenopausal women (Thune et al., 1997). In addition, physical activity has a very important protective role against bone loss, osteoporosis and chronic back pain by strengthening the musculoskeletal health (Vuori, 1995) and this helps to protect especially women in their older ages from the risk of falls, which might reduce the possibility of hip fractures (Bauman, 2004; Jaglal et al., 1993).

Additionally, the symptoms of depression, anxiety and stress may be reduced by the help of physical activity (Fox, 1999; Penedo, & Dahn, 2005). One of the most effective ways of facilitating weight loss or maintaining appropriate body weight is doing regular physical activity (U.S. Department of Health and Human Services, 1996).

In addition to the fact that physical activity has positive effects on one's physical and mental health, it plays a big role for the reduction of problems caused by sedentary



life style. American Heart Association (AHA) and the American College of Sports Medicine (ACSM) told that people should give up sedentary lifestyle and participate in physical activities in order to reduce the risk of chronic diseases and disabilities and improve their health that sedentary lifestyle can be controlled (Haskell et al., 2007). ACSM and AHA updated the recommendations for adults and state that “[t]o promote and maintain health, all healthy adults between 18 and 65 years old should do moderate-intensity aerobic physical activity for a minimum of 30 minutes on five days of each week or vigorous-intensity aerobic activity for a minimum of 20 minutes on three days of each week” (Haskell et al., 2007, p. 1423). On the other hand, although the benefits of participating in moderate levels of physical activity on health and the lessening of chronic disease are known, most people are still less active than the recommended level by ACSM, which in turn cause sedentary lifestyle to continue and be present as an independent risk factor for the expansion of cardiovascular disease (Cardinal, 1999).

U.S. Department of Health and Human Services reported in 2001 physical activity trends in the USA. According to their findings the percentage of people who achieved recommended level of physical activity was 24.3% in 1990 and 25.4% in 1998. This shows a slight increase, but insufficient activity rates were 45.0% in 1990 and 45.9% in 1998 and inactivity ratio among people in the society proved to be still very high. In other words, people still do not accomplish the levels of physical activity recommended by ACSM. According to a report prepared in 2001, a total of 54.6% of persons in the USA among adults were not active enough to practice the recommendations mentioned above (U.S. Department of Health and Human Services, 2003). Barnes and Schoenborn (2003) reported that in terms of overall physical activity (usual daily activities and leisure-time physical activity) level, women in the USA seem less active than men and women are more likely not to engage in physical activity in their later ages. They also claimed that age is an important determinant of being engaged in physical activities, in other word, as one gets older, s/he is more likely to be physically inactive. However, as the level of education and income increase, this likelihood decreases. These findings are relevant not only in the USA but also in Europe. Eurobarometer study in the European Union

in 2002 clarified that European countries is not sufficiently active to obtain optimal health benefits (Sjöström et al., 2006).

This inactivity prevalence is also quite similar in Turkey. World Health Organization (WHO) investigated the physical activity level of men and women in Turkey and they found out that women are less active than men in all age groups (WHO, 2003). The Ministry of Health of Turkey made a survey in 7 geographical regions and they reported only 3.5% of people took part in regular physical activity. In the city centers men participation was about 5.3% and women's participation was only 3.3% (Erel et al., 2004). So, it is not wrong to claim that we are not an active society for the level of physical activity mentioned above.

Besides, another report of WHO showed that people having Body mass index  $\geq 30$  kg/m<sup>2</sup>, which indicates obesity, is 20% for the ages of 20-29, 27.2% for the ages of 30-39 and 40.6% for the ages of 40-49 for employed and unemployed women in Bursa, Türkiye (Ersoy & Imamoglu, 2005). Because of less participation in physical activity and being assimilated by sedentary lifestyle, women are more susceptible for health risks. Gender differences in physical activity participation in different research studies have shown that women is less active across all age groups; therefore, in order to improve health, physical activity should be promoted among people especially among women having a sedentary lifestyle.

In order to promote physical activity, several intervention programs including counseling have been evaluated in different settings such as schools, worksites, and health care settings. In spite of the fact that studies about physical activity intervention programs are fresh, the results have been found successful in the studies (U.S. Department of Health and Human Services, 1996). Finding of various lifestyle physical activity intervention studies have illustrated that such intervention programs help to reduce cardiovascular disease risk factors by increasing physical activity. For example, Project Active which is the lifestyle physical activity intervention program was compared with a traditional structured exercise intervention program for 6 months and Project Active was founded to be successful in increasing physical

activity and improving cardiovascular disease risk factors for sedentary men and women (Dunn et al., 1997).

Moreover, many people spend more time at their workplaces, so in order to promote a physically active lifestyle especially among inactive women workers of the population, effective interventions are needed to be applied in the workplaces to reach more targets. A review study on worksite physical activity intervention pointed out that “[t]here was strong evidence that workplace counseling influenced physical activity behavior” (Dugdill et al., 2008, p.20). Dishman et al. (1998) reviewed 26 worksite physical activity intervention studies to analyze the effectiveness of intervention on the intended physical activity. In spite of the fact that interventions have resulted in a small positive effect on increasing physical activity in the studies, it has a potential to promote health and a positive influence on specific health behaviors at the workplace. Therefore, it can be claimed that all the people in our society are in need of effective interventions and these interventions should be feasible to be applied in the worksite settings. Another review about the effectiveness of worksite physical activity programs was done by Proper and his colleagues (2003) found out that because of the small number of high-quality experiments, the effectiveness of worksite physical activity programs have not been strongly supported by the studies. More controlled studies are needed for observing worksite physical activity interventions which have an undeniable role for reducing the risk of musculoskeletal disorders.

There has been a documented interest in preventing sedentary lifestyle through physical activity intervention programs especially counseling type approaches based on theoretical models. Currently, the most popular theoretical model used in physical activity intervention studies is the Transtheoretical Model (TTM) as it has shown success in promoting numerous health behaviors, including smoking cessation (Velicer et al., 1993), fat reduction (Curry, Kristal, & Bowen, 1992), and increasing physical activity (Marcus et al., 1992). In the study described here, physical activity counseling intervention program based on TTM is used since researchers indicated that as individuals attempt to change physical activity behavior and to adopt the desired behavior, they move through a series of stages at varying rates which are

called as stages of change or stages of readiness that are the central constructs of the used program (Dishman, 1994). The stages of change identified for physical activity are: *Pre-contemplation* (no intention of becoming physically active), *Contemplation* (intending to start physical activity within 6 months) *Preparation* (doing physical activity some, but not regularly), *Action* (doing physical activity regularly for last six months), and *Maintenance* (doing physical activity for at least six months or more) (Marshall & Biddle, 2001). Spencer and his colleagues (2006) reviewed one hundred and fifty studies about TTM application to physical activity and suggested that TTM can be applied to exercise behavior effectively.

According to King and his colleagues (1992) the key point in the TTM is to identify individual's stages of physical activity behavior to understand why s/he is sedentary, what s/he thinks about starting an activity or why s/he has stopped or the level of his/her consciousness about health benefits of physical activity, and then to develop appropriate specific intervention toward his/her to achieve intended behavior. Besides, giving an intervention to a person's stage of change requires that the intervention and its materials should provide information pertinent at the different stages. In other words, pre-contemplators should receive different intervention and materials than other stages.

Recently, brief and stage specific intervention methods, more preferably participant centered assessment and counseling for exercise (PACE<sup>®</sup>) program; have been used for the sedentary people to increase their physical activity level. PACE<sup>®</sup> was developed by a team of physicians, behavioral scientists and technical supports at the San Diego State University participant and other experts from medicine, public health and exercise science with the support from Centers for Disease Control and Prevention.

The PACE<sup>®</sup> was developed to provide a brief counseling program to healthy adults after assessing a patient's readiness to change. Deeply, participants complete PACE<sup>®</sup> assessment forms and based on their score, they receive 2 - 5 minute counseling founded on stage specific sections of the PACE<sup>®</sup> program. Participants receive a brief booster call two weeks later from the provider to discuss recommendations

given in the counseling and their physical activity program continuity. The aim of the PACE<sup>®</sup> counseling program is to emphasize the health benefits of being physically active and to increase motivation (Patrick et al., 1994). The effectiveness of PACE<sup>®</sup> program was evaluated by Calfas and her colleagues (1996). They found out that PACE<sup>®</sup> program was effective on sedentary patients as it provided meaningful increase in their moderate intensity physical activity levels. PACE<sup>®</sup> program is applied and effectively used in some population such as in the USA, Canada, Netherlands, Italy, and Japan. For example, individual face-to-face counseling at the workplace based on PACE<sup>®</sup> program positively influenced physical activity levels of patient visited general practice in the Netherlands (Van Sluijs et al., 2004).

Therefore, brief counseling intervention programs are necessary in our society to make people to be aware of the potentially harmful health consequences of a sedentary lifestyle and help them to take the first step to more active lifestyle.

## **1.2 Statement of the Problem**

Physical activity intervention programs have attracted attention recently and have been used in several places especially in the health units and worksites to some groups (youth, adults, adolescents). Such programs are recommended by researchers for their positive effects on health and their ability to encourage people to move from sedentary lifestyle to an active one. On the other hand, in spite of the recognized positive effects of physical activity intervention programs, there has been no theory based, controlled trials with brief and face to face counseling strategies having been studied with women at workplace in Turkey. The purpose of this study is to determine the effectiveness of a 4-week PACE<sup>®</sup> program in increasing physical activity levels and exercise stages of change levels of 21 to 57 year old sedentary working women, as compared to women who do not receive counseling.

## **1.3 Research Questions**

1. Do participants in intervention group increase their physical activity levels over four-week PACE<sup>®</sup> program when compared to the physical activity levels in control group?

2. Do intervention group advance further in stages of change following a four-week PACE<sup>®</sup> program when compared to the stages of change in the control group?
3. What is the relationship between physical activity level and stages of change?

#### **1.4 Significance of the Study**

There is a need for studies to evaluate the effectiveness of physical activity counseling in our population as there is almost no theory based physical activity counseling intervention programs. Many researchers agree upon the need for physical activity intervention programs to gain health benefits of physical activities. Because of less participation of women in physical activity, this need increases for women at workplace. The purpose of this study is to add the current body of knowledge the effects of intervention programs by applying most accepted intervention technique, which is participant centered assessment and counseling for physical activity, for sedentary working women. This may boost the future development of various and more effective physical activity interventions. Besides, health clinics, fitness centers, or worksites could use this program to make intervention or create new physical activity intervention programs that would meet the needs and interests of people.

#### **1.5 Assumptions of the Study**

This study is designed for sedentary working women at the worksite. It is assumed that participants of this study have completed “What is your PACE Score? Questionnaire”, “Physical Activity Readiness Questionnaire (PAR-Q)”, “FADA” questionnaire honestly.

#### **1.6 Limitations of the Study**

1. Physical activity level was measured by self-report questionnaire method which is based on self-report and hence participants could over or under estimate their physical activity levels.

2. Women are in the working in the same place so they may interact with each other and affect their participation.
3. The effectiveness of short duration counseling intervention in sedentary women needs further and long term studies to understand whether counseling effect for behavior change will still continue or not.
4. The study involved in participants who were willing to participate. This resulted in selection bias as participants may be willing to do physical activity and change their lifestyle.

### **1.7 Definitions of Terms**

**Physical Activity:** Physical activity is defined as bodily movement produced by the contraction of skeletal muscle that increases energy expenditure (USDHHS, 1996).

**Exercise:** Exercise is defined as planned, structured, and repetitive bodily movement done to improve or maintain one or more physical fitness (ACSM, 2000).

**Physical Fitness:** Physical fitness is defined as a set of attributes that people have or achieve that relates to the ability to perform physical activity (ACSM, 2000).

**MET:** The METs (work metabolic rate/resting metabolic rate) are multiples of the resting rate of oxygen consumption during physical activity. One MET represents the approximate rate of oxygen consumption of a seated adult at rest, or about 3.5 mL per min per kg. The equivalent energy cost of 1 MET in kilocalories per minute is about 1.2 for a 70 kg person, or approximately 1 kcal per kg per hour (Pate et. al., 1995).

**Moderate intensity physical activity:** Moderate physical activity is activity performed at an intensity of 3 to 6 METs (work metabolic rate/resting metabolic rate) -- the equivalent of brisk walking at 3 to 4 mph for most healthy adults (Pate et. al., 1995).

**Vigorous intensity physical activity:** Vigorous physical activity is activity performed at intensity more than 6 METs such as racket sports, single tennis, cycling (more than 10 mile per hour) (Pate et. al., 1995).

**BMI:** Body mass index: a measure of body fat that is the ratio of the weight of the body in the kilograms to the square of its height in meters (MEDLINE-Plus: Online version of Merriam-Webster's Medical Dictionary).

**Sedentary lifestyle:** Persons not participating in a regular exercise program or meeting the minimal physical activity recommendations from U.S. Surgeon General Report (ACSM, 2000).



## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 Background of the Study**

The review of the literature begins with the health benefits of physical activity, recent physical activity recommendations and continues with the physical activity participation rate of women. Then, TTM and exercise stages of change will be discussed and their application to the physical activity intervention studies will be explained. Some examples will be given about brief and participant centered physical activity intervention programs and their effects will be discussed. Lastly, self report measure of physical activity will be mentioned.

#### **2.2 Physical Activity and Health**

The 1996 Surgeon General's Report on Physical Activity and Health reported that participating in physical activity regularly had been shown to reduce morbidity and mortality from many chronic diseases such as cardiovascular disease, type 2 diabetes, hypertension, some type of cancer and obesity. In another study, Mora and his team (2007) investigated 27,055 healthy women about physical activity participation and cardiovascular disease risk factors for 3 years. The researchers identified that moderate level of physical activity is related with decreasing the threat of cardiovascular disease. Another research study has indicated that doing light to moderate level of physical activity decreases the risk of having cardiovascular diseases on women (Lee, Rexrode, Cook, Manson, & Buring, 2001). It is supported by the studies that a physically active person, who is doing more work-related and recreational activity, may have less coronary heart disease problems than sedentary people (Fox & Haskell, 1968). One study reviewed 43 studies and supported the idea that physical inactivity is the one the major cause of cardiovascular disease (Powell, Thompson, Caspersen, & Kendrick, 1987).

Jeon and his colleagues (2007) reviewed studies about moderate physical activity and type 2 diabetes, and indicated that moderate physical activity even brisk walking is effective to reduce the risk of type 2 diabetes. The review study of Praet and Van Loon (2007) pointed out that exercise could be considered as one of the treatment for diabetes, especially for type 2 diabetes. Besides, they said that endurance exercises should be given with respect to patient's disease stage.

In the longitudinal study in Harvard University Alumni showed that vigorous exercise has a beneficial effect on the prevention of hypertension (Paffenbarger, Wing, Hyde, & Jung, 1983). Paffenbarger and his colleagues (1991) mentioned that hypertension is the one of the most dangerous threats for people's health and lack of vigorous recreational activities contributes to the risks having that disease. Latest ACSM position stand pointed out that physical activity is one of the treatments for hypertension by lowering the blood pressure and also decreasing the risk for cardiovascular diseases (Pescatello et al., 2004).

Besides, physical activity has protective effect against colon cancer and connection to prevention of breast cancer (Marrett, Theis, & Ashbury, 2001; Lee, 2003). Rockhill and her colleagues (1999) supported to the idea that physical activity have beneficial effect on protecting from breast cancer. The researchers followed 25,624 women between the ages of 20 to 54 from 1974 to 1978 and 1977 to 1983 and found that participating in more leisure-time physical activity was effective for reducing the risk of breast cancer (Thune, Brenn, Lund, & Gaard, 1997). Another prospective study reported that there was a strong association between physical activity and colon cancer in women. When the level of leisure time physical activity participation increases, the incidence of colon cancer decreased (Martinez et al., 1997). The risk of developing colon cancer increases if high energy intake, high body mass index and physical inactivity are increased (Slattery et al., 1997).

Another dangerous health risk is obesity that is rapidly increasing day by day not only in adults but also in children and adversely affecting their health. In addition, obesity is triggering the risk of coronary heart diseases. In order to decrease the health risks of obesity, people need to be more active and be sensitive to their weight.

Physical activity may favorably promote weight loss and affect distribution of body fat (Rippe & Hess, 1998).

Other important benefits of physical activity are to help to reduce stress and depression and to increase self confidence (Gauvin & Spence, 1996). Another benefit of physical activity is the protection of the bones through supporting the health of musco-skeletal system. A study in 1989 investigated effects of exercise intervention on the bone loss of middle-aged women for 4 years and found out that exercise reduced bone loss significantly for premenopausal and postmenopausal women (Smith et al., 1989).

In the light of the research studies, it is not wrong to claim that physical activity works positively for providing substantial health benefits of people at any age. However, in spite of well-known positive health benefits of physical activity participation, people are inactive to achieve optimum benefits from physical activity. Therefore, physical inactivity is still considered to be one of the causes of poor health.

### **2.3 Physical Activity Recommendations**

The American College of Sports Medicine and American Heart Association recommends moderate-intensity physical activity for a minimum of 30 minutes on 5 days of each week or vigorous-intensity aerobic activity for a minimum of 20 minutes on 3 days of each week. They also stated that brisk walking and jogging speed up the heart rate could be practiced over two or three session in the day rather than a single session. In other words, you can divide 30 minutes walking in a day, 10 minutes in the morning, and 20 minutes in the evening. Besides, adults should do muscular strength activities two days in a week (Haskell, et al., 2007).

People could achieve health benefits by performing these moderate physical activities (USDHHS, 1996).

## **2.4 Women Physical Activity Participation**

The literature presented above indicates that physical inactivity is common especially in the developed countries and is a serious problem for both men and women. In the USA, National Health Survey in 1990 showed that women engage in physical activity less than men across all age groups (Piani & Schoenborn, 1993). It is obvious that women is less active than men in participating daily activity and leisure time physical activity and also the age has an adverse effect for women on their physical activity participation level (Barnes & Schoenborn, 2003).

With respect to results of the 2004 Physical Activity and Sport Monitor survey in Canada, women is less active than men and they are more likely to be inactive in older ages, too (Canadian Fitness and Lifestyles Research Institute, 2005). Also, there exists a huge difference in the level of engagement in vigorous physical activity between women and men; in other words, the number of men engaged in vigorous physical activity is higher than that of women (Caspersen, Pereira, & Curran, 2000). Therefore, it can be claimed that women are more susceptible to the risks of sedentary lifestyle and consequently getting less health benefits from physical activity as their participation is going to be lower in North America.

A higher rate of women (43.2%) than men (38.1%) reported no moderate level of physical activity in European countries (European Commission Directorate General Health and Consumer Protection, 2003). Eurobarometer study in 2006 found that women are less physically active than men across EU countries and men perform more physical activity than women by the way of sport, recreational or leisure activities (European Commission Directorate General Health and Consumer Protection, 2006). WHO applied World Health Survey in both rural and urban areas of Turkey that showed women are less active than men and women participation in such activities decreases with the age (WHO, 2003). Unfortunately, most women do not participate in regular physical activities and they generally prefer to have sedentary lifestyle.

## **2.5 Transtheoretical Model and Exercise Stages of Change**

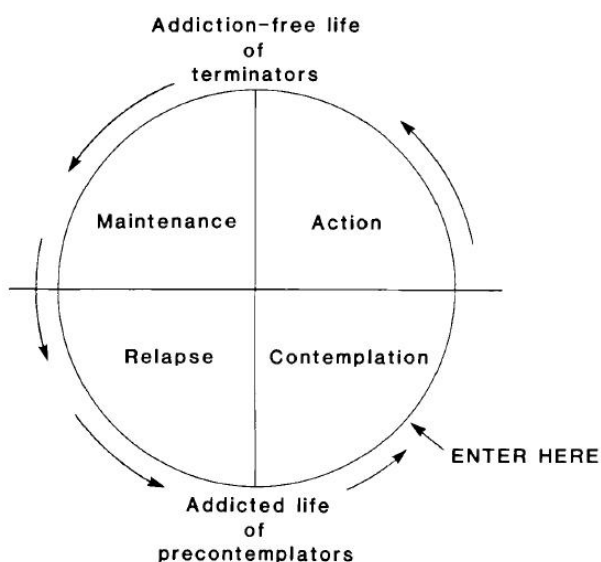
The Transtheoretical model is a stage-based behavior change model and concentrates on the individual's opinion of choice by promoting health behaviors (Prochaska & DiClemente, 1983; Prochaska & Velicer, 1997). The Transtheoretical model tries to understand how people improve and maintain health behavior (Sherwood & Jeffery, 2000). TTM and its application to physical activity have received substantial attention (Prochaska et al., 1994).

TTM consists of the following constructs: stages of change, self-efficacy, decisional balance, and processes of change however stages of change has become more popular recently and applied in the exercise studies (Reed et.al, 1997). It is found that behavior change takes place in a series of six stages, which are briefly discussed as follows:

1. Pre-contemplation is the stage when an individual does not intend to change behavior in the foreseeable future usually within the next 6 months.
2. Contemplation is the stage in which an individual seriously intends to change his/her existing behavioral pattern within the next 6 months.
3. Preparation is the stage in which an individual intends to make changes within the month and is ready to take small steps.
4. Action is the stage in which an individual has made the behavioral change for less than 6 months.
5. Maintenance is the stage in which an individual has reached the behavioral change for six months or more.
6. The final stage is the termination stage in which an individual has total confidence about not returning to old behavior (Prochaska & DiClemente, 1983; Prochaska, DiClemente, & Norcross, 1992; Dishman, 1994).

However, the last stage, termination stage, is not taken into account in the studies using exercise stage of change as their source assuming that at least 6 months is a period long enough to change a behavioral pattern to a habitual action (Fallon & Hausenblas, 2004).

In order to understand health behavior change, the stages should be carefully understood because “Stages may provide helpful framework for understanding chronic behavioral risk factors like sedentary lifestyle, smoking, and high fat diets” (Marcus & Simkin, 1994, p.1400). People intending to achieve a change in their behavior progress these stages at varying rates. This stage progression follows a cyclical pattern (Figure 1) which means an individual may recycle back or forward through the various stages (Marshall & Biddle, 2001). Prochaska and his colleagues’ review study (1993) confirmed that in order to adapt a successful intervention program, stage of participant’s readiness for change must be assessed. Mcinnis and her colleagues (2003) indicated that “Predicting a patient’s readiness to lose weight and identifying potential variables associated with successful weight loss are important steps in promoting a useful physical activity program.” (p. 1253).



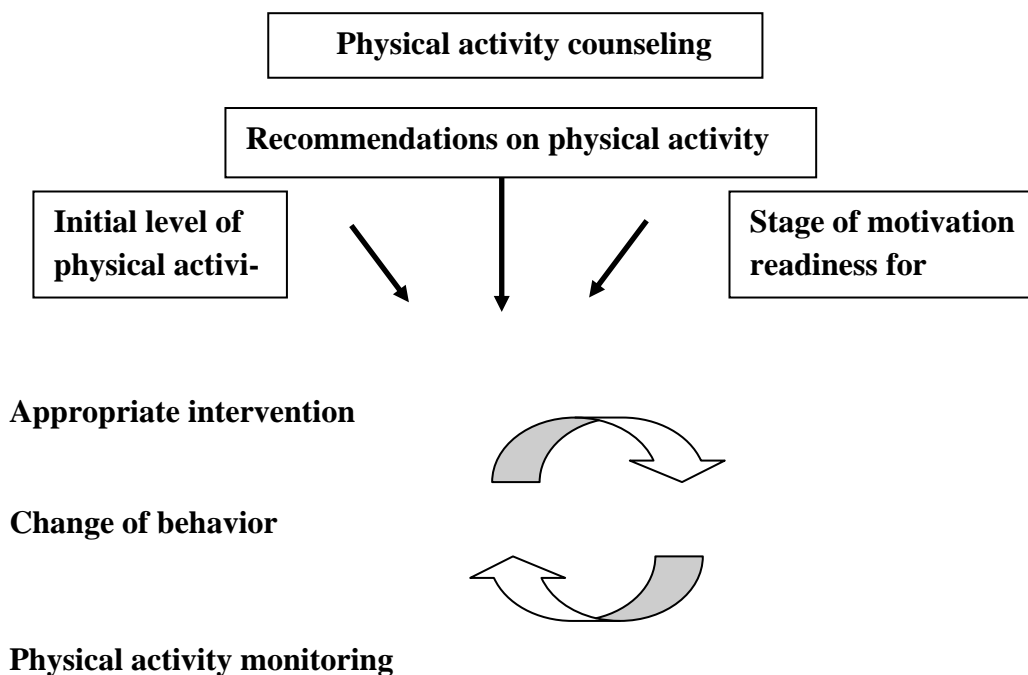
*Figure 1.* The Cyclical Model of Change Showing Movement between the Stages (O’Connell & Velicer, 1988).

Spencer and his colleagues (2006) reviewed 150 studies and recommended to use TTM for exercise to achieve behavioral change. 31 of the studies used stage-matched interventions and 25 of them were successful in promoting exercise. Armstrong and his colleagues (1993) supported the use of TTM in the exercise studies. A group of researchers successfully studied the stage of physical activity behavior change in the Australian population (Booth et al., 1993), in the female population in USA (Cardinal, 1995) and in the exercise intervention campaign for the worksites (Marcus et al., 1992). Nigg (2001) longitudinally studied to explain the adolescent exercise behavior for 3 years and indicated that TTM can be used to recognize adolescent exercise behavior.

Another study compared the stage matched and unmatched intervention programs in order to see the effects of programs on exercise behavior in the primary care settings and they could not find superior effect of stage matched intervention group to other intervention group. Both groups' physical activity level did not change and self efficacy increased in the groups (Naylor et al., 1999).

A recent study systematically reviewed 37 studies about the efficiency of interventions based on stages of change for health behaviors such as physical activity, smoking cessation, dietary change, and screening mammography. 7 studies aimed at promoting physical activity and three of them produced a significant effect on physical activity, but it did not seem to be longer effect (Riemsma et al., 2002).

Marcus and his colleagues (2006) intended to offer new ideas for physical activity studies by synthesizing the literature and suggested that "Researchers should further explore the efficacy of theory based individual tailoring of mediated motivational messages." (p. 2744). Baranowski and his colleagues (1998) told that people change their physical activity behavior for different reasons as everyone is different from each other. Therefore, physical activity intervention programs and its application procedures could be various.



*Figure 2. Factors Determining Physical Activity Counseling (Frey & Berg, 2002, p. 2).*

In order to provide effective counseling for the physical activity intervention, participant’s current level of physical activity and participant’s stage of readiness for change should be carefully observed (Figure 2).

## **2.6 Participant Centered Physical Activity Interventions**

As the benefits of participating in moderate level of physical activity regularly have mostly supported by the literature, the need for brief and stage based interventions in order to promote physical activity behavior has increased. Researchers are concentrated on the theory-based physical activity intervention methods to identify which intervention method is effective for behavior change. Physical activity intervention can be applied face to face or delivered through different delivery channels such as internet, mobile technology, mail, print materials or television and among different samples such as the elderly, mothers and patients (Marcus et al., 2006). These interventions can be organized in different settings such as health clinics, worksites, schools, fitness centers or home. The most important thing to reach more people and help them to do necessary healthy behavior change about



physical activity that they can move from sedentary lifestyle to active lifestyle. It is apparent that physical activity intervention successfully influences physical activity behavior (Sparling, Owen, Lambert, & Haskell, 2000).

As examples, The Physically Active for Life (PAL) project targeted older adults, 50 years and more, and applied activity counseling in which 12 physicians were randomized into intervention group and 12 physicians to standard care group. Patients reported satisfaction with exercise counseling and follow up questionnaire showed patients in the intervention group increased activity levels (Goldstein et al., 1999).

Lewis and Lynch (1993) conducted the study that physician provided 2-3 minutes physical activity counseling to 396 healthy adults. They also distributed educational handout and followed up by telephone one month later. They found significant difference between groups that member who received counseling were more active (89.1%) than other (80.2%) who did not received counseling.

Family physician provided counseling to 763 sedentary adults. There were three groups, one group was taken including verbal advice about exercise and the standard pamphlet on exercise were sent to their home address, second was taken counseling but tailored pamphlets on exercise were posted to them, third group is a control group which did not received any counseling and pamphlets. There was a significant difference in physical activity level of participants between counseling groups and control group after 1 and 6 month. Participants in the counseling groups reported more physical activity (40%) compared to control group (30%) (Bull, Jamrozik, & DPhill, 1998).

Another physical activity counseling program applied patients in the primary care. The Activity Counseling (ACT) program was clinical trial and participants were followed for 24 months. ACT program were significantly affected women cardiorespiratory fitness (JAMA, 2001).

Another intervention program was applied from exercise development officer who offered personalized 10 week physical activity program to inactive people aged

45-74. The control group was sent information on local leisure centers and did not taken any counseling or program. The intervention group reported an increase in the level of physical activity per week, as compared with the control group (Stevens, Hillsdon, Thorogood, & McArdle, 1998).

Petrella and his colleagues (2003) compared the exercise prescription instrument Step Test Exercise Prescription (STEP) with usual care counseling given by primary care doctors. Aerobic capacity of participants was significantly increased in the STEP intervention group (11%) compared to the control group (4%) over 6 months.

Green prescription applied a counseling program based on patient readiness level and the program seemed effective for increasing patient's physical activity level over a 6-week study period in New Zealand (Swinburn et al., 2000).

Another and the most applied intervention program is PACE<sup>®</sup> program that is based on the stages of change of TTM model. PACE<sup>®</sup> program is planned to enhance self-efficacy, decrease perceived barriers to activity, and increase consciousness of the benefits of physical activity. It applies participant centered and brief counseling based on individual' PACE<sup>®</sup> assessment score (Patrick et al., 1994). Long and her colleagues (1996) tested PACE<sup>®</sup> program in four geographical sites in the USA. Their multisite study showed that PACE<sup>®</sup> program was effective and materials were successful for both providers and patients.

PACE<sup>®</sup> program has been applied in different countries. For example, physical activity counseling at the workplace based on PACE<sup>®</sup> program positively influenced physical activity levels of employees in Netherlands (Proper et al., 2003). PACE<sup>®</sup> program was applied to overweight and obese people in Italy and individuals in the experimental group decreased in BMI and decreased their abdominal girth (Bolognesi, Nigg, Massarini, & Lippke, 2006). Computerized PACE<sup>®</sup> (PACE +) program applied in patients with essential hypertension and found to be effective to reduce blood pressure in Japan (Miura et al., 2004). PACE<sup>®</sup> program was evaluated in the general practice and was proven to be acceptable and feasible (van Sluijs, van Poppel, Stalman, & van Mechelen, 2004). PACE<sup>®</sup> program was tested on the overweight and obese patients and PACE<sup>®</sup> intervention group BMI and abdominal

circumference were reduced (Bertozzi et al., 2004). Modified PACE<sup>®</sup> program was used in Canada and the results confirmed the effectiveness of PACE<sup>®</sup> and energy expenditure of participants significantly increased from baseline to 1 month (Spink et al., 2008). However, some studies in the literature indicate different results for PACE<sup>®</sup> program. One of these is Norris and his team's study (2000) in which PACE<sup>®</sup> intervention program was applied to 812, and 30-year or older patients followed for 6 months. It is claimed in the study that PACE<sup>®</sup> program was not effective in increasing patients' self-reported physical activity levels, but it was effective in increasing stage of change for people who were in the contemplation stage (Norris et al., 2000).

## **2.7 Self Measure of Physical Activity Level**

Physical activity is defined as bodily movement produced by the contraction of skeletal muscle that increases energy expenditure (USDHHS, 1996). Physical activity can include different activities such as housework, yard work, child care, occupational activity, sport and leisure time activity.

There are some ways of measuring physical activity. The most precise measurement methods are to use laboratory equipment such as indirect calorimetry and direct calorimetry in order to analyze the amount of consumed oxygen and produced carbon dioxide and heat so that energy expenditure and caloric expenditure can be calculated accurately (Poon, Chodzko-Zajko, & Tomporowski, 2006). Second, pedometers and accelerometers have been used in the studies. Pedometers and accelerometers are carried by subjects during the day and it records subjects' daily activities and in some cases calories. Accelerometers precisely quantify physical activity and it provides detailed information about the pattern of physical activity (Riddoch, C. J., Mattocks, C., Deere, K. et al., 2007). Lastly, most commonly used method is self reported answers to survey that is indirect assessment of the physical activity level. Physical activity levels are measured by converting the self report answers into estimates of energy expenditure. One type of physical activity survey asks people to record their latest activities according to time frame which can be a day, a week, a month or a year. Different types of surveys ask people type, duration,

and frequency of home activities, job activities, leisure time activities, or conditions under which physical activities performed (Valanou, Bamia, & Trichopoulou, 2006). Prince and her colleagues (2008) reviewed the literature to examine the difference between self-report measurement of physical activity in adults such as; diaries or logs, questionnaires, surveys, and recall interviews and direct measurement such as; accelerometers, doubly labeled water, indirect calorimetry, heart rate monitors, and pedometers. Correlation between self-report and direct measurement of physical activity founded to be low-to-moderate, in other words two measures showed good agreement. Also, they said that the cost of direct measurement should be considered for the studies. Moreover, while determining the type of survey one should consider its validity and reliability for the study it is going to be used. Besides, Salcı and Koçak reviewed (2001) studies about commonly used questionnaires to determine physical activity level and stated that subjects' age, gender, socio-economic status and race should be considered while choosing appropriate type of survey. Another criterion for the selection of assessment methods for physical activity level is that the method should be feasible to be used in the study. Validated questionnaires such as FADA are inexpensive, easy to administer, and readily applicable to measure adults' physical activity levels.

## **2.8 Summary**

The health of women could be improved by changing physical activity behavior from sedentary lifestyle to active lifestyle and increasing physical activity level. Brief and stage specific physical activity counseling method based on the constructs of TTM have been widely used successfully to affect physical activity behaviors of participants in most studies. More research is needed to create new interventions and test them that will be successful in increasing physical activity level in women and to decrease the risks of chronic diseases. There has been no study investigating physical activity intervention methods with randomized controlled trial using participant centered physical activity counseling program and measured effectiveness of counseling program on physical activity level of Turkish women population. Therefore, PACE<sup>®</sup> program was used in this study. This may boost the future development of physical activity interventions.

## CHAPTER III

### METHOD

This chapter discusses the type of research design, who the participants were, what instruments were used, and how the data were analyzed. The study design was an experimental one where participants were passively recruited and then randomly assigned to either an intervention group or a control group. Then, pre and post test design was applied to investigate the effects of PACE<sup>®</sup> physical activity intervention group compared to control group on physical activity level and stages of change of sedentary women. The target population of this study was sedentary women at METU.

#### 3.1 Participants

The participants were women working at METU, Ankara. It was a convenience sample of subjects aged 21 to 57. The purpose of the study was explained to each participant before obtaining their written consent. Also, confidentiality of the information was provided and right to withdraw without bearing any responsibility was maintained throughout the study. Participants completed the Physical Activity Measurement Questionnaire which is including demographic questions measuring at baseline (see Appendix A). Questions were asked pertaining to age, marital status, the level of education and tobacco usage. The measures for eligibility were completed with three more questionnaires: one is “Physical Activity Readiness Questionnaire (PAR-Q)” (Appendix B). At that stage individuals were excluded from the study if they answered yes to any of the questions in PAR-Q. Depending upon the results of this questionnaire, some participants were excluded if they had any other serious chronic medical conditions such as cardiovascular heart disease, hypertension, diabetic and cancer. Second is Physical Activity Questionnaire’ demographic part and if they said pregnant, they were excluded. Last one is “What is your PACE Score?” (Appendix C) to identify participants’ current level of physical activity and readiness to change. If the participants in the pre-contemplation stage or

contemplation stage with respect to “What is Your PACE Score” questionnaire, they were assumed to meet the study criteria. Participants in the action stage were excluded because they were already participating in 30 minutes moderate exercise 5 or more days, or participating in vigorous exercise 3 or more days in a week.

### **3.2 Procedures**

Participants who were determined to be eligible were given a letter which contains the details of the study (Appendix D). 182 participants were randomly assigned to one of two groups: PACE<sup>©</sup> intervention or control group as indicated previously. The study lasted 4 weeks and started on March 16 and concluded on April 26, 2009. Participants in intervention and control group underwent a baseline measurement (pre-test) and a measurement at the conclusion of the study (post-test). Women in the intervention group received brief and participant assessment centered counseling (PACE<sup>©</sup>). The group completed PACE<sup>©</sup> program which includes relevant issues for each stage of change. Different protocols are applied for different stages so that the provider can easily tailor recommendations to meet the needs of each participant in order to increase the level of effectiveness of counseling. As mentioned previously, the purpose of intervention method is to increase the physical activity level of participants and advance further in the stages from pre-contemplation stage to contemplation stage or contemplation stage to action stage. After two weeks from counseling, intervention group took booster phone call or electronic mail from provider. Besides, physical characteristics of participants including Body Mass Index (BMI) were recorded for the purpose of between group comparisons at baseline and post-test.

### **3.3 Intervention Group**

The intervention group received PACE<sup>©</sup> program (Appendix E and F) and a brief (2-5 minutes) counseling tailored to the subject’s reported stages of change (Patrick et al., 1994). The PACE<sup>©</sup> program is intended to enable providers to help their participants achieve the health benefits of physical activity. The PACE<sup>©</sup> program has been validated in the primary care setting (Calfas et al., 1996). If the women reported that she is in the pre-contemplation stage which means she is physically inactive and

not ready to become active, “Getting out of Your Chair” guided her counseling (Appendix E). Women in this stage received a personalized message to think about the personal benefits of physical activity on their health and to strongly consider starting a physical activity program. If they were physically inactive but ready to become active (contemplators), “Planning the First Step” guided counseling between participants and provider (Appendix F). Women in contemplation stage could collaborate with PACE<sup>®</sup> provider to establish an initial physical activity goal and discuss the benefits of physical activity. Participants were asked to sign an agreement written by the provider indicating that they were ready to follow the steps in the program. Two weeks later, provider telephoned or mailed participants to ask about their progress towards their goal. The purpose of the call or mail is to inquire the progress in the program, offer support, and help participants solve problems they may encounter.

### **3.4 Control Group**

Women in the control group did not receive any counseling, they completed only the questionnaire at the beginning of the study, and 4 weeks later they completed the questionnaires again.

### **3.5 Instruments**

#### **3.5.1 Demographic and Lifestyle Questionnaire**

Information about self reported age, height, weight, marital status, having a child, level of education, and smoking habit was collected at baseline (Appendix A).

#### **3.5.2 Physical Activity Readiness Questionnaire (PAR-Q)**

The revised version of PAR-Q, developed by Canadian exercise experts, is a valid and proven tool for screening individuals prior to participation in physical activity (Shephard, Cox, & Simper, 1981). The questionnaire is used to identify risk factors of participation in physical activity and assist participants whether they should check with a doctor before beginning their regular physical activity program and becoming more active. The questionnaire contains 7 yes/no questions that assessed the

participants' readiness to be more active. In this study translation of this questionnaire was used. Before the application process, the material was given to 80 women for test-retest reliability. There was one week of interval between the test and retest sessions. Test-retest reliability coefficients of the Turkish version of PAR-Q Questionnaire were found to be statistically significant ( $p = .00$ ).

### 3.5.3 What is Your PACE Score? Questionnaire

It determines participant's current level of physical activity and readiness to change. This is a short assessment tool that participants are asked to identify one statement out of 8 items that best describe their current involvement with physical activity or intentions to do physical activity (Calfas et al., 1996) and has a test-retest reliability of 0.80 (Isrow-Cohen, B., Sallis J. F., Calfas, K.J., Long, B.J., Wooten, W.J., and Patrick, K., unpublished manuscript, as cited in Calfas et al. 1997). The PACE Score identifies participant's stage of change and is used to select an appropriate counseling.

Participants choosing #1 on the "What is Your PACE Score?" questionnaire are classified in pre-contemplation which means they are inactive and not ready to change. Participants choosing #2, #3, or #4 are classified in contemplation which means they are inactive but ready to change. Participants choosing item #5, #6, #7, or #8 is classified in action which means they are active. For this study, only participants in pre-contemplation or contemplation stage were taken into account.

PACE<sup>©</sup> materials including assessment forms, and three distinct counseling protocols, were adapted by following the translation and back-translation methodology. PACE<sup>©</sup> materials were translated into Turkish language by a METU faculty member who is fluent in both languages for validity testing. The translated material was then reviewed by a panel of experts consisting of two experts in physical activity and exercise science. The panel determined content validity and appropriateness of items in the stages of change and also the instruction and definitions used in the questionnaire. After completing the review, I revised the PACE<sup>©</sup> material following the feedback given by the expert panel. The PACE<sup>©</sup> material was then backward translated from Turkish to English by a METU faculty member



who is proficient in both Turkish and English. The two versions of PACE<sup>®</sup> materials backward translations were then compared with the original one and reviewed by the panel of experts. The minimal revision of language used in PACE<sup>®</sup> material was made in order to make material more suitable and understandable in the Turkish context. In addition, Turkish version was applied to 80 women for test-retest reliability. There was one week of interval between the test and retest session. Test-retest reliability of the Turkish version of What is your PACE Score? Questionnaire was high ( $r = .98$ ).

#### 3.5.4 FADA Questionnaire

It is a self-report measure of physical activity and it was administered at baseline and at the end of four week follow-up period. FADA which is called 7-day Physical Activity Assessment Questionnaire has demonstrated high level of test-retest reliability between the ranges ( $r = 0.84-0.98$ ) and adequate validity, so FADA is accepted reliable and valid questionnaire for the ages of 18 to 65 years old working in different occupations (Karaca, & Turnagöl, 2007). FADA is 7-day Physical Activity Assessment Questionnaire which consists of work and non-work activities. Then, amount of estimated-metabolic-equivalent (MET) consumed per week are calculated. The questionnaire designed to capture physical activity for a full 24 hours each day for a period of 1 week.

### 3.6 Physical Measures

Body mass index was hand calculated using the formula below:

$$\frac{\text{Weight (kg)}}{(\text{Height (cm)})^2}$$

### **3.7 Permissions**

Permission was obtained from Dr. Karen Calfas on July 18, 2008 to use PACE<sup>®</sup> intervention including assessments forms and counseling materials. The permission includes the translation of the PACE<sup>®</sup> materials into the Turkish language and use them in print form (Appendix G).

Dr. Ayda Karaca gave permission to use her physical activity questionnaire (FADA).

## **CHAPTER IV**

### **RESULTS**

The findings of the study are presented in this chapter. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 15 for Windows software. The study results for each of the specific research questions are presented. Since the study includes two groups and two points, one way repeated measures ANOVA was used in analyses.

#### **4.1 Sampling & Participants**

METU could provide convenient sampling as there is many women staff in academic and administrative departments. However, it was impossible to study with every working woman due to financial limitations and application difficulties. Since all the women working at METU could not be selected for this study, it was announced to everybody for their voluntary participation. Therefore, the participants were not selected randomly. However, the variety of departments and units of participants and of their age level would enable us to obtain at least a predictive value about working woman at the university.

Participants were recruited by posting flyers, circulating e-mail notices about the PACE<sup>©</sup> program at the university and the web site which is [www.sporhocam.com](http://www.sporhocam.com) between March 1 and March 16, 2009. Two hundred nineteen women scheduled to complete forms. Twenty nine (13.24%) of these potential participants were declined to participate. One hundred ninety women agreed to participate in the study and signed consent forms. Seven were excluded because they reported moderate physical activity for 30 minutes on 5 or more days per week or vigorous activity for 20 minutes on 3 or more days in a week with respect to “What is Your PACE Score” Questionnaire. One is excluded due to physical problems, indicated by responses on the PAR-Q questionnaire. Random sampling was used to divide the participants into control and intervention groups. 87 in the intervention group and 95 in the control group completed the study protocol.

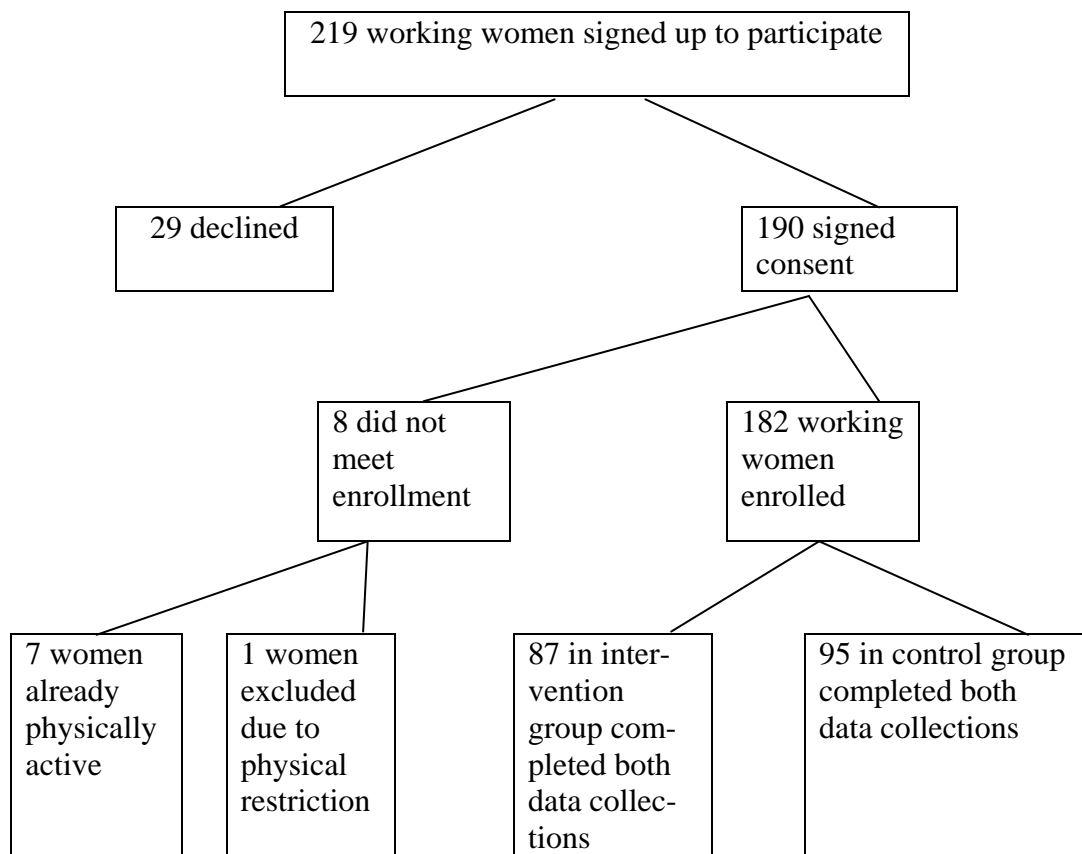


Figure 3. The Distribution of the Participants

#### 4.2 Description of Sample

The mean age of the sample was 31.26 ( $SD = 7.22$ ). One hundred two of the participants (46.7%) were under 30 years of age and 53.2% were over thirty. The majority of the group (75.8%) was undergraduate level. The half of the group (51.1%) was married. The majority of the group (72.0%) did not have smoking habit. The demographic characteristics of the sample are presented in Table 1.

Table 1  
*Description of Demographic Characteristics of the Sample at Baseline*  
*(N = 182)*

Variable	Frequency	%
<b>Age</b>		
20 – 29 years	85	46.7
30 – 39 years	70	38.5
40 – 49 years	25	13.7
49 – 57 years	2	1.0
<b>Education</b>		
Undergraduate	138	75.8
Bachelor degree	39	21.4
Doctoral degree	5	2.7
<b>Marital Status</b>		
Not married	89	48.9
Married	93	51.1
<b>Smoking habit</b>		
Yes	51	28.0
No	131	72.0

### 4.3 Baseline Physical Activity Measures

#### 4.3.1 PACE Stages Score.

The mean of PACE Stage Score was 2.34, which means that average participant's current physical activity status is in the contemplation stage with respect to PACE. In other words, participants are seriously planning to change his/her existing physical activity status within the next 6 months (Table 2).

#### 4.3.2 FADA Questionnaire:

Participants' reported baseline physical activity level mean was 567.87 MET-minutes per week (Table 2). US Department of Health and Human Service announced (2008) the common guideline is that total weekly physical activity including moderate and vigorous physical activities in the range of 500 to 1.000 MET-minutes per week produces substantial health benefits for adults.

### 4.3.3 Physical Measures

Mean body mass index (BMI) for the total group was 22.37 (Table 2).

Table 2

*Description of Participants' Baseline Physical Activity and Physical Measures*

Physical Activity and Physical Measures	Mean (SD)	Median	Mode	(Range)
Physical Activity Measures				
PACE Stages Scores	2.35 (1.04)	2.0	2.0	(1-4)
FADA Questionnaire MET/week	567.87 (425.03)	448.05	468.65	19.36
Physical Measures				
BMI (182)	22.37 (3.54)	21.64	23.05	-----

### 4.4 Assumptions of ANOVA

ANOVA needs three important assumptions for the data. In order to check the assumptions of ANOVA, groups should be independent, groups' variances must be equal and groups should have normal sampling distribution (Kerr, A. W., Hall, H. K., & Kozub, S., 2002).

First of all, independence of sample was verified by checking on how subjects were selected and how they were assigned to groups. In this study, experimental and control groups are different from each other. Moreover, they were randomly assigned. Then, the independence of sample assumption is hold for ANOVA. Secondly, groups which are compared should have homogenous (equal) variance for ANOVA. The assumption was assessed by the examination of the results of Levene's test which is a relatively robust measure of homogeneity of variance. Since none of the  $p$  values are smaller than 0.05 (not significant), we do not reject the null hypothesis that there is no difference between the variances (Green, S. B., Salkind, N. J., & Akey, T. M., 2000). Then, equality of variance assumptions is satisfied (Table 3).

Table 3

*Levene's Test of Equality of Group's Variances*

Variable	F	(df1, df2)	(Pr > F)
Physical activity level	.68	(1, 180)	.41
Physical activity level 4-week	.54	(1, 180)	.47
Pace level baseline	3.71	(1, 180)	.06
Pace level 4-week	1.54	(1, 180)	.22

Lastly, Normality of sampling distribution was checked by Shapiro-Wilk test. If  $p < .05$ , we reject the null hypothesis that the variable is normally distributed; if  $p > .05$ , we do not reject the null hypothesis that the variable is normally distributed. Then, according to Shapiro-Wilk test, PACE stages variables meet the normality assumption but Physical Activity Level variables do not meet the normality assumption (Table 4). However, it is probably as effective to visually inspect distribution graphs for each group, so we can also check the normality assumptions by histograms and density (Morgan, G. A., & Griego, O. V., 1998).

The graphs (Figure 4 and Figure 5) below show that we can assume normality of physical activity level variables, too. Then, normality assumptions are satisfied for ANOVA.

After the checking the violations of the ANOVA assumptions for the data, there was not any problem for the ANOVA. In general, ANOVA is considered to be relatively robust to violations of normality and homogeneity of variance, especially when sample sizes are equal or nearly equal and large enough (Morgan, G. A., & Griego, O. V., 1998).

Table 4  
Shapiro-Wilk Test for Normality

Groups	Variable	W	V	z	sig. (Pr > z)
Intervention group	Physical activity level baseline	.85	11.27	5.33	.00
	Physical activity level 4-week	.91	6.94	4.27	.00
	Pace level baseline	.98	1.76	1.25	.11
	Pace level 4-week	.99	.74	-.65	.74
Control group	Physical activity level baseline	.82	14.27	5.88	.00
	Physical activity level 4-week	.79	16.84	6.25	.00
	Pace level baseline	1.00	.19	-3.63	1.00
	Pace level 4-week	1.00	.28	-2.82	1.00

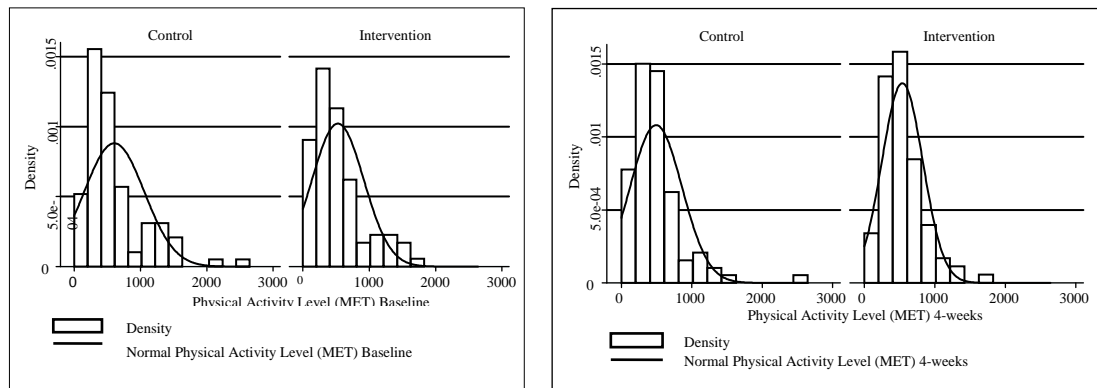


Figure 4. Histograms of Physical Activity Level Variables for Intervention and Control Groups

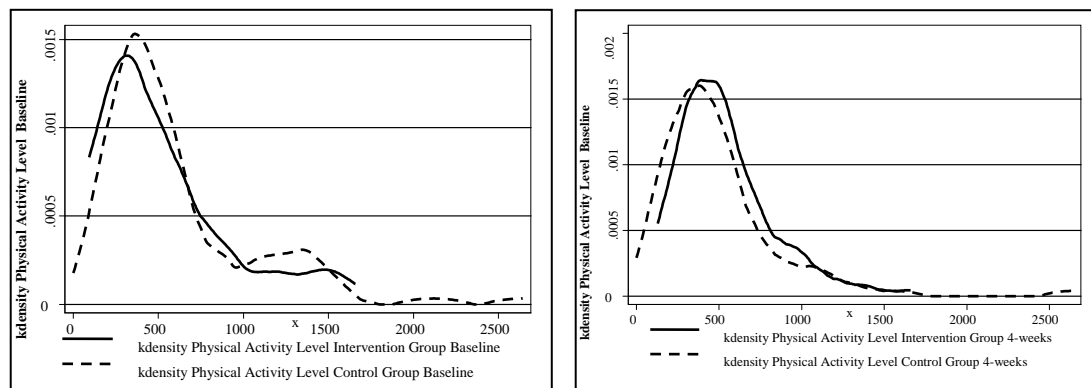


Figure 5. Kernel Density Plots of Physical Activity Level Variables for Intervention and Control Group



## 4.5 Examination of Research Questions

### 4.5.1 Research Question 1

Do participants in the intervention group increase their physical activity levels over four-week intervention program when compared to the physical activity levels in control group?

Mean of the physical activity level of intervention group was significantly higher immediately after the PACE<sup>®</sup> program ( $M = 537.80$ ,  $SD = 291.55$ ) than before the PACE<sup>®</sup> program ( $M = 527.07$ ,  $SD = 390.65$ ). However, the mean of physical activity level of control group was decreased during four weeks from ( $M = 605.24$ ,  $SD = 453.07$ ) to ( $M = 492.27$ ,  $SD = 492.27$ ).

Table 5  
*Description of Control and Intervention Group's Physical Activity Measures at Baseline and 4-weeks*

Variables	Baseline Control Mean (SD)	4-Weeks Control Mean (SD)	Baseline Intervention Mean (SD)	4-Weeks Intervention Mean (SD)
PACE – Stages Scores (182)	2.53 (1.06)	2.43 (1.06)	2.14 (.99)	2.47 (.97)
FADA Questionnaire MET-minutes/week	605.24 (453.07)	492.27 (369.10)	527.07 (390.65)	537.80 (291.55)

A one way repeated measures ANOVA was conducted to examine the effect of PACE program on physical activity level of sedentary working women between intervention group and control group before and after intervention. The results for the ANOVA indicated significant differences in measurement between first week and fourth week, Wilks'  $\Lambda = .98$ ,  $F(1,180) = 3.74$ ,  $p = .06$ , multivariate  $\eta^2 = .02$ . There was a significant difference in measurement between intervention group and control group before and after intervention, Wilks'  $\Lambda = .97$ ,  $F(1,180) = 5.48$ ,  $p = .02$ , multivariate  $\eta^2 = .03$  (Table 6).

Table 6  
*Multivariate Tests for Physical Activity Level*

Effect		Value	F	Hy- phote- sis df	Error df	Sig.	Eta Squar ed	
Time	Pillai's Trace	.02	3.744	1	180	.06	.02	
	Wilks' Lambda	.98	3.74	1	180	.06*	.02	
	Hotelling's Trace	.02	3.74	1	180	.06	.02	
	Roy's Largest Root	.02	3.74	1	180	.06	.02	
Time *	Pillai's Trace	.03	5.48	1	180	.02	.03	
	Wilks' Lambda	.97	5.48	1	180	.02**	.03	
	Group	Hotelling's Trace	.03	5.48	1	180	.02	.03
		Roy's Largest Root	.03	5.48	1	180	.02	.03

\* Significant difference ( $p < .10$ ), \*\* Significant difference ( $p < .05$ )

Follow-up polynomial contrasts indicated a significant linear effect with the means of physical activity level for intervention and control group over time,  $F(1,180) = 5.48$ ,  $p = .02$ , partial  $\eta^2 = .03$ ,  $p < .05$ . This means that after four week intervention, mean physical activity frequency changes in a way that is linear.

The figure 6 illustrates that physical activity level of intervention group increased after the counseling but physical activity level of control group decreased.

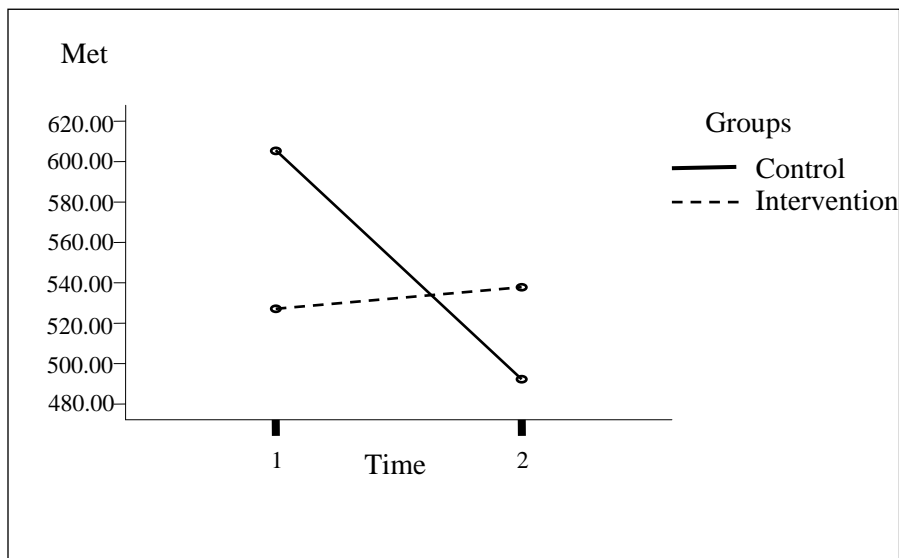


Figure 6. Estimated Marginal Means for Physical Activity

A Pair-wise comparison was conducted between the groups and pair-wise comparisons were found to be significant,  $p = .06$ ,  $p < .10$  (Table 7).

Table 7  
*Pairwise Comparisons for Physical Activity*

(I) factor1	(J) factor1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Upper Bound	Lower Bound
1	2	51.121	26.420	0.06	-1.011	103.253
2	1	-51.121	26.420	0.06	-103.253	1.011

As a result of repeated measures ANOVA for physical activity level, our statistical analysis proved the research question 1. Then, “participants in intervention group increased their physical activity levels over four-week intervention program when compared to the physical activity levels in control group”.

#### 4.5.2 Research Question 2

Do intervention group advance further in stages of change following a four-week intervention program when compared to the stages of change in the control group?

As can be seen in Table 5 that PACE Stage score of control group was decreased their mean from ( $M = 2.52$ ,  $SD = 1.06$ ) to ( $M = 2.43$ ,  $SD = 1.06$ ) but PACE Stage score of intervention group mean was increased from ( $M = 2.14$ ,  $SD = 0.99$ ) to ( $M = 2.47$ ,  $SD = 0.98$ ). At baseline, the control group had twenty (21.05%) of its participants at PACE Stage 1 and seventy five (78.95%) of its participants at PACE Stage 2, 3 and 4 but twenty five (28.73%) of the intervention group were at PACE Stage 1 and sixty two (71.26%) of its participants at PACE Stage 2,3 and 4. After four weeks, the intervention group had only thirteen (14.94%) of its participants in PACE Stage 1 and seventy four (85.06%) of its participants in PACE Stage 2, 3 and 4 but the control group had twenty two (23.16%) of its participants in the PACE Stage1 and seventy three (76.84%) of its participants at PACE Stage 2, 3 and 4.

A one way repeated measures ANOVA was conducted to examine the effect of PACE program on stages of change of sedentary working women between intervention group and control group before and after intervention. The results for the ANOVA indicated a significant time effect, Wilks'  $\Lambda = .95$ ,  $F(1,180) = 9.80$ ,  $p = .002$ , multivariate  $\eta^2 = .05$ . There was a significant difference in measurement between intervention group and control group, before and after intervention, Wilks'  $\Lambda = .85$ ,  $F(1,180) = 31.55$ ,  $p = .00$ , multivariate  $\eta^2 = .15$  (Table 8).

Table 8  
*Multivariate Tests for Stages of Change*

Effect		Value	F	Hy- pho- tesis df	Error df	Sig.	Eta Square d
Time	Pillai's Trace	.52	9.80	1	180	.002	.05
	Wilks' Lambda	.95	9.80	1	180	.002*	.05
	Hotelling's Trace	.05	9.80	1	180	.002	.05
	Roy's Largest Root	.05	9.80	1	180	.002	.05
* Group	Pillai's Trace	.15	31.55	1	180	.00	.15
	Wilks' Lambda	.85	31.55	1	180	.00*	.15
	Hotelling's Trace	.18	31.55	1	180	.00	.15
	Roy's Largest Root	.18	31.55	1	180	.00	.15

\* Significant difference ( $p < .01$ )

Follow-up polynomial contrasts indicated a significant linear effect with the means of stages of change for intervention and control group over time,  $F(1,180) = 9.80$ ,  $p = .002$ ,  $p < .01$ , partial  $\eta^2 = .05$ . This means that after four week intervention, mean physical activity frequency changes in a way that is linear. The figure 7 illustrates that stages of change of intervention group increased after the counseling but stages of change of control group decreased.

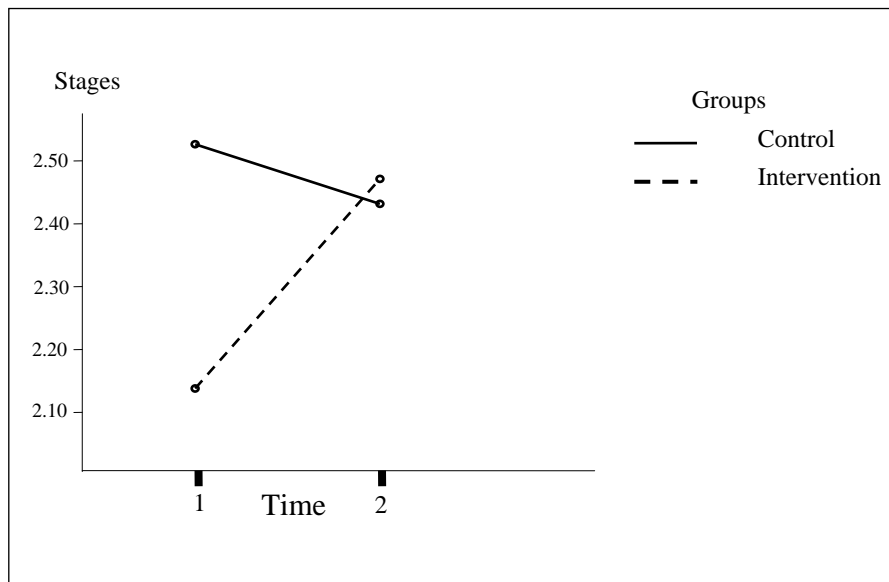


Figure 7. Estimated Marginal Means for Stages of Change

A pair-wise comparison was conducted between the groups. Pair-wise comparisons were found to be significant,  $p = .005$ ,  $p < .01$  (Table 9).

Table 9  
Pairwise Comparisons for Stages of Change

(I) fac- tor1	(J) fac- tor1	Mean Dif- ference (I- J)	Std. Er- ror	Sig.	95% Confidence Interval for Difference	
					Upper Bound	Lower Bound
1	2	-0.108	0.038	0.005	-0.182	-0.033
2	1	0.108	0.038	0.005	0.033	0.182

Moreover, the figures 8 and figure 9 below show the stages of change baseline and after the intervention for the intervention group with respect to the control group.

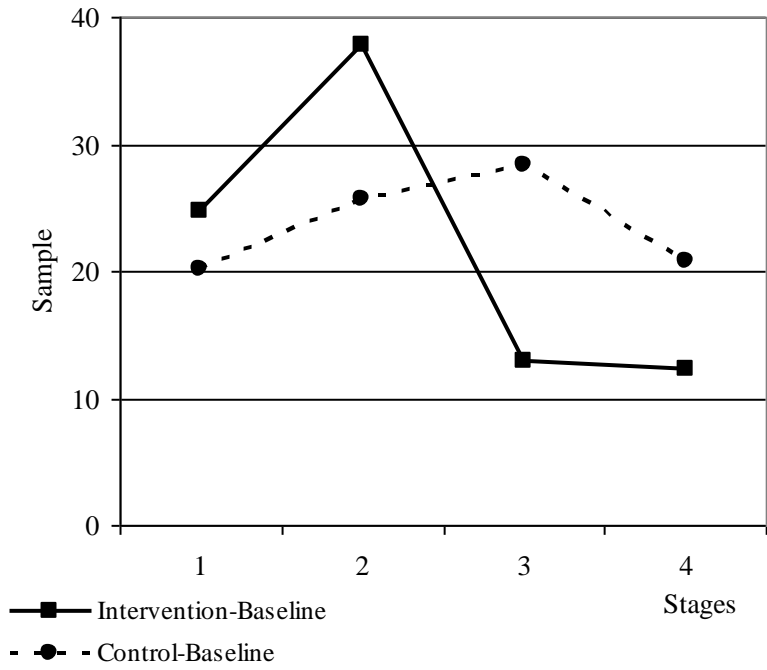


Figure 8. PACE Stages Comparisons at Baseline for Intervention and Control Groups

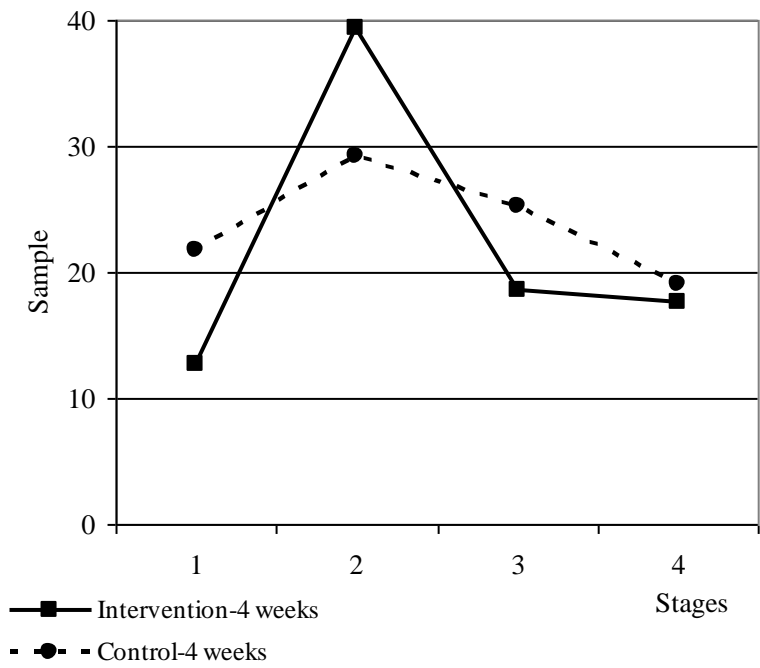


Figure 9. PACE Stages Comparisons after 4 weeks for Intervention and Control Groups

As a result of repeated measures ANOVA for stages of change, our statistical analysis proved the research question 2. Then, “intervention group advance further in stages of change following a four-week intervention program when compared to the stages of change in the control group”.

#### 4.5.3 Research Question 3

What is the relationship between physical activity level and stages of change?

A simple linear correlation analysis showed that there was a positive and significant correlation between physical activity difference and stages of change. The correlation between physical activity change and stages of change is positive and significant ( $r = .23, p < .01$ ). If stages of change increase, physical activity increases. Second, the correlation between physical activity change and advance further in stages of change is positive and significant ( $r = .18, p < .05$ ). If advance further in stages of change increases, physical activity change increases, as well. Lastly, the correlation between physical activity increase and advance further in stages of change is positive and significant ( $r = .29, p < .01$ ). If advance further in stages of change increases, physical activity increases. As a result, statistical analysis shows that the relationship between physical activity level and stages of change is positive and significant.

#### 4.6 Summary

The data analysis indicates that women in the intervention group who received PACE<sup>©</sup> program improved their physical activity level and stages of change significantly. Women in the control group, on the other hand, had significant change but this change indicated that there was a decline in their physical activity level and stages of change. This can be considered as an interesting finding and can be connected to the absence of counseling for that group. Besides, there is a positive relationship exist that when the physical activity stage of change improved, physical activity level increased. However, before ending up with such an explanation, a further research study should take place, which is beyond the boundaries of the existing study.

## **CHAPTER V**

### **DISCUSSION**

This study examined the brief, and participant centered physical activity counseling method PACE<sup>©</sup> program on the physical activity levels and stages of change of sedentary working women at METU, Ankara. One of the basic findings of this study is that PACE<sup>©</sup> program matched to the participant's stage of physical activity produced meaningful increase in physical activity level and stages of change. Besides, this study provides an understanding of the relationship between a brief physical activity intervention program and physical activity level and stages of change. The use of experimental design increases the level of confidence in explaining the relationship between physical activity intervention program and physical activity level and stages of change.

Sedentary working women who received PACE<sup>©</sup> counseling program at worksite were more likely to increase physical activity level and stages of change, which supports to use of the PACE<sup>©</sup> program with sedentary women. The use of PACE<sup>©</sup> program is providing background for other intervention studies in Turkey. The study provides encouraging results in relating to physical activity intervention programs for sedentary working women. Physical activity intervention studies designed to target to increase physical activity level of the population and especially sedentary population are very valuable because physical activity has several health benefits and decreases morbidity and mortality (USDHHS, 1998).

#### **5.1 Summary of Findings**

##### **5.1.1 Physical Activity Level**

Physical activity level should be improved in order to gain health benefits and support the quality of life; therefore, it is not wrong to claim that an increase in the level of physical activity can be considered as an important contribution to human's life. According to the results of many studies in the literature, physical activity level



of sedentary working women increases by the help of PACE<sup>®</sup> program. In this study, physical activity level, parallel to the findings of many existing studies, increased in the intervention group as they took PACE<sup>®</sup> counseling program with respect to their stages of change. Sedentary working women weekly MET minutes per week values increased after the PACE<sup>®</sup> program as they started to either participating in activities or increasing their daily activities, both of which are necessary to leave sedentary lifestyle and choosing more active lifestyle. During the counseling, mostly daily walking was recommended for participants as it is easy to continue and suitable for the sedentary people, and the health benefits of participating in moderate level of physical activities explained. E-mail or phone call follow up motivated them to continue to their activities or encouraged them to ask their questions about their exercise program which was recommended during the counseling. Although duration period of the study (four weeks) might not be considered as long enough to arrive at some conclusions, it was observed that it helped participants to move forward in physical activity level after the study completed. However, a follow up study is needed to see their participation in physical activities following the duration period. In other words, whether they will continue applying the requirements of a healthy life style or not should be checked in another study.

Calfas and her colleagues applied the PACE counseling in physicians office and physicians provided brief counseling to 255 healthy, sedentary and adult patients that the intervention group increased walking than control group but control group slightly decreased their activity counts per hour measured by accelerometer during 6 weeks (Calfas et al., 1996). Similarly, one of the findings of our study was that the control group decreased their physical activity level with respect to MET values. As Orleans (2000) indicated many people can be sedentary or active at different time's period in their lives. Keeping this claim in the background, there might be some explanations for such a finding. A highly possible one of these can be the period that the study has been carried out. As explained earlier, this study was applied between the second half of March and mid April. Actually, this period is a hectic one due to the fact that it is almost the beginning of the spring semester when there is a huge amount of academic and administrative errands to be done. In such a period, it might be probable for already physically active people to replace their physical activity

with the daily work temporarily. Considering the fact that level of physical activity fluctuates with various reasons, such as season, work load either at home or workplace, it can be suggested that such a fluctuation in the level of physical activity level of the control group might be related to the increasing level of workload in their work place. Moreover, before the study period, there was the semester break in which people have more free time to allocate for their sport and recreational activities. Since the members of the control group are already physically active people, it might be assumed that they had a more physically active period, which increases their recorded activity level for the study. Newman et al's study (2009) confirms that physical activity levels can fluctuate throughout the year. Given the fact that before summer people are physically more active to be ready for the coming season, it is not wrong to assume that during the semester holiday, subjects in the control group had more exercise than they do in their normal routine. This phenomenon might be another explanation for the fluctuation in their level of physical activity. In other words, it might be assumed that their initial reports about their level of physical activity would be affected their having more free time to spend for themselves, which affect the level of physical activity positively. As a result, they might indicate a higher level of physical activity at the beginning of the study. In addition to that, having no counseling during the study might be a discouraging factor for them to maintain the same level of physical activity. According to a study done by Kirk, Mutrie, MacIntyre, and Fisher (2004) indicated that the experimental group who had counseling increased their level of physical activity, whereas accelerometer counts per week for the control group having no counseling significantly decreased. Therefore it might not be wrong that the decrease in their level of activity can be a function of lack of counseling for the control group. A last but not least factor affecting the results of control group might be related to the duration of the study itself. As it is mention in previous parts of the study, it was a four week period in which performance of both groups have been assessed. However, in the literature, as mentioned earlier, there are many studies indicating no negative change in the mean performance of control groups. Yet, all these studies consist of longer periods of duration or a longer follow up period. Therefore, the

findings related to the control group in the existing study might have been different if it had had a longer follow up period, or we had had more time to perform the study.

All in all, it can be suggested that counseling has a positive effect on people's level of physical activity. It encourages sedentary women to participate in suggested type of physical activity more and more helping them to be more conscious about the importance of physical activity on their health. As it was indicated, a lack of sufficient reinforcement or counseling may lead to drop in physical activity level of women, which once more underlines the importance of it.

#### 5.1.2 PACE Stages of Change

The results pointed out that intervention group showed an increase in stages of change at 4 weeks. The hypothesis that participants' stage of change would increase was confirmed for the intervention group. This supported by other research studies which have been done in other countries. Previous research supports stages of change as a valid measure of exercise behavior (Cardinal, 1997; Schumann et. al., 2002) it is also important that PACE stages of change questionnaire is well-designed that participants can respond more accurately. Besides, the improvement in stages of change may be related with some factors such as; the involvement in the physical activity study could motivate them to do activity, they can understand their lack of activity while completing the questionnaire so they could force themselves to do activity, which was observed at least within the scope of this study. Counseling may well affect their behavior to understand the health benefits of physical activity participation. Besides, this study yielded similar results to Calfas work (1996). The control group stages of change dropped so their physical activity level dropped. PACE program was designed with respect to the US culture and meanly 6 weeks could be enough to see the effects, but in Turkish population, more counseling time may be more effective because of cultural differences.

If the stages of change is increased, the physical activity level increases so intervention material helped people to advance further in the stage of change and it resulted in boosting physical activity level and spending calories during the week. If participant started to change behavior about physical activity, their physical activity

level started to increase. This result supports the idea that in order to be successful to increase the physical activity level of people, first we should try to understand and modify their behavior pattern. Stage of change is very important to understand the participant's attitude about the physical activities, then applying intervention program with respect to his/her stage resulted in improving weekly physical activities and MET minutes per week values as well. Participant in the precontemplation stage advanced further to the contemplation stage. In the first stage they had no intention to participate but they took counseling and started to increase their daily activities so that their MET minutes per week values increased.

## **5.2 Recommendations**

The study is the first of its type in the Turkey to search the effect of physical activity counseling method on the physical activity level of sedentary working women. This study supports the efficacy of brief, tailored intervention program performed by PACE<sup>®</sup> materials and PACE specialist on the physical activity level of sedentary working women. PACE<sup>®</sup> material is simple and easy to use both by specialist and participants. PACE<sup>®</sup> material can be used by exercise specialist, physical educators and fitness instructors if adequate education is given because those people have more chance to meet people in the sports center and fitness centers. The intervention program applied for working women in the worksite is valuable solution for working women that need to increase physical activity level and stages of change. We need these kinds of physical activity intervention programs that generate a participants' exercise behavior and promotes physical activity level.

The study suggest that giving brief intervention and tailor them with phone and listen to them about their problems in their activities help them to motivate and continue to their activities.

Physical activity intervention studies can be applied to housewives, children at schools and in different kinds of worksite settings. The physical activity intervention materials can be developed and distributed to health centers, schools, sport centers and fitness centers, as well. Moreover, in order to avoid some misleading results, the same study might be repeated in different seasons and with longer periods of

duration. Such an effort might help us to understand the nature of participants' attitudes towards physical exercise and counseling, which, in turn, will help them to improve their life quality.

## REFERENCES

- American College of Sports Medicine. (2000). *ACSM's guidelines for exercise testing and prescription* (6th ed.). Baltimore: Williams and Wilkins.
- Armstrong, C. A., Sallis, J. F., Hovell, M. F., & Hofstetter, C. R. (1993). Stages of change, self-efficacy, and the adoption of vigorous exercise: a prospective analysis. *Journal of Sport and Exercise Psychology, 15*, 390-402.
- Bauman, A. E. (2004). Updating the evidence that physical activity is good for health—an epidemiological review 2000-2003. *Journal of Science and Medicine in Sport, 7* (1), Supplement: 6-19.
- Baranowski, T., Anderson, A., & Carmack, C. (1998). Mediating Variable Framework in Physical Activity Interventions How Are We Doing? How Might We Do Better? *American Journal of Preventive Medicine, 15* (4), 266-297.
- Barnes, P. M., & Schoenborn, C. A. (2003). *Physical activity among adults: United States, 2000*. Advance data from vital and health statistics; no. 333. Hyattsville, Maryland: National Center for Health Statistics. Retrieved January 3, 2009, from [www.cdc.gov/nchs/data/ad/ad333.pdf](http://www.cdc.gov/nchs/data/ad/ad333.pdf).
- Bertozi, N., Bakken, E., Bolognesi, M., Castoldi, F., Massarini, M., Galvani, C., et al. (2004). Promoting physical activity in overweight and obese patients: counseling in primary care from Italy (Cesena, 2002–2003). *Sport Sciences for Health, 1*, 25-30.
- Blair, S., & Brodney, S. (1999). Effects of physical inactivity and obesity on morbidity and mortality: current evidence and research issues. *Medicine & Science in Sports & Exercise, 31* (11), 646-662.

- Blair, S. N., Kohl, H. W., Gordon, N. F., & Paffenbarger, R. S. (1992). How much physical activity is good for health? *Annual Reviews Public Health, 13*, 99-126.
- Bolognesi, M., Nigg, C. R., Massarini, M., & Lippke, S. (2006). Reducing obesity indicators through brief physical activity counseling (PACE) in Italian primary care settings. *Annals of Behavioral Medicine, 31* (2), 179-185.
- Booth, M. L., Macaskill, P., Owen, N., Oldenburg, B., Marcus, B. H., & Bauman, A. (1993). Population prevalence and correlates of stages of change in physical activity. *Health Education & Behavior, 20* (3), 431-440.
- Brownson, R. C., Eyler, A. A., King, A. C., Brown, D. R., Shyu, Y. L., & Sallis, J. F. (2000). Patterns and correlates of physical activity among US women 40 years and older. *American Journal of Public Health, 90* (2), 264-270.
- Bull, F. C., Jamrozik, K., & Dphil, F. (1998). Advice on exercise from a family physician can help sedentary patients to become active. *American Journal of Preventive Medicine, 15* (2), 85-94.
- Calfas, K. J., Long, B. J., Sallis, J. F., Wooten, W. J., Pratt, M., & Patrick, K. (1996). A controlled trial of physician counseling to promote the adoption of physical activity. *Preventive Medicine, 25* (3), 225-233.
- Calfas, K.J., Sallis, J. F., Oldenburg, B., & French, M. (1997). Mediators of change in physical activity following an intervention in primary care: PACE. *Preventive Medicine, 26*, 297-304.
- Canadian Fitness and Lifestyles Research Institute. (2005). *CFLRI physical activity monitor publication*. Ottawa: Canadian Fitness and Lifestyles Research Institute.

- Canadian Fitness and Lifestyles Research Institute. (2005). *Local opportunities for physical activity and sport: Trends from 1999–2004. Section A: Physical activity and sport participation rates in Canada*. Ottawa: Canadian Fitness and Lifestyles Research Institute.
- Cardinal, B. J. (1995). The stages of exercise scale and stages of exercise behavior in female adults. *Journal of Sports Medicine and Physical Fitness*, 35, 87-92.
- Caspersen, C. J., Pereira, M. A., & Curran, K. M. (2000). Changes in physical activity patterns in the United States, by sex and cross-sectional age. *Medicine & Science in Sports & Exercise*, 32 (9), 1601-1609.
- Centers for Disease Control and Prevention (1996). *Physical activity and health: a report of the surgeon general*. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- Chan, C. B., & Ryan, D. A. (2009). Assessing the Effects of Weather Conditions on Physical Activity Participation Using Objective Measures. *International Journal of Environmental Research and Public Health*, 6, 2639-2654.
- Colditz, G. A., Cannuscio, C. C., & Frazier, A. L. (1997). Physical activity and reduced risk of colon cancer: implications for Prevention. *Cancer Causes and Control*, 8, 649-667.
- Curry, S. J., Kristal, A. R. & Bowen, D. J. (1992). An application of the stage model of behavior change to dietary fat reduction. *Health Education Research*, 7, 97-105.
- Dishman, R. K. (1994). *Advances in exercise adherence*. Champaign (IL): Human; Kinetics.
- Dishman, R. K., Oldenburg, B., O'Neal, H. & Shephard, R. J. (1998). Worksite physical activity interventions. *American Journal of Preventive Medicine*, 15 (4), 345-361.



- Dugdill, L., Brettle, A., Hulme, C., McCluskey, S. & Long, A. F. (2008). Workplace physical activity interventions: a systematic review. *International Journal of Workplace Health Management*, 1 (1), 20-40.
- Dunn, A.L., Marcus, B. H., Kampert, J. B., Garcia, M. E., Kohl, H. W., & Blair, S. N. (1999). Comparison of lifestyle and structured interventions to increase physical activity and cardiorespiratory fitness: A randomized trial. *Journal of the American Medical Association*, 281(4), 327-334.
- Erel, C., Uğurlu, M., Aydinli, F., Kesici, C., Çakir, B., Özoğlu, F., & Kaplan, Y. (2004). *Sağlıklı beslenelim, kalbimizi koruyalım projesi araştırma raporu*. Ankara: T.C. Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü Gıda Güvenliği Daire Başkanlığı Toplum Beslenmesi Şubesi.
- Ersoy, C. & Imamoglu, S. (2005) Comparison of the obesity risk and related factors in employed and unemployed (housewife) premenopausal urban women. *World Health Organization*. Retrieved January 3, 2009, from <http://www.who.int/infobase/mddetails.aspx?surveycode=102445a1>
- European Commission Directorate General Health and Consumer Protection. (2003). *Physical Activity (Special Eurobarometer 183-6/wave 58.2)*. Brussels: European Commission.
- European Commission Directorate General Health and Consumer Protection. (2006). *Health and Food (Special Eurobarometer 246/wave 64.3)*. Brussels: European Commission.
- Fagard, R. H. (2005). Physical activity, physical fitness and the incidence of hypertension. *Journal of Hypertension*, 23, 265–267.
- Fallon, E. A., & Hausenblas, H. A. (2004). Transtheoretical model: Is termination applicable to exercise? *American Journal of Health Studies*, 35, 44.
- Fox, K. R. (1999). The influence of physical activity on mental well-being. *Public Health Nutrition*, 2 (3a), 411–418.

- Fox, S. M., & Haskell, W. L. (1968). Physical activity and the prevention of coronary heart disease. *Bulletin of the New York Academy of Medicine*, 44 (8), 950-967.
- Frank, P. J., & Jason, D. R. (2005). Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, 18 (2), 189-193.
- Frey, I., & Berg, A. (2002). Physical activity counseling: assessment of physical activity by questionnaire. *European Journal of Sport Science*, 2 (4), 1-6.
- Gauvin, L., & Spence, J. C. (1996). Physical activity and psychological well-being: knowledge base, current issues, and caveats. *Nutrition Reviews*, 54 (4 Pt 2), 53-65.
- Goldstein, M. G., Pinto, B. M., Lynn, H., Jette, A. M., Rakowski, W., McDermott, S., et al. (1999). Physician-based physical activity counseling for middle-aged and older adults: a randomized trial. *Annals of Behavioral Medicine* 21 (1), 40-47.
- Green, S. B., Salkind, N. J., & Akey, T. M. (2000). *Using SPSS for Windows. Analyzing and Understanding Data*. New Jersey: Prentice-Hall Inc.
- Haskell, W. L., Lee, I., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., Macera, C. A., Heath, G. W., Thompson, P.D., Bauman, A. (2007). Physical activity and public health updated recommendation for adults; from the American College of Sports Medicine the American Heart Association. *Circulation*, 116, 1081-1093.
- Haskell, W. L., Lee, I., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., Macera, C. A., Heath, G. W., Thompson, P.D., Bauman, A. (2007). Physical activity and public health updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine & Science in Sports & Exercise, Special Reports*, 1423-1434.

- JAMA (2001). Effects of physical activity counseling in primary care: the activity counseling trial: a randomized controlled trial. *JAMA*, 286, 677-687.
- Jaglal, S. B., Kreiger N. & Darlington, G. (1993). Past and recent physical activity and risk of hip fracture. *American Journal of Epidemiology*, 138 (2), 107-118.
- Jeon, C. Y, Lokken, R. P., Hu, F. B. & Van Dam, R. M. (2007). Physical activity of moderate intensity and risk of type 2 diabetes. *Diabetes Care*, 30, 744–752.
- Karaca, A. & Turnagöl, H. H. (2007). Çalışan bireylerde üç farklı fiziksel aktivite anketinin güvenilirliği ve geçerliği. *Hacettepe Journal of Sport Sciences*, 18 (2), 68-84.
- King, A. C., Blair, S. N., Bild, D. E., Dishman, R. K., Dubbert, P. M., Marcus, B. H., Oldridge, N. B., Paffenbarger, R. S., Powell, K. E. & Yeager, K.K. (1992). Determinants of physical activity and interventions in adults. *Medicine and Science in Sports and Exercise*, 26, Suppl: 6, 221-236.
- Kerr, A. W., Hall, H. K., & Kozub, S. (2002). *Doing Statistics with SPSS*. Great Britain: Cromwell Press Limited.
- Kirk, A., Mutrie, N., MacIntyre, P. & Fisher, M. (2004). Effects of a 12-month physical activity counselling intervention on glycaemic control and on the status of cardiovascular risk factors in people with Type 2 diabetes. *Diabetologia*, 47, 821-832.
- LaMonte, M. J., Blair S.N. & Church, T. S. (2005). Physical activity and diabetes prevention. *Journal of Applied Physiology*, 99, 1205-1213.
- Lee, I-M. (2003). Physical activity and cancer prevention-data from epidemiologic studies. *Medicine & Science in Sports & Exercise*, 35 (11), 1823-1827.

- Lee, I-Min, Rexrode, K. M., Cook, N. R., Manson, J. E., Buring, J. E. (2001). Physical activity and coronary heart disease in women is "no pain, no gain" passé? *The Journal of the American Medical Association*, 285, 1447-1454.
- Lewis, B. S., & Lynch W. D. (1993). The effect of physician advice on exercise behavior. *Preventive Medicine*, 22 (1), 110-121
- Long, B. J., Calfas, K. J., Wooten, W., Sallis, J.F., Patrick, K., Goldstein, M. & Marcus, B. H. (1996). A multisite field test of the acceptability of physical activity counseling in primary care: Project PACE. *American Journal of Preventive Medicine*, 12 (2), 73-81.
- Marcus, B. H., Banspach, S. W., Lefebvre, R. C., Rossi, J. S., Carleton, R. A., & Abrams, D. B. (1992). Using the stages of change model to increase the adoption of physical activity among community participants. *American Journal of Health Promotion*, 6, 424-429.
- Marcus, B. H., & Simkin, L. R. (1994). The Transtheoretical model: application to exercise behavior. *Medicine and Science in Sports and Exercise*, 26, 1400-1404.
- Marcus, B. H., Williams, D. M., Dubbert, P. M., Sallis, J. F., King, A. C., Yancey, A. K., Franklin, B. A., Buchner, D., Daniels, S. R. & Claytor, R. P. (2006). Physical activity intervention studies: what we know and what we need to know: a scientific statement from the American Heart Association council on nutrition, physical activity, and metabolism (subcommittee on physical activity); council on cardiovascular disease in the young; and the interdisciplinary working group on quality of care and outcomes research. *Circulation*, 114, 2739 – 2752.
- Margret, L., Theism, B., Ashbury, F. D. & Expert Panel. (2001). Workshop report. Physical activity and cancer prevention. (C. E. Matthews: Expert Panel Member) *Chronic Diseases in Canada* , 21 (4), 143-149.

- Marshall, S.J. & Biddle, S. J. H. (2001). The transtheoretical model of behavior change: a meta-analysis of applications to physical activity and exercise. *Annals of Behavioral Medicine, 23* (4), 229–246.
- Martinez, M. E., Giovannucci, E., Spiegelman, D., Hunter, D. J., Willett, W. C., Colditz, G. A. (1997). Leisure-time physical activity, body size, and colon cancer in women. *Journal of the National Cancer Institute, 89* (13), 948-955.
- Mccinnis, K. J., Franklin, B. A., & Rippe, J. M. (2003). Counseling for physical activity in overweight and obese patients. *American Family Physician, 67* (6), 1249-1256.
- Miura, S., Yamaguchi, Y., Urata, H., Himeshima, Y., Otsuka, N., Tomita, S., Yamatsu, K., Nishida, S. & Saku, K. (2004). Efficacy of a multicomponent program (patient-centered assessment and counseling for exercise plus nutrition (PACE+ JAPAN) for lifestyle modification in patients with essential hypertension. *Hypertension Research, 27* (11), 859-864.
- Mora, S., Cook, N., Buring, J. E., Ridker, P. M. & Lee, I.M. (2007). Physical activity and reduced risk of cardiovascular events: potential mediating mechanisms. *Circulation, 116*, 2110-2218.
- Morgan, G. A., & Griego, O. V. (1998). *Easy use and Interpretation of SPSS for Windows: Answering Research Questions with Statistics*. New Jersey: Lawrence Erlbaum Associates, Inc., Publishers.
- Naylor, P. J., Simmonds, G., Riddoch, C., Velleman, G. & Turton, P. (1999). Comparison of stage-matched and unmatched interventions to promote exercise behavior in the primary care setting. *Health Education Research, 14* (5), 653-666.

- Newman, M. A., Pettee, K. K., Storti, K. L., Richardson, C. R., Kuller, L. H., Kriska, A. M. (2009). Monthly variation in physical activity levels in postmenopausal women. *Medicine & Science in Sports & Exercise*, 41 (2), 322-327.
- Nigg, C. R. (2001). Explaining adolescent exercise behavior change: a longitudinal application of the Transtheoretical model. *Annals of Behavioral Medicine*, 23 (1), 11-20.
- Norris, S. L., Grothaus, L. C., Buchner, D. M., & Pratt, M. (2000). Effectiveness of physician-based assessment and counseling for exercise in a staff model HMO. *Preventive Medicine*, 30, 513–523.
- O'Connell, D., & Velicer, W. F. (1988). A decisional balance measure and the stages of change model for weight loss. *The International Journal of the Addictions*, 23 (7), 729-750.
- Oguma, Y., & Tagawa-Shinoda, T. (2004). Physical activity decreases cardiovascular disease risk in women review and meta-analysis. *American Journal of Preventive Medicine*, 26 (5), 407-418.
- Paffenbarger, R. S, Jung, D. L., Leung, R. W., & Hyde, R. T. (1991). Physical activity and hypertension: an epidemiological view. *Annals of Medicine*, 23 (3), 319- 327.
- Paffenbarger, R. S., Wing, A. L., Hyde, R. T., & Jung, D. L. (1983). Physical activity and incidence of hypertension in college alumni. *American Journal of Epidemiology*, 117 (3), 245-257.

- Pate, R. R., Pratt, M., Blair, S. N., Haskell, W. L., Macera, C. A., Bouchard, C., Buchner, D., Ettinger, W., Heath, G. W., King, A. C., Kriska, A. K., Leon, A. S., Marcus, B. H., Morris, J., Paffenbarger, R. S., Patrick, K., Pollock, M. L., Rippe, J. M., Sallis, J., & Wilmore, J. H. (1995). Physical Activity and Public Health - A Recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *JAMA*, 273, 402-407.
- Patrick, K., Sallis, J. F., Long, B., Calfas, K. J., Wooten, W., Heath, G., & Pratt, M. (1994). A new tool for encouraging activity. Project PACE. *The Physician and Sports Medicine*, 22 (11), 45-55.
- Pescatello, L. S., Franklin, B. A., Fagard, R., Farquhar, W. B., Kelley, G. A., & Ray, C. A. (2004). Exercise and hypertension. *Medicine & Science in Sports & Exercise, Position Stand*, 533-553.
- Petrella, R. J., Koval, J. F., Cunningham, D. A., & Paterson, D. H. (2003). Can primary care doctors prescribe exercise to improve fitness? The step test exercise prescription (STEP) project. *American Journal of Preventive Medicine*, 24, 316-322.
- Piani, A.L., & Schoenborn, C. A. (1993). Health Promotion and Disease Prevention: United States, 1990. National Center for Health Statistics. *Vital Health Statistics 10* (185). (DHHS publication: no. (PHS) 93-1513).
- Poon, L. W., Chodzko-Zajko, W. J., & Tomporowski, P. D. (2006). *Active Living, Cognitive Functioning, and Aging*. Human Kinetics.
- Powell, K. E., Thompson, P. D., Caspersen, C. J., & Kendrick, J. S. (1987). Physical activity and the incidence of coronary heart disease. *Annual Review of Public Health*, 8, 253-287.
- Praet, S. F. E., & Van Loon, L. J. C. (2007). Optimizing the therapeutic benefits of exercise in Type 2 diabetes. *Journal of Applied Physiology*, 103, 1113-1120.

- Prince, S., Adamo, K. B., Hamel, M. E., Hardt, J., Gorber, S. C., & Tremblay, M. (2008). A comparison of direct versus self-report measures for assessing physical activity in adults: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 5 (56), 1-24.
- Prochaska, J. O. & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, 51 (3), 390-395.
- Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1993). In search of how people change: applications to addictive behaviors. *Addictions Nursing Network*, 5 (1), 2-16.
- Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how change: applications to addictive behaviours. *American Psychologist*, 47, 1102–1114.
- Prochaska JO, Marcus BH: *The transtheoretical model: Applications to Exercise*. In Dishman; RK (ed), *Advances in Exercise Adherence*. Champaign, IL: Human Kinetics, 194, 161-180.
- Prochaska, J. O. & Velicer, W. F. (1997). Behavior change: The transtheoretical model of health behavior change. *American Journal of Health Promotion*, 12 (1), 38-48.
- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., Fiore, C., Harlow, L.L., Redding, C.A., Rosenbloom, D., & Rossi, S.R. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology*. 13 (1), 39–46.
- Proper, K. I., Koning, M., Beek, A. J., Hildebrandt, V. H., Bosscher, R. J. & Mechelen, W. (2003). The effectiveness of worksite physical activity programs on physical activity, physical fitness, and health. *Clinical Journal of Sport Medicine*. 13 (2), 106-117.



- Proper, K. I., Hildebrandt, V. H., Beek, A. J., Twisk, Jos W. R. & Mechelen, W. (2003). Effect of individual counseling on physical activity fitness and health a randomized controlled trial in a workplace setting. *American Journal of Preventive Medicine*, 24 (3), 218-226.
- Reed, G. R., Velicer, W. F., Prochaska, J. O., Rossi, J. S., & Marcus, B. H. (1997) What makes a good staging algorithm: Example from regular exercise. *American Journal of Health Promotion*, 12, 57-66.
- Riddoch, C. J., Mattocks, C., Deere, K., Saunders, J., Kirkby, J., Tilling, K., Leary, S. D., Blair, S. N. & Ness, A. R. (2007). Objective measurement of levels and patterns of physical activity. *Archives of Disease in Childhood*, 92, 963-969.
- Riemsma, RP., Pattenden, J., Bridle, C., Sowden, AJ., Mather, L., Watt, IS., & Walker, A. (2002). A systematic review of the effectiveness of interventions based on a stages-of-change approach to promote individual behaviour change. *Health Technology Assessment*, 6 No: 24. *REPORT*
- Rippe, J. M. & Hess, S. (1998). The role of physical activity in the prevention and management of obesity. *Journal of the American Dietetic Association*, 98 (supp.2), 31-38.
- Rockhill, B., Willett, W. C., Hunter, D. J., Manson, J. E., Hankinson, S. E., & Colditz, G. A. (1999). A prospective study of recreational physical activity and breast cancer risk. *Archives of Internal Medicine*, 159, 2290-2296.
- Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü. (2004). *Sağlıklı Beslenelim, Kalbimizi Koruyalım Projesi Araştırma Raporu*. Ankara: Sağlık Bakanlığı.
- Salcı, Y., & Koçak, S. (2001). Fiziksel aktivite düzeyini belirlemede yaygın olarak kullanılan anketler. *Gazi Beden Eğitimi ve Spor Bilimleri Dergisi*, 6, (4), 19-28.

- Sherwood, N. E., & Jeffery, R. W. (2000). The behavioral determinants of exercise: Implications for physical activity interventions. *Annual Review of Nutrition, 20*, 21-44.
- Slattery, M., L., Potter, J., Caan, B., Edwards, S., Coates, A., Berry Khe-Ni Ma, & Berry, T. D. (1997). Energy balance and colon cancer - beyond physical activity. *Cancer Research, 57* (1), 75-80.
- Smith, E. L., Gilligan C., McAdam M., Ensign, C. P., & Smith, P. E. (1989). Deterring bone loss by exercise intervention in premenopausal and postmenopausal women. *Calcified Tissue International, 44* (5), 313- 321.
- Sjöström, M, Oja, P., Hagströmer, M., Smith, B. J., & Bauman, A. (2006). Health-enhancing physical activity across European Union countries: the Eurobarometer study. *Journal of Public Health, 14*, 291–300.
- Sparling, P. B., Owen, N., Lambert, E. V., & Haskell, W. L. (2000). Promoting physical activity: the new imperative for public health. *Health Education Research, 15* (3), 367-376.
- Spencer, L., Adams, T. B., Malone, S., Roy, L., & Yost, E. (2006). Applying the transtheoretical model to exercise: a systematic and comprehensive review of the literature. *Health Promotion Practice, 4*, 428-443.
- Spink, K. S., Reeder, B., Chad, K., Wilson, K., & Nickel, D. (2008). Examining physician counselling to promote the adoption of physical activity. *Physician Counselling, 99* (1), 26-30.
- SPSS 15.0 for Windows. Chicago, III: SPSS, Inc., 2007.
- Sundquist, K., Qvist, J., Johansson, S.E., & Sundquist, J. (2005). The long-term effect of physical activity on incidence of coronary heart disease: a 12-year follow-up study. *Preventive Medicine, 41*, 219–225.

- Stevens, W., Hillsdon, M., Thorogood, M., & McArdle, D. (1998). Cost-effectiveness of a primary care based physical activity intervention in 45-74 year old men and women: a randomised controlled trial. *British Journal of Sports Medicine*, 32, 236-241.
- Swinburn, B. A., Walter, L. G., Arroll, B., Tilyard, M. W., & Russell, D. G. (1998). The Green Prescription study: a randomized controlled trial of written exercise advice provided by general practitioners. *American Journal of Public Health*, 88 (2), 288-291.
- Thune, I., Brenn, T., Lund, E., & Gaard, M. (1997). Physical activity and the risk of breast cancer. *The New England Journal of Medicine*, 336 (18), 1269-1275.
- U.S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- U.S. Department of Health and Human Services. (2001). Physical activity trends-United States, 1990-1998. *Centers for Disease Control and Prevention, Weekly Report*, 50 (9), 166-169. Retrieved January 10, 2009, from: <http://www.cdc.gov>
- U.S. Department of Health and Human Services. (2003). Prevalence of physical activity, including lifestyle activities among adults-United States, 2000 - 2001. *Centers for Disease Control and Prevention, Weekly Report*, 52 (32), 764-769. Retrieved January 10, 2009, from: <http://www.cdc.gov>
- Thomas, S., Reading, J., & Shephard, R. J. (1992). Revision of the physical activity readiness questionnaire (PAR-Q). *Canadian Journal of Sport Science*, 17 (4), 338-345.

- Thune, I., Brenn, T., Lund, E., & Gaard, M. (1997). Physical activity and the risk of breast cancer. *The New England Journal of Medicine*, 336 (18), 1269-1275.
- Valanou, E. M., Bamia, C., & Trichopoulou, A. (2006). Methodology of physical-activity and energy-expenditure assessment: a review. *Journal of Public Health*, 14, 58-65.
- Van Sluijs, E. M.F., Van Poppel, M. N. M., Stalman, W. A. B., & Van Mechelen, W. (2004). Feasibility and acceptability of a physical activity promotion programme in general practice. *Family Practice*, 21 (4), 429–436.
- Velicer, W. F., Prochaska, J. O., Bellis, J. M., DiClemente, C. C. , Rossi, J. S., Fava, J.L., & Steiger, J. H. (1993). *Addictive Behaviors*, 18 (3), 269-290.
- Vuori, I. (1995). Exercise and physical health: musculoskeletal health and functional capabilities. *Research Quarterly for Exercise & Sport*, 66 (4), 276-285.
- Wannamethee, S.G., & Shaper, A.G. (2001). Physical activity in the prevention of cardiovascular disease: an epidemiological perspective. *Sports Medicine*, 31 (2), 101-114.
- World Health Organization. (2003) World Health Survey, Turkey. Retrieved January 3, 2009, from <http://www.who.int/infobase/reportviewer.aspx?rptcode=ALL&surveycode=101738a1&dm=21>.

## APPENDIX A

### FİZİKSEL AKTİVİTE DEĞERLENDİRME ANKETİ

Fiziksel aktivite hergün farklılık gösterebilir. Bu nedenle sorulara cevap verirken **‘GENEL OLARAK NE KADAR’** sorusuna cevap aramanız yeterli olacaktır. **Haftada en az 1 kez** olmak üzere, **düzenli** olarak yapmakta olduğunuz aktiviteleri ve bu aktiviteleri **ne zamandan beri** yaptığınızı belirtmeniz, fiziksel aktivite alışkanlığınızı belirlememizi sağlayacaktır. **Zaman ayırıp katıldığınız için teşekkür ederim.**

#### KİŞİSEL BİLGİLER

Adınız Soyadınız: \_\_\_\_\_

Cep Telefonu: \_\_\_\_\_ E-Posta: \_\_\_\_\_

Yaşınız: \_\_\_\_\_ Boyunuz: \_\_\_\_\_ Kilonuz: \_\_\_\_\_

Medeni Durumunuz: Evli  Bekar

Hamile misiniz? Evet  Hayır

Çocuğunuz var mı? Evet  Hayır  Var ise kaç tane: \_\_\_\_\_

En son aldığınız eğitim dereceniz nedir? \_\_\_\_\_

Sigara kullanıyor musunuz? Evet  Hayır  Günde kaç adet: \_\_\_\_\_

Fiziksel aktivite yapmanızı engelleyecek herhangi bir rahatsızlığınız var mı? (Kalp – dolaşım sistemi hastalığı, yüksek tansiyon, diyabet, kanser vb.) \_\_\_\_\_

### FİZİKSEL AKTİVİTE DEĞERLENDİRME ANKETİ

#### İŞ İLE İLGİLİ AKTİVİTELER

Eğer herhangi bir işte çalışmıyorsanız bu bölümü doldurmayınız

1-İşiniz: \_\_\_\_\_

2-Haftada kaç gün çalışıyorsunuz? \_\_\_\_\_ gün

3-Günde kaç saat çalışıyorsunuz? \_\_\_\_\_ saat

4-Günlük çalışma sürenizin kaç saatinde oturuyorsunuz? (Çalışırken ve dinlenirken oturuş süreleri toplanarak yazılacak) \_\_\_\_\_ saat Hiç oturmuyorum

\*\* \*Eğer iş saatlerinizi 2, 3 ve 4. sorularda tanımlayamıyorsanız detaylı olarak açıklayınız:

.....

## ULAŞIM İLE İLGİLİ AKTİVİTELER

Bu bölümde iş, ev, okul, alışveriş, v.b. yerlere ulaşım şeklinizi belirtirken gidiş-dönüş toplamını yazınız.

9- <u>Ulaşım şekli</u>	<u>Haftada</u>	<u>Günde</u>	<u>Kaç aydan beri</u>
	<u>kaç gün</u>	<u>kaç dakika</u>	
Yürüyerek	_____	_____	_____
Araba kullanarak	_____	_____	_____
Oturarak	_____	_____	_____
Ayakta	_____	_____	_____
Diğer (belirtiniz)	_____	_____	_____

## EVDE GEÇİRİLEN ZAMAN İÇERİSİNDEKİ AKTİVİTELER

### Uyku

11-Hafta içi bir günde kaç saat uyuyorsunuz? \_\_\_\_\_ saat

Hafta sonu bir günde kaç saat uyuyorsunuz? \_\_\_\_\_ saat

12- Evde, uyku dışında geçirdiğiniz süre içinde yaptığınız ev işlerini, hafta içi kaç gün ve 1 günde kaç dakika, hafta sonu kaç gün ve 1 günde kaç dakika yaptığınızı belirtin.

<u>Ev işleri</u>	<u>HAFTA İÇİ</u>		<u>HAFTA SONU</u>	
	<u>Haftada</u>	<u>Günde</u>	<u>Haftada</u>	<u>Günde</u>
	<u>kaç gün</u>	<u>kaç dk.</u>	<u>kaç gün</u>	<u>kaç dk.</u>
Temizlik yapma .....	_____	_____	_____	_____
Yemek yapma, masa hazırlama ve toplama	_____	_____	_____	_____
Bulaşık (makineye dizme ve çıkartma veya elde)	_____	_____	_____	_____
Çamaşır (makineye koyma, çıkarıp asma ve katlama)	_____	_____	_____	_____
Ütü yapma .....	_____	_____	_____	_____
Alışveriş .....	_____	_____	_____	_____
Çocuk bakımı .....	_____	_____	_____	_____
Tamirat .....	_____	_____	_____	_____
Diğer (Belirtiniz): .....	_____	_____	_____	_____
Diğer (Belirtiniz): .....	_____	_____	_____	_____
<b>13- Evde oturarak yapılan aktiviteler</b>				
Ders çalışma .....	_____	_____	_____	_____
Bilgisayar kullanma .....	_____	_____	_____	_____
Kitap okuma v.b. ....	_____	_____	_____	_____
Televizyon izleme .....	_____	_____	_____	_____
Diğer (Belirtiniz): .....	_____	_____	_____	_____
Diğer (Belirtiniz): .....	_____	_____	_____	_____

## HOBİ OLARAK YAPILAN AKTİVİTELER

Evde ya da ev dışında düzenli olarak haftada en az bir kez yaptığınız hobileriniz ile ilgili sorulara cevap verirken hafta içi kaç gün ve 1 günde kaç dakika, hafta sonu kaç gün ve 1 günde kaç dakika olduğunu belirtiniz.

	<u>HAFTA İÇİ</u>		<u>HAFTA SONU</u>	
	Haftada kaç gün	Günde kaç dk.	Haftada kaç gün	Günde kaç dk.
Hobileriniz				
Resim yapmak .....	_____	_____	_____	_____
Müzik aleti çalmak .....	_____	_____	_____	_____
Diğer (Belirtiniz): .....	_____	_____	_____	_____

## MERDİVEN ÇIKMA

1 kat merdiven=20 basamak.

Örn: 5. katta oturuyor ve günde 2 kez çıkıyorsanız, (5 katX2 kez) 1 günde 10 kat merdiven çıkıyorsunuz anlamına gelmektedir. Not: Sadece çıktığınız kat sayısını yazınız (indiğinizi yazmayınız).

10-Bir günde kaç kat merdiven çıkıyorsunuz? \_\_\_\_\_ kat

## SPOR AKTİVİTELERİ

Halen düzenli olarak haftada en az bir kere yaptığınız spor aktivitelerini haftada kaç gün, günde kaç dakika ve kaç aydan beri yaptığınızı yazınız ve zorlanma düzeyinizi işaretleyiniz.

Spor dalı	Haftada	Günde	Kaç aydan beri	Zorlanma düzeyi				
	kaç gün	kaç dk.		Hiç	Az	Orta	Çok	Çok fazla
Yürüyüş	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Koşu	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bisiklet	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aerobik-step	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Futbol	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tenis	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Masa tenisi	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diğer (.....)	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diğer (.....)	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diğer (.....)	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## DİĞER AKTİVİTELER

Bu bölümde; düzenli olarak haftada en az bir kez yaptığınız ve herhangi bir bölümde belirtmediğiniz fiziksel aktivite düzeyinizin belirlenmesinde sonucu etkileyecek aktivitelerinizi yazınız.

	<u>HAFTA İÇİ</u>		<u>HAFTA SONU</u>	
	Haftada kaç gün	Günde kaç dk.	Haftada kaç gün	Günde kaç dk.
Diğer aktiviteler				
Diğer (Belirtiniz): .....	_____	_____	_____	_____
Diğer (Belirtiniz): .....	_____	_____	_____	_____

## APPENDIX B

### FİZİKSEL AKTİVİTE HAZIR OLMA DURUMU ANKETİ

(PAR-Q)\*

#### KENDİ BAŞINA UYGULANAN ANKET FORMU

Bu form sizin kendinize yardımcı olmanız amacıyla düzenlenmiştir. Düzenli egzersiz ve sağlık arasındaki ilişki çok açıktır. Eğer hayatınızda fiziksel aktivite durumunuzu artırmak istiyorsanız bu formun doldurulması ilk adım olacaktır.

Birçok insan için fiziksel aktivite herhangi bir probleme veya tehlikeye sebep olmayabilir. Bu form fiziksel aktivitenin uygun olmadığı veya aktivite şiddetine göre tıbbi öneri alması gereken az sayıdaki yetişkinler için hazırlanmıştır.

*Bu soruları cevaplarırken sağduyunuza kulak veriniz. Soruların yanındaki size uygun Evet veya Hayır cevabını dikkatli bir şekilde işaretleyiniz.*

EVET	HAYIR	
<input type="radio"/>	<input type="radio"/>	1. Doktorunuz hiç kalp ile ilgili bir sorunuz olduğunu ve sadece doktor tarafından önerilen egzersizleri yapmanız gerektiğini söyledi mi?
<input type="radio"/>	<input type="radio"/>	2. Fiziksel aktivite sırasında göğsünüzde ağrı hissediyor musunuz?
<input type="radio"/>	<input type="radio"/>	3. Geçen ay fiziksel aktivite yapmadığınız esnada göğsünüzde ağrı hissettiniz mi?
<input type="radio"/>	<input type="radio"/>	4. Baş dönmesi sonucu dengenizi kaybettiğiniz veya bilincinizi yitirdiğiniz oldu mu?
<input type="radio"/>	<input type="radio"/>	5. Kemik veya eklemlerinizde fiziksel aktivitenizi değiştirirken kötüye gidecek bir sorun var mı?
<input type="radio"/>	<input type="radio"/>	6. Doktorunuz yüksek tansiyon veya kalp sorunuz ile ilgili düzenli kullanmanız için ilaç verdi mi?
<input type="radio"/>	<input type="radio"/>	7. Fiziksel aktivite yapmanızı engelleyecek bildiğiniz herhangi bir sorunuz var mı?

**Not:** Eğer soğuk algınlığı veya iyi hissetmeme gibi bir durumunuz var ise egzersiz programınızı erteleyin.

\* “PAR-Q and YOU” nun 1994 yılındaki revize edilmiş versiyonundan adapte edilmiştir. “PAR-Q and YOU” nun hakları Canadian Society for Exercise Physiology’ a aittir.

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## APPENDIX C

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Katılımcı Adı Soyadı

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Tarih



### PACE Skorunuz Nedir?

“Şiddetli” egzersizler şu tip aktiviteleri içerir: hafif tempolu koşu, koşu, hızlı bisiklet kullanma, aerobik egzersizler, egzersiz amaçlı yüzmeye, tenis ve raket sporları. Sizi hafif tempolu koşu kadar zorlayıcı bir çalışma gerektiren ve 20 dakika süren herhangi bir aktivite sayılmalıdır. Bu tip aktiviteler genellikle kalp atışlarınızı hızlandırır, terletir ve nefes alışverişini artırır. (Ağırlık egzersizlerini saymayınız). Düzenli şiddetli egzersizler en az haftanın 3 günü ve günde en az 20 dakika yapılır.

“Orta Şiddetli” egzersizler şu tip aktiviteleri içerir: hızlı yürüyüş, bahçe işleri, yavaş bisiklet sürme, dans etme, eşli tenis ve ağır ev işleri. Sizi hızlı yürüyüş kadar zorlayıcı bir çalışma gerektiren ve en az 10 dakika süren herhangi bir aktivite sayılmalıdır. Düzenli orta şiddetli egzersizler en az haftanın 5 günü ve günde en az 30 dakika yapılır.

#### HALİ HAZIRDAKİ FİZİKSEL AKTİVİTE DURUMU

**Sadece birini işaretleyiniz.**

1. Şu sıralarda düzenli olarak şiddetli veya orta şiddetli egzersiz yapmıyorum ve önümüzdeki 6 ay içinde de başlamayı düşünmüyorum.
2. Şu sıralarda düzenli olarak şiddetli veya orta şiddetli egzersiz yapmıyorum fakat önümüzdeki 6 ay içinde başlamayı düşünüyorum.
3. Düzenli olarak şiddetli veya orta şiddetli egzersiz yapmaya başlamak için çalışıyorum fakat yapamıyorum.
4. Haftada 3 günden az şiddetli egzersiz yapıyorum veya haftada 5 günden az orta şiddette egzersiz yapıyorum.
5. Geçtiğimiz 1 ila 5 ay içinde haftada en az 5 gün 30 dakika orta şiddette egzersiz yapıyorum.
6. Geçtiğimiz 6 ay ve daha fazla süre haftanın 5 veya daha fazla günü günde 30 dakika orta şiddette egzersiz yapıyorum.
7. Geçtiğimiz 1 ila 5 ay arasında haftanın 3 veya daha fazla günü şiddetli egzersiz yapıyorum.
8. Geçtiğimiz 6 ay veya daha uzun zamandır haftanın 3 veya daha fazla günü şiddetli egzersiz yapıyorum.

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## APPENDIX D

### GÖNÜLLÜ KATILIM (BİLGİLENDİRİLMİŞ ONAY) FORMU

**1. ARAŞTIRMANIN ADI:**

Katılımcı merkezli fiziksel aktivite danışmanlığının çalışan kadınların fiziksel aktivite düzeyleri üzerindeki etkinliğinin ölçülmesidir.

**2. ARAŞTIRMACININ ADI SOYADI ve İLETİŞİM BİLGİLERİ:**

Özkan Altun,

Telefon Numarası: 0533 8472054,

Elektronik posta adresi: [sporhocam@gmail.com](mailto:sporhocam@gmail.com)

**3. ARAŞTIRMANIN AMACI:**

Araştırmanın amacı; Türkçe'ye uyarlanan katılımcı merkezli fiziksel aktivite danışmanlığı protokolünün (PACE<sup>®</sup>) çalışan kadınların fiziksel aktivite düzeyleri üzerindeki etkinliğini ölçmektir.

**4. KATILIMCILAR:**

Araştırmada yaklaşık 100 gönüllü katılımcı olacaktır. Araştırmaya katılım kriterleri; 21-65 yaş arasında üniversitede çalışan bayanlar katılabilecektir. PAR-Q anketinde herhangi bir soruya "Evet" cevabı verenler, hamile olanlar, kalp – damar hastalığı olanlar, göğüs ağrısı bulananlar, yüksek tansiyon hastaları ve fiziksel aktivite yaptığında durumu kötüye gidebilecek olanlar çalışmaya alınmayacaktır. Haftanın 5 günü orta şiddette fiziksel aktiviteye katılanlar veya haftanın 3 günü şiddetli aktivite yapanlar çalışmaya alınmayacaktır.

**5. PROSEDÜR:**

Araştırma Özkan Altun tarafından yürütülür ve 6 hafta sürer. Tüm katılımcılar 5 - 10'ar dakika süren 3 adet anketi doldurduktan sonra katılımcılar rastgele denek grubu ya da kontrol grubu olarak belirlenir. Denek grubundaki katılımcılara uzman tarafından yaklaşık 2 ile 5 dakika arasında fiziksel aktivite danışmanlığı verilir ve ayrıca 2 hafta sonra katılımcı telefon ile aranarak bazı sorulara cevap vermesi beklenir. Kontrol grubu katılımcılarına ise danışmanlık verilmeyecektir. 6 hafta sonra tüm katılımcılara 2 anket yeniden uygulanır.

**6. ARAŞTIRMANIN FAYDALARI:**

Tüm katılımcılar fiziksel aktivite hakkında kendi tutum ve davranışlarını daha iyi öğrenirler. Ayrıca fiziksel aktivitenin sağlık üzerindeki olumlu etkileri konusunda bilgilendirilmiş olurlar.

**7. ARAŞTIRMANIN RİSKLERİ:**

Bu araştırmaya katılmanın bilinen bir riski olmamasına rağmen katılımcılara fiziksel aktivite rutinlerinde değişiklik yapmadan önce doktorlarına danışmaları önerilir.

**8. ARAŞTIRMAYA KATILMAMA veya ARAŞTIRMADAN ÇEKİLME:**

Katılım tamamen gönüllüdür. İstedığınız zaman araştırmadan ayrılabilirsiniz. Ayrıca anketlerde yer alan soruların bazılarında cevap vermeyebilirsiniz.

**9. DENEKLERİN GİZLİLİK HAKLARI:**

Sizi tanımak için aldığımız bilgi kayıtları gizli tutulur. Araştırmanın sonuçları yayınlanabilir. Deneklerin kimlik gizliliği korunur ve yayınlarda hiçbir şekilde açıklanmaz. Araştırma ekibi bilgilerinizi gizli tutmak için çaba harcar. Örneğin; hiçbir materyalin üzerine adınızın yazılmamasıyla, katılımcıların adını içeren belgeleri araştırma tamamlandıktan sonra 3 yıl içinde yok ederek ve bu bilgilere araştırmayı yürüten kişiler haricinde ulaşılmasını engelleyerek kimliğinizi gizli tutar.

**Bu bilgilendirme formunu okudum, araştırma ile ilgili sorularımı sordum ve bu araştırmaya katılmaya hazırım.**

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**Katılımcının Adı Soyadı**

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**İmza**

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**Tarih**

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**Araştırmacının Adı Soyadı**

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**İmza**

## APPENDIX E



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Katılımcı Adı Soyadı      Tarih

### SANDALYENİZDEN KALKIN

*Değerlendirme Sonucu = 1*

PACE değerlendirmenizde önümüzdeki 6 ay içinde düzenli olarak fiziksel aktiviteye başlamaya niyetli olmadığınızı belirtmişsiniz. Herkes kendi düzenine göre bazı değişiklikler yapabilir. Fakat PACE ve sağlık uzmanınız sizin fiziksel aktivitenin birçok faydalarını bildiğinizden emin olmak istiyor.

*Fiziksel aktivitenin faydalarını düşünün.* Lütfen fiziksel aktivitenin 10 faydasını sıralayın. Bunları haberlerden görmüş, bir yerlerde okumuş veya arkadaşlarınızdan duymuş olabilirsiniz. Şimdi ve gelecekte kazanabileceğiniz faydaları sıralayınız.

1. -----
2. -----
3. -----
4. -----
5. -----
6. -----
7. -----
8. -----

Eğer 10 fayda sıraladıysanız, mükemmel. Çok iyi bilgilendirilmişsiniz. Fakat fiziksel aktivitenin saydıklarınızdan daha fazla faydası olduğunu biliyor musunuz? Lütfen sayfayı çeviriniz ve fiziksel olarak aktif olduğunuzda elde edebileceğiniz faydaları gözden geçiriniz. Daha önce bilmediğiniz fakat sizin için önemli olan 4 veya daha fazla faydayı yazınız.

1. -----
2. -----
3. -----
4. -----

Tüm bu faydalar nedeniyle doktorlar fiziksel olarak aktif olmanın sağlığınız üzerinde çok önemli etkileri olduğunu farkındadır. Sizin şimdi fiziksel aktiviteye başlamaya hazır olmadığınızı anlıyoruz. Fakat bütün bu faydaların nasıl yardımcı olacağını düşününüz.

*Orta Şiddetli Fiziksel Aktivite hakkında iyi haberler:* Çok terlemeden fiziksel aktivitenin birçok faydası olabileceğini biliyor musunuz? Fiziksel aktivite önerileri değişti. Yeni öneriler herkes tarafından yapılabilir çünkü bunlar orta düzeyde fiziksel aktivitenin günlük olarak yapılmasına yoğunlaşmaktadır. Hafif yürüyüş, bisiklet sürme, bebek arabasını itme ve bahçe çapalama işleri orta şiddette fiziksel aktivitedir. Aktif olmak günlük yaşantınızın angarya yerine eğlenceli kısmı olabilir. Güncel fiziksel aktivite önerisi şu şekildedir:

*“Her birey haftanın birçok ve tercihen her günü günde toplam 30 dakika veya daha fazla orta şiddetli fiziksel aktivite yapmalıdır. Hızlı yürüyüş orta şiddette fiziksel aktivite örneğidir.”*

Bu cümleden 30 dakikalık egzersizin tamamını bir seferde yapmak zorunda olmadığınızı anlayabilirsiniz. Fiziksel aktiviteden fayda sağlamak için özel kıyafetler giymenize, özel ekipmanlar kullanmanıza veya çok fazla para harcamanıza gerek yoktur.

### SADECE DANIŞMAN KULLANIMI İÇİN:

- Danışmanınız olarak sizi fiziksel açıdan daha aktif olmaya teşvik ediyorum. Eğer başlamaya hazırsanız, bir sonraki randevumuzda görüşmek üzere. Tıbbi durumunuz ve sağlık geçmişinize dayanarak en fazla faydayı sağlayacağınız fiziksel aktivite:-----  
-----  
Danışman İmzası:-----

*Danışmanınız fiziksel aktiviteden elde edeceğiniz yararları düşünmeniz konusunda sizi teşvik ediyor.*

*Birçok insan haftanın birkaç günü 30 dakika yürüyerek sağlığını iyileştiriyor.  
Eğer fiziksel aktiviteye nasıl başlayacağınız konusunda bilgi almak istiyorsanız  
doktorunuza danışınız.*

Fiziksel aktivitenin sayısız faydası olduğunu yüzlerce araştırma göstermiştir.  
Fiziksel aktivite vücut sistemlerinin gelişmesine katkıda bulunur ve pek çok zihinsel ve fiziksel rahatsızlık riskini azaltır

<b>FİZİKSEL AKTİVİTENİN FAYDALARI</b>	
<b>Hemen elde edeceğiniz faydalar</b> <ul style="list-style-type: none"><li>• Kan şekerini düzenler</li><li>• Çalışmadan sonra metabolizmayı hızlandırır</li><li>• Zihin sağlığını geliştirir</li><li>• Kendine güveni ve saygıyı geliştirir</li><li>• Kişiyi kendini daha iyi hissettirir</li><li>• Yaşam kalitesini artırır</li><li>• Depresyonu azaltır</li><li>• Öfkeyi azaltır</li><li>• Endişeyi azaltır</li><li>• Stres ile baş etmenize yardımcı olur</li><li>• Yaşamsal fonksiyonları ve enerji kapasitesini geliştirir</li><li>• Uyku düzenini iyileştirir</li><li>• Rahatlamayı sağlar</li><li>• Sigarayı bırakmada yardımcı olur</li><li>• Diyet değişikliklerine yardımcı olur</li><li>• Kas dokularını yeniler</li><li>• Ağrı eşliğinizi artırır</li><li>• Bazı hormonları düzenler</li><li>• Beyne kan akışını iyileştirir</li><li>• Bilişsel faaliyetleri artırır</li><li>• Madde bağımlılığından iyileşmede yardımcı olur</li><li>• Kalori yakar</li></ul>	<b>Uzun vadede elde edeceğiniz faydalar</b> <ul style="list-style-type: none"><li>• Uzun yaşamı destekler. Aktif insanlar 2 yıl daha uzun yaşar</li><li>• Yaşam kalitesini artırır</li><li>• Kalp krizi riskini % 50 azaltır</li><li>• Kan basıncını düşürür</li><li>• Yüksek tansiyon riskini azaltır</li><li>• Trigliserit (kandaki yağ hücreleri) düşürür</li><li>• HDL (iyi) kolesterolü artırır</li><li>• Göğüs kanseri riskini azaltır</li><li>• Kolon kanseri riskini azaltır</li><li>• Prostat kanseri riskini azaltır</li><li>• Diyabet riskini azaltır</li><li>• Bağışıklık sistemi fonksiyonlarını güçlendirir</li><li>• Kilo kontrolü sağlar</li><li>• Kilo vermeye yardımcı olur</li><li>• Yağları yakmada etkindir</li><li>• Tehlikeli karın yağlanmasının azalmasına yardımcı olur</li><li>• Kiloyu korumak için gereklidir</li><li>• Depresyonu önler</li><li>• Endişeyi önler</li><li>• Bağışıklık sistemini güçlendirir</li><li>• Kalbinizi güçlendirir</li><li>• Pıhtılaşma süresini azaltır</li><li>• Yaşlılarda düşmeyi azaltır</li><li>• Osteoporosis riskini azaltır</li><li>• Arterit hastalarının fonksiyonlarını geliştirir.</li></ul>

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## APPENDIX F



### İLK ADIMI PLANLAMA

Değerlendirme sonucu = 2 – 4

Tebrikler. PACE skorunuza göre fiziksel aktivite düzeyinizi arttırmaya hazır olduğunuzu söylediniz. Fiziksel ve zihinsel sağlığınızı geliştirme yönünde büyük bir adım atıyorsunuz. Bu form aktivite programınızı yapmanıza yardımcı olacaktır.

Katılımcı Adı Soyadı

Tarih

Aktif olmaktan kazanacağınız iki önemli fayda nedir? Bunları aşağıya yazmanız aklınızda tutmanızda yardımcı olacaktır.

1. ----- 2. -----

Bu fiziksel aktivite önerilerini inceleyiniz (örnek aktiviteler arkadadır).

- Haftanın 5 ila 7 günü 30 ila 60 dakika arasında orta şiddette fiziksel aktivite yapın.
- Haftanın 3 ila 5 günü 20 ila 40 dakika arasında şiddetli fiziksel aktivite yapın.
- Çoğu hareketsiz insan orta şiddette aktiviteler ile başlamalıdır.

### FİZİKSEL AKTİVİTE PLANI OLUŞTURUN

Bir veya iki aktivite seçin. Eğleniyor musunuz? Ekipmanları, olanakları ve sınıfları karşılayabilecek misiniz? Sizinle beraber bu aktiviteye katılabilecek aileniz veya arkadaşlarınız var mı? Yıl boyunca devam edebilir misiniz? Bir B planı yapın.

Aktivite Tipi: -----

Aktiviteyi nerede yapacaksınız? Bu aktiviteyi evde veya çevrenizde yapabilecek misiniz? Spor salonu, park veya sağlık kulübüne gitmenize gerek var mı?

Aktivite Yeri: -----

Size göre bu aktiviteyi yapmak için en gerçekçi zaman ne zamandır? Diğer aktiviteleri planlamak zorunda mısınız? Acele etmeyin, amacınıza ulaşmaya çalışın.

Aktivite Günleri ve Zamanları -----

Her seferinde bu aktiviteyi ne kadar süre yapmayı planlıyorsunuz? Süreyi, zaman içerisinde yavaş yavaş arttırmalısınız. 5 ila 10 dakika ile başlayın ve 30 ila 60 dakika arasında orta şiddetli veya 20 ila 40 dakika arasında şiddetli aktiviteye yükselin.

Aktivite Süresi: -----

Yeni aktivite programınızda kim size destek veya yardımcı olabilir? Sizinle birlikte çalışacak birini bulmanız idealdir. Birinin sizi desteklemesini veya size yardımcı olmasını isteyebilirsiniz.

Kim size destek olabilir ve nasıl? -----

### SADECE DANIŞMAN KULLANIMI İÇİN:

Sağlık durumunuza göre, danışmanınız sağlığınızı iyileştirmeniz için şunları önermektedir.

- Fiziksel aktivite seviyenizi arttırmadan önce egzersiz testi yaptırmanız gerekir.\*
  - Düzenli yürüyüş programına veya diğer orta şiddetli aktivitelerden birine başlayarak pek çok fayda sağlayabilirsiniz.
  - Eğer koşu gibi şiddetli bir aktivite yapmak istiyorsanız, egzersiz testi yaptırmanız gerekmektedir.\*
  - Orta şiddetli veya şiddetli fiziksel aktivite yapabilirsiniz.
- \* Randevu veya onay için ofisi arayınız.

### ÖNERİLEN PROGRAM (SŞTS)

Sıklık S haftada \_\_\_\_\_ sefer

Şiddet Ş orta şiddetli \_\_\_\_\_ şiddetli \_\_\_\_\_

Tipi T \_\_\_\_\_

Süre S Her seansta \_\_\_\_\_ dakika

Bu fiziksel aktivite planını \_\_\_\_\_ dan

\_\_\_\_\_ kadar uygulama konusunda hemfikirim.

Katılımcı İmzası \_\_\_\_\_

Danışman İmzası \_\_\_\_\_

## AKTİVİTE ÖRNEKLERİ

### Orta Şiddetli

Yürüyüş (evde, işte veya yemek arasında)  
Bahçe işleri (düzenli olarak)  
Tırmanma yürüyüşleri  
Yavaş bisiklet sürme  
Dans etme  
Paten veya tekerlekli paten ile kayma  
Eşli Tenis  
Bebek arabası itme

### ENGELLERİ NASIL AŞABİLİRSİNİZ

#### Engel

- Zamanın yok
- Egzersizden hoşlanmıyorum
- Egzersiz yapmak için kendimi çok yorgun hissediyorum
- Hava çok kötü
- Egzersiz sıkıcı
- Egzersiz yapınca ağrılarım oluyor

### Şiddetli

Tempolu yürüyüş  
Aerobik Dans  
Basketbol  
Hızlı bisiklet sürme  
Kayak  
Egzersiz amaçlı yüzme  
Tenis ve raket sporları  
Futbol

#### Nasıl Aşılabilir

Sadece haftada 3 adet 30 dakikadan söz ediyoruz. Haftada 3 Televizyon dizisi izlemeden yapabilirsiniz. Egzersiz yapmayın. Sizi harekete geçirecek bir oyun ve hobi ile başlayınız. Birçok insanın yaptığı gibi kendinize “Bu egzersiz bana enerji verecek” deyin. Her türlü hava koşullarında evde yapabileceğiniz birçok aktivite vardır. Arkadaşlarınıza danışın. Aktivite sırasında müzik dinlemek sizi meşgul edecektir. Yürüyüş, tırmanma veya koşu egzersizi sırasında pek çok güzellikler görebilirsiniz. Arkadaşınızla aktivite yapın. Başlangıçta fiziksel aktivite sonrası hafif kas ağrısı olması yaygındır. 2 ila 3 gün içinde kaybolacaktır. Yavaş yavaş ilerleyerek bunu aşabilirsiniz.

### AKTİVİTE GÜNLÜĞÜ

Fiziksel aktivitelerinizi takip etmek için bu günlüğü kullanın. Ne kadar süre aktivite yaptığınızı, düşüncelerinizi ve deneyimlerinizi aşağıya yazın. Sizi aktivitenizden alıkoyacak engelleri yazın. Bu form dolduğu zaman kendinize yenisini yapın.

TARİH	AKTİVİTE	SÜRE	DÜŞÜNCE/ÖNERİLER

Önümüzdeki 3 ay içinde düzenli fiziksel aktivite yapma konusunda ne kadar eminsiniz?

Pek emin değilim

Biraz eminim

Kesinlikle eminim

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APPENDIX G

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 _____ Ozkan Altun	<u>28 July 2008</u> _____ Date
 _____ Karen J. Calfas, Ph.D. Santech, Inc.	<u>7/30/08</u> _____ Date